HAZARD RANKING SYSTEM (HRS) PACKAGE
MAGNA METALS
CORTLANDT MANOR, WESTCHESTER COUNTY, NY

EPA ID No.: NYD001394881

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September 2018

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
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HRS DOCUMENTATION RECORD - COVER SHEET

Name of Site: Magna Metals

Date Prepared: September 2018

Contact Persons

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Pathways, Components, or Threats Not Scored

The surface water migration pathway—drinking water threat, the surface water migration pathway—ground water to surface water component, the ground water migration pathway, the soil exposure and subsurface intrusion pathway, and the air migration pathway were not scored because the listing decision is not affected significantly by those pathways, components, or threats. The site score is sufficient to list the site based on the surface water migration pathway—human food chain threat and the surface water migration pathway—environmental threat.

Data indicate that there is an area of soil-gas contamination beneath an active office/warehouse building adjacent to the former Magna Metals building and there is a release to indoor air. Overburden groundwater exists in the form of a very shallow water-bearing unit that is typically less than five feet in thickness; the observed flow direction is to the west [Ref. 15, pp. 7, 121]. The Remedial Investigation (RI) data showed the presence of a groundwater and soil-gas plume containing trichloroethylene (TCE) and other volatile organic compounds (VOC) at the site [Ref. 9, pp. 55–57; 12, pp. 6–13; 15, pp. 110, 113]. During the RI, groundwater samples showed TCE concentrations as high as 4,700 micrograms per liter (µg/L) [Ref. 9, pp. 55, 86–91, 97, 100–101]. The highest concentrations of VOCs in groundwater were detected in the vicinity of Source 1 and the former Magna Metals building [Ref. 15, p. 7]. The results of soil-vapor investigations show that the soil-gas plume contains TCE, cis-1,2-dichloroethylene (DCE) (a TCE breakdown product), and toluene, and it extends beneath the occupied office/warehouse building at the facility [Ref. 47, pp. 6–9, 13, 17; 48, pp. 2, 28–36, 45; 49, pp. 5–11, 16–18, 25; 50, pp. 6–8, 13, 19; 51, pp. 6–8, 12–13, 20]. Soil vapor intrusion into the building has occurred, as shown by elevated levels of TCE in indoor air samples collected from the building [Ref. 50, pp. 7–9, 15–16, 19; 51, pp. 7–9, 15,17, 20]. A sub-slab depressurization system (SSDS) was installed in 2011 so as to mitigate the imminent acute exposure risks to on-site workers [Ref. 52, pp. 6–12]. Post-installation indoor air sampling indicated non-detect levels, and the SSDS is regularly inspected and maintained [Ref. 52, pp. 11–12; 53, pp. 1–6; 54, pp. 1–9]. The continued presence of elevated levels of VOCs in the subsurface remain a concern as the threat posed by the VOCs has only been mitigated and might present future exposure via ingestion, contact, or inhalation [Ref. 15, p. 7].

Subsurface intrusion and ground water to surface water are exposure pathways of concern at the site [Ref. 6, pp. 10–12; 10, p. 84; 51, pp. 7–8], however, these components are not scored because the site already receives a listing-eligible site score based on the surface water migration pathway.

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HRS DOCUMENTATION RECORD

Name of Site:	Magna Metals	Date Prepared:	September 2018
EPA ID No.:	NYD001394881		
EPA Region:	2		
Street Address of Site*:	510 Furnace Dock Road, Cortlandt Manor, NY 10567		
County and State:	Westchester County, New York		
General Location in the State:	Lower Hudson River valley		
Topographic Map:	Mohegan Lake, NY		
Latitude*:	41° 16′ 28.20” North (41.2745°)		
Longitude*:	73° 52′ 13.44″ West (-73.8704°)		
Site Reference Point:	Approximate center of the former Magna Metals building at Source 2		

[**Figures 1 through 5**; Ref. 3, p. 1; 4, p. 1; 5, p. 1; 6, pp. 7, 44]

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, disposed, or placed, or has otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Ground Water[1] Pathway	Not Scored
Surface Water Pathway	100.00
Soil Exposure and Subsurface Intrusion Pathway	Not Scored
Air Pathway	Not Scored
HRS SITE SCORE	50.00

[1] “Ground water” and “groundwater” are synonymous; the spelling is different due to “ground water” being codified as part of the HRS, while “groundwater” is the modern spelling.

WORKSHEET FOR COMPUTING HRS SITE SCORE
MAGNA METALS

	S	S^2
1. Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	Not Scored	
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100.00	10,000.00
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	
2c. Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	100.00	10,000.00
3a. Soil Exposure Component Score (S_{se}) (from Table 5-1, line 22)	Not Scored	
3b. Subsurface Intrusion Component Score (S_{ssi}) (from Table 5-11, line 12)	Not Scored	
3c. Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi}) (from Table 5-11, line 13)	Not Scored	
4. Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	
5. Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$	10,000.00	
6. **HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MAGNA METALS

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	not scored
2b. Runoff	25	not scored
2c. Distance to Surface Water	25	not scored
2d. Potential to Release by Overland Flow (lines 2a [2b + 2c])	500	not scored
3. Potential to Release by Flood		
3a. Containment (Flood)	10	not scored
3b. Flood Frequency	50	not scored
3c. Potential to Release by Flood (lines 3a x 3b)	500	not scored
4. Potential to Release (lines 2d + 3c)	500	not scored
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	*	not scored
7. Hazardous Waste Quantity	*	not scored
8. Waste Characteristics	100	not scored
Targets		
9. Nearest Intake	50	not scored
10. Population		
10a. Level I Concentrations	**	not scored
10b. Level II Concentrations	**	not scored
10c. Potential Contamination	**	not scored
10d. Population (lines 10a + 10b + 10c)	**	not scored
11. Resources	5	not scored
12. Targets (lines 9 + 10d + 11)	**	not scored
13. DRINKING WATER THREAT SCORE ([lines 5 x 8 x 12]/82,500)	100	not scored

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MAGNA METALS

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+08
16. Hazardous Waste Quantity	*	100
17. Waste Characteristics	1,000	320
Targets		
18. Food Chain Individual	50	20
19. Population		
19a. Level I Concentrations	**	0
19b. Level II Concentrations	**	0
19c. Potential Human Food Chain Contamination	**	0.0000003
19d. Population (lines 19a + 19b + 19c)	**	0.0000003
20. Targets (lines 18 + 19d)	**	20.0000003
21. HUMAN FOOD CHAIN THREAT SCORE ([lines 14 x 17 x 20]/82,500)	100	42.66

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
MAGNA METALS

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	MAXIMUM VALUE	VALUE ASSIGNED
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	*	5.00E+08
24. Hazardous Waste Quantity	*	100
25. Waste Characteristics	1,000	320
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0
26b. Level II Concentrations	**	50
26c. Potential Contamination	**	Not scored
26d. Sensitive Environments (lines 26a + 26b + 26c)	**	50
27. Targets (line 26d)	**	50
28. ENVIRONMENTAL THREAT SCORE ([lines 22 x 25 x 27]/82,500)	60	60.00
29. WATERSHED SCORE (lines 13 + 21 + 28)	100	100.00
30. SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE (S_{of})	100	100.00
SURFACE WATER MIGRATION PATHWAY SCORE (S_{sw})	100	100.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable

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6.	New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation. Record of Decision, Magna Metals State Superfund Project, Cortlandt, Westchester County, Site No. 360003. June 2011. [68 pages]
7.	Doty, Jack, NYSDEC. Memorandum to Dave Knowles, Subject: #360003 Magna Metals; with attached invoices from Frontier Chemical Waste Process Inc. January 16, 1981. [7 pages]
8.	Evans, Louis A., NYSDEC, Division of Environmental Enforcement. Letter to Edward S. Wactlar; Blau, Kramer, Wactlar & Lieberman, P.C. Attorneys at Law; Re: ISC Properties, Inc., Order on Consent, Site # 360003 [enclosed]. May 27, 1987. [16 pages]
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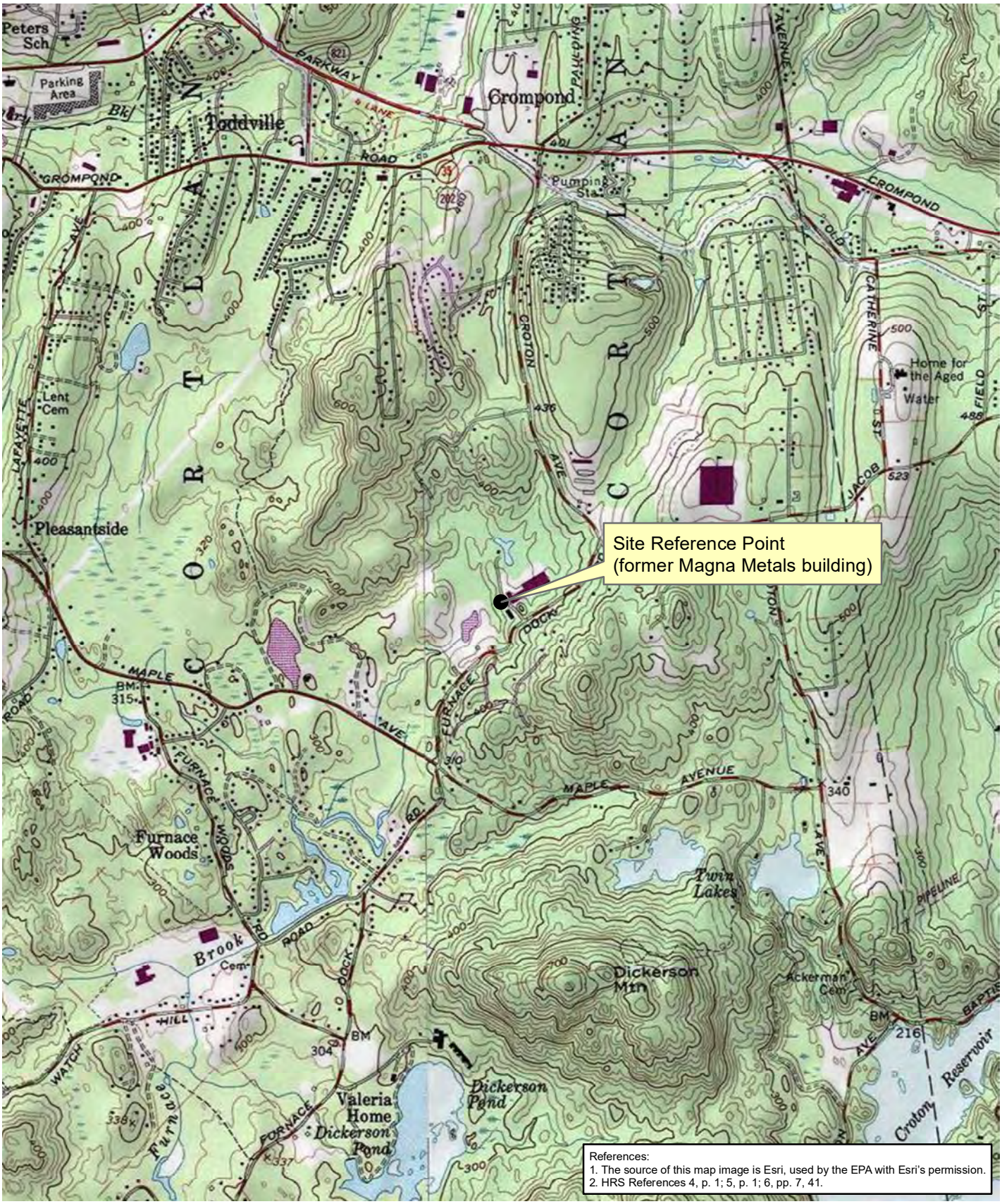
SITE DESCRIPTION

The Magna Metals site as scored for HRS purposes consists of two sources of hazardous substances at the former Magna Metals, Inc. (Magna) facility in Cortlandt Manor, Westchester County, New York, as well as sediment, contaminated with site-attributable hazardous substances as a result of releases from site sources [Ref. 6, pp. 9–12]. Magna was a metal plating facility that operated from 1955 to 1979 [Ref. 6, p. 8]. Historical documents prepared by the property owner and by New York State Department of Environmental Conservation (NYSDEC) document the presence of inorganic constituents, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) in waste materials deposited at the site and the presence of metals in sediment that meet the criteria for observed release [see **Sections 2.2, 4.1.2.1.1**]. For the Magna Metals site, EPA is evaluating the surface water migration pathway, overland/flood migration component—human food chain threat and the surface water migration pathway, overland/flood migration component—environmental threat. The site sources are evaluated as surface impoundments (Source 1) and contaminated soil (Source 2), as further discussed in **Section 2.2**. Sampling and analysis of sediment by NYSDEC documents the presence of several hazardous substances at levels that meet the criteria for observed release [see **Section 4.1.2.1.1**]. A downstream fishery is evaluated as being subject to potential contamination, and wetland frontage greater than 1 mile in length is evaluated as being subject to actual contamination [see **Sections 4.1.3.3 and 4.1.4.3**].

The former Magna facility is located at 510 Furnace Dock Road, Cortlandt Manor, Westchester County, New York; the geographic coordinates of the former building are 41.2745° north latitude, -73.8704° west longitude [Ref. 3, p. 1; 5, p. 1; 6, pp. 7, 41]. Magna conducted metal plating, polishing, and lacquering operations at the facility from 1955 to June 1979 [Ref. 7, p. 1; 8, p. 4; 9, p. 8]. During the course of its operations, Magna installed a series of interconnected settling tanks and leach pits west and northwest of the building for the disposal of industrial and sanitary wastewater into the ground [Ref. 6, pp. 7–8, 43; 7, p. 1; 8, p. 4; 9, pp. 24–26, 210–212]; this former wastewater disposal system is evaluated as Source 1. The former Magna building, which was demolished in 2013, was part of a larger commercial property; other buildings on the property continue to be used for offices, a laboratory, and warehousing [Ref. 5, p. 1; 6, pp. 7, 47–48; 18, pp. 2, 5]. A wetland area, an unnamed tributary to Furnace Brook, and an unnamed pond are located just west-southwest of the former Magna operation, and the surrounding area is primarily residential [Ref. 6, pp. 7, 41, 48]. **Figure 1** presents a Location Map and **Figure 2** presents a Sources Map for the Magna Metals site.

The former wastewater disposal system (i.e., Source 1) at the former Magna facility consists of two rectangular, concrete settling tanks connected to a series of eleven concrete leach pits [Ref. 9, pp. 24, 39]. The leach pits, each approximately 6 feet in diameter, are constructed of cinderblock or of perforated concrete cylinders, emplaced vertically with bottoms open to underlying soil or gravel and with concrete or metal covers [Ref. 9, pp. 24–25, 35, 39]. NYSDEC reports that the leach pits appear to have been constructed with gravel bottoms and gravel packing around the sides to facilitate the percolation of water away from the pits [Ref. 9, p. 25]. The settling tanks and leach pits, including those reportedly used as septic tanks for sanitary waste, are connected by perforated plastic pipes [Ref. 9, pp. 25, 39, 212, 216–217]. During Remedial Investigation (RI) sampling by former property owner ISC Properties, Inc. (ISCP) in 2003, it was discovered that some of the leach pits had been left open to the elements, while others had been covered over with soil; one leach pit was filled with debris and was inaccessible for sampling [Ref. 9, pp. 25–26, 35, 214–216].

During Magna's operation, the company discharged iron, lead, copper, nickel, and zinc chlorides; cyanides; sulfates; waste trichloroethylene (TCE); cooling water from the TCE bath; and floor drain capture to its wastewater disposal system [Ref. 6, pp. 8, 43; 7, p. 1; 9, pp. 8, 24–26, 39, 210–212]. During a water pollution investigation in October 1978, Westchester County Health Department (WCHD) collected four wastewater samples at Magna, including "influent wastewater to industrial disposal system", "overflow or effluent from industrial disposal system", "influent wastewater", and "overflow or effluent wastewater", as well as a sample of ponded liquid near one of the leach pits; the samples were analyzed for pH and metals [Ref. 9, pp. 8–9, 12; 10, pp. 10–12]. The wastewater samples showed pH values from 7.8 to 11.3 and they all contained levels of chromium, copper, cyanide, iron, nickel, and zinc [Ref. 9, p. 12; 10, pp. 10–12]. One of the samples also contained lead above the groundwater standard [Ref. 10, pp. 10–12].



SCALE:

2,000 1,000 0 2,000

Graphic Scale in Feet

TITLE:

Site Location Map
Magna Metals
Cortlandt Manor, New York

PROJECT:

MAGNA METALS

CLIENT NAME:

EPA

WESTON SOLUTIONS

DATE:

August 2018

FIGURE #:

1

P:\SAT2\Magna_Metals\MXD\2018_06\22375_Site_Location_Map.mxd



Legend

Source 1

- Settling Tank
- Leach Pit
- Inferred Leach Pit
- Pipe Connections
- Inferred Piping
- Background Soil Sample Location

Source 2

- Contaminated Soil Sample Location
- Source 2 (contaminated soil) – Total Area = 60154 ft^2
- Delineated Wetlands

SCALE: 150 75 0 150
Graphic Scale in Feet

PROJECT: MAGNA METALS

CLIENT NAME: EPA

TITLE:
Sources Map
Magna Metals
Cortlandt Manor, New York

WESTON SOLUTIONS SM

DATE: August 2018

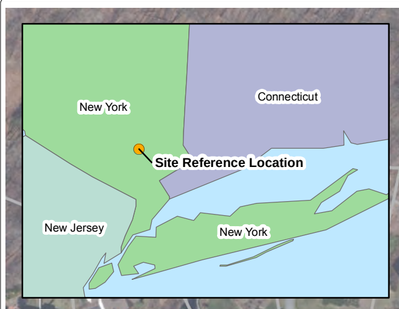
FIGURE #: 2

P:\SAT2\Magna_Metals\MXD\2018_06\22378_Site_Source_Map.mxd

In December 1979, Magna consolidated 49,780 pounds of corrosive liquid waste, which was a combination of potash cleaners, copper cyanide, electroplating cyanide, and waste from some of the leach pits and removed it from the facility; in February 1980, Magna additionally removed drummed waste materials, including waste TCE, contaminated paint thinners, and acids [Ref. 7, pp. 1–7]. Sampling investigations conducted by Magna, NYSDEC, WCHD, and the property owner after the waste removals show the continuing presence of hazardous substances in Source 1 [Ref. 8, pp. 4–5; 9, pp. 8–10, 47–49]. Analytical results for aqueous, soil, and sludge samples collected from various points within the former wastewater disposal system in 1982, 1983, 1984, 1997, and 2003 have indicated the presence of arsenic, benz(a)anthracene, benzo(a)pyrene, cadmium, chromium, chrysene, copper, cyanide, 1,4-dichlorobenzene, cis- and trans-1,2-dichloroethylene (DCE), ethylbenzene, lead, manganese, mercury, 2-methylnaphthalene, nickel, selenium, silver, thallium, trichloroethylene (TCE), vinyl chloride, xylenes, and zinc [Ref. 9, pp. 9–10, 15, 18–23, 47–49, 58–63, 97–98; 10, pp. 26–29, 50–54, 185–192, 278]. During the 2003 leach pit survey and sampling event, sludge ranging up to 1.3 feet thick was found to remain in the leach pits and was underlain by soil at depths of approximately 7 to 8 feet below the pit openings [Ref. 9, p. 35; 11, pp. 4–5].

Sampling investigations also show the presence of contaminated soil at the Magna Metals site, which is evaluated as Source 2. In 1996, 1997, 2003, and 2008, under NYSDEC oversight, the former property owner collected surface and subsurface soil samples in support of the RI at the former Magna facility [Ref. 9, pp. 28–29, 97–98, 264–284; 13, pp. 5–6; 14, p. 1]. The analytical results indicated the presence of arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, and zinc at concentrations significantly above background levels and above NYSDEC-recommended soil cleanup criteria [Ref. 9, pp. 49, 52–55, 79–84, 97–98, 317, 368, 372, 387–389, 411–414, 440, 778–787, 803–805, 808–809]. Soil sampling performed in 2013 and 2015 by NYSDEC in support of a Pre-Design Investigation (PDI) confirms the presence of contaminated soil in Source 2; analytical results show the presence of arsenic, cadmium, chromium, copper, cyanide, lead, nickel, selenium, TCE, xylenes, and zinc at concentrations significantly above background levels [see **Source 2, Section 2.2.2; Ref. 25, 26, 36, 37, 38, 39, 40, and 44 for additional analytical data packages associated with the PDI sampling effort**].

The RI included surface water and sediment sampling; analytical results indicated contamination, and the PDI sediment sampling results from 2013 through 2015 confirm that there is an observed release to surface water from site sources [see **Section 4.1.2.1.1**]. The data document the presence of an extensive zone of contamination along the surface water migration pathway associated with the site, as shown in **Figures 3 and 4**.



BSSB812-0-0.5
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BSSB811-0-0.5
BSSB819-0-0.5
BSSB810-0-0.5
BSSB820-0-0.5
BSSB809-0-0.5
Unnamed Tributary
BSSB808-0-0.5
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BSSB806-0-0.5
BSSB805-0-0.5
BSSB804-0-0.5
WTSD501-0-0.5
WTSD502-0-0.5
PASD601-0-0.5
BRSD706-0-0.5
WTSD521-0-0.5
BRSD704-0-0.5
WTSD520-0-0.5
BRSD710-0-0.5
WTSD519-0-0.5
PASD610-0-0.5
WTSD523-0-0.5
WTSD515-0-0.5
BRSD716-0-0.5
PASD619-0-0.5
PASD620-0-0.5
BRSD722-0-0.5
Unnamed Tributary
Manmade Pond
PASD623-0-0.5
PASD623-0-0.5 D
BRSD752-0-0.5
BRSD752-0-0.5D
BRSD736-0-0.5
BRSD751-0-0.5
BRSD739-0-0.5
BRSD738-0-0.5
BRSD750-0-0.5
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SD805
SD809
SD817
SD822
SD825
SD825 DUP
SD830
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BRSD858-0-0.5
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BRSD857-0-0.5
BRSD854-0-0.5
BRSD846-0-0.5

References:
1. The source of this map image is Esri, used by the EPA with Esri's permission.
2. HRS References 9, pp. 35, 39, 97–98; 17, pp. 6–10; 18, p. 5; 19, pp. 10, 11, 13; 20, p. 6; 68, p. 10

180 90 0 180
Scale in Feet

Legend

- Source 1 (former wastewater disposal system)

Probable Points of Entry (PPE)

- PPE 1
- PPE 2
- Sediment Background Sample Location
- Sediment Observed Release Sample Location
- Tax Parcel Boundaries
- Source 2 (contaminated soil)
- Stream - Outside Zone of Contamination
- Zone of Contamination
- Delineated Wetlands

P:\SAT2\Magna_Metals\MXD\2018_06\22380_Magna_Metals_Sediment_Release.mxd

DRAWING TITLE:
Site Map Showing Observed Release and Zone of Contamination
Magna Metals
Cortlandt Manor, New York

FIGURE: 3
SCALE: 1" = 180'
DATE: August 2018

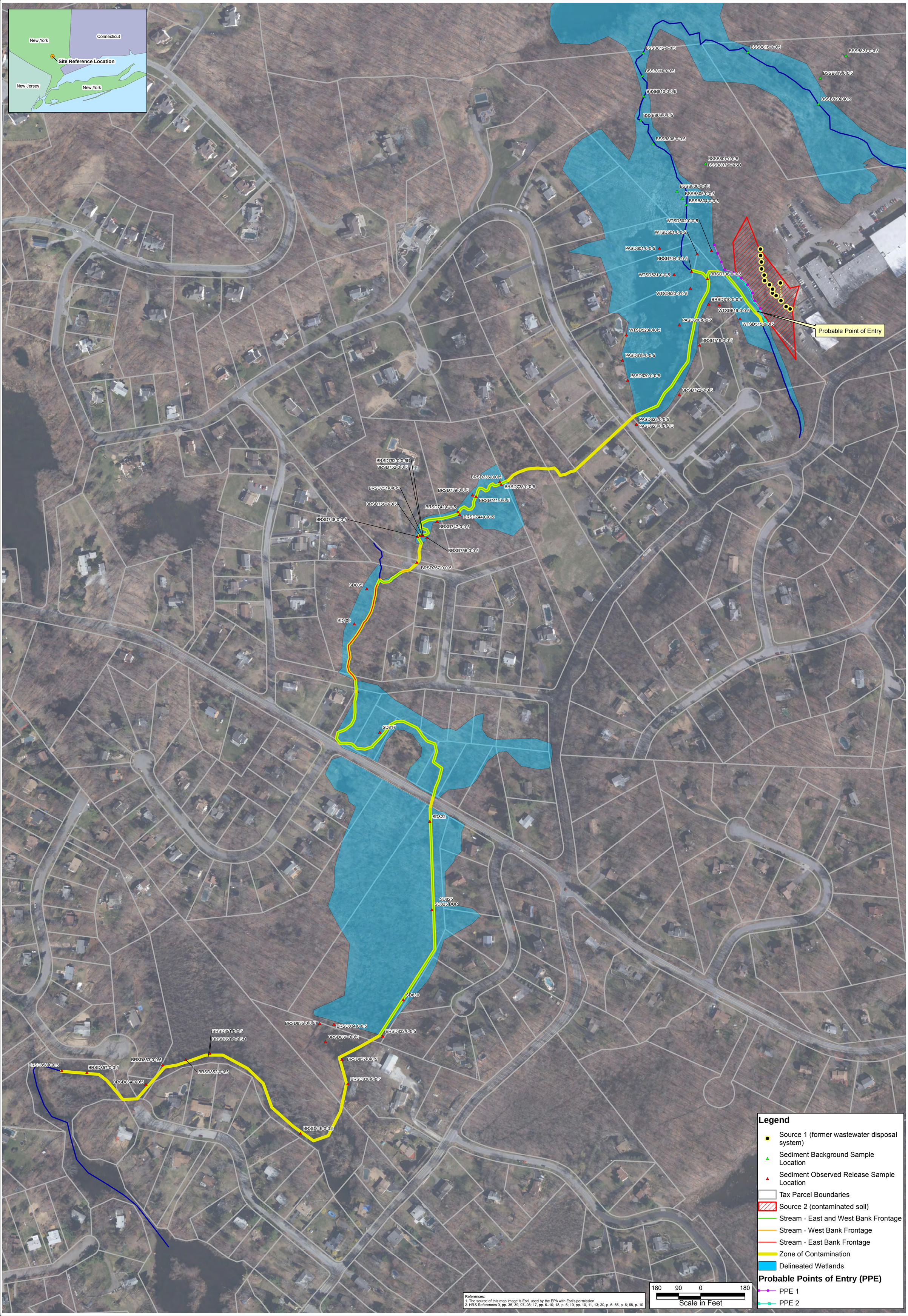
CLIENT NAME: EPA

PROJECT NAME: Magna Metals

N W E S

REPORT DATE: August 2018
PROJECT MANAGER: G. Gilliland
DRAWING: 22380_Magna_Metals_Sediment_Release.mxd
PATH: P:\SAT2\Magna_Metals\MXD\2018_06\
CHECKED BY: G. Gilliland
REVISION No. 0
CONTRACT No.
DELIVERY ORDER NO.
WORK ORDER No. 20408.012.004.0564.00
DRAWN/MODIFIED BY: J. Gardner
DATE CREATED: 6/13/2018

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com



DRAWING TITLE:

Wetland Frontage along
Zone of Contamination
Magna Metals
510 Furnace Dock Rd, Cortlandt Manor, NY

CLIENT NAME: EPA

PROJECT NAME: Magna Metals

N W E S

REPORT DATE: August 2018

PROJECT MANAGER: G. Gilliland

DRAWING: 22383_Magna_Metals_Wetlands_Frontage.mxd

PATH: P:\SAT2\Magna_Metals\MXD\2018_06\

CHECKED BY: G. Gilliland

REVISION No.: 0

CONTRACT No.:

DELIVERY ORDER NO.:

WORK ORDER No.: 20408.012.004.0564.00

DRAWN/MODIFIED BY: K. Heulitt

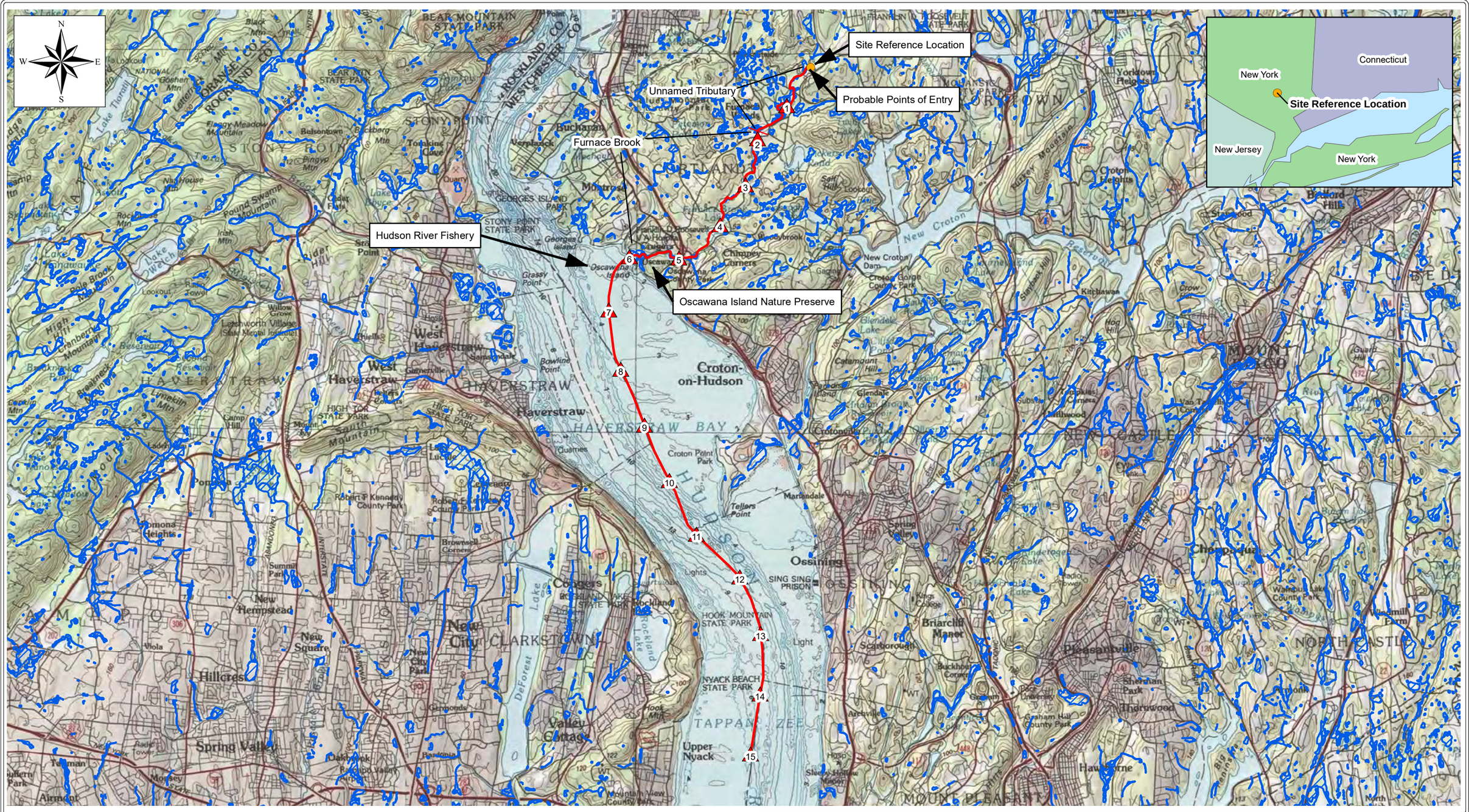
DATE CREATED: 6/13/2018

FIGURE: 4

SCALE: See Above

DATE: August 2018

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com



Legend

- Site Reference Location
- Surface Water Pathway Marker
- Surface Water Pathway
- HRS-Eligible Wetland

References:
1. The source of this map image is Esri, used by the EPA with Esri's permission.
2. National Wetlands Inventory. U.S. Fish & Wildlife Service (US FWS). Acquisition Date: 4/13/2018. https://www.fws.gov/wetlands/Data/Data-Download.html
3. HRS References 5, p. 1; 63, pp. 30, 31, 37; 64, p. 1; 67, pp. 1–2.

SCALE: 8,000 4,000 0 8,000 Feet

PROJECT: Magna Metals

CLIENT NAME: EPA

TITLE: Surface Water Pathway Target Distance Limit Map
Magna Metals
Cortlandt Manor, NY

DATE: August 2018

FIGURE #: 5

P:\SAT2\Magna_Metals\MXD\2018_06\22379_Magna_Metals_SW_Pathway.mxd

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

Number of the source: Source No. 1

Name and description of the source: Former Wastewater Disposal System (settling tanks/leach pits/piping)

Source Type: Surface Impoundment

During the course of its metal plating operations, Magna installed a series of interconnected settling tanks and leach pits west and northwest of the former Magna Metals building for the disposal of industrial and sanitary wastewater into the ground [Ref. 6, pp. 7–8, 42–43; 7, p. 1; 8, p. 4; 9, pp. 24–26, 98, 210–212]. This former wastewater disposal system at the former Magna facility is evaluated as Source 1 (see **Figure 2**). The source consists of two rectangular, concrete settling tanks connected by perforated piping to a series of eleven concrete leach pits [Ref. 9, pp. 24–25, 39, 212]. The leach pits, each approximately 6 feet in diameter, are constructed of cinderblock or of perforated concrete cylinders, emplaced vertically with bottoms open to underlying soil and with concrete or metal covers [Ref. 9, pp. 24–25, 35, 39]. During the RI at the former Magna facility, the investigators observed that the leach pit construction included gravel bottoms and gravel packing around the sides to facilitate the percolation of water away from the pits [Ref. 9, p. 25]. The settling tanks and leach pits, including those reportedly used as septic tanks for sanitary waste, are connected by perforated plastic pipes [Ref. 9, pp. 25, 39, 212, 216–217]. While attempting to locate all components and connections of the system during the RI, investigators encountered an obstruction believed to be another leach pit and were unable to trace the full length of some of the piping [Ref. 9, pp. 24–25, 39]; these features of Source 1 are depicted in **Figure 2** as inferred leach pit or inferred piping, as applicable.

During RI sampling in 2003, it was discovered that some of the leach pits had been left open to the elements, while others had been covered over with soil; one leach pit was filled with debris and was inaccessible for sampling during the RI [Ref. 9, pp. 25–26, 35, 214–216]. NYSDEC performed remedial design sampling in 2013 and 2015 to characterize the full impact of Source 1 on surrounding soils, but continued to find hazardous substances in excess of soil cleanup objectives; Source 1 remains in place awaiting remediation, and continues to pose a threat to the surface water pathway [Ref. 18, pp. 1–3, 5; 19, pp. 2–4, 10].

Source 1 is scored as source type: surface impoundment as this is the primary HRS source type that corresponds to the former wastewater disposal system.

Location of the source, with reference to a map of the site:

Source 1 is located west and northwest of the former Magna Metals building, as shown in **Figures 2 and 3**.

Containment

Release to surface water via overland migration:

There is evidence of hazardous substance migration from Source 1. Historical documentation indicates that overflow from Source 1 and ponded liquid near Source 1 contained high levels of the same metals found within Source 1, and that vegetation in an area downgradient of Source 1 had been adversely affected by the overland waste flow [Ref. 7, p. 1; 9, p. 12]. The leach pits are located within a steep hillside; surface soil contamination in the area downslope of Source 1 provides further evidence of overland flow of contaminants (the soil contamination at the former Magna facility [i.e., Source 2] is primarily associated with Source 1, from both overland flow and subsurface migration of wastewater) [Ref. 6, p. 22; 9, pp. 9, 52–53, 80–81, 97–98; 18, p. 5; 19, p. 10]. Based on the documented evidence of hazardous substance migration via overland flow from the source, a surface water containment factor value for overland migration of 10 is assigned for Source 1 [Ref. 1, Table 4-2].

Release to surface water via flood:

The containment factor value for release to surface water via flood is not evaluated because it does not affect the listing decision.

2.2.2 Hazardous Substances

During Magna's operation, the company reportedly discharged iron, lead, copper, nickel, and zinc chlorides; cyanides; sulfates; waste TCE; cooling water from the TCE bath; and floor drain capture to its wastewater disposal system [Ref. 6, pp. 8, 43; 7, p. 1; 9, pp. 8, 24–26, 39, 210–212]. During a water pollution investigation in October 1978, WCHD collected four wastewater samples at Magna, including "influent wastewater to industrial disposal system", "overflow or effluent from industrial disposal system", "influent wastewater", and "overflow or effluent wastewater", as well as a sample of ponded liquid near one of the leach pits; the samples were analyzed for pH and metals [Ref. 9, pp. 8–9, 12; 10, pp. 10–12]. The wastewater samples showed pH values from 7.8 to 11.3 and they all contained levels of chromium, copper, cyanide, iron, nickel, and zinc that exceeded NYSDEC groundwater standards by one to four orders of magnitude [Ref. 9, p. 12; 10, pp. 10–12]. One of the samples also contained lead above the groundwater standard [Ref. 10, pp. 10–12].

In December 1979 and February 1980, Magna removed waste materials from the former Magna facility, including waste from some of the leach pits [Ref. 7, pp. 1–7]. Sampling investigations conducted by Magna, NYSDEC, WCHD, and the property owner after the waste removals show the continuing presence of hazardous substances in Source 1 [Ref. 8, pp. 4–5; 9, pp. 8–10, 47–49]. Analytical results for aqueous, soil, and sludge samples collected from various points within the former wastewater disposal system in 1982, 1983, 1984, 1997, and 2003 have indicated the presence of arsenic, benz(a)anthracene, benzo(a)pyrene, cadmium, chromium, chrysene, copper, cyanide, 1,4-dichlorobenzene, cis- and trans-1,2-DCE, ethylbenzene, lead, manganese, mercury, 2-methylnaphthalene, nickel, selenium, silver, thallium, TCE, vinyl chloride, xylenes, and zinc [Ref. 9, pp. 9–10, 15, 18–23, 47–49, 58–63, 97–98; 10, pp. 26–29, 50–54, 185–192, 278]. During the 2003 investigation, sludge ranging up to 1.3 feet thick was found to remain in the leach pits and was underlain by soil at depths of approximately 7 to 8 feet below the pit openings [Ref. 9, p. 35]. **Section 2.2.2** provides additional detail regarding the hazardous substances found in Source 1.

The wastewater samples collected by WCHD in October 1978 showed the deposition of wastewater containing high levels of chromium, copper, cyanide, lead, nickel, and zinc into the wastewater disposal system (i.e., into Source 1) [Ref. 9, pp. 8–9, 12]. Sampling investigations conducted by WCHD, NYSDEC, and the property owner after the waste removals show the continuing presence of hazardous substances in Source 1 [Ref. 8, pp. 4–5; 9, pp. 8–10, 47–49]. Analytical results for aqueous, soil, and sludge samples collected from various points within the former wastewater disposal system in 1978, 1982, 1983, 1984, 1997, and 2003 have indicated the presence of several metals, VOCs, and semi-volatile organic compounds (SVOCs) [Ref. 9, pp. 9–10, 15, 18–23, 47–49, 58–63, 97–98; 10, pp. 26–29, 50–54, 185–192, 278], as listed below.

It was discovered during the RI that some leach pits were constructed with gravel bottoms to allow percolation; the 2003 samples characterized as soil were collected from inside the pits directly beneath samples characterized as sludge, but not beneath gravel bottoms [Ref. 9, pp. 25, 27, 35, 202–203]. Therefore, the soil and sludge samples are all considered to represent Source 1 waste material.

TABLE 1. HAZARDOUS SUBSTANCES, SOURCE 1

Hazardous Substance	Evidence	Reference(s)
Arsenic	NYSDEC, 11/16/82: Extract sample R001201 (pit 1 extraction). NYSDEC, 5/15/84: Water sample 05 (distribution tank adjacent to building), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A) and water sample LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, and LP-0A.	9, pp. 9–10, 15, 19–21, 27, 37–39, 47–49, 58, 60–63, 98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278
Benz(a)anthracene	ISCP, July-October 2003: Sludge and soil samples from leach/septic pits LP-05, LP-07, and LP-0A.	9, pp. 27, 35, 37–39, 48–49, 60–62, 98, 430, 804–807

TABLE 1. HAZARDOUS SUBSTANCES, SOURCE 1		
Hazardous Substance	**Evidence**	**Reference(s)**
Benzo(a)pyrene	ISCP, July-October 2003: Sludge and soil samples from leach/septic pits LP-05, LP-07, and LP-0A.	9, pp. 27, 35, 37–39, 48–49, 60–62, 98, 430, 804–807
Cadmium	NYSDEC, 8/19/82 and 11/16/82: Extract samples pit 1 (Water only) and R001203 (pit 5 extraction). NYSDEC, 5/15/84: Sludge samples 06 (leaching pit 4), and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-09, and LP-0A.	9, pp. 9–10, 15, 20, 27, 35, 37–39, 47–49, 58, 60–62, 97–98, 211, 420–421, 424–425, 452, 804–810; 10, pp. 54, 192, 278
Chromium	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system) and 3 (overflow or effluent from industrial disposal system). NYSDEC, 8/19/82 and 11/16/82: Extract sample R001203 (pit 5 extraction). NYSDEC, 5/15/84: Water samples 05 (distribution tank adjacent to building) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06A, LP-09, and LP-0A.	9, pp. 8–10, 12, 15, 19–20, 27, 35, 37–39, 48–49, 60–62, 98, 211, 420–425, 452, 804–810
Chrysene	ISCP, July-October 2003: Sludge and soil samples from leach/septic pits LP-05, LP-07, and LP-0A.	9, pp. 27, 35, 37–39, 48–49, 61–62, 98, 430, 804–807
Copper	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system), 3 (overflow or effluent from industrial disposal system), 4 (influent wastewater), and 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples pit A (Manhole cover, sand), pit 1 (Water only), pit 2 (Soil, sludge), pit 4 (Soil mix), pit 5 (Sand), R001201 (pit 1 extraction), and R001203 (pit 5 extraction). NYSDEC, 5/15/84: Water samples 05 (septic distribution tank) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A), and water samples SP-AQ (septic tank A) and LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, and LP-0A.	9, pp. 8–10, 12, 15, 19–20, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278
Cyanide	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system) 3 (overflow or effluent from industrial disposal system), 4 (influent wastewater), and 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples pit A (Manhole cover, sand), pit 1 (Water only), pit 2 (Soil, sludge), pit 4 (Soil mix), pit 5 (Sand), R001202 (pit 1 extraction), and R001203 (pit 5 extraction). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A), and water samples SP-AQ (septic tank A) and LP-AQ (leach pit G).	9, pp. 8–9, 12, 15; 10, pp. 54, 192, 278

TABLE 1. HAZARDOUS SUBSTANCES, SOURCE 1		
Hazardous Substance	**Evidence**	**Reference(s)**
cis-1,2-DCE	ISCP, 5/14/97: Water sample LP-AQ (leach pit G). ISCP, July-October 2003: Sludge sample from septic tank ST-01.	9, pp. 27, 35, 37–39, 47–49, 58, 416, 805–806; 10, pp. 50, 186, 278
trans-1,2-DCE	NYSDEC, 5/15/84: Water sample 08 (leaching pit A).	9, pp. 10, 22, 24
Lead	WCHD, 10/3/78: Wastewater sample 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples R001201 (pit 1 extraction), R001203 (pit 5 extraction), and R001203EX (pit 5 extraction). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-09, and LP-0A.	9, pp. 8–9, 12, 15, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278
Manganese	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system) 3, (overflow or effluent from industrial disposal system), 4 (influent wastewater), and 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples pit A (Manhole cover, sand), pit 1 (Water only), pit 2 (Soil, sludge), pit 4 (Soil mix), pit 5 (Sand), R001201 (pit 1 extraction), and R001203 (pit 5 extraction). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A), and water samples SP-AQ (septic tank A) and LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, and LP-09.	9, pp. 8–9, 12, 15, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278
Mercury	NYSDEC, 5/15/84: Water sample 08 (leaching pit A). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, and LP-06A.	9, pp. 10, 19, 24, 27, 35, 37–39, 47–49, 59–62, 97–98, 420–426, 452, 804–810; 10, pp. 54, 192, 278
Nickel	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system), 3 (overflow or effluent from industrial disposal system), 4 (influent wastewater), and 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples pit A (Manhole cover, sand), pit 1 (Water only), pit 2 (Soil, sludge), pit 4 (Soil mix), pit 5 (Sand), R001201 (pit 1 extraction), and R001203 (pit 5 extraction). NYSDEC, 5/15/84: Water samples 05 (septic distribution tank) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A), and water samples SP-AQ (septic tank A) and LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, and LP-0A.	9, pp. 8–10, 12, 15, 19–20, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278

TABLE 1. HAZARDOUS SUBSTANCES, SOURCE 1		
Hazardous Substance	**Evidence**	**Reference(s)**
Selenium	NYSDEC, 8/19/82 and 11/16/82: Extract sample R001203 (pit 5 extraction). NYSDEC, 5/15/84: Water samples 05 (septic distribution tank) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A) and water sample SP-AQ (septic tank A). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, and LP-0A.	9, pp. 9–10, 15, 19–21, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278
Silver	NYSDEC, 8/19/82 and 11/16/82: Extract samples R001201 (pit 1 extraction) and R001203 (pit 5 extraction). NYSDEC, 5/15/84: Sludge samples 06 (leaching pit 4), and 07 (leaching pit 2). ISCP, July-October 2003: Sludge sample from leach pit LP-06.	9, pp. 9–10, 15, 20, 27, 35, 38–39, 48–49, 98, 211, 425, 806–808
Thallium	ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-02, LP-06, LP-06A, and LP-07.	9, pp. 27, 35, 38–39, 48–49, 61–62, 98, 421, 425–426, 452, 805–808
TCE	WCHD 3/15/83: Water sample ST (septic tank) and soil sample P2 (Soil-leachate pit 2). NYSDEC, 5/15/84: Water samples 05 (distribution septic tank adjacent to building) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Water sample LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach pits LP-03, LP-06A, and LP-08.	9, pp. 9–10, 18, 22–23, 27, 35, 37–39, 47–49, 58, 97–98, 432, 450, 806–807, 809; 10, pp. 50, 186, 278
Vinyl chloride	ISCP, 5/14/97: Water sample LP-AQ (leach pit G).	10, pp. 50, 186, 278
Xylenes	NYSDEC, 5/15/84: Sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, July-October 2003: Sludge samples from leach/septic pits ST-01 and LP-07.	9, pp. 10, 23, 27, 35, 38–39, 48–49, 62, 98, 211, 417, 432, 805–807
Zinc	WCHD, 10/3/78: Wastewater samples 2 (influent wastewater to industrial disposal system), 3 (overflow or effluent from industrial disposal system), 4 (influent wastewater), and 5 (overflow or effluent wastewater). NYSDEC, 8/19/82 and 11/16/82: Extract samples pit A (Manhole cover, sand), pit 1 (Water only), pit 2 (Soil, sludge), pit 4 (Soil mix), pit 5 (Sand), R001201 (pit 1 extraction), and R001203 (pit 5 extraction). NYSDEC, 5/15/84: Water samples 05 (septic distribution tank) and 08 (leaching pit A), and sludge samples 06 (leaching pit 4) and 07 (leaching pit 2). ISCP, 5/14/97: Sludge sample SP-SL (septic tank A), and water samples SP-AQ (septic tank A) and LP-AQ (leach pit G). ISCP, July-October 2003: Sludge and soil samples from leach/septic pits ST-01, ST-02, LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, and LP-0A.	9, pp. 8–10, 12, 15, 19–20, 27, 35, 37–39, 47–49, 59–63, 97–98, 211, 420–428, 452, 804–810; 10, pp. 54, 192, 278

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Tier A – Hazardous Constituent Quantity

The hazardous constituent quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.1]. There are insufficient historical and current data [manifests, potentially responsible party (PRP) records, State records, permits, waste concentration data, etc.] available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of *Tier B*, Hazardous Wastestream Quantity [Ref 1, Section 2.4.2.1.1].

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Tier B – Hazardous Wastestream Quantity

The hazardous wastestream quantity for Source 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.2]. There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total mass or partial mass of the hazardous wastestreams plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 1 with reasonable confidence. Scoring proceeds to the evaluation of *Tier C*, Volume [Ref. 1, Section 2.4.2.1.2].

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Volume (Tier C)

The volume for Source 1 can be determined based on facility records. Source 1 consists of two rectangular settling tanks, 11 cylindrical leach pits, and perforated piping that connects the structures; the sizes of the settling tanks, piping, and one of the leach pits are unknown, while the ten other leach pits are 6 feet in diameter and at least 7 feet deep [Ref. 9, pp. 24–25, 35]. Using the formula for volume of a cylinder ($V = \pi r^2 h$) and converting to cubic yards ($1\ yd^3 = 27\ ft^3$), the minimum volume of Source 1 is 73.3 yd^3. The source type is "Surface Impoundment", so the volume (V) of the source (73.3 yd^3) is divided by 2.5 to assign a hazardous waste quantity factor to the volume measure [Ref. 1, Section 2.4.2 and Table 2-5]. Based on these calculations, Tier C – Volume is assigned a value of 29.3 for Source 1 [Ref. 1, Section 2.4.2 and Table 2-5].

Volume (V) of source in yd^3 = 73.3
Volume Assigned Value = 73.3/2.5 = 29.3

2.4.2.1.4 Area (Tier D)

As the volume of Source 1 can be determined, an area measure value of 0 is assigned [Ref. 1, Section 2.4.2.1.3].

Area (A) Value: 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is 29.3 for Tier C – Volume [Ref. 1, Section 2.4.2.1.5].

Source Hazardous Waste Quantity Value: 29.3

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

Number of the source: Source No. 2

Name and description of the source: Contaminated Soil

Source Type: Contaminated Soil

Source 2 consists of the contaminated soil found at the former Magna facility, primarily in the area downslope of Source 1, as indicated by the RI sampling activities in 1996, 1997, and 2003, and confirmed by the PDI sampling activities in 2013 and 2015 [**Figure 2**]. The former property owner collected surface and subsurface soil samples in support of the RI; the analytical results indicated the presence of arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, and zinc at concentrations significantly above background levels and above NYSDEC-recommended soil cleanup criteria [Ref. 9, pp. 28–29, 49, 52–55, 79–84, 97–98, 264-268, 273–284, 317, 368, 372, 387–389, 411–414, 440, 778–787, 803–805, 808–809]. The PDI sampling performed by NYSDEC confirms the ongoing presence of contaminated soil; analytical results show the presence of arsenic, cadmium, chromium (total and hexavalent), copper, cyanide, lead, nickel, selenium, TCE, xylenes, and zinc at concentrations significantly above background levels [see **Section 2.2.2** below].

The soil contamination at the former Magna facility (i.e., Source 2) is primarily associated with migration from Source 1, from both overland flow and subsurface migration of wastewater [Ref. 6, p. 22; 9, pp. 9, 52–53, 80–81, 97–98; 18, p. 5; 19, p. 10]. Historical documentation indicates that overflow from Source 1 and ponded liquid near Source 1 contained high levels of the same metals found in Source 2, and that vegetation in an area downslope of Source 1 had been adversely affected by the overland waste flow [Ref. 7, p. 1; 9, p. 12].

Location of the source, with reference to a map of the site:

Source 2 is located west of the former Magna building and within the footprint of the former building, as shown in **Figures 2 and 3**.

Containment

Release to surface water via overland migration:

Contaminated soil is present at the ground surface at some locations and within a foot of the surface at many others (see **Section 2.2.2** below), indicating that there is no engineered cover for Source 2. In addition, Source 2 is in direct contact with an HRS-eligible wetland, constituting an observed release by direct observation (see **Figure 2 and Section 4.1.2.1.1**). Based on the lack of containment features associated with Source 2 and the direct contact of Source 2 with surface water, a surface water containment factor value for overland migration of 10 is assigned for the source [Ref. 1, Table 4-2].

Release to surface water via flood:

The containment factor value for release to surface water via flood is not evaluated because it does not affect the listing decision.

2.2.2 Hazardous Substances

Laboratory analytical results for soil samples collected by NYSDEC in 2013 and 2015 confirm the presence of arsenic, cadmium, chromium, copper, cyanide, lead, nickel, selenium, TCE, xylenes, and zinc at concentrations significantly above background levels in soil at the former Magna facility. Site-specific background levels were established during the RI through the collection and analysis of surface and subsurface soil samples in areas of little or no impact at the facility. Although NYSDEC did not specifically designate background samples during the 2013 and 2015 PDI sampling activities, samples collected at the edges or outside of the main areas of concern show comparable levels to the earlier background samples and are considered to represent background conditions for the sake of comparison (see **Table 2** below).

Although not required for sources, background samples are presented to demonstrate the relative increase of source contaminant levels over background levels. The following tables present the results that document background samples and contaminated samples that exhibit concentrations that are significantly above the associated site-specific background level (i.e., three times greater, or above the quantitation limit if not detected in background samples) [Ref. 1, Section 2.3]. This evaluation differs from previous evaluations of soil contamination, which used NYSDEC-established soil cleanup levels to delineate areas of contamination. The background and contaminated samples were collected during the same timeframe (2013 and 2015), are the same location types (surface soil and soil borings), similar depth intervals, and same analyses; the samples were collected according to state technical guidance [Ref. 16, pp. 9–10, 21, 24–26; 18, pp. 1–5; 19, pp. 1–11]. The predominant soil type at the sample locations is sand [Ref. 9, pp. 42, 264, 284; 18, pp. 6–37; 19, pp. 40–42, 63–89]. The same EPA SW-846 analytical methods were used for analyses of all background and contaminated samples, and included Target Analyte List (TAL) Metals by Methods 6010B/C and 7471/7471A, Cyanide by Method 9014, and VOCs by Method 8260C [Ref. 9, p. 47; 10, p. 49; 29, pp. 1–2; 34, pp. 1–3; 45, pp. 1, 3].

For inorganics, the previous site-specific background results from 1997 and 2003 are included to demonstrate the maximum overall site-specific background level for each hazardous substance. Maximum background level for each hazardous substance is denoted by ***bold italics*** in the background table. All results are presented in milligrams per kilogram (mg/kg) for consistency.

Background Samples

TABLE 2. BACKGROUND SAMPLES, SOURCE 2

Hazardous Substance	Sample ID	Depth (in.)	Sample Date	Result (mg/kg)	RDL/RL (mg/kg)	References
Arsenic (adjustment factor = 1.74)	MMS-SS04-01	0–12	4/11/97	3.1	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	2.9	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	U	0.66	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	1.6 B	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	2.6	1.5	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	***0–2***	***7/29/03***	***4.3***	***1.4***	***9, pp. 53, 82, 98, 413, 803–804***
	MM-SS15-072903	0–2	7/29/03	3.7	1.3	9, pp. 53, 82, 98, 414, 803–804
	RASB304-0-0.5	0–6	11/5/13	1.5 J (2.6)	2.5	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7

TABLE 2. BACKGROUND SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RDL/RL (mg/kg)**	**References**
	RASB305-0-0.5	0–6	11/5/13	1.2 J (2.1)	2.4	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	1.4 J (2.4)	2.7	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	LPSB114-3-4	36–48	3/24/15	2.0 J (3.5)	2.8	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	U	2.7	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
Cadmium (adjustment factor = 1.41)	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	U	0.22	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	U	0.22	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	0.45 J (0.63)	0.76	9, pp. 53, 98, 413, 803–804
	MM-SS14-072903	0–2	7/29/03	0.29 J (0.41)	0.68	9, pp. 53, 98, 413, 803–804
	MM-SS15-072903	0–2	7/29/03	0.16 J (0.23)	0.67	9, pp. 53, 82, 98, 414, 803–804
	RASB301-0-0.5	0–6	11/5/13	0.6	0.26	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	0.45	0.28	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	***12–18***	***11/5/13***	***0.69***	***0.26***	***18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8***
	RASB304-0-0.5	0–6	11/5/13	0.45	0.25	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	48–54	11/5/13	0.21 J (0.30)	0.25	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	0.57	0.24	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	0.36	0.27	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	0.34	0.27	
	LPSB114-3-4	36–48	3/24/15	0.17 J (0.24)	0.28	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	U	0.27	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
Chromium	MMS-SS04-01	0–12	4/11/97	21.1	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	14.1	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	2.2 B	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	6.8	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	19.5	1.5	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	0–2	7/29/03	15.4	1.4	9, pp. 53, 82, 98, 413, 803–804
	MM-SS15-072903	***0–2***	***7/29/03***	***70.5***	***1.3***	***9, pp. 53, 82, 98, 414, 803–804***

TABLE 2. BACKGROUND SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RDL/RL (mg/kg)**	**References**
	RASB301-0-0.5	0–6	11/5/13	68	0.53	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	25	0.55	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	12–18	11/5/13	37	0.53	18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8
	RASB304-0-0.5	0–6	11/5/13	14	0.49	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	48–54	11/5/13	45	0.50	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	11	0.48	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	11	0.55	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	10	0.53	
	LPSB114-3-4	36–48	3/24/15	12	0.57	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	15	0.55	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
Copper (adjustment factor = 1.22)	MMS-SS04-01	0–12	4/11/97	14.8	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	12.8	NR	9, pp. 783–787; 10, pp. 32, 62, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	13.7	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	20.6	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	22.8	3.8	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	0–2	7/29/03	21.2	3.4	9, pp. 53, 82, 98, 413, 803–804
	MM-SS15-072903	0–2	7/29/03	22.4	3.4	9, pp. 53, 82, 98, 414, 803–804
	RASB301-0-0.5	0–6	11/5/13	74 J (90)	0.53	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	37 J (45)	0.55	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	12–18	11/5/13	56 J (68)	0.53	18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8
	RASB304-0-0.5	0–6	11/5/13	26 J (32)	0.49	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	***48–54***	***11/5/13***	***78 J (95)***	***0.50***	***18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8***
	RASB305-0-0.5	0–6	11/5/13	30 J (37)	0.48	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	24 J (29)	0.55	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	22 J (27)	0.53	
	LPSB114-3-4	36–48	3/24/15	19	0.57	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	12	0.55	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30

TABLE 2. BACKGROUND SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RDL/RL (mg/kg)**	**References**
Cyanide	***LPSB114-3-4***	***36–48***	***3/24/15***	***0.44***	***0.35***	***19, pp. 3–4, 10, 40; 42, pp. 35, 118; 45, pp. 1–5, 30***
	LPSB114-4-5	48–60	3/24/15	U	0.51	19, pp. 3–4, 10, 40; 42, pp. 37, 118; 45, pp. 1–5, 30
Lead (adjustment factor = 1.44)	MMS-SS04-01	0–12	4/11/97	12.2	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	18.1	NR	9, pp. 783–787; 10, pp. 32, 62, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	2.2 J (3.2)	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	3.7	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	67.4	0.46	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	***0–2***	***7/29/03***	***91.7***	***0.41***	***9, pp. 53, 82, 98, 413, 803–804***
	MM-SS15-072903	0–2	7/29/03	39.2	0.40	9, pp. 53, 82, 98, 414, 803–804
	RASB301-0-0.5	0–6	11/5/13	14	0.79	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	6.1	0.83	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	12–18	11/5/13	9.9	0.79	18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8
	RASB304-0-0.5	0–6	11/5/13	14	0.74	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	48–54	11/5/13	1.8	0.75	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	30	0.72	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	5.0	0.82	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	5.3	0.80	
	LPSB114-3-4	36–48	3/24/15	11	0.85	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	4.4	0.82	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
Nickel	MMS-SS04-01	0–12	4/11/97	18.8	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	16.2	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	6.7 B	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	15.2	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	17.8	6.1	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	0–2	7/29/03	17.3	5.5	9, pp. 53, 82, 98, 413, 803–804
	MM-SS15-072903	***0–2***	***7/29/03***	***87.5***	***5.4***	***9, pp. 53, 82, 98, 414, 803–804***

TABLE 2. BACKGROUND SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RDL/RL (mg/kg)**	**References**
	RASB301-0-0.5	0–6	11/5/13	59	0.53	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	42	0.55	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	12–18	11/5/13	52	0.53	18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8
	RASB304-0-0.5	0–6	11/5/13	15	0.49	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	48–54	11/5/13	75	0.50	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	17	0.48	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	11	0.55	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	11	0.53	
	LPSB114-3-4	36–48	3/24/15	17	0.57	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	20	0.55	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
Selenium (adjustment factor = 2.38)	MMS-SS04-01	0–12	4/11/97	1.2 J (2.9)	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	1.6 J (3.8)	NR	9, pp. 783–787; 10, pp. 32, 62, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	U	0.89	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	0.9 B	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS14-072903	0–2	7/29/03	1.1	0.68	9, pp. 53, 82, 98, 413, 803–804
	MM-SS15-072903	0–2	7/29/03	0.63 J (1.5)	0.63	9, pp. 53, 82, 98, 414, 803–804
	RASB301-0-0.5	0–6	11/5/13	U	5.3	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	U	2.8	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	***12–18***	***11/5/13***	***U***	***13***	***18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8***
	RASB304-0-0.5	0–6	11/5/13	U	2.5	18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7
	RASB304-4-4.5	48–54	11/5/13	U	2.5	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	U	2.4	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	U	2.7	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	U	2.7	
	LPSB114-3-4	36–48	3/24/15	U	2.8	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	U	2.7	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30
TCE	BDSB406-1-1.5	12–18	11/5/13	U	0.0021	18, pp. 4–5, 11; 30, pp. 35, 80; 34, pp. 1–5, 7

TABLE 2. BACKGROUND SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RDL/RL (mg/kg)**	**References**
	BDSB406D-1-1.5	12–18	11/5/13	U	0.0021	18, pp. 4–5, 11; 30, pp. 39, 39, 80; 34, pp. 1–5, 7
Xylenes, m,p-	BDSB406-1-1.5	12–18	11/5/13	U	0.0041	18, pp. 4–5, 11; 30, pp. 35, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	U	0.0021	18, pp. 4–5, 11; 30, pp. 39, 39, 80; 34, pp. 1–5, 7
Xylene, o-	BDSB406-1-1.5	12–18	11/5/13	U	0.0021	18, pp. 4–5, 11; 30, pp. 35, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	U	0.0021	18, pp. 4–5, 11; 30, pp. 39, 39, 80; 34, pp. 1–5, 7
Zinc (adjustment factor = 1.50)	MMS-SS04-01	0–12	4/11/97	41.1 J (61.6)	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-SS05-01	0–12	4/11/97	34.2 J (51.3)	NR	9, pp. 783–787; 10, pp. 32, 62, 182, 236, 278
	MMS-MW01-01 (MMS-MW1-01)	72–96	11/19/97	11.2 J (16.8)	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MMS-MW01-02	144–168	11/19/97	23.3 J (34.9)	NR	9, pp. 798–802; 10, pp. 32, 65, 159, 256, 278
	MM-SS13-072903	0–2	7/29/03	19.8	3.0	9, pp. 53, 82, 98, 413, 803–804
	MM-SS14-072903	0–2	7/29/03	50.7 J (76.1)	2.7	9, pp. 53, 82, 98, 413, 803–804
	MM-SS15-072903	0–2	7/29/03	44.4 J (66.6)	2.7	9, pp. 53, 82, 98, 414, 803–804
	RASB301-0-0.5	0–6	11/5/13	66	1.1	18, pp. 3, 5, 25; 30, pp. 52, 81; 34, pp. 1–5, 8
	RASB302-0-0.5	0–6	11/5/13	65	1.1	18, pp. 3, 5, 26; 30, pp. 48, 81; 34, pp. 1–5, 8
	RASB303-1-1.5	12–18	11/5/13	72	1.1	18, pp. 3, 5, 27; 30, pp. 50, 81; 34, pp. 1–5, 8
	RASB304-0-0.5	***0–6***	***11/5/13***	***280***	***0.98***	***18, pp. 3, 5, 28; 30, pp. 44, 81; 34, pp. 1–5, 7***
	RASB304-4-4.5	48–54	11/5/13	12	0.99	18, pp. 3, 5, 28; 30, pp. 46, 81; 34, pp. 1–5, 8
	RASB305-0-0.5	0–6	11/5/13	130	0.96	18, pp. 3, 5, 29; 30, pp. 42, 80; 34, pp. 1–5, 7
	BDSB406-1-1.5	12–18	11/5/13	32	1.1	18, pp. 4–5, 11; 30, pp. 36, 40, 80; 34, pp. 1–5, 7
	BDSB406D-1-1.5	12–18	11/5/13	35	1.1	
	LPSB114-3-4	36–48	3/24/15	40	1.1	19, pp. 3–4, 10, 40; 42, pp. 34, 118; 45, pp. 1–5, 30
	LPSB114-4-5	48–60	3/24/15	26	1.1	19, pp. 3–4, 10, 40; 42, pp. 36, 118; 45, pp. 1–5, 30

RDL/RL = Reporting detection limit/Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 9, p. 47; 10, p. 49; 30, p. 73; 34, p. 5; 42, p. 115; 45, p. 5].

NR = The value is not reported in the available documentation.

B = The analyte value is less than the required method detection limit but greater than the instrument detection limit [Ref. 10, p. 185].

J = The reported value is estimated [Ref. 10, p. 185]. These estimated results have been adjusted up to account for potential low or unknown bias in the background samples per EPA Quick Reference Fact Sheet *Using Qualified Data*

to Document an Observed Release and Observed Contamination; the adjustment factors are provided in the table and the adjusted results are shown in parentheses [Ref. 46, pp. 5–8, 18].
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit [Ref. 34, p. 5; 45, p. 5].

Contaminated Samples

The results listed here are significantly above background levels (i.e., equal to three times or greater than the maximum background levels; or equal to or greater than the quantitation limit where the maximum background is non-detect) and are considered to represent the minimum extent of contaminated soil at the former Magna facility.

TABLE 3. CONTAMINATED SAMPLES, SOURCE 2

Hazardous Substance	Sample ID	Depth (in.)	Sample Date	Result (mg/kg)	RL (mg/kg)	References
Arsenic (adjustment factor = 1.74)	BDSB404-1-1.5	12–18	11/5/13	110 J (63.2)	2.9	18, pp. 4–5, 9; 30, pp. 32, 80; 34, pp. 1–5, 7
	LPSB112-12.5-13	150–156	11/6/13	19	2.4	18, pp. 3, 5, 23; 32, pp. 24, 107; 34, pp. 1–5, 11
	LPSB113-9-9.5	108–114	11/6/13	25 J (14)	2.6	18, pp. 3, 5, 24; 31, pp. 13, 98; 34, pp. 1–5, 9
	UASB209-1-1.5	12–18	11/8/13	21	3.9	18, pp. 3, 5, 36; 33, pp. 38, 157; 34, pp. 1–5, 13
Cadmium	LPSB101-6.5-7	78–84	11/8/13	2.6	0.29	18, pp. 3, 5, 12; 33, pp. 19, 157; 34, pp. 1–5, 13
Chromium	LPSB105-7.5-8	90–96	11/7/13	300	0.56	18, pp. 3, 5, 16; 32, pp. 40, 107; 34, pp. 1–5, 11
	LPSB111-6.5-7	78–84	11/6/13	230	0.53	18, pp. 3, 5, 22; 31, pp. 24, 98; 34, pp. 1–5, 9
	UASB218-1-2	12–24	2/6/15	270	0.54	19, pp. 4, 10, 77; 35, pp. 26, 59; 45, pp. 1–5, 8
	UASB218-2-3	24–36	2/6/15	350	0.57	19, pp. 4, 10, 77; 35, pp. 28, 60; 45, pp. 1–5, 8
	UASB218-3-4	36–48	2/6/15	260	0.51	19, pp. 4, 10, 77; 35, pp. 30, 60; 45, pp. 1–5, 8
	UASB218-7-8	84–96	2/6/15	310	0.50	19, pp. 4, 10, 77; 35, pp. 32, 60; 45, pp. 1–5, 8
	UASB219-1-2	12–24	2/6/15	280	0.55	19, pp. 4, 11, 78; 35, pp. 36, 60; 45, pp. 1–5, 8
	UASB219-4-5	48–60	2/6/15	290	0.58	19, pp. 4, 11, 78; 35, pp. 38, 60; 45, pp. 1–5, 8
	UASB219-4-5-1	48–60	2/6/15	320	0.55	19, pp. 4, 11, 78; 35, pp. 40, 60; 45, pp. 1–5, 9
	UASB219-5-6	60–72	2/6/15	280	0.53	19, pp. 4, 11, 78; 35, pp. 42, 60; 45, pp. 1–5, 9
	UASB219-6-7	72–84	2/6/15	290	0.58	19, pp. 4, 11, 78; 35, pp. 44, 60; 45, pp. 1–5, 9
	UASB219-7-7.5	84–90	2/6/15	330	0.59	19, pp. 4, 11, 78; 35, pp. 46, 60; 45, pp. 1–5, 9
	UASB220-15-16	180–192	3/25/15	360	0.58	19, pp. 4, 11, 79; 42, pp. 96, 121; 45, pp. 1–5, 34
	UASB224-18-19	216–228	3/25/15	240	0.61	19, pp. 4, 10, 83; 42, pp. 70, 119; 45, pp. 1–5, 32
Copper (adjustment factor = 1.22)	BDSB404-1-1.5	12–18	11/5/13	2,900 J (2,377)	0.58	18, pp. 4–5, 9; 30, pp. 32, 80; 34, pp. 1–5, 7
	BDSB405-1-1.5	12–18	11/5/13	1,200 J (984)	0.53	18, pp. 4–5, 10; 30, pp. 20, 80; 34, pp. 1–5, 7

TABLE 3. CONTAMINATED SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RL (mg/kg)**	**References**
	BDSB405-6-6.5	72–78	11/5/13	520 J (426)	0.56	18, pp. 4–5, 10; 30, pp. 24, 80; 34, pp. 1–5, 7
	LPSB101-6.5-7	78–84	11/8/13	850	0.58	18, pp. 3, 5, 12; 33, pp. 19, 157; 34, pp. 1–5, 13
	LPSB102-9-9.5	108–114	11/7/13	5,300	0.7	18, pp. 3, 5, 13; 32, pp. 56, 108; 34, pp. 1–5, 12
	LPSB110-0-0.5	0–6	11/6/13	520 J (426)	0.54	18, pp. 3, 5, 21; 31, pp. 28, 98; 34, pp. 1–5, 9
	LPSB113-9-9.5	108–114	11/6/13	520 J (426)	0.52	18, pp. 3, 5, 24; 31, pp. 13, 98; 34, pp. 1–5, 9
	UASB203-0-0.5	0–6	11/8/13	570	0.62	18, pp. 3, 5, 30; 33, pp. 98, 159; 34, pp. 1–5, 15
	UASB203-1-1.5	12–18	11/8/13	480	0.62	18, pp. 3, 5, 30; 33, pp. 102, 159; 34, pp. 1–5, 15
	UASB209-0-0.5	0–6	11/8/13	680	0.76	18, pp. 3, 5, 36; 33, pp. 34, 157; 34, pp. 1–5, 13
	UASB209-1-1.5	12–18	11/8/13	1,400	0.77	18, pp. 3, 5, 36; 33, pp. 38, 157; 34, pp. 1–5, 13
	UASB210-0-0.5	0–6	11/8/13	510	0.71	18, pp. 3, 5, 37; 33, pp. 23, 157; 34, pp. 1–5, 13
	UASB210-1-1.5	12–18	11/8/13	690	0.59	18, pp. 3, 5, 37; 33, pp. 27, 157; 34, pp. 1–5, 13
	UASB211-4-5	48–60	2/24/15	370	0.53	19, pp. 4, 11, 71; 41, pp. 29, 60; 45, pp. 1–5, 23
	UASB228-2-2.5	24–30	2/4/15	770	0.66	19, pp. 3–4, 10, 40; 35, pp. 14, 59; 45, pp. 1–5, 7
Cyanide	UASB214-3-3.8	36–45.6	2/24/15	2.5	0.37	19, pp. 4, 11, 73; 41, pp. 20, 59; 45, pp. 1–5, 22
	UASB222-6-6.5	72–78	3/23/15	1.8	0.51	19, pp. 4, 10, 81; 42, pp. 15, 117; 45, pp. 1–5, 29
	UASB228-2-2.5	24–30	2/4/15	3.8	0.52	19, pp. 4, 11, 86; 35, pp. 15, 59; 45, pp. 1–5, 7
	UASB228-7.5-8	90–96	2/4/15	3.4	0.39	19, pp. 4, 11, 86; 35, pp. 17, 59; 45, pp. 1–5, 7
Lead	LPSB101-6.5-7	78–84	11/8/13	640	0.87	18, pp. 3, 5, 12; 33, pp. 19, 157; 34, pp. 1–5, 13
	LPSB102-9-9.5	108–114	11/7/13	430	1.0	18, pp. 3, 5, 13; 32, pp. 56, 108; 34, pp. 1–5, 12
Nickel	BDSB404-1-1.5	12–18	11/5/13	1,000	0.58	18, pp. 4–5, 9; 30, pp. 32, 80; 34, pp. 1–5, 7
	LPSB105-7.5-8	90–96	11/7/13	400	0.56	18, pp. 3, 5, 16; 32, pp. 40, 107; 34, pp. 1–5, 11
	UASB209-1-1.5	12–18	11/8/13	450	0.77	18, pp. 3, 5, 36; 33, pp. 38, 157; 34, pp. 1–5, 13
	UASB210-1-1.5	12–18	11/8/13	280	0.59	18, pp. 3, 5, 37; 33, pp. 27, 157; 34, pp. 1–5, 13
	UASB218-0-1	0–12	2/6/15	280	0.62	19, pp. 4, 10, 77; 35, pp. 24, 59; 45, pp. 1–5, 8
	UASB218-1-2	12–24	2/6/15	660	0.54	19, pp. 4, 10, 77; 35, pp. 26, 59; 45, pp. 1–5, 8

TABLE 3. CONTAMINATED SAMPLES, SOURCE 2						
Hazardous Substance	**Sample ID**	**Depth (in.)**	**Sample Date**	**Result (mg/kg)**	**RL (mg/kg)**	**References**
	UASB218-2-3	24–36	2/6/15	670	0.57	19, pp. 4, 10, 77; 35, pp. 28, 60; 45, pp. 1–5, 8
	UASB218-3-4	36–48	2/6/15	580	0.51	19, pp. 4, 10, 77; 35, pp. 30, 60; 45, pp. 1–5, 8
	UASB218-7-8	84–96	2/6/15	710	0.50	19, pp. 4, 10, 77; 35, pp. 32, 60; 45, pp. 1–5, 8
	UASB218-8-9	96–108	2/6/15	450	0.53	19, pp. 4, 10, 77; 35, pp. 34, 60; 45, pp. 1–5, 8
	UASB219-1-2	12–24	2/6/15	400	0.55	19, pp. 4, 11, 78; 35, pp. 36, 60; 45, pp. 1–5, 8
	UASB219-4-5	48–60	2/6/15	730	0.58	19, pp. 4, 11, 78; 35, pp. 38, 60; 45, pp. 1–5, 8
	UASB219-4-5-1	48–60	2/6/15	690	0.55	19, pp. 4, 11, 78; 35, pp. 40, 60; 45, pp. 1–5, 9
	UASB219-5-6	60–72	2/6/15	710	0.53	19, pp. 4, 11, 78; 35, pp. 42, 60; 45, pp. 1–5, 9
	UASB219-6-7	72–84	2/6/15	660	0.58	19, pp. 4, 11, 78; 35, pp. 44, 60; 45, pp. 1–5, 9
	UASB219-7-7.5	84–90	2/6/15	650	0.59	19, pp. 4, 11, 78; 35, pp. 46, 60; 45, pp. 1–5, 9
	UASB220-15-16	180–192	3/25/15	300	0.58	19, pp. 4, 11, 79; 42, pp. 96, 121; 45, pp. 1–5, 34
	UASB224-18-19	216–228	3/25/15	450	0.61	19, pp. 4, 11, 83; 42, pp. 70, 119; 45, pp. 1–5, 32
	UASB230-4-5	48–60	3/24/15	410	0.54	19, pp. 4, 11, 88; 42, pp. 48, 118; 45, pp. 1–5, 31
Selenium	BDSB405-1-1.5	12–18	11/5/13	220	2.7	18, pp. 4–5, 10; 30, pp. 20, 80; 34, pp. 1–5, 7
	UASB209-1-1.5	12–18	11/8/13	19	3.9	18, pp. 3, 5, 36; 33, pp. 38, 157; 34, pp. 1–5, 13
	UASB228-2-2.5	24–30	2/4/15	40	3.3	19, pp. 3–4, 10, 40; 35, pp. 14, 59; 45, pp. 1–5, 7
TCE	BDSB403-1-1.5	12–18	11/5/13	0.040	0.0022	18, pp. 4–5, 8; 30, pp. 27, 80; 34, pp. 1–5, 7
	BDSB404-1-1.5	12–18	11/5/13	0.0053	0.0022	18, pp. 4–5, 9; 30, pp. 31, 80; 34, pp. 1–5, 7
Xylenes, m,p-	LPSB102-9-9.5	108–114	11/7/13	3.6	0.44	18, pp. 3, 5, 13; 32, pp. 55, 108; 34, pp. 1–5, 12
	LPSB105-7.5-8	90–96	11/7/13	0.017	0.0043	18, pp. 3, 5, 16; 32, pp. 39, 107; 34, pp. 1–5, 11
Xylene, o-	LPSB102-9-9.5	108–114	11/7/13	1.5	0.22	18, pp. 3, 5, 13; 32, pp. 55, 108; 34, pp. 1–5, 12
	LPSB105-7.5-8	90–96	11/7/13	0.0097	0.0021	18, pp. 3, 5, 16; 32, pp. 39, 107; 34, pp. 1–5, 11
Zinc	BDSB404-1-1.5	12–18	11/5/13	890	1.2	18, pp. 4–5, 9; 30, pp. 32, 80; 34, pp. 1–5, 7
	LPSB101-6.5-7	78–84	11/8/13	920	1.2	18, pp. 3, 5, 12; 33, pp. 19, 157; 34, pp. 1–5, 13
	LPSB102-9-9.5	108–114	11/7/13	8,700	14	18, pp. 3, 5, 13; 32, pp. 56, 108; 34, pp. 1–5, 12

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 30, p. 73; 31, p. 91; 32, p. 98; 33, p. 150; 34, p. 5; 35, p. 57; 41, p. 57; 42, p. 115; 45, p. 5].
J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 34, p. 5]. These estimated results have been adjusted down to account for possible high bias in the contaminated samples, per EPA Quick Reference Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination*; the adjustment factors are provided in the table and the adjusted results are shown in parentheses [Ref. 46, pp. 5–8, 18].

2.4.2 Hazardous Waste Quantity

2.4.2.1.1 Tier A – Hazardous Constituent Quantity

The hazardous constituent quantity for Source 2 could not be adequately determined according to the HRS requirements; that is, the total mass of all Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.1]. There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 2 with reasonable confidence. As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of *Tier B,* Hazardous Wastestream Quantity [Ref 1, Section 2.4.2.1.1].

Hazardous Constituent Quantity (C) Value: NS

2.4.2.1.2 Tier B – Hazardous Wastestream Quantity

The hazardous wastestream quantity for Source 2 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.2]. There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total mass or partial mass of the hazardous wastestreams plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source 2 with reasonable confidence. Scoring proceeds to the evaluation of *Tier C*, Volume [Ref. 1, Section 2.4.2.1.2].

Hazardous Wastestream Quantity (W) Value: NS

2.4.2.1.3 Tier C – Volume

Sampling and analytical results show that soil at the former Magna facility is contaminated with metals and VOCs (see **Sections 2.2.1 and 2.2.2**). However, the volume of contaminated soil is unknown. Therefore, the volume of the source is assigned a value of 0 [Ref. 1, Section 2.4.2.1.3].

Volume (V) Assigned Value: 0

2.4.2.1.4 Tier D – Area

Sampling and analytical results show that soil at the former Magna facility is contaminated with metals and VOCs (see **Sections 2.2.1** and **2.2.2**). The soil contamination surrounds Source 1 and is associated with overland flow and subsurface migration of contaminated wastewater from that source [Ref. 6, p. 22; 9, pp. 9, 52–53, 80–81, 97–98; 18, p. 5; 19, p. 10]. The area of contaminated soil as documented according to HRS criteria is approximately 60,154 square feet (ft^2) [**Figure 2**]. The source type is "Contaminated Soil", so the area value is divided by 34,000 to obtain the assigned value shown below [Ref. 1, Section 2.4.2.1.4].

Dimensions of source = 60,154 ft^2
Area (A) Assigned Value: 60,154/34,000 = 1.77

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 2 is 1.77 for Tier D – Area [Ref. 1, Section 2.4.2.1].

Source Hazardous Waste Quantity Value: 1.77

SITE SUMMARY OF SOURCE DESCRIPTIONS

TABLE 4. HAZARDOUS WASTE QUANTITY AND CONTAINMENT

Source Number	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Air	
				Gas	Particulate
1	29.3	NS	10	NS	NS
2	1.77	NS	10	NS	NS

NS = Not Scored

Other Possible Sources

No other possible sources at the site have been identified.

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/Flood Component

Topography across the former Magna facility is fairly steep from east to west [Ref. 9, p. 42]. The nearest surface water body is the large wetland complex to the west and northwest of site sources, which includes broad-leaf deciduous forest, emergent communities, perennial streams, ponds, and small ponded areas [Ref. 9, p. 104]. Sources 1 and 2 at the site are located just upslope (i.e., east) of this freshwater wetland complex, and stormwater drainage flows west with the topography, from the source areas into the wetlands and streams [Ref. 6, p. 12; 9, p. 42]. Historical documentation indicates that overflow from Source 1 and ponded liquid near Source 1 contained high levels of the same metals found in Source 1, and that vegetation in an area downgradient of Source 1 had been adversely affected by the overland waste flow [Ref. 7, p. 1; 9, p. 12]. Surface soil contamination in the area downslope of Source 1 provides further evidence of overland flow of contaminants (the soil contamination at the former Magna facility [i.e., Source 2] is primarily associated with Source 1, from both overland flow and subsurface migration of wastewater) [Ref. 6, p. 22; 9, pp. 9, 52–53, 80–81, 97–98; 18, p. 5; 19, p. 10]. The overland flow appears to have resulted in a probable point of entry (PPE) line (i.e., PPE1) into the wetlands from Source 1; the overland distance to the nearest point of PPE1 is approximately 60 feet. Source 2 intersects the wetland area, forming a PPE line (i.e., PPE2) that overlaps the Source 1 PPE and extends further south; the overland distance to PPE2 is 0 feet or negligible. See **Figures 2 and 3** for depictions of the PPEs with respect to the Source 1 and 2 locations.

The wetlands where the PPEs are located are palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands (PFO1C) and palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetlands (PFO1E); they are contiguous to two small streams that converge within the wetland complex [Ref. 9, pp. 104, 134, 194; 56, pp. 2, 7, 11]. One stream (approximately 1.5 feet wide and 6 inches deep) flows northerly into the wetland complex and enters the southerly-flowing stream (approximately 3 feet wide and 6–8 inches deep); the merged stream flows southwesterly through wetlands and a manmade pond (i.e., impounded reach) [Ref. 9, pp. 104–105, 194; 56, pp. 2, 8, 11]. The small, unnamed tributary stream flows through a culvert at the southwest edge of the pond, beneath Cross Road and private property, and resurfaces to the southwest [Ref. 9, pp. 104, 118, 194; 56, p. 11]. It flows for a total of approximately 1.8 miles from the PPEs to the main branch of Furnace Brook, which in turn flows for approximately 5 miles to its terminus at the Hudson River; there are several ponds or ponded areas along the tributary and along Furnace Brook between the former Magna facility and the Hudson River [Ref. 55, pp. 1–3; 57, p. 4; 68, p. 6]. The unnamed tributaries and Furnace Brook are fresh water streams that have contiguous fresh water wetlands [Ref. 9, pp. 104, 122, 130, 170, 194; 55, pp. 7–8]. The target distance limit (TDL) for the site is completed in the Hudson River approximately 8 miles downstream of Furnace Brook [Ref. 55, p. 3; **Figure 5**]. The Hudson River is a large river with an average flow greater than 22,000 cubic feet per second (cfs), and the portion of the river within the TDL is tidal [Ref. 60, p. 1]. The salt water/fresh water interface moves through the area and salinity of the river fluctuates with the tides, however, it is generally brackish or saline in the lower Hudson River near Cortlandt Manor [Ref. 61, pp. 1–11; 62, pp. 9–12].

The RI included surface water and sediment sampling; analytical results indicated contamination, and the PDI sediment sampling results from 2013 through 2015 confirm that there is an observed release to surface water from site sources; the release affects the stream, wetlands, and pond that are located adjacent to the sources at the site [see **Section 4.1.2.1.1**]. Targets within the surface water TDL include approximately 1.5 miles of freshwater wetland frontage along the zone of contamination, a downstream fishery used for recreation and consumption in the Hudson River, eagle habitat along the Hudson River, and other sensitive environmental areas such as the Oscawana Island Nature Preserve located at the mouth of Furnace Brook [Ref. 56, pp. 3, 6; 58, p. 6; 63, p. 31; 64, p. 2; 67, pp. 1–2].

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

An observed release to surface water is documented by direct observation and by chemical analysis.

Observed Release by Direct Observation

Source 2 is in direct contact with an HRS-eligible wetland (see **Figure 2**), constituting an observed release by direct observation. Soil samples UASB210-0-0.5 and UASB210-1-1.5, collected within Source 2 along the eastern edge of the wetland, contain copper at concentrations that significantly exceed background levels; sample UASB210-1-1.5 also contains nickel at a concentration that meets the criteria for significance above background (see **Source 2, Section 2.2.2**). Therefore, source material that contains one or more site-attributable hazardous substances is known to be in direct contact with surface water and there is an observed release by direct observation [Ref. 1, Section 4.1.2.1.1].

Observed Release by Chemical Analysis

The sediment sampling and analysis by NYSDEC documents an observed release by chemical analysis of arsenic, cadmium, chromium, copper, and nickel along the surface water migration pathway from the PPE to NYSDEC sediment sampling location BRSD858, approximately 1.5 miles (almost 8,000 feet) downstream [**Figure 3**; see **Tables 5 and 6** below]. This zone of contamination affects approximately 1.5 miles of wetland frontage [**Figure 3**].

The sediment samples that document background and observed release conditions were collected by the NYSDEC PDI investigation team between March 2013 and March 2015 [Ref. 17, pp. 1–10; 20, pp. 1–37; 69, pp. 2192–2194]. (Although subsurface sampling shows the presence of elevated levels of site-related hazardous substances throughout the adjacent stream, wetlands, and pond, these data are not considered in the evaluation of observed release due to the lack of subsurface background samples for comparison [Ref. 17, pp. 2–8].) The background and observed release samples all were collected from the 0- to 6-inch depth interval, and they were analyzed for metals according to SW-846 Method 6010C [Ref. 17, pp. 1–10; 20, pp. 1–37; 45, pp. 1-5; 69, pp. 4–5, 2192–2194]. All the samples were collected from downstream locations in the wetland complex to the west of site sources and downstream areas (see **Table 9** for the specific surface water body for each sample). The analytical results show the presence of arsenic, cadmium, chromium, copper, and nickel at concentrations significantly above background. **Tables 5** presents the results that demonstrate background conditions and **Table 6** presents the results that meet observed release criteria.

To show that the increase in contaminant concentrations are not due to any of the differences between background and release sediment sample characteristics, release concentrations are compared to the maximum reported background concentration in the observed release evaluation. Estimated concentrations (flagged "J") used in the observed release evaluation were adjusted per EPA Quick Reference Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination* to account for possible bias in the analytical results; estimated background results were multiplied by adjustment factors to account for possible low bias, and estimated release concentrations were divided by adjustment factors to account for possible high bias [Ref. 46, pp. 5–8, 18]. The HRS significant increase criteria were verified in consideration of the projected adjustments, which are shown in parentheses after reported results in the background and observed release tables below.

TABLE 5. BACKGROUND SEDIMENT SAMPLE CONCENTRATIONS (mg/kg)

Field Sample ID	Lab Sample ID	Sample Date	Arsenic		Cadmium		Chromium		Copper		Nickel		References
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
BSSB804-0-0.5	13E0231-09	5/7/13	U	3.0	U	0.49	***41***	0.42	***35 J (43)***	1.3	70 J (95)	0.40	17, pp. 1–3, 10; 28, pp. 23, 46; 29, pp. 1–4, 24
BSSB805-0-0.5	13E0231-07	5/7/13	U	1.3	U	0.21	7.7	0.18	4.4 J (5.4)	0.54	15 J (20)	0.17	17, pp. 1–3, 10; 28, pp. 19, 46; 29, pp. 1–4, 24
BSSB806-0-0.5	13E0231-08	5/7/13	U	1.3	U	0.22	10	0.19	4.9 J (6.0)	0.57	15 J (20)	0.18	17, pp. 1–3, 10; 28, pp. 21, 46; 29, pp. 1–4, 24
BSSB807-0-0.5	13E0231-05	5/7/13	2.2	1.4	U	0.23	35	0.20	10 J (12)	0.60	26 J (35)	0.19	17, pp. 1–3, 10; 28, pp. 15, 46; 29, pp. 1–4, 24
BSSB807-0-0.5D	13E0231-06	5/7/13	***2.4***	1.5	U	0.25	34	0.21	10 J (12)	0.64	25 J (34)	0.20	17, pp. 1–3, 10; 28, pp. 17, 46; 29, pp. 1–4, 24
BSSB808-0-0.5	13E0231-10	5/7/13	U	1.1	U	0.18	28	0.15	7.8 J (9.5)	0.46	38 J (51)	0.15	17, pp. 1–3, 10; 28, pp. 25, 46; 29, pp. 1–4, 24
BSSB809-0-0.5	13E0231-11	5/7/13	U	1.1	U	0.18	30	0.16	7.3 J (8.9)	0.48	***110 J (149)***	0.15	17, pp. 1–3, 10; 28, pp. 27, 47; 29, pp. 1–4, 24
BSSB810-0-0.5	13E0231-12	5/7/13	U	1.1	U	0.19	16	0.16	8.4 J (10)	0.48	40 J (54)	0.15	17, pp. 1–3, 10; 28, pp. 29, 47; 29, pp. 1–4, 24
BSSB811-0-0.5	13E0231-13	5/7/13	U	1.1	U	0.19	8.5	0.16	4.1 J (5.0)	0.48	30 J (41)	0.15	17, pp. 1–3, 10; 28, pp. 31, 47; 29, pp. 1–4, 25
BSSB812-0-0.5	13E0231-14	5/7/13	U	1.0	U	0.17	7.2	0.14	6.6 J (8.1)	0.44	8.8 J (12)	0.14	17, pp. 1–3, 10; 28, pp. 33, 47; 29, pp. 1–4, 25
BSSB816-0-0.5	13E0231-01	5/7/13	U	1.1	***0.39***	0.18	8.6	0.15	5.4 J (6.6)	0.47	12 J (16)	0.15	17, pp. 1–3, 10; 28, pp. 5, 46; 29, pp. 1–4, 24
BSSB819-0-0.5	13E0231-03	5/7/13	U	1.9	U	0.31	23	0.26	27 J (33)	0.80	17 J (23)	0.25	17, pp. 1–3, 10; 28, pp. 9, 46; 29, pp. 1–4, 24
BSSB820-0-0.5	13E0231-02	5/7/13	U	1.2	U	0.19	16	0.16	18 J (22)	0.49	14 J (19)	0.16	17, pp. 1–3, 10; 28, pp. 7, 46; 29, pp. 1–4, 24
BSSB821-0-0.5	13E0231-04	5/7/13	U	1.3	U	0.21	4.5	0.18	4.1 J (5.0)	0.54	4.1 J (5.5)	0.17	17, pp. 1–3, 10; 28, pp. 11, 46; 29, pp. 1–4, 24

mg/kg = milligrams per kilogram.

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 28, p. 43; 29, p. 4].

U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit [Ref. 29, p. 4].

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted up to account for possible low bias in the background samples, per EPA Quick Reference Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 29, pp. 1–4; 46, pp. 5–8, 18].

TABLE 6. OBSERVED RELEASE SEDIMENT CONCENTRATIONS (mg/kg) – Page 1 of 4

Field Sample ID	Lab Sample ID	Sample Date	Arsenic		Cadmium		Chromium		Copper		Nickel		References
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
Maximum Background Level			***2.4***	1.5	***0.39***	0.18	***41***	0.42	***35 J (43)***	1.3	***110 J (149)***	0.15	17, pp. 1–3, 10; 28, pp. 5–33, 46–47; 29, pp. 1–4, 24–25
WTSD501-0-0.5	13C0854-13	3/22/13	---		---		---		590	2.9	---		17, pp. 1–3, 6; 23, pp. 30, 96; 29, pp. 1–4, 12
WTSD502-0-0.5	13C0854-12	3/22/13	---		---		---		380	3.8	---		17, pp. 1–3, 6; 23, pp. 28, 96; 29, pp. 1–4, 12
WTSD515-0-0.5	13C0680-22	3/21/13	---		---		180 J (140)	1.9	---		---		17, pp. 1–3, 6; 22, pp. 49, 62; 29, pp. 1–4, 11
WTSD519-0-0.5	13C0680-17	3/21/13	19	3.9	1.6	0.39	270	0.78	---		---		17, pp. 1–3, 6; 22, pp. 39, 61; 29, pp. 1–4, 11
WTSD520-0-0.5	13C0613-14	3/19/13	---		1.8	1.3	---		220 J (180)	2.7	---		17, pp. 1–3, 7; 21, pp. 36, 102; 29, pp. 1–4, 7
WTSD521-0-0.5	13C0613-17	3/19/13	---		1.9 J (1.3)	1.4	---		500 J (410)	2.8	---		17, pp. 1–3, 7; 21, pp. 43, 102; 29, pp. 1–4, 7
WTSD523-0-0.5	13C0680-12	3/21/13	---		---		---		130	0.97	---		17, pp. 1–3, 7; 22, pp. 29, 61; 29, pp. 1–4, 11
PASD601-0-0.5	13C0613-05	3/19/13	---		1.9 J (1.3)	1.2	---		220 J (180)	2.4	---		17, pp. 1–3, 7; 21, pp. 16, 101; 29, pp. 1–4, 6
PASD610-0-0-5	13C0950-31	3/28/13	---		3.2 J (2.3)	1.6	---		330 J (270)	3.3	---		17, pp. 1–3, 7; 24, pp. 70, 171; 29, pp. 1–4, 17
PASD619-0-0.5	13C0680-18	3/21/13	100	6.4	3.2	0.64	140	1.3	260	1.3	---		17, pp. 1–3, 7; 22, pp. 41, 61; 29, pp. 1–4, 11
PASD620-0-0.5	13C0613-32	3/18/13	---		---		210	0.72	---		---		17, pp. 1–3, 7; 21, pp. 74, 104; 29, pp. 1–4, 8
PASD623-0-0.5	13C0680-10	3/21/13	---		---		190	0.62	690	0.62	640	0.62	17, pp. 1–3, 7; 22, pp. 25, 60; 29, pp. 1–4, 10
PASD623-0-0.5 D	13C0680-11	3/21/13	---		---		170	0.57	650	0.57	720	0.57	17, pp. 1–3, 7; 22, pp. 2, 27, 61; 29, pp. 1–4

mg/kg = milligrams per kilogram.

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 21, p. 99; 22, p. 58; 23, p. 93; 24, p. 166; 28, p. 43; 29, p. 4].

--- = Result does not meet observed release criteria.

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted down to account for possible high bias in the release samples, per EPA Quick Reference Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 29, pp. 1–4; 46, pp. 5–8, 18].

TABLE 6. OBSERVED RELEASE SEDIMENT CONCENTRATIONS (mg/kg) – Page 2 of 4													
Field Sample ID	**Lab Sample ID**	**Sample Date**	**Arsenic**		**Cadmium**		**Chromium**		**Copper**		**Nickel**		**References**
			Result	**RL**	**Result**	**RL**	**Result**	**RL**	**Result**	**RL**	**Result**	**RL**	
Maximum Background Level			***2.4***	1.5	***0.39***	0.18	***41***	0.42	***35 J (43)***	1.3	***110 J (149)***	0.15	17, pp. 1–3, 10; 28, pp. 5–33, 46–47; 29, pp. 1–4, 24–25
BRSD704-0-0.5	13C0950-58	3/28/13	---		---		---		300 J (246)	2.7	---		17, pp. 1–3, 8; 24, pp. 124, 173; 29, pp. 1–4, 19
BRSD706-0-0.5	13C0950-50	3/28/13	---		---		---		140	1.6	---		17, pp. 1–3, 8; 24, pp. 108, 172; 29, pp. 1–4, 18
BRSD710-0-0.5	13C0680-16	3/21/13	---		---		140	0.66	---		---		17, pp. 1–3, 8; 22, pp. 37, 61; 29, pp. 1–4, 11
BRSD716-0-0.5	13C0680-14	3/21/13	---		---		170	0.63	---		---		17, pp. 1–3, 8; 22, pp. 33, 61; 29, pp. 1–4, 11
BRSD722-0-0.5	13C0613-26	3/18/13	---		---		160	0.59	---		---		17, pp. 1–3, 8; 21, pp. 62, 103; 29, pp. 1–4, 8
BRSD736-0-0.5	13E0068-01	4/30/13	---		---		150	0.94	970 J (795)	0.94	---		17, pp. 1–3, 9; 27, pp. 7, 70; 29, pp. 1–4, 22
BRSD738-0-0.5	13E0068-03	4/30/13	---		---		---		270 J (221)	0.58	---		17, pp. 1–3, 9; 27, pp. 11, 70; 29, pp. 1–4, 22
BRSD739-0-0.5	13E0068-04	4/30/13	---		---		170	0.95	1300 J (1066)	0.95	---		17, pp. 1–3, 9; 27, pp. 13, 70; 29, pp. 1–4, 22
BRSD741-0-0.5	13E0068-06	4/30/13	---		---		---		180 J (148)	0.88	---		17, pp. 1–3, 9; 27, pp. 17, 70; 29, pp. 1–4, 22
BRSD742-0-0.5	13E0068-07	4/30/13	---		---		---		170 J (139)	0.79	---		17, pp. 1–3, 9; 27, pp. 19, 70; 29, pp. 1–4, 22
BRSD744-0-0.5	13E0068-09	4/30/13	---		1.2	0.49	140	0.98	240 J (197)	0.98	---		17, pp. 1–3, 9; 27, pp. 23, 70; 29, pp. 1–4, 22
BRSD747-0-0.5	13E0068-12	4/30/13	---		---		---		180 J (148)	1.0	---		17, pp. 1–3, 9; 27, pp. 29, 71; 29, pp. 1–4, 22
BRSD748-0-0.5	13E0068-13	4/30/13	---		---		---		190 J (156)	0.99	---		17, pp. 1–3, 9; 27, pp. 31, 71; 29, pp. 1–4, 22

mg/kg = milligrams per kilogram.

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 21, p. 99; 22, p. 58; 24, p. 166; 27, p. 67; 28, p. 43; 29, p. 4].

--- = Result does not meet observed release criteria.

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted down to account for possible high or unknown bias in the release samples, per EPA Quick Reference Fact Sheet *Using Qualified Data to Document and Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 29, pp. 1–4; 46, pp. 5–8, 18].

TABLE 6. OBSERVED RELEASE SEDIMENT CONCENTRATIONS (mg/kg) – Page 3 of 4

Field Sample ID	Lab Sample ID	Sample Date	Arsenic		Cadmium		Chromium		Copper		Nickel		References
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
Maximum Background Level			***2.4***	1.5	***0.39***	0.18	***41***	0.42	***35 J (43)***	1.3	***110 J (149)***	0.15	17, pp. 1–3, 10; 28, pp. 5–33, 46–47; 29, pp. 1–4, 24–25
BRSD750-0-0.5	13E0068-15	4/30/13	---		---		---		240 J (197)	0.83	---		17, pp. 1–3, 9; 27, pp. 37, 71; 29, pp. 1–4, 23
BRSD751-0-0.5	13E0068-16	4/30/13	---		---		---		170 J (139)	1.0	---		17, pp. 1–3, 9; 27, pp. 39, 71; 29, pp. 1–4, 23
BRSD752-0-0.5	13E0068-17	4/30/13	---		---		140	0.91	---		---		17, pp. 1–3, 9; 27, pp. 41, 71; 29, pp. 1–4, 23
BRSD752-0-0.5D	13E0068-18	4/30/13	---		1.3	0.44	130	0.88	---		---		17, pp. 1–3, 9; 27, pp. 43, 71; 29, pp. 1–4, 23
BRSD756-0-0.5	13E0068-22	4/30/13	---		1.3	0.53	170	1.1	190 J (156)	1.1	---		17, pp. 1–3, 9; 27, pp. 51, 72; 29, pp. 1–4, 23
BRSD757-0-0.5	13E0068-23	4/30/13	---		---		---		160 J (131)	1.1	---		17, pp. 1–3, 9; 27, pp. 53, 72; 29, pp. 1–4, 23
SD805	480-49854-5	11/8/13	---		---		---		414	1.3	---		68, p. 10; 69, pp. 5, 9, 38, 2192–2194
SD809	480-49854-9	11/8/13	---		---		---		617	1.3	---		68, p. 10; 69, pp. 5, 11, 42, 2192–2194
SD817	480-49854-17	11/7/13	---		---		---		132	1.3	---		68, p. 10; 69, pp. 5, 15, 50, 2192–2194
SD822	480-49854-22	11/7/13	---		---		---		144	1.2	---		68, p. 10; 69, pp. 5, 20, 55, 2192–2194
SD825	480-49854-25	11/7/13	---		---		---		267	1.3	---		68, p. 10; 69, pp. 5, 23, 58, 2192–2194
SD825 DUP	480-49854-34	11/7/13	---		---		---		314	1.4	---		68, p. 10; 69, pp. 5, 30, 2192–2194
SD830	480-49854-30	11/7/13	---		---		---		426	1.3	---		68, p. 10; 69, pp. 5, 28, 2192–2194

mg/kg = milligrams per kilogram.

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 27, p. 67; 28, p. 43; 29, p. 4; 69, p. 4].

--- = Result does not meet observed release criteria.

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted down to account for possible high bias in the release samples, per EPA Quick Reference Fact Sheet *Using Qualified Data to Document an Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 29, pp. 1–4; 46, pp. 5–8, 18].

TABLE 6. OBSERVED RELEASE SEDIMENT CONCENTRATIONS (mg/kg) – Page 4 of 4

Field Sample ID	Lab Sample ID	Sample Date	Arsenic		Cadmium		Chromium		Copper		Nickel		References
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	
Maximum Background Level			***2.4***	1.5	***0.39***	0.18	***41***	0.42	***35 J (43)***	1.3	***110 J (149)***	0.15	17, pp. 1–3, 10; 28, pp. 5–33, 46–47; 29, pp. 1–4, 24–25
BRSD832-0-0.5	15C0559-18	3/12/15	---		1.5	1.4	---		170	2.9	---		20, pp. 1–3, 6, 16; 43, pp. 45, 81; 45, pp. 1–5, 27
BRSD834-0-0.5	15C0559-20	3/12/15	---		1.6	1.2	---		160	2.5	---		20, pp. 1–3, 6, 18; 43, pp. 49, 81; 45, pp. 1–5, 27
BRSD835-0-0.5	15C0559-21	3/12/15	---		1.5	1.3	---		---		---		20, pp. 1–3, 6, 19; 43, pp. 51, 82; 45, pp. 1–5, 27
BRSD836-0-0.5	15C0559-22	3/12/15	---		1.5	1.2	---		310	2.5	---		20, pp. 1–3, 6, 20; 43, pp. 53, 82; 45, pp. 1–5, 27
BRSD837-0-0.5	15C0559-23	3/12/15	---		1.5	1.2	---		350	2.5	---		20, pp. 1–3, 6, 21; 43, pp. 55, 82; 45, pp. 1–5, 27
BRSD838-0-0.5	15C0559-24	3/12/15	---		1.8	1.5	---		360	2.9	---		20, pp. 1–3, 6, 22; 43, pp. 57, 82; 45, pp. 1–5, 27
BRSD846-0-0.5	15C0559-28	3/12/15	---		2.0	1.5	---		300	3.1	---		20, pp. 1–3, 6, 29; 43, pp. 65, 82; 45, pp. 1–5, 28
BRSD851-0-0.5	15C0559-15	3/11/15	---		2.5	2.1	170	4.2	2,800	4.2	450	4.2	20, pp. 1–3, 6, 30; 43, pp. 39, 81; 45, pp. 1–5, 26
BRSD851-0-0.5-1	15C0559-16	3/11/15	---		2.7	2.1	170	4.1	2,500	4.1	---		20, pp. 1–3, 6, 30; 43, pp. 41, 81; 45, pp. 1–5, 26
BRSD852-0-0.5	15C0559-14	3/11/15	---				---		150	1.7	---		20, pp. 1–3, 6, 31; 43, pp. 37, 81; 45, pp. 1–5, 26
BRSD853-0-0.5	15C0559-13	3/11/15	---				---		380	4.6	---		20, pp. 1–3, 6, 32; 43, pp. 35, 81; 45, pp. 1–5, 26
BRSD854-0-0.5	15C0559-12	3/11/15	---		1.8	1.5	---		230	3.1	---		20, pp. 1–3, 6, 33; 43, pp. 33, 81; 45, pp. 1–5, 26
BRSD857-0-0.5	15C0559-11	3/11/15	---				---		1,000	4.9	---		20, pp. 1–3, 6, 36; 43, pp. 31, 81; 45, pp. 1–5, 26
BRSD858-0-0.5	15C0559-10	3/11/15	---				---		350	4.6	---		20, pp. 1–3, 6, 37; 43, pp. 29, 80; 45, pp. 1–5, 26

mg/kg = milligrams per kilogram.

RL = Reporting limit; these limits are sample- and matrix-dependent quantitation limits and hence are equivalent to the sample quantitation limit defined in the HRS Rule [Ref. 1, Section 1.1; 28, p. 43; 29, p. 4; 43, p. 78; 45, p. 5].

--- = Result does not meet observed release criteria.

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4; see **Table 5**].

Attribution

Magna Metals conducted metal plating, polishing, and lacquering at the facility from 1955 to June 1979. During operations, the facility used Source 1, Magna's wastewater disposal system consisting of a series of interconnected settling tanks and leach pits, for the disposal of industrial wastewater into the ground [Ref. 6, pp. 7–8, 43; 7, p. 1; 8, p. 4; 9, pp. 8, 24–26, 210–212]. Source 1 was constructed with cinderblock, perforated concrete, perforated piping, and gravel to facilitate percolation of wastewater into the ground [Ref. 9, pp. 24–25, 35, 39, 212, 216–217; 18, p. 5]. During Magna's operation, the company discharged iron, lead, copper, nickel, and zinc chlorides; cyanides; sulfates; and waste TCE to Source 1 [Ref. 6, pp. 8, 43; 7, p. 1; 9, pp. 8, 24–26, 39, 210–212]. Wastewater influent, effluent, and overflow samples collected at Magna in October 1978 contained levels of chromium, copper, and nickel above NYSDEC standards [Ref. 9, pp. 8–9, 12; 10, pp. 10–12]. Sludge remains in the leach pits and is underlain by soil or gravel [Ref. 9, pp. 35, 202–203]. Sampling investigations conducted by Magna, NYSDEC, WCHD, and the former property owner show the continuing presence of hazardous substances in the sludge and underlying soil, including arsenic, cadmium, chromium, copper, and nickel [Ref. 8, pp. 4–5; 9, pp. 9–10, 15, 18–23, 47–49, 58–63, 97–98; 10, pp. 26–29, 50–54, 185–192, 278]. Sampling investigations from 2006 to 2015 also show the presence of contaminated soil at the former Magna facility (Source 2); arsenic, cadmium, chromium, copper, nickel, and other organic and inorganic substances are present at concentrations significantly above background levels [Ref. 9, pp. 28–29, 49, 52–55, 79–84, 97–98, 264–284, 317, 368, 372, 387–389, 411–414, 440, 778–787, 803–805, 808–809; 13, pp. 5–6; also see **Source 2, Section 2.2.2**]. The continuing presence of hazardous substances in these uncontained sources, which are derived from the wastewater discharge that ceased in 1979, indicates that these sources have been draining into the adjacent surface water for almost 40 years. In addition, Source 2 is in direct contact with an HRS-eligible wetland at the PPE, constituting an observed release by direct observation: source material that contains one or more site-attributable hazardous substances is known to have entered surface water through direct deposition and there is an observed release by direct observation (see **Figure 2 and Section 4.1.2.1.1**).

Historically, the concentrations of copper and other metals in sediment at all locations downstream of site sources is higher than the background levels, and there are no other known sources or releases of metals between the upstream background sample locations and the locations that show observed release concentrations [Ref. 10, pp. 84, 92–96; 17, pp. 6–10; 18, p. 5; 19, pp. 10–15; 20, pp. 6–7; 68, pp. 6–12]. The former Magna facility and the associated site sources are located adjacent to the affected surface water on the outer perimeter of an industrial park, which represents the only significant development in the surrounding area [Ref. 10, p. 84; 68, p. 6]. The owner of the industrial park has leased property to various tenants whose waste disposal practices are unknown, including Con Edison and a furniture business [Ref. 10, p. 10; 51, p. 3; 68, p. 6]. The office/warehouse building east of the former Magna building has had some manufacturing activities [Ref. 51, pp. 3–4]. Current tenants include a marketer and distributer of medical testing instruments; a development and manufacturing company specializing in electrical power distribution and motor/hoist control systems for rigging, lighting, staging and sound; and a wholesale distributer of retail merchandise [Ref. 51, p. 4]. Business activities include corporate management, laboratory testing of equipment, and warehouse storage; there is a refrigerated storage unit containing reagents for control testing of laboratory machines, and a maintenance room where there is storage of containerized chemicals and cleaning products; there is no reported storage or indication of a release of the hazardous substances found in the observed release from these facilities [Ref. 51, pp. 3–6]. The areas surrounding the industrial park where the former Magna facility is located consist of forested wetlands, forested uplands, and residential areas; due to private ownership and steep slopes, access to much of the area is limited [Ref. 6, p. 8; 10, pp. 10, 74, 76, 83–84]. Other nearby land uses include an inactive emery mine to the north-northwest, and farming locations to the northeast and west [Ref. 10, pp. 76, 83; 51, p. 3]. The areas along the documented zone of contamination are similar to the areas in the vicinity of the site sources (i.e., forested wetlands within residential development) [Ref. 68, pp. 6–12].

During the RI, a dumping area was observed north of the former Magna building, where building materials and several excavated underground storage tanks were discovered; the area is not known to be associated with the former Magna operation [Ref. 9, p. 109]. A smaller dump area was found in the woodland northwest of the former Magna building, where two 55-gallon drums were observed [Ref. 9, p. 109]. Both areas were within the same industrial/commercial park as the former Magna Metals facility [Ref. 9, p. 109]. In addition, direct push soil samples were collected to determine if a former drum storage area reported in historic NYSDEC documentation may have contributed to contamination; the location was at the southwestern corner of the active commercial building, southeast of Sources 1 and 2 [Ref. 13, pp. 5, 8]. Soil borings to depths of 2 feet and 6 feet did not show any elevated photoionization detector (PID) readings, and the soil samples collected from the borings did not indicate any exceedances of NYSDEC's

recommended soil criteria for commercial use [Ref. 13, pp. 5, 8, 12–14, 30–36]; therefore these areas are not expected to have contributed to the contamination detected in the observed release.

A refuse area north of the former Magna building was investigated during the PDI, with five soil borings ranging in depth from 1 to 5.5 feet below ground surface (bgs); chromium was detected above NYSDEC's soil cleanup objective (SCO) concentration of 19 mg/kg in four samples, and barium had a concentration above the commercial use SCO of 400 mg/kg in one sample [Ref. 18, pp. 2, 3, 5; 25–29]. It is therefore possible that this area contributed partly to the chromium concentrations in the observed release.

Hazardous Substances Released:

Arsenic	Copper
Cadmium	Nickel
Chromium	

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Observed Release Factor Value: 550

4.1.3.2 Human Food Chain Threat - Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

TABLE 7. HUMAN FOOD CHAIN TOXICITY/PERSISTENCE/BIOACCUMULATION						
Hazardous Substance	**Source Number**	**Toxicity Factor Value**	**River Persistence Factor Value ***	**Food Chain Bioaccumulation Factor Value ****	**Toxicity/Persistence/ Bioaccumulation Factor Value (HRS Table 4-16)**	**Ref. 2 Page**
Arsenic	1, 2, OR	10,000	1	500	5×10^6	1
Benz(a)anthracene	1	100	1	50,000	5×10^6	3
Benzo(a)pyrene	1	10,000	1	50,000	5×10^8	5
Cadmium	1, 2, OR	10,000	1	50,000	5×10^8	7
Chromium	1, 2, OR	10,000	1	500	5×10^6	9
Chrysene	1	1,000	1	5,000	5×10^6	11
Copper	1, 2, OR	100	1	50,000	5×10^6	13
Cyanide	1, 2	1,000	0.07	0.5	35	15
cis-1,2-DCE	1	1,000	0.07	50	3,500	17
trans-1,2-DCE	1	100	0.07	50	350	19
Lead	1, 2	10,000	1	5,000	5×10^7	21
Manganese	1	10,000	1	50,000	5×10^8	23
Mercury	1	10,000	1	50,000	5×10^8	25
Nickel	1, 2, OR	10,000	1	5	5×10^4	27
Selenium	1, 2	100	1	500	5×10^4	29
Silver	1	100	1	50,000	5×10^6	31
Thallium	1	10,000	1	500	5×10^6	33
TCE	1, 2	1,000	0.07	50	3,500	35
Vinyl chloride	1	10,000	0.0007	5	35	37
Xylenes	1, 2	100	0.07	50	350	39
Zinc	1, 2	10	1	50,000	5×10^5	41

OR = Observed release.

* The predominant water category between the PPE and the nearest fishery is River; therefore, the river persistence factor value is assigned to each hazardous substance [Ref. 1, Sections 4.1.2.2.1.2 and 4.1.3.2.1.2].

** The fishery being evaluated is located in a tidal portion of the Hudson River through which the salt water/fresh water interface moves at least periodically [Ref. 62, pp. 9–13]. Therefore, the higher of the fresh water or salt water human food chain bioaccumulation factor values is assigned to each hazardous substance [Ref. 1, Section 4.1.3.2.1.3].

4.1.3.2.2 Hazardous Waste Quantity

TABLE 8. HAZARDOUS WASTE QUANTITY		
Source Number	**Source Hazardous Waste Quantity (HWQ) Value (HRS Section 2.4.2.1.5)**	**Is source hazardous constituent quantity data complete? (yes/no)**
1	29.3	No
2	1.77	No
Sum of Values:	31 (rounded to nearest integer as specified in HRS Section 2.4.2.2)	

The sum of hazardous waste quantity values corresponds to a hazardous waste quantity factor value of 1 in HRS Table 2-6 [Ref. 1, Section 2.4.2.2]. However, the HRS states that if any target is subject to Level I or Level II concentrations, assign either the value for Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway [Ref. 1, Section 2.4.2.2]. As described in **Section 4.1.4.3.1.2**, wetlands are subject to Level II concentrations in the surface water migration pathway. Therefore, a hazardous waste quantity factor value of 100 is assigned for the surface water migration pathway.

4.1.3.2.3 Waste Characteristics Factor Category Value

Benzo(a)pyrene, cadmium, manganese, and mercury, which are associated with site sources that have surface water pathway containment factor values greater than 0 for the watershed, correspond to a toxicity/persistence factor value of 10,000 and a bioaccumulation potential factor value of 50,000, as shown in the table above [Ref. 1, Section 4.1.3.2.1.4; 1a, Section 2.4.1; 2, pp. 5, 7, 23, 25].

(Toxicity/Persistence Factor Value) x (Hazardous Waste Quantity Factor Value) =
$10{,}000 \times 100 = 1 \times 10^6$
(Subject to a maximum of 1×10^8)
[Ref. 1, Section 4.1.3.2.3]

(Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) x
(Bioaccumulation Potential Factor Value) = $(1 \times 10^6) \times (50{,}000) = 5 \times 10^{10}$
(Subject to a maximum of 1×10^{12})
[Ref. 1, Section 4.1.3.2.3]

The resulting waste characteristics product of 5×10^{10} corresponds to a waste characteristics factor category value of 320 in Table 2-7 of the HRS [Ref. 1, Section 2.4.3.1].

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Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8
Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 320

4.1.3.3 Human Food Chain Threat - Targets

The Hudson River within the 15-mile TDL is used for consumption fishing [**Figure 5**; Ref. 63, pp. 7, 17, 30–40; 64, p. 2]. There are fishing access locations to the river from public boat launches and along the shoreline [Ref. 65, pp. 28–29; 66, p. 3]. Species reported to be fished include striped bass and blue crabs [Ref. 63, pp. 37–40]. The Hudson River at Furnace Brook is one example of a specific location within the TDL where consumption fishing (subsistence) is reported [**Figure 5**; Ref. 64, p. 2]. The available documentation does not demonstrate that the fishery is located within the zone of contamination; therefore, the target fishery is evaluated for potential contamination [**Figures 4 and 5**; Ref. 1, Section 4.1.3.3].

There is historical evidence of bass fishing in Furnace Brook [Ref. 59, p. 2]. In addition, there are no fishing restrictions at Furnace Dock Lake (a.k.a. Furnace Brook Pond, a.k.a. Railroad Pond) and there is anecdotal evidence of fishing at Oscawana Park, both of which are located along Furnace Brook within the TDL; however, there is no direct documentation of fishing for consumption at these locations and these areas are not herein evaluated as fisheries [Ref. 58, p. 7; 66, p. 3; 67, pp. 1–2].

Sediment Samples for Observed Release

Notes on the table below:

All results are presented in milligrams per kilogram (mg/kg).

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted per EPA Quick Reference Fact Sheet *Using Qualified Data to Document and Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 46, pp. 5–8, 18].

TABLE 9. SAMPLES FOR OBSERVED RELEASE

Sample ID	Surface Water Body	Distance from PPE [Figure 4]	Hazardous Substance	Concentration (mg/kg)	Reference(s)
WTSD501-0-0.5	wetland	0.05 mile	Copper	590	17, p. 6; 23, pp. 30, 96; 29, pp. 1–4, 12; 46, pp. 5–8, 18
WTSD502-0-0.5	wetland	0.05 mile	Copper	380	17, p. 6; 23, pp. 28, 96; 29, pp. 1–4, 12; 46, pp. 5–8, 18
WTSD515-0-0.5	wetland	0.02 mile	Chromium	180 J (140)	17, p. 6; 22, pp. 49, 62; 29, pp. 1–4, 11; 46, pp. 5–8, 18
WTSD519-0-0.5	wetland	0.04 mile	Arsenic Cadmium Chromium	19 1.6 270	17, p. 6; 22, pp. 39, 61; 29, pp. 1–4, 11
WTSD520-0-0.5	wetland	0.04 mile	Cadmium Copper	1.8220 J (180)	17, p. 7; 21, pp. 36, 102; 29, pp. 1–4, 7; 46, pp. 5–8, 18
WTSD521-0-0.5	wetland	0.07 mile	Cadmium Copper	1.9 J (1.3) 500 J (410)	17, p. 7; 21, pp. 43, 102; 29, pp. 1–4, 746, pp. 5–8, 18
WTSD523-0-0.5	wetland	0.12 mile	Copper	130	17, p. 7; 22, pp. 29, 61; 29, pp. 1–4, 11
PASD601-0-0.5	pond	0.09 mile	Cadmium Copper	1.9 J (1.3) 220 J (180)	17, p. 7; 21, pp. 16, 101; 29, pp. 1–4, 6; 46, pp. 5–8, 18
PASD610-0-0.5	pond	0.08 mile	Cadmium Copper	3.2 J (2.3) 330 J (270)	17, p. 7; 24, pp. 70, 171; 29, pp. 1–4, 17; 46, pp. 5–8, 18

TABLE 9. SAMPLES FOR OBSERVED RELEASE					
Sample ID	**Surface Water Body**	**Distance from PPE [Figure 4]**	**Hazardous Substance**	**Concentration (mg/kg)**	**Reference(s)**
PASD619-0-0.5	pond	0.15 mile	Arsenic Cadmium Chromium Copper	100 3.2 140 260	17, p. 7; 22, pp. 41, 61; 29, pp. 1–4, 11
PASD620-0-0.5	pond	0.16 mile	Chromium	210	17, p. 7; 21, pp. 74, 104; 29, pp. 1–4, 8
PASD623-0-0.5	pond	0.17 mile	Chromium Copper Nickel	190 690 640	17, p. 7; 22, pp. 25, 60; 29, pp. 1–4, 10
PASD623-0-0.5 D	pond	0.17 mile	Chromium Copper Nickel	170 650 720	17, p. 7; 22, pp. 2, 27, 61; 29, pp. 1–4
BRSD704-0-0.5	unnamed tributary	0.06 mile	Copper	300 J (246)	17, p. 8; 24, pp. 124, 173; 29, pp. 1–4, 19; 46, pp. 5–8, 18
BRSD706-0-0.5	unnamed tributary	0.04 mile	Copper	140	17, p. 8; 24, pp. 108, 172; 29, pp. 1–4, 18
BRSD710-0-0.5	unnamed tributary	0.06 mile	Chromium	140	17, p. 8; 22, pp. 37, 61; 29, pp. 1–4, 11
BRSD716-0-0.5	unnamed tributary	0.08 mile	Chromium	170	17, p. 8; 22, pp. 33, 61; 29, pp. 1–4, 11
BRSD722-0-0.5	unnamed tributary	0.15 mile	Chromium	160	17, p. 8; 21, pp. 62, 103; 29, pp. 1–4, 8
BRSD736-0-0.5	unnamed tributary	0.29 mile	Chromium Copper	150 970 J (795)	17, p. 9; 27, pp. 7, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD738-0-0.5	unnamed tributary	0.29 mile	Copper	270 J (221)	17, p. 9; 27, pp. 11, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD739-0-0.5	unnamed tributary	0.31 mile	Chromium Copper	170 1300 J (1066)	17, p. 9; 27, pp. 13, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD741-0-0.5	unnamed tributary	0.31 mile	Copper	180 J (148)	17, p. 9; 27, pp. 17, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD742-0-0.5	unnamed tributary	0.33 mile	Copper	170 J (139)	17, p. 9; 27, pp. 19, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD744-0-0.5	unnamed tributary	0.33 mile	Cadmium Chromium Copper	1.2 140 240 J (197)	17, p. 9; 27, pp. 23, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD747-0-0.5	unnamed tributary	0.35 mile	Copper	180 J (148)	17, p. 9; 27, pp. 29, 71; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD748-0-0.5	unnamed tributary	0.37 mile	Copper	190 J (156)	17, p. 9; 27, pp. 31, 71; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD750-0-0.5	unnamed tributary	0.37 mile	Copper	240 J (197)	17, p. 9; 27, pp. 37, 71; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD751-0-0.5	unnamed tributary	0.37 mile	Copper	170 J (139)	17, p. 9; 27, pp. 39, 71; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD752-0-0.5	unnamed tributary	0.37 mile	Chromium	140	17, p. 9; 27, pp. 41, 71; 29, pp. 1–4, 23
BRSD752-0-0.5D	unnamed tributary	0.37 mile	Cadmium Chromium	1.3 130	17, p. 9; 27, pp. 43, 71; 29, pp. 1–4, 23
BRSD756-0-0.5	unnamed tributary	0.37 mile	Cadmium Chromium Copper	1.3 170 190 J (156)	17, p. 9; 27, pp. 51, 72; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD757-0-0.5	unnamed tributary	0.39 mile	Copper	160 J (131)	17, p. 9; 27, pp. 53, 72; 29, pp. 1–4, 23; 46, pp. 5–8, 18

TABLE 9. SAMPLES FOR OBSERVED RELEASE					
Sample ID	**Surface Water Body**	**Distance from PPE [Figure 4]**	**Hazardous Substance**	**Concentration (mg/kg)**	**Reference(s)**
SD805	unnamed tributary	0.43 mile	Copper	414	68, p. 10; 69, pp. 5, 9, 38
SD809	unnamed tributary	0.46 mile	Copper	617	68, p. 10; 69, pp. 5, 11, 42
SD817	unnamed tributary	0.65 mile	Copper	132	68, p. 10; 69, pp. 5, 15, 50
SD822	unnamed tributary	0.75 mile	Copper	144	68, p. 10; 69, pp. 5, 20, 55
SD825	unnamed tributary	0.82 mile	Copper	267	68, p. 10; 69, pp. 5, 23, 58
SD825 DUP	unnamed tributary	0.82 mile	Copper	314	68, p. 10; 69, pp. 5, 30, 63
SD830	unnamed tributary	0.90 mile	Copper	426	68, p. 10; 69, pp. 5, 28, 67
BRSD832-0-0.5	unnamed tributary	0.95 mile	Cadmium Copper	1.5 170	20, p. 6, 16; 43, pp. 45, 81; 45, pp. 1–5, 27
BRSD834-0-0.5	unnamed tributary	0.99 mile	Cadmium Copper	1.6 160	20, p. 6, 18; 43, pp. 49, 81; 45, pp. 1–5, 27
BRSD835-0-0.5	unnamed tributary	1.02 miles	Cadmium	1.5	20, p. 6, 19; 43, pp. 51, 82; 45, pp. 1–5, 27
BRSD836-0-0.5	unnamed tributary	1.05 miles	Cadmium Copper	1.5 310	20, p. 6, 20; 43, pp. 53, 82; 45, pp. 1–5, 27
BRSD837-0-0.5	unnamed tributary	1.08 miles	Cadmium Copper	1.5 350	20, p. 6, 21; 43, pp. 55, 82; 45, pp. 1–5, 27
BRSD838-0-0.5	unnamed tributary	1.1 miles	Cadmium Copper	1.8 360	20, p. 6, 22; 43, pp. 57, 82; 45, pp. 1–5, 27
BRSD846-0-0.5	unnamed tributary	1.25 miles	Cadmium Copper	2.0 300	20, p. 6, 29; 43, pp. 65, 82; 45, pp. 1–5, 28
BRSD851-0-0.5	unnamed tributary	1.35 miles	Cadmium Chromium Copper Nickel	2.5 170 2,800 450	20, p. 6, 30; 43, pp. 39, 81; 45, pp. 1–5, 26
BRSD851-0-0.5-1	unnamed tributary	1.35 miles	Cadmium Chromium Copper	2.7 170 2,500	20, p. 6, 30; 43, pp. 41, 81; 45, pp. 1–5, 26
BRSD852-0-0.5	unnamed tributary	1.38 miles	Copper	150	20, p. 6, 31; 43, pp. 37, 81; 45, pp. 1–5, 26
BRSD853-0-0.5	unnamed tributary	1.40 miles	Copper	380	20, p. 6, 32; 43, pp. 35, 81; 45, pp. 1–5, 26
BRSD854-0-0.5	unnamed tributary	1.44 miles	Cadmium Copper	1.8 230	20, p. 6, 33; 43, pp. 33, 81; 45, pp. 1–5, 26
BRSD857-0-0.5	unnamed tributary	1.48 miles	Copper	1,000	20, p. 6, 36; 43, pp. 31, 81; 45, pp. 1–5, 26
BRSD858-0-0.5	unnamed tributary	1.5 miles	Copper	350	20, p. 6, 37; 43, pp. 29, 80; 45, pp. 1–5, 26

4.1.3.3.1 Food Chain Individual

There is an observed release to surface water of hazardous substances, including cadmium, with a bioaccumulation potential factor value of 500 or greater in several samples identified below, and there is a fishery present within the 15-mile TDL [see **Sections 4.1.2.1.1**, **4.1.3.2.1.3**, and **4.1.3.3**]. Therefore, a food chain individual factor value of 20 is assigned [Ref. 1, Section 4.1.3.3.1].

Sample IDs:	WTSD519-0-0.5, WTSD520-0-0.5, WTSD521-0-0.5, PASD601-0-0.5, PASD610-0-0.5, PASD619-0-0.5, BRSD744-0-0.5, BRSD752-0-0.5D, BRSD756-0-0.5, BRSD832-0-0.5, BRSD834-0-0.5, BRSD835-0-0.5, BRSD836-0-0.5, BRSD837-0-0.5, BRSD838-0-0.5, BRSD846-0-0.5, BRSD851-0-0.5, BRSD851-0-0.5-1, BRSD854-0-0.5
Hazardous Substance:	Cadmium
Bioaccumulation Potential:	50,000
References:	See **Section 4.1.2.1.1** and **Table 9**.

TABLE 10. FISHERIES

Identity of Fishery	Type of Surface Water Body	Dilution Weight	Reference(s)
Hudson River	Large river*	0.0001	Ref. 1, Table 4-13; 60, p. 1; 61, pp. 1–11; 62, pp. 9–12; 63, pp. 30–31

*The average tidal discharge at a gauging station located north of the subject fishery is greater than 22,000 cubic feet per second (cfs), and the entire segment of the river that lies within the TDL is tidal [**Figure 5**; Ref. 60, p. 1; 61, pp. 1–11; 62, pp. 9–12]. The tidal discharge rate at the subject fishery is considered to lie within the flow characteristics range of Greater than 10,000 to 100,000 cfs [Ref. 1, Table 4-13].

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Food Chain Individual Factor Value: 20

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

The Level I concentrations factor value is 0 because there are no documented fisheries subject to Level I concentrations [Ref. 1, Section 4.1.3.3.2.1].

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Level I Concentrations Factor Value: 0

4.1.3.3.2.2 Level II Concentrations

The Level II concentrations factor value is 0 because there are no documented fisheries subject to Level II concentrations [Ref. 1, Section 4.1.3.3.2.2].

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Level II Concentrations Factor Value: 0

4.1.3.3.2.3 Potential Human Food Chain Contamination

The Hudson River within the 15-mile TDL is used for consumption fishing [Ref. 63, pp. 7, 17, 30–40; 64, p. 2]. There are fishing access locations to the river from public boat launches and along the shoreline [Ref. 65, pp. 28–29; 66, p. 3]. Species reported to be fished include striped bass and blue crabs [Ref. 63, pp. 37–40]. The Hudson River at Furnace Brook is one example of a specific location within the TDL where consumption fishing is reported [Ref. 64, p. 2]. The available documentation does not demonstrate that the fishery is located within the zone of contamination; therefore, the target fishery is evaluated for potential contamination [**Figure 4**; Ref. 1, Section 4.1.3.3].

The Hudson River is a large river; the average tidal discharge at a gauging station located north of the subject fishery is greater than 22,000 cubic feet per second (cfs), and the entire segment of the river that lies within the TDL is tidal [**Figure 5**; Ref. 60, p. 1; 61, pp. 1–11; 62, pp. 9–12]. The tidal discharge rate at the subject fishery is considered to lie within the flow characteristics range of Greater than 10,000 to 100,000 cfs [Ref. 1, Table 4-13]. The salt water/fresh water interface moves through the area and salinity of the river fluctuates with the tides, however, it is generally brackish or saline in the lower Hudson River near Cortlandt [Ref. 61, pp. 1–11; 62, pp. 9–12]. The potential human food chain contamination value is calculated below [Ref. 1, Section 4.1.3.3.2.3].

TABLE 11. POTENTIAL HUMAN FOOD CHAIN CONTAMINATION

Identity of Fishery	Annual Production (Pounds)	Type of Surface Water Body (Table 4-13)	Average Annual Flow (cfs)	Population Value (P_i) (Table 4-18)	Dilution Weight (D_i) (Table 4-13)	$P_i \times D_i$
Hudson River	Greater than 0	Large river	>10,000 to 100,000	0.03	0.0001	0.000003

Sum of Pi x Di: 0.000003
(Sum of Pi x Di)/10: 0.0000003

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Potential Human Food Chain Contamination Factor Value: 0.0000003

4.1.4.2 Environmental Threat - Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

TABLE 12. ECOSYSTEM TOXICITY/PERSISTENCE/BIOACCUMULATION						
Hazardous Substance	**Source Number**	**Fresh Water Ecotoxicity Factor Value***	**River Persistence Factor Value****	**Fresh Water Ecosystem Bioaccumulation Factor Value***	**Ecotoxicity/Persistence/ Bioaccumulation Factor Value (HRS Table 4-21)**	**Ref. 2 Page**
Arsenic	1, 2, OR	10	1	50,000	5×10^5	1
Benz(a)anthracene	1	10,000	1	50,000	5×10^8	3
Benzo(a)pyrene	1	10,000	1	50,000	5×10^8	5
Cadmium	1, 2, OR	10,000	1	50,000	5×10^8	7
Chromium	1, 2, OR	10,000	1	500	5×10^6	9
Chrysene	1	1,000	1	5,000	5×10^6	11
Copper	1, 2, OR	1,000	1	50,000	5×10^7	13
Cyanide	1, 2	1,000	0.4	0.5	200	15
cis-1,2-DCE	1	0	0.07	50	0	17
trans-1,2-DCE	1	1	0.07	50	3.5	19
Lead	1, 2	1,000	1	50,000	5×10^7	21
Manganese	1	100	1	50,000	5×10^6	23
Mercury	1	10,000	1	50,000	5×10^8	25
Nickel	1, 2, OR	100	1	50,000	5×10^6	27
Selenium	1, 2	1,000	1	500	5×10^5	29
Silver	1	10,000	1	50	5×10^5	31
Thallium	1	100	1	500	5×10^4	33
TCE	1, 2	100	0.07	50	350	35
Vinyl chloride	1	0	0.0007	5	0	37
Xylenes	1, 2	100	0.07	50	350	39
Zinc	1, 2	10	1	50,000	5×10^5	41

OR = Observed release.

* The sensitive environments being evaluated are located in fresh water [Ref. 55, pp. 7–8; 56, pp. 1–6]. Therefore, the fresh water environmental toxicity and bioaccumulation factor values are assigned to each hazardous substance [Ref. 1, Section 4.1.4.2.1.3].

** The predominant water category between the PPEs and the nearest sensitive environment along the hazardous substance migration path for the watershed is River; therefore, the river persistence factor value is assigned to each hazardous substance [Ref. 1, Sections 4.1.2.2.1.2 and 4.1.4.2.1.2].

4.1.4.2.2 Hazardous Waste Quantity

TABLE 13. HAZARDOUS WASTE QUANTITY		
Source Number	**Source Hazardous Waste Quantity (HWQ) Value (Ref. 1, Section 2.4.2.1.5)**	**Is source hazardous constituent quantity data complete? (yes/no)**
1	29.3	No
2	1.77	No
Sum of Values:	31 (rounded to nearest integer as specified in Ref. 1, Section 2.4.2.2)	

The sum of hazardous waste quantity values corresponds to a hazardous waste quantity factor value of 1 in HRS Table 2-6 [Ref. 1, Section 2.4.2.2]. However, the HRS states that if any target is subject to Level I or Level II concentrations, assign either the value for Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor

value for that pathway [Ref. 1, Section 2.4.2.2]. As described in **Section 4.1.4.3.1.2**, wetlands are subject to Level II concentrations in the surface water migration pathway. Therefore, a hazardous waste quantity factor value of 100 is assigned for the surface water migration pathway.

4.1.4.2.3 Waste Characteristics Factor Category Value

Benz(a)anthracene, benzo(a)pyrene, cadmium, and mercury, which are associated with site sources that have surface water pathway containment factor values greater than 0 for the watershed, correspond to an ecotoxicity/persistence factor value of 10,000 and bioaccumulation potential factor value of 50,000, as shown in the table above [Ref. 1, Section 4.1.4.2.1.4; 2, pp. 3, 5, 7, 25].

(Ecotoxicity/persistence factor value) x (hazardous waste quantity factor value) =
$10{,}000 \times 100 = 1 \times 10^{6}$
(Subject to a maximum of 1×10^{8})
[Ref. 1, Section 4.1.4.2.3]

(Ecotoxicity/persistence factor value x hazardous waste quantity factor value) x
(bioaccumulation potential factor value) = $(1 \times 10^{6}) \times (50{,}000) = 5 \times 10^{10}$
(Subject to a maximum of 1×10^{12})
[Ref. 1, Section 4.1.4.2.3]

The resulting waste characteristics product of 5×10^{10} corresponds to a waste characteristics factor category value of 320 in Table 2-7 of the HRS [Ref. 1, Section 2.4.3.1].

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^{8}
Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 320

4.1.4.3 Environmental Threat - Targets

The zone of contamination (i.e., the stream segment where observed release by chemical analysis is documented) along the surface water migration pathway downstream of the site sources extends from the PPE to sediment sample location BRSD858-0-0.5, a length of approximately 1.5 miles (almost 8,000 feet) [**Figure 3**; Ref. 56, pp. 1–3, 6]. The zone of contamination includes approximately 1.5 miles of contaminated wetland frontage, as documented by EPA in April 2018 [Ref. 56, pp. 3, 6]. The wetland classifications include palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands (PFO1C); palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetlands (PFO1E); and palustrine unconsolidated bottom, permanently flooded, excavated (PUBHx), which meet the 40 CFR 230.3 definition of a wetland and are HRS-eligible (i.e., positive indicators of hydric soils, wetland hydrology, and wetland vegetation were observed at all wetland locations) [Ref. 55, pp. 7–8; 56, pp. 1–11]. These, freshwater wetlands are located along the hazardous substance migration path in the area of Level II concentrations, and the total wetland frontage considered as subject to actual contamination is 1.51 miles [Ref. 1, Section 4.1.4.3.1; 56, pp. 3, 6]. There are no media-specific benchmarks for sediment, so the target wetlands are subject to Level II concentrations [Ref. 1, Sections 2.5 and 4.1.4.3; 2, pp. 2, 8, 10, 14, 28].

Samples for Observed Release/Level II Concentrations

The sediment concentrations meet the criteria for Level II concentrations because they meet criteria for observed release and their locations are associated with eligible HRS wetlands at the PPEs and contiguous with the unnamed tributary along the extent of the observed release [**Section 4.1.2.1.1 and Figures 3 and 4**; Ref. 1, Sections 2.5 and 4.1.4.3.1]:

Notes on the table below:

mg/kg = milligrams per kilogram.

J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample [Ref. 29, p. 4]. These estimated results have been adjusted per EPA Quick Reference Fact Sheet *Using Qualified Data to Document and Observed Release and Observed Contamination*; the adjusted results are shown in parentheses [Ref. 46, pp. 5–8, 18].

TABLE 14. SAMPLES FOR OBSERVED RELEASE/LEVEL II CONCENTRATIONS

Sample ID	Surface Water Body	Distance from PPE [Figure 4]	Hazardous Substance	Concentration (mg/kg)	Reference(s)
WTSD501-0-0.5	wetland	0.05 mile	Copper	590	17, p. 6; 23, pp. 30, 96; 29, pp. 1–4, 12; 46, pp. 5–8, 18
WTSD502-0-0.5	wetland	0.05 mile	Copper	380	17, p. 6; 23, pp. 28, 96; 29, pp. 1–4, 12; 46, pp. 5–8, 18
WTSD515-0-0.5	wetland	0.02 mile	Chromium	180 J (140)	17, p. 6; 22, pp. 49, 62; 29, pp. 1–4, 11; 46, pp. 5–8, 18
WTSD519-0-0.5	wetland	0.04 mile	Arsenic Cadmium Chromium	19 1.6 270	17, p. 6; 22, pp. 39, 61; 29, pp. 1–4, 11
WTSD520-0-0.5	wetland	0.04 mile	Cadmium Copper	1.8 220 J (180)	17, p. 7; 21, pp. 36, 102; 29, pp. 1–4, 7; 46, pp. 5–8, 18
WTSD521-0-0.5	wetland	0.07 mile	Cadmium Copper	1.9 J (1.3) 500 J (410)	17, p. 7; 21, pp. 43, 102; 29, pp. 1–4, 7; 46, pp. 5–8, 18
WTSD523-0-0.5	wetland	0.12 mile	Copper	130	17, p. 7; 22, pp. 29, 61; 29, pp. 1–4, 11

TABLE 14. SAMPLES FOR OBSERVED RELEASE/LEVEL II CONCENTRATIONS					
Sample ID	**Surface Water Body**	**Distance from PPE [Figure 4]**	**Hazardous Substance**	**Concentration (mg/kg)**	**Reference(s)**
PASD601-0-0.5	pond	0.09 mile	Cadmium Copper	1.9 J (1.3) 220 J (180)	17, p. 7; 21, pp. 16, 101; 29, pp. 1–4, 6; 46, pp. 5–8, 18
PASD610-0-0.5	pond	0.08 mile	Cadmium Copper	3.2 J (2.3) 330 J (270)	17, p. 7; 24, pp. 70, 171; 29, pp. 1–4, 17; 46, pp. 5–8, 18
PASD619-0-0.5	pond	0.15 mile	Arsenic Cadmium Chromium Copper	100 3.2 140 260	17, p. 7; 22, pp. 41, 61; 29, pp. 1–4, 11
PASD620-0-0.5	pond	0.16 mile	Chromium	210	17, p. 7; 21, pp. 74, 104; 29, pp. 1–4, 8
PASD623-0-0.5	pond	0.17 mile	Chromium Copper Nickel	190 690 640	17, p. 7; 22, pp. 25, 60; 29, pp. 1–4, 10
PASD623-0-0.5 D	pond	0.17 mile	Chromium Copper Nickel	170 650 720	17, p. 7; 22, pp. 2, 27, 61; 29, pp. 1–4, 10
BRSD704-0-0.5	unnamed tributary	0.06 mile	Copper	300 J (246)	17, p. 8; 24, pp. 124, 173; 29, pp. 1–4, 19; 46, pp. 5–8, 18
BRSD706-0-0.5	unnamed tributary	0.04 mile	Copper	140	17, p. 8; 24, pp. 108, 172; 29, pp. 1–4, 18
BRSD710-0-0.5	unnamed tributary	0.06 mile	Chromium	140	17, p. 8; 22, pp. 37, 61; 29, pp. 1–4, 11
BRSD716-0-0.5	unnamed tributary	0.08 mile	Chromium	170	17, p. 8; 22, pp. 33, 61; 29, pp. 1–4, 11
BRSD722-0-0.5	unnamed tributary	0.15 mile	Chromium	160	17, p. 8; 21, pp. 62, 103; 29, pp. 1–4, 8
BRSD736-0-0.5	unnamed tributary	0.29 mile	Chromium Copper	150 970 J (795)	17, p. 9; 27, pp. 7, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD738-0-0.5	unnamed tributary	0.29 mile	Copper	270 J (221)	17, p. 9; 27, pp. 11, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD739-0-0.5	unnamed tributary	0.31 mile	Chromium Copper	170 1300 J (1066)	17, p. 9; 27, pp. 13, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD741-0-0.5	unnamed tributary	0.31 mile	Copper	180 J (148)	17, p. 9; 27, pp. 17, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD742-0-0.5	unnamed tributary	0.33 mile	Copper	170 J (139)	17, p. 9; 27, pp. 19, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD744-0-0.5	unnamed tributary	0.33 mile	Cadmium Chromium Copper	1.2 140 240 J (197)	17, p. 9; 27, pp. 23, 70; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD747-0-0.5	unnamed tributary	0.35 mile	Copper	180 J (148)	17, p. 9; 27, pp. 29, 71; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD748-0-0.5	unnamed tributary	0.37 mile	Copper	190 J (156)	17, p. 9; 27, pp. 31, 71; 29, pp. 1–4, 22; 46, pp. 5–8, 18
BRSD750-0-0.5	unnamed tributary	0.37 mile	Copper	240 J (197)	17, p. 9; 27, pp. 37, 71; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD751-0-0.5	unnamed tributary	0.37 mile	Copper	170 J (139)	17, p. 9; 27, pp. 39, 71; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD752-0-0.5	unnamed tributary	0.37 mile	Chromium	140	17, p. 9; 27, pp. 41, 71; 29, pp. 1–4, 23
BRSD752-0-0.5D	unnamed tributary	0.37 mile	Cadmium Chromium	1.3 130	17, p. 9; 27, pp. 43, 71; 29, pp. 1–4, 23

TABLE 14. SAMPLES FOR OBSERVED RELEASE/LEVEL II CONCENTRATIONS					
Sample ID	**Surface Water Body**	**Distance from PPE [Figure 4]**	**Hazardous Substance**	**Concentration (mg/kg)**	**Reference(s)**
BRSD756-0-0.5	unnamed tributary	0.37 mile	Cadmium Chromium Copper	1.3 170 190 J (156)	17, p. 9; 27, pp. 51, 72; 29, pp. 1–4, 23; 46, pp. 5–8, 18
BRSD757-0-0.5	unnamed tributary	0.39 mile	Copper	160 J (131)	17, p. 9; 27, pp. 53, 72; 29, pp. 1–4, 23; 46, pp. 5–8, 18
SD805	unnamed tributary	0.43 mile	Copper	414	68, p. 10; 69, pp. 5, 9, 32, 38
SD809	unnamed tributary	0.46 mile	Copper	617	68, p. 10; 69, pp. 5, 11, 32, 42
SD817	unnamed tributary	0.65 mile	Copper	132	68, p. 10; 69, pp. 5, 15, 32, 50
SD822	unnamed tributary	0.75 mile	Copper	144	68, p. 10; 69, pp. 5, 20, 32, 55
SD825	unnamed tributary	0.82 mile	Copper	267	68, p. 10; 69, pp. 5, 23, 32, 58
SD825 DUP	unnamed tributary	0.82 mile	Copper	314	68, p. 10; 69, pp. 5, 30, 32, 63
SD830	unnamed tributary	0.90 mile	Copper	426	68, p. 10; 69, pp. 5, 28, 32, 67
BRSD832-0-0.5	unnamed tributary	0.95 mile	Cadmium Copper	1.5 170	20, p. 6, 16; 43, pp. 45, 81; 45, pp. 1–5, 27
BRSD834-0-0.5	unnamed tributary	0.99 mile	Cadmium Copper	1.6 160	20, p. 6, 18; 43, pp. 49, 81; 45, pp. 1–5, 27
BRSD835-0-0.5	unnamed tributary	1.02 miles	Cadmium	1.5	20, p. 6, 19; 43, pp. 51, 82; 45, pp. 1–5, 27
BRSD836-0-0.5	unnamed tributary	1.05 miles	Cadmium Copper	1.5 310	20, p. 6, 20; 43, pp. 53, 82; 45, pp. 1–5, 27
BRSD837-0-0.5	unnamed tributary	1.08 miles	Cadmium Copper	1.5 350	20, p. 6, 21; 43, pp. 55, 82; 45, pp. 1–5, 27
BRSD838-0-0.5	unnamed tributary	1.1 miles	Cadmium Copper	1.8 360	20, p. 6, 22; 43, pp. 57, 82; 45, pp. 1–5, 27
BRSD846-0-0.5	unnamed tributary	1.25 miles	Cadmium Copper	2.0 300	20, p. 6, 29; 43, pp. 65, 82; 45, pp. 1–5, 28
BRSD851-0-0.5	unnamed tributary	1.35 miles	Cadmium Chromium Copper Nickel	2.5 170 2,800 450	20, p. 6, 30; 43, pp. 39, 81; 45, pp. 1–5, 26
BRSD851-0-0.5-1	unnamed tributary	1.35 miles	Cadmium Chromium Copper	2.7 170 2,500	20, p. 6, 30; 43, pp. 41, 81; 45, pp. 1–5, 26
BRSD852-0-0.5	unnamed tributary	1.38 miles	Copper	150	20, p. 6, 31; 43, pp. 37, 81; 45, pp. 1–5, 26
BRSD853-0-0.5	unnamed tributary	1.40 miles	Copper	380	20, p. 6, 32; 43, pp. 35, 81; 45, pp. 1–5, 26
BRSD854-0-0.5	unnamed tributary	1.44 miles	Cadmium Copper	1.8 230	20, p. 6, 33; 43, pp. 33, 81; 45, pp. 1–5, 26
BRSD857-0-0.5	unnamed tributary	1.48 miles	Copper	1,000	20, p. 6, 36; 43, pp. 31, 81; 45, pp. 1–5, 26
BRSD858-0-0.5	unnamed tributary	1.5 miles	Copper	350	20, p. 6, 37; 43, pp. 29, 80; 45, pp. 1–5, 26

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

The Level I concentrations factor value is 0 because there are no sensitive environments subject to Level I concentrations [Ref. 1, Section 4.1.4.3.1.1].

==========

Level I Concentrations Factor Value: 0

4.1.4.3.1.2 Level II Concentrations

The target wetlands are subject to Level II concentrations because they are located in a Level II zone of contamination delineated by samples meeting observed release criteria [**Figure 4**; Ref. 1, Sections 2.5 and 4.1.4.3].

Sensitive Environments

There are currently no known sensitive environments other than wetlands that are considered as subject to Level II concentrations [Ref. 1, Section 4.1.4.3].

Wetlands

There are HRS-eligible wetlands along the zone of contamination, and the total wetland frontage subject to actual contamination is greater than 1.0 mile [**Figure 4**; 56, pp. 3, 6].

TABLE 15. LEVEL II CONCENTRATIONS – WETLANDS

Wetland	Wetland Frontage	Wetlands Rating Value (HRS Table 4-24)	Reference
Furnace Brook unnamed tributary	1.5 miles*	50	**Figure 4**; Ref. 56, pp. 3, 6

*The most upstream and downstream points of frontage of wetlands on both the east and west banks of the watercourse were documented using a Trimble ProXR DGPS global positioning system (GPS) unit, after which the GPS points were plotted and the total length of wetland frontage along the zone of contamination determined using geographical information systems (GIS) technology [Ref. 56, pp. 2–3].

Wetland Value: 50

Sum of Sensitive Environments Value + Wetland Value: 50

==========

Level II Concentrations Factor Value: 50

4.1.4.3.1.3 Potential Contamination

The potential contamination factor value is not scored because the site already receives a listing-eligible site score based on other factors.

Sensitive Environments

The sensitive environment value (S_j) is not scored.

Wetlands

Although the most recent wetlands mapping information available from both U.S. Fish and Wildlife Service (USFWS) and New York State indicate that there is potentially contaminated wetland frontage within the TDL, the wetland frontage value (W_j) is not scored [Ref. 55, pp. 4–8].

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Potential Contamination Factor Value: NS

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December 14, 1990

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Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[FRL-3730-8]

RIN 2050 AB73

Hazard Ranking System

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is adopting revisions to the Hazard Ranking System (HRS), the principal mechanism for placing sites on the National Priorities List (NPL). The revisions change the way EPA evaluates potential threats to human health and the environment from hazardous waste sites and make the HRS more accurate in assessing relative potential risk. These revisions comply with other statutory requirements in the Superfund Amendments and Reauthorization Act of 1986 (SARA).

DATES: Effective date March 14, 1991. As discussed in Section III H of this preamble, comments are invited on the addition of specific benchmarks in the air and soil exposure pathways until January 14, 1991.

ADDRESSES: Documents related to this rulemaking are available at and comments on the specific benchmarks in the air and soil exposure pathways may be mailed to the CERCLA Docket Office, OS-245, U.S. Environmental Protection Agency, Waterside Mall, 401 M Street, SW, Washington, DC 20460, phone 202-382-3046. Please send four copies of comments. The docket is available for viewing by appointment only from 9:00 am to 4:00 pm, Monday through Friday, excluding Federal holidays. The docket number is 105NCP-HRS.

FOR FURTHER INFORMATION CONTACT: Steve Caldwell or Agnes Ortiz, Hazardous Site Evaluation Division, Office of Emergency and Remedial Response, OS-230, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or the Superfund Hotline at 800-424-9346 (in the Washington, DC area, 202-382-3000).

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I. Background

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 *et seq.*), commonly called the Superfund, in response to the dangers posed by uncontrolled releases of hazardous substances, contaminants, and pollutants. To implement section 105(8)(A) of CERCLA and Executive Order 12316 (46 FR 42237, August 20, 1981), the U.S. Environmental Protection Agency (EPA) revised the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300, on July 16, 1982 (47 FR 31180), with later revisions on September 16, 1985 (50 FR 37624), November 20, 1985 (50 FR 47912), and March 8, 1990 (55 FR 8666). The NCP sets forth guidelines and procedures for responding to releases or potential release of hazardous substances, pollutants, or contaminants.

Section 105(8)(A) of CERCLA (now section 105(a)(8)(A)) requires EPA to establish:

> Criteria for determining priorities among releases or threatened releases [of hazardous substances] throughout the United States for the purpose of taking remedial action and, to the extent practicable taking into account the potential urgency of such action, for the purpose of taking removal action. Criteria and priorities * * * shall be based upon the relative risk or danger to public health or welfare or the environment * * * taking into account to the extent possible the population at risk, the hazard potential of the hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact, [and] the potential for destruction of sensitive ecosystems * * *.

To meet this requirement and help set priorities, EPA adopted the Hazard Ranking System (HRS) as appendix A to the NCP (47 FR 31180, July 16, 1982). The HRS is a scoring system used to assess the relative threat associated with actual or potential releases of hazardous substances at sites. The HRS is the primary way of determining whether a site is to be included on the National Priorities List (NPL), the Agency's list of sites that are priorities for long-term evaluation and remedial response, and is a crucial part of the Agency's program to address the identification of actual and potential releases. (Each State can nominate one site to the NPL as a State top priority regardless of its HRS score; sites may also be added in response to a health advisory from the Agency for Toxic Substances and Disease Registry (see NCP, 40 CFR 300.425(c)(3)).) Under the original HRS, a score was determined for a site by evaluating three migration pathways—ground water, surface water, and air. Direct contact and fire and explosion threats were also evaluated to determine the need for emergency actions, but did not enter into the decision on whether to place a site on the NPL.

In 1986, Congress enacted the Superfund Amendments and Reauthorization Act of 1986 (SARA) (Pub. L. 99-499), which added section 105(c)(1) to CERCLA, requiring EPA to amend the HRS to assure "to the maximum extent feasible, that the hazard ranking system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review." Congress, in its Conference Report on SARA, stated the substantive standard against which HRS revisions could be assessed:

> This standard is to be applied within the context of the purpose for the National Priorities List; i.e., identifying for the States and the public those facilities and sites which appear to warrant remedial actions. * * * This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions. The standard requires the Hazard Ranking System to rank sites as accurately as the Agency believes is feasible using information from preliminary assessments and site inspections * * * Meeting this standard does not require long-term monitoring or an accurate determination of the full nature and extent of contamination at sites or the projected levels of exposure such as might be done during remedial investigations and feasibility studies. This provision is intended to ensure that the Hazard Ranking System performs with a degree of accuracy appropriate to its role in expeditiously identifying candidates for response actions. [H.R. Rep. No. 962, 99th Cong., 2nd Sess. at 199-200 [1986]]

Section 105(c)(2) further specifies that the HRS appropriately assess the human health risks associated with actual or potential contamination of surface waters used for recreation or drinking

water and that this assessment should take into account the potential migration of any hazardous substance through surface water to downstream sources of drinking water.

SARA added two criteria for evaluating sites under section 105(a)(8)(A): Actual or potential contamination of the ambient air and threats through the human food chain. In addition, CERCLA section 118, added by SARA, requires EPA to give a high priority to facilities where the release of hazardous substances has resulted in the closing of drinking water wells or has contaminated a principal drinking water supply. Finally, CERCLA section 125, added by SARA, requires revisions to the HRS to address facilities that contain substantial volumes of wastes specified in section 3001(b)(3)(A)(i) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act (RCRA). These wastes include fly ash wastes, bottom ash wastes, slag wastes, and flue gas emission control wastes generated primarily from the combustion of coal or other fossil fuels. Specifically, section 125 requires EPA to revise the HRS to assure the appropriate consideration of each of the following site-specific characteristics of such facilities:

- The quantity, toxicity, and concentrations of hazardous constituents that are present in such waste and a comparison with other wastes;
- The extent of, and potential for, release of such hazardous constituents into the environment; and
- The degree of risk to human health and the environment posed by such constituents.

EPA published an advance notice of proposed rulemaking (ANPRM) on April 9, 1987 (52 FR 11513), announcing its intention to revise the HRS and requesting comments on a number of issues. After a comprehensive review of the original HRS, including consideration of alternative models and Science Advisory Board review, EPA published a notice of proposed rulemaking (NPRM) for HRS revisions on December 23, 1988 (53 FR 51962). The NPRM contains a detailed preamble, which should be consulted for a more extensive discussion of CERCLA, SARA, the HRS, and the proposed changes to the HRS.

Today, EPA is publishing the revised HRS, which will supersede the HRS previously in effect as appendix A to the NCP. CERCLA section 105(c)(1) states that the revised HRS shall be applied to any site newly listed on the NPL after its effective date; as specified in section 105(c)(3), sites scored with the original HRS prior to that effective date need not be reevaluated.

The HRS is a scoring system based on factors grouped into three factor categories. The factor categories are multiplied and then normalized to 100 points to obtain a pathway score (e.g., the ground water migration pathway score). The final HRS score is obtained by combining the pathway scores using a root-mean-square method. The proposed HRS revised every factor to some extent. A few factors were replaced, and several new factors were added. The major proposed changes included:

(1) Consideration of potential as well as actual releases to air;

(2) Addition of mobility factors;

(3) Addition of dilution and distance weightings for the water migration pathways and modification of distance weighting in the air migration pathway;

(4) Revisions to the toxicity factor;

(5) Additions to the list of covered sensitive environments;

(6) Addition of human food chain and recreation threats to the surface water migration pathway;

(7) Revision of the hazardous waste quantity factor to allow a tiered approach;

(8) Addition of health-based benchmarks for evaluating population factors and ecological-based benchmarks for evaluating sensitive environments;

(9) Addition of factors for evaluating the maximally exposed individual; and

(10) Inclusion of a new onsite exposure pathway.

EPA conducted a field test of the proposed HRS to assess the feasibility of implementing the proposed HRS factors, to determine resources required for specific tasks, to assess the availability of information needed for evaluation of sites, and to identify difficulties with the use of the proposed revisions. To meet the objectives, site inspections were performed at 29 sites nationwide. The sites were selected either because work was already planned at the site or because the sites had specific features EPA wanted to test using the proposed revisions to the HRS. The major results of the field test were summarized on September 14, 1989 (54 FR 37949), when the field test report was made available for public review and comment.

II. Overview of the Final Rule

The rule being promulgated today incorporates substantial changes to revisions proposed in December 1988. EPA has changed the rule for three reasons: (1) To respond to the general comment submitted by many commenters that the factor categories and pathways need to be consistent with each other; (2) to respond to specific recommendations made by commenters; and (3) to respond to problems identified during the field test and discussed in the field test report. Major changes affecting multiple pathways include:

- Multiplication of hazardous waste quantity factor, toxicity, and other waste characteristics factors;
- Uncapping of population factors (i.e., no limit is placed on maximum value);
- Revised criteria for establishing an observed release;
- Capping of potential to release at a value less than observed release;
- Revision of the toxicity evaluation to select carcinogenic and non-cancer chronic values in preference to acute toxicity values;
- Elimination of Level III concentrations and extension of weighting based on levels of exposure to nearest individual (well/intake; formerly maximally exposed individual) factors;
- Modification of the weights assigned to Level I and Level II concentrations;
- Revisions to the benchmarks used and methods for determining exceedance of benchmarks;
- Use of ranges to assign values for potentially exposed populations;
- Inclusion of factors assessing exposures of the nearest individual in all pathways;
- Revisions to distance and dilution weights in all pathways except ground water migration;
- Replacement of the use factors with less heavily weighted resources factors;
- Evaluation of wetlands based on size or surface water frontage; and
- Specific instructions for the evaluation of radionuclides at radioactive waste sites and sites with radioactive and other hazardous substances wastes.

The major changes in the ground water migration pathway include:

- Replacement of depth to aquifer/hydraulic conductivity and sorptive capacity factors with travel time and depth to aquifer factors; and
- Revision of the mobility factor, including consideration of distribution coefficients.

In the surface water migration pathways, the major changes include:

- Elimination of the separate recreational use threat;
- Addition of a ground water to surface water component;

• Incorporation of bioaccumulation into the waste characteristics factor category rather than the targets factor category for the human food chain threat;

• Revision to allow use of additional tissue samples in establishing Level I concentrations for the human food chain threat; and

• Addition of ecosystem bioaccumulation potential factor for sensitive environments.

The major changes in the soil exposure pathway (formerly the onsite exposure pathway) include:

• Elimination of separate consideration of the high risk population;

• Inclusion of hazardous waste quantity in the waste characteristics factor category;

• Consideration of workers in the resident threat's targets factor category; and

• Revisions to scoring of terrestrial sensitive environments.

The major changes in the air migration pathway include:

• Separate evaluation of gas and particulate potential to release; and

• Consideration of actual contamination in evaluating sensitive environments.

Figures 1 to 4 show the differences between the pathways in the original HRS and in the final rule.

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Figure 1

Ground Water Migration Pathway

ORIGINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release or Route Characteristics Depth to Aquifer of Concern Net Precipitation Permeability of Unsaturated Zone Physical State Containment		Toxicity/Persistence Hazardous Waste Quantity		Ground Water Use Distance to Nearest Well/ Population Served

FINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release or Potential to Release Containment Net Precipitation Depth to Aquifer Travel Time		Toxicity/Mobility Hazardous Waste Quantity		Nearest Well Population Resources Wellhead Protection Area

Figure 2

Surface Water Migration Pathway

ORIGINAL HRS

Likelihood of Release	X	**Waste Characteristics**	X	**Targets**
Observed Release		Toxicity/Persistence		Surface Water Use
or		Hazardous Waste Quantity		Distance to Sensitive Environment
Route Characteristics				Population Served/Distance to Nearest Intake Downstream
Facility Slope/Intervening Terrain				
1-Year, 24-Hour Rainfall				
Distance to Nearest Surface Water				
Physical State				
Containment				

Figure 2

Surface Water Migration Pathway (continued)

FINAL HRS

Likelihood of Release:
Overland Flow/Flood Component

Observed Release
or
Potential to Release

By Overland Flow
- Containment
- Runoff
- Distance to Surface Water

By Flood
- Containment
- Flood Frequency

or

Likelihood of Release:
Ground Water to Surface Water Component

Observed Release
or
Potential to Release
- Containment
- Net Precipitation
- Depth to Aquifer
- Travel Time

X

Drinking Water Threat

Waste Characteristics	x	**Targets**
Toxicity/Mobility[1]/Persistence		Nearest Intake Population
Hazardous Waste Quantity		Resources

+

Human Food Chain Threat

Waste Characteristics	x	**Targets**
Toxicity/Mobility[1]/ Persistence/Bioaccumulation		Food Chain Individual Population
Hazardous Waste Quantity		

+

Environmental Threat

Waste Characteristics	x	**Targets**
Ecosystem Toxicity/Mobility[1]/ Persistence/Bioaccumulation		Sensitive Environments
Hazardous Waste Quantity		

[1] Mobility is only applicable to the Ground Water to Surface Water Component.

Figure 3

Soil Exposure Pathway[1]

FINAL HRS

Resident Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Observed Contamination		Toxicity Hazardous Waste Quantity		Resident Individual Resident Population Workers Resources Terrestrial Sensitive Environments

+

Nearby Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Attractiveness/Accessibility Area of Contamination		Toxicity Hazardous Waste Quantity		Population Within 1 Mile Nearby Individual

[1] New pathway.

Figure 4

Air Migration Pathway

ORIGINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release		Reactivity and Incompatibility Toxicity Hazardous Waste Quantity		Population Within 4-Mile Radius Distance to Sensitive Environment Land Use

FINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release or Potential to Release Gas Gas Containment Gas Source Type Gas Migration Potential Particulate Particulate Containment Particulate Source Type Particulate Migration Potential		Toxicity/Mobility Hazardous Waste Quantity		Nearest Individual Population Resources Sensitive Environments

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Section III of this preamble summarizes and responds to major issues raised by commenters. These issues are organized so that issues that affect multiple pathways are covered first, followed by discussions of individual pathway issues. Section IV provides a section-by-section discussion of the final rule. All substantive changes not discussed in section III are identified in section IV. Because the rule has been substantially rewritten to clarify the requirements, editorial changes are not generally noted.

III. Discussion of Comments

About 100 groups and individuals submitted comments on the ANPRM and NPRM. Nineteen of these also submitted comments on the field test report; two other groups submitted comments only on the field test report. The commenters included more than 20 State agencies, several Federal agencies, companies, trade associations, Indian tribes, environmental groups, technical consultants, and individuals. This section summarizes and responds to the major issues raised by commenters. A description of the comments and EPA's response to each issue raised in the comments are available in *Responses to Comments on Revisions to the Hazard Ranking System (HRS)* in the EPA CERCLA docket (see **ADDRESSES** section above).

A. Simplification

In response to SARA, EPA proposed revisions to the HRS so that, to the maximum extent feasible, it accurately assesses the relative risks posed by hazardous waste sites to human health and the environment. Consequently, the proposed rule required more data than did the original HRS.

A number of commenters stated that the data collection requirements of the proposed rule were excessive given its purpose as a screening tool. These commenters expressed concern that the data requirements were too extensive for a screening process; specifically, that the data requirements would lengthen the time needed to score sites with the HRS, increase the cost of listing sites, and, therefore, limit the money available for remedial actions. Most commenters—even those who considered that the revisions increased the accuracy of the model—stated that the resources required to evaluate sites under the proposed HRS were excessive.

One commenter suggested the proposed HRS would be so expensive to implement that EPA would need to develop a new screening tool to determine whether a site should undergo an HRS evaluation. Another commenter suggested that because of the complexity of the proposed revisions, preliminary scoring of a site during the site assessment process would be impractical because sites would advance too far in the site assessment process before they were determined not to be NPL candidates. Several commenters stated that, with the additional requirements, the proposed HRS is more of a quantitative risk-assessment tool than the screening tool it is supposed to be. Another suggested that the increased accuracy of the proposed rule over the original HRS is of marginal value relative to the amount of time and money involved, and that the HRS is no longer a quick and inexpensive method of assessing relative risks associated with sites.

Several commenters expressed concern that the increased data requirements of the proposed HRS would affect the schedule of the entire site assessment process. They suggested that these requirements would create a backlog of sites to be evaluated, slow the process of listing sites, and delay cleanup. Some noted that this would be contrary to the goal of identifying and evaluating sites expeditiously.

In response, the Agency believes the requirements of the final rule are within the scope of the site assessment process and that a new screening tool to determine whether a site should undergo an HRS evaluation will not be needed. To assist in screening sites, the site assessment process is divided into two stages:

- A preliminary assessment (PA), which focuses on a visual inspection, collection of available local, State, and Federal permitting data, site-specific information (e.g., topography, population), and historical industrial activity; and
- A site inspection (SI), where PA data are augmented by additional data collection, including sampling of appropriate environmental media and wastes, to determine the likelihood of a site receiving a high enough HRS score to be considered for the NPL.

The field test identified a best estimate of the average and range of costs incurred to support the data requirements of the proposed HRS. These cost estimates represented the entire site assessment process from PA to SI, and comprehensive evaluations for all pathways at most sites. As such, the Agency believes these cost estimates overstate the costs associated with site assessments occurring on the greater universe of CERCLA sites. The amount of data collected during an SI varies from site to site depending on the complexity of the site and the number of environmental media believed to be contaminated. Some SIs may be limited in scope if data are easy to obtain, while others require more substantial resource commitments. The most important factors in determining costliness of an SI are (1) the presence or absence of ground water monitoring wells in situations where ground water is affected, and (2) the number of affected media, which determines the number of samples taken and analyzed. The Agency believes the greater universe of CERCLA sites will not require the more substantial resource commitments.

Finally, EPA does not agree that the requirements of the final rule will delay the listing of sites. The site assessment process screens sites at each stage, thereby limiting the number of sites that require evaluation for scoring. The Agency believes that it will be possible to score sites expeditiously with the revised HRS.

The Agency believes the additional data requirements of the final rule will make it more accurately reflect the relative risks posed by sites, but also that the HRS should be as simple as possible to make it easier to implement and to retain its usefulness as a screening device. This approach responds to the majority of commenters who recommended that EPA simplify the proposed HRS to make it easier and less expensive to implement. In response to these comments, the rule adopted today includes a number of changes from the proposed rule that simplify the HRS. These simplifying changes were based largely on EPA's field test of the proposed rule, sensitivity studies, and issue analyses undertaken by EPA in response to comments.

- In the surface water migration pathway, the proposed recreation threat has been eliminated as a separate threat. Instead of requiring a separate set of detailed calculations and data, the final rule accounts for recreational use exposures through resources factors, where points may be added for recreation use.
- In the ground water migration pathway, the proposed potential to release has been simplified by dropping "sorptive capacity," by revising "depth to aquifer" and making it a separate factor, and by eliminating the requirement to consider all geological layers between the hazardous substance and the aquifer in evaluating travel time to the aquifer. The "travel time" factor (the depth to aquifer/hydraulic conductivity factor in the proposed rule)

is now based on the layer(s) with the lowest hydraulic conductivity.

- In the three migration pathways (i.e., ground water, surface water, and air), the use factors in the proposed rule—"land use" in the air migration pathway, "drinking water use" and "other water use" in the ground water migration pathway, and "drinking water use" and "other water use" in the surface water migration pathway—have been replaced by "resources" factors. The "fishery use" factor has been dropped from the surface water migration pathway. A resources factor has been added to the soil exposure pathway.
- In the soil exposure pathway, the requirement that children under seven be counted as a separate population has been dropped. The "accessibility/frequency of use" factor has been replaced by a simpler "attractiveness/accessibility" factor.
- In the surface water migration pathway, the "runoff curve number," which required determining the predominant land use within the drainage area, has been replaced by a simpler factor, "soil group," which only requires classifying the predominant soil group in the drainage area into one of four categories.
- In the air migration pathway, the maps used to assign values of particulate migration potential (formerly particulate mobility under potential to release) have been simplified.
- In all pathways, potentially exposed populations are assigned values based on ranges rather than exact counts, reducing documentation requirements.
- In the surface water and ground water migration pathways, Level III benchmarks have been dropped.
- In all pathways, hazardous waste quantity values are based on ranges, which will reduce documentation requirements. The methodology and explanation for evaluating the hazardous waste quantity factor have been simplified.
- Containment tables have been simplified in the air, ground water, and surface water migration pathways.

A number of the simplifications, such as the changes to the travel time and hazardous waste quantity factors, better reflect the uncertainty of the underlying site data and, therefore, do not generally affect the accuracy of the HRS. In addition, EPA notes that some revisions that may appear to make the HRS more complex actually make it more flexible. For example, the hierarchy for determining hazardous waste quantity allows using data on the quantity of hazardous constituents if they are available or can be determined; additionally, data on the quantity of hazardous wastestreams, source volume, and source area can be used, depending on the completeness of data within the hierarchy. The hierarchy allows a site to be scored at the most precise level for which data are reasonably available, but does not require extensive data collection where available data are less precise.

In response to comments on the complexity of the rule language, the presentation of the HRS has been reorganized and clarified. Factors that are evaluated in more than one pathway are explained in a separate section of the final rule (§ 2) to eliminate the repetition of instructions. The proposed HRS included descriptive background material that, while useful, made the HRS difficult to read. Much of this descriptive material has been removed from the rule.

B. HRS Structure Issues

Although the proposed rule retained the basic structure of the original HRS, a number of commenters felt that the HRS should provide results consistent with the results of a quantitative risk assessment. Several commenters identified this issue explicitly, while others identified specific aspects of the proposed rule that they believed to be inconsistent with basic risk assessment principles. The commenters maintained that if the HRS is to reflect relative risks to the extent feasible, as required by the statute, its structure should be modified to better reflect the methods employed in quantitative risk assessments. Commenters stressed the need for EPA to follow the advice of the EPA Science Advisory Board (SAB) as expressed in the SAB review of the HRS:

> Revisions to the HRS should begin with the development of a chain of logic, without regard for the ease or difficulty of collecting data, that would lead to a risk assessment for each site. This framework, but not the underlying logic, would be simplified to account for the very real difficulties of data collection.
>
> This chain of logic * * * should lead to a situation in which an increased score reflects an increased risk presented by a site.

In response to the structural issues raised by commenters and to the statutory mandate to reflect relative risk to the extent feasible, EPA made a number of changes to the final rule. These structural changes affect how various factors are scored and how scores are combined, but do not involve changes in the types or amount of data required to score a site with the HRS. The Agency stresses that the limited data generated at the SI stage are designed to support site screening, and are not intended to provide support for a quantitative risk assessment.

General structural changes. While the final rule retains the basic structure of the proposed rule in that three factor categories (likelihood of release, waste characteristics, and targets) continue to be multiplied together to obtain pathway scores, the structure has been changed in certain respects to make the underlying logic of the HRS more consistent with risk assessment principles.

The key structural changes to the waste characteristics factor category were to make use of consistent scales and to multiply the hazardous waste quantity and toxicity (or, depending on the pathway and threat, toxicity/mobility, toxicity/persistence, or toxicity/persistence/bioaccumulation) factors. Within the waste characteristics factor category, factors have been modified so they are on linear scales. These modifications make the functional relationships between the HRS factors more consistent with the toxicity and exposure parameters evaluated in risk assessments.

Where possible, the final rule assigns similar maximum point values to factor categories across pathways. The likelihood of release (likelihood of exposure) factor category is assigned a maximum value of 550; the waste characteristics factor category is assigned a maximum value of 100 (except for the human food chain and environmental threats of the surface water migration pathway); the targets factor category is not assigned a maximum. EPA determined that in general targets should be a key determinant of site threat because the data on which the targets factors are based are relatively more reliable than most other data available at the SI stage.

Likelihood of release. Except in the air migration pathway, the proposed rule assigned the same maximum value to observed release and potential to release. In the final rule, an observed release is assigned a value of 550 points and potential to release has a maximum value of 500 in all pathways. This relative weighting of values reflects the greater confidence (the association of risks with targets) when reporting an observed release as opposed to a potential release. As a result of this change in point values at the factor category level, as well as the new maximums for most pathways, the values assigned to individual potential to release factors have been adjusted.

Waste characteristics. The proposed rule assigned a maximum point value to

hazardous substance quantities of 1,000 pounds. Because some sites have hazardous substance quantities far in excess of that amount and because it is reasonable to assume that these sites present some additional risk, all else being equal, the final rule elevates the maximum value to quantities in excess of 1,000,000 pounds. Even when hazardous waste quantity is documented with precision, EPA concluded that there are diminishing returns in considering quantities above this amount.

Although the HRS does not employ the same type and quality of information that would be used to support a risk assessment (e.g., pounds of waste and mobility are combined in the ground water pathway as a surrogate for long-term magnitude of releases), as waste characteristics values rise, contamination resulting from conditions at the sites in general should be worse. As a result of using linear scales and incorporation of a multiplicative relationship between hazardous waste quantity, toxicity, and other waste characteristics factors, the influence of the waste characteristics factor category could be disproportionately large relative to the likelihood of release and targets factor categories in determining overall pathway scores. Therefore, EPA is limiting—through use of a scale transformation—the values assigned to the waste characteristics factor category, shown in Table 2–7 of the final HRS, to limit the effect of waste characteristics on the pathway scores.

While the waste characteristics factor values are limited to values of 0 to 100 in most cases, the waste characteristics factor category may reach values of up to 1,000 for both the human food chain and environmental threats in the surface water migration pathway. These exceptions have been made to accommodate the bioaccumulation factor (or ecosystem bioaccumulation factor), applied in these threats but not in other pathways or threats, which can add up to four orders of magnitude to the waste characteristics factor values before reduction to the scale values of 0 to 1,000.

Targets. The final rule includes two major structural changes to the targets factor category. Population factor values are not capped as they were in the proposed rule. This change allows a site with a large population but a low waste characteristics value to receive scores similar to a site with a smaller population but larger waste characteristics value (as would be done in a risk assessment). A second change in the targets factors involves the nearest individual (or intake or well) factors (i.e., the maximally exposed individual factors in the proposed rule). These factors are now assigned values based on exposure to Level I and Level II contamination (50 and 45 points, respectively). Potentially exposed nearest individuals are assigned a maximum of 20 points in all pathways. EPA changed the assigned values for these factors to give more relative weight to individuals that are exposed to documented contamination.

C. Hazardous Waste Quantity

In the NPRM, EPA proposed to change the hazardous waste quantity factor to allow the use of four levels of data depending on what data are available and how complete they are. Hazardous waste quantity for a source could be based on (a) hazardous constituent quantity, (b) the total quantity of hazardous wastes in the source, (c) the volume of the source, or (d) the area of the source. Each source at the site would be evaluated separately, based on data available for the source.

EPA received numerous comments relating to changes in the hazardous waste quantity factor. Several commenters agreed that allowing use of waste constituent data, when available, was an improvement over the original HRS. Several also supported the tiered approach to scoring hazardous waste quantity when constituent data were incomplete or unavailable.

Two commenters stated that the emphasis on hazardous constituent data will require more extensive and expensive site investigations. These commenters have misunderstood the revisions. The rule does not require the scorer to determine hazardous constituent quantities in all instances, but simply encourages use of those data when they are available. This approach allows a scorer the flexibility to use different types of available data for scoring hazardous waste quantity. At a minimum, the scorer need only determine the area of a source (or the area of observed contamination), which is routinely done in site inspections. Where better data are available, they may be used in scoring the factor. This approach is in keeping with the intent of Congress that the HRS should act as a screening tool for identifying sites warranting further investigation.

Several commenters stated that the methodology for determining hazardous waste quantity was too complex and time consuming, and that its administrative costs outweighed its benefits. Others found the proposed rule instructions and tables confusing and hard to follow.

EPA strongly disagrees with the claim that the costs of the revised approach to scoring waste quantity outweigh its benefits. The amount of hazardous substances present at a site is an important indicator of the potential threat the site poses. At the same time, EPA recognizes that cost is an important consideration. In revising the hazardous waste quantity factor, however, the Agency believes it has established an appropriate balance between time and cost required for scoring this factor and the degree of accuracy needed to evaluate the relative risk of the site properly.

In response to comments, EPA has modified the hazardous waste quantity scoring methodology to make it easier to understand and to use. The changes include elimination of proposed rule Table 2–13, Hazardous Waste Quantity Factor Evaluation Methodology and Worksheet. In addition, the scale for the hazardous waste quantity factor has been divided into ranges that span two orders of magnitude (100x) to reflect the uncertainty inherent in estimates of hazardous waste quantities at typical sites. The practical effect of this scale change is to reduce the data collection and documentation requirements. See §§ 2.4.2–2.4.2.2. The final rule also clarifies the treatment of wastes classified as hazardous under RCRA. Under CERCLA, any RCRA hazardous waste stream is considered a hazardous substance. If this definition were strictly applied in evaluating hazardous waste quantity of RCRA hazardous wastestreams, hazardous constituent quantity and hazardous wastestream quantity would be the same because the entire wastestream would be considered a hazardous substance. The final rule makes clear that only the constituents in a RCRA wastestream that are CERCLA hazardous substances should be evaluated for determining hazardous constituent quantity; for the other three tiers, however, the entire RCRA wastestream is considered as is any other wastestream.

As discussed in section III Q, EPA will consider removal actions when calculating waste quantities. EPA believes consideration of removal actions is likely to increase incentives for rapid actions. If there has been a removal at a site, and the hazardous constituent quantity for all sources and associated releases is adequately determined, the hazardous waste quantity factor value will be based only on the amount remaining after the removal. This will result in lowering some hazardous waste quantity factor values.

Where an adequate determination of the hazardous constituent quantity remaining after the removal cannot be made, EPA has established minimum hazardous waste quantity factor values in order to ensure that the HRS score reflects any continuing risks at the sites. In this case, the assigned hazardous waste quantity factor value will be the current hazardous waste quantity factor value (as derived in Table 2–6), or the minimum value, whichever is greater.

The proposed rule assigned a minimum hazardous waste quantity factor value of 10 when data on hazardous constituent quantity was not complete. In the final rule, for migration pathways (i.e., not the soil exposure pathway), if the hazardous constituent quantity is not adequately determined, and if any target is subject to Level I or II contamination, the minimum hazardous waste quantity factor value will be 100.

If the hazardous constituent quantity for all sources is not adequately determined, and none of the targets are subject to Level I or II contamination, the minimum factor value assigned for hazardous waste quantity depends on whether there has been a removal action, and what the hazardous waste quantity factor value would have been without consideration of the removal action. If there has not been a removal action, the minimum hazardous waste quantity factor value will be 10. If there has been a removal action and if a factor value of 100 or greater would have been assigned without consideration of the removal action, a minimum hazardous waste quantity factor value of 100 will be assigned. If the hazardous waste quantity factor value was less than 100 prior to consideration of the removal action, a minimum hazardous waste quantity factor value of 10 will be assigned. This will ensure that the Agency provides an incentive for removal actions and that in no case will consideration of removal actions result in an increased hazardous waste quantity factor value score.

D. Toxicity

The proposed HRS substantially changed the basis for evaluating toxicity. The major change was that hazardous substance toxicity would be based on carcinogenicity, chronic non-cancer toxicity, and acute toxicity. For each migration pathway and each surface water threat except human food chain and recreation, toxicity was combined with mobility or persistence factors to select the hazardous substance with the highest combined value for toxicity and the applicable mobility or persistence factor. For the human food chain threat, only substances with the highest bioaccumulation values were evaluated for toxicity/persistence. For the recreation threat, only substances with the highest dose adjusting factor values were evaluated for toxicity/persistence. In addition, ecosystem toxicity rather than human toxicity was evaluated for the environmental threat of the surface water migration pathway.

Several commenters expressed concern about or opposition to using the single most hazardous substance at a site to score toxicity, stating that the approach seems overly conservative and unlikely to distinguish sites on the basis of hazard. Some commenters suggested that EPA allow flexibility in weighting the toxicity values of multiple substances either by concentration, waste quantity, or proportion information, whenever such information is available. One commenter suggested basing toxicity on a fixed percentage of the hazardous substances known to be present at a site.

The Agency agrees that, for purposes of accurately assessing the risk to human health and the environment posed by a site, it would be preferable to evaluate the overall toxicity by considering all hazardous substances present, based on some type of dose- (or concentration-) weighted toxicity approach. EPA believes, however, that this approach is not feasible because the data requirements would be excessive. Such an approach would be feasible only when relative exposure levels of multiple substances are known or can reasonably be estimated; however, these data can be obtained only by conducting a comprehensive risk assessment. Extensive concentration data would be required to be confident that comparable concentrations are being used for the various substances, and that the multi-substance toxicity of the contaminants is not, in fact, being underestimated. Use of inadequate data could result in underestimating or overestimating the toxicity of substances in a pathway.

EPA considered a number of alternatives to the use of a single hazardous substance to score toxicity (mobility/persistence) and tested some of these on several real and hypothetical sites. The analyses included comparisons between the single most toxic substance and the average toxicity value for all substances, the average toxicity value for the 10 most toxic substances, and the concentration-weighted average value of all substances. These alternatives were also tested using toxicity/mobility values. The results of these analyses showed that using a single substance approach usually resulted in an assigned value (either toxicity or toxicity/mobility) that was within one interval in the scale of values of the alternatives tested; for example, the single substance approach would assign a value of 1,000 for toxicity whereas averaging the toxicities would assign a value of 1,000 or 100, the next lower scale value. (The final rule uses linear scales to assign values for toxicity, mobility, and persistence. The scales for toxicity now range from 0 to 10,000 rather than 0 to 5; consequently, the default value for toxicity is now 100 rather than 3.) The Agency recognizes the uncertainty in the use of the single substance approach, but concludes that it is a reasonable approach for a screening model, especially given the general unavailability of information to support alternatives. In making this judgment, the Agency notes that the single substance approach to evaluating the toxicity factor was not identified in SARA as a portion of the HRS requiring further examination, even though it had been used in the original HRS and EPA had received criticism similar to the above comments prior to the enactment of SARA.

Several commenters suggested that additive, synergistic, or antagonistic effects among substances be considered in scoring toxicity when several substances are found at a site. In particular, one commenter suggested increasing the scores for sites with a large number of hazardous substances to account for additive or synergistic effects.

As noted in EPA's 1988 *Technical Support Document for the Proposed Revisions to the Hazard Ranking System*, quantitative consideration of synergistic/antagonistic effects between hazardous substances is generally not possible even in RI/FS risk assessments because appropriate data are lacking for most combinations of substances. Interactive effects have been documented for only a few substance mixtures, and the Agency's risk assessment guidelines for mixtures (51 FR 34014, September 24, 1986) emphasize that although additivity is a theoretically sound concept, it is best applied for assessing mixtures of similar acting components that do not interact. Thus, the Agency believes that consideration of interactive effects in evaluating toxicity in the HRS is not feasible, nor is it necessary to allow use of the HRS as a screening model. The Agency rejects the suggestion that scores should simply be raised for sites

with numerous substances because this approach ignores the technical complexities related to interactions (i.e., the possibility of antagonistic effects.)

One commenter suggested that a waste's toxicity should be assessed in terms of its "degree of risk," and that this could be measured by comparing constituent concentrations at the point of exposure to appropriate toxicity reference levels. Two commenters stated that toxicity should be measured at a likely point of human exposure rather than at the waste site.

The toxicity of a substance, as used in the HRS, is an inherent property, often expressed quantitatively as a dose or exposure concentration associated with a specific response (i.e., a dose-response relationship). These toxicity values, in general, are independent of expected environmental exposure levels; many are based on laboratory tests on animals. Risk, on the other hand, is a function of toxicity, the concentration of a substance in environmental media to which humans may be exposed, and the likelihood of exposure to that medium (and the population likely to be exposed). The toxicity factor in the waste characteristics factor category of the HRS is intended to reflect only the inherent toxicity (i.e., the basic dose-response relationship) of substances found at the site. The HRS as a whole is intended to evaluate, to the extent feasible, relative risks posed by sites by including factors for likelihood of release, waste quantity, toxicity, and the proximity of potentially exposed populations. If actual contamination (for example, of drinking water) has been detected at a site, the measured environmental concentration of each substance is compared with its appropriate health-based or ecological-based concentration limit (i.e., its benchmark). If these environmental concentrations equal or exceed a benchmark, certain target factors are assigned higher values than if environmental concentrations are less than benchmarks.

Two commenters suggested using Cancer Potency Factors to score toxicity only for Class A and B1 carcinogens, and using reference doses (RfDs) for scoring Class B2 and C carcinogens (i.e., substances for which there is inadequate or no direct human evidence of carcinogenicity).

In response, EPA believes that because the HRS is a screening tool, it should maintain a conservative (i.e., protective) approach to evaluation of potential cancer risks. EPA's 1986 *Guidelines for Carcinogen Risk Assessment* (51 FR 34014, September 24, 1986) provide for substances in Class A and Class B (both B1 and B2) to be regarded as suitable for quantitative human risk assessment. In general, according to EPA's 1989 *Risk Assessment Guidance for Superfund: Human Health Evaluation Manual,* Class C substances are evaluated for cancer risks within the Superfund risk assessment process. Thus, the use of cancer risk information for Class B2 and C substances in the HRS is consistent with the objective of maintaining a conservative approach and with other Agency and Superfund program risk assessment guidelines.

In response to comments that the best available data should be used to score sites, that accepted Agency practices be relied on, and that consistency across pathways be encouraged, the Agency has modified slightly the way the toxicity value for a substance is selected. The final rule requires the use of carcinogenicity and chronic toxicity data, when available, over acute toxicity data. If both slope factors and RfDs are available, the higher of the values assigned for these types of toxicity parameters is used. If neither is available, but acute toxicity data are available, the acute toxicity data are used to assign toxicity factor values. EPA decided to give preference to slope factors and RfD values because these undergo more extensive Agency review and are based on long-term exposure studies.

E. Radionuclides

The proposed HRS assigned radionuclides a maximum toxicity value, but included no other procedures specific to radionuclides.

One commenter, the U.S. Department of Energy (DOE), asserted that the proposed HRS "* * * contains an inequitable bias regarding radionuclides * * *" DOE specifically criticized assigning maximum toxicity factor values to radionuclides, "* * * where, in fact, the health impact associated with radionuclides is associated with the type of decay, the level of decay energy, the half-life, the mobility, the concentration of the radionuclide, internal biological factors, and external pathway factors." DOE proposed using concepts for evaluating radionuclides that were included in its Modified Hazard Ranking System (mHRS). In its subsequent comments on the HRS field test report, DOE stated that it considered the "* * * method of handling radionuclides in the proposed revised HRS to be a serious flaw in the evaluation system."

In the final rule, EPA has clarified and significantly changed how radionuclides are evaluated. Instead of using or adapting the mHRS directly, however, EPA modified the proposed HRS to account more fully for radionuclides based on EPA's own methods for evaluating them, which are similar to and generally consistent with the radiation analysis concepts underlying the mHRS.

The final rule evaluates radionuclides within the same basic structure as other hazardous substances, and the evaluation of many individual HRS factors is the same whether radionuclides are present or not. Table 7-1 of the final rule lists HRS factors and indicates which are evaluated differently for radionuclides. Essentially, radionuclides are simply treated as additional hazardous substances with certain special characteristics that are accounted for by separate scoring rules for some HRS factors. For sites containing only radionuclides, the scoring process is very similar to the process at other hazardous substance sites, except that different scoring rules are applied to a number of substance-specific factors and a few other factors. For sites containing both radionuclides and other hazardous substances, both types of substances are scored for all HRS factors that are substance-specific, with overall factor values based either on combined values or the higher of the values, as appropriate.

EPA notes that, although some radioactive substances are statutorily excluded from the definition of "hazardous waste" in both CERCLA and RCRA (specifically, source, special nuclear, and byproduct material as defined in the Atomic Energy Act of 1954), such substances may be, and generally are, "hazardous substances" as defined in section 101(14) of CERCLA and therefore may be addressed under CERCLA. Radioactive substances should be included in HRS scoring and section 7 of the final rule is intended to facilitate that analysis. It also should be noted that two narrow categories of releases (either from "nuclear incidents" or from sites designated under the Uranium Mill Tailings Radiation Control Act of 1978) are excluded from CERCLA's definition of the term "release" (CERCLA section 101(22)), and such releases should not be scored using the HRS.

The major changes to the HRS in the evaluation of radionuclides apply to establishing observed releases, to factors in the waste characteristics category, and to determining the level of actual contamination in the targets factor category. The HRS components that have been modified are briefly described below.

The criteria for establishing an observed release through analysis of samples for radionuclides differ considerably from the criteria used for other hazardous substances. These criteria are divided into three groups: radionuclides that occur naturally or are ubiquitous in the environment; manmade radionuclides that are not ubiquitous in the environment; and gamma radiation (soil exposure pathway only). (See § 7.1.1.)

The hazardous waste quantity factor for sources (and areas of observed contamination) containing radionuclides has been modified to reflect the different units used to measure the amount of radiation (curies, a measure of activity) versus the units used for other hazardous substances (pounds, a measure of mass). EPA believes it is preferable to use activity units rather than mass units because activity is the standard measure of radiation quantity and is a better indicator of energy released and potential to cause human health damage than is mass. In addition, the hierarchy for evaluating the waste quantity factor for sources (and areas of observed contamination) containing radionuclides is limited to Tiers A and B. Tiers C and D, based on source volume and source area, respectively, are not used because adequate data to derive their quantitative relationship to Tier A were unavailable. Thus, the waste quantity factor is based either on radionuclide constituent quantity (Tier A) or radionuclide wastestream quantity (Tier B).

For sites containing only radionuclides, hazardous waste quantity is calculated based on the activity content of the radionuclides or radionuclide wastestreams associated with each source. For sites with both radionuclides and other hazardous substances, hazardous waste quantity is evaluated separately for the two types of hazardous substance for each source, and the values are then summed in determining the hazardous waste quantity value. The scale for scoring radionuclide waste quantity was derived based on concepts of risk equivalence between radionuclides and other hazardous substances.

In the proposed rule, all radionuclides were automatically assigned a maximum default value for the toxicity factor. The final rule evaluates radionuclides individually on the basis of human toxicity, across a range of factor values based on the potential to cause cancer (i.e., cancer slope factors). Non-cancer effects are not considered for radionuclides because cancer is generally the most significant toxic effect. Incorporated in the development of cancer slope factors are the type of radioactive decay; energy emitted during decay; biological uptake, distribution, and retention; and radiation dose-response relationship. Thus, across the set of scoring ranges used, radionuclides that are more potent carcinogens per unit activity now receive higher toxicity factor values than those that are less potent. The new toxicity scoring scale for radionuclides was derived in a manner consistent with the derivation of the existing carcinogenicity scale for other hazardous substances. Taken together, the new toxicity and hazardous waste quantity scales for radionuclides result in a risk equivalence between radionuclides and other hazardous substances.

Mobility of radionuclides in both the air and ground water migration pathways is evaluated in the same way as mobility for other hazardous substances; that is, on the basis of the chemical and physical characteristics of the radionuclide. Similarly, the bioaccumulation (and ecosystem bioaccumulation) potential factor is evaluated in the same way for radionuclides as for other hazardous substances. The final rule clarifies that radionuclides should be scored for these factors in all relevant pathways.

The persistence factor in the surface water migration pathway has been modified so that radionuclides are evaluated solely on the basis of half-life, which for HRS purposes is based on both radioactive half-life and volatilization half-life. Sorption to sediments is not considered, nor are hydrolysis, photolysis, or biodegradation. Other than this change in the processes considered to estimate surface water half-life, the scoring of the persistence factor is the same for radionuclides as for other hazardous substances.

The final rule extends to radionuclides the benchmark concept used throughout the HRS for weighting certain targets factor values. Measured levels of specific radionuclides at potential exposure points are compared to benchmark levels, and additional weight is given to targets subject to actual contamination (Levels I and II). This approach for weighting target factors using benchmarks is similar for radionuclides and for other hazardous substances, although both the specific benchmark values used for radionuclides and the methods for deriving the values are different. Benchmarks for evaluating radionuclide contamination parallel those used for other hazardous substances in that available Federal standards and screening concentrations are used when applicable. At sites with both radionuclides and other hazardous substances, each radionuclide and other substance is evaluated separately. If no individual substance equals or exceeds its benchmark, the ratios of the measured concentrations to the screening concentrations for cancer for radionuclides and other hazardous substances are added. Radionuclides are not evaluated using screening concentrations for non-cancer effects.

Specific benchmark values for radionuclides are in activity units instead of mass units, however, to reflect the appropriate measurement units for the level of radionuclide contamination. Radionuclide benchmarks include drinking water maximum contaminant levels (MCLs) for both the ground water and the surface water/drinking water threat pathways; Uranium Mill Tailings Radiation Control Act (UMTRCA) standards for the soil exposure pathway; and screening levels corresponding to 10^{-6} individual cancer risk for inhalation or oral exposures, as derived from cancer slope factors, for all pathways and threats incorporating human health benchmarks. The radionuclide benchmarks are consistent with EPA's radionuclide risk assessment methods in that they incorporate standard data or assumptions about contact/consumption rates for various environmental media and radiation dose-response, as well as the specific radionuclide's type of decay, decay energy, biological absorption, and biological half-life. Furthermore, radionuclide benchmarks for the soil exposure pathway account for external exposure (i.e., exposure to radiation originating outside the human body) from gamma-emitting radioactive materials in surficial material as well as from ingestion, which is the sole basis for non-radioactive hazardous substance benchmarks for the soil exposure pathway, because external exposure from gamma-emitting radionuclides can be an extremely important exposure route.

F. Mobility/Persistence

The proposed rule added mobility factors to both the ground water and air migration pathways and modified the persistence factor in the surface water migration pathway to consider a greater number of potential degradation mechanisms.

The Agency received a large number of comments critical of several aspects

of the ground water mobility factor. The most common issues included:

- Concern about the use of coefficients of aqueous migration to establish mobility values for inorganic cations and anions;
- Suggestions that solubility values, distribution coefficients, and other measures be used to establish mobility values for anions and cations; and
- Requests that the same measures of mobility be used for organics and inorganics.

Criticism of the use of the coefficients of aqueous migration focused on its obscurity; except for geochemists, few scientists are familiar with the measure. In response to these comments and because coefficients of aqueous migration are not available for all hazardous substances and radionuclides, the Agency decided to replace coefficients of aqueous migration.

The majority of commenters stated a preference for using parameters related either to hazardous substance release (solubility) or to transport (distribution coefficients) as measures of mobility. The ground water mobility factor is intended to reflect the fraction of a hazardous substance expected to be released from sources, migrate through porous media, and contaminate aquifers and the drinking water wells that draw from them. Because mobility is concerned with both release and transport, the Agency concluded that mobility for all hazardous substances in ground water will be evaluated using both solubility and distribution coefficient values. A default value is assigned when none of the hazardous substances eligible to be evaluated can be assigned a mobility factor value based on available data.

A number of commenters raised questions about the persistence factor in the surface water migration pathway. In general, the commenters were divided between those who wanted more degradation mechanisms considered and those who believed the equation in the proposed rule for calculating half-lives was too complex. Several commenters suggested including sorption of substances by sediments.

In response to these comments, EPA has made several changes to the persistence factor. The free-radical oxidation half-life has been dropped from the equation used to calculate half-life because the data on which its half-life values are based are typically derived from ideal, laboratory conditions that differ greatly from conditions found in nature; few field validation studies have been conducted to provide a basis for extrapolating these laboratory values to natural environments. Thus, EPA concluded that including free-radical oxidation in the persistence equation resulted in an overemphasis of the influence of free-radical oxidation as a degradation mechanism. For hazardous substances that sorb readily to particulates found in natural water bodies, the persistence equation as proposed overemphasized the importance of degradation mechanisms that occur in the liquid phase. Log K_{ow}, the logarithm of the n-octanol-water partition coefficient, has been added to account for sorption to sediments.

The Agency received several comments concerning the mobility factors in the air migration pathway. The most significant of the issues raised by commenters were:

- Whether consideration of mobility in both the likelihood of release factor category and the waste characteristics factor category counts mobility twice;
- Whether the approach used in the proposed rule properly reflected the dynamics of releases of gases from sources into the atmosphere; and
- Whether the Thornthwaite P-E Index was sufficient as the sole measure of particulate mobility and whether particle size should be included.

In response to these and other related structural and air migration pathway comments, the Agency thoroughly re-assessed the adequacy of the mobility factors in the likelihood of release and waste characteristics factor categories. Based on this review, EPA has made several changes to the mobility factors in the final rule. In response to the "double counting" issue, the Agency believes there are differences between mobility in the context of likelihood of release and mobility in the context of waste characteristics. The potential to release mobility factor is a measure of the likelihood that a source at a site will release a substance to the air; the waste characteristics mobility factor, together with the hazardous waste quantity factor, is a measure of the magnitude of release. To highlight these differences, the names of the likelihood of release mobility factors have been changed to gas (or particulate) migration potential.

In response to comments on air migration pathway mobility and structure, EPA reviewed gas and particulate release rate models to develop revised mobility factors that improve evaluations of release magnitude and duration. The gas and particulate mobility factors in the final rule are a result of that review. The gas mobility factor is based on a simplified release model and is determined by the vapor pressure of the most toxic/mobile hazardous substance available for migration to the atmosphere at the site. The particulate mobility factor is based on a simplified fine-particle wind-erosion model and reflects the combined effects of differing wind speeds and soil moisture. Analyses indicated that soil moisture was dominant over both wind speed and particle size, which are essentially equal in effect. Because of the comparative difficulty of determining particle sizes in an SI, a single particle size was assumed to apply to all sites. This constant particle size value was factored into the simplified model yielding the factor in the final rule.

G. Observed Release

The proposed HRS described how to determine whether an observed release was significantly above background levels based on multiples of detection limits and background concentrations.

Some commenters stated that the proposed revisions treated observed release in an overly complex manner. A number of commenters, primarily from the mining industries, were concerned about the consideration of background concentration in determining an observed release. (See Section III P below for a summary of their concerns and EPA's response.)

As in the proposed rule, observed releases may be established based on either direct observation or chemical analysis of samples. In the case of direct observation, material (e.g., particulate matter) containing hazardous substances must be seen entering the medium directly or must have been deposited in the medium.

EPA has replaced the proposed rule criteria for establishing an observed release by chemical analysis with simpler criteria. In the final HRS, an observed release is established when a sample measurement equals or exceeds the sample quantitation limit (SQL) and is at least three times above the background level, and available information attributes some portion of the release of the hazardous substance to the site. (The SQL is the quantity of a hazardous substance that can be reasonably quantified, given the limits of detection for the methods of analysis and sample characteristics that may affect quantitation (e.g., dilution, concentration).) When a background concentration is not detected (i.e., below detection limits), an observed release is established when the sample measurement equals or exceeds the SQL. Any time the sample measurement is less than the SQL, no observed release is established. Table 2-3 of the

final rule provides the criteria for determining when analytic sampling information is sufficient for establishing an observed release (or observed contamination in the soil exposure pathway). The final rule also provides procedures to be followed when the SQL is unavailable and defines various types of detection and quantitation limits in the context of the HRS. (See § 2.3 of the final rule.)

H. Benchmarks

SARA requires that EPA give high priority to sites that have led to closing of drinking water wells or contamination of principal drinking water supplies. To respond to this mandate, the proposed rule added health-based benchmarks to the ground water and surface water migration pathways; in addition, ecological-based benchmarks were added to evaluate sensitive environments targets in surface water. In the proposed rule, population factors were evaluated at Level I if a health-based benchmark had been exceeded. If actual contamination was present, but the benchmark was not exceeded, populations were evaluated based on two levels of contamination (i.e., Level II and Level III). Sensitive environments in the surface water migration pathway were evaluated based on two levels of actual contamination (exceeding benchmark or not exceeding benchmark). Where several hazardous substances were present below benchmarks, the percentages of their concentrations relative to their benchmarks were added to determine which level was used to assign values.

Of the commenters on this issue, most supported EPA's proposal to give extra weighting to sites where measured exposure-point concentrations exceed benchmarks. One commenter who dissented suggested giving extra weighting to sites where actual contamination is documented; documentation of an observed release (or observed contamination) would be the only criterion for assigning higher values to target factors, and the relationship of the concentration of hazardous substances to benchmarks would not be used. The other dissenting commenter suggested that EPA re-evaluate the role of health-based benchmarks in the HRS because common sense, and other laws, will discourage people from drinking water contaminated above benchmark levels, and because evaluating this factor will entail large resource expenditures for marginal gains in discrimination.

The final rule weights most targets based on actual and potential exposure to contamination across all pathways and threats, including those for which benchmarks were not originally proposed, because EPA believes that this approach both improves the ability of the HRS to identify sites that pose the greatest threat to human health and the environment and increases the internal consistency of the HRS. (See §§ 2.5, 2.5.1, 2.5.2, 3.3.1, 3.3.2, 4.1.2.3.1, 4.1.2.3.2, 4.1.3.3.1, 4.1.3.3.2, 4.1.4.3.1, 4.2.2.3.1, 4.2.2.3.2, 4.2.3.3.1, 4.2.3.3.2, 4.2.4.3.1, 5.1.3.1, 5.1.3.2, 6.3.1, 6.3.2, 6.3.4, 7.3.1, 7.3.2.) In the final rule, both the population factors and the factors reflecting the hazard to the nearest individual (or well or intake) are evaluated in relation to health-based benchmarks in all pathways. The sensitive environment factor in the surface water environmental threat is weighted in relation to ecological-based benchmarks; however, in the soil exposure and air migration pathways, the sensitive environment factor is weighted simply on the basis of exposure to actual contamination, and no benchmarks are used.

The Agency chose to use benchmarks in all pathways in response to comments that specifically suggested such a change; it is also responding to comments that the HRS should better reflect relative risks and that the approaches in all pathways should be consistent. The Agency has concluded that the concerns expressed by commenters outweigh the concerns about uncertainties in the evaluation of samples collected in air and soil and about the lack of regulatory standards and criteria on which to base soil or air benchmarks that led the Agency not to include benchmarks for those pathways in the proposed rule. In short, EPA carefully considered this point and concluded that the consistent application of benchmarks across all pathways provides for the most reasonable use of data given the purpose of the HRS as a screening tool.

EPA generally selected specific criteria based on applicable or relevant and appropriate requirements (ARARs), excluding State standards, that have been selected for the protection of public health and the environment as outlined in the NCP (55 FR 8666, March 8, 1990). In the HRS NPRM, EPA proposed to use MCLs, maximum contaminant level goals (MCLGs), and screening concentrations (SCs) based on cancer slope factors as drinking water benchmarks, and Food and Drug Administration (FDA) Action Levels as benchmarks for the human food chain threat. EPA also proposed to use Ambient Water Quality Criteria (AWQC) as ecological-based benchmarks for the environmental threat. EPA received 21 comments from 12 commenters on which benchmarks the HRS should use and whether additional information should be considered in establishing benchmarks. Opinion was divided on the use of specific types of benchmarks: three commenters supported the use of MCLs; three did not. Two commenters supported the use of MCLGs, two opposed such use, and one suggested that EPA consider the economic impact of using the value of 0 (i.e., the MCLG for a carcinogen) as a health-based benchmark. Two commenters suggested including relevant State drinking water standards, and one suggested including concentrations based on RfDs. One commenter expressed concern that the current lack of water quality standards for many substances might make the benchmark system ineffective in identifying sites that pose a significant threat to human health. Two commenters suggested that carcinogen weight of evidence should be used in establishing SCs (e.g., the individual risk level should be lower for a Class A carcinogen than for a Class B2 carcinogen). Two commenters suggested considering other important routes of exposure (e.g., inhalation of hazardous substances volatilized from water, or dermal contact with contaminated water) in establishing drinking water benchmarks.

EPA conducted a number of analyses on specific benchmarks and on the modification of factors to consider in establishing HRS benchmarks. As a result of public comments and these analyses, EPA has concluded that the HRS is improved by including concentrations based on nationally uniform standards, criteria, or toxicity values as health-based or ecological-based benchmarks in all pathways and threats. EPA's conclusion is based on several considerations. First, the addition of benchmarks across all pathways and the use of ARARs for those benchmarks improves linkages with the RI/FS process. That is, the HRS benchmarks will be those used most frequently during RI/FSs, and the additional points provided by equalling or exceeding a benchmark will aid in identifying areas requiring follow-up in the RI/FS. Second, the internal consistency of the HRS is improved by using benchmarks because concentrations measured at or above benchmark levels are treated in a parallel manner across all pathways, allowing more consistent and fuller use of the relatively costly sampling data

collected during the SI. Third, the number of hazardous substances for which at least one health-based or ecological-based benchmark is available is increased, allowing for more uniform assessment of sites nationwide.

The benchmark criteria that the Agency has concluded are most appropriate for each pathway and threat are listed below. As discussed above, EPA agrees with comments suggesting that benchmarks also be used in the soil exposure and air migration pathways and has selected criteria for these pathways based upon the kinds of factors discussed above. While EPA believes the criteria for the soil exposure and air migration pathways in the final rule are appropriate, it is open to any comments that members of the public may wish to submit regarding these criteria and specifically solicits such comments at this time. EPA asks that any such comments be submitted on or before (30 days after the date of publication in the **Federal Register**).

For the final rule, EPA has selected the following types of benchmarks in each pathway and threat, subject to any revisions in the criteria for air and soil exposure that may be made in response to comments. (Benchmarks for radionuclides are discussed in Section III E of this preamble.)

- Benchmarks in the ground water migration pathway and the surface water drinking water threat include MCLs, non-zero MCLGs, screening concentrations (SCs) for non-cancer effects based on RfDs for oral exposures, and SCs for cancer based on slope factors for oral exposures and 10^{-6} individual cancer risk (see Table 3–10). Because SCs based on RfDs and slope factors are used as drinking water benchmarks, MCLGs with a value of 0 have been dropped as HRS benchmarks.
- Benchmarks in the surface water human food chain threat include FDA Action Levels for fish or shellfish, SCs for non-cancer effects based on RfDs for oral exposures, and SCs for cancer based on slope factors for oral exposures and 10^{-6} individual cancer risk (see Table 4–17).
- Benchmarks in the surface water environmental threat include AWQC and Ambient Aquatic Life Advisory Concentrations (AALACs); AALACs will be considered as they become available (see Table 4–22).
- Benchmarks in the soil exposure pathway include SCs for non-cancer effects based on RfDs for oral exposures, and SCs for cancer based on slope factors for oral exposures and 10^{-6} individual cancer risk (see Table 5–3).
- Benchmarks in the air migration pathway include National Ambient Air Quality Standards, National Emission Standards for Hazardous Air Pollutants (NESHAPs) that are expressed in ambient concentration units, SCs for non-cancer effects based on RfDs for inhalation exposures, and SCs for cancer based on slope factors for inhalation exposures and 10^{-6} individual cancer risk (see Table 6–14).

Several commenters suggested technical refinements for deriving health-based benchmarks. Although qualifying information is useful and important and is, in fact, used extensively in the RI/FS process, the benefits of including such information in the HRS must be balanced against its limited scope and purpose as well as the limited data available to determine concentration at the point of exposure. Consequently, in the final rule:

- All health-based benchmarks are set in reference to the major exposure concern for each pathway or threat (e.g., benchmarks in the air migration pathway are set in reference to inhalation only; benchmarks in drinking water, the human food chain threat, and the soil exposure pathway are set in reference to ingestion), except for radionuclides for which external exposure is also considered in the soil exposure pathway;
- All benchmarks are set in reference to uniform exposure assumptions that are consistent with RI/FS procedures (e.g., water consumption is assumed to be two liters per day; body weight is assumed to be 70 kg);
- State water quality standards and other State or local regulations are not included as benchmarks because they would introduce regional variation in the HRS;
- A hierarchy has been developed to provide a single benchmark concentration for each hazardous substance by pathway and threat; and
- Qualitative weight-of-evidence is not used in deriving SCs for carcinogens.

In the NPRM, EPA requested comments on how many tiers (levels) of actual contamination to consider when weighting populations relative to benchmarks (i.e., which of three alternative methods presented should be adopted). EPA received two comments on this issue and three related comments regarding the weighting factors for each level. One commenter supported Alternative 2 (i.e., use of two levels of observed contamination and one level of potential contamination). Another commenter suggested that Level II and Level III concentrations be combined to include the range of contaminant levels above background, but below health-based benchmarks. A third commenter suggested that the weighting factors for each level be reconsidered. A fourth commenter suggested that $\frac{1}{1000}$ of a benchmark factor is inappropriate because it is excessively conservative and difficult to detect. The fifth commenter suggested that because Level III represents concentrations with cancer risks below 10^{-7}, populations exposed to Level III concentrations should not be considered in the population category of drinking water threats.

EPA conducted a number of analyses on the subject of benchmark tiers and has dropped Level III contamination. In the final rule, Level I contamination is defined as concentration levels for targets which meet the criteria for actual contamination (see § 2.5 of the final rule) and are at or above media-specific benchmark levels; Level II contamination is defined as concentration levels for targets which either meet the criteria for actual contamination but are less than media-specific benchmarks, or meet the criteria for actual contamination based on direct observation; and potential contamination is defined as targets that are potentially subject to releases (i.e., targets that are not associated with actual contamination for that pathway or threat). These three tiers are used to assign values to both the nearest individual (or well or intake) and the population factors. As a result of EPA's analyses of benchmark issues, the weighting assigned to Level I and Level II contamination has been changed and made consistent across pathways. For example, Level I populations are now multiplied by a factor of 10 in all pathways. As in the proposed rule, potentially contaminated populations and nearest individuals (or wells or intakes) are distance or dilution weighted.

The proposed rule summed the ratios of all hazardous substances to their individual benchmarks as a means of defining the level of actual contamination, and EPA requested comments on the appropriateness of this approach to scoring multiple substances detected in drinking water. Of the 10 comments in response to this proposal, nine strongly opposed the proposed approach, particularly when applied to drinking water standards (i.e., MCLs), MCLGs, and noncarcinogens. One commenter supported the proposed approach.

EPA has decided to retain the summing of ratios of hazardous substances to their individual benchmarks, but in a modified form. The final rule sums measures of carcinogenic and noncarcinogenic effects separately;

concentrations specified in regulatory limits (e.g., NAAQS, MCLs, or FDA Action Levels) are not included in the summing algorithm. EPA recognizes that a more precise estimate of relative risk would be obtained by summing the ratios of hazardous substances to their individual RfD-based concentrations by segregating substances according to major effect, target organ, and mechanism of action. In fact, such a segregation is recommended during the RI/FS. However, health-based benchmarks are used in the HRS to provide a higher weight to populations exposed to hazardous substances at levels that might result in adverse health effects. As a consequence, EPA believes that use of the summed ratios of hazardous substances within pathways and threats to their individual RfD-based benchmark levels is appropriate for the screening purpose of the HRS.

EPA proposed and solicited comments on a range of 10^{-4} to 10^{-7} for individual cancer risk levels of concern in establishing levels of actual contamination with respect to health-based benchmarks. EPA received eight comments concerning this risk range. Four commenters suggested restricting the range to 10^{-4} to 10^{-6}, primarily because this range would be consistent with risk levels identified in the NCP and used by other EPA regulatory programs. Three commenters said the SCs for carcinogens should be the 10^{-6} individual cancer risk level. One commenter stated that 10^{-4} to 10^{-7} generally is the risk range considered for Superfund response. The final rule defines only two levels of actual contamination: significantly above background and equal to or above benchmark, and significantly above background but less than benchmark. When an applicable or relevant and appropriate requirement does not exist for a carcinogen, EPA selects remedies resulting in cumulative risks that fall within a range of 10^{-4} to 10^{-6} incremental individual lifetime cancer risk based on the use of reliable cancer potency information. EPA has selected the 10^{-6} screening risk level in defining the HRS benchmark level for cancer risk because it is the lower end of the cancer risk range (i.e., 10^{-4} to 10^{-6}) identified in the NCP and used by other EPA regulatory programs.

Two commenters objected to assigning releases of substances with no benchmarks to Level II as a default value. One suggested assigning unknowns to Level III because substances that are frequently released or are known or suspected to cause health problems are studied before those that are not. The other objected because "the absence of data is not data."

Because EPA has decided to adopt a benchmark system incorporating only two levels of actual contamination, the default level is Level II. If none of the hazardous substances eligible to be evaluated at a sampling location has an applicable benchmark, but actual contamination has been established, the actual contamination at the location is assigned to Level II.

I. Use Factors

The proposed HRS included factors to assign values to uses of potentially affected resources in the three migration pathways: ground water use (drinking water and other) in the ground water migration pathway, drinking water and other use and fishery use in the surface water migration pathway, and land use in the air migration pathway.

EPA received a number of comments on each of these factors. The commenters raised specific objections to distinctions drawn among various potential uses and to the weights assigned to those uses. For example, for the ground water use factor, some commenters asserted that the HRS should not delineate between private and public water supply contamination. For the surface water use factors, a commenter recommended a range of assigned values for irrigation of commercial food or forage crops because of variations in rates of uptake of hazardous substances. For the land use factor, two commenters urged giving greater consideration to institutional land use because of the sensitive populations that would be exposed.

Partly in response to these comments, and in an effort to simplify the HRS, EPA has substantially revised the method of incorporating resource use information in targets factor categories. The field test indicated that collecting data on each of the use factors involved considerable effort at many sites. In addition, because of weighting factors applied to potentially contaminated populations, at sites with no actual contamination, use factors were contributing more to the targets value than were large populations. As some commenters pointed out, the use factors mixed concerns about human health with concerns about the value of the resource and, therefore, were partially redundant with population factors. To avoid redundancy with human health concerns as evaluated through the population factor, EPA has made major changes in how resource uses are evaluated and scored in the final rule.

In each migration pathway, the use factors have been replaced by a resources factor that assigns values to resources appropriate for the pathway. In addition, a resources factor has been added to the soil exposure pathway. The resources factor for a pathway is assigned a maximum of five points if any of the resource uses for that pathway exists within the target distance limit in the ground water or surface water migration pathway, within one-half mile of a source in the air migration pathway, or within an area of observed contamination in the soil exposure pathway. If none of the uses exists, the factor is assigned a value of 0.

The resources factor in the ground water migration pathway assigns a value of 5 for wells supplying water for irrigation of commercial food or commercial forage crops (five-acre minimum), watering of commercial livestock, as an ingredient in commercial food preparation, or as a supply for commercial aquaculture or for a major or designated water recreation area (excluding drinking water use)—for example, water parks (see § 3.3.3). A value of 5 is also assigned if the water in the aquifer is usable for drinking water, but not used.

The resources factor in the drinking water threat of the surface water migration pathway assigns a value of 5 if the surface water is designated by a State for drinking water use but not used, or is usable but not used for drinking water. In addition, points may be assigned for intakes supplying water for irrigation of commercial food or commercial forage crops (five-acre minimum), watering of commercial livestock, as an ingredient in commercial food preparation, or if the water body is used as a major or designated water recreation area (see § 4.1.2.3.3). The fishery use factor has been deleted to avoid double-counting of fisheries.

In the air migration pathway, the resources factor is assigned a value of 5 if there is commercial agriculture or commercial silviculture, or a major or designated recreation area within a half mile of a source (see § 6.3.3). The distance of one-half mile for the agricultural, silvicultural, and recreational areas was determined by the distance weighting factors for the air migration pathway, which reflect the rapid diminishing of air contaminant concentrations beyond one-half mile from a source. Therefore, resources beyond this distance are not considered in this pathway.

A resources factor has also been added to the resident population threat of the soil exposure pathway. The factor is assigned a value of 5 if there is commercial agriculture, commercial silviculture, or commercial livestock production or grazing on an area of observed contamination at the site.

J. Sensitive Environments

The proposed rule expanded the list of sensitive environments considerably and, for the surface water and air pathways, counted all sensitive environments within the target distance limit, rather than just the one with the highest assigned value; for the soil exposure pathway, only the sensitive environment assigned the highest value was counted. Potentially contaminated sensitive environments were distance/dilution weighted; in the surface water environmental threat, actual contamination of sensitive environments was evaluated on the basis of ecological-based benchmarks.

EPA received relatively few comments on issues related to sensitive environments. However, participants in the field test requested clarification of three categories of sensitive environments involving spawning areas, migratory pathways, and feeding areas critical for the maintenance of a fish species within a river system, coastal embayment, or estuary. In particular, critical migratory pathways and feeding areas were difficult to identify and seemed to provide little discrimination among surface waters in some areas of the country.

EPA has redefined critical spawning areas to include shellfish beds, and has limited the areas to those used for intense or concentrated spawning by a given species. Critical migratory pathways and feeding areas have been combined into a single category and limited to anadromous fish (i.e., fish that ascend from the ocean to spawn), which face special problems in migrating substantial distances between the ocean and their spawning areas. These feeding areas are further restricted to only those areas in which the fish spend extended periods of time. Examples include areas where juveniles of anadromous species feed for prolonged periods (e.g., weeks) as they prepare to migrate from fresh water to the ocean, and holding areas along the adult migratory pathways.

Terrestrial areas used for breeding by large or dense aggregations of vertebrates (e.g., heron rookery, sea lion breeding beach) have been added to the list of sensitive environments to parallel the spawning areas listed for fish species. Water segments designated by a State as not attaining toxic water quality standards have been removed because these environments are already degraded and thus are not analogous to the other sensitive environments listed. Also, the assigned value for State designated areas for protection or maintenance of aquatic life has been changed from 50 points to 5 points (see Table 4–23 in final rule) to be consistent with the points assigned under the resources factor for State designated areas for drinking water use.

In response to public comment, National Monuments have been added to the 100-point category on the list of terrestrial sensitive environments considered under the soil exposure pathway. "State designated natural areas" and "particular areas, relatively small in size, important to the maintenance of unique biotic communities" were also added to the list of terrestrial sensitive environments in response to public comment. These latter two categories were already considered in the air and surface water pathway evaluation of sensitive environments. (See Table 5–5.)

The method for evaluating wetlands has been revised, partially because participants in the field test had difficulty identifying discrete wetlands. Some wetlands were patchy and could be classified as one large or many small wetlands. Other wetlands were divided by rivers or roads, or changed from one type of wetland to another, making it unclear whether more than one wetland should be counted. To eliminate these difficulties, wetlands are now evaluated on the basis of size and level of contamination. In the air migration pathway, wetlands are evaluated based on acreage and level of contamination (see § 6.3.4); in the surface water migration pathway, wetlands are evaluated by linear frontage along the surface water hazardous substance migration path and level of contamination (see § 4.1.4.3.1). Distinguishing among wetlands on the basis of size and level of contamination should improve the discriminating ability of the sensitive environments factor. In the drier portions of the country, where even small wetlands (e.g., prairie potholes) are very important, small wetlands may also qualify as "particular areas, relatively small in size, important to the maintenance of unique biotic communities."

Sensitive environments other than wetlands are not evaluated on the basis of size for several reasons. Most other HRS sensitive environments tend to be less common and less widely distributed nationally than wetlands (e.g., see EPA's 1989 *Field Test of the Proposed Revised HRS*) and, therefore, their numbers and boundaries tend to be easier to identify. In addition, the value of many sensitive environments is independent of size; for example, the size of a critical habitat of an endangered species may vary solely due to the type of species present. Furthermore, potential or actual contamination of even a small portion of many sensitive environments—for example, a wildlife refuge—tends to be viewed as unacceptable.

An ecosystem bioaccumulation potential factor has been added to the waste characteristics factor category of the surface water environmental threat in response to comments that hazardous substances that demonstrate an ability to bind to sediments and/or to bioaccumulate (e.g., PCBs, mercury) tend to pose the greatest long-term threats to aquatic organisms. The accumulation of hazardous substances in the aquatic food chain can result in adverse effects in aquatic species and in other animals that ingest aquatic species (e.g., waterfowl). The ecosystem bioaccumulation potential factor differs slightly from the bioaccumulation potential factor in the human food chain threat, primarily in that all BCF data are considered in deriving it and not just BCF data for human food chain organisms.

The EPA ambient aquatic life advisory concentrations (AALACs) have been added to the data hierarchy used to assign the ecosystem toxicity value (see § 4.1.4.2.1.1). The Natural Heritage Program alternative sensitive environment rating factors have been removed from the rule because of problems that arose during the field tests; field test participants found that the availability of information varied substantially among States. However, a Natural Heritage Program Data Center can assist in identifying many of the sensitive environment types listed in Tables 4–23 and 5–5.

K. Use of Available Data

A number of commenters stated that all available data should be used when scoring a site. Several cited the tiered approach to hazardous waste quantity as a model that could be applied to other factors. Under this method, where data are available, they would be used; where data are not available, defaults or more generalized approaches would be applied. Several commenters specifically suggested using this approach for ground water flow direction and for scoring mining sites. These commenters argued that it would be less expensive and time-consuming to use available data when scoring a site

than to wait until the remedial investigation to consider the additional information.

EPA considered modifying the HRS to allow the use of additional data, but determined that further expanding the HRS to account for varying levels of data availability is inconsistent with the HRS's role as an initial screening tool. Adding tiers to various factors to accommodate the use of all available data would make the HRS considerably more difficult to apply and could lead to substantial inconsistencies in how sites are investigated and evaluated. EPA Regions and States would have to determine, for each set of data presented, whether the data quality was good enough for the data to be considered. Debates over decisions on data quality could delay scoring and, ultimately, delay cleanup at sites. Therefore, the Agency believes that the limited use of tiers in the final HRS represents a reasonable tradeoff between the need to limit the complexity of the system and the desire to accommodate risk-related information that is generally outside the scope of a site inspection.

L. Ground Water Migration Pathway

The proposed rule included a number of significant changes in the ground water migration pathway: new hydrogeologic factors were added; populations were distance weighted unless exposed to actual contamination; a maximally exposed individual (MEI) factor was added; the target distance limit was extended; a mobility factor was added and combined with toxicity; and a wellhead protection area factor was added. Figure 5 shows the proposed ground water migration pathway and the final rule pathway.

Ground water flow direction. Neither the original HRS nor the proposed HRS directly considered ground water flow direction in evaluating targets. The proposed HRS indirectly considered ground water flow direction by weighting populations based on actual and potential contamination of drinking water wells.

EPA received 50 letters from 40 commenters on this issue; 27 letters responded to the ANPRM, 21 to the NPRM, and two to the field test report. Commenters included eight States, three Federal agencies, the mining, petroleum, chemical, and cement industries, utilities, and professional engineers. The commenters supported the consideration of ground water flow direction data, at least in some circumstances. Numerous commenters urged the use of ground water flow direction data when they are either available or easily obtained. They suggested several methods to incorporate flow direction, including:

- Considering use of a radial impact area when directional release routes can be determined. Only a half circle with a three-mile radius for the downgradient portion (and a half-mile radius for the rest of the circle) should be considered when scoring;
- Differentiating between upgradient and downgradient areas using topographic maps, evaluating water levels at wells, and noting the presence of major surface water bodies;
- Expending the effort to obtain accurate data and considering selected upgradient locations as a precaution against unanticipated anomalies;
- Excluding drinking water wells where analytical data prove no contamination is present;
- Having a "professional" review available information and conduct a site visit;
- Using available flow direction data and developing regionally based defaults when no data are available;
- Installing piezometers to determine flow direction in the PA/SI phase and when no ground water flow data are available;
- Incorporating ground water flow direction into the "depth to aquifer" and "distance to nearest well/population served" scores; and
- Affording responsible parties the opportunity to determine flow direction.

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Figure 5

Ground Water Migration Pathway

PROPOSED HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release		Toxicity/Mobility		Maximally Exposed Individual
or		Hazardous Waste Quantity		Population
Potential to Release				Ground Water Use
Containment				Wellhead Protection Area
Net Precipitation				
Depth to Aquifer/ Hydraulic Conductivity				
Sorptive Capacity				

FINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release		Toxicity/Mobility		Nearest Well
or		Hazardous Waste Quantity		Population
Potential to Release				Resources
Containment				Wellhead Protection Area
Net Precipitation				
Depth to Aquifer				
Travel Time				

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Commenters suggested that data on ground water flow are either readily available or can be easily obtained at reasonable cost and are no more imprecise than other aspects of the HRS. Some commenters stated that the level of effort required to estimate the direction of ground water flow is no greater than that required to determine other hydrogeologic parameters in the HRS.

EPA reviewed a range of options for considering ground water flow direction in evaluating targets. For the reasons discussed above under "Use of Available Data," the Agency decided that it was not feasible to adopt a tiered approach in the targets factors for evaluating ground water flow direction. EPA does not agree that increased accuracy warrants the increased complexity of accounting for ground water flow direction, because this level of accuracy is not required for a screening tool that is intended to assess relative risk. This level of accuracy, however, is needed to determine the extent of remedial action and, therefore, is appropriate at the time of the RI.

EPA disagrees with the argument that determining ground water flow direction is no more difficult than determining other ground water factors. Aquifer interconnections and discontinuities as well as hydraulic conductivity and depth to aquifer, which are evaluated in the final rule, are geologic features that are unlikely to change over the short-term. In contrast, ground water flow direction can be influenced by factors such as seasonal flows and pumping from well fields. In addition, the ground water flow direction may be different in each aquifer at the site, and the direction of hazardous substance migration is not always the same as the direction of ground water flow. Therefore, data on ground water flow direction would need to be considerably more extensive than would the data required to document the other hydrogeologic factors. EPA notes that in the final rule, many of the other hydrogeologic factors considered have been simplified and the sorptive capacity factor has been dropped. EPA also notes that ground water flow direction was not identified in SARA as a portion of the HRS requiring further examination, even though ground water flow direction was not considered in the original HRS and the Agency had received criticism similar to the above comments prior to enactment of SARA.

Although the final rule does not consider ground water flow direction directly in evaluating targets, it does consider flow direction indirectly in the method used to evaluate target populations. If wells have not been contaminated by the site, as the commenters assume upgradient wells would not be, the population drawing from those wells is distance weighted and, thus, populations drawing from the wells would have to be substantial before a large number of points could be assigned. Moreover, in addition to providing a measure of the population at risk from the site, the target factors afford a measure of the value of the ground water resources in the area of the site and of the potential need for expanded uses of the ground water.

Aquifer interçonnections. Aquifer interconnections facilitate the transfer of ground water or hazardous substances between aquifers. The final rule specifies that if aquifer interconnections occur within two miles of the sources at the site (or within areas of observed ground water contamination attributed to sources at the site that extend beyond two miles from the sources), the interconnected aquifers are treated as a single aquifer for the purposes of scoring the site. Thus, for example, when an observed release to a shallow aquifer has been identified, targets using deeper aquifers interconnected to the shallow aquifer are included in the evaluation of the combined aquifer. This approach is common to the original as well as the revised HRS.

In practice, EPA has found that studies in the field to determine whether aquifers are interconnected in the vicinity of a site will generally require resources more consistent with remedial investigations than SIs, especially where installation of deep wells is necessary to conduct aquifer testing. Thus, EPA has in the past relied largely on existing information to make such determinations and the Agency finds it necessary to continue that approach. Examples of the types of information useful in identifying aquifer interconnections were given in the proposed rule. This information includes literature or well logs indicating that no lower relative hydraulic conductivity layer or confining layer separates the aquifers being assessed (e.g., presence of a layer with a hydraulic conductivity lower by two or more orders of magnitude); literature or well logs indicating that a lower relative hydraulic conductivity layer or confining layer separating the aquifers is not continuous through the two-mile radius (i.e., hydrogeologic interconnections between the aquifers are identified); evidence that withdrawals of water from one aquifer (e.g., pumping tests, aquifer tests, well tests) affect water levels in another aquifer; and observed migration of any constituents from one aquifer to another within two miles. For this last type of information, the mechanism of vertical migration does not have to be defined, and the constituents do not have to be attributable to the site being evaluated. Other mechanisms that can cause interconnection (e.g., boreholes, mining activities, faults, etc.) will also be considered. While the descriptive text has been removed from the rule, the approaches mentioned in the proposed rule will be used in making aquifer interconnection determinations. In general, EPA will base such determinations on the best information available; in the absence of definitive studies and where costs of field studies are prohibitive, the Agency will rely on expert opinion (e.g., U.S. Geological Survey staff or State geologists). In the absence of such information, EPA assumes that aquifers are not interconnected.

Ground water potential to release factors. EPA proposed replacing the depth to the aquifer of concern and permeability factors of the original HRS with depth to aquifer/hydraulic conductivity and sorptive capacity factors. EPA received more than 75 comments on these factors, in addition to general comments on evaluating ground water potential to release in response to the ANPRM.

Several commenters supported consideration of depth to aquifer in evaluating the ground water migration pathway. One commenter stated that use of a depth to aquifer/hydraulic conductivity matrix, which was intended to reflect travel time to ground water, was an improvement over considering these two parameters individually and additively. Concerns were raised, however, about how to determine depth to aquifer. In addition, commenters stated that the two-mile radius for evaluating hydrogeologic factors should be extended to four miles, while others commented that the distance should be measured from vertical points as near to the source as possible.

Commenters generally supported the proposal to include hydraulic conductivity, although many believed that the proposed method was too complicated; several commenters suggested that the single least conductive layer(s) should be used. Another concern was the lack of data for determining hydraulic conductivity. One commenter stated that unless data can confirm that the geologic strata

extend throughout the entire area of a site, assigning a hydraulic conductivity value is highly questionable.

Some commenters offered alternative approaches to evaluating hydraulic conductivity. These included replacing the proposed method with:

- Assigned "confidence levels" tied to professional estimates based on regional data and judgment;
- Consideration of actual travel time in the unsaturated zone; or
- An assumption of maximum hydraulic conductivity among the various geological layers below the site.

More than 20 comments were received on the sorptive capacity factor, but there was little consensus among the commenters. A number of commenters agreed that the factor should be added, but stated that the approach was not detailed enough and that more waste- and site-specific information should be required. Other commenters agreed that the factor was an improvement, but said that sorptive capacity should be dropped because the waste- and site-specific information needed for an accurate evaluation cannot be collected during a screening process. Others said that it was too complex as proposed and should be dropped.

Based on these comments and the field test results, EPA examined the depth to aquifer/hydraulic conductivity and sorptive capacity factors. The examination showed that the lowest hydraulic conductivity layer(s) accounted for almost all of the travel time to the aquifer if a one-foot or three-foot minimum layer thickness was used. Accordingly, in the final rule, the depth to aquifer/hydraulic conductivity factor has been replaced with a simpler factor, travel time, which is determined using a matrix of the hydraulic conductivity and thickness of the lowest hydraulic conductivity layer(s) with at least a three-foot thickness. (See § 3.1.2.4 and Table 3–7 of the final rule.)

To conform with the change limiting the travel time factor to the least conductive layer(s), and to meet the goal of simplification, a change to the sorptive capacity factor was necessary. The proposed rule evaluated this factor using all layers between the source and the aquifer. In reexamining this factor, EPA concluded that depth to aquifer is one of the major parameters affecting total sorbent content, at least within the HRS ranges for the factor. Depth to aquifer also indirectly reflects geochemical retardation mechanisms because, all else being equal, the effect of these retardation mechanisms increases as the depth to aquifer increases. At the field test sites, using only the layer(s) of lowest hydraulic conductivity decreased the calculated sorbent content between 10 and 99 percent. For these reasons, EPA has decided to replace the sorptive capacity factor with a depth to aquifer factor. (See § 3.1.2.3 and Table 3–5 of the final rule).

M. Surface Water Migration Pathway

The proposed rule made major changes to the evaluation of releases or threatened releases to surface water. The pathway was divided into four threats: drinking water, human food chain, recreational use, and environmental. Other changes included consideration of flood potential; revision of potential overland flow; addition of dilution weights for potentially contaminated populations; extension of the target distance limit to 15 miles; revision of the persistence factor to consider more degradation mechanisms; addition of a bioaccumulation factor for evaluation of human food chain toxicity/persistence and populations; addition of ecosystem toxicity to evaluate the environmental threat; and addition of a maximally exposed individual factor (MEI) factor to the drinking water threat. Figure 6 shows the proposed rule and the overland flow/flood migration component of the surface water migration pathway in the final rule.

Recreational use threat. SARA stated that the HRS should consider threats to surface water used for recreation and drinking water, and the proposed HRS included a recreational use threat in the surface water migration pathway. A number of States, several companies and trade associations, and two Federal agencies identified problems with the proposed recreational use threat. Some commenters objected to weighting it as heavily as the drinking water threat, while others suggested that evaluating the threat was too complicated for use in a screening tool. Many commenters said that proposed methods for assigning values to recreation areas were too broadly drawn and that a limited number of recreation areas should be considered. Two commenters suggested using actual attendance data, and one commenter suggested that recreational uses be considered in other pathways as well.

EPA's field test indicated that the recreational use threat evaluation was too complex for HRS purposes and, at the same time, was not very accurate. Several field test participants commented that the recreation target population was difficult to evaluate and that the approach for determining population was inaccurate and time-consuming. In addition, the population factor did not provide meaningful discrimination among sites. The proposed rule used the physical characteristics (e.g., capital improvements) of a recreational site as the basis for determining the distance limit used to evaluate population, but because major and minor sites may have the same types of capital improvements (e.g., boat ramps, picnic facilities), the same distance limit could be associated with a minor recreation area and a major recreation area. The alternative approach would be to require actual use data to evaluate targets; however, site-specific population data are not available for many recreation areas, making it difficult to obtain accurate estimates of the population at risk. The target distance limits, which ranged from 10 to 125 miles, also contributed to the problems with evaluating targets. The Agency invited comments on refining these calculations; no alternative approaches were suggested, and EPA did not identify viable alternatives.

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Figure 6

Surface Water Migration Pathway

PROPOSED HRS

Likelihood of Release X **Drinking Water Threat**

Likelihood of Release		Drinking Water Threat	
Observed Release or Potential to Release By Overland Flow Containment Runoff Distance to Surface Water By Flood Containment Flood Frequency		**Waste Characteristics** Toxicity/Persistence Hazardous Waste Quantity	**Targets** Maximally Exposed Individual Population Surface Water Use

+

Human Food Chain Threat

Waste Characteristics		Targets
Toxicity/Persistence/ Bioaccumulation Hazardous Waste Quantity		Population Fishery Use

+

Recreational Use Threat

Waste Characteristics		Targets
Toxicity/Persistence/Dose Adjusting Factor Hazardous Waste Quantity		Population

+

Environmental Threat

Waste Characterisitics		Targets
Ecosystem Toxicity/ Persistence Hazardous Waste Quantity		Sensitive Environments

Figure 6

Surface Water Migration Pathway - Overland Flow/Flood Component

FINAL HRS

Likelihood of Release X **Drinking Water Threat**

Likelihood of Release		Drinking Water Threat	
Observed Release or Potential to Release By Overland Flow Containment Runoff Distance to Surface Water By Flood Containment Flood Frequency		**Waste Characteristics** Toxicity/Persistence Hazardous Waste Quantity	X

EPA is also concerned that many qualities of recreation areas (e.g., uniqueness, attractiveness, value) cannot be readily quantified or measured, which poses significant problems for a screening tool. Therefore, the recreational use threat has been removed from the final rule. Instead, factors related to recreational use are being included in the assessment of resource factors in the air, surface water, and ground water migration pathways. (See the discussion of resources factors above and §§ 3.3.3, 4.1.2.3.3, 4.2.2.3.3, and 6.3.3 of the rule.) Recreational use is also a major component of the evaluation of the attractiveness/accessibility factor in the soil exposure pathway (see § 5.2.1.1 of the rule).

Human food chain. SARA requires that EPA consider "the damage to natural resources which may affect the human food chain * * *" Accordingly, the surface water migration pathway of the proposed rule included evaluation of threats to human health via the aquatic food chain.

A number of commenters suggested that terrestrial food chain threats should also be evaluated because most of the food eaten in the United States originates on land, and the terrestrial human food chain is, therefore, more important than the aquatic human food chain. Commenters specifically stated that the HRS should account for human food chain threats involving irrigated crops, livestock, and game animals. One commenter stated that the SARA mandate would not be fulfilled if only aquatic human food chain threats were evaluated.

After conducting an investigation into possible methods, EPA determined that it would not be practical to include a separate evaluation of terrestrial human food chain threats in the HRS. The terrestrial food chain is more complex and site-specific and is less understood than the aquatic food chain, and its assessment requires considerably more data. These factors render evaluation of the relative risks associated with the terrestrial human food chain well beyond the capability of a screening system such as the HRS. The final rule, therefore, does not separately evaluate terrestrial human food chain threats. These threats are, however, considered indirectly under the resources target components in the air migration pathway, ground water migration pathway, soil exposure pathway, and drinking water threat portion of the surface water migration pathway.

The proposed rule required the estimation of bioaccumulation potentials for hazardous substances posing threats via the human food chain. One commenter stated that the estimation of bioaccumulation potentials requires excessive time and resources, and that this step should be dropped from the HRS.

EPA disagrees and considers the bioaccumulation potentials of hazardous substances to be among the most important factors determining the degree of human health threat posed by substances via the human food chain. Substances that do not bioaccumulate pose less of a threat via the human food chain than substances that bioaccumulate, all else being equal. Conversely, substances with high bioaccumulation potentials can pose very significant threats via the human food chain even if they are only moderately toxic, or are present in modest quantities. EPA believes that compiling bioaccumulation potential tables will reduce the effort and resources required to score this factor.

EPA received several comments stating that bioaccumulation potential was not given sufficient weight in the evaluation of human food chain threats. EPA evaluated the use of bioaccumulation potential during the field test and determined that there was considerable uncertainty related to this factor, in part because of major differences in uptake associated with different species in different environments. In addition, bioconcentration values have been computed for only a few species for most substances. In light of this uncertainty, EPA decided that bioaccumulation potential should not be given additional weight in the HRS. In addition, as part of the structural changes discussed in Section III B, the bioaccumulation potential factor was moved from the targets factor category to the waste characteristics factor category so that it is evaluated consistently with the other waste characteristics factors that reflect exposure. As part of these changes, the use of the bioaccumulation potential factor in selecting the substance posing the greatest hazard also has been modified.

The final rule broadens the definition of actual contamination of the human food chain by modifying one criterion and adding a new criterion defining actual contamination. The proposed rule defined a fishery as actually contaminated if (1) the fishery was closed as a result of contamination and a substance for which the fishery was closed had been documented in an observed release from the site, or (2) a tissue sample from a human food chain organism from the fishery was found to contain a hazardous substance at a concentration level exceeding the FDAAL for that substance in fish tissue and the substance had been documented in an observed release from the site. In both cases, at least a portion of the fishery must be within the boundaries of the observed release.

Under the final rule, the former criterion (closed fishery) remains essentially unchanged. The latter criterion (tissue contamination) has been modified: A fishery is considered actually contaminated if the concentration of a hazardous substance in tissue of an essentially sessile benthic human food chain organism from the watershed is at a level that meets the criteria for an observed release from the site and at least a portion of the fishery is within the boundaries of the observed release. A new criterion has also been added: A fishery is considered actually contaminated if a hazardous substance having a bioaccumulation potential factor value of 500 or greater either is present in an observed release established by direct observation or is present in a surface water or sediment sample at a level that meets the criteria for an observed release from the site and at least a portion of the fishery is within the boundaries of the observed release. Only the portion of a fishery within the boundaries of an observed release is considered actually contaminated.

EPA broadened the definition of actually contaminated fisheries on the basis of field test results. With the more narrow definition in the proposed rule, few actually contaminated fisheries were identified because:

(1) Closed fisheries did not exist at most sites;

(2) Hazardous substance concentration data from tissues of applicable organisms were available for only a small portion of fisheries; and

(3) FDAALs exist for only a relatively small number of hazardous substances.

The final rule also introduces two levels of actually contaminated fisheries or portions of fisheries:

- Level I: Applicable when concentrations of site-related hazardous substances meeting the criteria for actual contamination of the fishery equal or exceed the benchmark concentration levels established in the final rule based on FDAALs, screening concentrations corresponding to elevated cancer risks, and screening concentrations corresponding to elevated chronic, non-cancer toxicity risks via oral exposures. The final rule allows Level I contamination to be established based on hazardous

substance concentrations in tissue samples from "organisms other than essentially sessile benthic organisms" (e.g., fish, lobsters, crabs), even though these organisms cannot be used to establish observed releases or actual contamination.

• Level II: Applicable to all actually contaminated fisheries (or portions of actually contaminated fisheries) not meeting Level I criteria.

The final rule assigns human food chain populations associated with Level I concentrations tenfold greater weight than those associated with Level II concentrations. The final rule also describes the procedures for determining, where applicable, the part of a fishery subject to Level I concentrations, the part subject to Level II concentrations, and/or the part subject to potential contamination.

EPA received several comments suggesting that, to be consistent with the other threats, a maximally exposed individual factor should be incorporated into the human food chain threat. The Agency agrees, and to provide this consistency the final rule incorporates a maximally exposed individual factor (the food chain individual) into the human food chain targets factor category. As with similar factors in other pathways and threats, the food chain individual is assigned points according to the level of contamination. Where actual contamination of a fishery is documented, the food chain individual factor is assigned 50 points for Level I and 45 points for Level II concentrations. Where no actual contamination of a fishery is documented, but there is documentation of an observed release of a hazardous substance having a bioaccumulation potential factor value of 500 or greater to a watershed containing a fishery within the target distance limit, the food chain individual is assigned a value of 20 points. Where there are no observed releases to surface water or no observed release of a hazardous substance with a bioaccumulation potential factor value of 500 or greater, but a fishery is present (i.e., there is a potentially contaminated fishery) within the target distance limit, the food chain individual is assigned points ranging from 0 to 20, depending on the dilution weight assigned to the associated surface water body.

The proposed rule estimated human food chain production of actually contaminated or potentially contaminated fisheries based on harvest data or stocking data for those fisheries, if available. Where such data were not available, production estimates were based on productivity of the surface water body or the estimated standing crop of aquatic biota in the fisheries. The proposed rule included a table of standing crop default values for estimating human food chain production of the fishery.

EPA received numerous comments to the effect that the standing crop default table was difficult to use, provided several different values for some water bodies and none for others, and provided unreliable data. Several commenters stated that standing crop values are not an appropriate basis for estimating aquatic human food chain production. One commenter pointed out that standing crop estimates do not correlate well with harvest for various water body types. Another commenter stated that estimates of harvest from fish and game officials are preferable to standing crop default values because standing crop is a measure of biomass (weight of all edible living organisms in the water body) rather than productivity.

EPA agrees with the commenters. In the final rule, estimates of fishery human food chain production are based on fish harvest data (including stocking data) as opposed to standing crop data. When site-specific data are not available, harvest rates are to be estimated based on the average harvest per unit area for the particular water body type under assessment and the geographic area in which the water body is located.

Ground water discharge to surface water. A number of commenters and field test participants suggested that the HRS should consider the potential impact of ground water discharges to surface water because contaminated ground water can be a significant source of surface water contamination. Field test participants noted that some sites have no overland flow route, but surface water can be contaminated through ground water discharges.

EPA agrees and has added a ground water to surface water migration component to the surface water migration pathway. Figure 7 shows the structure of this component. The surface water migration pathway, therefore, now includes two components: The overland flow/flood migration component, which retains the structure of the surface water migration pathway as proposed (except for the changes discussed in this preamble), and the new ground water to surface water migration component. Either or both components may be scored; if both are scored, the surface water migration pathway score is the higher of the two scores. EPA selected the higher of the two scores rather than combining them because, if scores were combined, the amount of hazardous substances at the site available to migrate via each component would have to be apportioned between the two components. The site-specific data needed to determine the appropriate apportionment are rarely available.

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Figure 7

Surface Water Migration Pathway - Ground Water to Surface Water Component[1]

FINAL HRS

Likelihood of Release X **Drinking Water Threat**

Observed Release or Potential to Release Containment Net Precipitation Depth to Aquifer Travel Time	**Waste Characteristics** Toxicity/Mobility/Persistence Hazardous Waste Quantity	**Targets** Nearest Intake Population Resources

+

Human Food Chain Threat

Waste Characteristics	**Targets**
Toxicity/Mobility/Persistence/ Bioaccumulation Hazardous Waste Quantity	Food Chain Individual Population

+

Environmental Threat

Waste Characteristics	**Targets**
Ecosystem Toxicity/Mobility/ Persistence/Bioaccumulation Hazardous Waste Quantity	Sensitive Environments

[1] New component.

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The ground water to surface water migration component evaluates three threats: drinking water, human food chain, and environmental. The component is scored only if: (1) A portion of the surface water is within one mile of any source at the site that could release to ground water; (2) there is no discontinuity in the uppermost aquifer between the source and the portion of the surface water within one mile of the source; and (3) the bottom of the surface water is at or below the top of the aquifer. The target distance limit for the component is determined the same way as for the overland flow/flood component. For each threat, likelihood of release is based on either observed release or potential to release. An observed release is established if, and only if, there is an observed release to the uppermost aquifer, while potential to release is based on ground water potential to release factors, except that only the uppermost aquifer is considered. (See § 4.2.2.1.2.)

The hazardous waste quantity factor is scored in the same way it is scored for the overland flow/flood migration component, except that only sources that could release to ground water are considered (see § 4.2.2.2.2). Toxicity, ground water mobility, and surface water persistence are considered in selecting the substance potentially posing the greatest hazard in drinking water (see § 4.2.2.2.1). By considering ground water mobility, the final rule reflects the fraction of a hazardous substance expected to be released from the sources and to migrate through ground water to the surface water body. For human food chain and environmental threats, bioaccumulation (or ecosystem bioaccumulation) potential is also considered in selecting the substance potentially posing the greatest hazard (see § 4.2.3.2.1).

The targets factors in this component are evaluated in the same way as targets factors in the overland flow/flood migration component, except that a dilution-weight adjustment is combined with the surface water dilution weights for populations potentially exposed to contamination. The dilution-weight adjustment was added because the HRS assumes that hazardous substances migrate via ground water in all directions from a site. Under this assumption, except in those instances where the surface water body completely surrounds the site, only a portion of the hazardous substances can be assumed to reach the surface water through the ground water. The dilution-weight adjustment accounts for the portion of the hazardous substances assumed to be available to migrate to surface water through ground water. The probable point of entry is defined as the shortest straight-line distance, within the aquifer boundaries, from the sources at the site to the surface water body. Therefore, the actual targets considered may differ somewhat from targets evaluated in the overland flow/flood migration component because the two probable points of entry may differ. This approach might allow evaluation of intakes, fisheries, and sensitive environments that may be exposed to contamination from a site but are upstream from the point of overland flow entry.

N. Soil Exposure Pathway

The onsite exposure pathway, which was added to the HRS in the proposed rule, has been renamed the soil exposure pathway in the final rule. The pathway was primarily designed to assess the potential threats posed by direct exposure to wastes and contaminated surficial materials at a site. It evaluated two threats—the resident population and the nearby population. In the proposed rule, the resident population threat included three types of targets: High risk population on a property with observed contamination, all other residents and people attending school or day care on a property with observed contamination, and terrestrial sensitive environments in which there is observed contamination. The nearby population was based on people who live or attend school within a one-mile travel distance and who did not meet the criteria for resident population. Figure 8 summarizes the proposed and final rules.

A number of commenters supported the inclusion of the pathway, but raised issues related to its evaluation. For example, commenters objected to evaluating the waste characteristics factor category solely on toxicity. Three commenters objected to limiting the high risk population to children under seven. Other commenters stated that collecting data on the high risk population would be difficult. A number of commenters questioned how the onsite area and area of contamination would be defined and how accessibility of the site was evaluated.

In response to these comments and to the field test results, EPA has made a number of changes to the soil exposure pathway. The name of the pathway has been changed to be more consistent with terminology used in the Superfund human health evaluation process.

As suggested by commenters, the final rule limits the area within which human targets are evaluated for the resident population threat to locations within property boundaries and within a distance limit of 200 feet from an area of observed contamination. The 200-foot limit accounts for those situations where the property boundary is very large, and exposure to contaminated surficial materials is unlikely or infrequent because of the distance of residences, schools, or work places from an area of observed contamination on the same property.

To make the pathway consistent with the other pathways and in response to comments, the final rule includes hazardous waste quantity in the waste characteristics factor category and multiplies it by the factor value for toxicity. New factors, resident individual and nearby individual, have been added to make the pathway consistent with the other pathways, all of which assign values for the maximally exposed individual (e.g., nearest individual or intake). Population is evaluated using two levels of actual contamination based on health-based benchmarks. Separate consideration of the high risk population (children under seven) has been eliminated because the field test indicated that this factor could greatly add to the time and expense of scoring a site yet resulted in little discrimination among sites. This change also makes the soil exposure pathway more consistent with the other pathways.

In the nearby population threat, the hazardous waste quantity factor in the likelihood of exposure factor category has been renamed "area of contamination" to reflect both the intent of the factor and how it is evaluated. The accessibility/frequency of use factor has been revised and renamed the "attractiveness/accessibility" factor. The revised factor emphasizes recreational uses of areas of observed contamination because they are most likely to result in exposures to contaminated surficial materials. In addition, the weighting of the nearby population relative to the resident population has been reduced to better reflect the relative levels of exposure for those threats.

A number of commenters questioned whether workers should be counted when evaluating target populations in the soil exposure pathway. One commenter suggested that soil exposure scoring should "not include activities at facilities that presently are regulated under the Occupational Safety and Health Administration (OSHA)." Other commenters, however, stated that workers should be counted in the target population. One commenter argued that

not counting a facility's work force is inconsistent with other population counting techniques. Another commenter said that workers should be included in the resident population because the proposed method of calculating soil exposure pathway scores can result in inappropriately low scores when onsite workers are exposed to wastes or contaminated soil.

In response to these comments, the Agency investigated statutory, regulatory, and policy conditions that might restrict the inclusion of workers in the target population for the soil exposure pathway. This analysis found no broad statutory or regulatory authority for excluding workers covered by OSHA regulations from consideration as targets in the HRS. Although the definition of a release under CERCLA section 101(22) excludes "any release which results in exposure to persons solely within a workplace * * *" it only does so for purposes of claims by workers who are already covered by State worker compensation laws. The legislative history of section 101(22) specifically anticipated that authority under CERCLA might, in appropriate cases, be used to respond to releases within a workplace. Thus, the Agency concludes that there are no broad statutory or regulatory restrictions against consideration of activities at OSHA-regulated facilities.

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Figure 8

Soil Exposure Pathway

PROPOSED HRS

Resident Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Observed Contamination		Toxicity		High Risk Population Total Resident Population Terrestrial Sensitive Environments

+

Nearby Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Waste Quantity Accessibility/Frequency of Use		Toxicity		Population Within 1 Mile

FINAL HRS

Resident Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Observed Contamination		Toxicity Hazardous Waste Quantity		Resident Individual Resident Population Workers Resources Terrestrial Sensitive Environments

+

Nearby Population Threat

Likelihood of Exposure	X	Waste Characteristics	X	Targets
Attractiveness/Accessibility Area of Contamination		Toxicity Hazardous Waste Quantity		Population Within 1 Mile Nearby Individual

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The soil exposure pathway is designed to account for exposures and health risks resulting from ingestion of contaminated surficial materials. Because ingestion exposures are comparable for some types of workers and residents, the Agency has decided to include workers in the resident population threat. However, substantial variability in the kinds of workers and work activities at sites (e.g., indoor and outdoor) leads to considerable variability in exposure potential. The Agency believes that determining specific categories or types of workers is beyond the scope of HRS data collection. Thus, workers are assigned target points on a prorated basis: 5 points are assigned for sites with up to 100 workers; 10 points for sites with 101 to 1,000 workers, and 15 points for greater than 1,000 workers. Prorating workers will reduce the data collection effort. Evaluation of workers is not affected by health-based benchmarks. (See § 5.1.3.3.) Nearby workers are not counted in the nearby population because the Agency considers it unlikely that workers from nearby workplaces would regularly visit contaminated areas outside the property boundary of their workplace during the workday, and because there is no way to estimate accurately the number of workers who might.

O. Air Migration Pathway

The proposed rule made several significant changes to the air migration pathway in the original HRS. In response to the SARA mandate to consider potential as well as actual releases to air, the proposed rule included an evaluation of the potential to release. The proposed rule also added a mobility factor to the waste characteristics factor category and an MEI factor to the targets category. Finally, the proposed rule added explicit distance weighting factors for evaluating all factors in the targets category. Figure 9 shows the proposed air migration pathway and the final rule pathway.

The public provided numerous comments on these changes and raised new issues as well. The most significant new issue concerned the structural inconsistency in the treatment of gases and particulates in the proposed air migration pathway. For example, commenters observed that in the potential to release evaluation, it was possible to assign a high containment value to a source with good gas containment and poor particulate containment while assigning high source type and mobility values based on the presence of gaseous hazardous substances. This combination would yield an inappropriately high potential to release value. This concern was also noted in discussions with field test personnel.

The Agency agrees with these commenters and investigated methods to better reflect the differences between gases and particulates. As a result of these analyses, EPA has made several changes to the final rule in both the likelihood of release and waste characteristics factor categories.

In the likelihood of release factor category, the final rule evaluates source potential to release separately for gases and particulates. Only those sources containing gaseous hazardous substances are evaluated for gas potential to release, and only those sources containing hazardous substances that can be released as particulates are evaluated for particulate potential to release. This change in potential to release structure necessitated other changes in the scoring of potential to release including development of separate gas and particulate source type factors and migration potential factors. The names of these latter factors were also changed to highlight the differences between potential to release "mobility" and waste characteristics "mobility." (See §§ 6.1.2.1.3, 6.1.2.2.3.)

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Figure 9

Air Migration Pathway

PROPOSED HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release or Potential to Release Source Containment Source Type Source Mobility		Toxicity/Mobility Hazardous Waste Quantity		Maximally Exposed Individual Population Land Use Sensitive Environments

FINAL HRS

Likelihood of Release	X	Waste Characteristics	X	Targets
Observed Release or Potential to Release Gas Gas Containment Gas Source Type Gas Migration Potential Particulate Particulate Containment Particulate Source Type Particulate Migration Potential		Toxicity/Mobility Hazardous Waste Quantity		Nearest Individual Population Resources Sensitive Environments

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In addition to these changes in the basic structure of the potential to release factors, the final rule includes several additional changes in the source type list, migration potential factors, and containment factors. Based on the experience gained in the field test, EPA added several source types to the source type list. Some of these additions (e.g., surface impoundment (not buried/backfilled); dry) simply clarify classifications that were implied in the proposed source type list. Other additions, such as source types involving biogas release, were considered early in the development of the proposed HRS but were not included originally in the interest of simplicity. Field test experience, however, indicated that their inclusion in the final rule was necessary. Finally, new distinctions within some source types (e.g., the various types of piles) were added partly in response to comments and partly as a result of field test experience. As applicable, source type values were also revised. (See §§ 6.1.2.1.2, 6.1.2.2.2 and Table 6-4.)

The revised gas and particulate migration potential factors are very similar to the proposed likelihood of release gas and particulate mobility factors. Several commenters questioned the need for including dry relative soil volatility in the final gas migration factor. A simplification analysis indicated that dry relative soil volatility was redundant, as it was almost completely determined by vapor pressure. Hence, the final gas migration potential factor includes only vapor pressure and Henry's law constant. The particulate migration potential factor in the final rule is simply the particulate component of the proposed potential to release mobility factor.

The containment factors were also changed as a result of the field test, a review of recent information on covering systems, the examination of air release rate models, and the public comments on the need for simplicity in the final rule. The final list of containment descriptions eliminated many redundant descriptions and changed others, retaining only those distinctions that are necessary based on type of source. (See §§ 6.1.2.1.1, 6.1.2.2.1 and Tables 6-3, 6-9.) As discussed in Section III F above, two new mobility factors were developed for the waste characteristics factor category.

Commenters generally supported the concept of distance weighting target factors. However, several disagreed with the approach used to develop the proposed factor values. Some commenters suggested basing the factor values on long-term meteorology and the size of the site, while others suggested that additional atmospheric phenomena (e.g., particulate deposition) be reflected in the final values. As a result of these comments, EPA has revised the distance weighting factors used in the final rule to reflect long-term atmospheric phenomena. Analyses indicated that particulate deposition and other similar phenomena as well as site size were not sufficiently significant within four miles of a site to warrant their inclusion in the final factor values. EPA also notes that the distance weighting factor values are now incorporated in the population factor value table. (See § 6.3.2.4 and Table 6-17.)

P. Large Volume Wastes

Mining waste sites. A number of commenters representing mining companies, trade associations, and State and Federal agencies commented on how the proposed HRS would score mining waste sites; commenters representing waste management facilities raised similar issues in regard to their sites. This section summarizes and addresses the major issues addressed by these commenters.

Commenters raised several concerns regarding the appropriate consideration of background levels of metals in documenting direct or indirect releases from mining waste sites. One commenter recommended that in determining direct releases from a mining waste site, EPA should consider the natural characteristics of the site prior to mining and the changes in migration rates resulting from mining. The commenter explained that the concentration of metals in a mining waste pile may be similar to or less than natural concentrations in soil or rocks below and adjacent to the pile. To document indirect releases, the commenter suggested that EPA require collection of detailed information on site geology and hydrological gradients to ensure proper consideration of background levels. Finally, the commenter asserted that although it is appropriate to weight observed releases more heavily than potential releases at sites with synthetic organic hazardous substances, the criteria used to define observed release are not valid at sites with natural sources of metals. Another commenter agreed and suggested that because of background levels of inorganic elements, the proposed HRS could identify as an observed release concentrations unrelated to mining activities.

EPA recognizes that natural background concentrations of metals in soil or rocks can affect the measured concentration necessary to establish an observed release at a mining waste site. This consideration is reflected in the requirement that concentrations significantly above background be shown to establish an observed release. Moreover, EPA has clarified the observed release criteria in the final rule to explain that they specify minimum differences necessary to establish an observed release by chemical analysis.

Several commenters questioned the treatment of metals in the ground water mobility factor. One commenter stated that the proposed HRS is biased against mining waste sites because it gives greater consideration to the accurate assessment of the mobility of organic substances than to that of naturally occurring metals. The commenter noted that the proposed persistence factor for the surface water migration pathway accounts for the degradation of hazardous substances in the environment through four processes. None of these processes, according to the commenter, applies to metallic elements, which received a default value of 3 (the highest possible score for persistence). Another commenter stated that decreased mobility was considered only for organic compounds, even though inorganic compounds are immobile in some situations.

One commenter stated that adding a metals mobility factor, as EPA's Science Advisory Board (SAB) recommended, would allow the HRS to reflect more accurately the potential for metallic elements to migrate in the aqueous phase. Two commenters were concerned that metals would be assigned a "worst-case" default value for mobility. On the other hand, another commenter stated that consideration of the mobility of metals in the revised HRS would at least partially rectify the bias in the current HRS against high-volume, low-concentration mining wastes.

A number of these commenters appear to have misunderstood the proposed rule. Metals were not automatically assigned the maximum value as a default in the ground water mobility factor, but rather were assigned values based on their coefficient of aqueous migration. The final rule automatically assigns the maximum value for mobility only to metals establishing an observed release by chemical analysis, which is the same way organics and nonmetallic inorganics are evaluated. For metals and metal compounds not establishing an observed release by chemical analysis, mobility is based on water solubility and distribution coefficient (K_d), the same as for organics and nonmetalli-

inorganics. If none of the hazardous substances (including metals, organics, and nonmetallic inorganics) eligible to be evaluated for the site can be assigned a mobility factor value based on available data, § 3.2.1.2 of the final rule assigns a mobility factor value of 0.002 for all of the hazardous substances. This value was selected based on a review of the range of mobility factor values assigned to those hazardous substances (including metals) for which data were available for assigning mobility factor values. The value of 0.002 is clearly not a worst-case default (which would be 1.0).

EPA believes that the persistence factor is not biased against metals. Elemental metals do not degrade and, therefore, should receive higher scores for persistence than other substances subject to degradation processes.

One commenter claimed that the soil exposure pathway is likely to bias the HRS scores of mining waste sites toward higher values because such sites contain large volumes of waste covering large surface areas, and because of geographic factors, these large areas are seldom secured against direct public access. In addition, according to the commenter, the public may be attracted to mining waste sites. The commenter suggested that the soil exposure pathway incorrectly assumes there is an exposure because there is access to mining waste sites.

EPA does not agree that the soil exposure pathway is biased against mining waste sites. The pathway evaluates exposures of people via contact with surficial hazardous substances. The Agency believes that, all else being equal, large contaminated surface areas with public access, including those associated with mining waste sites, should receive higher scores for the soil exposure pathway than smaller sites with more restricted access. Even sites with large contaminated surface areas are unlikely to be assigned high scores except when they are near residential areas or include a listed sensitive environment. As some commenters representing mining-related activities have noted in the past, most mines are located some distance from inhabited areas.

Three commenters stated that the original HRS was biased against sites such as mining waste sites that are characterized by high volumes of waste with relatively low concentrations of toxic constituents. Two of these commenters suggested that mining wastes would be appropriate for hazardous constituent quantity determination because such wastes are relatively homogeneous (compared to other wastes) and, therefore, have fairly consistent concentrations. One of these two commenters also stated that the hazardous waste quantity factor equations in Table 2–14 of the proposed rule should be revised to be less conservative. The remaining commenter suggested that the proposed HRS was still biased against mining waste sites because they are still scored based on the quantity of waste rather than on the concentration of the waste at the point of exposure.

EPA does not agree that the HRS is biased against high-volume, low-concentration waste sites. The final rule incorporates concentration data in three factors: (1) Likelihood of release (concentration data can be used for establishing an observed release); (2) hazardous waste quantity (concentration data, if available and adequate, can be used for calculating hazardous constituent quantity); and (3) targets (concentrations of hazardous substances present in drinking water wells or at other exposure points can be used to determine weightings for nearest individuals (or wells or intakes), populations, and sensitive environments factors). EPA has not explicitly required concentration data for all sites because of the substantial costs for obtaining these data and the very high degree of uncertainty associated with data collected during SIs.

EPA requested that the SAB review issues related to large-volume waste sites before the NPRM was published. The SAB final report is available in the CERCLA docket. Two commenters stated that the Agency did not adequately consider the SAB's recommendations for revising the HRS, specifically those concerning the use of mobility data.

The SAB, in its review of the original HRS, examined whether large-volume waste sites (e.g., mining waste sites) had been treated differently than other waste sites and concluded that insufficient data were presented to demonstrate that the original HRS was biased against mining waste sites. However, the SAB noted that the original HRS had the potential for such a bias, particularly when scoring potential to release, because the original HRS did not consider mobility, concentration of hazardous constituents, and transport. The SAB suggested several possible modifications to improve the application of the HRS to mining waste sites.

Based in part on the SAB suggestions, EPA proposed several changes to the overall scoring process to make the HRS more accurately reflect risks associated with mining waste sites, notably, addition of a mobility factor to the air and ground water migration pathways, changes in the persistence factor, incorporation of a tiered hazardous waste quantity factor that can account for waste concentration data, and addition of health-based benchmarks for evaluating population. As explained in the NPRM, determining speciation of metals and pH, as the SAB had suggested, is not feasible given the temporal and spatial variations at hazardous waste sites and the limitations on SI data collection. Moreover, determining speciation is not feasible for most substances given EPA's current analytical procedures; requiring speciation analyses would add substantially to the cost of data collection.

Two commenters stated that the proposed HRS can significantly overestimate risks associated with mining waste sites that consist of high-volume, low-concentration wastes. One of these commenters recommended a "preliminary evaluation system" to more accurately reflect the actual risks associated with such sites and remove any bias in the HRS relative to other types of sites. This commenter also suggested that in proposing the HRS revisions, EPA had ignored the results of its own studies under RCRA sections 3001 and 8002, which the commenter believed to be more focused efforts to quantify risks from mining waste sites than the HRS revisions.

EPA does not believe that a separate "preliminary evaluation system" for scoring mining waste sites would be appropriate. A single HRS can be applied uniformly to all sites, allowing the Agency to evaluate sites relative to each other with respect to actual and potential hazards. The Agency examined the RCRA studies cited by the commenter before proposing HRS revisions. Those studies, which focus on the management of wastes at active facilities, concluded that many special study waste sites (e.g., mining) do not present very high risks, while others may present substantial risks. EPA believes that the conclusions of these studies and the Agency's subsequent regulatory determinations (i.e., not to regulate most mining wastes under RCRA Subtitle C) are not inconsistent with a determination that some mining waste releases can require Superfund response actions. Furthermore, the HRS is designed so that it can be applied to closed and abandoned sites as well as active sites.

Other large volume waste sites. Several commenters suggested that the proposed HRS did not meet CERCLA section 125 requirements for sites

involving fossil fuel combustion wastes. These commenters generally agreed that section 125 requires EPA to consider the quantity and concentration of hazardous constituents in fossil fuel combustion wastes and that the proposed HRS had not adequately addressed this requirement.

One commenter supported the Agency's proposal to allow consideration of concentration data when such data are available. Three commenters stated that the proposed HRS would often assign fossil fuel combustion waste sites high scores in part because of the worst-case assumptions or "default values" for certain factors (i.e., hazardous waste quantity, toxicity, target populations). The commenters claimed that fossil fuel combustion waste sites receive high scores merely because of the large quantity of waste, although this waste presents no significant adverse environmental effects, and that these high scores are inconsistent with EPA's findings in the RCRA section 8002 study. One of the three commenters suggested that the proposed HRS retained certain deficiencies of the original HRS, such as assuming that all hazardous substances in the waste consist of the single most toxic constituent in the waste.

EPA does not believe that the approach taken in the final rule creates a bias against fossil fuel combustion wastes. Partly because concentration data are considered in the final rule, fossil fuel combustion waste sites are not expected to score disproportionately high when compared with other types of sites. The HRS assumes that it is not possible to determine in a consistent manner the relative contribution to risk of all hazardous substances found at sites. Given this assumption, EPA has determined that basing the toxicity of the combination of substances at a site on the toxicity of the substance posing the greatest hazard is a reasonable and appropriately conservative approach. In many cases, the substance posing the greatest hazard is not several orders of magnitude more toxic than other hazardous substances at the site. Therefore, the effect of this approach on the toxicity factor value—which is evaluated in one order of magnitude scoring categories—is not as great as some commenters have suggested (see also section III D). In addition, as noted above, worst-case defaults are not assigned for mobility; population factors have no default values.

Two commenters suggested that because CERCLA section 125 contains no statutory deadlines, EPA should take as much time as necessary to adequately respond. These commenters recommended that EPA extend the tiered approach of the hazardous waste quantity factor to other factors to take advantage of the extensive data on fossil fuel combustion wastes generated by the electric utility industry.

The Agency does not agree that the tiered approach used in the hazardous waste quantity factor should be extended to other factors for fossil fuel combustion waste sites (see also section III K). EPA believes that creating a separate HRS to score certain types of sites would not allow the Agency to provide a uniform measure of relative risk at a wide variety of sites, as Congress intended.

One commenter recommended that EPA consider using fate and transport models currently under development to incorporate quantitative representations of specific processes and mechanisms into the HRS. EPA carefully examined this possibility and concluded that although the use of fate and transport models could conceivably increase the accuracy of the HRS for some pathways, collection of the required site-specific data would be far too complex and costly. Fate and transport models are appropriate for a comprehensive risk assessment, but not for a screening tool such as the HRS. In addition, EPA's review suggested that it would be more difficult to achieve consistent results among users of such models than with the HRS. EPA points out that it used fate and transport models to develop the distance weighting factors used in the HRS target calculations, and also that the HRS incorporates several hazardous substance parameters (e.g., mobility) and site parameters (e.g., travel time) that are components of fate and transport models.

Two commenters expressed concern that the proposed HRS fails to account for the leachability of hazardous constituents as required by CERCLA section 125. According to the commenters, some hazardous constituents pose no risk via ground water because they will never be released to that medium. Thus, even if hazardous waste quantity and concentration are considered adequately, hazardous waste quantity scores for fossil fuel combustion sites will be erroneously high unless leachability is considered as well.

EPA examined the availability of leachate data and the feasibility of using such data for calculating hazardous substance quantity for all types of sources and wastes. The Agency decided against using leachate concentrations because:

- Leachate data are not available for all sources and wastes, and available leachate data on high-volume wastes and some landfills have limited applicability for estimating the quantity of leachable hazardous substances;
- Leachate data derived from lab studies are limited and do not realistically represent the universe of field conditions such as heterogeneity of wastes, chemistry of leachate, and density and pore volume of disposed wastes; and
- Any method for using leachate data could not be consistently or uniformly applied to all sites.

EPA also examined the feasibility of developing site-specific leachate data for estimating leachable hazardous substance quantity for the ground water migration pathway. EPA decided against this option because reliable estimation of leachable hazardous substance quantity requires comprehensive sampling of site-specific heterogeneous waste, which would be prohibitively expensive and not feasible. In some cases, such sampling would be technically unfeasible and unsafe.

EPA evaluated alternatives for developing a surrogate for estimating leachable hazardous substance quantity. The Agency found that adding the mobility factor to the ground water migration pathway, based both on solubilities and distribution coefficients (K_ds) of hazardous substances, and multiplying it by the hazardous waste quantity factor would be a feasible alternative for approximating the fraction of hazardous substance quantity expected to be released to ground water.

Q. Consideration of Removal Actions (Current Versus Initial Conditions)

The original HRS based the evaluation of factors on initial conditions. In the preamble to the proposed rule, EPA specifically requested comments on whether sites should be scored on the basis of initial or current conditions. The principal question is whether the effect of response actions, such as the removal of some quantity of the waste, should be considered when sites are scored. Initial conditions are defined by the timing of the response action; that is, initial conditions are the conditions that existed prior to any response action. For sites where no response action has occurred, initial and current conditions are the same for evaluating sites.

Of the 25 commenters responding to this issue, 15—including all industry commenters—supported scoring on current conditions. In the preamble of

the proposed rule, EPA presented two approaches for considering response actions in HRS scores: (1) Consider these actions only for those pathways and factors for which they are most appropriate; and (2) consider these actions in all pathways, but make exceptions at sites where initial conditions more accurately reflect risks.

Those who stated a preference favored the second, specifying that the exceptions should be clearly defined in the final rule. These commenters stated that scoring all pathways on current conditions would encourage responsible parties to clean up sites quickly. They reasoned that if cleanups are delayed, the threat of migration of the hazardous substances increases; therefore, scoring on current conditions is consistent with the intent of CERCLA because it encourages rapid remedial action. One commenter said that scoring on initial conditions made little sense when, as a result of the cleanup, the level of residual contamination was below the level required by CERCLA.

Several proponents of scoring on current conditions stated that EPA's concern that responsible parties would clean up sites just enough to avoid being listed on the NPL was unfounded. They argued that the proposed scoring system is too complicated to manipulate, and that predicting the effect of partial cleanups on the final score would be difficult. Others suggested that where contamination remains, sampling during an SI will discover it.

Ten commenters did not fully support scoring on current conditions. Only one opposed any consideration of current conditions. Several commenters supported scoring the soil exposure and air migration pathways on current conditions. Others stated that response actions should be considered only when the actions are conducted under Federal or State direction, or when the action constitutes a complete cleanup. Several added that State actions should not be considered because it would penalize States with active remedial programs. One commenter suggested scoring sites on both current and initial conditions; if the response action had addressed all hazards, then the current conditions score should be used.

Based on public comment, EPA has decided to change its policy on consideration of removal actions. The Agency agrees that consideration of such actions in HRS scores is likely to increase incentives for rapid actions by responsible parties, reducing risks to the public and allowing for more cost effective expenditure of the Fund. In making this decision, EPA tried to balance the benefits of considering removal actions in HRS scores (e.g., increased incentives for rapid actions) while also ensuring that the HRS score reflects any continuing risks at sites where contamination occurred prior to any response action.

Therefore, EPA will calculate waste quantities based on current conditions. However, EPA believes the accuracy of this approach depends on being able to determine with reasonable confidence the quantity of hazardous constituents remaining in sources at the site and the quantity released into the environment. As a consequence, where the Agency does not have sufficient information to estimate the quantity of hazardous constituents remaining in the sources at the site and in the associated releases, a minimum factor value may be assigned to the hazardous waste quantity factor value. Thus, removal actions may not reduce waste quantity factor values unless the quantity of hazardous constituents remaining in sources and in releases can be estimated with reasonable confidence.

In addition to providing incentives for early response, this approach also provides incentives for potentially responsible parties to ascertain the extent of the remaining contamination at sites. Potentially responsible parties undertaking removal actions will have the primary responsibility for collecting any data needed to support a determination of the quantity of hazardous constituents remaining. EPA expects responsible parties may need to conduct sampling and analyses to determine the extent of hazardous substance migration in soils and other media in order to estimate with reasonable confidence the quantity of hazardous constituents remaining.

EPA decided not to limit the consideration of response actions to certain pathways (e.g., the soil exposure pathway) because this would overstate the risk at sites where removal of wastes has eliminated threats in all pathways. Moreover, a more limited approach to consideration of response actions would provide less incentive for rapid response action.

EPA will evaluate a site based on current conditions provided that response actions actually have removed wastes from the site for proper disposal or destruction in a facility permitted under the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), or by the Nuclear Regulatory Commission. HRS scoring will not consider the effects of responses that do not reduce waste quantities such as providing alternate drinking water supplies to populations with drinking water supplies contaminated by the site. In such cases, EPA believes that the initial targets factor should be used to reflect the adverse impacts caused by contamination of drinking water supplies; otherwise, a contaminated aquifer could be artificially shielded from further remediation. This decision is consistent with SARA section 118(a), which requires that EPA give high priority to sites where contamination from the site results in closed drinking water wells. Similarly, if residents are relocated or if a school is closed because of contamination due to the site, EPA will consider the initial targets in scoring the site.

As noted in the proposed rule preamble, EPA would only consider removals conducted prior to an SI. EPA believes that the SI is the appropriate time to evaluate conditions, because it is the source of most of the data used to score a site. Because response action at sites may be an ongoing process, it would be burdensome to recalculate scores continually to reflect such actions.

In response to commenters, EPA also considered whether response actions should be considered in HRS scores only if they are performed under a State or EPA order. EPA decided not to choose this approach for two reasons. First, it would diminish the incentive for an expeditious response at the site if a signed order were required. Second, because a response action must be conducted before the SI to be considered in the HRS score, there would be little information on site conditions upon which this order could be based.

EPA has also decided not to differentiate between response actions initiated by States and those conducted by other parties. The Agency believes this approach will help ensure consistent application of the HRS by avoiding situations where two similar sites are scored using different sets of rules. Moreover, although the Agency is sympathetic to concerns about disincentives to States for initiating actions, it believes that such cases will be rare. Many State (and Federal) removal actions are interim measures designed to stabilize conditions at the site. Given the more limited definition of response action noted above (e.g., removal of waste from the site for disposal or destruction in a RCRA-permitted facility), many actions conducted by States would not be considered in HRS scoring. In addition, in many cases, State and Federal removal actions are undertaken after an SI has been conducted. As noted above,

EPA will only consider removals conducted before the SI in the HRS score.

R. Cutoff Score

In the NPRM preamble, EPA proposed that the cutoff score for the revised HRS be functionally equivalent to the current cutoff score of 28.5. The Agency also requested comment on three proposed options for determining functional equivalence:

- Option 1: Score sites using both the original and final rule, then use statistical analysis to determine what revised HRS score best corresponds to 28.5;
- Option 2: Choose a score that would result in an NPL of the same size as the NPL that would be created by using the original HRS; and
- Option 3: Identify the risk level that would correspond to 28.5 in the original HRS and then determine what revised HRS score corresponds to that risk level.

Some commenters stated that there cannot be a functional equivalence if the revisions have any meaning. They argued that if the revisions meet the statutory mandate to make the HRS more accurate, the scores should be different and, therefore, cannot be related. Several commenters supported the use of a functional equivalent, but were divided about which option should be used. One commenter stated that the 28.5 score should be evaluated to determine whether it reflected minimum risk levels. If it did, the commenter suggested that a functional equivalent would be appropriate and should be determined using equivalent risk levels (option 3), but also with an eye toward keeping the NPL to a manageable size (option 2).

Commenters not supporting the use of a functional equivalent suggested a variety of alternative approaches, including:

- Establish the cutoff score based on risk, without regard to the current cutoff level or a functional equivalent;
- Leave the score at 28.5;
- Propose a new cutoff score and a description of methodology in a public notice with a 60-day public comment period;
- Lower the cutoff score to provide an incentive to responsible parties to undertake remedial efforts and make it possible for sites where a removal action has taken place to make the NPL, thus reducing the controversy over whether to score sites based on current conditions;
- Raise the cutoff score by at least 20 points;
- Eliminate the present cutoff score by creating categories of sites instead of individual ranks as a means of prioritizing NPL sites;
- Amend the NPL annually to include only those sites that deserve priority attention (e.g., orphaned sites) and are likely to receive Superfund financing; or
- Rank all sites showing any degree of public health and/or environmental risk on a relative scale and perform remedial activities based on available funding.

In addition, four commenters felt that the cutoff score for the final rule should not be fixed until the technical merits and potential scores of representative sites are tested and compared using both the current and proposed HRS. Further, one commenter noted that the field test did not indicate the relationship between the revised HRS score for a given site and the current score; another added that until this equivalency issue is clarified, meaningful comment on any proposed revisions cannot be made.

Based on an analysis of 110 test sites, EPA has decided not to change the cutoff score at this time. This conclusion was reached after applying all three approaches to setting a cutoff score that would be functionally equivalent to 28.5. In its analysis, the Agency scored field test sites with both the original and revised HRS. The data from these test sites show that few sites score in the range of 25 to 30 with the revised HRS model. The Agency believes that this range may represent a breakpoint in the distribution of site scores and that the sites scoring above the range of 25–30 are clearly the types of sites that the Agency should capture with a screening model. Because the analysis did not point to a single number as the appropriate cutoff, the Agency has decided to continue to employ 28.5 as a management tool for identifying sites that are candidates for the National Priorities List.

EPA believes that the cutoff score has been, and should continue to be, a mechanism that allows it to make objective decisions on national priorities. Because the HRS is intended to be a screening system, the Agency has never attached significance to the cutoff score as an indicator of a specific level of risk from a site, nor has the Agency intended the cutoff to reflect a point below which no risk was present. The score of 28.5 is not meant to imply that risky and non-risky sites can be precisely distinguished. Nevertheless, the cutoff score has been a useful screening tool that has allowed the Agency to set priorities and to move forward with studying and, where appropriate, cleaning up hazardous waste sites. The vast majority of sites scoring above 28.5 in the past have been shown to present risks. EPA believes that a cutoff score of 28.5 will continue to serve this crucial function.

IV. Section-by-Section Analysis of Rule Changes

Besides the changes discussed above, EPA has made substantial editorial revisions in the rule being adopted today. Source characterization is discussed in section 2 of the final rule, along with factors that are evaluated in each pathway. These factors include hazardous waste quantity, toxicity, and evaluation of targets based on benchmarks. The order of presentation of the pathways has been changed to ground water, surface water, soil exposure, and air. Following the four sections describing the pathways, a section has been added explaining how to evaluate sites that have radionuclides either as the only hazardous substances at the site or in combination with other hazardous substances.

In general, descriptive text that provided background information has been removed as have references and data sources; the sections have been rewritten to make the rule easier to read and to apply. The figures presenting overviews of the pathways and the scoring sheets have been revised throughout to reflect changes in the rule and assigned values.

This section describes, for each section of the rule and each table, the specific substantive changes; editorial changes that do not affect the content of the rule are not generally noted.

Section 1 Introduction

The text explaining the background of the HRS and describing the rule has been removed. Definitions of a number of additional terms used in the rule have been added for clarity. The definition of "hazardous substance" has been revised for clarification. The definition of "site" has been clarified and now indicates that the area between sources may also be considered part of the site. The definition of "source" has been revised to explain that those volumes of air, ground water, surface water, or surface water sediments that become contaminated by migration of hazardous substances are not considered a source, except contaminated ground water plumes or contaminated surface water sediments may be considered a source if they cannot be attributed to an identified source. In addition, the definition of source now includes soils contaminated by migration of hazardous substances.

Under the original HRS, the Agency took the approach that all feasible efforts should be made to identify sources before listing a site on the NPL. If, after an appropriate effort has failed to identify a source, the Agency believed that the contamination was likely to have originated at the type of source that would be addressed under Superfund, such sites were listed. Subsequent investigations after listing have generally identified a specific source. In some cases, EPA has not listed contaminated media without clearly identified sources because it appeared the source of pollution would not be addressed by Superfund programs; an example of such a source would be extensive, low-level contamination of surface water sediments caused by pesticide applications. EPA has found this approach to be generally workable and will continue to evaluate, on a case-by-case basis, whether sites with no identified sources should be listed.

Where contaminated media with no identified sources exist, the final rule generally assigns a hazardous waste quantity factor value to such contamination, with the value depending on whether there are any targets subject to Level I or Level II concentrations. For contaminated sediments in the surface water migration pathway, if there is a clearly defined direction of flow, target distances are measured from the point of observed sediment contamination that is farthest upstream. For ground water plumes and for contaminated sediments where there is no clear direction of flow, the center of the observed ground water or sediment contamination is used for the purpose of measuring target distance limits.

Section 2 Evaluations Common to Multiple Pathways

This section covers factors and evaluations common to multiple pathways. The major changes to these factors include: observed release criteria have been revised; the toxicity factor has been changed to a linear rather than a log scale; scales for hazardous waste quantity have been made linear and expanded, and the hazardous waste quantity minimum value has been changed; the waste characteristics factor category score is now obtained by multiplying the factor values and using a table to assign the final score; use of benchmarks has been extended to all pathways and to the nearest individual (well/intake) factor; and the methods for comparisons to benchmarks have been changed as have the benchmarks used. The purpose of this part is to make the rule less repetitious by presenting full explanations of the evaluation of certain factors only once rather than in each pathway in which they occur. Exceptions related to radionuclides are noted throughout the rule and referenced to Section 7.

Section 2.1 Overview. Introduces the pathways and threats included in HRS scoring.

Section 2.1.1 Calculation of HRS site score. Provides the equation used to calculate the final HRS score.

Section 2.1.2 Calculation of pathway score. Indicates, in general, how pathway scores are calculated and includes a sample pathway score sheet (Table 2–1).

Section 2.1.3 Common evaluations. Lists evaluations common to all pathways.

Section 2.2 Characterize sources. Introduces source characterization and references Table 2–2, the new sample source characterization worksheet.

Section 2.2.1 Identify sources. Explains that for the three migration pathways, sources are identified, and for the soil exposure pathway, areas of observed contamination are identified.

Section 2.2.2 Identify hazardous substances associated with a source. Covers information previously provided in the introduction to the waste characteristics factor category.

Section 2.2.3 Identify hazardous substances available to a pathway. Explains which hazardous substances may be considered available to each pathway. For the three migration pathways, the primary limitation on availability of a hazardous substance to a pathway is that the substance must be in a source with a containment factor value, for that pathway, greater than 0; that is, the hazardous substance must be available to migrate from its source to the medium evaluated. For the soil exposure pathway, the primary limitation is that the substance must meet the criteria for observed contamination and, for the nearby threat, it must also be accessible.

Section 2.3 Likelihood of release. Specifies the criteria for establishing an observed release (discussed in section III G of this preamble) and explains that potential to release factors are evaluated only when an observed release cannot be documented. Table 2–3, which replaces Table 2–2 in the proposed rule, provides the revised observed release criteria for chemical analyses for the migration pathways. Table 2–3 is also used in establishing observed contamination for the soil exposure pathway.

Section 2.4 Waste characteristics. Defines the waste characteristics factor category.

Section 2.4.1 Selection of substance potentially posing greatest hazard. Explains how to select the substance potentially posing the greatest hazard.

Section 2.4.1.1 Toxicity factor. Explains how to assign toxicity values. Changes in the approach to scoring toxicity are discussed in section III D of this preamble. Table 2–4 (proposed rule Table 2–11) has been revised to make the assigned factor values linear rather than logarithmic values; however, the relationship among the values has not changed. A provision to always assign lead (and its compounds) an HRS toxicity factor value of 10,000 was added as a result of changes since the time of the proposed rule in the way EPA develops chronic toxicity values for lead (i.e., reference doses, in units of intake (mg/kg-day), are no longer developed for lead).

Section 2.4.1.2 Hazardous substance selection. Lists which factors are combined, in each pathway or threat, to select the hazardous substance potentially posing the greatest hazard. For each migration pathway, each substance eligible for consideration is evaluated based on the combination of toxicity (human or ecosystem) and/or mobility, persistence, and bioaccumulation (or ecosystem bioaccumulation) potential. The substances selected for each pathway or threat are those with the highest combined values. For the soil exposure pathway, the substance with the highest toxicity value is selected from among substances that meet the criteria for observed contamination for the threat being evaluated. The use of bioaccumulation in the selection of substances in the human food chain threat has changed as a result of the structural changes discussed above. In the proposed rule, only substances with the highest bioaccumulation values were evaluated for toxicity/persistence; in the final rule, the substance with the highest combined toxicity/persistence/bioaccumulation value is selected in the human food chain threat of the overland flow/flood migration component. For the ground water to surface water migration component, mobility is also considered. This revised method better reflects the overall threat.

Section 2.4.2 Hazardous waste quantity. Describes how to calculate the hazardous waste quantity factor value, as explained in section III D of this preamble. The explanation has been simplified from that presented in the proposed rule, and a discussion of unallocated sources has been added. A discussion clarifying the method for evaluating hazardous waste quantity in the soil exposure pathway was also added, and clarifying language on this

point was inserted throughout the subsections of § 2.4.2. Table 2–13 from the proposed rule has been eliminated.

Section 2.4.2.1 Source hazardous waste quantity. Details the measures that may be considered in evaluating hazardous waste quantity for a source or area of observed contamination.

Section 2.4.2.1.1 Hazardous constituent quantity. Explains how to assign a value to the hazardous constituent quantity factor. An explanation of the treatment of RCRA hazardous wastes has been added to clarify the scoring of these wastes. Table 2–5, Hazardous Waste Quantity Evaluation Equations (proposed rule Table 2–14), has been revised in several ways. The constant divisor of 10 has been moved from these equations and is now incorporated into the factor values assigned using Table 2–6. Two types of surface impoundments are now listed to ensure that buried surface impoundments are treated appropriately. The term "tanks" has been added to containers other than drums to clarify how tanks should be evaluated. Also, equations for calculating hazardous waste quantity based on area have been revised based on a study of waste sites. The study indicated that new depth assumptions should be used for some sources; the land treatment equation was revised based on data from the same study about typical loading rates in land treatment operations.

Section 2.4.2.1.2 Hazardous wastestream quantity. Explains how to assign a value for hazardous wastestream quantity based on the mass of the wastestream. An explanation of the treatment of RCRA hazardous wastes has been added to clarify the scoring of these wastes.

Section 2.4.2.1.3 Volume. Explains how to assign a value for source volume.

Section 2.4.2.1.4 Area. Explains how to assign a value for source area.

Section 2.4.2.1.5 Calculation of source hazardous waste quantity value. Explains how to assign a value to source hazardous waste quantity.

Section 2.4.2.2 Calculation of hazardous waste quantity factor value. Explains how to assign a factor value to hazardous waste quantity using Table 2–6. The values in Table 2–6 include several changes. The cap applied to the factor value (i.e., the lowest hazardous waste quantity value required to assign the maximum factor value) has been increased to reflect more accurately the range of hazardous substance quantities found at waste sites. The cap is set based on the maximum quantity found at current NPL sites. Rather than being assigned a maximum of 100, as in the proposed rule, the assigned factor values range to 1,000,000. Each factor value less than the cap is assigned for quantities that range across two orders of magnitude. The two-order-of-magnitude ranges reflect the uncertainty in estimates of both quantity and concentration of the hazardous substances in sources and associated releases as well as uncertainty in identifying all sources and associated releases. Using the ranges also simplifies documentation requirements. Non-zero values below 1 are rounded to 1 to ensure that sites with small amounts of hazardous substances will receive a non-zero score for waste characteristics. When hazardous constituent quantity data are incomplete, the minimum hazardous waste quantity factor value is 10, except for: (1) Migration pathways that have any target subject to Level I or II concentrations; and (2) migration pathways where there has been a removal action and the hazardous waste quantity factor value would be 100 or greater without consideration of the removal action. In these cases, the minimum hazardous waste quantity factor value has been changed to 100 (see sections III C and III Q above for further discussion of the new minimum values).

Section 2.4.3 Waste characteristics factor category value. Explains how to assign a value to the waste characteristics factor category. As discussed above, the final waste characteristics factor value is capped at 100 (1,000 with bioaccumulation potential). Values are assigned by placing the product of the waste characteristics factors into ranges of one order of magnitude, to a cap of 10^8 (10^{12} if bioaccumulation potential is considered).

Section 2.4.3.1 Factor category value. Explains how to use Table 2–7 to assign a value to waste characteristics when bioaccumulation (or ecosystem bioaccumulation) potential is not considered.

Section 2.4.3.2 Factor category value, considering bioaccumulation potential. Explains how to use Table 2–7 to assign a value to waste characteristics when bioaccumulation (or ecosystem bioaccumulation) potential is considered.

Section 2.5 Targets. Explains how targets factors are evaluated. This approach generally involves three levels of evaluation (Level I, Level II, and Potential) and the use of media-specific concentration benchmarks, as discussed in section III H of this preamble. Level III has been dropped; use of benchmarks has been extended to all pathways and to factors that assign values to the nearest individual (well/intake). Also discusses assigning level based on direct observation and describes when tissue samples that do not establish actual contamination may be used in comparisons to benchmarks.

Section 2.5.1 Determination of level of actual contamination at a sampling location. Explains the approach used for evaluating the level of actual contamination at a sampling location; changes have been made to allow the level of actual contamination in the human food chain threat to be based on tissue samples from aquatic food chain organisms that cannot be used to establish an observed release.

Section 2.5.2 Comparison to benchmarks. Lists benchmarks and explains how to determine whether benchmarks have been equalled or exceeded (see section III H of this preamble); changes have been made to allow the level of actual contamination in the human food chain threat to be based on tissue samples from aquatic food chain organisms that cannot be used to establish an observed release.

Section 3 Ground Water Migration Pathway

The ground water migration pathway evaluates threats resulting from releases or potential releases of hazardous substances to aquifers. The major changes specific only to this pathway include replacement of the depth to aquifer/hydraulic conductivity and sorptive capacity factors with travel time and depth to aquifer factors; a revised approach for assigning mobility values; removal of the ground water use factors and their replacement by a resources factor; evaluation of the nearest well factor based on benchmarks; and revisions to scoring of sites having both karst and non-karst aquifers present.

Section 3.0 Ground Water Migration Pathway. Descriptive text has been removed. Figure 3–1 has been revised to reflect revisions to the factors evaluated, and Table 3–1 has been revised to reflect the new factor category values throughout.

Section 3.0.1 General considerations. The title has been changed.

Section 3.0.1.1 Ground water target distance limit. An explanation of the treatment of contaminated ground water plumes with no identified source has been added. For these plumes, measurement of the target distance limit begins at the center of the area of observed ground water contamination;

the center is determined based on available data.

Section 3.0.1.2 Aquifer boundaries. Descriptive text has been removed.

Section 3.0.1.2.1 Aquifer interconnections. Descriptive text has been removed as have examples of information useful for identifying aquifer interconnections.

Section 3.0.1.2.2 Aquifer discontinuities. Descriptive text has been removed.

Section 3.0.1.3 Karst aquifer. Descriptive text has been removed, and references to factors have been revised to reflect changes in factors. Text was added to clarify that karst aquifers underlying any portion of the sources at a site are given special consideration.

Section 3.1 Likelihood of release. Descriptive text has been removed.

Section 3.1.1 Observed release. Description of the criteria for establishing an observed release has been revised as discussed in Section III G of this preamble.

Section 3.1.2 Potential to release. Text has been revised to reflect changes in the factors evaluated and to clarify that karst aquifers underlying any portion of the sources at a site are given special consideration in evaluating depth to aquifer and travel time.

Section 3.1.2.1 Containment. Explanatory text has been removed and the ground water containment table is referenced. Only sources that meet the minimum size requirement (i.e., that have a source hazardous waste quantity value of 0.5 or higher) are used in assigning containment factor values. This requirement has been added to ensure that very small, uncontained sources do not unduly influence the score. For example, a site might have a large, but highly contained source and a very small, uncontained source; without a minimum size requirement, potential to release could be assigned the maximum value based on the very small source, which could overestimate the potential hazard posed by the site. If no source meets the minimum size requirement, the highest ground water containment factor value assigned to the sources at the site is used as the factor value. Table 3–2—Containment Factor Values for Ground Water Migration Pathway, has been simplified by combining repetitious items and has been moved from an attachment to the proposed rule into the body of the rule.

Section 3.1.2.2 Net precipitation. A new map has been added as Figure 3–2 to assign net precipitation factor values. The equation for calculating monthly potential evapotranspiration was clarified. Descriptive text has been removed.

Section 3.1.2.3 Depth to aquifer. As described in section III L of this preamble, the depth to aquifer factor has replaced the sorptive capacity factor and is no longer combined in a matrix with hydraulic conductivity for scoring. Table 3–5 is new and provides the factor values. The depth to aquifer factor reflects the geochemical retardation capacity of the subsurface materials, which generally increases as the depth increases. Depth to aquifer factor values are assigned to three depth ranges. Clarifying language was added related to karst aquifers.

Section 3.1.2.4 Travel time. As discussed in section III L of this preamble, this factor replaces the depth to aquifer/hydraulic conductivity factor and is based on the least conductive layer(s) rather than on the conductivities of all layers between the hazardous substances and the aquifer. Table 3–7 has been revised to reflect these changes. Table 3–5 from the proposed rule has been renumbered as Table 3–6. Text on how to obtain information to score this factor has been removed. Clarifying language was added related to karst aquifers.

Section 3.1.2.5 Calculation of potential to release factor value. Text has been revised to reflect new factor names.

Section 3.1.3 Calculation of likelihood of release factor category value. New maximum value of 550 based on observed release has been added.

Section 3.2 Waste characteristics. Descriptive text has been removed.

Section 3.2.1 Toxicity/mobility. Descriptive text has been removed.

Section 3.2.1.1 Toxicity. References § 2.4.1.1.

Section 3.2.1.2 Mobility. As discussed in sections III F and III P of this preamble, the method for assigning mobility values to hazardous substances has been revised. Table 3–8 has been revised. Mobility values are now linear rather than categorical place holders and are assigned in a matrix combining water solubility and distribution coefficients. Mobility values may now vary by aquifer for a specific hazardous substance. The maximum mobility value is no longer assigned based on observed release by direct observation. A factor value of 0 is no longer assigned for mobility, as had been the case under the proposed rule, where categorical placeholder values were used; because mobility is now multiplied by toxicity and hazardous waste quantity, assigning a 0 value would result in a pathway score of 0. This result could understate the risk posed by a site with a large volume of highly toxic hazardous substances with low mobility. Furthermore, given the uncertainties about estimates of mobility in ground water and their applicability in site-specific situations, EPA determined that a 0 value should not be assigned to the mobility factor under any conditions.

Section 3.2.1.3 Calculation of toxicity/mobility factor value. Text has been simplified. Table 3–9 (proposed rule Table 3–10), the matrix for assigning factor values, has been revised to reflect the linear nature of the assigned values. Values for a specific hazardous substance may now vary by aquifer.

Section 3.2.2 Hazardous waste quantity. References § 2.4.2.

Section 3.2.3 Calculation of waste characteristics factor category value. Text has been revised to indicate the multiplication of the factors, the new maximum value, and the table used to assign the factor category value.

Section 3.3 Targets. Text has been revised to reflect the new names for factors. Descriptive text has been removed. Table 3–10 (Table 3–12 in the proposed rule) has been modified to list the revised benchmarks in this pathway.

Section 3.3.1 Nearest well. Title has been changed from maximally exposed individual. Text has been added to explain how to evaluate nearest wells with documented contamination (at Level I and II) and those potentially contaminated. Text was added to assign Level II contamination to any drinking water well where an observed release was established by direct observation. This section also explains how to evaluate wells drawing from karst aquifers. Table 3–11 has been renamed and the factor values have been changed. See section III B of this preamble for a discussion of the changes to assigned values for this factor.

Section 3.3.2 Population. As discussed in section III H, population is evaluated using health-based benchmarks for drinking water. For populations potentially exposed, population ranges are used to evaluate the factor. This section explains whom to count for population. Populations served by wells whose water is blended with that from other drinking water sources are to be apportioned based on the well's relative contribution to the total blended system. The rule includes instructions on the type of data to use when determining relative contributions of wells and intakes. This change is intended to reflect more accurately the exposure to populations through blended systems. The rule also includes instructions on how to apportion population for systems with standby wells or standby surface water intakes.

Section 3.3.2.1 Level of contamination. Explains how to evaluate population based on concentrations of hazardous substances in samples. Text was added to assign Level II contamination to any drinking water wells where there is an observed release by direct observation.

Section 3.3.2.2 Level I concentrations. Explains how to evaluate populations exposed to Level I concentrations. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 10.

Section 3.3.2.3 Level II concentrations. Explains how to evaluate populations exposed to Level II concentrations. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 1.

Section 3.3.2.4 Potential contamination. Explains how to assign values to populations potentially exposed to contamination from the site. The formula for calculating population values has been modified to reflect both the revised method for evaluating karst aquifers (see below) and the use of distance-weighted population values from Table 3–12, which has been added to assign distance-weighted values for populations in each distance category. The values are determined for each distance category and are then added across distance categories, and the sum is divided by 10 to derive the factor value for potentially contaminated population. The assigned values in Table 3–12 were determined by statistical simulation to yield the same population value, on average, as the use of the formulas in the proposed rule. The use of range values has been adopted as part of the simplification discussed in section III A. The rounding rules have also changed. The method for evaluating karst aquifers has been simplified and is explained in this section. Table 3–14 in the proposed rule, which included dilution weighting factors for the general case and for two special cases, has been removed, and the two special karst cases are no longer evaluated. (The generally applicable dilution factors for karst have not changed and are all incorporated into the distance-weighted population values in Table 3–12.) The scoring cap was eliminated, and the multiplier (i.e., weight) is now 0.1.

Section 3.3.2.5 Calculation of population factor value. Has been revised to reflect the changes in the evaluation of actually contaminated wells. The rounding rule has also been changed, and the scoring cap was eliminated.

Section 3.3.3 Resources. Describes how points are assigned to resource uses of ground water. Points may be assigned if there are no drinking water wells within the target distance limit, but the water is usable for drinking water. This scoring allows for consideration of potential future uses of the aquifers. (See section III I of this preamble for a discussion of the relative weighting of these factors.)

Section 3.3.4 Wellhead protection area. Explains how to assign values to this factor. The maximum value is assigned when a source or an observed release lies partially or fully within a wellhead protection area applicable to the aquifer being evaluated, and this value has been changed from 50 to 20 to adjust for scale changes. A new criterion for scoring this factor has been added. If a wellhead protection area applicable to the aquifer being evaluated is within the target distance limit and neither of the other conditions is met, a value of five is assigned. This change allows the HRS to place a value on the resource.

Section 3.3.5 Calculation of targets factor category value. Has been revised to reflect changes in the factor names. The rounding rule has been changed, and the scoring cap was eliminated.

Section 3.4 Ground water migration score for an aquifer. Text has been revised to reflect the new divisor for normalizing pathway scores.

Section 3.5 Calculation of ground water migration pathway score. Text has been simplified.

In addition to the above noted changes, the sorptive capacity factor has been eliminated and replaced by the depth to aquifer factor, as have the tables used to assign values to this factor (Tables 3–6 and 3–7 in the proposed rule). The ground water use factors have also been eliminated as have the tables used to assign their values (Tables 3–15 and 3–16 in the proposed rule). Figures 3–2, 3–3, and 3–4 and Tables 3–4, 3–8, 3–9, 3–13 of the proposed rule have been removed .

Section 4 Surface Water Migration Pathway

The surface water migration pathway evaluates threats resulting from releases or potential releases of hazardous substances to surface water bodies. One major change to this pathway is the addition of a new component for scoring ground water discharge to surface water; either this component or the overland flow/flood migration component or both may be scored. For each component, three threats are evaluated: drinking water threat, human food chain threat, and environmental threat. Other major changes specific to this pathway include elimination of the recreational use threat; simplification of overland flow potential to release factors; modifications to the human food chain threat including addition of a food chain individual; modifications to the treatment of bioaccumulation potential and addition of a similar factor, ecosystem bioaccumulation potential, to the evaluation of the environmental threat; modifications to the persistence factor; revisions to the dilution weights; additions of benchmarks, extension of benchmarks to evaluation of the nearest intake, and addition of levels of contamination to the human food chain targets; modifications to criteria for establishing actual food chain contamination; elimination of the surface water use factor; addition of a resources factor to the targets evaluation in the drinking water threat; and revisions to sensitive environments.

Section 4.0 Surface Water Migration Pathway. New structure of the pathway is explained. Descriptive text has been removed. Figure 4–1 has been revised to reflect revisions to the factors evaluated, and Table 4–1 has been revised to reflect the new factor category values throughout.

Section 4.0.1 Migration components. Explains how to score the two migration components.

Section 4.0.2 Surface water categories. A definition of coastal tidal waters has been added. Some surface water bodies that belong in this new category were listed in other categories in the proposed rule (e.g., bays and wetlands contiguous with oceans). Isolated perennial wetlands have been added to the definition of lakes; salt water harbors largely protected by seawalls have been removed from the definition of lakes. Ocean has been defined more precisely as areas seaward from the baseline of the Territorial Sea. Contiguous bays have been removed from, and wetlands contiguous to the Great Lakes have been added to ocean and ocean-like bodies. These definitional changes/clarifications more accurately reflect the different characteristics of the water bodies.

Section 4.1 Overland flow/flood migration component. As discussed in section III M of this preamble, the surface water migration pathway has been divided into two components. The overland flow/flood component is essentially the surface water migration pathway as proposed except that the recreational use threat has been eliminated.

Section 4.1.1 General considerations. Consists of several subsections.

Section 4.1.1.1 Definition of the hazardous substance migration path for overland flow/flood migration component. Text has been simplified.

Section 4.1.1.2 Target distance limit. Explains target distance limits for sites in general and adds an explanation of how to calculate the target distance limit for contaminated sediments with no identified source. For these latter sources only, when there is a clearly defined direction of flow, the target distance limit is measured beginning at the observed sediment contamination farthest upstream; when there is no clearly defined direction of flow, the target distance limit is measured from the center of the area of observed sediment contamination. Discusses the determination of whether surface water targets are subject to actual or potential contamination. Also, text was added to assign Level II to targets subject to actual contamination based on direct observation.

Section 4.1.1.3 Evaluation of the overland flow/flood migration component. Explains that for multiple watersheds, highest score assigned to a watershed is used instead of summing watershed scores as proposed.

Section 4.1.2 Drinking water threat. Descriptive text has been removed.

Section 4.1.2.1 Drinking water threat—likelihood of release. Text has been simplified to clarify when potential to release factors need to be evaluated.

Section 4.1.2.1.1 Observed release. Text has been revised to reflect the changed maximum value.

Section 4.1.2.1.2 Potential to release. Text has been revised to reflect the changed maximum value and has been simplified.

Section 4.1.2.1.2.1 Potential to release by overland flow. Explains when overland flow potential to release is not evaluated.

Section 4.1.2.1.2.1.1 Containment. Text has been revised to reflect changes in the numbering of the containment table. Only sources that meet the minimum size requirement (i.e., that have a source hazardous waste quantity value of 0.5 or higher) are used in assigning containment values. This requirement has been added to ensure that very small, uncontained sources do not unduly influence the score. For example, a site might have a large, but highly contained source and a very small, uncontained source; without a minimum size requirement, the potential to release could be assigned the maximum value based on the very small source, which could overestimate the potential hazard posed by the site. If no source meets the minimum size requirement, the source with the highest surface water containment factor value is used. Descriptive text has been removed. Table 4–2, Containment Factor Values for Surface Water Migration Pathway, has been simplified by combining repetitious items and has been moved from an attachment to the proposed rule into this section of the final rule.

Section 4.1.2.1.2.1.2 Runoff. Text on evaluating rainfall has been simplified by removing explanatory references. The runoff curve number has been simplified by substituting a soil group designation in its place. Table 4–4 (proposed rule Table 4–2) has been revised to list only the soil group designations. Based on analyses of runoff and actual drainage area sizes, Table 4–3 (proposed rule Table 4–3) has been revised by changing the divisions of drainage area size. Table 4–5 (proposed rule Table 4–4) has been revised to reflect the changes related to the use of soil group designations. Table 4–6 (proposed rule Table 4–5) has been revised so that the heading in the table reads Rainfall/Runoff Value; the values assigned have been adjusted on the basis of both the higher maximum value assigned to the factor category and the analyses described above. Explanatory text has been removed.

Section 4.1.2.1.2.1.3 Distance to surface water. Values assigned to distance to surface water factor values in Table 4–7 (proposed rule Table 4–6) have been revised to adjust for the higher maximum assigned to the factor category.

Section 4.1.2.1.2.1.4 Calculation of the factor value for potential to release by overland flow. Has not been changed except for assigned value.

Section 4.1.2.1.2.2 Potential to release by flood. Descriptive text has been removed.

Section 4.1.2.1.2.2.1 Containment (flood). Text in Table 4–8 (proposed rule Table 4–7) has been revised to incorporate new language on required documentation on containment. The requirement for certification by an engineer has been dropped. The new documentation requirements have been added to make the rule consistent with RCRA requirements.

Section 4.1.2.1.2.2.2 Flood frequency. Values assigned to this factor by Table 4–9 (proposed rule Table 4–8) have been revised to better reflect probabilities and to adjust for the higher maximum assigned to the factor category. Descriptive text has been removed.

Section 4.1.2.1.2.2.3 Calculation of the factor value for potential to release by flood. Has been revised to reflect a minimum size requirement for sources.

Section 4.1.2.1.2.3 Calculation of potential to release factor value. Text has been simplified, and the assigned value has been changed.

Section 4.1.2.1.3 Calculation of drinking water threat—likelihood of release factor category value. Text has been simplified. The maximum value has been changed, and the maximum for potential to release is no longer equal to the maximum for observed release.

Section 4.1.2.2 Drinking water threat—waste characteristics. Descriptive text has been removed.

Section 4.1.2.2.1 Toxicity/persistence. Editorial changes have been made.

Section 4.1.2.2.1.1 Toxicity. References § 2.4.1.1.

Section 4.1.2.2.1.2 Persistence. As discussed in section III F of this preamble, several changes have been made to this factor, including the deletion of free-radical oxidation as a decay process and the inclusion of consideration of K_{ow} to account for sorption to sediments. Table 4–10 (proposed rule Table 4–9) has been revised to change the values assigned from categorical numbers to linear scales. The divisions among the half-lives for rivers, oceans, coastal tidal waters, and Great Lakes have changed based on a study of travel time, and the text has been modified to clarify the procedure for determining whether to base the persistence factor on lakes or on rivers, oceans, coastal tidal waters, and Great Lakes. A factor value of 0 is no longer assigned for persistence, as had been the case under the proposed rule, where categorical place-holder values were used; because persistence is now multiplied by toxicity and hazardous waste quantity, assigning a 0 value would result in a pathway score of 0. This result could understate the risk posed by a site with a large volume of highly toxic hazardous substances with low persistence. Furthermore, given the uncertainties about half-life estimates and their applicability in site-specific situations, EPA determined that a 0 value should not be assigned to the persistence factor under any conditions. The text has been modified to clarify selection of an appropriate default value. Table 4–11—Persistence Values—Log K_{ow}, has been added. Descriptive text has been removed.

Section 4.1.2.2.1.3 Calculation of toxicity/persistence factor value. Table reference has been changed to reflect the change in numbering. Table 4–12 (proposed rule Table 4–10) has been changed to reflect the multiplicative relationship.

Section 4.1.2.2.2 Hazardous waste quantity. References § 2.4.2.

Section 4.1.2.3 Calculation of drinking water threat—waste characteristics factor category value. Text has been revised to indicate the multiplication of the factors, the new maximum value, and the table used to assign the factor category value.

Section 4.1.2.3 Drinking water threat—targets. Descriptive text has been removed. Text was added to assign Level II to actual contamination based on direct observation.

Section 4.1.2.3.1 Nearest intake. Title and the factor name have been changed. As discussed in Section III B of this preamble, this factor is now assigned values based on health-based benchmarks. Instructions for how to assign dilution weights to closed lakes and lakes with no surface flow entering have been added. Table 4–13, Surface Water Dilution Weights (proposed rule Table 4–11), has been revised to add more types of surface water bodies and to change the dilution weights. These changes have been made to reflect more accurately the flow ranges of water bodies and are based on analysis of data on flow rates and dilution.

Section 4.1.2.3.2 Population. As explained above, population is evaluated based on two levels of actual contamination. Targets potentially contaminated are dilution weighted and are assigned values based on ranges. Populations served by intakes which are blended with water from other drinking water sources are to be apportioned based on the intake's relative contribution to the total blended system. The rule includes instructions on the type of data to use when determining relative contributions of intakes and wells. This change is intended to reflect more accurately the exposure of populations through blended systems. The rule also includes instructions on how to apportion population for systems with standby wells or standby surface water intakes.

Section 4.1.2.3.2.1 Level of contamination. Explains how to evaluate population based on the level of contamination to which they are exposed.

Section 4.1.2.3.2.2 Level I concentrations. Descriptive text has been removed. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 10.

Section 4.1.2.3.2.3 Level II concentrations. Text has been simplified and revised to reflect the changes discussed above. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 1.

Section 4.1.2.3.2.4 Potential contamination. Equation used to calculate this factor has been revised as discussed above. A new table, Table 4–14, Dilution-Weighted Population Values for Potential Contamination Factor for Surface Water Migration Pathway, has been added to assign values, which are then added across different surface water body types and divided by 10 to derive the value for potentially contaminated population. The assigned values in Table 4–14 for each population range category were determined by statistical simulation to yield the same population value, on average, as the use of the formulas in the proposed rule. The use of range values has been added as part of the simplification discussed in section III A. The rounding rule has also been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 0.1.

Section 4.1.2.3.2.5 Calculation of population factor value. Explains how to combine values assigned to the three population groups. The rounding rule has also been changed, and the scoring cap was eliminated.

Section 4.1.2.3.3 Resources. As discussed in section III J of this preamble, this factor has been added to account for the potential impact of surface water contamination on resource uses.

Section 4.1.2.3.4 Calculation of drinking water threat—targets factor category value. Has been revised to reflect the changes in this factor category. The rounding rule has also been changed, and the scoring cap was eliminated.

Section 4.1.2.4 Calculation of drinking water threat score for a watershed. Text has been simplified. The divisor has changed.

Section 4.1.3 Human food chain threat. Descriptive text has been removed.

Section 4.1.3.1 Human food chain threat—likelihood of release. Section references have been changed.

Section 4.1.3.2 Human food chain threat—waste characteristics. Text has been simplified.

Section 4.1.3.2.1 Toxicity/persistence/bioaccumulation. Text has been simplified and modified because of the change in the use of bioaccumulation potential in selecting the substance potentially posing the greatest hazard.

Section 4.1.3.2.1.1 Toxicity. Has been changed to reference § 2.4.1.1. Also changed so that evaluation of toxicity is not limited to substances with the highest bioaccumulation potential.

Section 4.1.3.2.1.2 Persistence. Clarifies how to evaluate persistence for contaminated sediment sources, and adds coastal tidal waters as a category of surface water. Also changed so that evaluation of persistence is not limited to substances with the highest bioaccumulation potential.

Section 4.1.3.2.1.3 Bioaccumulation potential. As described in section III M of this preamble, the method of accounting for bioaccumulation potential in the selection of the substance potentially posing the greatest hazard has been changed. In the final rule, bioaccumulation potential is considered together with toxicity and persistence rather than as a primary selection criterion. This change was made because all three factors are now scored on linear scales. In addition, where data exist, separate bioconcentration factor values are assigned for salt water and fresh water; the text now clarifies that the higher of these values is used for fisheries in brackish water and for sites with fisheries present in both salt water and fresh water. The adjustment for biomagnification has been dropped because it tended to double count bioaccumulation. Both Table 4–15 (Table 4–14 in the proposed rule) and the text have been modified to clarify the data hierarchy for assigning bioaccumulation potential factor values. Also, Table 4–15 now makes it clear that the assigned values for bioaccumulation potential are on a linear scale.

Section 4.1.3.2.1.4 Calculation of toxicity/persistence/bioaccumulation factor value. Explains how to calculate a toxicity/persistence/bioaccumulation value. Table 4–16, Toxicity/Persistence/Bioaccumulation, has been added to assign the factor value.

Section 4.1.3.2.2 Hazardous waste quantity. References § 4.1.2.2.2.

Section 4.1.3.2.3 Calculation of human food chain threat—waste characteristics factor category value. Text has been revised to indicate the multiplication of the toxicity/persistence and hazardous waste quantity factor values, subject to a maximum, and the further multiplication of that product by the bioaccumulation potential factor value, subject to a maximum for this second product, and to reference the table for assigning the factor category value.

Section 4.1.3.3 Human food chain threat—targets. Has been revised to reflect addition of the new food chain individual and the deletion of the fishery use factor. As discussed in section III M of this preamble, criteria for establishing a fishery subject to actual contamination have been revised. Text was added to describe the additional

tissue samples that can be used to establish Level I contamination.

Section 4.1.3.3.1 Food chain individual. As discussed in section III M of this preamble, this factor is new. This section explains how to assign a value to the factor.

Section 4.1.3.3.2 Population. Has been changed as discussed in section III M of this preamble.

Section 4.1.3.3.2.1 Level I concentrations. The approach to calculating this factor value has been revised as discussed in section III M of this preamble. The rounding rule has been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 10.

Section 4.1.3.3.2.2 Level II concentrations. Explains how to assign values as discussed in section III M of this preamble. The rounding rule has been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 1.

Section 4.1.3.3.2.3 Potential human food chain contamination. The approach to calculating this factor value has been revised as discussed in section III M of this preamble. The rounding rule has been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 0.1.

Section 4.1.3.3.2.4 Calculation of the population factor value. Text has been revised to omit the maximum. The rounding rule has been changed, and the scoring cap was eliminated.

Section 4.1.3.3.3 Calculation of human food chain threat—targets factor category value. Explains how to calculate the targets value. The rounding rule has been changed, and the scoring cap was eliminated.

Section 4.1.3.4 Calculation of human food chain threat score for a watershed. Text has been simplified. The divisor has changed.

Section 4.1.4 Environmental threat. Descriptive text has been removed.

Section 4.1.4.1 Environmental threat—likelihood of release. Section references have been changed.

Section 4.1.4.2 Environmental threat—waste characteristics. Descriptive text has been removed.

Section 4.1.4.2.1 Ecosystem toxicity/persistence/bioaccumulation. Text has been revised to include the addition of ecosystem bioaccumulation potential as a multiplicative factor.

Section 4.1.4.2.1.1 Ecosystem toxicity. The approach for evaluating ecosystem toxicity has been revised. Additions have been made to the data hierarchy (see section III J of this preamble), and a default value of 100 was added to cover the situation where appropriate aquatic toxicity data were unavailable for all of the substances being evaluated. Table 4–19 (proposed rule Table 4–23) has been revised to make the factor linear and to eliminate the rating category of 0 (except when data are unavailable for a given substance); these changes make the ecosystem toxicity factor more consistent with the toxicity factor in the other pathways and threats. Text was added to clarify the evaluation of ecosystem toxicity for brackish water.

Section 4.1.4.2.1.2 Persistence. Section references have been changed. Clarifies how to evaluate persistence for contaminated sediment sources, and adds coastal tidal waters as a category of surface water.

Section 4.1.4.2.1.3 Ecosystem bioaccumulation potential. As explained in section III J of this preamble, this factor is new for this threat and is evaluated similarly to (but with several key differences from) the bioaccumulation potential factor in the human food chain threat.

Section 4.1.4.2.1.4 Calculation of ecosystem toxicity/persistence/bioaccumulation factor value. Section references have been changed. Table 4–20 (proposed rule Table 4–24) has been changed to reflect the changes in the values for the factors. Table 4–21, Ecosystem Toxicity/Persistence/Bioaccumulation Values, is new and assigns values for the combined toxicity/persistence/bioaccumulation factor.

Section 4.1.4.2.2 Hazardous waste quantity. Section references have been changed.

Section 4.1.4.2.3 Calculation of environmental threat—waste characteristics factor category value. Text has been revised to indicate the multiplication of the ecosystem toxicity/persistence and hazardous waste quantity factor values, subject to a maximum, and the further multiplication of that product by the ecosystem bioaccumulation potential factor value, subject to a maximum for this second product, and to reference the table for assigning the factor category value.

Section 4.1.4.3 Environmental threat—targets. Descriptive text has been removed.

Section 4.1.4.3.1 Sensitive environments. Explains how to evaluate sensitive environments. Table 4–22, Ecological-Based Benchmarks for Hazardous Substances in Surface Water, has been revised as described in section III H of this preamble. The rounding rule has also been changed.

Section 4.1.4.3.1.1 Level I concentrations. Explains the new method of evaluating wetlands based on wetland frontage, or, in some situations, wetland perimeter. Table 4–23, Sensitive Environments Rating Values, has been revised as discussed in section III J of this preamble. Table 4–24, Wetlands Rating Values for Surface Water Migration Pathway, has been added to assign values to wetlands based on the total length of wetlands. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 10.

Section 4.1.4.3.1.2 Level II concentrations. Has been revised to reflect the method of evaluating wetlands. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 1.

Section 4.1.4.3.1.3 Potential contamination. Has been revised to reflect the method of evaluating wetlands. The rounding rule has also been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 0.1.

Section 4.1.4.3.1.4 Calculation of environmental threat—targets factor category value. Has been revised to remove the maximum from the targets factor category. The rounding rule has also been changed.

Section 4.1.4.4 Calculation of environmental threat score for a watershed. Divisor for the threat has changed. A cap of 60 was explicitly placed on the environmental threat score, which results in the same maximum possible threat score as in the proposed rule. (In the proposed rule, environmental threat targets were capped at 120, which resulted in an environmental threat score maximum of 60.) However, in the final rule the targets category is uncapped and can score higher than 120 to compensate for low scores in other factor categories.

Section 4.1.5 Calculation of overland flow/flood migration component score for a watershed. Explains how to calculate the score for the watershed.

Section 4.1.6 Calculation of overland flow/flood migration component score. Explains how to calculate the score for the component based on the highest watershed score (in the proposed rule watershed scores were summed).

Section 4.2 Ground water to surface water migration component. As discussed in section III M of this preamble, this component has been added to the rule to account for contamination of surface water bodies through ground water migration of hazardous substances. Thus, all sections referring to this component are new.

Section 4.2.1 General considerations.

Section 4.2.1.1 Eligible surface waters. Explains the conditions that must apply before this component is

scored. In general, this component is scored only when there is a surface water within one mile of a source, the top of the uppermost aquifer is at or above the bottom of the surface water, and no aquifer discontinuity is established between the source and the portion of surface water within one mile of the source. Exceptions are also explained.

Section 4.2.1.2 Definition of the hazardous substance migration path for ground water to surface water migration component. Explains that the migration path is defined as shortest straight-line distance, within the aquifer boundary, from a source to surface water.

Section 4.2.1.3 Observed release of a specific hazardous substance to surface water in-water segment. Explains that before an observed release of an individual hazardous substance can be established to the surface water in-water segment, the substance must meet the criteria for an observed release both to ground water and to surface water (this requirement does not affect the actual scoring of observed release). Also clarifies the use of samples from the surface water in-water segment.

Section 4.2.1.4 Target distance limit. Explains the criteria for determining the target distance limit and for establishing whether targets are subject to actual or potential contamination.

Section 4.2.1.5 Evaluation of the ground water to surface water migration component. Explains the general approach for evaluating this component. Figure 4–2, Overview of Ground Water to Surface Water Migration Component, is new. Table 4–25, which is new, provides the scoring sheets for this component.

Section 4.2.2 Drinking water threat. Explains the general approach for evaluating this threat.

Section 4.2.2.1 Drinking water threat—likelihood of release. Explains the general approach for evaluating this factor category.

Section 4.2.2.1.1 Observed release. Explains that scoring an observed release is based on releases to ground water.

Section 4.2.2.1.2 Potential to release. Explains that scoring is based on the scoring of potential release to uppermost aquifer.

Section 4.2.2.1.3 Calculation of drinking water threat—likelihood of release factor category value. Explains how to assign the factor category value.

Section 4.2.2.2 Drinking water threat—waste characteristics. Explains the general approach for evaluating this factor category.

Section 4.2.2.2.1 Toxicity/mobility/persistence. Explains the approach for evaluating these factors.

Section 4.2.2.2.1.1 Toxicity. Explains that toxicity values are assigned to all hazardous substances available to migrate to ground water.

Section 4.2.2.2.1.2 Mobility. Explains that the mobility value is assigned to all hazardous substances available to migrate to ground water.

Section 4.2.2.2.1.3 Persistence. Explains that this factor value is assigned as in the drinking water threat for the overland flow/flood migration component for all hazardous substances available to migrate to ground water.

Section 4.2.2.2.1.4 Calculation of toxicity/mobility/persistence factor value. Explains that the factor value is the highest value assigned to any hazardous substance evaluated using Table 4–26, which is new.

Section 4.2.2.2.2 Hazardous waste quantity. Explains that hazardous waste quantity is calculated for hazardous substances available to migrate to ground water.

Section 4.2.2.2.3 Calculation of drinking water threat—waste characteristics factor category value. Explains how to calculate the factor category value.

Section 4.2.2.3 Drinking water threat—targets. Explains the general approach for evaluating this factor category.

Section 4.2.2.3.1 Nearest intake. Explains how to determine the dilution weight adjustment using Table 4–27, which was added, and how to assign factor values. Figure 4–3 was added to illustrate determination of the ground water to surface water angle. (See section III O of this preamble for a discussion of this adjustment.)

Section 4.2.2.3.2 Population. This section parallels other population factor sections.

Section 4.2.2.3.2.1 Level I concentrations. Parallels the population factor sections in the overland flow/flood migration component.

Section 4.2.2.3.2.2 Level II concentrations. Parallels the population factor sections in the overland flow/flood migration component.

Section 4.2.2.3.2.3 Potential contamination. Parallels the population factor sections in the overland flow/flood migration component, except for addition of the dilution weight adjustment.

Section 4.2.2.3.2.4 Calculation of population factor value. Parallels other population factor sections.

Section 4.2.2.3.3 Resources. Parallels other resources factor sections.

Section 4.2.2.3.4 Calculation of the drinking water threat—targets factor category value. Explains how to calculate the factor category value.

Section 4.2.2.4 Calculation of drinking water threat score for a watershed. Explains how to calculate the score for a watershed.

Section 4.2.3 Human food chain threat. Lists the factors evaluated.

Section 4.2.3.1 Human food chain threat—likelihood of release. Explains how to assign the factor category value.

Section 4.2.3.2 Human food chain threat—waste characteristics. Lists the factors evaluated.

Section 4.2.3.2.1 Toxicity/mobility/persistence/bioaccumulation. Explains how to calculate these factor values using Table 4–28, which is new.

Section 4.2.3.2.1.1 Toxicity. Explains how to calculate this factor value.

Section 4.2.3.2.1.2 Mobility. Explains how to calculate this factor value.

Section 4.2.3.2.1.3 Persistence. Explains how to calculate this factor value.

Section 4.2.3.2.1.4 Bioaccumulation potential. Explains how to calculate this factor value.

Section 4.2.3.2.1.5 Calculation of toxicity/mobility/persistence/bioaccumulation factor value. Explains how to calculate this value using Tables 3–9, 4–26, and 4–28.

Section 4.2.3.2.2 Hazardous waste quantity. Explains how to assign the factor value.

Section 4.2.3.2.3 Calculation of human food chain threat—waste characteristics factor category value. Explains how to calculate this factor category value.

Section 4.2.3.3 Human food chain threat—targets. Explains the factors to be evaluated.

Section 4.2.3.3.1 Food chain individual. Explains how to assign the factor value.

Section 4.2.3.3.2 Population. Explains how to calculate this factor value.

Section 4.2.3.3.2.1 Level I concentrations. Parallels the population factor in the human food chain threat for the overland flow/flood migration component.

Section 4.2.3.3.2.2 Level II concentrations. Parallels the population factor in the human food chain threat for the overland flow/flood migration component.

Section 4.2.3.3.2.3 Potential human food chain contamination. Parallels the population factor in the human food chain threat for the overland flow/flood component, except for addition of the dilution weight adjustment.

Section 4.2.3.3.2.4 Calculation of the population factor value. Explains how to calculate this factor value.

Section 4.2.3.3.3 Calculation of human food chain threat—targets factor category value. Explains how to calculate this factor category value.

Section 4.2.3.4 Calculation of human food chain threat score for a watershed. Explains how to calculate the score for a watershed.

Section 4.2.4 Environmental threat. Lists the factors evaluated.

Section 4.2.4.1 Environmental threat—likelihood of release. Explains how to calculate this factor category value.

Section 4.2.4.2 Environmental threat—waste characteristics. Explains how to calculate this factor category value.

Section 4.2.4.2.1 Ecosystem toxicity/mobility/persistence/bioaccumulation. Explains how to calculate these factor values.

Section 4.2.4.2.1.1 Ecosystem toxicity. Explains how to calculate this factor value.

Section 4.2.4.2.1.2 Mobility. Explains how to calculate this factor value.

Section 4.2.4.2.1.3 Persistence. Explains how to calculate this factor value.

Section 4.2.4.2.1.4 Ecosystem bioaccumulation potential. Parallels the ecosystem bioaccumulation evaluation in the overland flow/flood component, except expands the species considered as discussed in section III J.

Section 4.2.4.2.1.5 Calculation of ecosystem toxicity/mobility/persistence/bioaccumulation factor value. Explains how to calculate this factor value using Tables 3–9, 4–29, and 4–30, which were added.

Section 4.2.4.2.2 Hazardous waste quantity. Explains how to calculate this factor value.

Section 4.2.4.2.3 Calculation of environmental threat—waste characteristics factor category value. Explains how to calculate this factor category value.

Section 4.2.4.3 Environmental threat—targets. Explains how to calculate this factor category value.

Section 4.2.4.3.1 Sensitive environments. Explains how to calculate this factor value.

Section 4.2.4.3.1.1 Level I concentrations. Parallels factor sections in the overland flow/flood migration component.

Section 4.2.4.3.1.2 Level II concentrations. Parallels factor sections in the overland flow/flood migration component.

Section 4.2.4.3.1.3 Potential contamination. Parallels factor sections in the overland flow/flood migration component, except for addition of the dilution weight adjustment.

Section 4.2.4.3.1.4 Calculation of environmental threat—targets factor category value. Explains how to calculate the value for the factor category.

Section 4.2.4.4 Calculation of environmental threat score for a watershed. Explains how to calculate this threat score for a watershed.

Section 4.2.5 Calculation of ground water to surface water migration component score for a watershed. Explains how to calculate a watershed score for this component.

Section 4.2.6 Calculation of ground water to surface water migration component score. Explains how to calculate this score based on the scores for watersheds evaluated for this component.

Section 4.3 Calculation of surface water migration pathway score. Explains how to assign the pathway score.

In addition to the above noted changes, the recreational use threat has been eliminated. The drinking water use and other use factors have also been eliminated as have the tables (4–12 and 4–13 in the proposed rule) that related to scoring these factors. Figures 4–1, 4–2, and 4–3 as well as Tables 4–15, and 4–17 through 4–22 from the proposed rule have been eliminated.

Section 5 Soil Exposure Pathway

The soil exposure pathway evaluates threats resulting from contamination of surface material. The major changes specific to this pathway include revision of the name of the pathway; elimination of children under seven as a population that must be counted and evaluated separately; addition of hazardous waste quantity to the waste characteristics factor category; inclusion of workers in the evaluation of resident population targets; weighting of resident population based on benchmarks; inclusion of the nearest individual factor in both the resident and nearby targets factor category; inclusion of a resources factor in the resident population evaluation; and revisions to the sensitive environments factor.

Section 5.0 Soil Exposure Pathway. The name of the pathway has been changed from onsite exposure to soil exposure. Descriptive text has been removed. Figure 5–1 has been revised to reflect revisions to the factors evaluated. Table 5–1 has been revised to reflect the new factor category values throughout, which were made more consistent with the other pathways.

Section 5.0.1 General considerations. Has been revised to reflect the redefinition of source, discussed in section III N of this preamble. The methods for establishing areas of observed contamination and for determining the hazardous substances associated with an area of observed contamination have been clarified. The instructions have been revised to make clear that any part of a site that is covered by a permanent or otherwise maintained impermeable material such as asphalt is not considered in evaluating the pathway.

Section 5.1 Resident population threat. Has been revised to specify when the resident population threat should be evaluated. The requirements state that this threat is scored when there is an area of observed contamination within the property boundary and within 200 feet of a residence, school, day care center, or workplace, or within the boundaries of terrestrial sensitive environments and specified resources.

Section 5.1.1 Likelihood of exposure. Text has been simplified.

Section 5.1.2 Waste characteristics. Evaluation of waste characteristics has been changed to include hazardous waste quantity as well as toxicity. Hazardous waste quantity was added to the factor category in response to comments that the pathway did not consider the dose relationship; the combination of hazardous waste quantity and toxicity is a surrogate for that relationship and makes the pathway more consistent with the rest of the rule. The text has been revised to reflect the change.

Section 5.1.2.1 Toxicity. References the section explaining how to assign toxicity factor values.

Section 5.1.2.2 Hazardous waste quantity. This section is new and explains how to assign a value to this factor. Table 5–2, Hazardous Waste Quantity Evaluation Equations for Soil Exposure Pathway, is a revision of Table 2–14 from the proposed rule. This table differs from Table 2–5 of the final rule because generally only the top two feet of an area of observed contamination are considered in evaluating the pathway. Landfills, contaminated soils, waste piles, land treatment areas, dry surface impoundments, and buried/backfilled surface impoundments, which can be evaluated based on their volume in Table 2–5, are evaluated for this pathway using the area measure because the area measure now has a two-foot depth built into the equation. Surface impoundments containing

hazardous substances present as liquids, tanks, and containers may be evaluated based on volume because it is possible that a person could wade, swim, reach, or fall to a depth greater than two feet.

Section 5.1.2.3 Calculation of waste characteristics factor category value. Explains how to combine the toxicity and hazardous waste quantity factor values, subject to the new maximum.

Section 5.1.3 Targets. This factor category has been revised substantially. As discussed in section III N above, the high-risk target population has been eliminated, and workers have been added as targets. Table 5–3, Health-Based Benchmarks for Hazardous Substances in Soils, has been added to list benchmarks appropriate for this pathway.

Section 5.1.3.1 Resident individual. The resident individual factor has been added for consistency with other pathways.

Section 5.1.3.2 Resident population. Explains how to evaluate the resident population using health-based benchmarks, described in section III H above, and how to estimate this population.

Section 5.1.3.2.1 Level I concentrations. Explains how to assign a value for this new factor.

Section 5.1.3.2.2 Level II concentrations. Explains how to assign a value for this new factor.

Section 5.1.3.2.3 Calculation of resident population factor value. Explains how to calculate this factor value.

Section 5.1.3.3 Workers. Explains how to evaluate workers.

Section 5.1.3.4 Resources. Explains how to assign values if the area of observed contamination includes land used for commercial agriculture, commercial silviculture, or commercial livestock grazing or production.

Section 5.1.3.5 Terrestrial sensitive environments. The value assigned for this factor has been revised so that the value is based on the sum of the values assigned to terrestrial sensitive environments in areas of observed contamination, rather than on the highest scoring terrestrial sensitive environment. The maximum value that can be assigned to this factor is limited, but is higher than under the proposed rule. The limit is determined by scoring the pathway with only sensitive environments in the targets factor category; the pathway score under these conditions may not exceed 60 points. The sensitive environments listed in Table 5–5 have been modified. The text has been simplified and references changed to correspond to changes in the rule. The rounding rule has been changed.

Section 5.1.3.6 Calculation of resident population targets factor category value. Explains how to calculate the factor category value from the revised factors. The rounding rule has been changed.

Section 5.1.4 Calculation of resident population threat score. Has only minor editorial changes.

Section 5.2 Nearby population threat. Introductory text has been clarified.

Section 5.2.1 Likelihood of exposure. Lists the factors evaluated.

Section 5.2.1.1 Attractiveness/accessibility. As explained in section III N of this preamble, the name of this factor has changed as have the criteria used to assign values. This factor now emphasizes the use of the area by the general public. Descriptive text has been removed. Table 5–6 (proposed rule Table 5–4) has been changed by redefining the criteria and the assigned values, and by adding a value of 0 for sites that are physically inaccessible to the public.

Section 5.2.1.2 Area of contamination. The title of this section has been changed. This factor is now based solely on area of contamination, which relates to the likelihood of exposure, unlike hazardous waste quantity, which serves as part of the surrogate for dose. Values are assigned using Table 5–7, which is new.

Section 5.2.1.3 Likelihood of exposure factor category value. Text has been revised to reflect the new names of the factors. Table 5–8 (proposed rule Table 5–5) has been revised in response to the changes noted above for the attractiveness/accessibility and area of contamination factors.

Section 5.2.2 Waste characteristics. Text has been revised to reflect changes in the factor category.

Section 5.2.2.1 Toxicity. Explains how to evaluate the toxicity factor for the nearby population threat.

Section 5.2.2.2 Hazardous waste quantity. This section is new, as is consideration of this factor in this threat. As discussed above, this factor has been added in response to comments and to make the pathway more consistent with the other pathways. The section explains how to assign the factor value.

Section 5.2.2.3 Calculation of waste characteristics factor category value. Explains how to combine the toxicity and hazardous waste quantity factor values, subject to the new maximum.

Section 5.2.3 Targets. Descriptive text has been removed.

Section 5.2.3.1 Nearby individual. This section is new and explains how to assign a value to the nearby individual (i.e., resident or student with shortest travel distance) if there is no resident individual. The factor has been added to make the nearby threat consistent with other pathways. Table 5–9, Nearby Individual Factor Values, is new.

Section 5.2.3.2 Population within one mile. This section is new and includes the text that previously appeared under the Targets section. The section explains how to assign a value using Table 5–10. The text has been revised for clarity. Table 5–10, Distance-Weighted Population Values for Nearby Population Threat, is new. The table assigns distance-weighted values for population in each travel distance category. The values in the table were determined by statistical simulation to yield the same population, on average, as the use of the formulas in the proposed rule. The distance weights have been modified as follows: for travel distance of >0 to ¼ mile, the assigned distance weight is 0.025; for $>$ ¼ to ½ mile, 0.0125, and for $>$ ½ to 1 mile, 0.00625. The use of population ranges has been adopted as part of the simplification discussed in section III A.

Section 5.2.3.3 Calculation of nearby population targets factor category value. Text has been revised to reflect the changes in the targets factor category and in the rounding rule.

Section 5.2.4 Calculation of nearby population threat score. Minor editorial changes only.

Section 5.3 Calculation of the soil exposure pathway score. Has been changed to reflect the change in the value used as a divisor.

In addition to the above noted changes, Figures 5–2 and 5–3 and Tables 5–4 and 5–6 from the proposed rule have been removed.

Section 6 Air Migration Pathway

The air migration pathway evaluates the relative threat resulting from releases or potential releases of hazardous substances, either as gases or particulates, to the air. The major changes specific to this pathway include separate evaluation of gas and particulates in the likelihood to release factor category; inclusion of benchmarks to evaluate population and the nearest individual; weighting of sensitive environments based on actual or potential contamination; revision of the distance weights; deletion of the land use factor and inclusion of a resources factor in the evaluation of population; and revisions to the mobility factor.

Section 6.0 Air Migration Pathway. Descriptive text has been removed. Figure 6–1 has been revised to reflect revisions to the factors evaluated, and Table 6–1 has been revised to reflect the new factor category values throughout.

Section 6.1 Likelihood of release. Has been revised to eliminate explanatory text and to add instructions about which factors to evaluate for this factor category.

Section 6.1.1 Observed release. As discussed in section III G of this preamble, the specific criteria have been revised.

Section 6.1.2 Potential to release. As explained in section III O of this preamble, the method for evaluating this factor has been revised. Gas potential to release and particulate potential to release are evaluated separately. The explanatory text has been removed.

Section 6.1.2.1 Gas potential to release. Explains how this factor is evaluated. Table 6–2 (proposed rule Table 2–3) has been revised to apply only to the gas potential to release factors.

Section 6.1.2.1.1 Gas containment. Descriptive text has been removed. Table 6–3 (proposed rule Table 2–5) has been simplified. The depth requirements and other containment requirements have been revised based on public comment, the field test, and a review of recent information on covering systems. Consideration of biogas releases has been added. Assigned values have been revised and also reflect the revised maximum value for the factor.

Section 6.1.2.1.2 Gas source type. New source types have been added to Table 6–4 (proposed rule Table 2–6), and the assigned values have been revised. As explained in section III O of this preamble, new source types and subgroups for specific types have been added, in response to comments and the field test, to make this factor easier to evaluate. Treatment of sources when no source meets the minimum size has been clarified.

Section 6.1.2.1.3 Gas migration potential. As explained in section III O of this preamble, this section has been renamed and the approach for assigning values changed slightly. This section explains how to assign values to each substance and subsequently to the source using Tables 6–5, 6–6, and 6–7. Dry soil relative volatility has been removed as a measure of gas migration potential. The footnotes have been removed from Table 6–5 (proposed rule Table 2–7) and the name has been changed to "Values for Vapor Pressure and Henry's Constant." The titles of Tables 6–6 and 6–7 have been changed. The values assigned have also been changed to reflect the revised maximum value for the factor category. Descriptive text has been removed.

Section 6.1.2.1.4 Calculation of gas potential to release value. Explains how to calculate this value.

Section 6.1.2.2 Particulate potential to release. Explains how this factor is evaluated. Table 6–8 (proposed rule Table 2–3) has been revised to apply only to the particulate potential to release factors.

Section 6.1.2.2.1 Particulate containment. References Table 6–9 (Table 2–5 from the proposed rule). The criteria and values assigned using this table have been changed, as discussed in section III O of this preamble. Considerations of depth have been added for particulates.

Section 6.1.2.2.2 Particulate source type. In response to comments, new kinds of source types and subgroups of source types have been added to make this factor easier to score. The values assigned have been revised to reflect the changed factor category maximum. Treatment of sources when no source meets the minimum size has been clarified.

Section 6.1.2.2.3 Particulate migration potential. Has been renamed. Descriptive text has been removed. Proposed rule Figure 2–3 has been simplified, expanded, and renumbered as Figure 6–2. Proposed rule Table 2–9 has been renumbered as Table 6–10.

Section 6.1.2.2.4 Calculation of particulate potential to release value. Describes how to calculate this value.

Section 6.1.2.3 Calculation of potential to release factor value for the site. Text has been simplified and modified to account for gas and particulate potential to release.

Section 6.1.3 Calculation of likelihood of release factor category value. Describes calculation procedure.

Section 6.2 Waste characteristics. Descriptive text has been removed.

Section 6.2.1 Toxicity/mobility. Text has been simplified.

Section 6.2.1.1 Toxicity. Descriptive text has been removed and § 2.4.1.1 is referenced.

Section 6.2.1.2 Mobility. As explained in section III F of this preamble, the scoring of this factor has changed. Gas mobility is now based only on vapor pressure. The maximum value assigned for particulate mobility is no longer the same as the maximum assigned for gas mobility. The particulate mobility values are assigned based on Figure 6–3 or the equation in the text along with Table 6–12. The values assigned have been put on linear scales to be consistent with the new structure of the waste characteristics factor category. The text has been simplified.

Section 6.2.1.3 Calculation of toxicity/mobility factor value. Table 6–13, proposed rule Table 2–12, the matrix for assigning toxicity/mobility factor values has been revised to reflect the changes in values assigned to both factors.

Section 6.2.2 Hazardous waste quantity. Descriptive text has been removed and § 2.4.2 is referenced.

Section 6.2.3 Calculation of waste characteristics factor category value. The text has been revised to indicate the multiplication of the component factors, the new maximum value, and the table used to assign the factor category value.

Section 6.3 Targets. The target distance limit has been modified to include targets beyond four miles when an observed release extends beyond that distance. Text has been added to explain how to evaluate populations and sensitive environments exposed to actual contamination. Text was added to clarify that actual contamination based on an observed release established by direct observation should be considered Level II. Table 6–14, Health-Based Benchmarks for Hazardous Substances in Air, has been added to list the benchmarks used for this pathway. Table 6–15, Air Migration Pathway Distance Weights (proposed rule Table 2–16), has been revised to reflect changes in the distance weights discussed in section III O of this preamble.

Section 6.3.1 Nearest individual. The title has been changed from maximally exposed individual. As discussed above, this factor is now evaluated based on actual contamination and potential contamination. The name of Table 6–16 (proposed rule Table 2–15) has been changed and the values have been revised based on changes to the distance weights. Descriptive text has been removed.

Section 6.3.2 Population. Evaluation of population based on health-based benchmarks has been added as discussed in section III H of this preamble.

Section 6.3.2.1 Level of contamination. Explains how to evaluate population based on concentrations of hazardous substances in samples.

Section 6.3.2.2 Level I concentrations. Explains how to evaluate populations exposed to Level I concentrations. The scoring cap was eliminated, and the multiplier (i.e., weight) is now 10.

Section 6.3.2.3 Level II concentrations. Explains how to

evaluate populations exposed to Level II concentrations.

Section 6.3.2.4 Potential contamination. Explains how to assign values to populations potentially exposed to contamination from the site. The formula for calculating population values has been revised. Table 6–17, which assigns distance-weighted values for populations in each distance category, has been added. The values in the table were determined by statistical simulation to yield the same population, on average, as the use of the formulas in the proposed rule. The use of population ranges has been adopted as part of the simplification discussed in section III A. The rounding rule has been changed, the scoring cap was eliminated, and the multiplier (i.e., weight) is now 0.1.

Section 6.3.2.5 Calculation of the population factor value. Explains how to calculate the factor value. The scoring cap was eliminated.

Section 6.3.3 Resources. Explains how to assign points to resources, which in this pathway is based on the presence of commercial agriculture, commercial silviculture, and major or designated recreation areas.

Section 6.3.4 Sensitive environments. Explains how sensitive environments are evaluated based on actual and potential contamination. The maximum value that can be assigned to this factor is limited, but is greater than in the proposed rule. The limit is determined by scoring the pathway with only sensitive environments in the targets factor category; the pathway score under these conditions may not exceed 60 points.

Section 6.3.4.1 Actual contamination. Explains how to assign factor values for sensitive environments subject to actual contamination and how to assign values to wetlands based on total acreage. A new Table 6–18, Wetlands Rating Values for the Air Migration Pathway, has been added to assign values to wetlands based on acreage.

Section 6.3.4.2 Potential contamination. Explains how to calculate the factor value for potentially contaminated sensitive environments and how to assign values to wetlands based on total acreage within each distance category. The rounding rule has been changed.

Section 6.3.4.3 Calculation of sensitive environments factor value. Explains how to calculate the factor value. The rounding rule has been changed.

Section 6.3.5 Calculation of targets factor category value. Text has been revised to reflect the new names for factors.

Section 6.4 Calculation of air migration pathway score. Text has been revised to reflect the new divisor.

In addition to the above noted changes, the land use factor, Figure 2–2, and Tables 2–2, 2–3, 2–13, 2–17, and 2–19 in the proposed rule have been removed.

Section 7 Sites Containing Radioactive Substances

This entire part of the rule is new. As discussed in section III E of the preamble, this section has been added to provide direction on evaluating sites containing radioactive substances. Table 7–1 lists factors evaluated differently for such sites.

Section 7.1 Likelihood of release/likelihood of exposure. Explains the approach to evaluating the factor category.

Section 7.1.1 Observed release/observed contamination. Explains how to evaluate observed release (observed contamination) for radionuclides. The evaluation differs for radionuclides that occur naturally or are ubiquitous in the environment, for man-made radionuclides without ubiquitous background concentrations in the environment, and for gamma-emitting radionuclides in the soil exposure pathway. This section also explains the appropriate procedures for sites with mixed radioactive and other hazardous substances.

Section 7.1.2 Potential to release. Explains that potential to release factors are evaluated on the physical and chemical properties of radionuclides, not their radioactivity.

Section 7.2 Waste characteristics. Lists the factors evaluated.

Section 7.2.1 Human toxicity. Explains how to assign toxicity values to radioactive substances and describes appropriate procedures for sites containing mixed radionuclides and other hazardous substances.

Section 7.2.2 Ecosystem toxicity. Explains that ecosystem toxicity for radionuclides is assigned a value in the same way as is human toxicity except that the default value is 100 rather than 1,000.

Section 7.2.3 Persistence. Explains that radioactive substances are assigned persistence values based solely on half-life—radioactive half-life and volatilization half-life. Explains how to evaluate persistence for mixed radioactive and other hazardous substances.

Section 7.2.4 Selection of the substance potentially posing greatest hazard. The section explains how to select the substance potentially posing the greatest hazard.

Section 7.2.5 Hazardous waste quantity. Explains how to evaluate the hazardous waste quantity factor for sites containing radioactive substances.

Section 7.2.5.1 Source hazardous waste quantity for radionuclides. Describes differences between the migration pathways and the soil exposure pathway.

Section 7.2.5.1.1 Radionuclide constituent quantity (Tier A). Explains how to evaluate radionuclide constituent quantity for radionuclides.

Section 7.2.5.1.2 Radionuclide wastestream quantity (Tier B). Explains how to evaluate radionuclide wastestream quantity for radionuclides.

Section 7.2.5.1.3 Calculation of source hazardous waste quantity value for radionuclides. Explains how to assign a source value.

Section 7.2.5.2 Calculation of hazardous waste quantity factor value for radionuclides. Explains how to calculate the hazardous waste quantity factor value for radionuclides and describes use of the minimum value, which is either 10 or 100 (as described in section 2.4.2.2 above).

Section 7.2.5.3 Calculation of hazardous waste quantity factor value for sites containing mixed radioactive and other hazardous substances. Explains how to calculate the factor value for these sites.

Section 7.3 Targets. Explains how to evaluate targets at sites containing radioactive substances and sites containing radioactive and other hazardous substances.

Section 7.3.1 Level of contamination at a sampling location. Explains how to determine the appropriate level of contamination.

Section 7.3.2 Selection of benchmarks and comparisons with observed release/observed contamination. This section lists the benchmarks and explains how they are used in determining the level of contamination.

V. Required Analyses

A. Executive Order No. 12291

Under Executive Order No. 12291, the Agency must judge whether a regulation is "major" and thus subject to the requirement of a Regulatory Impact Analysis. The rule published today is not major because the rule will not result in an effect on the economy of $100 million or more, will not result in increased costs or prices, will not have significant adverse effects on competition, employment, investment, productivity, and innovation, and will

not significantly disrupt domestic and export markets.

To estimate the costs associated with the final rule, a final economic analysis entitled "Economic Impact Analysis of the Revised Hazard Ranking System" was prepared as an addendum to the December 1987 economic impact analysis (EIA) to incorporate new data. As in the January 1988 EIA, the total annual cost of implementing the final rule is estimated as a function of the number of Screening SIs (SSI) and Listing SIs (LSI) that will be conducted annually and the unit cost of each. In the January 1988 EIA, estimates of total costs were developed assuming 1,130 SSIs and 100 LSIs would be conducted annually. The Agency now estimates that 1,100 SIs will be conducted annually (EPA is no longer using the terms SSI and LSI). The total annual cost is estimated to be $78.8 million, the sum of the cost of conducting 1,000 SIs at a unit cost of $55,000, 70 SIs for NPL sites (without monitoring wells) at a unit cost of $100,000, and 30 SIs for NPL sites (with monitoring wells) at a unit cost of $160,000.

To estimate the incremental cost of implementing the final revised version of the HRS, the unit cost of conducting all preremedial listing activities using the current HRS from the January 1988 EIA is updated. That cost was estimated to be $58,200 in the January 1988 EIA, and was developed assuming the PA had already been conducted. The 1988 estimate is a function of 480 hours of Field Investigation Team (FIT) technical time valued at $40 per hour and 30 samples being evaluated at a unit cost of $1,300 per sample. To compare the costs of the current HRS to those developed above for the final revised version of the HRS, the FIT technical time is valued at $50 per hour and each sample evaluation is estimated to cost $1,000. The revised total cost of conducting all listing activities beyond the PA for the current HRS, therefore, is estimated to be $54,000. In addition, the average level of effort for a PA under the current HRS is estimated to be 60 hours, and the unit cost of the PA, assuming a $50 FIT hourly rate, is estimated to be $3,000.

Based on these revisions, the annual cost of using the current HRS is estimated to be $65.4 million, the sum of the cost of conducting 2,000 PAs at a unit cost of $3,000 ($6 million) and the cost of conducting 1,100 SIs at a unit cost of $54,000 ($59.4 million). Compared to the current HRS, the annual incremental cost of using the final revised version of the HRS is estimated to be $13.4 million. On the basis of this evaluation, implementing the final revised version of the HRS would not constitute a major rule, because the annual incremental cost of the final rule is less than $100 million. No negative economic effects are anticipated from this rule.

B. Regulatory Flexibility Determination

Appendix A of the December 1987 EIA includes an assessment of the ability of responsible parties to pay the costs of HRS scoring under the current HRS and the three alternative scoring mechanisms considered at that time. That analysis evaluated the impact of HRS costs under each ranking methodology on the financial viability of 15 sample companies. Under that analysis, only the smallest sample firm (one with an average net income of $53,700) was expected to have difficulty in paying the costs of conducting a complete SI under each of the alternative ranking scenarios. The new unit cost of a complete SI developed during the Phase I field test and used in this economic analysis falls within the range of costs already evaluated in appendix A of the December 1987 EIA. Given the previous analysis, EPA concludes that most sample firms are healthy enough financially to be able to afford the expenditures associated with HRS site inspections. Responsible Parties (RPs) that are financially similar to the smallest firm (Firm 15 in appendix A of the December 1987 RIA), however, do not have the assets or the income to enable them to assume payments similar to the estimates derived for the SI done under the current HRS or the final revised version of the HRS.

The Regulatory Flexibility Act of 1980 requires that Federal agencies explicitly consider the effects of proposed and existing regulations on small entities and examine alternative regulations that would reduce significant adverse impacts on small entities. The small entities that could be affected by the revisions to the HRS are small businesses and small municipalities that are responsible for hazardous wastes at a site. Based on the updated analysis presented here, EPA concludes that using the final rule is unlikely to result in a significant impact on a substantial number of small entities. As discussed in the December 1987 EIA, this conclusion is drawn because small firms are no more or less likely to be responsible parties than are large firms. In addition, when they are RPs, small firms usually are one of several companies responsible for a site and probably would not bear the full burden of liability for HRS expenditures and other cleanup costs.

C. Paperwork Reduction Act

The information collection requirements contained in this rule have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and has assigned OMB control number 2050-0095.

Public reporting burden for this collection of information is estimated to be 620 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM—U.S. Environmental Protection Agency, 401 M St., SW., Washington, DC 20460; and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

D. Federalism Implications

E.O. 12612 requires agencies to assess whether a regulation will have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPA has determined that this regulation does not have federalism implications and that, therefore, a Federalism Assessment is not required.

List of Subjects in 40 CFR Part 300

Air pollution controls, Chemicals, Hazardous materials, Intergovernmental relations, Natural resources, Oil pollution, Reporting and recordkeeping, Superfund, Waste treatment and disposal, Water pollution control, Water supply.

Dated: November 9, 1990.

William K. Reilly,

Administrator.

40 CFR part 300 is amended as follows:

PART 300—[AMENDED]

1. The authority citation for part 300 continues to read as follows:

Authority: 42 U.S.C. 9605; 33 U.S.C. 1321(c)(2); E.O. No. 117535, 38 FR 21243; E.O No. 12580, 52 FR 2923.

2. Part 300, appendix A is revised to read as follows:

Appendix A to Part 300—The Hazard Ranking System

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1.0 Introduction

The Hazard Ranking System (HRS) is the principal mechanism the U.S. Environmental Protection Agency (EPA) uses to place sites on the National Priorities List (NPL). The HRS serves as a screening device to evaluate the potential for releases of uncontrolled hazardous substances to cause human health or environmental damage. The HRS provides a measure of relative rather than absolute risk. It is designed so that it can be consistently applied to a wide variety of sites.

1.1 Definitions

Acute toxicity: Measure of toxicological responses that result from a single exposure to a substance or from multiple exposures within a short period of time (typically several days or less). Specific measures of acute toxicity used within the HRS include lethal $dose_{50}$ (LD_{50}) and lethal $concentration_{50}$ (LC_{50}), typically measured within a 24-hour to 96-hour period.

Ambient Aquatic Life Advisory Concentrations (AALACs): EPA's advisory concentration limit for acute or chronic toxicity to aquatic organisms as established under section 304(a)(1) of the Clean Water Act, as amended.

Ambient Water Quality Criteria (AWQC): EPA's maximum acute or chronic toxicity concentrations for protection of aquatic life and its uses as established under section 304(a)(1) of the Clean Water Act, as amended.

Bioconcentration factor (BCF): Measure of the tendency for a substance to accumulate in the tissue of an aquatic organism. BCF is determined by the extent of partitioning of a substance, at equilibrium, between the tissue of an aquatic organism and water. As the ratio of concentration of a substance in the organism divided by the concentration in water, higher BCF values reflect a tendency for substances to accumulate in the tissue of aquatic organisms. [unitless].

Biodegradation: Chemical reaction of a substance induced by enzymatic activity of microorganisms.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (Pub. L. 96–510, as amended).

Chronic toxicity: Measure of toxicological responses that result from repeated exposure to a substance over an extended period of time (typically 3 months or longer). Such responses may persist beyond the exposure or may not appear until much later in time than the exposure. HRS measures of chronic toxicity include Reference Dose (RfD) values.

Contract Laboratory Program (CLP): Analytical program developed for CERCLA waste site samples to fill the need for legally defensible analytical results supported by a high level of quality assurance and documentation.

Contract-Required Detection Limit (CRDL). Term equivalent to contract-required quantitation limit, but used primarily for inorganic substances.

Contract-Required Quantitation Limit (CRQL): Substance-specific level that a CLP laboratory must be able to routinely and reliably detect in specific sample matrices. It is not the lowest detectable level achievable, but rather the level that a CLP laboratory should reasonably quantify. The CRQL may or may not be equal to the quantitation limit of a given substance in a given sample. For HRS purposes, the term CRQL refers to both the contract-required quantitation limit and the contract-required detection limit.

Curie (Ci): Measure used to quantify the amount of radioactivity. One curie equals 37 billion nuclear transformations per second, and one picocurie (pCi) equals 10^{-12} Ci.

Decay product: Isotope formed by the radioactive decay of some other isotope. This newly formed isotope possesses physical and chemical properties that are different from

those of its parent isotope, and may also be radioactive.

Detection Limit (DL): Lowest amount that can be distinguished from the normal random "noise" of an analytical instrument or method. For HRS purposes, the detection limit used is the method detection limit (MDL) or, for real-time field instruments, the detection limit of the instrument as used in the field.

Dilution weight: Parameter in the HRS surface water migration pathway that reduces the point value assigned to targets as the flow or depth of the relevant surface water body increases. [unitless].

Distance weight: Parameter in the HRS air migration, ground water migration, and soil exposure pathways that reduces the point value assigned to targets as their distance increases from the site. [unitless].

Distribution coefficient (K_d): Measure of the extent of partitioning of a substance between geologic materials (for example, soil, sediment, rock) and water (also called partition coefficient). The distribution coefficient is used in the HRS in evaluating the mobility of a substance for the ground water migration pathway. [ml/g].

ED_{10} (10 percent effective dose): Estimated dose associated with a 10 percent increase in response over control groups. For HRS purposes, the response considered is cancer. [milligrams toxicant per kilogram body weight per day (mg/kg-day)].

Food and Drug Administration Action Level (FDAAL): Under section 408 of the Federal Food, Drug and Cosmetic Act, as amended, concentration of a poisonous or deleterious substance in human food or animal feed at or above which FDA will take legal action to remove adulterated products from the market. Only FDAALs established for fish and shellfish apply in the HRS.

Half-life: Length of time required for an initial concentration of a substance to be halved as a result of loss through decay. The HRS considers five decay processes: biodegradation, hydrolysis, photolysis, radioactive decay, and volatilization.

Hazardous substance: CERCLA hazardous substances, pollutants, and contaminants as defined in CERCLA sections 101(14) and 101(33), except where otherwise specifically noted in the HRS.

Hazardous wastestream: Material containing CERCLA hazardous substances (as defined in CERCLA section 101(14)) that was deposited, stored, disposed, or placed in, or that otherwise migrated to, a source.

HRS *"factor":* Primary rating elements internal to the HRS.

HRS *"factor category":* Set of HRS factors (that is, likelihood of release [or exposure], waste characteristics, targets).

HRS *"migration pathways":* HRS ground water, surface water, and air migration pathways.

HRS *"pathway":* Set of HRS factor categories combined to produce a score to measure relative risks posed by a site in one of four environmental pathways (that is, ground water, surface water, soil, and air).

HRS *"site score":* Composite of the four HRS pathway scores.

Henry's law constant: Measure of the volatility of a substance in a dilute solution of water at equilibrium. It is the ratio of the vapor pressure exerted by a substance in the gas phase over a dilute aqueous solution of that substance to its concentration in the solution at a given temperature. For HRS purposes, use the value reported at or near 25° C. [atmosphere-cubic meters per mole (atm-m^3/mol)].

Hydrolysis: Chemical reaction of a substance with water.

Karst: Terrain with characteristics of relief and drainage arising from a high degree of rock solubility in natural waters. The majority of karst occurs in limestones, but karst may also form in dolomite, gypsum, and salt deposits. Features associated with karst terrains typically include irregular topography, sinkholes, vertical shafts, abrupt ridges, caverns, abundant springs, and/or disappearing streams. Karst aquifers are associated with karst terrain.

LC_{50} (lethal concentration, 50 percent): Concentration of a substance in air [typically micrograms per cubic meter ($\mu g/m^3$)] or water [typically micrograms per liter ($\mu g/l$)] that kills 50 percent of a group of exposed organisms. The LC_{50} is used in the HRS in assessing acute toxicity.

LD_{50} (lethal dose, 50 percent): Dose of a substance that kills 50 percent of a group of exposed organisms. The LD_{50} is used in the HRS in assessing acute toxicity [milligrams toxicant per kilogram body weight (mg/kg)].

Maximum Contaminant Level (MCL): Under section 1412 of the Safe Drinking Water Act, as amended, the maximum permissible concentration of a substance in water that is delivered to any user of a public water supply.

Maximum Contaminant Level Goal (MCLG): Under section 1412 of the Safe Drinking Water Act, as amended, a nonenforceable concentration for a substance in drinking water that is protective of adverse human health effects and allows an adequate margin of safety.

Method Detection Limit (MDL): Lowest concentration of analyte that a method can detect reliably in either a sample or blank.

Mixed radioactive and other hazardous substances: Material containing both radioactive hazardous substances and nonradioactive hazardous substances, regardless of whether these types of substances are physically separated, combined chemically, or simply mixed together.

National Ambient Air Quality Standards (NAAQS): Primary standards for air quality established under sections 108 and 109 of the Clean Air Act, as amended.

National Emission Standards for Hazardous Air Pollutants (NESHAPs): Standards established for substances listed under section 112 of the Clean Air Act, as amended. Only those NESHAPs promulgated in ambient concentration units apply in the HRS.

Octanol-water partition coefficient (K_{ow} [or P]): Measure of the extent of partitioning of a substance between water and octanol at equilibrium. The K_{ow} is determined by the ratio between the concentration in octanol divided by the concentration in water at equilibrium. [unitless].

Organic carbon partition coefficient (K_{oc}): Measure of the extent of partitioning of a substance, at equilibrium, between organic carbon in geologic materials and water. The higher the K_{oc}, the more likely a substance is to bind to geologic materials than to remain in water. [ml/g].

Photolysis: Chemical reaction of a substance caused by direct absorption of solar energy (direct photolysis) or caused by other substances that absorb solar energy (indirect photolysis).

Radiation: Particles (alpha, beta, neutrons) or photons (x- and gamma-rays) emitted by radionuclides.

Radioactive decay: Process of spontaneous nuclear transformation, whereby an isotope of one element is transformed into an isotope of another element, releasing excess energy in the form of radiation.

Radioactive half-life: Time required for one-half the atoms in a given quantity of a specific radionuclide to undergo radioactive decay.

Radioactive substance: Solid, liquid, or gas containing atoms of a single radionuclide or multiple radionuclides.

Radioactivity: Property of those isotopes of elements that exhibit radioactive decay and emit radiation.

Radionuclide/radioisotope: Isotope of an element exhibiting radioactivity. For HRS purposes, "radionuclide" and "radioisotope" are used synonymously.

Reference dose (RfD): Estimate of a daily exposure level of a substance to a human population below which adverse noncancer health effects are not anticipated. [milligrams toxicant per kilogram body weight per day (mg/kg-day)].

Removal action: Action that removes hazardous substances from the site for proper disposal or destruction in a facility permitted under the Resource Conservation and Recovery Act or the Toxic Substances Control Act or by the Nuclear Regulatory Commission.

Roentgen (R): Measure of external exposures to ionizing radiation. One roentgen equals that amount of x-ray or gamma radiation required to produce ions carrying a charge of 1 electrostatic unit (esu) in 1 cubic centimeter of dry air under standard conditions. One microroentgen (μR) equals 10^{-6} R.

Sample quantitation limit (SQL): Quantity of a substance that can be reasonably quantified given the limits of detection for the methods of analysis and sample characteristics tha may affect quantitation (for example, dilution, concentration).

Screening concentration: Media-specific benchmark concentration for a hazardous substance that is used in the HRS for comparison with the concentration of that hazardous substance in a sample from that media. The screening concentration for a specific hazardous substance corresponds to its reference dose for inhalation exposures or for oral exposures, as appropriate, and, if the substance is a human carcinogen with a weight-of-evidence classification of A, B, or C, to that concentration that corresponds to its 10^{-6} individual lifetime excess cancer risk for inhalation exposures or for oral exposures, as appropriate.

Site: Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources.

Slope factor (also referred to as cancer potency factor): Estimate of the probability of response (for example, cancer) per unit intake of a substance over a lifetime. The slope factor is typically used to estimate upper-bound probability of an individual developing cancer as a result of exposure to a particular level of a human carcinogen with a weight-of-evidence classification of A, B, or C. [$(mg/kg\text{-}day)^{-1}$ for non-radioactive substances and $(pC_i)^{-1}$ for radioactive substances].

Source: Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance. Sources do not include those volumes of air, ground water, surface water, or surface water sediments that have become contaminated by migration, except: in the case of either a ground water plume with no identified source or contaminated surface water sediments with no identified source, the plume or contaminated sediments may be considered a source.

Target distance limit: Maximum distance over which targets for the site are evaluated. The target distance limit varies by HRS pathway.

Uranium Mill Tailings Radiation Control Act (UMTRCA) Standards: Standards for radionuclides established under sections 102, 104, and 108 of the Uranium Mill Tailings Radiation Control Act, as amended.

Vapor pressure: Pressure exerted by the vapor of a substance when it is in equilibrium with its solid or liquid form at a given temperature. For HRS purposes, use the value reported at or near 25° C. [atmosphere or torr].

Volatilization: Physical transfer process through which a substance undergoes a change of state from a solid or liquid to a gas.

Water solubility: Maximum concentration of a substance in pure water at a given temperature. For HRS purposes, use the value reported at or near 25° C. [milligrams per liter (mg/l)].

Weight-of-evidence: EPA classification system for characterizing the evidence supporting the designation of a substance as a human carcinogen. EPA weight-of-evidence groupings include:

Group A: Human carcinogen--sufficient evidence of carcinogenicity in humans.
Group B1: Probable human carcinogen--limited evidence of carcinogenicity in humans.
Group B2: Probable human carcinogen--sufficient evidence of carcinogenicity in animals.
Group C: Possible human carcinogen--limited evidence of carcinogenicity in animals.
Group D: Not classifiable as to human carcinogenicity--applicable when there is no animal evidence, or when human or animal evidence is inadequate.
Group E: Evidence of noncarcinogenicity for humans.

2.0 Evaluations Common to Multiple Pathways

2.1 *Overview.* The HRS site score (S) is the result of an evaluation of four pathways:

- Ground Water Migration (S_{gw}).
- Surface Water Migration (S_{sw}).
- Soil Exposure (S_s).
- Air Migration (S_a).

The ground water and air migration pathways use single threat evaluations, while the surface water migration and soil exposure pathways use multiple threat evaluations. Three threats are evaluated for the surface water migration pathway: drinking water, human food chain, and environmental. These threats are evaluated for two separate migration components--overland/flood migration and ground water to surface water migration. Two threats are evaluated for the soil exposure pathway: resident population and nearby population.

The HRS is structured to provide a parallel evaluation for each of these pathways and threats. This section focuses on these parallel evaluations, starting with the calculation of the HRS site score and the individual pathway scores.

2.1.1 *Calculation of HRS site score.* Scores are first calculated for the individual pathways as specified in sections 2 through 7 and then are combined for the site using the following root-mean-square equation to determine the overall HRS site score, which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

2.1.2 *Calculation of pathway score.* Table 2-1, which is based on the air migration pathway, illustrates the basic parameters used to calculate a pathway score. As Table 2-1 shows, each pathway (or threat) score is the product of three "factor categories": likelihood of release, waste characteristics, and targets. (The soil exposure pathway uses likelihood of exposure rather than likelihood of release.) Each of the three factor categories contains a set of factors that are assigned numerical values and combined as specified in sections 2 through 7. The factor values are rounded to the nearest integer, except where otherwise noted.

2.1.3 *Common evaluations.* Evaluations common to all four HRS pathways include:

- Characterizing sources.
  - –Identifying sources (and, for the soil exposure pathway, areas of observed contamination [see section 5.0.1]).
  - –Identifying hazardous substances associated with each source (or area of observed contamination).
  - –Identifying hazardous substances available to a pathway.

TABLE 2-1.—SAMPLE PATHWAY SCORESHEET

Factor category	Maximum value	Value assigned
Likelihood of Release		
1. Observed Release	550	
2. Potential to Release	500	
3. Likelihood of Release (higher of lines 1 and 2)	550	
Waste Characteristics		
4. Toxicity/Mobility	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets		
7. Nearest Individual		
7a. Level I	50	
7b. Level II	45	
7c. Potential Contamination	20	
7d. Nearest Individual (higher of lines 7a, 7b, or 7c)	50	
8. Population		
8a. Level I	(b)	
8b. Level II	(b)	
8c. Potential Contamination	(b)	
8d. Total Population (lines 8a+8b+8c)	(b)	
9. Resources	5	
10. Sensitive Environments	(b)	
10a. Actual Contamination	(b)	
10b. Potential Contamination	(b)	
10c. Sensitive Environments (lines 10a+10b)	(b)	
11. Targets (lines 7d+8d+9+10c)	(b)	
12. **Pathway Score** is the product of Likelihood of Release, Waste Characteristics, and Targets, divided by 82,500. Pathway scores are limited to a maximum of 100 points.		

[a] Maximum value applies to waste characteristics category. The product of lines 4 and 5 is used in Table 2-7 to derive the value for the waste characteristics factor category.

[b] There is no limit to the human population or sensitive environments factor values. However, the pathway score based solely on sensitive environments is limited to a maximum of 60 points.

- Scoring likelihood of release (or likelihood of exposure) factor category.
  - –Scoring observed release (or observed contamination).
  - –Scoring potential to release when there is no observed release.
- Scoring waste characteristics factor category.
  - –Evaluating toxicity.
  - –Combining toxicity with mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential, as appropriate to the pathway (or threat).
  - –Evaluating hazardous waste quantity.
  - –Combining hazardous waste quantity with the other waste characteristics factors.
  - –Determining waste characteristics factor category value.
- Scoring targets factor category.
  - –Determining level of contamination for targets.

These evaluations are essentially identical for the three migration pathways (ground water, surface water, and air). However, the

evaluations differ in certain respects for the soil exposure pathway.

Section 7 specifies modifications that apply to each pathway when evaluating sites containing radioactive substances.

Section 2 focuses on evaluations common at the pathway and threat levels. Note that for the ground water and surface water migration pathways, separate scores are calculated for each aquifer (see section 3.0) and each watershed (see sections 4.1.1.3 and 4.2.1.5) when determining the pathway scores for a site. Although the evaluations in section 2 do not vary when different aquifers or watersheds are scored at a site, the specific factor values (for example, observed release, hazardous waste quantity, toxicity/mobility) that result from these evaluations can vary by aquifer and by watershed at the site. This can occur through differences both in the specific sources and targets eligible to be evaluated for each aquifer and watershed and in whether observed releases can be established for each aquifer and watershed. Such differences in scoring at the aquifer and watershed level are addressed in sections 3 and 4, not section 2.

2.2 *Characterize sources.* Source characterization includes identification of the following:

- Sources (and areas of observed contamination) at the site.
- Hazardous substances associated with these sources (or areas of observed contamination).
- Pathways potentially threatened by these hazardous substances.

Table 2-2 presents a sample worksheet for source characterization.

2.2.1 *Identify sources.* For the three migration pathways, identify the sources at the site that contain hazardous substances. Identify the migration pathway(s) to which each source applies. For the soil exposure pathway, identify areas of observed contamination at the site (see section 5.0.1).

TABLE 2-2.—SAMPLE SOURCE CHARACTERIZATION WORKSHEET

Source: _____

A. Source dimensions and hazardous waste quantity.

Hazardous constituent quantity: _____

Hazardous wastestream quantity: _____

Volume: _____

Area: _____

Area of observed contamination: _____

B. Hazardous substances associated with the source.

Hazardous substance	Available to pathway						
	Air		Ground water (GW)	Surface water (SW)		Soil	
	Gas	Particulate		Overland/ flood	GW to SW	Resident	Nearby

2.2.2 *Identify hazardous substances associated with a source.* For each of the three migration pathways, consider those hazardous substances documented in a source (for example, by sampling, labels, manifests, oral or written statements) to be associated with that source when evaluating each pathway. In some instances, a hazardous substance can be documented as being present at a site (for example, by labels, manifests, oral or written statements), but the specific source(s) containing that hazardous substance cannot be documented. For the three migration pathways, in those instances when the specific source(s) cannot be documented for a hazardous substance, consider the hazardous substance to be present in each source at the site, except sources for which definitive information indicates that the hazardous substance was not or could not be present.

For an area of observed contamination in the soil exposure pathway, consider only those hazardous substances that meet the criteria for observed contamination for that area (see section 5.0.1) to be associated with that area when evaluating the pathway.

2.2.3 *Identify hazardous substances available to a pathway.* In evaluating each migration pathway, consider the following hazardous substances available to migrate from the sources at the site to the pathway:

- Ground water migration.
  - –Hazardous substances that meet the criteria for an observed release (see section 2.3) to ground water.
  - –All hazardous substances associated with a source with a ground water containment factor value greater than 0 (see section 3.1.2.1).
- Surface water migration—overland/flood component.
  - –Hazardous substances that meet the criteria for an observed release to surface water in the watershed being evaluated.
  - –All hazardous substances associated with a source with a surface water containment factor value greater than 0 for the watershed (see sections 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1).
- Surface water migration—ground water to surface water component.
  - –Hazardous substances that meet the criteria for an observed release to ground water.
  - –All hazardous substances associated with a source with a ground water containment factor value greater than 0 (see sections 4.2.2.1.2 and 3.1.2.1).
- Air migration.
  - –Hazardous substances that meet the criteria for an observed release to the atmosphere.
  - –All gaseous hazardous substances associated with a source with a gas containment factor value greater than 0 (see section 6.1.2.1.1).
  - –All particulate hazardous substances associated with a source with a particulate containment factor value greater than 0 (see section 6.1.2.2.1).
- For each migration pathway, in those instances when the specific source(s) containing the hazardous substance cannot be documented, consider that hazardous substance to be available to migrate to the pathway when it can be associated (see section 2.2.2) with at least one source having a containment factor value greater than 0 for that pathway.

In evaluating the soil exposure pathway, consider the following hazardous substances available to the pathway:

• Soil exposure—resident population threat.

–All hazardous substances that meet the criteria for observed contamination at the site (see section 5.0.1).

• Soil exposure—nearby population threat.

–All hazardous substances that meet the criteria for observed contamination at areas with an attractiveness/accessibility factor value greater than 0 (see section 5.2.1.1).

2.3 *Likelihood of release.* Likelihood of release is a measure of the likelihood that a waste has been or will be released to the environment. The likelihood of release factor category is assigned the maximum value of 550 for a migration pathway whenever the criteria for an observed release are met for that pathway. If the criteria for an observed release are met, do not evaluate potential to release for that pathway. When the criteria for an observed release are not met, evaluate potential to release for that pathway, with a maximum value of 500. The evaluation of potential to release varies by migration pathway (see sections 3, 4 and 6).

Establish an observed release either by direct observation of the release of a hazardous substance into the media being evaluated (for example, surface water) or by chemical analysis of samples appropriate to the pathway being evaluated (see sections 3, 4, and 6). The minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site. Use the criteria in Table 2–3 as the standard for determining analytical significance. (The criteria in Table 2–3 are also used in establishing observed contamination for the soil exposure pathway, see section 5.0.1.) Separate criteria apply to radionuclides (see section 7.1.1).

TABLE 2–3.—OBSERVED RELEASE CRITERIA FOR CHEMICAL ANALYSIS

Sample Measurement < Sample Quantitation Limit [a]
No observed release is established.
Sample Measurement ≥ SAMPLE QUANTITATION LIMIT [a]
An observed release is established as follows: • If the background concentration is not detected (or is less than the detection limit), an observed release is established when the sample measurement equals or exceeds the sample quantitation limit.[a] • If the background concentration equals or exceeds the detection limit, an observed release is established when the sample measurement is 3 times or more above the background concentration.

[a] If the sample quantitation limit (SQL) cannot be established, determined if there is an observed release as follows:

—If the sample analysis was performed under the EPA Contract Laboratory Program, use the EPA contract-required quantitation limit (CRQL) in place of the SQL.

—If the sample analysis is not performed under the EPA Contract Laboratory Program, use the detection limit (DL) in place of the SQL.

2.4 *Waste characteristics.* The waste characteristics factor category includes the following factors: hazardous waste quantity, toxicity, and as appropriate to the pathway or threat being evaluated, mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential.

2.4.1 *Selection of substance potentially posing greatest hazard.* For all pathways (and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (or threat) and use that substance in evaluating the waste characteristics category of the pathway (or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure pathway, base the selection on the toxicity factor alone.

Evaluation of the toxicity factor is specified in section 2.4.1.1. Use and evaluation of the mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factors vary by pathway (or threat) and are specified under the appropriate pathway (or threat) section. Section 2.4.1.2 identifies the specific factors that are combined with toxicity in evaluating each pathway (or threat).

2.4.1.1 *Toxicity factor.* Evaluate toxicity for those hazardous substances at the site that are available to the pathway being scored. For all pathways and threats, except the surface water environmental threat, evaluate human toxicity as specified below. For the surface water environmental threat, evaluate ecosystem toxicity as specified in section 4.1.4.2.1.1.

Establish human toxicity factor values based on quantitative dose-response parameters for the following three types of toxicity:

• Cancer—Use slope factors (also referred to as cancer potency factors) combined with weight-of-evidence ratings for carcinogenicity. If a slope factor is not available for a substance, use its ED_{10} value to estimate a slope factor as follows:

$$\text{Slope factor} = \frac{1}{6\ (ED_{10})}$$

• Noncancer toxicological responses of chronic exposure—use reference dose (RfD) values.

• Noncancer toxicological responses of acute exposure—use acute toxicity parameters, such as the LD_{50}.

Assign human toxicity factor values to a hazardous substance using Table 2–4, as follows:

• If RfD and slope factor values are both available for the hazardous substance, assign the substance a value from Table 2–4 for each. Select the higher of the two values assigned and use it as the overall toxicity factor value for the hazardous substance.

• If either an RfD or slope factor value is available, but not both, assign the hazardous substance an overall toxicity factor value from Table 2–4 based solely on the available value (RfD or slope factor).

• If neither an RfD nor slope factor value is available, assign the hazardous substance an overall toxicity factor value from Table 2–4 based solely on acute toxicity. That is, consider acute toxicity in Table 2–4 only when both RfD and slope factor values are not available.

• If neither an RfD, nor slope factor, nor acute toxicity value is available, assign the hazardous substance an overall toxicity factor value of 0 and use other hazardous substances for which information is available in evaluating the pathway.

TABLE 2–4.—TOXICITY FACTOR EVALUATION

Chronic Toxicity (Human)

Reference dose (RfD) (mg/kg-day)	Assigned value
RfD < 0.0005	10,000
0.0005 ≤ RfD < 0.005	1,000
0.005 ≤ RfD < 0.05	100
0.05 ≤ RfD < 0.5	10
0.5 ≤ RfD	1
RfD not available	0

Carcinogenicity (Human)

Weight-of-evidence[a]/slope factor (mg/kg-day)$^{-1}$			Assigned value
A	B	C	
0.5 ≤ SF[b]	5 ≤ SF	50 ≤ SF	10,000
0.05 ≤ SF < 0.5	0.5 ≤ SF < 5	5 ≤ SF < 50	1,000
SF < 0.05	0.05 ≤ SF < 0.5	0.5 ≤ SF < 5	100
— — —	SF < 0.05	SF < 0.5	10
Slope factor not available.	Slope factor not available.	Slope factor not available.	0

[a] A, B, and C refer to weight-of-evidence categories. Assign substances with a weight-of-evidence category of D (inadequate evidence of carcinogenicity) or E (evidence of lack of carcinogenicity) a value of 0 for carcinogenicity.

[b] SF = Slope factor.

TABLE 2-4.—TOXICITY FACTOR EVALUATION—CONCLUDED

Acute Toxicity (Human)

Oral LD_{50} (mg/kg)	Dermal LD_{50} (mg/kg)	Dust or mist LC_{50} (mg/l)	Gas or vapor LC_{50} (ppm)	Assigned value
---	---	---	---	---
$LD_{50} < 5$	$LD_{50} < 2$	$LC_{50} < 0.2$	$LC_{50} < 20$	1,000
$5 \leq LD_{50} < 50$	$2 \leq LD_{50} < 20$	$0.2 \leq LC_{50} < 2$	$20 \leq LC_{50} < 200$	100
$50 \leq LD_{50} < 500$	$20 \leq LD_{50} < 200$	$2 \leq LC_{50} < 20$	$200 \leq LC_{50} < 2,000$	10
$500 \leq LD_{50}$	$200 \leq LD_{50}$	$20 \leq LC_{50}$	$2,000 \leq LC_{50}$	1
LD_{50} not available	LD_{50} not available	LC_{50} not available	LC_{50} not available	0

If a toxicity factor value of 0 is assigned to all hazardous substances available to a particular pathway (that is, insufficient toxicity data are available for evaluating all the substances), use a default value of 100 as the overall human toxicity factor value for all hazardous substances available to the pathway. For hazardous substances having usable toxicity data for multiple exposure routes (for example, inhalation and ingestion), consider all exposure routes and use the highest assigned value, regardless of exposure route, as the toxicity factor value.

For HRS purposes, assign both asbestos and lead (and its compounds) a human toxicity factor value of 10,000.

Separate criteria apply for assigning factor values for human toxicity and ecosystem toxicity for radionuclides (see sections 7.2.1 and 7.2.2).

2.4.1.2 *Hazardous substance selection.* For each hazardous substance evaluated for a migration pathway (or threat), combine the human toxicity factor value (or ecosystem toxicity factor value) for the hazardous substance with a mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor value as follows:

- Ground water migration.
  - –Determine a combined human toxicity/mobility factor value for the hazardous substance (see section 3.2.1).
- Surface water migration-overland/flood migration component.
  - –Determine a combined human toxicity/persistence factor value for the hazardous substance for the drinking water threat (see section 4.1.2.2.1).
  - –Determine a combined human toxicity/persistence/bioaccumulation factor value for the hazardous substance for the human food chain threat (see section 4.1.3.2.1).
  - –Determine a combined ecosystem toxicity/persistence/bioaccumulation factor value for the hazardous substance for the environmental threat (see section 4.1.4.2.1).
- Surface water migration-ground water to surface water migration component.
  - –Determine a combined human toxicity/mobility/persistence factor value for the hazardous substance for the drinking water threat (see section 4.2.2.2.1).
  - –Determine a combined human toxicity/mobility/persistence/bioaccumulation factor value for the hazardous substance for the human food chain threat (see section 4.2.3.2.1).
  - –Determine a combined ecosystem toxicity/mobility/persistence/bioaccumulation factor value for the hazardous substance for the environmental threat (see section 4.2.4.2.1).
- Air migration.
  - –Determine a combined human toxicity/mobility factor value for the hazardous substance (see section 6.2.1).

Determine each combined factor value for a hazardous substance by multiplying the individual factor values appropriate to the pathway (or threat). For each migration pathway (or threat) being evaluated, select the hazardous substance with the highest combined factor value and use that substance in evaluating the waste characteristics factor category of the pathway (or threat).

For the soil exposure pathway, select the hazardous substance with the highest human toxicity factor value from among the substances that meet the criteria for observed contamination for the threat evaluated and use that substance in evaluating the waste characteristics factor category.

2.4.2 *Hazardous waste quantity.* Evaluate the hazardous waste quantity factor by first assigning each source (or area of observed contamination) a source hazardous waste quantity value as specified below. Sum these values to obtain the hazardous waste quantity factor value for the pathway being evaluated.

In evaluating the hazardous waste quantity factor for the three migration pathways, allocate hazardous substances and hazardous wastestreams to specific sources in the manner specified in section 2.2.2, except: consider hazardous substances and hazardous wastestreams that cannot be allocated to any specific source to constitute a separate "unallocated source" for purposes of evaluating only this factor for the three migration pathways. Do not, however, include a hazardous substance or hazardous wastestream in the unallocated source for a migration pathway if there is definitive information indicating that the substance or wastestream could only have been placed in sources with a containment factor value of 0 for that migration pathway.

In evaluating the hazardous waste quantity factor for the soil exposure pathway, allocate to each area of observed contamination only those hazardous substances that meet the criteria for observed contamination for that area of observed contamination and only those hazardous wastestreams that contain hazardous substances that meet the criteria for observed contamination for that area of observed contamination. Do not consider other hazardous substances or hazardous wastestreams at the site in evaluating this factor for the soil exposure pathway.

2.4.2.1 *Source hazardous waste quantity.* For each of the three migration pathways, assign a source hazardous waste quantity value to each source (including the unallocated source) having a containment factor value greater than 0 for the pathway being evaluated. Consider the unallocated source to have a containment factor value greater than 0 for each migration pathway.

For the soil exposure pathway, assign a source hazardous waste quantity value to each area of observed contamination, as applicable to the threat being evaluated.

For all pathways, evaluate source hazardous waste quantity using the following four measures in the following hierarchy:

- Hazardous constituent quantity.
- Hazardous wastestream quantity.
- Volume.
- Area.

For the unallocated source, use only the first two measures.

Separate criteria apply for assigning a source hazardous waste quantity value for radionuclides (see section 7.2.5).

2.4.2.1.1 *Hazardous constituent quantity.* Evaluate hazardous constituent quantity for the source (or area of observed contamination) based solely on the mass of CERCLA hazardous substances (as defined in CERCLA section 101(14), as amended) allocated to the source (or area of observed contamination), except:

- For a hazardous waste listed pursuant to section 3001 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6901 et seq., determine its mass for the evaluation of this measure as follows:
  - –If the hazardous waste is listed solely for Hazard Code T (toxic waste), include only the mass of constituents in the hazardous waste that are CERCLA hazardous substances and not the mass of the entire hazardous waste.
  - –If the hazardous waste is listed for any other Hazard Code (including T plus any other Hazard Code), include the mass of the entire hazardous waste.
- For a RCRA hazardous waste that exhibits the characteristics identified under section 3001 of RCRA, as amended, determine its mass for the evaluation of this measure as follows:

-If the hazardous waste exhibits only the characteristic of toxicity (or only the characteristic of EP toxicity), include only the mass of constituents in the hazardous waste that are CERCLA hazardous substances and not the mass of the entire hazardous waste.
-If the hazardous waste exhibits any other characteristic identified under section 3001 (including any other characteristic plus the characteristic of toxicity [or the characteristic of EP toxicity]), include the mass of the entire hazardous waste.

Based on this mass, designated as C, assign a value for hazardous constituent quantity as follows:

• For the migration pathways, assign the source a value for hazardous constituent quantity using the Tier A equation of Table 2–5.

• For the soil exposure pathway, assign the area of observed contamination a value using the Tier A equation of Table 5–2 (section 5.1.2.2).

If the hazardous constituent quantity for the source (or area of observed contamination) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below. Instead assign these other three measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5.

If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2.

TABLE 2–5.—HAZARDOUS WASTE QUANTITY EVALUATION EQUATIONS

Tier	Measure	Units	Equation for assigning value [a]
A	**Hazardous constituent quantity (C)**	lb	C
B [b]	**Hazardous wastestream quantity (W)**	lb	W/5,000
C [b]	**/olume (V)**		
	Landfill	yd^3	V/2,500
	Surface impoundment	yd^3	V/2.5
	Surface impoundment (buried/backfilled)	yd^3	V/2.5
	Drums [c]	gallon	V/500
	Tanks and containers other than drums	yd^3	V/2.5
	Contaminated soil	yd^3	V/2,500
	Pile	yd^3	V/2.5
	Other	yd^3	V/2.5
D [b]	**Area (A)**		
	Landfill	ft^2	A/3,400
	Surface impoundment	ft^2	A/13
	Surface impoundment (buried/backfilled)	ft^2	A/13
	Land treatment	ft^2	A/270
	Pile [d]	ft^2	A/13
	Contaminated soil	ft^2	A/34,000

[a] Do not round to nearest integer.
[b] Convert volume to mass when necessary: 1 ton=2,000 pounds=1 cubic yard=4 drums=200 gallons.
[c] If actual volume of drums is unavailable, assume 1 drum=50 gallons.
[d] Use land surface area under pile, not surface area of pile.

2.4.2.1.2 *Hazardous wastestream quantity.* Evaluate hazardous wastestream quantity for the source (or area of observed contamination) based on the mass of hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants (as defined in CERCLA section 101[33], as amended) that are allocated to the source (or area of observed contamination). For a wastestream that consists solely of a hazardous waste listed pursuant to section 3001 of RCRA, as amended or that consists solely of a RCRA hazardous waste that exhibits the characteristics identified under section 3001 of RCRA, as amended, include the mass of that entire hazardous waste in the evaluation of this measure.

Based on this mass, designated as W, assign a value for hazardous wastestream quantity as follows:

• For the migration pathways, assign the source a value for hazardous wastestream quantity using the Tier B equation of Table 2–5.

• For the soil exposure pathway, assign the area of observed contamination a value using the Tier B equation of Table 5–2 (section 5.1.2.2).

Do not evaluate the volume and area measures described below if the source is the unallocated source or if the following condition applies:

• The hazardous wastestream quantity for the source (or area of observed contamination) is adequately determined—that is, total mass of all hazardous wastestreams and CERCLA pollutants and contaminants for the source and releases from the source (or for the area of observed contamination) is known or is estimated with reasonable confidence.

If the source is the unallocated source or if this condition applies, assign the volume and area measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5. Otherwise, assign the source (or area of observed contamination) a value for hazardous wastestream quantity based on the available data and proceed to section 2.4.2.1.3.

2.4.2.1.3 *Volume.* Evaluate the volume measure using the volume of the source (or the volume of the area of observed contamination). For the soil exposure pathway, restrict the use of the volume measure to those areas of observed contamination specified in section 5.1.2.2.

Based on the volume, designated as V, assign a value to the volume measure as follows:

• For the migration pathways, assign the source a value for volume using the appropriate Tier C equation of Table 2–5.

• For the soil exposure pathway, assign the area of observed contamination a value for volume using the appropriate Tier C equation of Table 5–2 (section 5.1.2.2).

If the volume of the source (or volume of the area of observed contamination, if applicable) can be determined, do not evaluate the area measure. Instead, assign the area measure a value of 0 and proceed to section 2.4.2.1.5. If the volume cannot be determined (or is not applicable for the soil exposure pathway), assign the source (or area of observed contamination) a value of 0 for the volume measure and proceed to section 2.4.2.1.4.

2.4.2.1.4 *Area.* Evaluate the area measure using the area of the source (or the area of the area of observed contamination). Based on this area, designated as A, assign a value to the area measure as follows:

• For the migration pathways, assign the source a value for area using the appropriate Tier D equation of Table 2–5.

• For the soil exposure pathway, assign the area of observed contamination a value for area using the appropriate Tier D equation of Table 5–2 (section 5.1.2.2).

2.4.2.1.5 *Calculation of source hazardous waste quantity value.* Select the highest of the values assigned to the source (or area of observed contamination) for the hazardous constituent quantity, hazardous wastestream quantity, volume, and area measures. Assign this value as the source hazardous waste quantity value. Do not round to the nearest integer.

2.4.2.2 *Calculation of hazardous waste quantity factor value.* Sum the source hazardous waste quantity values assigned to all sources (including the unallocated source) or areas of observed contamination for the pathway being evaluated and round this sum to the nearest integer, except: if the sum is greater than 0, but less than 1, round it to 1. Based on this value, select a hazardous waste quantity factor value for the pathway from Table 2–6.

TABLE 2–6.—HAZARDOUS WASTE QUANTITY FACTOR VALUES

Hazardous waste quantity value	Assigned value
0	0
1 [a] to 100	1 [b]
Greater than 100 to 10,000	100
Greater than 10,000 to 1,000,000	10,000
Greater than 1,000,000	1,000,000

[a] If the hazardous waste quantity value is greater than 0, but less than 1, round it to 1 as specified in text.
[b] For the pathway, if hazardous constituent quantity is not adequately determined, assign a value as specified in the text; do not assign the value of 1.

For a migration pathway, if the hazardous constituent quantity is adequately determined (see section 2.4.2.1.1) for all sources (or all portions of sources and releases remaining after a removal action), assign the value from Table 2–6 as the hazardous waste quantity factor value for the pathway. If the hazardous constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action) assign a factor value as follows:

- If any target for that migration pathway is subject to Level I or Level II concentrations (see section 2.5), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway.
- If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:
  - –If there has been no removal action, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.
  - –If there has been a removal action:
    - – –Determine values from Table 2–6 with and without consideration of the removal action.
    - – –If the value that would be assigned from Table 2–6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.
    - – –If the value that would be assigned from Table 2–6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

For the soil exposure pathway, if the hazardous constituent quantity is adequately determined for all areas of observed contamination, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the hazardous constituent quantity is not adequately determined for one or more areas of observed contamination, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

2.4.3 *Waste characteristics factor category value.* Determine the waste characteristics factor category value as specified in section 2.4.3.1 for all pathways and threats, except the surface water-human food chain threat and the surface water-environmental threat. Determine the waste characteristics factor category value for these latter two threats as specified in section 2.4.3.2.

2.4.3.1 *Factor category value.* For the pathway (or threat) being evaluated, multiply the toxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from section 2.4.2.2, subject to a maximum product of 1×10^{8}. Based on this waste characteristics product assign a waste characteristics factor category value to the pathway (or threat) from Table 2–7.

TABLE 2–7.—WASTE CHARACTERISTICS FACTOR CATEGORY VALUES

Waste characteristics product	Assigned value
0	0
Greater than 0 to less than 10	1
10 to less than 1×10^{2}	2
1×10^{2} to less than 1×10^{3}	3
1×10^{3} to less than 1×10^{4}	6
1×10^{4} to less than 1×10^{5}	10
1×10^{5} to less than 1×10^{6}	18
1×10^{6} to less than 1×10^{7}	32
1×10^{7} to less than 1×10^{8}	56
1×10^{8} to less than 1×10^{9}	100
1×10^{9} to less than 1×10^{10}	180
1×10^{10} to less than 1×10^{11}	320
1×10^{11} to less than 1×10^{12}	560
1×10^{12}	1,000

2.4.3.2 *Factor category value, considering bioaccumulation potential.* For the surface water-human food chain threat and the surface water-environmental threat, multiply the toxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from section 2.4.2.2, subject to:

- A maximum product of 1×10^{12}, *and*
- A maximum product exclusive of the bioaccumulation (or ecosystem bioaccumulation) potential factor of 1×10^{8}.

Based on the total waste characteristics product, assign a waste characteristics factor category value to these threats from Table 2–7.

2.5 *Targets.*

The types of targets evaluated include the following:

- Individual (factor name varies by pathway and threat).
- Human population.
- Resources (these vary by pathway and threat).
- Sensitive environments (included for all pathways except ground water migration).

The factor values that may be assigned to each type of target have the same range for each pathway for which that type of target is evaluated. The factor value for most types of targets depends on whether the target is subject to actual or potential contamination for the pathway and whether the actual contamination is Level I or Level II:

- Actual contamination: Target is associated either with a sampling location that meets the criteria for an observed release (or observed contamination) for the pathway or with an observed release based on direct observation for the pathway (additional criteria apply for establishing actual contamination for the human food chain threat in the surface water migration pathway, see sections 4.1.3.3 and 4.2.3.3). sections 3 through 6 specify how to determine the targets associated with a sampling location or with an observed release based on direct observation. Determine whether the actual contamination is Level I or Level II as follows:
  - –Level I:
    - – –Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination) for the pathway and are at or above media-specific benchmark values. These benchmark values (see section 2.5.2) include both screening concentrations and concentrations specified in regulatory limits (such as Maximum Contaminant Level (MCL) values), or
    - – –For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms are at or above benchmark values. Such tissue samples may be used in addition to media-specific concentrations only as specified in sections 4.1.3.3 and 4.2.3.3.
  - –Level II:
    - – –Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination) for the pathway, but are less than media-specific benchmarks. If none of the hazardous substances eligible to be evaluated for the sampling location has an applicable benchmark, assign Level II to the actual contamination at the sampling location, or
    - – –For observed releases based on direct observation, assign Level II to targets as specified in sections 3, 4, and 6, or
    - – –For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms, when applicable, are below benchmark values.
  - –If a target is subject to both Level I and Level II concentrations for a pathway (or threat), evaluate the target using Level I concentrations for that pathway (or threat).
- Potential contamination: Target is subject to a potential release (that is, target is not associated with actual contamination for that pathway or threat).

Assign a factor value for individual risk as follows (select the highest value that applies to the pathway or threat):

- 50 points if any individual is exposed to Level I concentrations.
- 45 points if any individual is exposed to Level II concentrations.
- Maximum of 20 points if any individual is subject to potential contamination. The value assigned is 20 multiplied by the distance or dilution weight appropriate to the pathway.

Assign factor values for population and sensitive environments as follows:

- Sum Level I targets and multiply by 10. (Level I is not used for sensitive environments in the soil exposure and air migration pathways.)
- Sum Level II targets.
- Multiply potential targets by distance or dilution weights appropriate to the pathway, sum, and divide by 10. Distance or dilution weighting accounts for diminishing exposure

with increasing distance or dilution within the different pathways.

• Sum the values for the three levels.

In addition, resource value points are assigned within all pathways for welfare-related impacts (for example, impacts to agricultural land), but do not depend on whether there is actual or potential contamination.

2.5.1 *Determination of level of actual contamination at a sampling location.* Determine whether Level I concentrations or Level II concentrations apply at a sampling location (and thus to the associated targets) as follows:

• Select the benchmarks applicable to the pathway (or threat) being evaluated.

• Compare the concentrations of hazardous substances in the sample (or comparable samples) to their benchmark concentrations for the pathway (or threat), as specified in section 2.5.2.

• Determine which level applies based on this comparison.

• If none of the hazardous substances eligible to be evaluated for the sampling location has an applicable benchmark, assign Level II to the actual contamination at that sampling location for the pathway (or threat).

In making the comparison, consider only those samples, and only those hazardous substances in the sample, that meet the criteria for an observed release (or observed contamination) for the pathway, except: tissue samples from aquatic human food chain organisms may also be used as specified in sections 4.1.3.3 and 4.2.3.3 of the surface water-human food chain threat. If any hazardous substance is present in more than one comparable sample for the sampling location, use the highest concentration of that hazardous substance from any of the comparable samples in making the comparisons.

Treat sets of samples that are not comparable separately and make a separate comparison for each such set.

2.5.2 *Comparison to benchmarks.* Use the following media-specific benchmarks for making the comparisons for the indicated pathway (or threat):

• Maximum Contaminant Level Goals (MCLGs)—ground water migration pathway and drinking water threat in surface water migration pathway. Use only MCLG values greater than 0.

• Maximum Contaminant Levels (MCLs)—ground water migration pathway and drinking water threat in surface water migration pathway.

• Food and Drug Administration Action Level (FDAAL) for fish or shellfish—human food chain threat in surface water migration pathway.

• EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life—environmental threat in surface water migration pathway.

• EPA Ambient Aquatic Life Advisory Concentrations (AALAC)—environmental threat in surface water migration pathway.

• National Ambient Air Quality Standards (NAAQS)—air migration pathway.

• National Emission Standards for Hazardous Air Pollutants (NESHAPs)—air migration pathway. Use only those NESHAPs promulgated in ambient concentration units.

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• Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures (air migration pathway) or for oral exposures (ground water migration pathway; drinking water and human food chain threats in surface water migration pathway; and soil exposure pathway).

• Screening concentration for noncancer toxicological responses corresponding to the RfD for inhalation exposures (air migration pathway) or for oral exposures (ground water migration pathway; drinking water and human food chain threats in surface water migration pathway; and soil exposure pathway).

Select the benchmark(s) applicable to the pathway (or threat) being evaluated as specified in sections 3 through 6. Compare the concentration of each hazardous substance from the sampling location to its benchmark concentration(s) for that pathway (or threat). Use only those samples and only those hazardous substances in the sample that meet the criteria for an observed release (or observed contamination) for the pathway, except: tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of any applicable hazardous substance from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations for that pathway (or threat). If more than one benchmark applies to the hazardous substance, assign Level I if the concentration of the hazardous substance equals or exceeds the lowest applicable benchmark concentration.

If no hazardous substance individually equals or exceeds its benchmark concentration, but more than one hazardous substance either meets the criteria for an observed release (or observed contamination) for the sample (or comparable samples) or is eligible to be evaluated for a tissue sample (see sections 4.1.3.3 and 4.2.3.3), calculate the indices I and J specified below based on these hazardous substances.

For those hazardous substances that are carcinogens (that is, those having a carcinogen weight-of-evidence classification of A, B, or C), calculate an index I for the sample location as follows:

$$I = \sum_{i=1}^{n} \frac{C_i}{SC_i}$$

where:

C_i = Concentration of hazardous substance i in sample (or highest concentration of hazardous substance i from among comparable samples).

SC_i = Screening concentration for cancer corresponding to that concentration that corresponds to its 10^{-6} individual cancer risk for applicable exposure (inhalation or oral) for hazardous substance i.

n = Number of applicable hazardous substances in sample (or comparable samples) that are carcinogens and for which an SC_i is available.

For those hazardous substances for which an RfD is available, calculate an index J for the sample location as follows:

$$J = \sum_{j=1}^{m} \frac{C_j}{CR_j}$$

where:

C_j = Concentration of hazardous substance j in sample (or highest concentration of hazardous substance j from among comparable samples).

CR_j = Screening concentration for noncancer toxicological responses corresponding to RfD for applicable exposure (inhalation or oral) for hazardous substance j.

m = Number of applicable hazardous substances in sample (or comparable samples) for which a CR_j is available.

If either I or J equals or exceeds 1, consider the sampling location to be subject to Level I concentrations for that pathway (or threat). If both I and J are less than 1, consider the sampling location to be subject to Level II concentrations for that pathway (or threat). If, for the sampling location, there are sets of samples that are not comparable, calculate I and J separately for each such set, and use the highest calculated values of I and J to assign Level I and Level II.

See sections 7.3.1 and 7.3.2 for criteria for determining the level of contamination for radioactive substances.

3.0 Ground Water Migration Pathway

Evaluate the ground water migration pathway based on three factor categories: likelihood of release, waste characteristics, and targets. Figure 3-1 indicates the factors included within each factor category.

Determine the ground water migration pathway score (S_{gw}) in terms of the factor category values as follows:

$$S_{gw} = \frac{(LR)\,(WC)\,(T)}{SF}$$

where:

LR = Likelihood of release factor category value.

WC = Waste characteristics factor category value.

T = Targets factor category value.

SF = Scaling factor.

Table 3-1 outlines the specific calculation procedure.

Calculate a separate ground water migration pathway score for each aquifer, using the factor category values for that aquifer for likelihood of release, waste characteristics, and targets. In doing so, include both the targets using water from that aquifer and the targets using water from all overlying aquifers through which the hazardous substances would migrate to reach the aquifer being evaluated. Assign the highest ground water migration pathway score that results for any aquifer as the ground water migration pathway score for the site.

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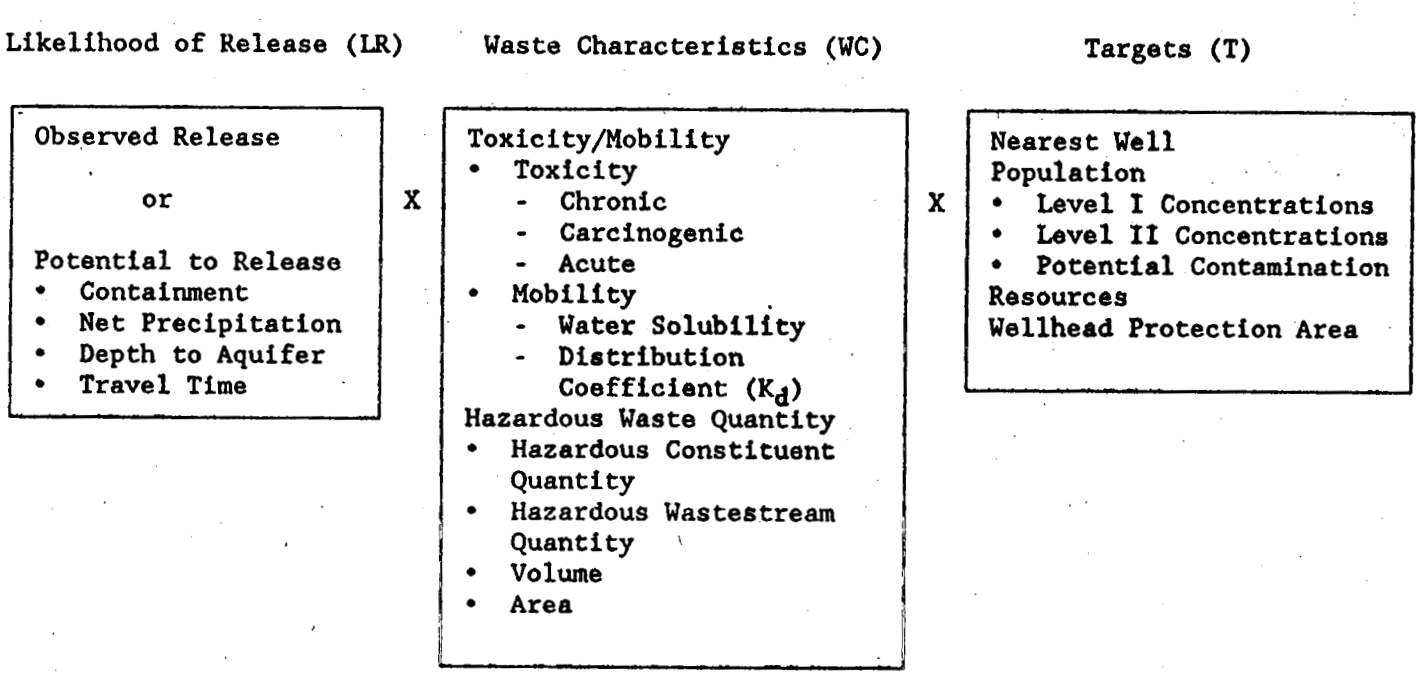

FIGURE 3-1
OVERVIEW OF GROUND WATER MIGRATION PATHWAY

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TABLE 3-1.—GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Likelihood of Release to an Aquifer:		
1. Observed Release	550	
2. Potential to Release:		
2a. Containment	10	
2b. Net Precipitation	10	
2c. Depth to Aquifer	5	
2d. Travel Time	35	
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	
3. Likelihood of Release (higher of lines 1 and 2e)	550	
Waste Characteristics:		
4. Toxicity/Mobility	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets:		
7. Nearest Well	50	
8. Population:		
8a. Level I Concentrations	(b)	
8b. Level II Concentrations	(b)	
8c. Potential Contamination	(b)	
8d. Population (lines 8a+8b+8c)	(b)	
9. Resources	5	
10. Wellhead Protection Area	20	
11. Targets (lines 7+8d+9+10)	(b)	
Ground Water Migration Score for an Aquifer:		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500] [c]	100	
Ground Water Migration Pathway Score:		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated) [c]	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

3.0.1 *General considerations*

3.0.1.1 *Ground water target distance limit.* The target distance limit defines the maximum distance from the sources at the site over which targets are evaluated. Use a target distance limit of 4 miles for the ground water migration pathway, except when aquifer discontinuities apply (see section 3.0.1.2.2). Furthermore, consider any well with an observed release from a source at the site (see section 3.1.1) to lie within the target distance limit of the site, regardless of the well's distance from the sources at the site.

For sites that consist solely of a contaminated ground water plume with no identified source, begin measuring the 4-mile target distance limit at the center of the area of observed ground water contamination. Determine the area of observed ground water contamination based on available samples that meet the criteria for an observed release.

3.0.1.2 *Aquifer boundaries.* Combine multiple aquifers into a single hydrologic unit for scoring purposes if aquifer interconnections can be established for these aquifers. In contrast, restrict aquifer boundaries if aquifer discontinuities can be established.

3.0.1.2.1 *Aquifer interconnections.* Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site. In addition, if observed ground water contamination attributable to the sources at the site extends beyond 2 miles from the sources, use any locations within the limits of this observed ground water contamination in evaluating aquifer interconnections. If data are not adequate to establish aquifer interconnections, evaluate the aquifers as separate aquifers.

3.0.1.2.2 *Aquifer discontinuities.* Evaluate whether aquifer discontinuities occur within the 4-mile target distance limit. An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4-mile target distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit.

When an aquifer discontinuity is established within the 4-mile target distance limit, exclude that portion of the aquifer beyond the discontinuity in evaluating the ground water migration pathway. However, if hazardous substances have migrated across an apparent discontinuity within the 4-mile target distance limit, do not consider this to be a discontinuity in scoring the site.

3.0.1.3 *Karst aquifer.* Give a karst aquifer that underlies any portion of the sources at the site special consideration in the evaluation of two potential to release factors (depth to aquifer in section 3.1.2.3 and travel time in section 3.1.2.4), one waste characteristics factor (mobility in section 3.2.1.2), and two targets factors (nearest well in section 3.3.1 and potential contamination in section 3.3.2.4).

3.1 *Likelihood of release.* For an aquifer, evaluate the likelihood of release factor category in terms of an observed release factor or a potential to release factor.

3.1.1 *Observed release.* Establish an observed release to an aquifer by demonstrating that the site has released a hazardous substance to the aquifer. Base this demonstration on either:

- Direct observation—a material that contains one or more hazardous substances has been deposited into or has been observed entering the aquifer.
- Chemical analysis—an analysis of ground water samples from the aquifer indicates that the concentration of hazardous substance(s) has increased significantly above the background concentration for the site (see section 2.3). Some portion of the significant increase must be attributable to the site to establish the observed release, except: when the source itself consists of a ground water plume with no identified source, no separate attribution is required.

If an observed release can be established for the aquifer, assign the aquifer an observed release factor value of 550, enter this value in Table 3-1, and proceed to section 3.1.3. If an observed release cannot be established for the aquifer, assign an observed release factor value of 0, enter this value in Table 3-1, and proceed to section 3.1.2.

3.1.2 *Potential to release.* Evaluate potential to release only if an observed release cannot be established for the aquifer. Evaluate potential to release based on four factors: containment, net precipitation, depth to aquifer, and travel time. For sources overlying karst terrain, give any karst aquifer that underlies any portion of the sources at the site special consideration in evaluating depth to aquifer and travel time, as specified in sections 3.1.2.3 and 3.1.2.4.

3.1.2.1 *Containment.* Assign a containment factor value from Table 3-2 to each source at the site. Select the highest containment factor value assigned to those sources with a source hazardous waste quantity value of 0.5 or more (see section

2.4.2.1.5). (Do not include this minimum size requirement in evaluating any other factor of this pathway.) Assign this highest value as the containment factor value for the aquifer being evaluated. Enter this value in Table 3-1.

If no source at the site meets the minimum size requirement, then select the highest value assigned to the sources at the site and assign it as the containment factor value for the aquifer being evaluated. Enter this value in Table 3-1.

3.1.2.2 *Net precipitation.* Assign a net precipitation factor value to the site. Figure 3-2 provides computed net precipitation factor values, based on site location. Where necessary, determine the net precipitation factor value as follows:

- Determine monthly precipitation and monthly evapotranspiration:
  - –Use local measured monthly averages.
  - –When local data are not available, use monthly averages from the nearest National Oceanographic and Atmospheric Administration weather station that is in a similar geographic setting.

TABLE 3-2.—CONTAINMENT FACTOR VALUES FOR GROUND WATER MIGRATION PATHWAY

Source	Assigned value
All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)	
Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures).	10
No liner	10
No evidence of hazardous substance migration from source area, a liner, *and*:	
(a) None of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) functioning leachate collection and removal system immediately above liner.	10
(b) Any one of the three items in (a) present	9
(c) Any two of the items in (a) present	7
(d) All three items in (a) present plus a functioning ground water monitoring system	5
(e) All items in (d) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, functioning ground water monitoring system, *and*:	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.	3
(g) None of the deficiencies in (f) present	0
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.	0
Surface Impoundment	
Evidence of hazardous substance migration from surface impoundment	10
No liner	10
Free-liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained	10
No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, *and*:	
(a) Liner	9
(b) Liner with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.	5
(c) Double liner with functioning leachate collection and removal system between liners, and functioning ground water monitoring system.	3
No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).	Evaluate using **All sources** criteria (with no bulk or free liquid deposited).
Land Treatment	
Evidence of hazardous substance migration from land treatment zone	10
No functioning, maintained, run-on control and runoff management system	10
No evidence of hazardous substance migration from land treatment zone *and*:	
(a) Functioning and maintained run-on control and runoff management system	7
(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.	5
(c) Land treatment area maintained in compliance with 40 CFR 264.280	0

TABLE 3-2.—CONTAINMENT FACTOR VALUES FOR GROUND WATER MIGRATION PATHWAY—Continued

Source	Assigned value
Containers	
All containers buried	Evaluate using **All sources** criteria.
Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).	10
No liner (or no essentially impervious base) under container area	10
No diking (or no similar structure) surrounding container area	10
Diking surrounding container area unsound or not regularly inspected and maintained	10
No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspected and maintained, *and*:	
(a) Liner (or essentially impervious base) under container area	9
(b) Essentially impervious base under container area with liquids collection and removal system	7
(c) Containment system includes essentially impervious base, liquids collection system, sufficient capacity to contain 10 percent of volume of all containers, and functioning and maintained run-on control; plus functioning ground water monitoring system, and spilled or leaked hazardous substances and accumulated precipitation removed in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.	5
(d) Free liquids present, containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, single liner under container area with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.	5
(e) Same as (d) except: double liner under container area with functioning leachate collection and removal system between liners.	3
Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing free liquids not deposited in any container, and functioning and maintained run-off control present.	0
No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquid or solidification of remaining wastes and waste residues).	Evaluate using **All sources** criteria (with no bulk or free liquid deposited).
Tank	
Below-ground tank	Evaluate using **All sources** criteria.
Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).	10
Tank and ancillary equipment not provided with secondary containment (e.g., liner under tank area, vault system, double wall).	10
No diking (or no similar structure) surrounding tank and ancillary equipment	10
Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained	10
No evidence of hazardous substance migration from tank area, tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, *and*:	
(a) Tank and ancillary equipment provided with secondary containment	9
(b) Tank and ancillary equipment provided with secondary containment with leak detection and collection system.	7
(c) Tank and ancillary equipment provided with secondary containment system that detects and collects spilled or leaked hazardous substances and accumulated precipitation and has sufficient capacity to contain 110 percent of volume of largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in timely manner, at least weekly inspection of tank and secondary containment system, all leaking or unfit-for-use tank systems promptly responded to, and functioning ground water monitoring system.	5
(d) Containment system has sufficient capacity to hold volume of all tanks within tank containment area and to provide adequate freeboard, single liner under that containment area with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.	5
(e) Same as (d) except: double liner under tank containment area with functioning leachate collection and removal system between liners.	3
Tank is above ground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.	0

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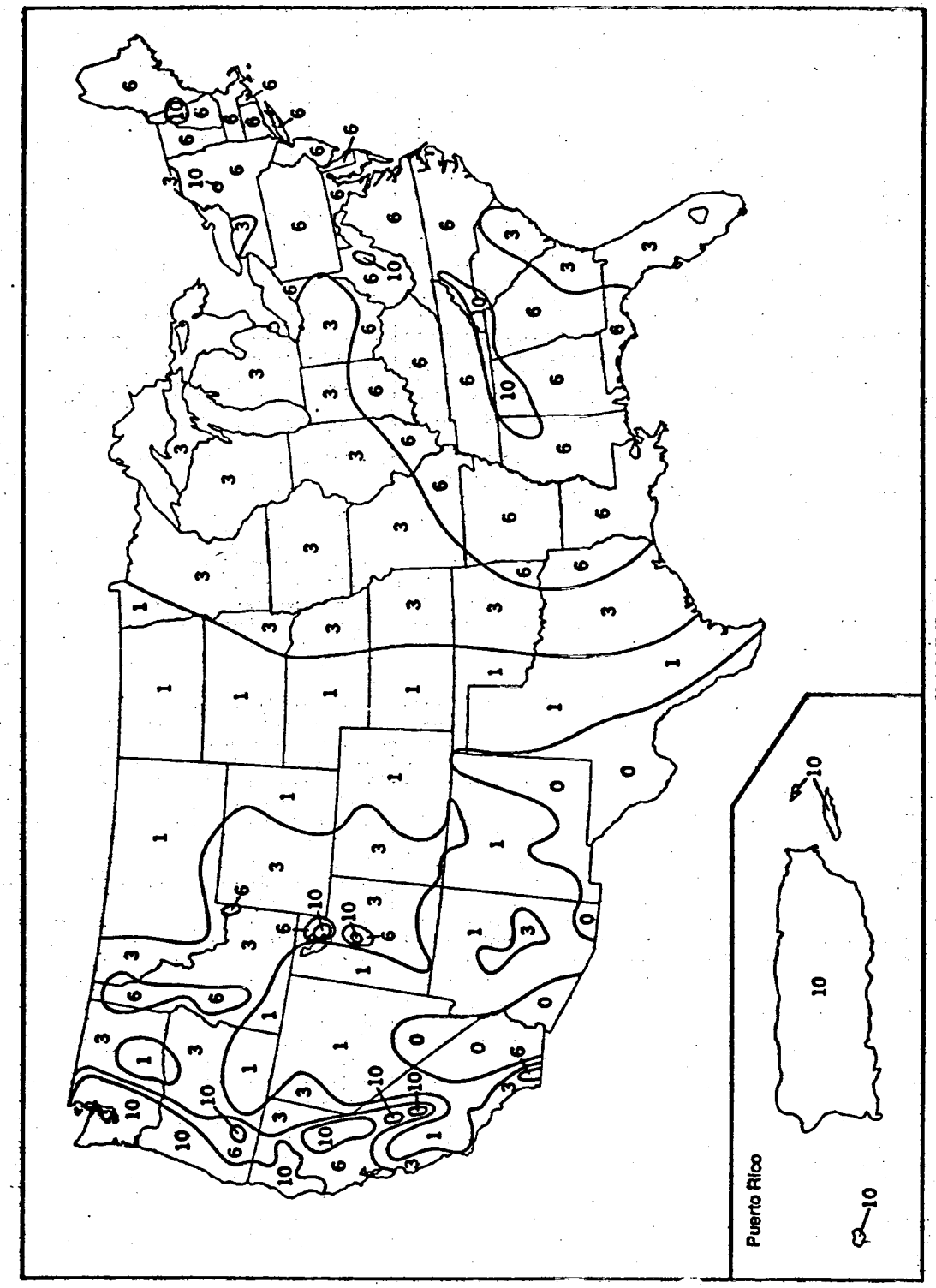
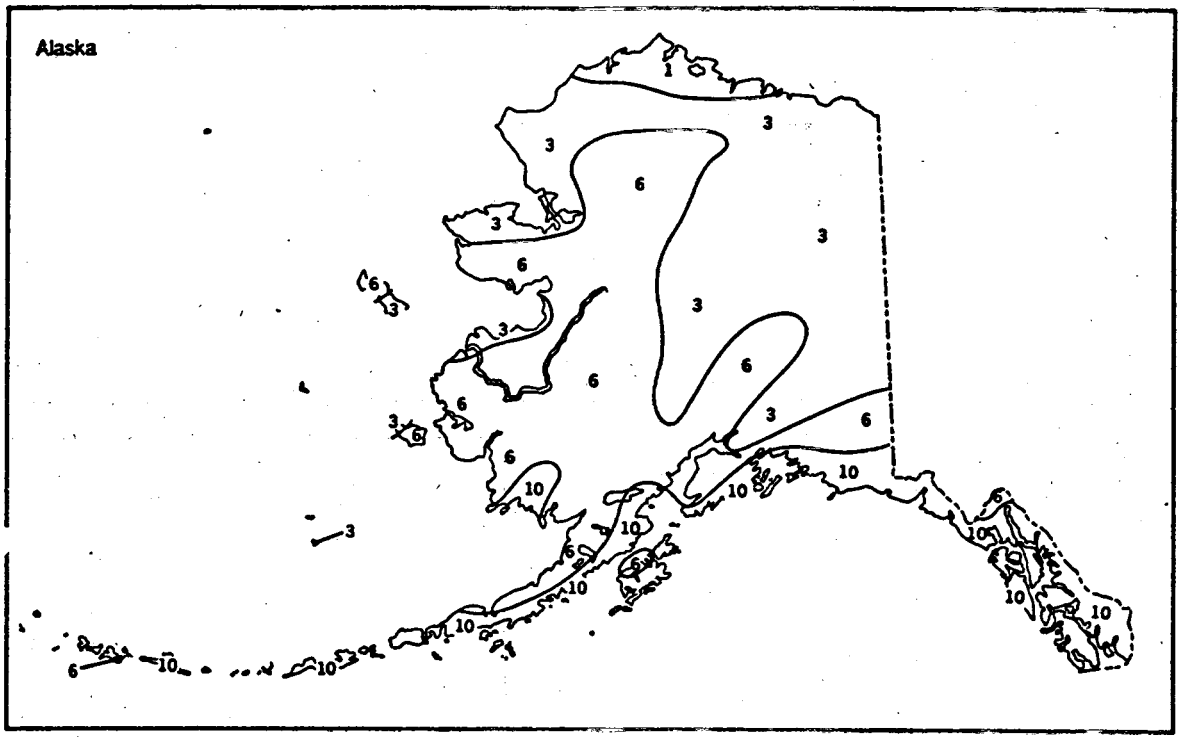


FIGURE 3-2
NET PRECIPITATION FACTOR VALUES



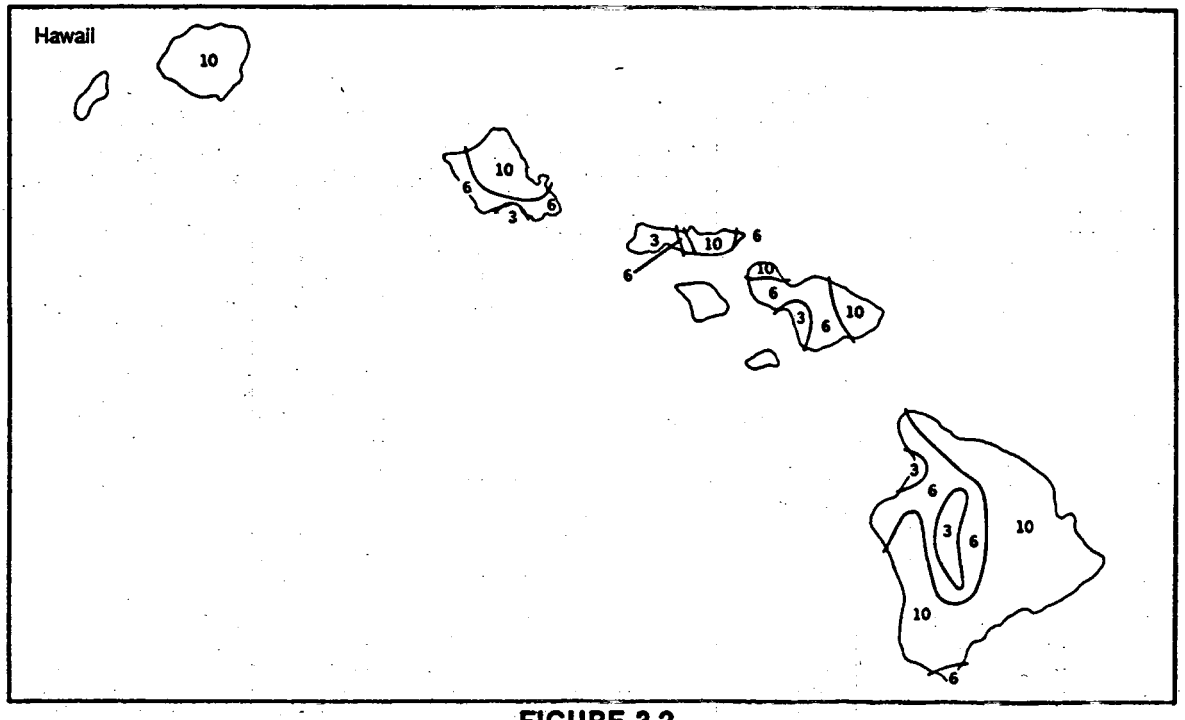


FIGURE 3-2
NET PRECIPITATION FACTOR VALUES
(CONCLUDED)

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–When measured monthly evapotranspiration is not available, calculate monthly potential evapotranspiration (E_i) as follows:

$E_i = 0.6\ F_i\ (10\ T_i/I)^a$

where:

E_i = Monthly potential evapotranspiration (inches) for month i.

F_i = Monthly latitude adjusting value for month i.

T_i = Mean monthly temperature (°C) for month i.

$$I = \sum_{i=1}^{12} (T_i/5)^{1.514}$$

$$a = 6.75\times10^{-7} I^3 - 7.71\times10^{-5} I^2 + 1.79\times10^{-2} I + 0.49239$$

Select the latitude adjusting value for each month from Table 3–3. For latitudes lower than 50° North or 20° South, determine the monthly latitude adjusting value by interpolation.

• Calculate monthly net precipitation by subtracting monthly evapotranspiration (or monthly potential evapotranspiration) from monthly precipitation. If evapotranspiration (or potential evapotranspiration) exceeds precipitation for a month, assign that month a net precipitation value of 0.

• Calculate the annual net precipitation by summing the monthly net precipitation values.

• Based on the annual net precipitation, assign a net precipitation factor value from Table 3–4.

Enter the value assigned from Figure 3–2 or from Table 3–4, as appropriate, in Table 3–1.

TABLE 3–3.—MONTHLY LATITUDE ADJUSTING VALUES[a]

Latitude[b] (degrees)	Month											
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
≥50 N	0.74	0.78	1.02	1.15	1.33	1.36	1.37	1.25	1.06	0.92	0.76	0.70
45 N	0.80	0.81	1.02	1.13	1.28	1.29	1.31	1.21	1.04	0.94	0.79	0.75
40 N	0.84	0.83	1.03	1.11	1.24	1.25	1.27	1.18	1.04	0.96	0.83	0.81
35 N	0.87	0.85	1.03	1.09	1.21	1.21	1.23	1.16	1.03	0.97	0.89	0.85
30 N	0.90	0.87	1.03	1.08	1.18	1.17	1.20	1.14	1.03	0.98	0.89	0.88
20 N	0.95	0.90	1.03	1.05	1.13	1.11	1.14	1.11	1.02	1.00	0.93	0.94
10 N	1.00	0.91	1.03	1.03	1.08	1.06	1.08	1.07	1.02	1.02	0.98	0.99
0	1.04	0.94	1.04	1.01	1.04	1.01	1.04	1.04	1.01	1.04	1.01	1.04
10 S	1.08	0.97	1.05	0.99	1.00	0.96	1.00	1.02	1.00	1.06	1.05	1.09
20 S	1.14	0.99	1.05	0.97	0.96	0.91	0.95	0.99	1.00	1.08	1.09	1.15

[a] Do not round to nearest integer.
[b] For unlisted latitudes lower than 50° North or 20° South, determine the latitude adjusting value by interpolation.

TABLE 3–4.—NET PRECIPITATION FACTOR VALUES

Net precipitation (inches)	Assigned value
0	0
Greater than 0 to 5	1
Greater than 5 to 15	3
Greater than 15 to 30	6
Greater than 30	10

3.1.2.3 *Depth to aquifer.* Evaluate depth to aquifer by determining the depth from the lowest known point of hazardous substances at a site to the top of the aquifer being evaluated, considering all layers in that interval. Measure the depth to an aquifer as the distance from the surface to the top of the aquifer minus the distance from the surface to the lowest known point of hazardous substances eligible to be evaluated for that aquifer. In evaluating depth to aquifer in karst terrain, assign a thickness of 0 feet to a karst aquifer that underlies any portion of the sources at the site. Based on the calculated depth, assign a value from Table 3–5 to the depth to aquifer factor.

Determine the depth to aquifer only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the depth to aquifer factor for any aquifer that does not have an observed release. If the necessary geologic information is available at multiple locations, calculate the depth to aquifer at each location. Use the location having the smallest depth to assign the factor value. Enter this value in Table 3–1.

TABLE 3–5.—DEPTH TO AQUIFER FACTOR VALUES

Depth to aquifer[a] (feet)	Assigned value
Less than or equal to 25	5
Greater than 25 to 250	3
Greater than 250	1

[a] Use depth of all layers between the hazardous substances and aquifer. Assign a thickness of 0 feet to any karst aquifer that underlies any portion of the sources at the site.

3.1.2.4 *Travel time.* Evaluate the travel time factor based on the geologic materials in the interval between the lowest known point of hazardous substances at the site and the top of the aquifer being evaluated. Assign a value to the travel time factor as follows:

• If the depth to aquifer (see section 3.1.2.3) is 10 feet or less, assign a value of 35.

• If, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

• Otherwise:

–Select the lowest hydraulic conductivity layer(s) from within the above interval. Consider only layers at least 3 feet thick. However, do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

–Determine hydraulic conductivities for individual layers from Table 3–6 or from in-situ or laboratory tests. Use representative, measured, hydraulic conductivity values whenever available.

–If more than one layer has the same lowest hydraulic conductivity, include all such layers and sum their thicknesses. Assign a thickness of 0 feet to a karst layer that underlies any portion of the sources at the site.

–Assign a value from Table 3–7 to the travel time factor, based on the thickness and hydraulic conductivity of the lowest hydraulic conductivity layer(s).

TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-6}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-4}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s) [b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-5}	35	25	15	15
Less than 10^{-5} to 10^{-7}	15	15	5	5
Less than 10^{-7}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3-1.

3.1.2.5 *Calculation of potential to release factor value.* Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as the potential to release factor value for the aquifer. Enter this value in Table 3-1.

3.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3-1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3-8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (K_d).
- If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3-8.—GROUND WATER MOBILITY FACTOR VALUES [a]

Water solubility (mg/l)	Distribution coefficient (K_d) (ml/g)			
	Karst [c]	≤10	>10 to 1,000	>1,000
Present as liquid [b]	1	1	0.01	0.0001
Greater than 100	1	1	0.01	0.0001
Greater than 1 to 100	0.2	0.2	0.002	$2x10^{-5}$
Greater than 0.01 to 1	0.002	0.002	$2x10^{-5}$	$2x10^{-7}$
Less than or equal to 0.01	$2x10^{-5}$	$2x10^{-5}$	$2x10^{-7}$	$2x10^{-9}$

[a] Do not round to nearest integer.

[b] Use if the hazardous substance is present or deposited as a liquid.

[c] Use if the entire interval from the source to the aquifer being evaluated is karst.

• If none of the hazardous substances eligible to be evaluated can be assigned a mobility factor value, use a default value of 0.002 as the mobility factor value for all these hazardous substances.

Determine the water solubility to be used in Table 3–8 for the hazardous substance as follows (use this same water solubility for all aquifers):

• For any hazardous substance that does not meet the criteria for an observed release by chemical analysis, if the hazardous substance is present or deposited as a liquid, use the water solubility category "Present as Liquid" in Table 3–8 to assign the mobility factor value to that hazardous substance.

• Otherwise:

–For any hazardous substance that is a metal (or metalloid) and that does not meet the criteria for an observed release by chemical analysis, establish a water solubility for the hazardous substance as follows:

– –Determine the overall range of water solubilities for compounds of this hazardous substance (consider all compounds for which adequate water solubility information is available, not just compounds identified as present at the site).

– –Calculate the geometric mean of the highest and the lowest water solubility in this range.

– –Use this geometric mean as the water solubility in assigning the hazardous substance a mobility factor value from Table 3–8.

–For any other hazardous substance (either organic or inorganic) that does not meet the criteria for an observed release by chemical analysis, use the water solubility of that hazardous substance to assign a mobility factor value from Table 3–8 to the hazardous substance.

For the aquifer being evaluated, determine the distribution coefficient to be used in Table 3–8 for the hazardous substance as follows:

• For any hazardous substance that does not meet the criteria for an observed release by chemical analysis, if the entire interval from a source at the site to the aquifer being evaluated is karst, use the distribution coefficient category "Karst" in Table 3–8 in assigning the mobility factor value for that hazardous substance for that aquifer.

• Otherwise:

–For any hazardous substance that is a metal (or metalloid) and that does not meet the criteria for an observed release by chemical analysis, use the distribution coefficient for the metal or (metalloid) to assign a mobility factor value from Table 3–8 for that hazardous substance.

–For any other inorganic hazardous substance that does not meet the criteria for an observed release by chemical analysis, use the distribution coefficient for that inorganic hazardous substance, if available, to assign a mobility factor value from Table 3–8. If the distribution coefficient is not available, use a default value of "less than 10" as the distribution coefficient, except: for asbestos use a default value of "greater than 1,000" as the distribution coefficient.

–For any hazardous substance that is organic and that does not meet the criteria for an observed release by chemical analysis, establish a distribution coefficient for that hazardous substance as follows:

– –Estimate the K_d range for the hazardous substance using the following equation:

$K_d = (K_{oc})(f_s)$

where:

K_{oc} = Soil-water partition coefficient for organic carbon for the hazardous substance.

f_s = Sorbent content (fraction of clays plus organic carbon) in the subsurface.

– –Use f_s values of 0.03 and 0.77 in the above equation to establish the upper and lower values of the K_d range for the hazardous substance.

– –Calculate the geometric mean of the upper and lower K_d range values. Use this geometric mean as the distribution coefficient in assigning the hazardous substance a mobility factor value from Table 3–8.

3.2.1.3 *Calculation of toxicity/mobility factor value.* Assign each hazardous substance a toxicity/mobility factor value from Table 3–9, based on the values assigned to the hazardous substance for the toxicity and mobility factors. Use the hazardous substance with the highest toxicity/mobility factor value for the aquifer being evaluated to assign the value to the toxicity/mobility factor for that aquifer. Enter this value in Table 3–1.

TABLE 3–9.—TOXICITY/MOBILITY FACTOR VALUES [a]

Mobility factor value	Toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.2	2,000	200	20	2	0.2	0
0.01	100	10	1	0.1	0.01	0
0.002	20	2	0.2	0.02	0.002	0
0.0001	1	0.1	0.01	0.001	$1x10^{-4}$	0
$2x10^{-5}$	0.2	0.02	0.002	$2x10^{-4}$	$2x10^{-5}$	0
$2x10^{-7}$	0.002	$2x10^{-4}$	$2x10^{-5}$	$2x10^{-6}$	$2x10^{-7}$	0
$2x10^{-9}$	$2x10^{-5}$	$2x10^{-6}$	$2x10^{-7}$	$2x10^{-8}$	$2x10^{-9}$	0

[a] Do not round to nearest integer.

3.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value for the ground water pathway (or aquifer) as specified in section 2.4.2. Enter this value in Table 3–1.

3.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity/mobility and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 3–1.

3.3 *Targets.* Evaluate the targets factor category for an aquifer based on four factors: nearest well, population, resources, and Wellhead Protection Area. Evaluate these four factors based on targets within the target distance limit specified in section 3.0.1.1 and the aquifer boundaries specified in section 3.0.1.2. Determine the targets to be included in evaluating these factors for an aquifer as specified in section 3.0.

3.3.1 *Nearest well.* In evaluating the nearest well factor, include both the drinking water wells drawing from the aquifer being evaluated and those drawing from overlying aquifers as specified in section 3.0. Include standby wells in evaluating this factor only if they are used for drinking water supply at least once every year.

If there is an observed release by direct observation for a drinking water well within the target distance limit, assign Level II concentrations to that well. However, if one or more samples meet the criteria for an observed release for that well, determine if that well is subject to Level I or Level II concentrations as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3–10 in determining the level of contamination.

Assign a value for the nearest well factor as follows:

• If one or more drinking water wells is subject to Level I concentrations, assign a value of 50.

• If not, but if one or more drinking water wells is subject to Level II concentrations, assign a value of 45.

• If none of the drinking water wells is subject to Level I or Level II concentrations, assign a value as follows:

–If one of the target aquifers is a karst aquifer that underlies any portion of the sources at the site and any well draws drinking water from this karst aquifer within the target distance limit, assign a value of 20.

–If not, determine the shortest distance to any drinking water well, as measured from any source at the site with a ground water containment factor value greater than 0. Select a value from Table 3–11 based on this distance. Assign it as the value for the nearest well factor.

Enter the value assigned to the nearest well factor in Table 3–1.

TABLE 3–10.—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN DRINKING WATER

- Concentration corresponding to Maximum Contaminant Level (MCL).
- Concentration corresponding to a nonzero Maximum Contaminant Level Goal (MCLG).
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for oral exposures.
- Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for oral exposures.

TABLE 3–11.—NEAREST WELL FACTOR VALUES

Distance from source (miles)	Assigned value
Level I concentrations[a]	50
Level II concentrations[a]	45
0 to ¼	20
Greater than ¼ to ½	18
Greater than ½ to 1	9
Greater than 1 to 2	5
Greater than 2 to 3	3
Greater than 3 to 4	2
Greater than 4	0

[a] Distance does not apply.

3.3.2 *Population.* In evaluating the population factor, include those persons served by drinking water wells within the target distance limit specified in section 3.0.1.1. For the aquifer being evaluated, count those persons served by wells in that aquifer and those persons served by wells in overlying aquifers as specified in section 3.0. Include residents, students, and workers who regularly use the water. Exclude transient populations such as customers and travelers passing through the area. Evaluate the population based on the location of the water supply wells, not on the location of residences, work places, etc. When a standby well is maintained on a regular basis so that water can be withdrawn, include it in evaluating the population factor.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

In determining the population served by a well, if the water from the well is blended with other water (for example, water from other ground water wells or surface water intakes), apportion the total population regularly served by the blended system to the well based on the well's relative contribution to the total blended system. In estimating the well's relative contribution, assume each well and intake contributes equally and apportion the population accordingly, except: if the relative contribution of any one well or intake exceeds 40 percent based on average annual pumpage or capacity, estimate the relative contribution of the wells and intakes considering the following data, if available:

• Average annual pumpage from the ground water wells and surface water intakes in the blended system.

• Capacities of the wells and intakes in the blended system.

For systems with standby ground water wells or standby surface water intakes, apportion the total population regularly served by the blended system as described above, except:

• Exclude standby surface water intakes in apportioning the population.

• When using pumpage data for a standby ground water well, use average pumpage for the period during which the standby well is used rather than average annual pumpage.

• For that portion of the total population that could be apportioned to a standby ground water well, assign that portion of the population either to that standby well or to the other ground water well(s) and surface water intake(s) that serve that population; do not assign that portion of the population both to the standby well and to the other well(s) and intake(s) in the blended system. Use the apportioning that results in the highest population factor value. (Either include all standby well(s) or exclude some or all of the standby well(s) as appropriate to obtain this highest value.) Note that the specific standby well(s) included or excluded and, thus, the specific apportioning may vary in evaluating different aquifers and in evaluating the surface water pathway.

3.3.2.1 *Level of contamination.* Evaluate the population served by water from a point of withdrawal based on the level of contamination for that point of withdrawal. Use the applicable factor: Level I concentrations, Level II concentrations, or potential contamination.

If no samples meet the criteria for an observed release for a point of withdrawal and there is no observed release by direct observation for that point of withdrawal, evaluate that point of withdrawal using the potential contamination factor in section 3.3.2.4. If there is an observed release by direct observation, use Level II concentrations for that point of withdrawal. However, if one or more samples meet the criteria for an observed release for the point of withdrawal, determine which factor (Level I or Level II concentrations) applies to that point of withdrawal as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3–10 in determining the level of contamination. Evaluate the point of withdrawal using the Level I concentrations factor in section 3.3.2.2 or the Level II concentrations factor in section 3.3.2.3, as appropriate.

For the potential contamination factor, use population ranges in evaluating the factor as specified in section 3.3.2.4. For the Level I and Level II concentrations factors, use the population estimate, not population ranges, in evaluating both factors.

3.3.2.2 *Level I concentrations.* Sum the number of people served by drinking water from points of withdrawal subject to Level I concentrations. Multiply this sum by 10. Assign this product as the value for this factor. Enter this value in Table 3–1.

3.3.2.3 *Level II concentrations.* Sum the number of people served by drinking water from points of withdrawal subject to Level II concentrations. Do not include those people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 3–1.

3.3.2.4 *Potential contamination.* Determine the number of people served by drinking water from points of withdrawal subject to potential contamination. Do not include those people already counted under the Level I and Level II concentrations factors.

Assign distance-weighted population values from Table 3–12 to this population as follows:

• Use the "Karst" portion of Table 3–12 to assign values only for that portion of the population served by points of withdrawal that draw drinking water from a karst aquifer that underlies any portion of the sources at the site.

–For this portion of the population, determine the number of people included within each "Karst" distance category in Table 3–12.

TABLE 3–12.—DISTANCE-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FACTOR FOR GROUND WATER MIGRATION PATHWAY [a]

Distance category (miles)	Number of people within the distance category												
	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000
Other Than Karst [b]:													
0 to ¼	0	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455
Greater than ¼ to ½	0	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122
Greater than ½ to 1	0	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385
Greater than 1 to 2	0	0.7	3	10	30	94	294	939	2,939	9,385	29,364	93,845	293,842
Greater than 2 to 3	0	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219
Greater than 3 to 4	0	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596
Karst [c]:													
0 to ¼	0	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455
Greater than ¼ to ½	0	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122
Greater than ½ to 1	0	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227
Greater than 1 to 2	0	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227
Greater than 2 to 3	0	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227
Greater than 3 to 4	0	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227

[a] Round the number of people present within a distance category to nearest integer. Do not round the assigned distance-weighted population value to nearest integer.
[b] Use for all aquifers, except karst aquifers underlying any portion of the sources at the site.
[c] Use only for karst aquifers underlying any portion of the sources at the site.

–Assign a distance-weighted population value for each distance category based on the number of people included within the distance category.

• Use the "Other Than Karst" portion of Table 3–12 for the remainder of the population served by points of withdrawal subject to potential contamination.

–For this portion of the population, determine the number of people included within each "Other Than Karst" distance category in Table 3–12.

–Assign a distance-weighted population value for each distance category based on the number of people included within the distance category.

Calculate the value for the potential contamination factor (PC) as follows:

$$PC = \frac{1}{10} \sum_{i=1}^{n} (W_i + K_i)$$

where:

W_i = Distance-weighted population from "Other Than Karst" portion of Table 3–12 for distance category i.

K_i = Distance-weighted population from "Karst" portion of Table 3–12 for distance category i.

n = Number of distance categories.

If PC is less than 1, do not round it to the nearest integer; if PC is 1 or more, round to the nearest integer. Enter this value in Table 3–1.

3.3.2.5 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and potential contamination. Do not round this sum to the nearest integer. Assign this sum as the population factor value for the aquifer. Enter this value in Table 3–1.

3.3.3 *Resources.* To evaluate the resources factor, select the highest value specified below that applies for the aquifer being evaluated. Assign this value as the resources factor value for the aquifer. Enter this value in Table 3–1.

Assign a resources value of 5 if water drawn from any target well for the aquifer being evaluated or overlying aquifers (as specified in section 3.0) is used for one or more of the following purposes:

• Irrigation (5-acre minimum) of commercial food crops or commercial forage crops.

• Watering of commercial livestock.

• Ingredient in commercial food preparation.

• Supply for commercial aquaculture.

• Supply for a major or designated water recreation area, excluding drinking water use.

Assign a resources value of 5 if no drinking water wells are within the target distance limit, but the water in the aquifer being evaluated or any overlying aquifers (as specified in section 3.0) is usable for drinking water purposes.

Assign a resources value of 0 if none of the above applies.

3.3.4 *Wellhead Protection Area.* Evaluate the Wellhead Protection Area factor based on Wellhead Protection Areas designated according to section 1428 of the Safe Drinking Water Act, as amended. Consider only those Wellhead Protection Areas applicable to the aquifer being evaluated or overlying aquifers (as specified in section 3.0). Select the highest value below that applies. Assign it as the value for the Wellhead Protection Area factor for the aquifer being evaluated. Enter this value in Table 3–1.

Assign a value of 20 if either of the following criteria applies for the aquifer being evaluated or overlying aquifers:

• A source with a ground water containment factor value greater than 0 lies, either partially or fully, within or above the designated Wellhead Protection Area.

• Observed ground water contamination attributable to the sources at the site lies, either partially or fully, within the designated Wellhead Protection Area.

If neither criterion applies, assign a value of 5, if, within the target distance limit, there is a designated Wellhead Protection Area applicable to the aquifer being evaluated or overlying aquifers.

Assign a value of 0 if none of the above applies.

3.3.5 *Calculation of targets factor category value.* Sum the factor values for nearest well, population, resources, and Wellhead Protection Area. Do not round this sum to the nearest integer. Use this sum as the targets factor category value for the aquifer. Enter this value in Table 3–1.

3.4 *Ground water migration score for an aquifer.* For the aquifer being evaluated, multiply the factor category values for likelihood of release, waste characteristics, and targets, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum value of 100, as the ground water migration pathway score for the aquifer. Enter this score in Table 3–1.

3.5 *Calculation of ground water migration pathway score.* Calculate a ground water migration score for each aquifer underlying the sources at the site, as appropriate. Assign the highest ground water migration score for an aquifer as the ground water migration pathway score (S_{gw}) for the site. Enter this score in Table 3–1.

4.0 *Surface Water Migration Pathway.*

4.0.1 *Migration components.* Evaluate the surface water migration pathway based on two migration components:

• Overland/flood migration to surface water (see section 4.1).

• Ground water to surface water migration (see section 4.2).

Evaluate each component based on the same three threats: drinking water threat, human food chain threat, and environmental threat.

Score one or both components, considering their relative importance. If only one component is scored, assign its score as the surface water migration pathway score. If

both components are scored, select the higher of the two scores and assign it as the surface water migration pathway score.

4.0.2 *Surface water categories.* For HRS purposes, classify surface water into four categories: rivers, lakes, oceans, and coastal tidal waters.

Rivers include:

- Perennially flowing waters from point of origin to the ocean or to coastal tidal waters, whichever comes first, and wetlands contiguous to these flowing waters.
- Aboveground portions of disappearing rivers.
- Man-made ditches only insofar as they perennially flow into other surface water.
- Intermittently flowing waters and contiguous intermittently flowing ditches only in arid or semiarid areas with less than 20 inches of mean annual precipitation.

Lakes include:

- Natural and man-made lakes (including impoundments) that lie along rivers, but excluding the Great Lakes.
- Isolated, but perennial, lakes, ponds, and wetlands.
- Static water channels or oxbow lakes contiguous to rivers.
- Small rivers, without diking, that merge into surrounding perennially inundated wetlands.
- Wetlands contiguous to water bodies defined here as lakes.

Ocean and ocean-like water bodies include:

- Ocean areas seaward from the baseline of the Territorial Sea. (This baseline represents the generalized coastline of the United States. It is parallel to the seaward limit of the Territorial Sea and other maritime limits such as the inner boundary of Federal fisheries jurisdiction and the limit of States jurisdiction under the Submerged Lands Act, as amended.)
- The Great Lakes.
- Wetlands contiguous to the Great Lakes.

Coastal tidal waters include:

- Embayments, harbors, sounds, estuaries, back bays, lagoons, wetlands, etc. seaward from mouths of rivers and landward from the baseline of the Territorial Sea.

4.1 *Overland/flood migration component.* Use the overland/flood migration component to evaluate surface water threats that result from overland migration of hazardous substances from a source at the site to surface water. Evaluate three types of threats for this component: drinking water threat, human food chain threat, and environmental threat.

4.1.1 *General considerations.*

4.1.1.1 *Definition of hazardous substance migration path for overland/flood migration component.* The hazardous substance migration path includes both the overland segment and the in-water segment that hazardous substances would take as they migrate away from sources at the site:

- Begin the overland segment at a source and proceed downgradient to the probable point of entry to surface water.
- Begin the in-water segment at this probable point of entry.
  - –For rivers, continue the in-water segment in the direction of flow (including any tidal flows) for the distance established by the target distance limit (see section 4.1.1.2).
  - –For lakes, oceans, coastal tidal waters, or Great Lakes, do not consider flow direction. Instead apply the target distance limit as an arc.
  - –If the in-water segment includes both rivers and lakes (or oceans, coastal tidal waters, or Great Lakes), apply the target distance limit to their combined in-water segments.

For sites that consist of contaminated sediments with no identified source, the hazardous substance migration path consists solely of the in-water segment specified in section 4.1.1.2.

Consider a site to be in two or more watersheds for this component if two or more hazardous substance migration paths from the sources at the site do not reach a common point within the target distance limit. If the site is in more than one watershed, define a separate hazardous substance migration path for each watershed. Evaluate the overland/flood migration component for each watershed separately as specified in section 4.1.1.3.

4.1.1.2 *Target distance limit.* The target distance limit defines the maximum distance over which targets are considered in evaluating the site. Determine a separate target distance limit for each watershed as follows:

- If there is no observed release to surface water in the watershed or if there is an observed release only by direct observation (see section 4.1.2.1.1), begin measuring the target distance limit for the watershed at the probable point of entry to surface water and extend it for 15 miles along the surface water from that point.
- If there is an observed release from the site to the surface water in the watershed that is based on sampling, begin measuring the target distance limit for the watershed at the probable point of entry; extend the target distance limit either for 15 miles along the surface water or to the most distant sample point that meets the criteria for an observed release to that watershed, whichever is greater.

In evaluating the site, include only surface water targets (for example, intakes, fisheries, sensitive environments) that are within or contiguous to the hazardous substance migration path and located, partially or wholly, at or between the probable point of entry and the target distance limit applicable to the watershed:

- If flow within the hazardous substance migration path is reversed by tides, evaluate upstream targets only if there is documentation that the tidal run could carry substances from the site as far as those upstream targets.
- Determine whether targets within or contiguous to the hazardous substance migration path are subject to actual or potential contamination as follows:
  - –If a target is located, partially or wholly, either at or between the probable point of entry and any sampling point that meets the criteria for an observed release to the watershed or at a point that meets the criteria for an observed release by direct observation, evaluate that target as subject to actual contamination, except as otherwise specified for fisheries in section 4.1.3.3 and for wetlands in section 4.1.4.3.1.1. If the actual contamination is based on direct observation, assign Level II to the actual contamination. However, if the actual contamination is based on samples, determine whether the actual contamination is at Level I or Level II concentrations as specified in sections 4.1.2.3, 4.1.3.3, and 4.1.4.3.1.
  - –If a target is located, partially or wholly, within the target distance limit for the watershed, but not at or between the probable point of entry and any sampling point that meets the criteria for an observed release to the watershed, nor at a point that meets the criteria for an observed release by direct observation, evaluate it as subject to potential contamination.

For sites consisting solely of contaminated sediments with no identified source, determine the target distance limit as follows:

- If there is a clearly defined direction of flow for the surface water body (or bodies) containing the contaminated sediments, begin measuring the target distance limit at the point of observed sediment contamination that is farthest upstream (that is, at the location of the farthest available upstream sediment sample that meets the criteria for an observed release); extend the target distance limit either for 15 miles along the surface water or to the most distant downstream sample point that meets the criteria for an observed release to that watershed, whichever is greater.
- If there is no clearly defined direction of flow, begin measuring the target distance limit at the center of the area of observed sediment contamination. Extend the target distance limit as an arc either for 15 miles along the surface water or to the most distant sample point that meets the criteria for an observed release to that watershed, whichever is greater. Determine the area of observed sediment contamination based on available samples that meet the criteria for an observed release.

Note that the hazardous substance migration path for these contaminated sediment sites consists solely of the in-water segment defined by the target distance limit; there is no overland segment.

For these contaminated sediment sites, include only those targets (for example, intakes, fisheries, sensitive environments) that are within or contiguous to the hazardous substance migration path and located, wholly or partially, within the target distance limit for the site. Determine whether these targets are subject to actual or potential contamination as follows:

- If a target is located, partially or wholly, within the area of observed sediment contamination, evaluate it as subject to actual contamination, except as otherwise specified for fisheries in section 4.1.3.3 and wetlands in section 4.1.4.3.1.1.
  - –If a drinking water target is subject to actual contamination, evaluate it using Level II concentrations.

–If a human food chain target or environmental target is subject to actual contamination, evaluate it using Level I or Level II concentrations, as appropriate (see sections 4.1.3.3 and 4.1.4.3.1).

• If a target is located, partially or wholly, within the target distance limit for the watershed, but not within the area of observed sediment contamination, evaluate it as subject to potential contamination.

4.1.1.3 *Evaluation of overland/flood migration component.* Evaluate the drinking water threat, human food chain threat, and environmental threat for each watershed for this component based on three factor categories: likelihood of release, waste characteristics, and targets. Figure 4–1 indicates the factors included within each factor category for each type of threat.

Determine the overland/flood migration component score (S_{of}) for a watershed in terms of the factor category values as follows:

$$S_{of} = \sum_{i=1}^{3} \frac{(LR_i)(WC_i)(T_i)}{SF}$$

where:

LR_i = Likelihood of release factor category value for threat i (that is, drinking water, human food chain, or environmental threat).

WC_i = Waste characteristics factor category value for threat i.

T_i = Targets factor category value for threat i.

SF = Scaling factor.

Table 4–1 outlines the specific calculation procedure.

If the site is in only one watershed, assign the overland/flood migration score for that watershed as the overland/flood migration component score for the site.

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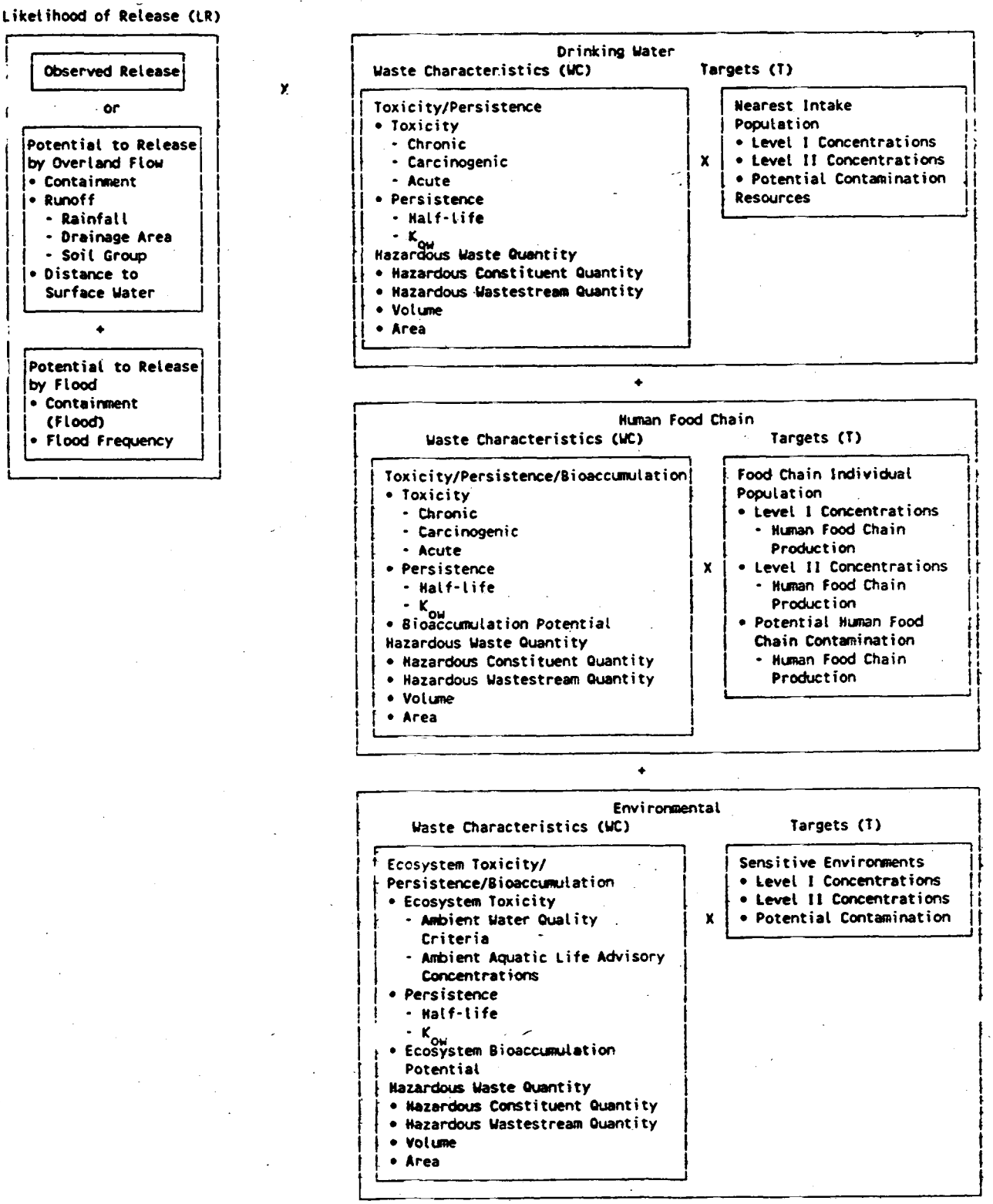

FIGURE 4-1
OVERVIEW OF SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT

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TABLE 4-1.—SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Drinking Water Threat		
Likelihood of Release:		
1. Observed Release	550	
2. Potential to Release by Overland Flow:		
2a. Containment	10	
2b. Runoff	25	
2c. Distance to Surface Water	25	
2d. Potential to Release by Overland Flow (lines 2a[2b+2c])	500	
3. Potential to Release by Flood:		
3a. Containment (Flood)	10	
3b. Flood Frequency	50	
3c. Potential to Release by Flood (lines 3a×3b)	500	
4. Potential to Release (lines 2d+3c, subject to a maximum of 500)	500	
5. Likelihood of Release (higher of lines 1 and 4)	550	
Waste Characteristics:		
6. Toxicity/Persistence	(a)	
7. Hazardous Waste Quantity	(a)	
8. Waste Characteristics	100	
Targets:		
9. Nearest Intake	50	
10. Population		
10a. Level I Concentrations	(b)	
10b. Level II Concentrations	(b)	
10c. Potential Contamination	(b)	
10d. Population (lines 10a+10b+10c)	(b)	
11. Resources	5	
12. Targets (lines 9+10d+11)	(b)	
Drinking Water Threat Score:		
13. Drinking Water Threat Score ([lines 5×8×12]/82,500, subject to a maximum of 100)	100	
Human Food Chain Threat		
Likelihood of Release:		
14. Likelihood of Release (same value as line 5)	550	
Waste Characteristics:		
15. Toxicity/Persistence/Bioaccumulation	(a)	
16. Hazardous Waste Quantity	(a)	
17. Waste Characteristics	1,000	
Targets:		
18. Food Chain Individual	50	
19. Population		
19a. Level I Concentrations	(b)	
19b. Level II Concentrations	(b)	
19c. Potential Human Food Chain Contamination	(b)	
19d. Population (lines 19a+19b+19c)	(b)	
20. Targets (lines 18+19d)	(b)	
Human Food Chain Threat Score:		
21. Human Food Chain Threat Score ([lines 14×17×20]/82,500, subject to a maximum of 100)	100	
Environmental Threat		
Likelihood of Release:		
22. Likelihood of Release (same value as line 5)	550	
Waste Characteristics:		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	(a)	
24. Hazardous Waste Quantity	(a)	
25. Waste Characteristics	1,000	
Targets:		
26. Sensitive Environments		
26a. Level I Concentrations	(b)	
26b. Level II Concentrations	(b)	
26c. Potential Contamination	(b)	
26d. Sensitive Environments (lines 26a+26b+26c)	(b)	
27. Targets (value from line 26d)	(b)	
Environmental Threat Score:		
28. Environmental Threat Score ([lines 22×25×27]/82,500, subject to a maximum of 60)	60	
Surface Water Overland/Flood Migration Component Score for a Watershed		
29. Watershed Score [c] (lines 13+21+28, subject to a maximum of 100)	100	
Surface Water Overland/Flood Migration Component Score		
30. Component Score (S_{of}) [c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

If the site is in more than one watershed:

• Calculate a separate overland/flood migration component score for each watershed, using likelihood of release, waste characteristics, and targets applicable to each watershed.

• Select the highest overland/flood migration component score from the watersheds evaluated and assign it as the overland/flood migration component score for the site.

4.1.2 *Drinking water threat.* Evaluate the drinking water threat for each watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.1.2.1 *Drinking water threat—likelihood of release.* Evaluate the likelihood of release factor category for each watershed in terms of an observed release factor or a potential to release factor.

4.1.2.1.1 *Observed release.* Establish an observed release to surface water for a watershed by demonstrating that the site has released a hazardous substance to the surface water in the watershed. Base this demonstration on either:

• Direct observation:

–A material that contains one or more hazardous substances has been seen entering surface water through migration or is known to have entered surface water through direct deposition, or

–A source area has been flooded at a time that hazardous substances were present, and one or more hazardous substances were in contact with the flood waters, or

–When evidence supports the inference of a release of a material that contains one or more hazardous substances by the site to surface water, demonstrated adverse effects associated with that release may also be used to establish an observed release.

• Chemical analysis:

–Analysis of surface water, benthic, or sediment samples indicates that the concentration of hazardous substance(s) has increased significantly above the background concentration for the site for that type of sample (see section 2.3).

– –Limit comparisons to similar types of samples and background concentrations—for example, compare surface water samples to surface water background concentrations.

– –For benthic samples, limit comparisons to essentially sessile organisms.

–Some portion of the significant increase must be attributable to the site to establish the observed release, except: when the site itself consists of contaminated sediments with no identified source, no separate attribution is required.

If an observed release can be established for a watershed, assign an observed release factor value of 550 to that watershed, enter this value in Table 4–1, and proceed to section 4.1.2.1.3. If no observed release can be established for the watershed, assign an observed release factor value of 0 to that watershed, enter this value in Table 4–1, and proceed to section 4.1.2.1.2.

4.1.2.1.2 *Potential to release.* Evaluate potential to release only if an observed release cannot be established for the watershed. Evaluate potential to release based on two components: potential to release by overland flow (see section 4.1.2.1.2.1) and potential to release by flood (see section 4.1.2.1.2.2). Sum the values for these two components to obtain the potential to release factor value for the watershed, subject to a maximum value of 500.

4.1.2.1.2.1 *Potential to release by overland flow.* Evaluate potential to release by overland flow for the watershed based on three factors: containment, runoff, and distance to surface water.

Assign potential to release by overland flow a value of 0 for the watershed if:

• No overland segment of the hazardous substance migration path can be defined for the watershed, or

• The overland segment of the hazardous substance migration path for the watershed exceeds 2 miles before surface water is encountered.

If either condition applies, enter a value of 0 in Table 4–1 and proceed to section 4.1.2.1.2.2 to evaluate potential to release by flood. If neither applies, proceed to section 4.1.2.1.2.1.1 to evaluate potential to release by overland flow.

4.1.2.1.2.1.1 *Containment.* Determine the containment factor value for the watershed as follows:

• If one or more sources is located in surface water in the watershed (for example, intact sealed drums in surface water), assign the containment factor a value of 10 for the watershed. Enter this value in Table 4–1.

• If none of the sources is located in surface water in the watershed, assign a containment factor value from Table 4–2 to each source at the site that can potentially release hazardous substances to the hazardous substance migration path for this watershed. Assign the containment factor value for the watershed as follows:

–Select the highest containment factor value assigned to those sources that meet the minimum size requirement described below. Assign this highest value as the containment factor value for the watershed. Enter this value in Table 4–1.

–If, for this watershed, no source at the site meets the minimum size requirement, then select the highest containment factor value assigned to the sources at the site eligible to be evaluated for this watershed and assign it as the containment factor value for the watershed. Enter this value in Table 4–1.

A source meets the minimum size requirement if its source hazardous waste quantity value (see section 2.4.2.1.5) is 0.5 or more. Do not include the minimum size requirement in evaluating any other factor of this surface water migration component, except potential to release by flood as specified in section 4.1.2.1.2.2.3.

4.1.2.1.2.1.2 *Runoff.* Evaluate runoff based on three components: rainfall, drainage area, and soil group.

TABLE 4–2.—CONTAINMENT FACTOR VALUES FOR SURFACE WATER MIGRATION PATHWAY

Source	Assigned value
All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)	
Evidence of hazardous substance migration from source area (i.e., source area includes source and any associated containment structures)	10
No evidence of hazardous substance migration from source area *and:*	
(a) Neither of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system.	10
(b) Any one of the two items in (a) present	9
(c) Any two of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) liner with functioning leachate collection and removal system immediately above liner.	7
(d) All items in (c) present	5
(e) All items in (c) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, *and:*	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run-on control system and runoff management system, or (3) no or nonmaintained engineered cover.	3
(g) None of the deficiencies in (f) present	0
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.	

TABLE 4–2.—CONTAINMENT FACTOR VALUES FOR SURFACE WATER MIGRATION PATHWAY—Concluded

Source	Assigned value
Surface Impoundment	
Evidence of hazardous substance migration from surface impoundment	10
Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained	10
No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, *and:*	
(a) No liner	9
(b) Liner	7
(c) Liner with functioning leachate collection and removal system below liner	5
(d) Double liner with functioning leachate collection and removal system between liners	3
No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).	Evaluate using **All Sources** criteria (with no bulk or free liquids deposited).
Land Treatment	
Evidence of hazardous substance migration from land treatment zone	10
No functioning and maintained run-on control and runoff management system	10
No evidence of hazardous substance migration from land treatment zone *and:*	
(a) Functioning and maintained run-on control and runoff management system	7
(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.	5
(c) Land treatment area maintained in compliance with 40 CFR 264.280	0
Containers	
All containers buried	Evaluate using **All Sources** criteria.
Evidence of hazardous substance migration from container area (i.e., container area includes containers and any associated containment structures).	10
No diking (or no similar structure) surrounding container area	10
Diking surrounding container area unsound or not regularly inspected and maintained	10
No evidence of hazardous substance migration from container area and container area surrounded by sound diking that is regularly inspected and maintained.	9
No evidence of hazardous substance migration from container area, container area surrounded by sound diking that is regularly inspected and maintained, *and:*	9
(a) Essentially impervious base under container area with liquids collection and removal system	7
(b) Containment system includes essentially impervious base, liquids collection system, sufficient capacity to contain 10 percent of volume of all containers, and functioning and maintained run-on control; and spilled or leaked hazardous substances and accumulated precipitation removed in timely manner to prevent overflow of collection system, at least weekly inspection of containers, hazardous substances in leaking or deteriorating containers transferred to containers in good condition, and containers sealed except when waste is added or removed.	5
(c) Free liquids present, containment system has sufficient capacity to hold total volume of all containers and to provide adequate freeboard, and single liner under container area with functioning leachate collection and removal system below liner.	5
(d) Same as (c) except: double liner under container area with functioning leachate collection and removal system between liners	3
Containers inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any unsealed or ruptured containers, liquids or materials containing free liquids not deposited in any container, and functioning and maintained run-on control present.	0
No evidence of hazardous substance migration from container area, containers leaking, and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).	Evaluate using All Sources criteria (with no bulk or free liquids deposited).
Tank	
Below-ground tank	Evaluate using All Sources criteria
Evidence of hazardous substance migration from tank area (i.e., tank area includes tank, ancillary equipment such as piping, and any associated containment structures).	10
No diking (or no similar structure) surrounding tank and ancillary equipment	10
Diking surrounding tank and ancillary equipment unsound or not regularly inspected and maintained	10
No evidence of hazardous substance migration from tank area and tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained.	9
No evidence of hazardous substance migration from tank area, tank and ancillary equipment surrounded by sound diking that is regularly inspected and maintained, *and:*	
(a) Tank and ancillary equipment provided with secondary containment (e.g., liner under tank area, vault system, double-wall) with leak detection and collection system.	7
(b) Tank and ancillary equipment provided with secondary containment system that detects and collects spilled or leaked hazardous substances and accumulated precipitation and has sufficient capacity to contain 110 percent of volume of largest tank within containment area, spilled or leaked hazardous substances and accumulated precipitation removed in a timely manner, at least weekly inspection of tank and secondary containment system, and all leaking or unfit-for-use tank systems promptly responded to.	5
(c) Containment system has sufficient capacity to hold total volume of all tanks within the tank containment area and to provide adequate freeboard, and single liner under tank containment area with functioning leachate collection and removal system below liner.	5
(d) Same as (c) except: double liner under tank containment area with functioning leachate collection and removal system between liners.	3
Tank is above ground, and inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate would be generated from any material released from tank, liquids or materials containing free liquids not deposited in any tank, and functioning and maintained run-on control present.	0

Rainfall. Determine the 2-year, 24-hour rainfall for the site. Use site-specific, 2-year, 24-hour rainfall data if records are available for at least 20 years. If such site-specific data are not available, estimate the 2-year, 24-hour rainfall for the site from a rainfall-frequency map. Do not round the rainfall value to the nearest integer.

Drainage area. Determine the drainage area for the sources at the site. Include in this drainage area both the source areas and the area upgradient of the sources, but exclude any portion of this drainage area for which runoff is diverted from entering the sources by storm sewers or run-on control and/or runoff management systems. Assign a drainage area value for the watershed from Table 4–3.

Soil group. Based on the predominant soil group within the drainage area described above, assign a soil group designation for the watershed from Table 4–4 as follows:

- Select the predominant soil group as that type which comprises the largest total area within the applicable drainage area.
- If a predominant soil group cannot be delineated, select that soil group in the drainage area that yields the highest value for the runoff factor.

Calculation of runoff factor value. Assign a combined rainfall/runoff value for the watershed from Table 4–5, based on the 2-year, 24-hour rainfall and the soil group designation. Determine the runoff factor value for the watershed from Table 4–6, based on the rainfall/runoff and drainage area values. Enter the runoff factor value in Table 4–1.

TABLE 4–3.—DRAINAGE AREA VALUES

Drainage area (acres)	Assigned value
Less than 50	1
50 to 250	2
Greater than 250 to 1,000	3
Greater than 1,000	4

TABLE 4–4.—SOIL GROUP DESIGNATIONS

Surface soil description	Soil group designation
Coarse-textured soils with high infiltration rates (for example, sands, loamy sands).	A
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams).	B
Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams).	C
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement).	D

TABLE 4–5.—RAINFALL/RUNOFF VALUES

2-Year, 24-hour rainfall (inches)	Soil group designation			
	A	B	C	D
Less than 1.0	0	0	2	3
1.0 to less than 1.5	0	1	2	3
1.5 to less than 2.0	0	2	3	4
2.0 to less than 2.5	1	2	3	4
2.5 to less than 3.0	2	3	4	4
3.0 to less than 3.5	2	3	4	5
3.5 or greater	3	4	5	6

TABLE 4–6.—RUNOFF FACTOR VALUES

Drainage area value	Rainfall/runoff value						
	0	1	2	3	4	5	6
1	0	0	0	1	1	1	1
2	0	0	1	1	2	3	4
3	0	0	1	3	7	11	15
4	0	1	2	7	17	25	25

4.1.2.1.2.1.3 *Distance to surface water.* Evaluate the distance to surface water as the shortest distance, along the overland segment, from any source with a surface water containment factor value greater than 0 to either the mean high water level for tidal waters or the mean water level for other surface waters. Based on this distance, assign a value from Table 4–7 to the distance to surface water factor for the watershed. Enter this value in Table 4–1.

4.1.2.1.2.1.4 *Calculation of factor value for potential to release by overland flow.* Sum the factor values for runoff and distance to surface water for the watershed and multiply this sum by the factor value for containment. Assign the resulting product as the factor value for potential to release by overland flow for the watershed. Enter this value in Table 4–1.

4.1.2.1.2.2 *Potential to release by flood.* Evaluate potential to release by flood for each watershed as the product of two factors: containment (flood) and flood frequency. Evaluate potential to release by flood separately for each source that is within the watershed. Furthermore, for each source, evaluate potential to release by flood separately for each category of floodplain in which the source lies. (See section 4.1.2.1.2.2.2 for the applicable floodplain categories.) Calculate the value for the potential to release by flood factor as specified in 4.1.2.1.2.2.3.

4.1.2.1.2.2.1 *Containment (flood).* For each source within the watershed, separately evaluate the containment (flood) factor for each category of floodplain in which the source is partially or wholly located. Assign a containment (flood) factor value from Table 4–8 to each floodplain category applicable to that source. Assign a containment (flood) factor value of 0 to each floodplain category in which the source does not lie.

4.1.2.1.2.2.2 *Flood frequency.* For each source within the watershed, separately evaluate the flood frequency factor for each category of floodplain in which the source is partially or wholly located. Assign a flood frequency factor value from Table 4–9 to each floodplain category in which the source is located.

4.1.2.1.2.2.3 *Calculation of factor value for potential to release by flood.* For each source within the watershed and for each category of floodplain in which the source is partially or wholly located, calculate a separate potential to release by flood factor value. Calculate this value as the product of the containment (flood) value and the flood frequency value applicable to the source for the floodplain category. Select the highest value calculated for those sources that meet the minimum size requirement specified in section 4.1.2.1.2.1.1 and assign it as the value for the potential to release by flood factor for the watershed. However, if, for this watershed, no source at the site meets the minimum size requirement, select the highest value calculated for the sources at the site eligible to be evaluated for this watershed and assign it as the value for this factor.

TABLE 4–7.—DISTANCE TO SURFACE WATER FACTOR VALUES

Distance	Assigned value
Less than 100 feet	25
100 feet to 500 feet	20
Greater than 500 feet to 1,000 feet	16
Greater than 1,000 feet to 2,500 feet	9
Greater than 2,500 feet to 1.5 miles	6
Greater than 1.5 miles to 2 miles	3

TABLE 4–8.—CONTAINMENT (FLOOD) FACTOR VALUES

Containment criteria	Assigned value
Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated.	0
Other	10

TABLE 4–9.—FLOOD FREQUENCY FACTOR VALUES

Floodplain category	Assigned value
Source floods annually	50
Source in 10-year floodplain	50
Source in 100-year floodplain	25
Source in 500-year floodplain	7
None of above	0

Enter this highest potential to release by flood factor value for the watershed in Table 4–1, as well as the values for containment (flood) and flood frequency that yield this highest value.

4.1.2.1.2.3 *Calculation of potential to release factor value.* Sum the factor values assigned to the watershed for potential to release by overland flow and potential to release by flood. Assign this sum as the potential to release factor value for the watershed, subject to a maximum value of 500. Enter this value in Table 4–1.

4.1.2.1.3 *Calculation of drinking water threat-likelihood of release factor category value.* If an observed release is established for the watershed, assign the observed release factor value of 550 as the likelihood of release factor category value for that watershed. Otherwise, assign the potential to release factor value for that watershed as the likelihood of release factor category value for that watershed. Enter the value assigned in Table 4–1.

4.1.2.2 *Drinking water threat-waste characteristics.* Evaluate the waste characteristics factor category for each

watershed based on two factors: toxicity/persistence and hazardous waste quantity. Evaluate only those hazardous substances that are available to migrate from the sources at the site to surface water in the watershed via the overland/flood hazardous substance migration path for the watershed (see section 4.1.1.1). Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to surface water in the watershed.
- All hazardous substances associated with a source that has a surface water containment factor value greater than 0 for the watershed (see sections 2.2.2, 2.2.3, 4.1.2.1.2.1.1, and 4.1.2.1.2.2.1).

4.1.2.2.1 *Toxicity/persistence.* For each hazardous substance, assign a toxicity factor value, a persistence factor value, and a combined toxicity/persistence factor value as specified in sections 4.1.2.2.1.1 through 4.1.2.2.1.3. Select the toxicity/persistence factor value for the watershed as specified in section 4.1.2.2.1.3.

4.1.2.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

4.1.2.2.1.2 *Persistence.* Assign a persistence factor value to each hazardous substance. In assigning this value, evaluate persistence based primarily on the half-life of the hazardous substance in surface water and secondarily on the sorption of the hazardous substance to sediments. The half-life in surface water is defined for HRS purposes as the time required to reduce the initial concentration in surface water by one-half as a result of the combined decay processes of biodegradation, hydrolysis, photolysis, and volatilization. Sorption to sediments is evaluated for the HRS based on the logarithm of the n-octanol-water partition coefficient (log K_{ow}) of the hazardous substance.

Estimate the half-life ($t_{1/2}$) of a hazardous substance as follows:

$$t_{1/2} = \frac{1}{\frac{1}{h} + \frac{1}{b} + \frac{1}{p} + \frac{1}{v}}$$

where:

h = Hydrolysis half-life.
b = Biodegradation half-life.
p = Photolysis half-life.
v = Volatilization half-life.

If one or more of these four component half-lives cannot be estimated for the hazardous substance from available data, delete that component half-life from the above equation. If none of these four component half-lives can be estimated for the hazardous substance from available data, use the default procedure indicated below. Estimate a half-life for the hazardous substance for lakes or for rivers, oceans, coastal tidal waters, and Great Lakes, as appropriate.

If a half-life can be estimated for a hazardous substance:

- Assign that hazardous substance a persistence factor value from the appropriate portion of Table 4-10 (that is lakes; or rivers, oceans, coastal tidal waters, and Great Lakes).
- Select the appropriate portion of Table 4-10 as follows:
  - If there is one or more drinking water intakes along the hazardous substance migration path for the watershed, select the nearest drinking water intake as measured from the probable point of entry. If the in-water segment between the probable point of entry and this selected intake includes both lakes and other water bodies, use the lakes portion of Table 4-10 only if more than half the distance to this selected intake lies in lake(s). Otherwise, use the rivers, oceans, coastal tidal waters, and Great Lakes portion of Table 4-10. For contaminated sediments with no identified source, use the point where measurement begins (see section 4.1.1.2) rather than the probable point of entry.
  - If there are no drinking water intakes but there are intakes or points of use for any of the resource types listed in section 4.1.2.3.3, select the nearest such intake or point of use. Select the portion of Table 4-10 based on this intake or point of use in the manner specified for drinking water intakes.
  - If there are no drinking water intakes and no specified resource intakes and points of use, but there is another type of resource listed in section 4.1.2.3.3 (for example, the water is usable for drinking water purposes even though not used), select the portion of Table 4-10 based on the nearest point of this resource in the manner specified for drinking water intakes.

TABLE 4-10.—PERSISTENCE FACTOR VALUES—HALF-LIFE

Surface water category	Substance half-life (days)	Assigned value *
Rivers, oceans, coastal tidal waters, and Great Lakes	Less than or equal to 0.2	0.0007
	Greater than 0.2 to 0.5	0.07
	Greater than 0.5 to 1.5	0.4
	Greater than 1.5	1
Lakes	Less than or equal to 0.02	0.0007
	Greater than 0.02 to 2	0.07
	Greater than 2 to 20	0.4
	Greater than 20	1

* Do not round to nearest integer.

If a half-life cannot be estimated for a hazardous substance from available data, use the following default procedure to assign a persistence factor value to that hazardous substance:

- For those hazardous substances that are metals (or metalloids), assign a persistence factor value of 1 as a default for all surface water bodies.
- For other hazardous substances (both organic and inorganic), assign a persistence factor value of 0.4 as a default for rivers, oceans, coastal tidal waters, and Great Lakes, and a persistence factor value of 0.07 as a default for lakes. Select the appropriate value in the same manner specified for using Table 4-10.

Use the persistence factor value assigned based on half-life or the default procedure unless the hazardous substance can be assigned a higher factor value from Table 4-11, based on its Log K_{ow}. If a higher value can be assigned from Table 4-11, assign this higher value as the persistence factor value for the hazardous substance.

TABLE 4-11.—PERSISTENCE FACTOR VALUES—LOG K_{ow}

Log K_{ow}	Assigned value *
Less than 3.5	0.0007
3.5 to less than 4.0	0.07
4.0 to 4.5	0.4
Greater than 4.5	1

* Use for lakes, rivers, oceans, coastal tidal waters, and Great Lakes. Do not round to nearest integer.

4.1.2.2.1.3 *Calculation of toxicity/persistence factor value.* Assign each hazardous substance a toxicity/persistence factor value from Table 4-12, based on the values assigned to the hazardous substance for the toxicity and persistence factors. Use

the hazardous substance with the highest toxicity/persistence factor value for the watershed to assign the toxicity/persistence factor value for the drinking water threat for the watershed. Enter this value in Table 4–1.

4.1.2.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value for the watershed as specified in section 2.4.2. Enter this value in Table 4–1.

4.1.2.2.3 *Calculation of drinking water threat-waste characteristics factor category value.* Multiply the toxicity/persistence and hazardous waste quantity factor values for the watershed, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the drinking water threat-waste characteristics factor category for the watershed. Enter this value in Table 4–1.

TABLE 4–12.—TOXICITY/PERSISTENCE FACTOR VALUES [a]

Persistence factor value	Toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.4	4,000	400	40	4	0.4	0
0.07	700	70	7	0.7	0.07	0
0.0007	7	0.7	0.07	0.007	0.0007	0

[a] Do not round to nearest integer.

4.1.2.3 *Drinking water threat-targets.* Evaluate the targets factor category for each watershed based on three factors: nearest intake, population, and resources.

To evaluate the nearest intake and population factors, determine whether the target surface water intakes are subject to actual or potential contamination as specified in section 4.1.1.2. Use either an observed release based on direct observation at the intake or the exposure concentrations from samples (or comparable samples) taken at or beyond the intake to make this determination (see section 4.1.2.1.1). The exposure concentrations for a sample (that is, surface water, benthic, or sediment sample) consist of the concentrations of those hazardous substances present that are significantly above background levels and attributable at least in part to the site (that is, those hazardous substance concentrations that meet the criteria for an observed release).

When an intake is subject to actual contamination, evaluate it using Level I concentrations or Level II concentrations. If the actual contamination is based on an observed release by direct observation, use Level II concentrations for that intake. However, if the actual contamination is based on an observed release from samples, determine which level applies for the intake by comparing the exposure concentrations from samples (or comparable samples) to health-based benchmarks as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3–10 (section 3.3.1) in determining the level of contamination from samples. For contaminated sediments with no identified source, evaluate the actual contamination using Level II concentrations (see section 4.1.1.2).

4.1.2.3.1 *Nearest intake.* Evaluate the nearest intake factor based on the drinking water intakes along the overland/flood hazardous substance migration path for the watershed. Include standby intakes in evaluating this factor only if they are used for supply at least once a year.

Assign the nearest intake factor a value as follows and enter the value in Table 4–1:

- If one or more of these drinking water intakes is subject to Level I concentrations as specified in section 4.1.2.3, assign a factor value of 50.
- If not, but if one or more of these drinking water intakes is subject to Level II concentrations, assign a factor value of 45.
- If none of these drinking water intakes is subject to Level I or Level II concentrations, determine the nearest of these drinking water intakes, as measured from the probable point of entry (or from the point where measurement begins for contaminated sediments with no identified source). Assign a dilution weight from Table 4–13 to this intake, based on the type of surface water body in which it is located. Multiply this dilution weight by 20, round the product to the nearest integer, and assign it as the factor value.

Assign the dilution weight from Table 4–13 as follows:

TABLE 4–13.—SURFACE WATER DILUTION WEIGHTS

Type of surface water body [a]		Assigned dilution weight [b]
Descriptor	Flow characteristics	
Minimal stream	Less than 10 cfs [c]	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	Greater than 100 to 1,000 cfs	0.01
Large stream to river	Greater than 1,000 to 10,000 cfs	0.001
Large river	Greater than 10,000 to 100,000 cfs	0.0001
Very large river	Greater than 100,000 cfs	0.00001
Coastal tidal waters [d]	Flow not applicable, depth not applicable	0.0001
Shallow ocean zone [e] or Great Lake	Flow not applicable, depth less than 20 feet	0.0001
Moderate depth ocean zone [e] or Great Lake	Flow not applicable, depth 20 to 200 feet	0.00001
Deep ocean zone [e] or Great Lake	Flow not applicable, depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

[a] Treat each lake as a separate type of water body and assign a dilution weight as specified in text.
[b] Do not round to nearest integer.
[c] cfs = cubic feet per second.
[d] Embayments, harbors, sounds, estuaries, back bays, lagoons, wetlands, etc., seaward from mouths of rivers and landward from baseline of Territorial Sea.
[e] Seaward from baseline of Territorial Sea. This baseline represents the generalized U.S. coastline. It is parallel to the seaward limit of the Territorial Sea and other maritime limits such as the inner boundary of the Federal fisheries jurisdiction and the limit of States jurisdiction under the Submerged Lands Act, as amended.

- For a river (that is, surface water body types specified in Table 4–13 as minimal stream through very large river), assign a dilution weight based on the average annual flow in the river at the intake. If available, use the average annual discharge as defined in the U.S. Geological Survey Water Resources Data Annual Report. Otherwise, estimate the average annual flow.
- For a lake, assign a dilution weight as follows:
  - For a lake that has surface water flow entering the lake, assign a dilution weight based on the sum of the

average annual flows for the surface water bodies entering the lake up to the point of the intake.

–For a lake that has no surface water flow entering, but that does have surface water flow leaving, assign a dilution weight based on the sum of the average annual flows for the surface water bodies leaving the lake.

–For a closed lake (that is, a lake without surface water flow entering or leaving), assign a dilution weight based on the average annual ground water flow into the lake, if available, using the dilution weight for the corresponding river flow rate in Table 4–13. If not available, assign a default dilution weight of 1.

• For the ocean and the Great Lakes, assign a dilution weight based on depth.

• For coastal tidal waters, assign a dilution weight of 0.0001; do not consider depth or flow.

• For a quiet-flowing river that has average annual flow of 10 cubic feet per second (cfs) or greater and that contains the probable point of entry to surface water, apply a zone of mixing in assigning the dilution weight:

–Start the zone of mixing at the probable point of entry and extend it for 3 miles from the probable point of entry, except: if the surface water characteristics change to turbulent within this 3-mile distance, extend the zone of mixing only to the point at which the change occurs.

–Assign a dilution weight of 0.5 to any intake that lies within this zone of mixing.

–Beyond this zone of mixing, assign a dilution weight the same as for any other river (that is, assign the dilution weight based on average annual flow).

–Treat a quiet-flowing river with an average annual flow of less than 10 cfs the same as any other river (that is, assign it a dilution weight of 1).

In those cases where water flows from a surface water body with a lower assigned dilution weight (from Table 4–13) to a surface water body with a higher assigned dilution weight (that is, water flows from a surface water body with more dilution to one with less dilution), use the lower assigned dilution weight as the dilution weight for the latter surface water body.

4.1.2.3.2 *Population.* In evaluating the population factor, include only persons served by drinking water drawn from intakes that are along the overland/flood hazardous substance migration path for the watershed and that are within the target distance limit specified in section 4.1.1.2. Include residents, students, and workers who regularly use the water. Exclude transient populations such as customers and travelers passing through the area. When a standby intake is maintained on a regular basis so that water can be withdrawn, include it in evaluating the population factor.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

In estimating the population served by an intake, if the water from the intake is blended with other water (for example, water from other surface water intakes or ground water wells), apportion the total population regularly served by the blended system to the intake based on the intake's relative contribution to the total blended system. In estimating the intake's relative contribution, assume each well or intake contributes equally and apportion the population accordingly, except: if the relative contribution of any one intake or well exceeds 40 percent based on average annual pumpage or capacity, estimate the relative contribution of the wells and intakes considering the following data, if available:

• Average annual pumpage from the ground water wells and surface water intakes in the blended system.

• Capacities of the wells and intakes in the blended system.

For systems with standby surface water intakes or standby ground water wells, apportion the total population regularly served by the blended system as described above, except:

• Exclude standby ground water wells in apportioning the population.

• When using pumpage data for a standby surface water intake, use average pumpage for the period during which the standby intake is used rather than average annual pumpage.

• For that portion of the total population that could be apportioned to a standby surface water intake, assign that portion of the population either to that standby intake or to the other surface water intake(s) and ground water well(s) that serve that population; do not assign that portion of the population both to the standby intake and to the other intake(s) and well(s) in the blended system. Use the apportioning that results in the highest population factor value. (Either include all standby intake(s) or exclude some or all of the standby intake(s) as appropriate to obtain this highest value.) Note that the specific standby intake(s) included or excluded and, thus, the specific apportioning may vary in evaluating different watersheds and in evaluating the ground water pathway.

4.1.2.3.2.1 *Level of contamination.* Evaluate the population factor based on three factors: Level I concentrations, Level II concentrations, and potential contamination. Determine which factor applies for an intake as specified in section 4.1.2.3. Evaluate intakes subject to Level I concentration as specified in section 4.1.2.3.2.2, intakes subject to Level II concentration as specified in section 4.1.2.3.2.3, and intakes subject to potential contamination as specified in section 4.1.2.3.2.4.

For the potential contamination factor, use population ranges in evaluating the factor as specified in section 4.1.2.3.2.4. For the Level I and Level II concentrations factors, use the population estimate, not population ranges, in evaluating both factors.

4.1.2.3.2.2 *Level I concentrations.* Sum the number of people served by drinking water from intakes subject to Level I concentrations. Multiply this sum by 10. Assign this product as the value for this factor. Enter this value in Table 4–1.

4.1.2.3.2.3 *Level II concentrations.* Sum the number of people served by drinking water from intakes subject to Level II concentrations. Do not include people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 4–1.

4.1.2.3.2.4 *Potential contamination.* For each applicable type of surface water body in Table 4–14, first determine the number of people served by drinking water from intakes subject to potential contamination in that type of surface water body. Do not include those people already counted under the Level I and Level II concentrations factors.

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TABLE 4-14
DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FACTOR FOR SURFACE WATER MIGRATION PATHWAY[a]

Type of Surface Water Body[b]	Number of People								
	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000
Minimal stream (< 10 cfs)	0	4	17	53	164	522	1,633	5,214	16,325
Small to moderate stream (10 to 100 cfs)	0	0.4	2	5	16	52	163	521	1,633
Moderate to large stream (> 100 to 1,000 cfs)	0	0.04	0.2	0.5	2	5	16	52	163
Large stream to river (> 1,000 to 10,000 cfs)	0	0.004	0.02	0.05	0.2	0.5	2	5	16
Large river (> 10,000 to 100,000 cfs)	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2
Very large river (> 100,000 cfs)	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2
Shallow ocean zone or Great Lake (depth < 20 feet)	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2
Moderate ocean zone or Great Lake (depth 20 to 200 feet)	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2
Deep ocean zone or Great Lakes (depth > 200 feet)	0	0	0	0	0.001	0.003	0.008	0.03	0.08
3-mile mixing zone in quiet flowing river (≥ 10 cfs)	0	2	9	26	82	261	817	2,607	8,163

TABLE 4-14 (Concluded)

Type of Surface Water Body[b]	Number of People				
	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000	3,000,001 to 10,000,000
Minimal stream (< 10 cfs)	52,137	163,246	521,360	1,632,455	5,213,590
Small to moderate stream (10 to 100 cfs)	5,214	16,325	52,136	163,245	521,359
Moderate to large stream (> 100 to 1,000 cfs)	521	1,633	5,214	16,325	52,136
Large stream to river (> 1,000 to 10,000 cfs)	52	163	521	1,632	5,214
Large river (> 10,000 to 100,000 cfs)	5	16	52	163	521
Very large river (> 100,000 cfs)	0.5	2	5	16	52
Shallow ocean zone or Great Lake (depth < 20 feet)	5	16	52	163	521
Moderate ocean zone or Great Lake (depth 20 to 200 feet)	0.5	2	5	16	52
Deep zone or Great Lake (depth > 200 feet)	0.3	1	3	8	26
3-mile mixing zone in quiet flowing river (≥ 10 cfs)	26,068	81,623	260,680	816,227	2,606,795

[a]Round the number of people to nearest integer. Do not round the assigned dilution-weighted population value to nearest integer.

[b]Treat each lake as a separate type of water body and assign it a dilution-weighted population value using the surface water body type with the same dilution weight from Table 4-13 as the lake. If drinking water is withdrawn from coastal tidal water or the ocean, assign a dilution-weighted population value to it using the surface water body type with the same dilution weight from Table 4-13 as the coastal tidal water or the ocean zone.

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For each type of surface water body, assign a dilution-weighted population value from Table 4–14, based on the number of people included for that type of surface water body. (Note that the dilution-weighted population values in Table 4–14 incorporate the dilution weights from Table 4–13. Do not multiply the values from Table 4–14 by these dilution weights.)

Calculate the value for the potential contamination factor (PC) for the watershed as follows:

$$PC = \frac{1}{10} \sum_{i=1}^{n} W_i$$

where:

W_i = Dilution-weighted population from Table 4–14 for surface water body type i.

n = Number of different surface water body types in the watershed.

If PC is less than 1, do not round it to the nearest integer; if PC is 1 or more, round to the nearest integer. Enter this value for the potential contamination factor in Table 4–1.

4.1.2.3.2.5 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and potential contamination. Do not round this sum to the nearest integer. Assign this sum as the population factor value for the watershed. Enter this value in Table 4–1.

4.1.2.3.3 *Resources.* To evaluate the resources factor for the watershed, select the highest value below that applies to the watershed. Assign this value as the resources factor value for the watershed. Enter this value in Table 4–1.

Assign a value of 5 if, within the in-water segment of the hazardous substance migration path for the watershed, the surface water is used for one or more of the following purposes:

- Irrigation (5 acre minimum) of commercial food crops or commercial forage crops.
- Watering of commercial livestock.
- Ingredient in commercial food preparation.
- Major or designated water recreation area, excluding drinking water use.

Assign a value of 5 if, within the in-water segment of the hazardous substance migration path for the watershed, the surface water is not used for drinking water, but either of the following applies:

- Any portion of the surface water is designated by a State for drinking water use under section 305(a) of the Clean Water Act, as amended.
- Any portion of the surface water is usable for drinking water purposes.

Assign a value of 0 if none of the above applies.

4.1.2.3.4 *Calculation of drinking water threat-targets factor category value.* Sum the nearest intake, population, and resources factor values for the watershed. Do not round this sum to the nearest integer. Assign this sum as the drinking water threat-targets factor category value for the watershed. Enter this value in Table 4–1.

4.1.2.4 *Calculation of the drinking water threat score for a watershed.* Multiply the drinking water threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 100, as the drinking water threat score for the watershed. Enter this value in Table 4–1.

4.1.3 *Human food chain threat.* Evaluate the human food chain threat for each watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.1.3.1 *Human food chain threat-likelihood of release.* Assign the same likelihood of release factor category value for the human food chain threat for the watershed as would be assigned in section 4.1.2.1.3 for the drinking water threat. Enter this value in Table 4–1.

4.1.3.2 *Human food chain threat-waste characteristics.* Evaluate the waste characteristics factor category for each watershed based on two factors: toxicity/persistence/bioaccumulation and hazardous waste quantity.

4.1.3.2.1 *Toxicity/persistence/bioaccumulation.* Evaluate all those hazardous substances eligible to be evaluated for toxicity/persistence in the drinking water threat for the watershed (see section 4.1.2.2).

4.1.3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

4.1.3.2.1.2 *Persistence.* Assign a persistence factor value to each hazardous substance as specified for the drinking water threat (see section 4.1.2.2.1.2), except: use the predominant water category (that is, lakes; or rivers, oceans, coastal tidal waters, or Great Lakes) between the probable point of entry and the nearest fishery (not the nearest drinking water or resources intake) along the hazardous substance migration path for the watershed to determine which portion of Table 4–10 to use. Determine the predominant water category based on distance as specified in section 4.1.2.2.1.2. For contaminated sediments with no identified source, use the point where measurement begins rather than the probable point of entry.

4.1.3.2.1.3 *Bioaccumulation potential.* Use the following data hierarchy to assign a bioaccumulation potential factor value to each hazardous substance:

- Bioconcentration factor (BCF) data.
- Logarithm of the n-octanol-water partition coefficient (log K_{ow}) data.
- Water solubility data.

Assign a bioaccumulation potential factor value to each hazardous substance from Table 4–15.

If BCF data are available for any aquatic human food chain organism for the substance being evaluated, assign the bioaccumulation potential factor value to the hazardous substance as follows:

- If BCF data are available for both fresh water and salt water for the hazardous substance, use the BCF data that correspond to the type of water body (that is, fresh water or salt water) in which the fisheries are located to assign the bioaccumulation potential factor value to the hazardous substance.
- If, however, some of the fisheries being evaluated are in fresh water and some are in salt water, or if any are in brackish water, use the BCF data that yield the higher factor value to assign the bioaccumulation potential factor value to the hazardous substance.
- If BCF data are available for either fresh water or salt water, but not for both, use the available BCF data to assign the bioaccumulation potential factor value to the hazardous substance.

If BCF data are not available for the hazardous substance, use log K_{ow} data to assign a bioaccumulation potential factor value to organic substances, but not to inorganic substances. If BCF data are not available, and if either log K_{ow} data are not available, the log K_{ow} is available but exceeds 6.0, or the substance is an inorganic substance, use water solubility data to assign a bioaccumulation potential factor value.

TABLE 4–15.—BIOACCUMULATION POTENTIAL FACTOR VALUES [a]

If bioconcentration factor (BCF) data are available for any aquatic human food chain organism, assign a value as follows: [b]

BCF	Assigned value
Greater than or equal to 10,000	50,000
1,000 to less than 10,000	5,000
100 to less than 1,000	500
10 to less than 100	50
1 to less than 10	5
Less than 1	0.5

If BCF data are not available, and log K_{ow} data are available and do not exceed 6.0, assign a value to an organic hazardous substance as follows (for inorganic hazardous substances, skip this step and proceed to the next):

Log K_{ow}	Assigned value
5.5 to 6.0	50,000
4.5 to less than 5.5	5,000
3.2 to less than 4.5	500
2.0 to less than 3.2	50
0.8 to less than 2.0	5
Less than 0.8	0.5

If BCF data are not available, and if either Log K_{ow} data are not available, a log K_{ow} is available but exceeds 6.0, or the substance is an inorganic substance, assign a value as follows:

TABLE 4–15.—BIOACCUMULATION POTENTIAL FACTOR VALUES [a]— Concluded

Water solubility (mg/l)	Assigned value
Less than 25	50,000
25 to 500	5,000
Greater than 500 to 1,500	500
Greater than 1,500	0.5

If none of these data are available, assign a value of 0.5.

[a] Do not round to nearest integer.
[b] See text for use of freshwater and saltwater BCF data.

Do not distinguish between fresh water and salt water in assigning the bioaccumulation potential factor value based on log K_{ow} or water solubility data.

If none of these data are available, assign the hazardous substance a bioaccumulation potential factor value of 0.5.

4.1.3.2.1.4 *Calculation of toxicity/persistence/bioaccumulation factor value.* Assign each hazardous substance a toxicity/persistence factor value from Table 4–12, based on the values assigned to the hazardous substance for the toxicity and persistence factors. Then assign each hazardous substance a toxicity/persistence/bioaccumulation factor value from Table 4–16, based on the values assigned for the toxicity/persistence and bioaccumulation potential factors. Use the hazardous substance with the highest toxicity/persistence/bioaccumulation factor value for the watershed to assign the value to this factor. Enter this value in Table 4–1.

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TABLE 4-16
TOXICITY/PERSISTENCE/BIOACCUMULATION FACTOR VALUES[a]

Toxicity/ Persistence Factor Value	Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
10,000	5×10^8	5×10^7	5×10^6	5×10^5	5×10^4	5,000
4,000	2×10^8	2×10^7	2×10^6	2×10^5	2×10^4	2,000
1,000	5×10^7	5×10^6	5×10^5	5×10^4	5,000	500
700	3.5×10^7	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350
400	2×10^7	2×10^6	2×10^5	2×10^4	2,000	200
100	5×10^6	5×10^5	5×10^4	5,000	500	50
70	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350	35
40	2×10^6	2×10^5	2×10^4	2,000	200	20
10	5×10^5	5×10^4	5,000	500	50	5
7	3.5×10^5	3.5×10^4	3,500	350	35	3.5
4	2×10^5	2×10^4	2,000	200	20	2
1	5×10^4	5,000	500	50	5	0.5
0.7	3.5×10^4	3,500	350	35	3.5	0.35
0.4	2×10^4	2,000	200	20	2	0.2
0.07	3,500	350	35	3.5	0.35	0.035
0.007	350	35	3.5	0.35	0.035	0.0035
0.0007	35	3.5	0.35	0.035	0.0035	0.00035
0	0	0	0	0	0	0

[a]Do not round to nearest integer.

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4.1.3.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned in section 4.1.2.2.2 for the drinking water threat. Enter this value in Table 4–1.

4.1.3.2.3 *Calculation of human food chain threat-waste characteristics factor category value.* For the hazardous substance selected for the watershed in section 4.1.3.2.1.4, use its toxicity/persistence factor value and bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category. First, multiply the toxicity/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^{8}. Then multiply this product by the bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this second product, assign a value from Table 2–7 (section 2.4.3.1) to the human food chain threat-waste characteristics factor category for the watershed. Enter this value in Table 4–1.

4.1.3.3 *Human food chain threat-targets.* Evaluate two target factors for each watershed: food chain individual and population. For both factors, determine whether the target fisheries are subject to actual or potential human food chain contamination.

Consider a fishery (or portion of a fishery) within the target distance limit of the watershed to be subject to actual human food chain contamination if any of the following apply:

- A hazardous substance having a bioaccumulation potential factor value of 500 or greater is present either in an observed release by direct observation to the watershed or in a surface water or sediment sample from the watershed at a level that meets the criteria for an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release (that is, it is located either at the point of direct observation or at or between the probable point of entry and the most distant sampling point establishing the observed release).
- The fishery is closed, and a hazardous substance for which the fishery has been closed has been documented in an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release.
- A hazardous substance is present in a tissue sample from an essentially sessile, benthic, human food chain organism from the watershed at a level that meets the criteria for an observed release to the watershed from the site, and at least a portion of the fishery is within the boundaries of the observed release.

For a fishery that meets any of these three criteria, but that is not wholly within the boundaries of the observed release, consider only the portion of the fishery that is within the boundaries of the observed release to be subject to actual human food chain contamination. Consider the remainder of the fishery within the target distance limit to be subject to potential food chain contamination.

In addition, consider all other fisheries that are partially or wholly within the target distance limit for the watershed, including fisheries partially or wholly within the boundaries of an observed release for the watershed that do not meet any of the three criteria listed above, to be subject to potential human food chain contamination. If only a portion of the fishery is within the target distance limit for the watershed, include only that portion in evaluating the targets factor category.

When a fishery (or portion of a fishery) is subject to actual food chain contamination, determine the part of the fishery subject to Level I concentrations and the part subject to Level II concentrations. If the actual food chain contamination is based on direct observation, evaluate it using Level II concentrations. However, if the actual food chain contamination is based on samples from the watershed, use these samples and, if available, additional tissue samples from aquatic human food chain organisms as specified below, to determine the part subject to Level I concentrations and the part subject to Level II concentrations:

- Determine the level of actual contamination from samples (including tissue samples from essentially sessile, benthic organisms) that meet the criteria for actual food chain contamination by comparing the exposure concentrations (see section 4.1.2.3) from these samples (or comparable samples) to the health-based benchmarks from Table 4–17, as described in section 2.5.1 and 2.5.2. Use only the exposure concentrations for those hazardous substances in the sample (or comparable samples) that meet the criteria for actual contamination of the fishery.
- In addition, determine the level of actual contamination from other tissue samples by comparing the concentrations of hazardous substances in the tissue samples (or comparable tissue samples) to the health-based benchmarks from Table 4–17, as described in sections 2.5.1 and 2.5.2. Use only those additional tissue samples and only those hazardous substances in the tissue samples that meet all the following criteria:
  - –The tissue sample is from a location that is within the boundaries of the actual food chain contamination for the site (that is, either at the point of direct observation or at or between the probable point of entry and the most distant sample point meeting the criteria for actual food chain contamination).
  - –The tissue sample is from a species of aquatic human food chain organism that spends extended periods of time within the boundaries of the actual food chain contamination for the site and that is not an essentially sessile, benthic organism.
  - –The hazardous substance is a substance that is also present in a surface water, benthic, or sediment sample from within the target distance limit for the watershed and, for such a sample, meets the criteria for actual food chain contamination.

TABLE 4–17.—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN HUMAN FOOD CHAIN

- Concentration corresponding to Food and Drug Administration Action Level (FDAAL) for fish or shellfish.
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for oral exposures.
- Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for oral exposures.

4.1.3.3.1 *Food chain individual.* Evaluate the food chain individual factor based on the fisheries (or portions of fisheries) within the target distance limit for the watershed. Assign this factor a value as follows:

- If any fishery (or portion of a fishery) is subject to Level I concentrations, assign a value of 50.
- If not, but if any fishery (or portion of a fishery) is subject to Level II concentrations, assign a value of 45.
- If not, but if there is an observed release of a hazardous substance having a bioaccumulation potential factor value of 500 or greater to surface water in the watershed and there is a fishery (or portion of a fishery) present anywhere within the target distance limit, assign a value of 20.
- If there is no observed release to surface water in the watershed or there is no observed release of a hazardous substance having a bioaccumulation potential factor value of 500 or greater, but there is a fishery (or portion of a fishery) present anywhere within the target distance limit, assign a value as follows:
  - –Using Table 4–13, determine the highest dilution weight (that is, lowest amount of dilution) applicable to the fisheries (or portions of fisheries) within the target distance limit. Multiply this dilution weight by 20 and round to the nearest integer.
  - –Assign this calculated value as the factor value.
- If there are no fisheries (or portions of fisheries) within the target distance limit of the watershed, assign a value of 0.

Enter the value assigned in Table 4–1.

4.1.3.3.2 *Population.* Evaluate the population factor for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential human food chain contamination. Determine which factor applies for a fishery (or portion of a fishery) as specified in section 4.1.3.3.

4.1.3.3.2.1 *Level I concentrations.* Determine those fisheries (or portions of fisheries) within the watershed that are subject to Level I concentrations.

Estimate the human food chain population value for each fishery (or portion of a fishery) as follows:

- Estimate human food chain production for the fishery based on the estimated annual

production (in pounds) of human food chain organisms (for example, fish, shellfish) for that fishery, except: if the fishery is closed and a hazardous substance for which the fishery has been closed has been documented in an observed release to the fishery from a source at the site, use the estimated annual production for the period prior to closure of the fishery or use the estimated annual production from comparable fisheries that are not closed.

• Assign the fishery a value for human food chain population from Table 4–18, based on the estimated human food production for the fishery.

• Set boundaries between fisheries at those points where human food chain production changes or where the surface water dilution weight changes.

Sum the human food chain population value for each fishery (and portion of a fishery). Multiply this sum by 10. If the product is less than 1, do not round it to the nearest integer; if 1 or more, round to the nearest integer. Assign the resulting value as the Level I concentrations factor value. Enter this value in Table 4–1.

4.1.3.3.2.2 *Level II concentrations.* Determine those fisheries (or portions of fisheries) within the watershed that are subject to Level II concentrations. Do not include any fisheries (or portions of fisheries) already counted under the Level I concentrations factor.

Assign each fishery (or portion of a fishery) a value for human food chain population from Table 4–18, based on the estimated human food production for the fishery. Estimate the human food chain production for the fishery as specified in section 4.1.3.3.2.1.

Sum the human food chain population value for each fishery (and portion of a fishery). If this sum is less than 1, do not round it to the nearest integer; if 1 or more, round to the nearest integer. Assign the resulting value as the Level II concentrations factor value. Enter this value in Table 4–1.

TABLE 4–18.—HUMAN FOOD CHAIN POPULATION VALUES [a]

Human food chain production (pounds per year)	Assigned human food chain population value
0	0
Greater than 0 to 160	0.03
Greater than 160 to 1,000	0.3
Greater than 1,000 to 10,000	3
Greater than 10,000 to 100,000	31
Greater than 100,000 to 1,000,000	310
Greater than 10^6 to 10^7	3,100
Greater than 10^7 to 10^8	31,000
Greater than 10^8 to 10^9	310,000
Greater than 10^9	3,100,000

[a] Do not round to nearest integer.

4.1.3.3.2.3 *Potential human food chain contamination.* Determine those fisheries (or portions of fisheries) within the watershed that are subject to potential human food chain contamination. Do not include those fisheries (or portion of fisheries) already counted under the Level I or Level II concentrations factors.

Calculate the value for the potential human food chain contamination factor (PF) for the watershed as follows:

$$PF = \frac{1}{10} \sum_{i=1}^{n} P_i D_i$$

where:

P_i = Human food chain population value for fishery i.

D_i = Dilution weight from Table 4–13 for fishery i.

n = Number of fisheries subject to potential human food chain contamination.

In calculating PF:

• Estimate the human food chain population value (P_i) for a fishery (or portion of a fishery) as specified in section 4.1.3.3.2.1.

• Assign the fishery (or portion of a fishery) a dilution weight as indicated in Table 4–13 (section 4.1.2.3.1), except: do not assign a dilution weight of 0.5 for a "3-mile mixing zone in quiet flowing river"; instead assign a dilution weight based on the average annual flow.

If PF is less than 1, do not round it to the nearest integer; if PF is 1 or more, round to the nearest integer. Enter the value assigned in Table 4–1.

4.1.3.3.2.4 *Calculation of population factor value.* Sum the values for the Level I concentrations, Level II concentrations, and potential human food chain contamination factors for the watershed. Do not round this sum to the nearest integer. Assign it as the population factor value for the watershed. Enter this value in Table 4–1.

4.1.3.3.3 *Calculation of human food chain threat-targets factor category value.* Sum the food chain individual and population factor values for the watershed. Do not round this sum to the nearest integer. Assign it as the human food chain threat-targets factor category value for the watershed. Enter this value in Table 4–1.

4.1.3.4 *Calculation of human food chain threat score for a watershed.* Multiply the human food chain threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 100, as the human food chain threat score for the watershed. Enter this score in Table 4–1.

4.1.4 *Environmental threat.* Evaluate the environmental threat for the watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.1.4.1 *Environmental threat-likelihood of release.* Assign the same likelihood of release factor category value for the environmental threat for the watershed as would be assigned in section 4.1.2.1.3 for the drinking water threat. Enter this value in Table 4–1.

4.1.4.2 *Environmental threat-waste characteristics.* Evaluate the waste characteristics factor category for each watershed based on two factors: ecosystem toxicity/persistence/bioaccumulation and hazardous waste quantity.

4.1.4.2.1 *Ecosystem toxicity/persistence/bioaccumulation.* Evaluate all those hazardous substances eligible to be evaluated for toxicity/persistence in the drinking water threat for the watershed (see section 4.1.2.2).

4.1.4.2.1.1 *Ecosystem toxicity.* Assign an ecosystem toxicity factor value from Table 4–19 to each hazardous substance on the basis of the following data hierarchy:

• EPA chronic Ambient Water Quality Criterion (AWQC) for the substance.

• EPA chronic Ambient Aquatic Life Advisory Concentrations (AALAC) for the substance.

• EPA acute AWQC for the substance.

• EPA acute AALAC for the substance.

• Lowest LC_{50} value for the substance.

In assigning the ecosystem toxicity factor value to the hazardous substance:

• If either an EPA chronic AWQC or AALAC is available for the hazardous substance, use it to assign the ecosystem toxicity factor value. Use the chronic AWQC in preference to the chronic AALAC when both are available.

• If neither is available, use the EPA acute AWQC or AALAC to assign the ecosystem toxicity factor value. Use the acute AWQC in preference to the acute AALAC.

• If none of the chronic and acute AWQCs and AALACs is available, use the lowest LC_{50} value to assign the ecosystem toxicity factor value.

• If an LC_{50} value is also not available, assign an ecosystem toxicity factor value of 0 to the hazardous substance and use other hazardous substances for which data are available in evaluating the pathway.

If an ecosystem toxicity factor value of 0 is assigned to all hazardous substances eligible to be evaluated for the watershed (that is, insufficient data are available for evaluating all the substances), use a default value of 100 as the ecosystem toxicity factor value for all these hazardous substances.

With regard to the AWQC, AALAC, or LC_{50} selected for assigning the ecosystem toxicity factor value to the hazardous substance:

• If values for the selected AWQC, AALAC, or LC_{50} are available for both fresh water and marine water for the hazardous substance, use the value that corresponds to the type of water body (that is, fresh water or salt water) in which the sensitive environments are located to assign the ecosystem toxicity factor value to the hazardous substance.

• If, however, some of the sensitive environments being evaluated are in fresh water and some are in salt water, or if any are in brackish water, use the value (fresh water or marine) that yields the higher factor value to assign the ecosystem toxicity factor value to the hazardous substance.

• If a value for the selected AWQC, AALAC, or LC_{50} is available for either fresh water or marine water, but not for both, use the available one to assign an ecosystem toxicity factor value to the hazardous substance.

TABLE 4-19.—ECOSYSTEM TOXICITY FACTOR VALUES

If an EPA chronic AWQC[a] or AALAC[b] is available, assign a value as follows:[c]

EPA chronic AWQC or AALAC	Assigned value
Less than 1 µg/l	10,000
1 to 10 µg/l	1,000
Greater than 10 to 100 µg/l	100
Greater than 100 to 1,000 µg/l	10
Greater than 1,000 µg/l	1

If neither an EPA chronic AWQC nor EPA chronic AALAC is available, assign a value based on the EPA acute AWQC or AALAC as follows:[c]

EPA acute AWQC or AALAC	Assigned value
Less than 100 µg/l	10,000
100 to 1,000 µg/l	1,000
Greater than 1,000 to 10,000 µg/l	100
Greater than 10,000 to 100,000 µg/l	10
Greater than 100,000 µg/l	1

TABLE 4-19. ECOSYSTEM TOXICITY FACTOR VALUES—Concluded

If neither an EPA chronic or acute AWQC nor EPA chronic or acute AALAC is available, assign a value from the LC_{50} as follows:

EPA acute AWQC or AALAC

LC_{50}	Assigned value
Less than 100 µg/l	10,000
100 to 1,000 µg/l	1,000
Greater than 1,000 to 10,000 µg/l	100
Greater than 10,000 to 100,000 µg/l	10
Greater than 100,000 µg/l	1

If none of the AWQCs and AALACs nor the LC_{50} is available, assign a value of 0.

[a] AWQC—Ambient Water Quality Criteria.
[b] AALAC—Ambient Aquatic Life Advisory Concentrations.
[c] Use the AWQC value in preference to the AALAC when both are available. See text for use of freshwater and marine values.

4.1.4.2.1.2 *Persistence.* Assign a persistence factor value to each hazardous substance as specified in section 4.1.2.2.1.2, except: use the predominant water category (that is lakes; or rivers, oceans, coastal tidal waters, or Great Lakes) between the probable point of entry and the nearest sensitive environment (not the nearest drinking water or resources intake) along the hazardous substance migration path for the watershed to determine which portion of Table 4-19 to use. Determine the predominant water category based on distance as specified in section 4.1.2.2.1.2. For contaminated sediments with no identified source, use the point where measurement begins rather than the probable point of entry.

4.1.4.2.1.3 *Ecosystem bioaccumulation potential.* Assign an ecosystem bioaccumulation potential factor value to each hazardous substance in the same manner specified for the bioaccumulation potential factor in section 4.1.3.2.1.3, except:

- Use BCF data for all aquatic organisms, not just for aquatic human food chain organisms.
- Use the BCF data that corresponds to the type of water body (that is, fresh water or salt water) in which the sensitive environments (not fisheries) are located.

4.1.4.2.1.4 *Calculation of ecosystem toxicity/persistence/bioaccumulation factor value.* Assign each hazardous substance an ecosystem toxicity/persistence factor value from Table 4-20, based on the values assigned to the hazardous substance for the ecosystem toxicity and persistence factors. Then assign each hazardous substance an ecosystem toxicity/persistence/bioaccumulation factor value from Table 4-21, based on the values assigned for the ecosystem toxicity/persistence and ecosystem bioaccumulation potential factors. Select the hazardous substance with the highest ecosystem toxicity/persistence/bioaccumulation factor value for the watershed and use it to assign the value to this factor. Enter this value in Table 4-1.

TABLE 4-20.—ECOSYSTEM TOXICITY/PERSISTENCE FACTOR VALUES[a]

Persistence factor value	Ecosystem toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.4	4,000	400	40	4	0.4	0
0.07	700	70	7	0.7	0.07	0
0.0007	7	0.7	0.07	0.007	0.0007	0

[a] Do not round to nearest integer.

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TABLE 4-21
ECOSYSTEM TOXICITY/PERSISTENCE/BIOACCUMULATION FACTOR VALUES[a]

Ecosystem Toxicity/ Persistence Factor Value	Ecosystem Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
10,000	5×10^8	5×10^7	5×10^6	5×10^5	5×10^4	5,000
4,000	2×10^8	2×10^7	2×10^6	2×10^5	2×10^4	2,000
1,000	5×10^7	5×10^6	5×10^5	5×10^4	5,000	500
700	3.5×10^7	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350
400	2×10^7	2×10^6	2×10^5	2×10^4	2,000	200
100	5×10^6	5×10^5	5×10^4	5,000	500	50
70	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350	35
40	2×10^6	2×10^5	2×10^4	2,000	200	20
10	5×10^5	5×10^4	5,000	500	50	5
7	3.5×10^5	3.5×10^4	3,500	350	35	3.5
4	2×10^5	2×10^4	2,000	200	20	2
1	5×10^4	5,000	500	50	5	0.5
0.7	3.5×10^4	3,500	350	35	3.5	0.35
0.4	2×10^4	2,000	200	20	2	0.2
0.07	3,500	350	35	3.5	0.35	0.035
0.007	350	35	3.5	0.35	0.035	0.0035
0.0007	35	3.5	0.35	0.035	0.0035	0.00035
0	0	0	0	0	0	0

[a]Do not round to nearest integer.

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4.1.4.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned in section 4.1.2.2.2 for the drinking water threat. Enter this value in Table 4–1.

4.1.4.2.3 *Calculation of environmental threat-waste characteristics factor category value.* For the hazardous substance selected for the watershed in section 4.1.4.2.1.4, use its ecosystem toxicity/persistence factor value and ecosystem bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category. First, multiply the ecosystem toxicity/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^8. Then multiply this product by the ecosystem bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this second product, assign a value from Table 2–7 (section 2.4.3.1) to the environmental threat-waste characteristics factor category for the watershed. Enter this value in Table 4–1.

TABLE 4–22.—ECOLOGICAL-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN SURFACE WATER

- Concentration corresponding to EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life (fresh water or marine).
- Concentration corresponding to EPA Ambient Aquatic Life Advisory Concentrations (AALAC).
- Select the appropriate AWQC and AALAC as follows:
  - –Use chronic value, if available; otherwise use acute value.
  - –If the sensitive environment being evaluated is in fresh water, use fresh water value, except: if no fresh water value is available, use marine value if available.
  - –If the sensitive environment being evaluated is in salt water, use marine value, except: if no marine value is available, use fresh water value if available.
  - –If the sensitive environment being evaluated is in both fresh water and salt water, or is in brackish water, use lower of fresh water or marine values.

TABLE 4–23.—SENSITIVE ENVIRONMENTS RATING VALUES

Sensitive environment	Assigned value
Critical habitat [a] for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Areas identified under Coastal Zone Management Act [b] Sensitive areas identified under National Estuary Program [c] or Near Coastal Waters Program [d] Critical areas identified under the Clean Lakes Program [e] National Monument [f] National Seashore Recreational Area National Lakeshore Recreational Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical [g] for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized for breeding by large or dense aggregations of animals [h] National river reach designated as Recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federal designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for protection or maintenance of aquatic life [i]	5

[a] Critical habitat as defined in 50 CFR 424.02.
[b] Areas identified in State Coastal Zone Management plans as requiring protection because of ecological value.
[c] National Estuary Program study areas (subareas within estuaries) identified in Comprehensive Conservation and Management Plans as requiring protection because they support critical life stages of key estuarine species (Section 320 of Clean Water Act, as amended).
[d] Near Coastal Waters as defined in Sections 104(b)(3), 304(1), 319, and 320 of Clean Water Act, as amended.
[e] Clean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State Clean Lake Plans as critical habitat (Section 314 of Clean Water Act, as amended).
[f] Use only for air migration pathway.
[g] Limit to areas described as being used for intense or concentrated spawning by a given species.
[h] For the air migration pathway, limit to terrestrial vertebrate species. For the surface water migration pathway, limit to terrestrial vertebrate species with aquatic or semiaquatic foraging habits.
[i] Areas designated under Section 305(a) of Clean Water Act, as amended.

TABLE 4–24.—WETLANDS RATING VALUES FOR SURFACE WATER MIGRATION PATHWAY

Total length of wetlands * (miles)	Assigned value
Less than 0.1	0
0.1 to 1	25
Greater than 1 to 2	50
Greater than 2 to 3	75
Greater than 3 to 4	100
Greater than 4 to 8	150
Greater than 8 to 12	250
Greater than 12 to 16	350
Greater than 16 to 20	450
Greater than 20	500

* Wetlands as defined in 40 CFR Section 230.3.

4.1.4.3 *Environmental threat-targets.* Evaluate the environmental threat-targets factor category for a watershed using one factor: sensitive environments.

4.1.4.3.1 *Sensitive environments.* Evaluate sensitive environments along the hazardous substance migration path for the watersbed based on three factors: Level I concentrations, Level II concentrations, and potential contamination.

Determine which factor applies to each sensitive environment as specified in section 4.1.2.3, except: use ecological-based benchmarks (Table 4–22) rather than health-based benchmarks (Table 3–10) in determining the level of contamination from samples. In determining the level of actual contamination, use a point of direct observation anywhere within the sensitive environment or samples (that is, surface water, benthic, or sediment samples) taken anywhere within or beyond the sensitive environment (or anywhere adjacent to or beyond the sensitive environment if it is contiguous to the migration path).

4.1.4.3.1.1 *Level I concentrations.* Assign value(s) from Table 4–23 to each sensitive environment subject to Level I concentrations.

For those sensitive environments that are wetlands, assign an additional value from Table 4–24. In assigning a value from Table 4–24, include only those portions of wetlands located along the hazardous substance migration path in the area of Level I concentrations. If a wetland is located partially along the area of Level I concentrations and partially along the area of Level II concentrations and/or potential contamination, then solely for purposes of Table 4–24, count the portion(s) along the areas of Level II concentrations or potential contamination under the Level II concentrations factor (section 4.1.4.3.1.2) or potential contamination factor (section 4.1.4.3.1.3), as appropriate.

Estimate the total length of wetlands along the hazardous substance migration path (that is, wetland frontage) in the area of Level I concentrations and assign a value from Table 4–24 based on this total length. Estimate this length as follows:

- For an isolated wetland or for a wetland where the probable point of entry to surface water is in the wetland, use the perimeter of that portion of the wetland subject to Level I concentrations as the length.
- For rivers, use the length of the wetlands contiguous to the in-water segment of the hazardous substance migration path (that is, wetland frontage).
- For lakes, oceans, coastal tidal waters, and Great Lakes, use the length of the wetlands along the shoreline within the target distance limit (that is, wetland frontage along the shoreline).

Calculate the Level I concentrations factor value (SH) for the watershed as follows:

$$SH = 10(WH + \sum_{i=1}^{n} S_i)$$

where:

WH = Value assigned from Table 4–24 to wetlands along the area of Level I concentrations.

S_i = Value(s) assigned from Table 4–23 to sensitive environment i.

n = Number of sensitive environments from Table 4–23 subject to Level I concentrations.

Enter the value assigned in Table 4–1.

4.1.4.3.1.2 *Level II concentrations.* Assign value(s) from Table 4–23 to each sensitive environment subject to Level II concentrations. Do not include sensitive environments already counted for Table 4–23 under the Level I concentrations factor for this watershed.

For those sensitive environments that are wetlands, assign an additional value from Table 4–24. In assigning a value from Table 4–24, include only those portions of wetlands located along the hazardous substance migration path in the area of Level II concentrations, as specified in section 4.1.4.3.1.1.

Estimate the total length of wetlands along the hazardous substance migration path (that is, wetland frontage) in the area of Level II concentrations and assign a value from Table 4–24 based on this total length. Estimate this length as specified in section 4.1.4.3.1.1, except: for an isolated wetland or for a wetland where the probable point of entry to surface water is in the wetland, use the perimeter of that portion of the wetland subject to Level II (not Level I) concentrations as the length.

Calculate the Level II concentrations value (SL) for the watershed as follows:

$$SL = WL + \sum_{i=1}^{n} S_i$$

where:

WL = Value assigned from Table 4–24 to wetlands along the area of Level II concentrations.

S_i = Value(s) assigned from Table 4–23 to sensitive environment i.

n = Number of sensitive environments from Table 4–23 subject to Level II concentrations.

Enter the value assigned in Table 4–1.

4.1.4.3.1.3 *Potential contamination.* Assign value(s) from Table 4–23 to each sensitive environment subject to potential contamination. Do not include sensitive environments already counted for Table 4–23 under the Level I or Level II concentrations factors.

For each type of surface water body in Table 4–13 (section 4.1.2.3.1), sum the value(s) assigned from Table 4–23 to the sensitive environments along that type of surface water body, except: do not use the surface water body type "3-mile mixing zone in quiet flowing river." If a sensitive environment is along two or more types of surface water bodies (for example, Wildlife Refuge contiguous to both a moderate stream and a large river), assign the sensitive environment only to that surface water body type having the highest dilution weight value from Table 4–13.

For those sensitive environments that are wetlands, assign an additional value from Table 4–24. In assigning a value from Table 4–24, include only those portions of wetlands located along the hazardous substance migration path in the area of potential contamination, as specified in section 4.1.4.3.1.1. Aggregate these wetlands by type of surface water body, except: do not use the surface water body type "3-mile mixing zone in quiet flowing river." Treat the wetlands aggregated within each type of surface water body as separate sensitive environments solely for purposes of applying Table 4–24. Estimate the total length of the wetlands within each surface water body type as specified in section 4.1.4.3.1.1, except: for an isolated wetland or for a wetland where the probable point of entry to surface water is in the wetland, use the perimeter of that portion of the wetland subject to potential contamination (or the portion of that perimeter that is within the target distance limit) as the length. Assign a separate value from Table 4–24 for each type of surface water body in the watershed.

Calculate the potential contamination factor value (SP) for the watershed as follows:

$$SP = \frac{1}{10} \sum_{j=1}^{m} ([W_j + S_j]D_j)$$

where:

$$S_j = \sum_{i=1}^{n} S_{ij}$$

S_{ij} = Value(s) assigned from Table 4–23 to sensitive environment i in surface water body type j.

n = Number of sensitive environments from Table 4–23 subject to potential contamination.

W_j = Value assigned from Table 4–24 for wetlands along the area of potential contamination in surface water body type j.

D_j = Dilution weight from Table 4–13 for surface water body type j.

m = Number of different surface water body types from Table 4–13 in the watershed.

If SP is less than 1, do not round it to the nearest integer; if SP is 1 or more, round to the nearest integer. Enter this value for the potential contamination factor in Table 4–1.

4.1.4.3.1.4 *Calculation of environmental threat-targets factor category value.* Sum the values for the Level I concentrations, Level II concentrations, and potential contamination factors for the watershed. Do not round this sum to the nearest integer. Assign this sum as the environmental threat-targets factor category value for the watershed. Enter this value in Table 4–1.

4.1.4.4 *Calculation of environmental threat score for a watershed.* Multiply the environmental threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 60, as the environmental threat score for the watershed. Enter this score in Table 4–1.

4.1.5 *Calculation of overland/flood migration component score for a watershed.* Sum the scores for the three threats for the watershed (that is, drinking water, human food chain, and environmental threats). Assign the resulting score, subject to a maximum value of 100, as the surface water overland/flood migration component score for the watershed. Enter this score in Table 4–1.

4.1.6 *Calculation of overland/flood migration component score.* Select the highest surface water overland/flood migration component score from the watersheds evaluated. Assign this score as the surface water overland/flood migration component score for the site, subject to a maximum score of 100. Enter this score in Table 4–1.

4.2 *Ground water to surface water migration component.* Use the ground water to surface water migration component to evaluate surface water threats that result from migration of hazardous substances from a source at the site to surface water via ground water. Evaluate three types of threats for this component: drinking water threat, human food chain threat, and environmental threat.

4.2.1 *General considerations.*

4.2.1.1 *Eligible surface waters.* Calculate ground water to surface water migration component scores only for surface waters (see section 4.0.2) for which all the following conditions are met:

- A portion of the surface water is within 1 mile of one or more sources at the site having a containment factor value greater than 0 (see section 4.2.2.1.2).
- No aquifer discontinuity is established between the source and the portion of the surface water within 1 mile of the source (see section 3.0.1.2.2). However, if hazardous substances have migrated across an apparent discontinuity within this 1 mile distance, do not consider a discontinuity present in scoring the site.
- The top of the uppermost aquifer is at or above the bottom of the surface water.

Do not evaluate this component for sites consisting solely of contaminated sediments with no identified source.

4.2.1.2 *Definition of hazardous substance migration path for ground water to surface water migration component.* The hazardous substance migration path includes both the ground water segment and the surface water in-water segment that hazardous substances would take as they migrate away from sources at the site:

- Restrict the ground water segment to migration via the uppermost aquifer between a source and the surface water.
- Begin the surface water in-water segment at the probable point of entry from the uppermost aquifer to the surface water. Identify the probable point of entry as that point of the surface water that yields the shortest straight-line distance, within the aquifer boundary (see section 3.0.1.2), from the sources at the site with a containment factor value greater than 0 to the surface water.
  - –For rivers, continue the in-water segment in the direction of flow (including any tidal flows) for the distance established by the target distance limit (see section 4.2.1.4).
  - –For lakes, oceans, coastal tidal waters, or Great Lakes, do not consider flow direction. Instead apply the target distance limit as an arc.
  - –If the in-water segment includes both rivers and lakes (or oceans, coastal tidal waters, or Great Lakes), apply the target distance limit to their combined in-water segments.

Consider a site to be in two or more watersheds for this component if two or more hazardous substance migration paths from the sources at the site do not reach a common point within the target distance limit. If the site is in more than one watershed, define a separate hazardous substance migration path for each watershed. Evaluate the ground water to surface water migration component for each watershed separately as specified in section 4.2.1.5.

4.2.1.3 *Observed release of a specific hazardous substance to surface water in-water segment.* Section 4.2.2.1.1 specifies the criteria for assigning values to the observed release factor for the ground water to surface water migration component. With regard to an individual hazardous substance, consider an observed release of that hazardous substance to be established for the surface water in-water segment of the ground water to surface water migration component only when the hazardous substance meets the criteria both for an observed release both to ground water (see section 4.2.2.1.1) and for an observed release by chemical analysis to surface water (see section 4.1.2.1.1).

If the hazardous substance meets the section 4.1.2.1.1 criteria for an observed release by chemical analysis to surface water but does not also meet the criteria for an observed release to ground water, do not use any samples of that hazardous substance from the surface water in-water segment in evaluating the factors of this component (for example, do not use the hazardous substance in establishing targets subject to actual contamination or in determining the level of actual contamination for a target).

4.2.1.4 *Target distance limit.* Determine the target distance limit for each watershed as specified in section 4.1.1.2, except: do not extend the target distance limit to a sample location beyond 15 miles unless at least one hazardous substance in a sample from that location meets the criteria in section 4.2.1.3 for an observed release to the surface water in-water segment.

Determine the targets eligible to be evaluated for each watershed and establish whether these targets are subject to actual or potential contamination as specified in section 4.1.1.2, except: do not establish actual contamination based on a sample location unless at least one hazardous substance in a sample from that location meets the criteria in section 4.2.1.3 for an observed release to the surface water in-water segment.

4.2.1.5 *Evaluation of ground water to surface water migration component.* Evaluate the drinking water threat, human food chain threat, and environmental threat for each watershed for this component based on three factor categories: likelihood of release, waste characteristics, and targets. Figure 4–2 indicates the factors included within each factor category for each type of threat.

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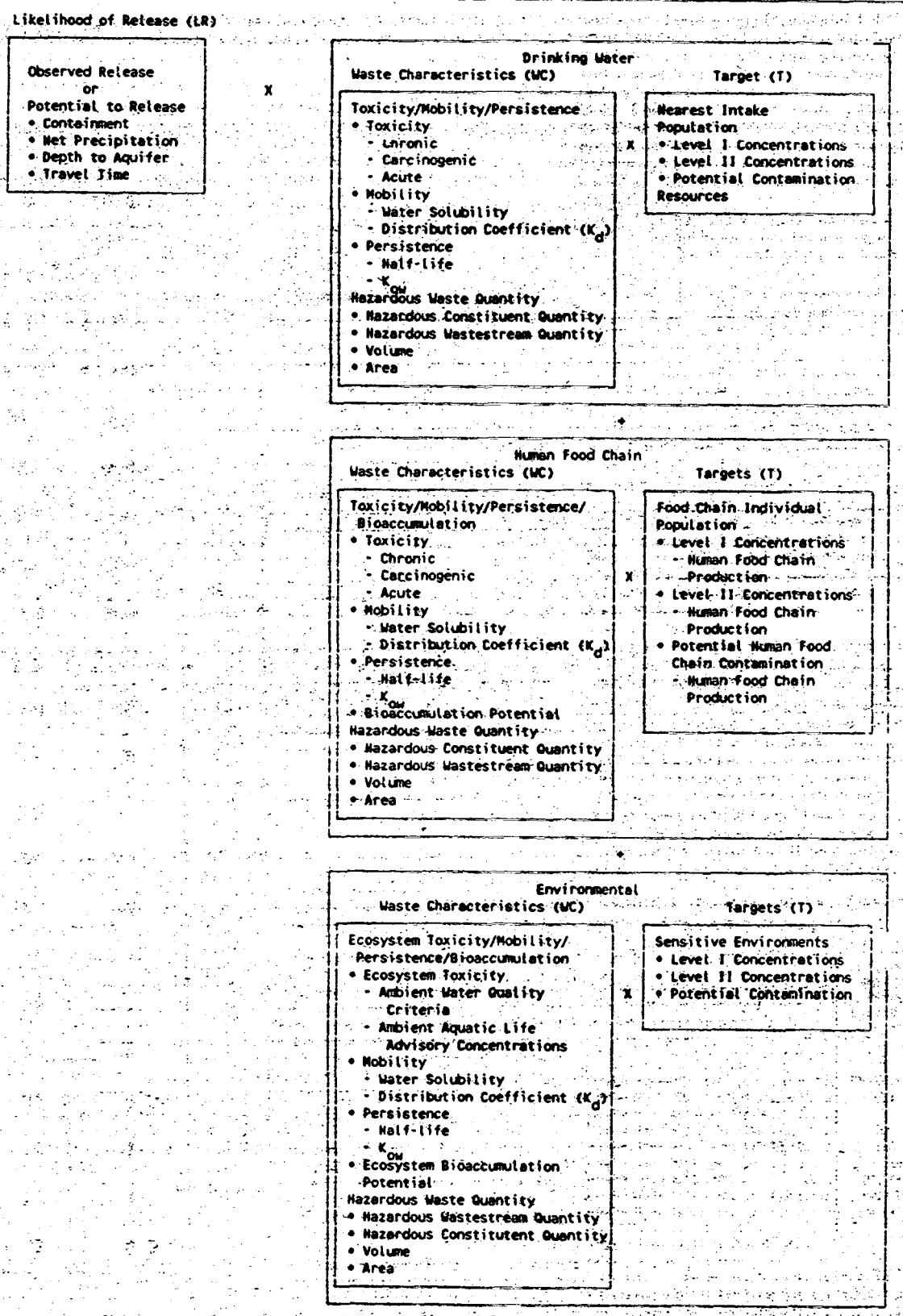

Figure 4-2
OVERVIEW OF GROUND WATER TO SURFACE WATER MIGRATION COMPONENT

Determine the ground water to surface water migration component score (S_{gs}) for a watershed in terms of the factor category values as follows:

$$S_{gs} = \frac{\sum_{i=1}^{3} (LR_i)(WC_i)(T_i)}{SF}$$

where:

LR_i = Likelihood of release factor category value for threat i (that is, drinking water, human food chain, or environmental threat).

WC_i = Waste characteristics factor category value for threat i.

T_i = Targets factor category value for threat i.

SF = Scaling factor.

Table 4–25 outlines the specific calculation procedure.

If the site is in only one watershed, assign the ground water to surface water migration component score for that watershed as the ground water to surface water migration component score for the site.

If the site is in more than one watershed:

- Calculate a separate ground water to surface water migration component score for each watershed, using likelihood of release, waste characteristics, and targets applicable to each watershed.
- Select the highest ground water to surface water migration component score from the watersheds evaluated and assign it as the ground water to surface water migration component score for the site.

TABLE 4–25.—GROUND WATER TO SURFACE WATER MIGRATION COMPONENT SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Drinking Water Threat		
Likelihood of Release to Aquifer:		
1. Observed Release	550	
2. Potential to Release:		
2a. Containment	10	
2b. Net Precipitation	10	
2c. Depth to Aquifer	5	
2d. Travel Time	35	
2e. Potential to Release (lines 2a[2b+2c+2d])	500	
3. Likelihood of Release (higher of lines 1 and 2e)	550	
Waste Characteristics:		
4. Toxicity/Mobility/Persistence	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets:		
7. Nearest Intake	50	
8. Population		
8a. Level I Concentrations	(b)	
8b. Level II Concentrations	(b)	
8c. Potential Contamination	(b)	
8d. Population (lines 8a + 8b + 8c)		
9. Resources	5	
10. Targets (lines 7 + 8d + 9)	(b)	
Drinking Water Threat Score:		
11. Drinking Water Threat Score ([lines 3 x 6 x 10]/82,500, subject to a maximum of 100)	100	
Human Food Chain Threat		
Likelihood of Release:		
12. Likelihood of Release (same value as line 3)	550	
Waste Characteristics:		
13. Toxicity/Mobility/Persistence/Bioaccumulation	(a)	
14. Hazardous Waste Quantity	(a)	
15. Waste Characteristics	1,000	
Targets:		
16. Food Chain Individual	50	
17. Population:		
17a. Level I Concentrations	(b)	
17b. Level II Concentrations	(b)	
17c. Potential Human Food Chain Contamination	(b)	
17d. Population (lines 17a + 17b + 17c)	(b)	
18. Targets (Lines 16 + 17d)	(b)	
Human Food Chain Threat Score:		
19. Human Food Chain Threat Score ([lines 12 x 15 x 18]/82,500, subject to a maximum of 100)	100	
Environmental Threat		
Likelihood of Release:		
20. Likelihood of Release (same value as line 3)	550	
Waste Characteristics:		
21 Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation	(a)	
22. Hazardous Waste Quantity	(a)	
23. Waste Characteristics	1,000	
Targets:		
24. Sensitive Environments:		
24a. Level I Concentrations	(b)	
24b. Level II Concentrations	(b)	
24c. Potential Contamination	(b)	
24d. Sensitive Environments (lines 24a + 24b + 24c)	(b)	
25. Targets (value from line 24d)	(b)	

TABLE 4–25.—GROUND WATER TO SURFACE WATER MIGRATION COMPONENT SCORESHEET—Continued

Factor categories and factors	Maximum value	Value assigned
Environmental Threat Score:		
26. Environmental Threat Score ([lines 20 x 23 x 25]/82,500, subject to a maximum of 60)	60	———
Ground Water to Surface Water Migration Component Score for a Watershed		
27. Watershed Score [c] (lines 11 + 19 + 26, subject to a maximum of 100)	100	———
28. Component Score (S_{gs}) [c] (highest score from Line 27 for all watersheds evaluated, subject to a maximum of 100)	100	———

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.

4.2.2 *Drinking water threat.* Evaluate the drinking water threat for each watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.2.2.1 *Drinking water threat-likelihood of release.* Evaluate the likelihood of release factor category for each watershed in terms of an observed release factor or a potential to release factor.

4.2.2.1.1 *Observed release.* Establish an observed release to the uppermost aquifer as specified in section 3.1.1. If an observed release can be established for the uppermost aquifer, assign an observed release factor value of 550 to that watershed, enter this value in Table 4–25, and proceed to section 4.2.2.1.3. If no observed release can be established, assign an observed release factor value of 0, enter this value in Table 4–25, and proceed to section 4.2.2.1.2.

4.2.2.1.2 *Potential to release.* Evaluate potential to release only if an observed release cannot be established for the uppermost aquifer. Calculate a potential to release value for the uppermost aquifer as specified in section 3.1.2 and sections 3.1.2.1 through 3.1.2.5. Assign the potential to release value for the uppermost aquifer as the potential to release factor value for the watershed. Enter this value in Table 4–25.

4.2.2.1.3 *Calculation of drinking water threat-likelihood of release factor category value.* If an observed release is established for the uppermost aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for the watershed. Otherwise, assign the potential to release factor value as the likelihood of release factor category value for the watershed. Enter the value assigned in Table 4–25.

4.2.2.2 *Drinking water threat-waste characteristics.* Evaluate the waste characteristics factor category for each watershed based on two factors: toxicity/mobility/persistence and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to the uppermost aquifer (see section 3.2). Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

4.2.2.2.1 *Toxicity/mobility/persistence.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, a persistence factor value, and a combined toxicity/mobility/persistence factor value as specified in sections 4.2.2.2.1.1 through 4.2.2.2.1.4.

4.2.2.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

4.2.2.2.1.2 *Mobility.* Assign a ground water mobility factor value to each hazardous substance as specified in section 3.2.1.2.

4.2.2.2.1.3 *Persistence.* Assign a surface water persistence factor value to each hazardous substance as specified in section 4.1.2.2.1.2.

4.2.2.2.1.4 *Calculation of toxicity/mobility/persistence factor value.* First, assign each hazardous substance a toxicity/mobility factor value from Table 3–9 (section 3.2.1.3), based on the values assigned to the hazardous substance for the toxicity and mobility factors. Then assign each hazardous substance a toxicity/mobility/persistence factor value from Table 4–26, based on the values assigned for the toxicity/mobility and persistence factors. Use the substance with the highest toxicity/mobility/persistence factor value for the watershed to assign the value to this factor. Enter this value in Table 4–25.

4.2.2.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned for the uppermost aquifer in section 3.2.2. Enter this value in Table 4–25.

4.2.2.2.3 *Calculation of drinking water threat-waste characteristics factor category value.* Multiply the toxicity/mobility/persistence and hazardous waste quantity factor values for the watershed, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the drinking water threat-waste characteristics factor category for the watershed. Enter this value in Table 4–25.

4.2.2.3 *Drinking water threat-targets.* Evaluate the targets factor category for each watershed based on three factors: nearest intake, population, and resources.

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TABLE 4-26
TOXICITY/MOBILITY/PERSISTENCE FACTOR VALUES[a]

Toxicity/Mobility Factor Value	Persistence Factor Value			
	1.0	0.4	0.07	0.0007
10,000	10,000	4,000	700	7
2,000	2,000	800	140	1.4
1,000	1,000	400	70	0.7
200	200	80	14	0.14
100	100	40	7	0.07
20	20	8	1.4	0.014
10	10	4	0.7	0.007
2	2	0.8	0.14	0.0014
1	1	0.4	0.07	7×10^{-4}
0.2	0.2	0.08	0.014	1.4×10^{-4}
0.1	0.1	0.04	0.007	7×10^{-5}
0.02	0.02	0.008	0.0014	1.4×10^{-5}
0.01	0.01	0.004	7×10^{-4}	7×10^{-6}
0.002	0.002	8×10^{-4}	1.4×10^{-4}	1.4×10^{-6}
0.001	0.001	4×10^{-4}	7×10^{-5}	7×10^{-7}
2×10^{-4}	2×10^{-4}	8×10^{-5}	1.4×10^{-5}	1.4×10^{-7}
1×10^{-4}	1×10^{-4}	4×10^{-5}	7×10^{-6}	7×10^{-8}
2×10^{-5}	2×10^{-5}	8×10^{-6}	1.4×10^{-6}	1.4×10^{-8}
2×10^{-6}	2×10^{-6}	8×10^{-7}	1.4×10^{-7}	1.4×10^{-9}
2×10^{-7}	2×10^{-7}	8×10^{-8}	1.4×10^{-8}	1.4×10^{-10}
2×10^{-8}	2×10^{-8}	8×10^{-9}	1.4×10^{-9}	1.4×10^{-11}
2×10^{-9}	2×10^{-9}	8×10^{-10}	1.4×10^{-10}	1.4×10^{-12}
0	0	0	0	0

[a]Do not round to nearest integer.

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For the nearest intake and population factors, determine whether the target surface water intakes are subject to actual or potential contamination as specified in section 4.1.1.2, subject to the restrictions specified in sections 4.2.1.3 and 4.2.1.4.

When the intake is subject to actual contamination, evaluate it using Level I concentrations or Level II concentrations. Determine which level applies for the intake by comparing the exposure concentrations from a sample (or comparable samples) to health-based benchmarks as specified in section 4.1.2.3, except use only those samples from the surface water in-water segment and only those hazardous substances in such samples that meet the conditions in sections 4.2.1.3 and 4.2.1.4.

4.2.2.3.1 *Nearest intake.* Assign a value to the nearest intake factor as specified in section 4.1.2.3.1 with the following modification. For the intake being evaluated, multiply its dilution weight from Table 4–13 (section 4.1.2.3.1) by a value selected from Table 4–27. Use the resulting product, not the value from Table 4–13, as the dilution weight for the intake for the ground water to surface water component. Do not round this product to the nearest integer.

Select the value from Table 4–27 based on the angle Θ, the angle defined by the sources at the site and either the two points at the intersection of the surface water body and the 1-mile distance ring of any two other points of the surface water body within the 1-mile distance ring, whichever results in the largest angle. (See Figure 4–3 for an example of how to determine Θ.) If the surface water body does not extend to the 1-mile ring at one or both ends, define Θ using the surface water endpoint(s) within the 1-mile ring or any two other points of the surface water body within the 1-mile distance ring, whichever results in the largest angle.

TABLE 4–27.—DILUTION WEIGHT ADJUSTMENTS

Angle Θ (degrees)	Assigned value [a]
0	0
Greater than 0 to 18	0.05
Greater than 18 to 54	0.1
Greater than 54 to 90	0.2
Greater than 90 to 126	0.3
Greater than 126 to 162	0.4
Greater than 162 to 198	0.5
Greater than 198 to 234	0.6
Greater than 234 to 270	0.7
Greater than 270 to 306	0.8
Greater than 306 to 342	0.9
Greater than 342 to 360	1.0

[a] Do not round to nearest integer.

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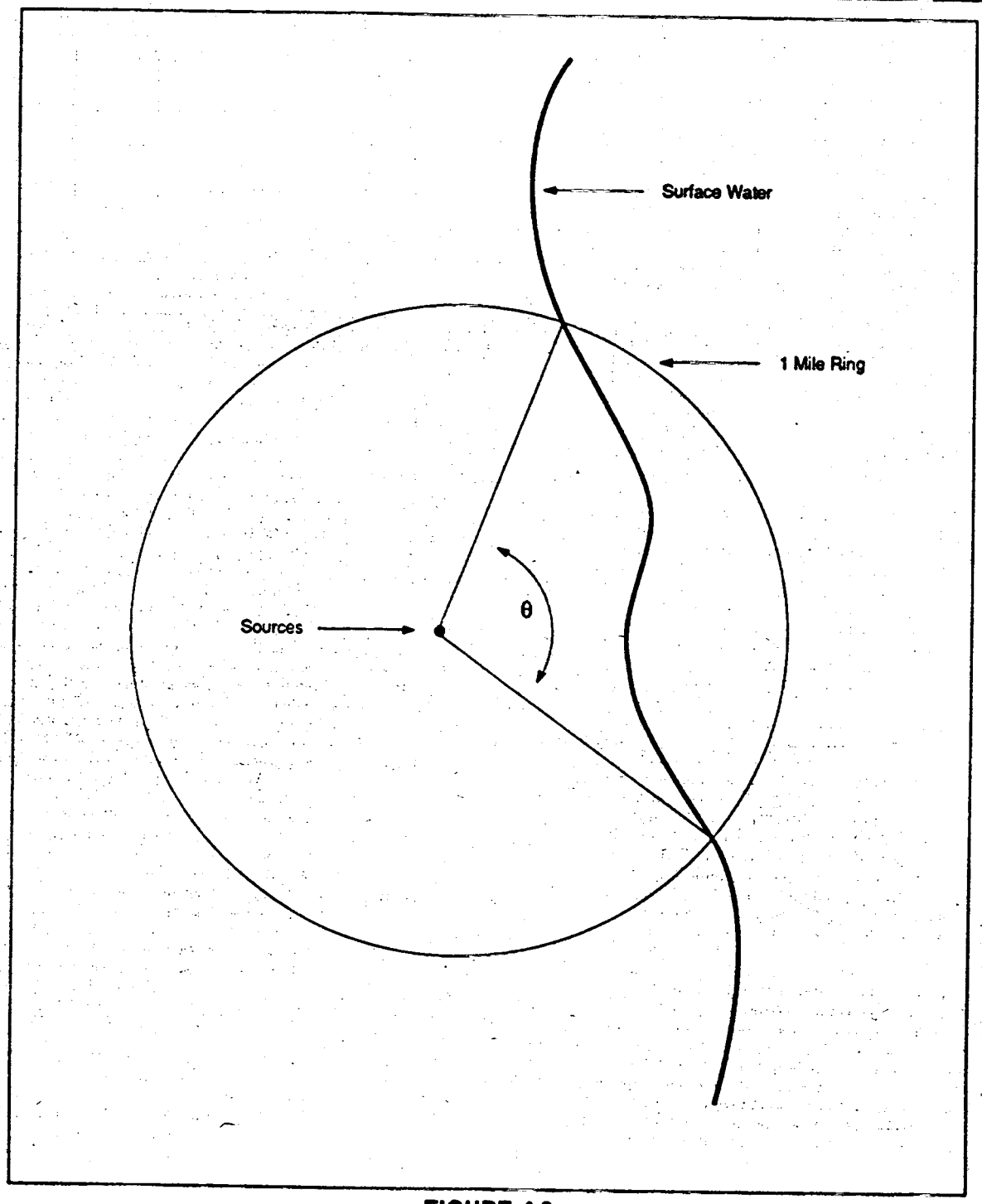

FIGURE 4-3
SAMPLE DETERMINATION OF GROUND WATER TO SURFACE WATER ANGLE

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TABLE 4-28
TOXICITY/MOBILITY/PERSISTENCE/BIOACCUMULATION FACTOR VALUES[a]

Toxicity/ Mobility/ Persistence Factor Value	Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
10,000	5×10^8	5×10^7	5×10^6	5×10^5	5×10^4	5,000
4,000	2×10^8	2×10^7	2×10^6	2×10^5	2×10^4	2,000
2,000	1×10^8	1×10^7	1×10^6	1×10^5	1×10^4	1,000
1,000	5×10^7	5×10^6	5×10^5	5×10^4	5,000	500
800	4×10^7	4×10^6	4×10^5	4×10^4	4,000	400
700	3.5×10^7	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350
400	2×10^7	2×10^6	2×10^5	2×10^4	2,000	200
200	1×10^7	1×10^6	1×10^5	1×10^4	1,000	100
140	7×10^6	7×10^5	7×10^4	7,000	700	70
100	5×10^6	5×10^5	5×10^4	5,000	500	50
80	4×10^6	4×10^5	4×10^4	4,000	400	40
70	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350	35
40	2×10^6	2×10^5	2×10^4	2,000	200	20
20	1×10^6	1×10^5	1×10^4	1,000	100	10
14	7×10^5	7×10^4	7,000	700	70	7
10	5×10^5	5×10^4	5,000	500	50	5
8	4×10^5	4×10^4	4,000	400	40	4
7	3.5×10^5	3.5×10^4	3,500	350	35	3.5
4	2×10^5	2×10^4	2,000	200	20	2
2	1×10^5	1×10^4	1,000	100	10	1
1.4	7×10^4	7,000	700	70	7	0.7

TABLE 4-28 (Continued)

Toxicity/ Mobility/ Persistence Factor Value	Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
1.0	5×10^4	5,000	500	50	5	0.5
0.8	4×10^4	4,000	400	40	4	0.4
0.7	3.5×10^4	3,500	350	35	3.5	0.35
0.4	2×10^4	2,000	200	20	2	0.2
0.2	1×10^4	1,000	100	10	1	0.1
0.14	7,000	700	70	7	0.7	0.07
0.1	5,000	500	50	5	0.5	0.05
0.08	4,000	400	40	4	0.4	0.04
0.07	3,500	350	35	3.5	0.35	0.035
0.04	2,000	200	20	2	0.2	0.02
0.02	1,000	100	10	1	0.1	0.01
0.014	700	70	7	0.7	0.07	0.007
0.01	500	50	5	0.5	0.05	0.005
0.008	400	40	4	0.4	0.04	0.004
0.007	350	35	3.5	0.35	0.035	0.0035
0.004	200	20	2	0.2	0.02	0.002
0.002	100	10	1	0.1	0.01	0.001
0.0014	70	7	0.7	0.07	0.007	7×10^{-4}
0.001	50	5	0.5	0.05	0.005	5×10^{-4}
8×10^{-4}	40	4	0.4	0.04	0.004	4×10^{-4}
7×10^{-4}	35	3.5	0.35	0.035	0.0035	3.5×10^{-4}
4×10^{-4}	20	2	0.2	0.02	0.002	2×10^{-4}

TABLE 4-28 (Continued)

Toxicity/ Mobility/ Persistence Factor Value	Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
2×10^{-4}	10	1	0.1	0.01	0.001	1×10^{-4}
1.4×10^{-4}	7	0.7	0.07	0.007	7×10^{-4}	7×10^{-5}
1×10^{-4}	5	0.5	0.05	0.005	5×10^{-4}	5×10^{-5}
8×10^{-5}	4	0.4	0.04	0.004	4×10^{-4}	4×10^{-5}
7×10^{-5}	3.5	0.35	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}
4×10^{-5}	2	0.2	0.02	0.002	2×10^{-4}	2×10^{-5}
2×10^{-5}	1	0.1	0.01	0.001	1×10^{-4}	1×10^{-5}
1.4×10^{-5}	0.7	0.07	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}
8×10^{-6}	0.4	0.04	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}
7×10^{-6}	0.35	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}
2×10^{-6}	0.1	0.01	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}
1.4×10^{-6}	0.07	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}
8×10^{-7}	0.04	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}
7×10^{-7}	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}	3.5×10^{-7}
2×10^{-7}	0.01	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}
1.4×10^{-7}	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}
8×10^{-8}	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}
7×10^{-8}	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}	3.5×10^{-7}	3.5×10^{-8}
2×10^{-8}	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}	1×10^{-8}
1.4×10^{-8}	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}

TABLE 4-28 (Concluded)

Toxicity/ Mobility/ Persistence Factor Value	Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
8×10^{-9}	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}	4×10^{-9}
2×10^{-9}	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}	1×10^{-8}	1×10^{-9}
1.4×10^{-9}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}
8×10^{-10}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}	4×10^{-9}	4×10^{-10}
1.4×10^{-10}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}	4×10^{-11}
1.4×10^{-11}	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}	7×10^{-11}	7×10^{-12}
1.4×10^{-12}	7×10^{-8}	7×10^{-9}	7×10^{-10}	7×10^{-11}	7×10^{-12}	7×10^{-13}
0	0	0	0	0	0	0

[a]Do not round to nearest integer.

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4.2.2.3.2 *Population.* Evaluate the population factor for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential contamination. Determine which factor applies to an intake as specified in section 4.2.2.3. Determine the population to be counted for that intake as specified in section 4.1.2.3.2, using the target distance limits in section 4.2.1.4 and the hazardous substance migration path in section 4.2.1.2.

4.2.2.3.2.1 *Level I concentrations.* Assign a value to this factor as specified in section 4.1.2.3.2.2.

4.2.2.3.2.2 *Level II concentrations.* Assign a value to this factor as specified in section 4.1.2.3.2.3.

4.2.2.3.2.3 *Potential contamination.* For each applicable type of surface water body in Table 4–14, determine the dilution-weighted population value as specified in section 4.1.2.3.2.4. Select the appropriate dilution weight adjustment value from Table 4–27 as specified in section 4.2.2.3.1.

Calculate the value for the potential contamination factor [PC] for the watershed as follows:

$$PC = \frac{A}{10} \sum_{i=1}^{n} W_i$$

where:

A = Dilution weight adjustment value from Table 4–27.

W_i = Dilution-weighted population from Table 4–14 for surface water body type i.

n = Number of different surface water body types in the watershed.

If PC is less than 1, do not round it to the nearest integer; if PC is 1 or more, round to the nearest integer. Enter the value in Table 4–25.

4.2.2.3.2.4 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and potential contamination. Do not round this sum to the nearest integer. Assign this sum as the population factor value for the watershed. Enter this value in Table 4–25.

4.2.2.3.3 *Resources.* Assign a value to the resources factor as specified in section 4.1.2.3.3.

4.2.2.3.4 *Calculation of drinking water threat-targets factor category value.* Sum the nearest intake, population, and resources factor values for the watershed. Do not round this sum to the nearest integer. Assign this sum as the drinking water threat-targets factor category value for the watershed. Enter this value in Table 4–25.

4.2.2.4 *Calculation of drinking water threat score for a watershed.* Multiply the drinking water threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 100, as the drinking water threat score for the watershed. Enter this score in Table 4–25.

4.2.3 *Human food chain threat.* Evaluate the human food chain threat for a watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.2.3.1 *Human food chain threat-likelihood of release.* Assign the same likelihood of release factor category value for the human food chain threat for the watershed as would be assigned in section 4.2.2.1.3 for the drinking water threat. Enter this value in Table 4–25.

4.2.3.2 *Human food chain threat-waste characteristics.* Evaluate the waste characteristics factor category for each watershed based on two factors: toxicity/mobility/persistence/bioaccumulation and hazardous waste quantity.

4.2.3.2.1 *Toxicity/mobility/persistence/bioaccumulation.* Evaluate all those hazardous substances eligible to be evaluated for toxicity/mobility/persistence in the drinking water threat for the watershed (see section 4.2.2.2.1).

4.2.3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

4.2.3.2.1.2 *Mobility.* Assign a ground water mobility factor value to each hazardous substance as specified for the drinking water threat (see section 4.2.2.2.1.2).

4.2.3.2.1.3 *Persistence.* Assign a surface water persistence factor value to each hazardous substance as specified for the drinking water threat (see section 4.2.2.2.1.3), except: use the predominant water category (that is, lakes; or rivers, oceans, coastal tidal waters, or Great Lakes) between the probable point of entry and the nearest fishery (not the nearest drinking water or resources intake) along the hazardous substance migration path for the watershed to determine which portion of Table 4–10 to use. Determine the predominant water category based on distance as specified in section 4.1.2.2.1.2.

4.2.3.2.1.4 *Bioaccumulation potential.* Assign a bioaccumulation potential factor value to each hazardous substance as specified in section 4.1.3.2.1.3.

4.2.3.2.1.5 *Calculation of toxicity/mobility/persistence/ bioaccumulation factor value.* Assign each hazardous substance a toxicity/mobility factor value from Table 3–9 (section 3.2.1.3), based on the values assigned to the hazardous substance for the toxicity and mobility factors. Then assign each hazardous substance a toxicity/mobility/persistence factor value from Table 4–26, based on the values assigned for the toxicity/mobility and persistence factors. Then assign each hazardous substance a toxicity/mobility/persistence/ bioaccumulation factor value from Table 4–28. Use the substance with the highest toxicity/mobility/persistence/ bioaccumulation factor value for the watershed to assign the value to this factor for the watershed. Enter this value in Table 4–25.

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4.2.3.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned in section 4.2.2.2.2 for the drinking water threat. Enter this value in Table 4–25.

4.2.3.2.3 *Calculation of human food chain threat-waste characteristics factor category value.* For the hazardous substance selected for the watershed in section 4.2.3.2.1.5, use its toxicity/mobility/ persistence factor value and bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category. First, multiply the toxicity/mobility/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^{8}. Then multiply this product by the bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this second product, assign a value from Table 2–7 (section 2.4.3.1) to the human food chain threat-waste characteristics factor category for the watershed. Enter this value in Table 4–25.

4.2.3.3 *Human food chain threat-targets.* Evaluate two target factors for the watershed: food chain individual and population.

For both factors, determine whether the target fisheries are subject to Level I concentrations, Level II concentrations, or potential human food chain contamination. Determine which applies to each fishery (or portion of a fishery) as specified in section 4.1.3.3, subject to the restrictions specified in sections 4.2.1.3 and 4.2.1.4.

4.2.3.3.1 *Food chain individual.* Assign a value to the food chain individual factor as specified in section 4.1.3.3.1 with the following modification. When a dilution weight is used, multiply the appropriate dilution weight from Table 4–13 by the adjustment value selected from Table 4–27, as specified in section 4.2.2.3.1. Use the resulting product, not the value from Table 4–13, as the dilution weight in assigning the factor value. Do not round this product to the nearest integer. Enter the value assigned in Table 4–25.

4.2.3.3.2 *Population.* Evaluate the population factor for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential human food chain contamination. Determine which of these factors is to be applied to each fishery as specified in section 4.2.3.3.

4.2.3.3.2.1 *Level I concentrations.* Assign a value to this factor as specified in section 4.1.3.3.2.1. Enter this value in Table 4–25.

4.2.3.3.2.2 *Level II concentrations.* Assign a value to this factor as specified in section 4.1.3.3.2.2. Enter this value in Table 4–25.

4.2.3.3.2.3 *Potential human food chain contamination.* Assign a value to this factor as specified in section 4.1.3.3.2.3 with the following modification. For each fishery being evaluated, multiply the appropriate dilution weight for that fishery from Table 4–13 by the adjustment value selected from Table 4–27, as specified in section 4.2.2.3.1. Use the resulting product, not the value from Table 4–13, as the dilution weight for the fishery. Do not round this product to the nearest integer. Enter the value assigned in Table 4–25.

4.2.3.3.2.4 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and potential human food chain contamination for the watershed. Do not round this sum to the nearest integer. Assign this sum as the population factor value for the watershed. Enter this value in Table 4–25.

4.2.3.3.3 *Calculation of human food chain threat-targets factor category value.* Sum the food chain individual and population factor values for the watershed. Do not round this sum to the nearest integer. Assign this sum as the human food chain threat-targets factor category value for the watershed. Enter this value in Table 4–25.

4.2.3.4 *Calculation of human food chain threat score for a watershed.* Multiply the human food chain threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 100, as the human food chain threat score for the watershed. Enter this score in Table 4–25.

4.2.4 *Environmental threat.* Evaluate the environmental threat for the watershed based on three factor categories: likelihood of release, waste characteristics, and targets.

4.2.4.1 *Environmental threat-likelihood of release.* Assign the same likelihood of release factor category value for the environmental threat for the watershed as would be assigned in section 4.2.2.1.3 for the drinking water threat. Enter this value in Table 4–25.

4.2.4.2 *Environmental threat-waste characteristics.* Evaluate the waste characteristics factor category for each watershed based on two factors: ecosystem toxicity/mobility/persistence/ bioaccumulation and hazardous waste quantity.

4.2.4.2.1 *Ecosystem toxicity/mobility/ persistence/bioaccumulation.* Evaluate all those hazardous substances eligible to be evaluated for toxicity/mobility/persistence in the drinking water threat for the watershed (see section 4.2.2.2.1).

4.2.4.2.1.1 *Ecosystem toxicity.* Assign an ecosystem toxicity factor value to each hazardous substance as specified in section 4.1.4.2.1.1.

4.2.4.2.1.2 *Mobility.* Assign a ground water mobility factor value to each hazardous substance as specified in section 4.2.2.2.1.2 for the drinking water threat.

4.2.4.2.1.3 *Persistence.* Assign a surface water persistence factor value to each hazardous substance as specified in section 4.2.2.2.1.3 for the drinking water threat, except: use the predominant water category (that is, lakes; or rivers, oceans, coastal tidal waters, or Great Lakes) between the probable point of entry and the nearest sensitive environment (not the nearest drinking water or resources intake) along the hazardous substance migration path for the watershed to determine which portion of Table 4–10 to use. Determine the predominant water category based on distance as specified in section 4.1.2.2.1.2.

4.2.4.2.1.4 *Ecosystem bioaccumulation potential.* Assign an ecosystem bioaccumulation potential factor value to each hazardous substance as specified in section 4.1.4.2.1.3.

4.2.4.2.1.5 *Calculation of ecosystem toxicity/mobility/persistence/ bioaccumulation factor value.* Assign each hazardous substance an ecosystem toxicity/ mobility factor value from Table 3–9 (section 3.2.1.3), based on the values assigned to the hazardous substance for the ecosystem toxicity and mobility factors. Then assign each hazardous substance an ecosystem toxicity/mobility/persistence factor value from Table 4–29, based on the values assigned for the ecosystem toxicity/mobility and persistence factors. Then assign each hazardous substance an ecosystem toxicity/ mobility/persistence/bioaccumulation factor value from Table 4–30, based on the values assigned for the ecosystem toxicity/mobility/ persistence and ecosystem bioaccumulation potential factors. Select the substance with the highest ecosystem toxicity/mobility/ persistence/bioaccumulation factor value for the watershed and use it to assign the value to this factor for the watershed. Enter this value in Table 4–25.

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TABLE 4-29
ECOSYSTEM TOXICITY/MOBILITY/PERSISTENCE FACTOR VALUES[a]

Ecosystem Toxicity/Mobility Factor Value	Persistence Factor Value			
	1.0	0.4	0.07	0.0007
10,000	10,000	4,000	700	7
2,000	2,000	800	140	1.4
1,000	1,000	400	70	0.7
200	200	80	14	0.14
100	100	40	7	0.07
20	20	8	1.4	0.014
10	10	4	0.7	0.007
2	2	0.8	0.14	0.0014
1	1	0.4	0.07	7×10^{-4}
0.2	0.2	0.08	0.014	1.4×10^{-4}
0.1	0.1	0.04	0.007	7×10^{-5}
0.02	0.02	0.008	0.0014	1.4×10^{-5}
0.01	0.01	0.004	7×10^{-4}	7×10^{-6}
0.002	0.002	8×10^{-4}	1.4×10^{-4}	1.4×10^{-6}
0.001	0.001	4×10^{-4}	7×10^{-5}	7×10^{-7}
2×10^{-4}	2×10^{-4}	8×10^{-5}	1.4×10^{-5}	1.4×10^{-7}
1×10^{-4}	1×10^{-4}	4×10^{-5}	7×10^{-6}	7×10^{-8}
2×10^{-5}	2×10^{-5}	8×10^{-6}	1.4×10^{-6}	1.4×10^{-8}
2×10^{-6}	2×10^{-6}	8×10^{-7}	1.4×10^{-7}	1.4×10^{-9}
2×10^{-7}	2×10^{-7}	8×10^{-8}	1.4×10^{-8}	1.4×10^{-10}
2×10^{-8}	2×10^{-8}	8×10^{-9}	1.4×10^{-9}	1.4×10^{-11}
2×10^{-9}	2×10^{-9}	8×10^{-10}	1.4×10^{-10}	1.4×10^{-12}
0	0	0	0	0

[a]Do not round to nearest integer.

TABLE 4-30
ECOSYSTEM TOXICITY/MOBILITY/PERSISTENCE/BIOACCUMULATION FACTOR VALUES[a]

Ecosystem Toxicity/ Mobility/ Persistence Factor Value	Ecosystem Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
10,000	5×10^8	5×10^7	5×10^6	5×10^5	5×10^4	5,000
4,000	2×10^8	2×10^7	2×10^6	2×10^5	2×10^4	2,000
2,000	1×10^8	1×10^7	1×10^6	1×10^5	1×10^4	1,000
1,000	5×10^7	5×10^6	5×10^5	5×10^4	5,000	500
800	4×10^7	4×10^6	4×10^5	4×10^4	4,000	400
700	3.5×10^7	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350
400	2×10^7	2×10^6	2×10^5	2×10^4	2,000	200
200	1×10^7	1×10^6	1×10^5	1×10^4	1,000	100
140	7×10^6	7×10^5	7×10^4	7,000	700	70
100	5×10^6	5×10^5	5×10^4	5,000	500	50
80	4×10^6	4×10^5	4×10^4	4,000	400	40
70	3.5×10^6	3.5×10^5	3.5×10^4	3,500	350	35
40	2×10^6	2×10^5	2×10^4	2,000	200	20
20	1×10^6	1×10^5	1×10^4	1,000	100	10
14	7×10^5	7×10^4	7,000	700	70	7
10	5×10^5	5×10^4	5,000	500	50	5
8	4×10^5	4×10^4	4,000	400	40	4
7	3.5×10^5	3.5×10^4	3,500	350	35	3.5
4	2×10^5	2×10^4	2,000	200	20	2
2	1×10^5	1×10^4	1,000	100	10	1
1.4	7×10^4	7,000	700	70	7	0.7

TABLE 4-30 (Continued)

Ecosystem Toxicity/ Mobility/ Persistence Factor Value	Esosystem Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
1.0	5×10^4	5,000	500	50	5	0.5
0.8	4×10^4	4,000	400	40	4	0.4
0.7	3.5×10^4	3,500	350	35	3.5	0.35
0.4	2×10^4	2,000	200	20	2	0.2
0.2	1×10^4	1,000	100	10	1	0.1
0.14	7,000	700	70	7	0.7	0.07
0.1	5,000	500	50	5	0.5	0.05
0.08	4,000	400	40	4	0.4	0.04
0.07	3,500	350	35	3.5	0.35	0.035
0.04	2,000	200	20	2	0.2	0.02
0.02	1,000	100	10	1	0.1	0.01
0.014	700	70	7	0.7	0.07	0.007
0.01	500	50	5	0.5	0.05	0.005
0.008	400	40	4	0.4	0.04	0.004
0.007	350	35	3.5	0.35	0.035	0.0035
0.004	200	20	2	0.2	0.02	0.002
0.002	100	10	1	0.1	0.01	0.001
0.0014	70	7	0.7	0.07	0.007	7×10^{-4}
0.001	50	5	0.5	0.05	0.005	5×10^{-4}
8×10^{-4}	40	4	0.4	0.04	0.004	4×10^{-4}
7×10^{-4}	35	3.5	0.35	0.035	0.0035	3.5×10^{-4}
4×10^{-4}	20	2	0.2	0.02	0.002	2×10^{-4}

TABLE 4-30 (Continued)

Ecosystem Toxicity/ Mobility/ Persistence Factor Value	Ecosystem Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
2×10^{-4}	10	1	0.1	0.01	0.001	1×10^{-4}
1.4×10^{-4}	7	0.7	0.07	0.007	7×10^{-4}	7×10^{-5}
1×10^{-4}	5	0.5	0.05	0.005	5×10^{-4}	5×10^{-5}
8×10^{-5}	4	0.4	0.04	0.004	4×10^{-4}	4×10^{-5}
7×10^{-5}	3.5	0.35	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}
4×10^{-5}	2	0.2	0.02	0.002	2×10^{-4}	2×10^{-5}
2×10^{-5}	1	0.1	0.01	0.001	1×10^{-4}	1×10^{-5}
1.4×10^{-5}	0.7	0.07	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}
8×10^{-6}	0.4	0.04	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}
7×10^{-6}	0.35	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}
2×10^{-6}	0.1	0.01	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}
1.4×10^{-6}	0.07	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}
8×10^{-7}	0.04	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}
7×10^{-7}	0.035	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}	3.5×10^{-7}
2×10^{-7}	0.01	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}
1.4×10^{-7}	0.007	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}
8×10^{-8}	0.004	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}
7×10^{-8}	0.0035	3.5×10^{-4}	3.5×10^{-5}	3.5×10^{-6}	3.5×10^{-7}	3.5×10^{-8}
2×10^{-8}	0.001	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}	1×10^{-8}
1.4×10^{-8}	7×10^{-4}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}

TABLE 4-30 (Concluded)

Ecosystem Toxicity/ Mobility/ Persistence Factor Value	Ecosystem Bioaccumulation Potential Factor Value					
	50,000	5,000	500	50	5	0.5
8×10^{-9}	4×10^{-4}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}	4×10^{-9}
2×10^{-9}	1×10^{-4}	1×10^{-5}	1×10^{-6}	1×10^{-7}	1×10^{-8}	1×10^{-9}
1.4×10^{-9}	7×10^{-5}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}
8×10^{-10}	4×10^{-5}	4×10^{-6}	4×10^{-7}	4×10^{-8}	4×10^{-9}	4×10^{-10}
1.4×10^{-10}	7×10^{-6}	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}	4×10^{-11}
$1 4 \times 10^{-11}$	7×10^{-7}	7×10^{-8}	7×10^{-9}	7×10^{-10}	7×10^{-11}	7×10^{-12}
$1 4 \times 10^{-12}$	7×10^{-8}	7×10^{-9}	7×10^{-10}	7×10^{-11}	7×10^{-12}	7×10^{-13}
0	0	0	0	0	0	0

[a] Do not round to nearest integer.

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4.2.4.2.2 *Hazardous waste quantity.* Assign the same factor value for hazardous waste quantity for the watershed as would be assigned in section 4.2.2.2.2 for the drinking water threat. Enter this value in Table 4–25.

4.2.4.2.3 *Calculation of environmental threat-waste characteristics factor category value.* For the hazardous substance selected for the watershed in section 4.2.4.2.1.5, use its ecosystem toxicity/mobility/persistence factor value and ecosystem bioaccumulation potential factor value as follows to assign a value to the waste characteristics factor category. First, multiply the ecosystem toxicity/mobility/persistence factor value and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^8. Then multiply this product by the ecosystem bioaccumulation potential factor value for this hazardous substance, subject to a maximum product of 1×10^{12}. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the environmental threat-waste characteristics category for the watershed. Enter the value in Table 4–25.

4.2.4.3 *Environmental threat-targets.* Evaluate the environmental threat-targets factor category for a watershed using one factor: sensitive environments.

4.2.4.3.1 *Sensitive environments.* Evaluate sensitive environments for the watershed based on three factors: Level I concentrations, Level II concentrations, and potential contamination. Determine which applies to each sensitive environment as specified in section 4.1.4.3.1, except: use only those samples from the surface water in-water segment and only those hazardous substances in such samples that meet the conditions in sections 4.2.1.3 and 4.2.1.4.

4.2.4.3.1.1 *Level I concentrations.* Assign a value to this factor as specified in section 4.1.4.3.1.1. Enter this value in Table 4–25.

4.2.4.3.1.2 *Level II concentrations.* Assign a value to this factor as specified in section 4.1.4.3.1.2. Enter this value in Table 4–25.

4.2.4.3.1.3 *Potential contamination.* Assign a value to this factor as specified in section 4.1.4.3.1.3 with the following modification. Multiply the appropriate dilution weight from Table 4–13 for the sensitive environments in each type of surface water body by the adjustment value selected from Table 4–27, as specified in section 4.2.2.3.1. Use the resulting product, not the value from Table 4–13, as the dilution weight for the sensitive environments in that type of surface water body. Do not round this product to the nearest integer. Enter the value assigned in Table 4–25.

4.2.4.3.1.4 *Calculation of environmental threat-targets-factor category value.* Sum the values for Level I concentrations, Level II concentrations, and potential contamination for the watershed. Do not round this sum to the nearest integer. Assign this sum as the environmental threat targets factor category value for the watershed. Enter this value in Table 4–25.

4.2.4.4 *Calculation of environmental threat score for a watershed.* Multiply the environmental threat factor category values for likelihood of release, waste characteristics, and targets for the watershed, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum of 60, as the environmental threat score for the watershed. Enter this score in Table 4–25.

4.2.5 *Calculation of ground water to surface water migration component score for a watershed.* Sum the scores for the three threats for the watershed (that is, drinking water, human food chain, and environmental threats). Assign the resulting score, subject to a maximum value of 100, as the ground water to surface water migration component score for the watershed. Enter this score in Table 4–25.

4.2.6 *Calculation of ground water to surface water migration component score.* Select the highest ground water to surface water migration component score from the watersheds evaluated. Assign this score as the ground water to surface water migration component score for the site, subject to a maximum score of 100. Enter this score in Table 4–25.

4.3 *Calculation of surface water migration pathway score.* Determine the surface water migration pathway score as follows:

- If only one of the two surface water migration components (overland/flood or ground water to surface water) is scored, assign the score of that component as the surface water migration pathway score.
- If both components are scored, select the higher of the two component scores from sections 4.1.6 and 4.2.6. Assign that score as the surface water migration pathway score.

5.0 Soil Exposure Pathway

Evaluate the soil exposure pathway based on two threats: Resident population threat and nearby population threat. Evaluate both threats based on three factor categories: Likelihood of exposure, waste characteristics, and targets. Figure 5–1 indicates the factors included within each factor category for each type of threat.

Determine the soil exposure pathway score (S_s) in terms of the factor category values as follows:

$$S_s = \frac{\sum_{i=1}^{2} (LE_i)(WC_i)(T_i)}{SF}$$

where:

LE_i = Likelihood of exposure factor category value for threat i (that is, resident population threat or nearby population threat).

WC_i = Waste characteristics factor category value for threat i.

T_i = Targets factor category value for threat i.

SF = Scaling factor.

Table 5–1 outlines the specific calculation procedure.

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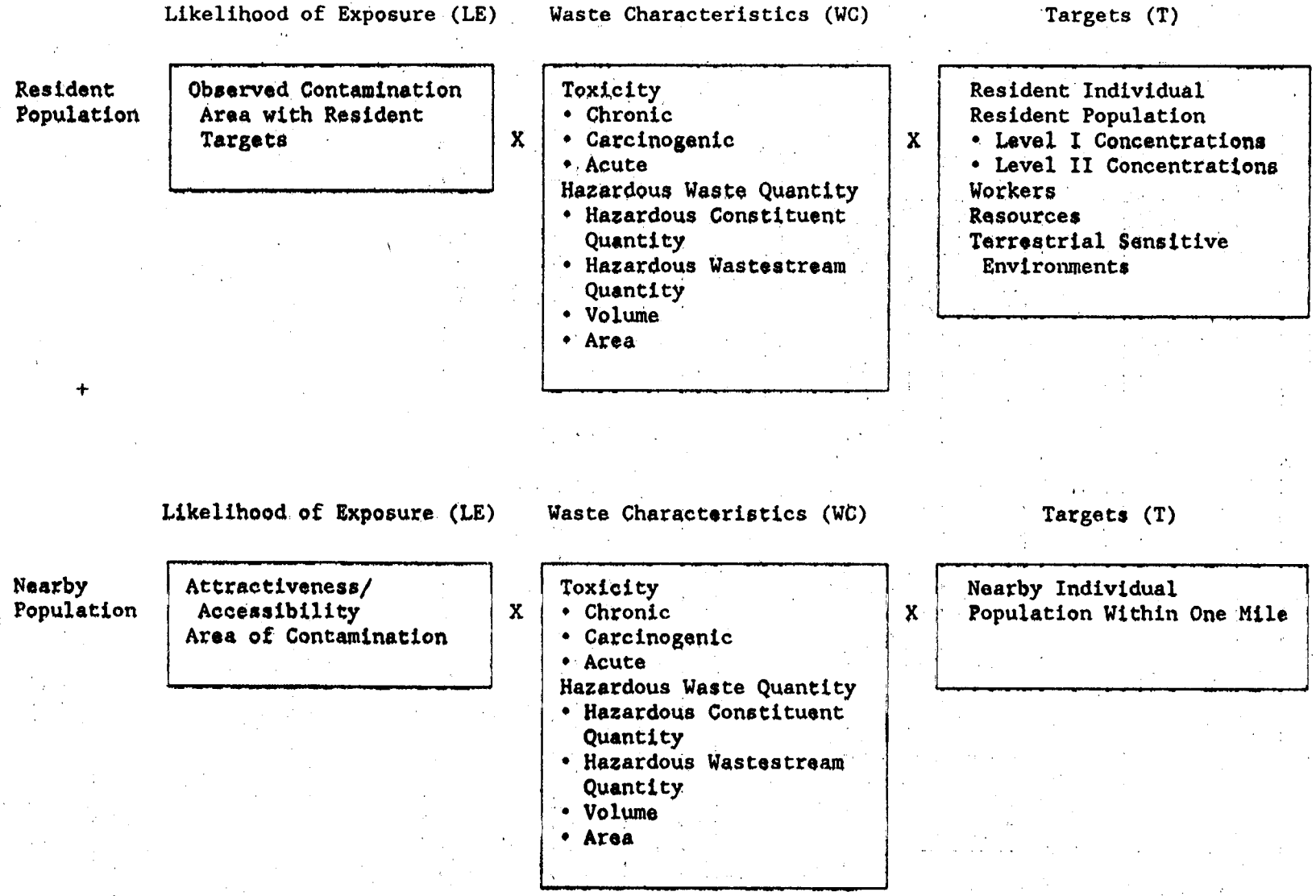

Figure 5-1
OVERVIEW OF SOIL EXPOSURE PATHWAY

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TABLE 5-1.—SOIL EXPOSURE PATHWAY SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Resident Population Threat		
Likelihood of Exposure		
1. Likelihood of Exposure	550	
Waste Characteristics		
2. Toxicity	(a)	
3. Hazardous Waste Quantity	(a)	
4. Waste Characteristics	100	
Targets		
5. Resident Individual	50	
6 Resident Population:		
6a. Level I Concentrations	(b)	
6b. Level II Concentrations	(b)	
6c. Resident Population (lines 6a + 6b)	(b)	
7. Workers	15	
8. Resources	5	
9. Terrestrial Sensitive Environments	(c)	
10. Targets (lines 5 + 6c + 7 + 8 + 9)	(b)	
Resident Population Threat Score		
11. Resident Population Threat (lines 1 × 4 × 10)	(b)	
Nearby Population Threat		
Likelihood of Exposure		
12. Attractiveness/Accessibility	100	
13. Area of Contamination	100	
14. Likelihood of Exposure	500	
Waste Characteristics		
15. Toxicity	(a)	
16. Hazardous Waste Quantity	(a)	
17. Waste Characteristics	100	
Targets		
18. Nearby Individual	1	
19. Population Within 1 Mile	(b)	
20. Targets (lines 18 + 19)	(b)	
Nearby Population Threat Score		
21. Nearby Population Threat (lines 14 × 17 × 20)	(b)	
Soil Exposure Pathway Score		
22. Soil Exposure Pathway Score [d] (S_s), (lines [11+21] / 82,500, subject to a maximum of 100)	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum of 60
[d] Do not round to nearest integer.

5.0.1 *General considerations.* Evaluate the soil exposure pathway based on areas of observed contamination:

- Consider observed contamination to be present at sampling locations where analytic evidence indicates that:
  - –A hazardous substance attributable to the site is present at a concentration significantly above background levels for the site (see Table 2–3 in section 2.3 for the criteria for determining analytical significance), *and*
  - –This hazardous substance, if not present at the surface, is covered by 2 feet or less of cover material (for example, soil).
- Establish areas of observed contamination based on sampling locations at which there is observed contamination as follows:
  - –For all sources except contaminated soil, if observed contamination from the site is present at any sampling location within the source, consider that entire source to be an area of observed contamination.
  - –For contaminated soil, consider both the sampling location(s) with observed contamination from the site and the area lying between such locations to be an area of observed contamination, unless available information indicates otherwise.
- If an area of observed contamination (or portion of such an area) is covered by a permanent, or otherwise maintained, essentially impenetrable material (for example, asphalt) that is not more than 2 feet thick, exclude that area (or portion of the area) in evaluating the soil exposure pathway.
- For an area of observed contamination, consider only those hazardous substances that meet the criteria for observed contamination for that area to be associated with that area in evaluating the soil exposure pathway (see section 2.2.2).

If there is observed contamination, assign scores for the resident population threat and the nearby population threat, as specified in sections 5.1 and 5.2. If there is no observed contamination, assign the soil exposure pathway a score of 0.

5.1 *Resident Population Threat.* Evaluate the resident population threat only if there is an area of observed contamination in one or more of the following locations:

- Within the property boundary of a residence, school, or day care center *and* within 200 feet of the respective residence, school, or day care center, or
- Within a workplace property boundary *and* within 200 feet of a workplace area, or
- Within the boundaries of a resource specified in section 5.1.3.4, or
- Within the boundaries of a terrestrial sensitive environment specified in section 5.1.3.5.

If not, assign the resident population threat a value of 0, enter this value in Table 5–1, and proceed to the nearby population threat (section 5.2).

5.1.1 *Likelihood of exposure.* Assign a value of 550 to the likelihood of exposure factor category for the resident population threat if there is an area of observed contamination in one or more locations listed in section 5.1. Enter this value in Table 5–1.

5.1.2 *Waste characteristics.* Evaluate waste characteristics based on two factors: toxicity and hazardous waste quantity. Evaluate only those hazardous substances that meet the criteria for observed contamination at the site (see section 5.0.1).

5.1.2.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1. Use the hazardous substance with the highest toxicity factor value to assign the value to the toxicity factor for the resident population threat. Enter this value in Table 5–1.

5.1.2.2 *Hazardous waste quantity.* Assign hazardous waste quantity factor value as specified in section 2.4.2. In estimating the hazardous waste quantity, use Table 5–2 and

• Consider only the first 2 feet of depth of an area of observed contamination, except as specified for the volume measure.

• Use the volume measure (see section 2.4.2.1.3) only for those types of areas of observed contamination listed in Tier C of Table 5–2. In evaluating the volume measure for these listed areas of observed contamination, use the full volume, not just the volume within the top 2 feet.

• Use the area measure (see section 2.4.2.1.4), not the volume measure, for all other types of areas of observed contamination, even if their volume is known.

Enter the value assigned in Table 5–1.

TABLE 5–2.—HAZARDOUS WASTE QUANTITY EVALUATION EQUATIONS FOR SOIL EXPOSURE PATHWAY

Tier	Measure	Units	Equation for assigning value [a]
A	Hazardous Constituent Quantity (C)	lb	C
B [b]	Hazardous Wastestream Quantity (W)	lb	W/5,000
C [b]	Volume (V)		
	Surface Impoundment [c]	yd^3	V/2.5
	Drums [d]	gallon	V/500
	Tanks and Containers Other Than Drums	yd^3	V/2.5
D [b]	Area (A)		
	Landfill	ft^2	A/34,000
	Surface Impoundment	ft^2	A/13
	Surface Impoundment (Buried/backfilled)	ft^2	A/13
	Land treatment	ft^2	A/270
	Pile [e]	ft^2	A/34
	Contaminated Soil	ft^2	A/34,000

[a] Do not round nearest integer.
[b] Convert volume to mass when necessary: 1 ton=2,000 pounds=1 cubic yard=4 drums=200 gallons.
[c] Use volume measure only for surface impoundments containing hazardous substances present as liquids. Use area measures in Tier D for dry surface impoundments and for buried/backfilled surface impoundments.
[d] If actual volume of drums is unavailable, assume 1 drum=50 gallons.
[e] Use land surface area under pile, not surface area of pile.

5.1.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 5–1.

5.1.3 *Targets.* Evaluate the targets factor category for the resident population threat based on five factors: resident individual, resident population, workers, resources, and terrestrial sensitive environments.

In evaluating the targets factor category for the resident population threat, count only the following as targets:

• Resident individual—a person living or attending school or day care on a property with an area of observed contamination *and* whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination.

• Worker—a person working on a property with an area of observed contamination *and* whose workplace area is on or within 200 feet of the area of observed contamination.

• Resources located on an area of observed contamination, as specified in section 5.1.

• Terrestrial sensitive environments located on an area of observed contamination, as specified in section 5.1.

5.1.3.1 *Resident individual.* Evaluate this factor based on whether there is a resident individual, as specified in section 5.1.3, who is subject to Level I or Level II concentrations.

First, determine those areas of observed contamination subject to Level I concentrations and those subject to Level II concentrations as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 5–3 in determining the level of contamination. Then assign a value to the resident individual factor as follows:

• Assign a value of 50 if there is at least one resident individual for one or more areas subject to Level I concentrations.

• Assign a value of 45 if there is no such resident individuals, but there is at least one resident individual for one or more areas subject to Level II concentrations.

• Assign a value of 0 if there is no resident individual.

Enter the value assigned in Table 5–1.

5.1.3.2 *Resident population.* Evaluate resident population based on two factors: Level I concentrations and Level II concentrations. Determine which factor applies as specified in sections 2.5.1 and 2.5.2, using the health-based benchmarks from Table 5–3. Evaluate populations subject to Level I concentrations as specified in section 5.1.3.2.1 and populations subject to Level II concentrations as specified in section 5.1.3.2.2.

TABLE 5–3.—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN SOILS

• Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for oral exposures.

• Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for oral exposures.

Count only those persons meeting the criteria for resident individual as specified in section 5.1.3. In estimating the number of people living on property with an area of observed contamination, when the estimate in based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

5.1.3.2.1 *Level I concentrations.* Sum the number of resident individuals subject to Level I concentrations and multiply this sum by 10. Assign the resulting product as the value for this factor. Enter this value in Table 5–1.

5.1.3.2.2 *Level II concentrations.* Sum the number of resident individuals subject to Level II concentrations. Do not include those people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 5–1.

5.1.3.2.3 *Calculation of resident population factor value.* Sum the factor values for Level I concentrations and Level II concentrations. Assign this sum as the resident population factor value. Enter this value in Table 5–1.

5.1.3.3 *Workers.* Evaluate this factor based on the number of workers that meet the section 5.1.3 criteria. Assign a value for these workers using Table 5–4. Enter this value in Table 5–1.

TABLE 5–4.—FACTOR VALUES FOR WORKERS

Number of workers	Assigned value
0	0
1 to 100	5
101 to 1,000	10
Greater than 1,000	15

5.1.3.4 *Resources.* Evaluate the resources factor as follows:

• Assign a value of 5 to the resources factor if one or more of the following is present on an area of observed contamination at the site:

–Commercial agriculture.
–Commercial silviculture.
–Commercial livestock production or commercial livestock grazing.

• Assign a value of 0 if none of the above are present.

Enter the value assigned in Table 5–1.

5.1.3.5 *Terrestrial sensitive environments.* Assign value(s) from Table 5–5 to each terrestrial sensitive environment that meets the eligibility criteria of section 5.1.3.

Calculate a value (ES) for terrestrial sensitive environments as follows:

$$ES = \sum_{i=1}^{n} S_i$$

where:

S_i = Value(s) assigned from Table 5–5 to terrestrial sensitive environment i.

n=Number of terrestrial sensitive environments meeting section 5.1.3 criteria.

Because the pathway score based solely on terrestrial sensitive environments is limited to a maximum of 60, determine the value for the terrestrial sensitive environments factor as follows:

TABLE 5–5.—TERRESTRIAL SENSITIVE ENVIRONMENTS RATING VALUES

Terrestrial sensitive environments	Assigned value
Terrestrial critical habitat [a] for Federal designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument	
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species	75
National Preserve (terrestrial)	
National or State Terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	
Terrestrial areas utilized for breeding by large or dense aggregations of animals [b]	
Terrestrial habitat known to be used by State designated endangered or threatened species	50
Terrestrial habitat known to be used by species under review as to its Federal designated endangered or threatened status	
State lands designated for wildlife or game management	25
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	

[a] Critical habitat as defined in 50 CFR 424.02.
[b] Limit to vertebrate species.

• Multiply the values assigned to the resident population threat for likelihood of exposure (LE), waste characteristics (WC), and ES. Divide the product by 82,500.

–If the result is 60 or less, assign the value ES as the terrestrial sensitive environments factor value.

–If the result exceeds 60, calculate a value EC as follows:

$$EC = \frac{(60)(82{,}500)}{(LE)(WC)}$$

Assign the value EC as the terrestrial sensitive environments factor value. Do not round this value to the nearest interger.

Enter the value assigned for the terrestrial sensitive environments factor in Table 5–1.

5.1.3.6 *Calculation of resident population targets factor category value.* Sum the values for the resident individual, resident population, workers, resources, and terrestrial sensitive environments factors. Do not round to the nearest integer. Assign this sum as the targets factor category value for the resident population threat. Enter this value in Table 5–1.

5.1.4 *Calculation of resident population threat score.* Multiply the values for likelihood of exposure, waste characteristics, and targets for the resident population threat, and round the product to the nearest integer. Assign this product as the resident population threat score. Enter this score in Table 5–1.

5.2 *Nearby population threat.* Include in the nearby population only those individuals who live or attend school within a 1-mile travel distance of an area of observed contamination at the site and who do not meet the criteria for resident individual as specified in section 5.1.3.

Do not consider areas of observed contamination that have an attractiveness/accessibility factor value of 0 (see section 5.2.1.1) in evaluating the nearby population threat.

5.2.1 *Likelihood of exposure.* Evaluate two factors for the likelihood of exposure factor category for the nearby population threat: attractiveness/accessibility and area of contamination.

5.2.1.1. *Attractiveness/accessibility.* Assign a value for attractiveness/accessibility from Table 5–6 to each area of observed contamination, excluding any land used for residences. Select the highest value assigned to the areas evaluated and use it as the value for the attractiveness/accessibility factor. Enter this value in Table 5–1.

5.2.1.2 *Area of contamination.* Evaluate area of contamination based on the total area of the areas of observed contamination at the site. Count only the area(s) that meet the criteria in section 5.0.1 and that receive an attractiveness/accessibility value greater than 0. Assign a value to this factor from Table 5–7. Enter this value in Table 5–1.

TABLE 5–6.—ATTRACTIVENESS/ ACCESSIBILITY VALUES

Area of observed contamination	Assigned value
Designated recreational area	100
Regularly used for public recreation (for example, fishing, hiking, softball)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements—for example, gravel road), with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement), with some public recreation use	25
Accessible, with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

TABLE 5–7.—AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned value
Less than or equal to 5,000	5
Greater than 5,000 to 125,000	20
Greater than 125,000 to 250,000	40
Greater than 250,000 to 375,000	60
Greater than 375,000 to 500,000	80
Greater than 500,000	100

5.2.1.3 *Likelihood of exposure factor category value.* Assign a value from Table 5–8 to the likelihood of exposure factor category, based on the values assigned to the attractiveness/accessibility and area of contamination factors. Enter this value in Table 5–1.

TABLE 5–8.—NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

Area of contamination factor value	Attractiveness/accessibility factor value						
	100	75	50	25	10	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

5.2.2 *Waste characteristics.* Evaluate waste characteristics based on two factors: toxicity and hazardous waste quantity. Evaluate only those hazardous substances that meet the criteria for observed contamination (see section 5.0.1) at areas that can be assigned an attractiveness/accessibility factor value greater than 0.

5.2.2.1 *Toxicity.* Assign a toxicity factor value as specified in section 2.4.1.1 to each hazardous substance meeting the criteria in section 5.2.2. Use the hazardous substance with the highest toxicity factor value to assign the value to the toxicity factor for the nearby population threat. Enter this value in Table 5–1.

5.2.2.2 *Hazardous waste quantity.* Assign a value to the hazardous waste quantity factor as specified in section 5.1.2.2, except: consider only those areas of observed contamination that can be assigned an attractiveness/accessibility factor value greater than 0. Enter the value assigned in Table 5–1.

5.2.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 5–1.

5.2.3 *Targets.* Evaluate the targets factory category for the nearby population threat based on two factors: nearby individual and population within a 1-mile travel distance from the site.

5.2.3.1 *Nearby individual.* If one or mor persons meet the section 5.1.3 criteria for a

resident individual, assign this factor a value of 0. Enter this value in Table 5–1.

If no person meets the criteria for a resident individual, determine the shortest travel distance from the site to any residence or school. In determining the travel distance, measure the shortest overland distance an individual would travel from a residence or school to the nearest area of observed contamination for the site with an attractiveness/accessibility factor value greater than 0. If there are no natural barriers to travel, measure the travel distance as the shortest straight-line distance from the residence or school to the area of observed contamination. If natural barriers exist (for example, a river), measure the travel distance as the shortest straight-line distance from the residence or school to the nearest crossing point and from there as the shortest straight-line distance to the area of observed contamination. Based on the shortest travel distance, assign a value from Table 5–9 to the nearest individual factor. Enter this value in Table 5–1.

TABLE 5–9.—NEARBY INDIVIDUAL FACTOR VALUES

Travel distance for nearby individual (miles)	Assigned value
Greater than 0 to ¼	1[a]
Greater than ¼ to 1	0

[a] Assign a value of 0 if one or more persons meet the section 5.1.3 criteria for resident individual.

5.2.3.2 *Population within 1 mile.* Determine the population within each travel distance category of Table 5–10. Count residents and students who attend school within this travel distance. Do not include those people already counted in the resident population threat. Determine travel distances as specified in section 5.2.3.1.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

Based on the number of people included within a travel distance category, assign a distance-weighted population value for that travel distance from Table 5–10.

Calculate the value for the population within 1 mile factor (PN) as follows:

$$PN = \frac{1}{10} \sum_{i=1}^{3} W$$

where:

W_i = Distance-weighted population value from Table 5–10 for travel distance category i.

If PN is less than 1, do not round it to the nearest integer; if PN is 1 or more, round to the nearest integer. Enter this value in Table 5–1.

5.2.3.3 *Calculation of nearby population targets factor category value.* Sum the values for the nearby individual factor and the population within 1 mile factor. Do not round this sum to the nearest integer. Assign this sum as the targets factor category value for the nearby population threat. Enter this value in Table 5–1.

TABLE 5–10.—DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT [a]

Travel distance category (miles)	Number of people within the travel distance category											
	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000
Greater than 0 to ¼	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034
Greater than ¼ to ½	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517
Greater than ½ to 1	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258

[a] Round the number of people present within a travel distance category to nearest integer. Do not round the assigned distance-weighted population value to nearest integer.

5.2.4 *Calculation of nearby population threat score.* Multiply the values for likelihood of exposure, waste characteristics, and targets for the nearby population threat, and round the product to the nearest integer. Assign this product as the nearby population threat score. Enter this score in Table 5–1.

5.3 *Calculation of soil exposure pathway score.* Sum the resident population threat score and the nearby population threat score, and divide the sum by 82,500. Assign the resulting value, subject to a maximum of 100, as the soil exposure pathway score (S_s). Enter this score in Table 5–1.

6.0 Air Migration Pathway

Evaluate the air migration pathway based on three factor categories: likelihood of release, waste characteristics, and targets. Figure 6–1 indicates the factors included within each factor category.

Determine the air migration pathway score (S_a) in terms of the factor category values as follows:

$$S_a = \frac{(LR)(WC)(T)}{SF}$$

where:

LR = Likelihood of release factor category value.

WC = Waste characteristics factor category value.

T = Targets factor category value.

SF = Scaling factor.

Table 6–1 outlines the specific calculation procedure.

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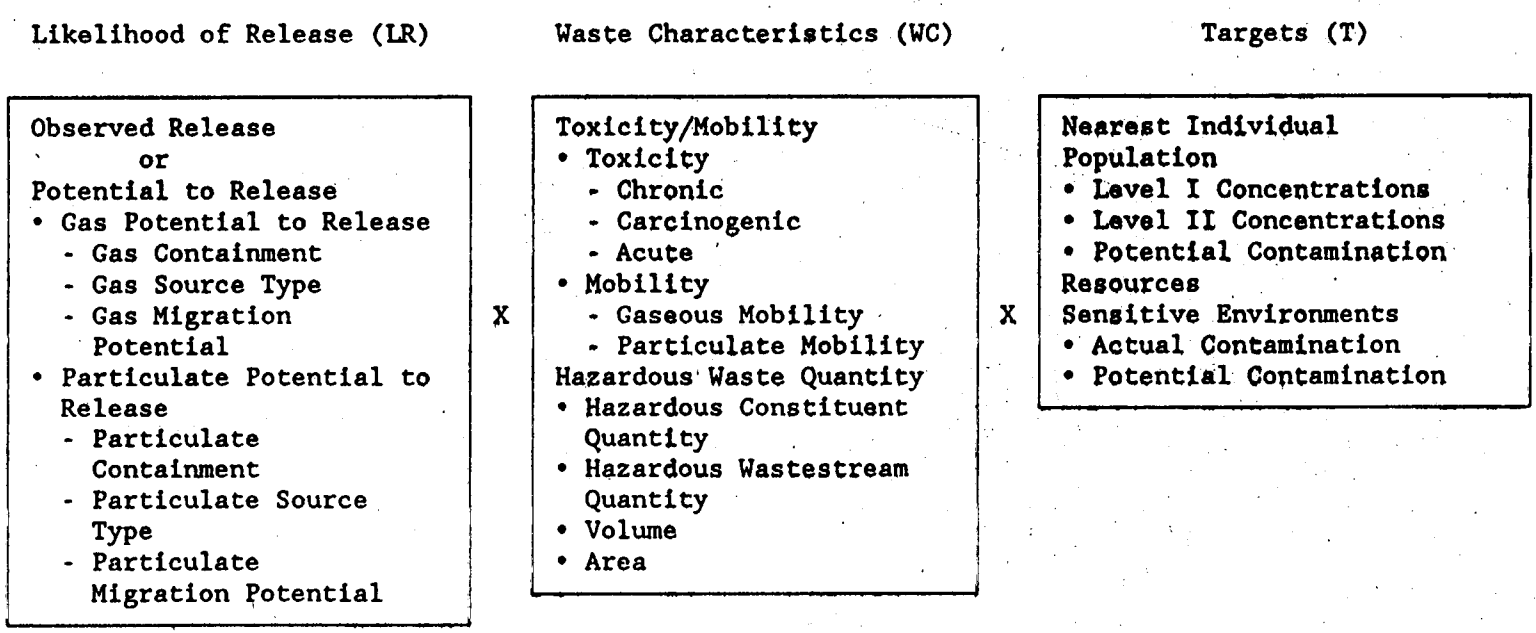

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FIGURE 6-1
OVERVIEW OF AIR MIGRATION PATHWAY

TABLE 6-1.—AIR MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Likelihood of Release		
1. Observed Release	550	
2. Potential to Release:		
2a. Gas Potential to Release	500	
2b. Particulate Potential to Release	500	
2c. Potential to Release (higher of lines 2a and 2b)	500	
3. Likelihood of Release (higher of lines 1 and 2c)	550	
Waste Characteristics		
4. Toxicity/Mobility	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets		
7. Nearest Individual	50	
8. Population:		
8a. Level I Concentrations	(b)	
8b. Level II Concentrations	(b)	
8c. Potential Contamination	(b)	
8d. Population (lines 8a+8b+8c)	(b)	
9. Resources	5	
10. Sensitive Environments		
10a. Actual Contamination	(c)	
10b. Potential Contamination	(c)	
10c. Sensitive Environments (lines 10a+10b)	(c)	
11. Targets (lines 7+8d+9+10c)	(b)	
Air Migration Pathway Score		
12. Pathway Score (S_a) [(lines 3×6×11)/82,500] [d]	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to maximum of 60.
[d] Do not round to nearest integer.

6.1 *Likelihood of Release.* Evaluate the likelihood of release factor category in terms of an observed release factor or a potential to release factor.

6.1.1 *Observed release.* Establish an observed release to the atmosphere by demonstrating that the site has released a hazardous substance to the atmosphere. Base this demonstration on either:

- Direct observation—a material (for example, particulate matter) that contains one or more hazardous substances has been seen entering the atmosphere directly. When evidence supports the inference of a release of a material that contains one or more hazardous substances by the site to the atmosphere, demonstrated adverse effects accumulated with that release may be used to establish an observed release.
- Chemical analysis—an analysis of air samples indicates that the concentration of ambient hazardous substance(s) has increased significantly above the background concentration for the site (see section 2.3). Some portion of the significant increase must be attributable to the site to establish the observed release.

If an observed release can be established, assign an observed release factor value of 550, enter this value in Table 6-1, and proceed to section 6.1.3. If an observed release cannot be established, assign an observed release factor value of 0, enter this value in Table 6-1, and proceed to section 6.1.2.

6.1.2 *Potential to release.* Evaluate potential to release only if an observed release cannot be established. Determine the potential to release factor value for the site by separately evaluating the gas potential to release and the particulate potential to release for each source at the site. Select the highest potential to release value (either gas or particulate) calculated for the sources evaluated and assign that value as the site potential to release factor value as specified below.

6.1.2.1 *Gas potential to release.* Evaluate gas potential to release for those sources that contain gaseous hazardous substances—that is, those hazardous substances with a vapor pressure greater than or equal to 10^{-8} torr.

Evaluate gas potential to release for each source based on three factors: gas containment, gas source type, and gas migration potential. Calculate the gas potential to release value as illustrated in Table 6-2. Combine sources with similar characteristics into a single source in evaluating the gas potential to release factors.

TABLE 6-2.—GAS POTENTIAL TO RELEASE EVALUATION

Source	Source type [a]	Gas containment factor value [b]	Gas source type factor value [c]	Gas migration potential factor value [d]	Sum	Gas source value
		A	B	C	(B+C)	A(B+C)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
Gas Potential to Release Factor (Select the Highest Gas Source Value)						

[a] Enter a Source Type listed in Table 6-4.
[b] Enter Gas Containment Factor Value from section 6.1.2.1.1.
[c] Enter Gas Source Type Factor Value from section 6.1.2.1.2.
[d] Enter Gas Migration Potential Factor Value from section 6.1.2.1.3.

6.1.2.1.1 *Gas containment.* Assign each source a value from Table 6–3 for gas containment. Use the lowest value from Table 6–3 that applies to the source, except: assign a value of 10 if there is evidence of biogas release or if there is an active fire within the source.

TABLE 6–3.—GAS CONTAINMENT FACTOR VALUES

Gas containment description	Assigned value
All situations except those specifically listed below	10
Evidence of biogas release	10 [a]
Active fire within source	10 [a]
Gas collection/treatment system functioning, regularly inspected, maintained, and completely covering source	0
Source substantially surrounded by engineering windbreak and no other containment specifically described in this table applies	7
Source covered with essentially impermeable, regularly inspected, maintained cover	0
Uncontaminated soil cover >3 feet:	
• Source substantially vegetated with little exposed soil	0
• Source lightly vegetated with much exposed soil	3
• Source substantially devoid of vegetation	7
Uncontaminated soil cover ≥1 foot and ≤3 feet:	
• Source heavily vegetated with essentially no exposed soil	
—Cover soil type resistant to gas migration [b]	3
—Cover soil type not resistant to gas migration [b] or unknown	7
• Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration [b]	7
• Other	10
Uncontaminated soil cover <1 foot:	
• Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration [b]	7
• Other	10
Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies	7
Source consists solely of intact, sealed containers:	
• Totally protected from weather by regularly inspected, maintained cover	0
• Other	3

[a] This value must be used if applicable.
[b] Consider moist fine-grained and saturated coarse-grained soils resistant to gas migration. Consider all other soils nonresistant.

6.1.2.1.2 *Gas source type.* Assign a value for gas source type to each source as follows:

• Determine if the source meets the minimum size requirement based on the source hazardous waste quantity value (see section 2.4.2.1.5). If the source receives a source hazardous waste quantity value of 0.5 or more, consider the source to meet the minimum size requirement.

• If the source meets the minimum size requirement, assign it a value from Table 6–4 for gas source type.

• If the source does not meet the minimum size requirement, assign it a value of 0 for gas source type.

If no source at the site meets the minimum size requirement, assign each source at the site a value from Table 6–4 for gas source type.

TABLE 6–4.—SOURCE TYPE FACTOR VALUES

Source type	Assigned value	
	Gas	Particulate
Active fire area	14	30
Burn pit	19	22
Containers or tanks (buried/below-ground):		
• Evidence of biogas release	33	22
• No evidence of biogas release	11	22
Containers or tanks, not elsewhere specified	28	14
Contaminated soil (excluding land treatment)	19	22
Landfarm/land treatment	28	22
Landfill:		
• Evidence of biogas release	33	22
• No evidence of biogas release	11	22
Pile:		
• Tailings pile	6	28
• Scrap metal or junk pile	6	17
• Trash pile	6	6
• Chemical waste pile	11	28
• Other waste piles	17	28
Surface impoundments (buried/backfilled):		
• Evidence of biogas release	33	22
• No evidence of biogas release	11	22
Surface impoundment (not buried/backfilled):		
• Dry	19	22
• Other	28	0
Other types of sources, not elsewhere specified	0	0

6.1.2.1.3 *Gas migration potential.* Evaluate this factor for each source as follows:

• Assign a value for gas migration potential to each of the gaseous hazardous substances associated with the source (see section 2.2.2) as follows:

–Assign values from Table 6–5 for vapor pressure and Henry's constant to each hazardous substance. If Henry's constant cannot be determined for a hazardous substance, assign that hazardous substance a value of 2 for the Henry's constant component.

–Sum the two values assigned to the hazardous substance.

–Based on this sum, assign the hazardous substance a value from Table 6–6 for gas migration potential.

• Assign a value for gas migration potential to each source as follows:

–Select three hazardous substances associated with the source:

– –If more than three gaseous hazardous substances can be associated with the source, select three that have the highest gas migration potential values.

– –If fewer than three gaseous hazardous substances can be associated with a source, select all of them.

–Average the gas migration potential values assigned to the selected hazardous substances.

–Based on this average value, assign the source a gas migration potential value from Table 6–7.

TABLE 6–5.—VALUES FOR VAPOR PRESSURE AND HENRY'S CONSTANT

Vapor pressure (Torr)	Assigned value
Greater than 10	3
Greater than 10^{-3} to 10	2
10^{-6} to 10^{-3}	1
Less than 10^{-6}	0

Henry's constant (atm-m³/mol)	Assigned value
Greater than 10^{-3}	3
Greater than 10^{-5} to 10^{-3}	2
10^{-7} to 10^{-5}	1
Less than 10^{-7}	0

TABLE 6–6.—GAS MIGRATION POTENTIAL VALUES FOR A HAZARDOUS SUBSTANCE

Sum of values for vapor pressure and Henry's constant	Assigned value
0	0
1 or 2	6
3 or 4	11
5 or 6	17

TABLE 6–7.—GAS MIGRATION POTENTIAL VALUES FOR THE SOURCE

Average of gas migration potential values for three hazardous substances [a]	Assigned value
0 to < 3	0
3 to < 8	6

TABLE 6–7.—GAS MIGRATION POTENTIAL VALUES FOR THE SOURCE—Concluded

Average of gas migration potential values for three hazardous substances [a]	Assigned value
8 to < 14	11
14 to 17	17

[a] If fewer than three hazardous substances can be associated with the source, compute the average based only on those hazardous substances that can be associated.

6.1.2.1.4 *Calculation of gas potential to release value.* Determine the gas potential to release value for each source as illustrated in Table 6–2. For each source, sum the gas source type factor value and gas migration potential factor value and multiply this sum by the gas containment factor value. Select the highest product calculated for the sources evaluated and assign it as the gas potential to release value for the site. Enter this value in Table 6–1.

6.1.2.2 *Particulate potential to release.* Evaluate particulate potential to release for those sources that contain particulate hazardous substances—that is, those hazardous substances with a vapor pressure less than or equal to 10^{-1} torr.

Evaluate particulate potential to release for each source based on three factors: particulate containment, particulate source type, and particulate migration potential. Calculate the particulate potential to release value as illustrated in Table 6–8. Combine sources with similar characteristics into a single source in evaluating the particulate potential to release factors.

6.1.2.2.1 *Particulate containment.* Assign each source a value from Table 6–9 for particulate containment. Use the lowest value from Table 6–9 that applies to the source.

6.1.2.2.2 *Particulate source type.* Assign a value for particulate source type to each source in the same manner as specified for gas sources in section 6.1.2.1.2.

6.1.2.2.3 *Particulate migration potential.* Based on the site location, assign a value from Figure 6–2 for particulate migration potential. Assign this same value to each source at the site.

TABLE 6–8.—PARTICULATE POTENTIAL TO RELEASE EVALUATION

Source	Source type [a]	Particulate containment factor value [b]	Particulate type factor value [c]	Particulate migration potential factor value [d]	Sum	Particulate source value
		A	B	C	(B+C)	A (B+C)
1						
2						
3						
4						
5						
6						
7						
8						
Particulate Potential to Release Factor Value (Select Highest Particulate Source Value)						

[a] Enter a Source Type listed in Table 6–4.
[b] Enter Particulate Containment Factor Value from section 6.1.2.2.1.
[c] Enter Particulate Source Type Factor Value from section 6.1.2.2.2.
[d] Enter Particulate Migration Potential Factor Value from section 6.1.2.2.3.

TABLE 6–9.—PARTICULATE CONTAINMENT FACTOR VALUES

Particulate containment description	Assigned value
All situations except those specifically listed below	10
Source contains only particulate hazardous substances totally covered by liquids	0
Source substantially surrounded by engineered windbreak and no other containment specifically described in this table applies	7
Source covered with essentially impermeable, regularly inspected, maintained cover	0
Uncontaminated soil cover > 3 feet:	
• Source substantially vegetated with little or no exposed soil	0
• Source lightly vegetated with much exposed soil	3
• Source substantially devoid of vegetation	7
Uncontaminated soil cover ≥ 1 foot and ≤ 3 feet:	
• Source heavily vegetated with essentially no exposed soil:	
—Cover soil type resistant to gas migration [a]	3
—Cover soil type not resistant to gas migration [a] or unknown	7
• Source substantially vegetated with little exposed soil and cover soil type resistant to gas migration [a]	7
• Other	10
Uncontaminated soil cover < 1 foot:	
• Source heavily vegetated with essentially no exposed soil and cover soil type resistant to gas migration [a]	7
• Other	10
Totally or partially enclosed within structurally intact building and no other containment specifically described in this table applies	7
Source consists solely of containers:	
• All containers contain only liquids	0
• All containers intact, sealed, and totally protected from weather by regularly inspected, maintained cover	0
• All containers intact and sealed	3
• Other	10

[a] Consider moist fine-grained and saturated coarse-grained soils resistant to gas migration. Consider all other soils nonresistant.

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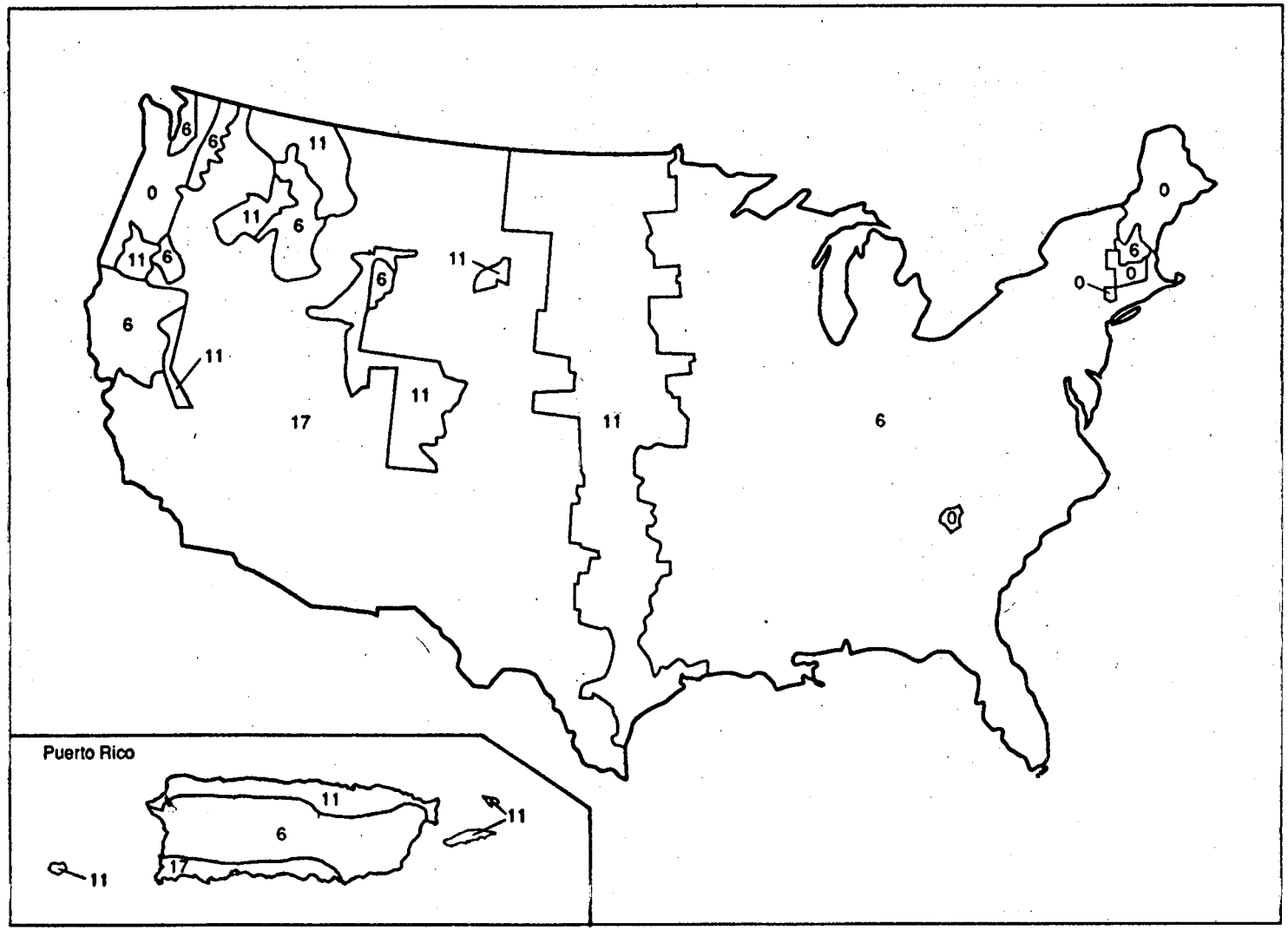

FIGURE 6-2
PARTICULATE MIGRATION POTENTIAL FACTOR VALUES

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FIGURE 6–2.—PARTICULATE MIGRATION POTENTIAL FACTOR VALUES—CONCLUDED

Location	Particulate migration potential assigned value
Hawaiian Islands	
Hilo, Hawaii	0
Honolulu, Oahu	17
Kahului, Maui	17
Lanai	17
Lihue, Kauai	11
Molokai	17
Pacific Islands	
Guam	6
Johnston Island	17
Koror Island	0
Kwajalein Island	6
Mujuro, Marshall Islands	0
Pago Pago, American Samoa	0
Ponape Island	0
Truk, Caroline Islands	0
Wake Island	17
Yap Island	0
Alaska	
Anchorage	17
Annette	0
Barrow	17
Barter Island	17
Bethel	17
Bettles	17
Big Delta	17
Cold Bay	6
Fairbanks	17
Gulkana	17
Homer	11
Juneau	0
King Salmon	11
Kodiak	0
Kotzebue	17
McGrath	17
Nome	11
St. Paul Island	11
Talkeetna	6
Unalakleet	17
Valdez	0
Yakutat	0
American Virgin Islands	
St. Croix	17
St. John	11
St. Thomas	11
Puerto Rico	
Arecibo	6
Coloso	6
Fajardo	11
Humacao	6
Isabela Station	11
Ponce	17
San Juan	11

For site locations not on Figure 6–2, and for site locations near the boundary points on Figure 6–2, assign a value as follows. First, calculate a Thornthwaite P–E index using the following equation:

$$PE = \sum_{i-1}^{12} 115\,[P_i/(T_i-10)]^{10/9}$$

where:

PE = Thornthwaite P–E index.

P_i = Mean monthly precipitation for month i, in inches.

T_i = Mean monthly temperature for month i, in degrees Fahrenheit; for any month having a mean monthly temperature less than 28.4 °F, use 28.4 °F.

Based on the calculated Thornthwaite P–E index, assign a source particulate migration potential value to the site from Table 6–10. Assign this same value to each source at the site.

TABLE 6–10.—PARTICULATE MIGRATION POTENTIAL VALUES

Thornthwaite P–E Index	Assigned value
Greater than 150	0
85 to 150	6
50 to less than 85	11
Less than 50	17

6.1.2.2.4 *Calculation of particulate potential to release value.* Determine the particulate potential to release value for each source as illustrated in Table 6–8. For each source, sum its particulate source type factor value and particulate migration potential factor value and multiply this sum by its particulate containment factor value. Select the highest product calculated for the sources evaluated and assign it as the particulate potential to release value for the site. Enter the value in Table 6–1.

6.1.2.3 *Calculation of potential to release factor value for the site.* Select the higher of the gas potential to release value assigned in section 6.1.2.1.4 and the particulate potential to release value assigned in section 6.1.2.2.4. Assign the value selected as the site potential to release factor value. Enter this value in Table 6–1.

6.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established, assign the observed release factor value of 550 as the likelihood of release factor category value. Otherwise, assign the site potential to release factor value as the likelihood of release factor category value. Enter the value in Table 6–1.

6.2 *Waste characteristics.* Evaluate the waste characteristics factor category based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to the atmosphere. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to the atmosphere.
- All gaseous hazardous substances associated with a source that has a gas containment factor value greater than 0 (see section 2.2.2, 2.2.3, and 6.1.2.1.1).
- All particulate hazardous substances associated with a source that has a particulate containment factor value greater than 0 (see section 2.2.2, 2.2.3, and 6.1.2.2.1).

6.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified below. Select the toxicity/mobility factor value for the air migration pathway as specified in section 6.2.1.3.

6.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1.

6.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance as follows:

- Gaseous hazardous substance.
  - –Assign a mobility factor value of 1 to each gaseous hazardous substance that meets the criteria for an observed release to the atmosphere.
  - –Assign a mobility factor value from Table 6–11, based on vapor pressure, to each gaseous hazardous substance that does not meet the criteria for an observed release.
- Particulate hazardous substance.
  - –Assign a mobility factor value of 0.02 to each particulate hazardous substance that meets the criteria for an observed release to the atmosphere.
  - –Assign a mobility factor value from Figure 6–3, based on the site's location, to each particulate hazardous substance that does not meet the criteria for an observed release. (Assign all such particulate hazardous substances this same value.)
  - –For site locations not on Figure 6–3 and for site locations near the boundary points on Figure 6–3, assign a mobility factor value to each particulate hazardous substance that does not meet the criteria for an observed release as follows:
  - –Calculate a value M:

    $M = 0.0182\,(U^3/[PE]^2)$

    where:

    U = Mean average annual wind speed (meters per second).

    PE = Thornthwaite P–E index from section 6.1.2.2.3.
  - –Based on the value M, assign a mobility factor value from Table 6–12 to each particulate hazardous substance.
- Gaseous and particulate hazardous substances.
  - –For a hazardous substance potentially present in both gaseous and particulate forms, select the higher of the factor values for gas mobility and particulate mobility for that substance and assign that value as the mobility factor value for the hazardous substance.

6.2.1.3 *Calculation of toxicity/mobility factor value.* Assign each hazardous substance a toxicity/mobility factor value from Table 6–13, based on the values assigned to the hazardous substance for the toxicity and mobility factors. Use the hazardous substance with the highest toxicity/mobility factor value to assign a value to the toxicity/mobility factor for the air migration pathway. Enter this value in Table 6–1.

TABLE 6–11.—GAS MOBILITY FACTOR VALUES

Vapor pressure (Torr)	Assigned value [a]
Greater than 10^{-1}	1.0
Greater than 10^{-3} to 10^{-1}	0.2
Greater than 10^{-5} to 10^{-3}	0.02

TABLE 6–11.—GAS MOBILITY FACTOR VALUES—Concluded

Vapor pressure (Torr)	Assigned value [a]
Greater than 10^{-7} to 10^{-5}	0.002
Less than or equal to 10^{-7}	0.0002

[a] Do not round to nearest integer.

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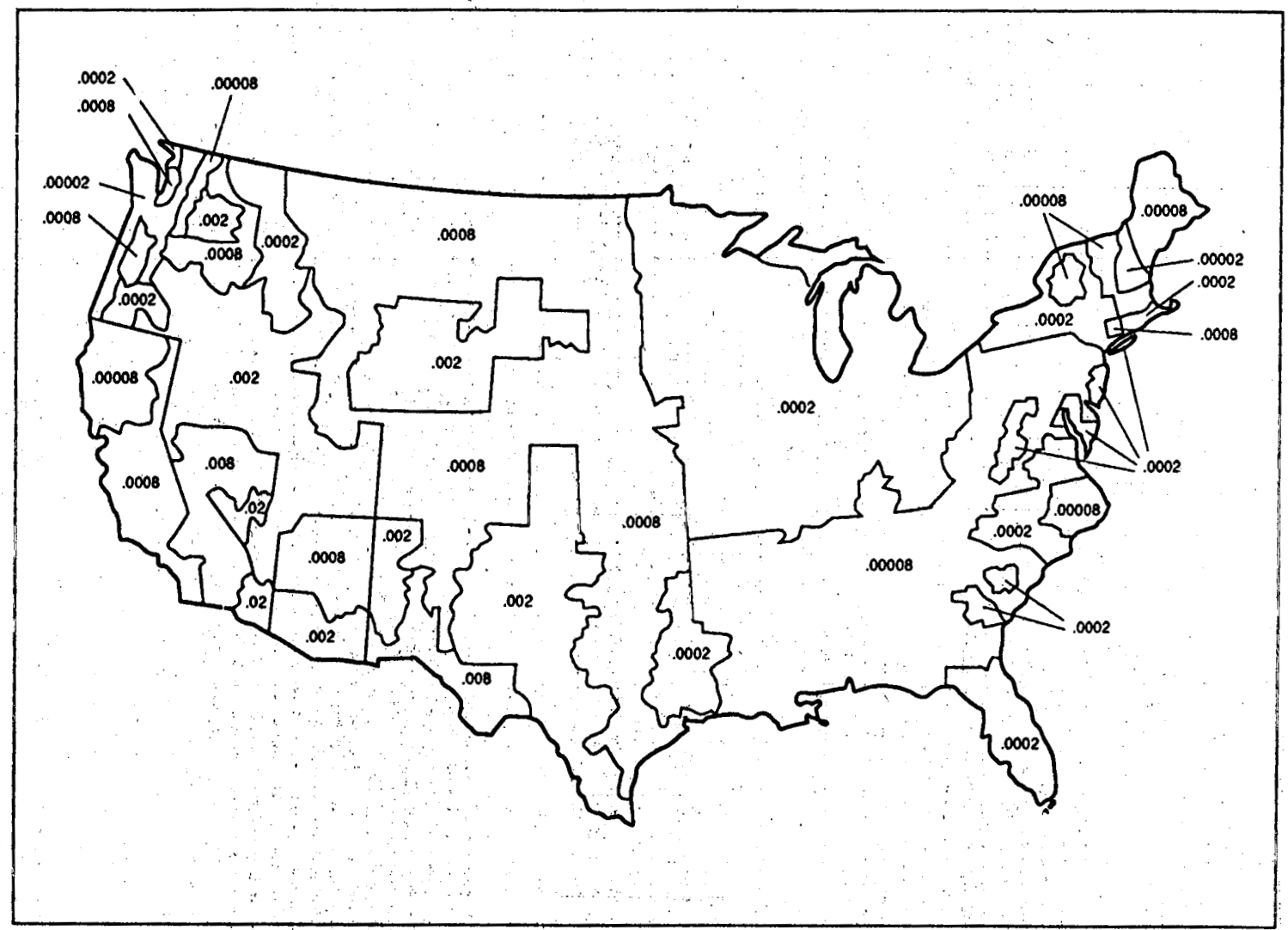
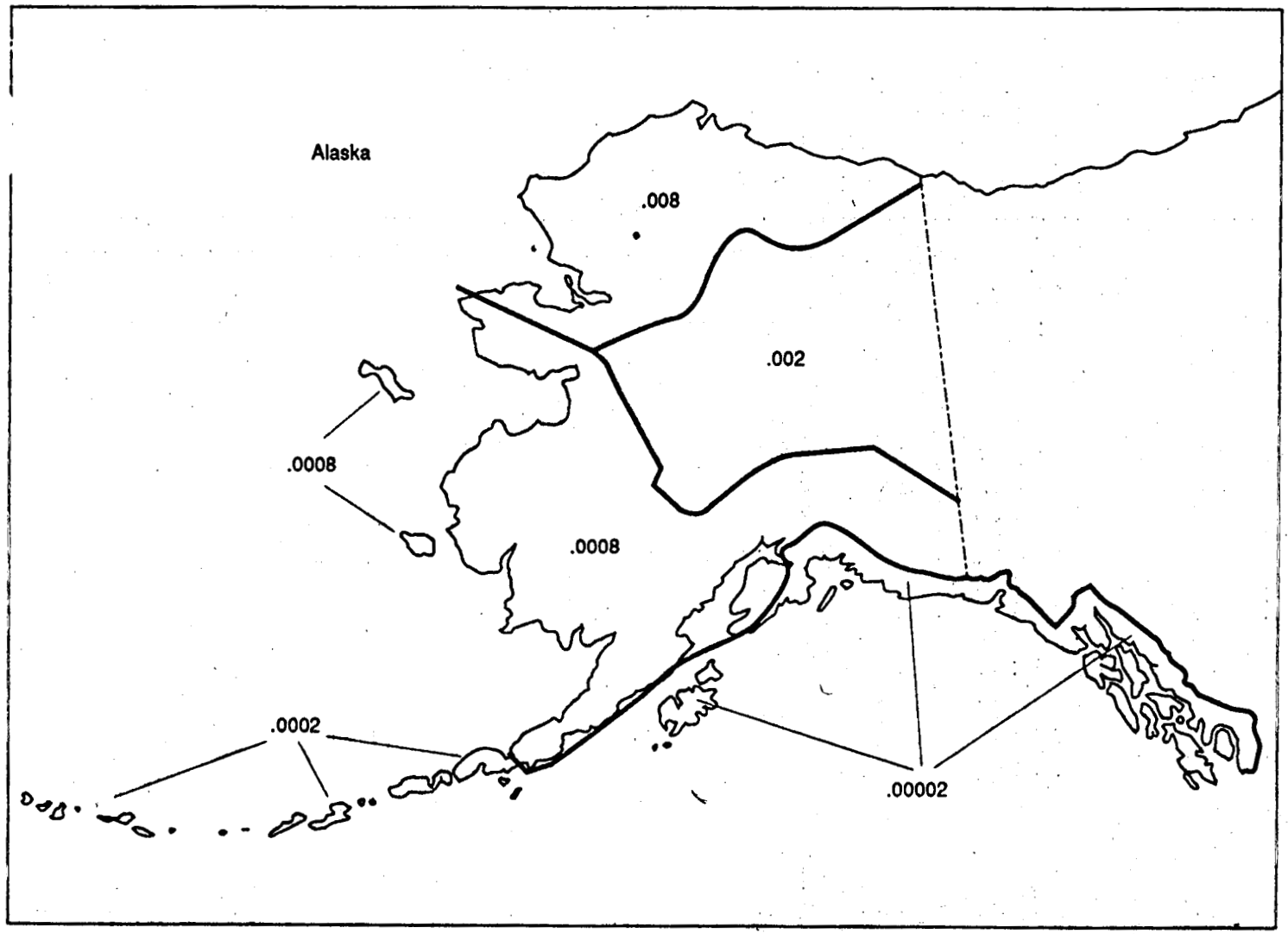


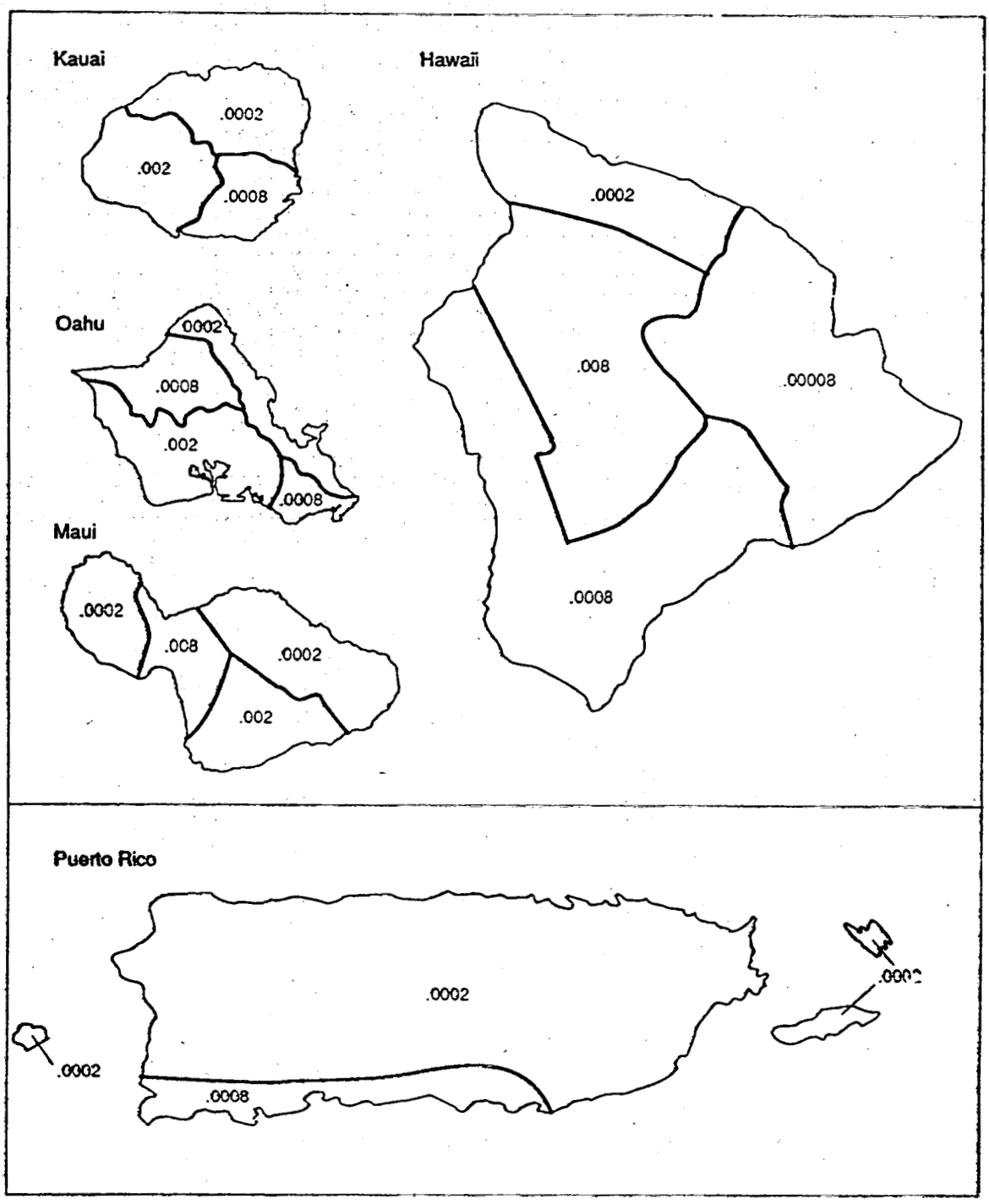
* Do not round to nearest integer.

FIGURE 6-3
PARTICULATE MOBILITY FACTOR VALUES*



[a] Do not round to nearest integer.

FIGURE 6-3
PARTICULATE MOBILITY FACTOR VALUES[a]
(CONTINUED)



[a] Do not round to nearest integer.

FIGURE 6-3
PARTICULATE MOBILITY FACTOR VALUES[a]
(CONTINUED)

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FIGURE 6-3.PARTICULATE MOBILITY FACTOR VALUES—CONTINUED

Location	Particulated mobility assigned value
Pacific Islands	
Guam	0.0002
Johnston Island	0.002
Koror Island	0.00008
Kwajalein Island	0.0002
Mujuro, Marshall Islands	0.00008
Pago Pago, American Samoa	0.00008
Ponape Island	0.00002
Truk, Caroline Islands	0.00008
Wake Island	0.002
Yap Island	0.00008

FIGURE 6-3.—PARTICULATE MOBILITY FACTOR VALUES—CONCLUDED

Location	Particulated mobility assigned value
American Virgin Islands	
St. Croix	0.0008
St. John	0.0002
St. Thomas	0.0002

TABLE 6-12.—PARTICULATE MOBILITY FACTOR VALUES

M	Assigned value [a]
Greater than 1.4×10^{-2}	0.02
Greater than 4.4×10^{-3} to 1.4×10^{-2}	0.008
Greater than 1.4×10^{-3} to 4.4×10^{-3}	0.002
Greater than 4.4×10^{-4} to 1.4×10^{-3}	0.0008
Greater than 1.4×10^{-4} to 4.4×10^{-4}	0.0002
Greater than 4.4×10^{-5} to 1.4×10^{-4}	0.00008
Less than or equal to 4.4×10^{-5}	0.00002

[a] Do not round to nearest integer.

TABLE 6-13.—TOXICITY/MOBILITY FACTOR VALUES [a]

Mobility factor value	Toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.2	2,000	200	20	2	0.2	0
0.02	200	20	2	0.2	0.02	0
0.008	80	8	0.8	0.08	0.008	0
0.002	20	2	0.2	0.02	0.002	0
0.0008	8	0.8	0.08	0.008	0.0008	0
0.0002	2	0.2	0.02	0.002	0.0002	0
0.00008	0.8	0.08	0.008	0.0008	0.00008	0
0.00002	0.2	0.02	0.002	0.0002	0.00002	0

[a] Do not round to nearest integer.

6.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value for the air migration pathway as specified in section 2.4.2. Enter this value in Table 6-1.

6.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity/mobility factor value and the hazardous waste quantity factor value, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2-7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 6-1.

6.3 *Targets.*

Evaluate the targets factor category based on four factors: nearest individual, population, resources, and sensitive environments. Include only those targets (for example, individuals, sensitive environments) located within the 4-mile target distance limit, except: if an observed release is established beyond the 4-mile target distance limit, include those additional targets that are specified below in this section and in section 6.3.4.

Evaluate the nearest individual and population factors based on whether the target populations are subject to Level I concentrations, Level II concentrations, or potential contamination. Determine which applies to a target population as follows.

If no samples meet the criteria for an observed release to air and if there is no observed release by direct observation, consider the entire population within the 4-mile target distance limit to be subject to potential contamination.

If one or more samples meet the criteria for an observed release to air or if there is an observed release by direct observation, evaluate the population as follows:

- Determine the most distant sample location that meets the criteria for Level I concentrations as specified in sections 2.5.1 and 2.5.2 and the most distant location (that is, sample location or direct observation location) that meets the criteria for Level II concentrations. Use the health-based benchmarks from Table 6-14 in determining the level of contamination for sample locations. If the most distant Level II location is closer to a source than the most distant Level I sample location, do not consider the Level II location.
- Determine the single most distant location (sample location or direct observation location) that meets the criteria for Level I or Level II concentrations.
- If this single most distant location is within the 4-mile target distance limit, identify the distance categories from Table 6-15 in which the selected Level I concentrations sample and Level II concentrations sample (or direct observation location) are located:
  - –Consider the target population anywhere within this furthest Level I distance category, or anywhere within a distance category closer to a source at the site, as subject to Level I concentrations.
  - –Consider the target population located beyond any Level I distance categories, up to and including the population anywhere within the furthest Level II distance category, as subject to Level II concentrations.
  - –Consider the remainder of the target population within the 4-mile target distance limit as subject to potential contamination.
- If the single most distant location is beyond the 4-mile target distance limit, identify the distance at which the selected Level I concentrations sample and Level II concentrations sample (or direct observation location) are located:
  - –If the Level I sample location is within the 4-mile target distance limit, identify the target population subject to Level I concentrations as specified above.
  - –If the Level I sample location is beyond the 4-mile target distance limit, consider the target population located anywhere within a distance from the sources at the site equal to the distance to this sample location to be subject to Level I concentrations and include them in the evaluation.
  - –Consider the target population located beyond the Level I target population, but located anywhere within a distance from the sources at the site equal to the distance to the selected Level II location, to be subject to Level II concentrations and include them in the evaluation.

–Do not include any target population as subject to potential contamination.

TABLE 6–14.—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN AIR

- Concentration corresponding to National Ambient Air Quality Standard (NAAQS).
- Concentration corresponding to National Emission Standards for Hazardous Air Pollutants (NESHAPs).
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures.
- Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for inhalation exposures.

TABLE 6–15.—AIR MIGRATION PATHWAY DISTANCE WEIGHTS

Distance category (miles)	Assigned distance weight *
0	1.0
Greater than 0 to ¼	0.25
Greater than ¼ to ½	0.054
Greater than ½ to 1	0.016
Greater than 1 to 2	0.0051
Greater than 2 to 3	0.0023
Greater than 3 to 4	0.0014
Greater than 4	0

* Do not round to nearest integer.

6.3.1 *Nearest individual.* Assign the nearest individual factor a value as follows:

- If one or more residences or regularly occupied buildings or areas is subject to Level I concentrations as specified in section 6.3, assign a value of 50.
- If not, but if one or more a residences or regularly occupied buildings or areas is subject to Level II concentrations, assign a value of 45.
- If none of the residences and regularly occupied buildings and areas is subject to Level I or Level II concentrations, assign a value to this factor based on the shortest distance to any residence or regularly occupied building or area, as measured from any source at the site with an air migration containment factor value greater than 0. Based on this shortest distance, assign a value from Table 6–16 to the nearest individual factor.

Enter the value assigned in Table 6–1.

TABLE 6–16.—NEAREST INDIVIDUAL FACTOR VALUES

Distance to nearest individual (miles)	Assigned value
Level I concentrations *	50
Level II concentrations *	45
0 to ⅛	20
Greater than ⅛ to ¼	7
Greater than ¼ to 1/2	2
Greater than ½ to 1	1
Greater than 1	0

* Distance does not apply.

6.3.2 *Population.* In evaluating the population factor, count residents, students, and workers regularly present within the target distance limit. Do not count transient populations such as customers and travelers passing through the area.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

6.3.2.1 *Level of contamination.* Evaluate the population factor based on three factors: Level I concentrations, Level II concentrations, and potential contamination.

Evaluate the population subject to Level I concentrations (see section 6.3) as specified in section 6.3.2.2, the population subject to Level II concentrations as specified in section 6.3.2.3, and the population subject to potential contamination as specified in section 6.3.2.4.

For the potential contamination factor, use population ranges in evaluating the factor as specified in section 6.3.2.4. For the Level I and Level II concentrations factors, use the population estimate, not population ranges, in evaluating both factors.

6.3.2.2 *Level I concentrations.* Sum the number of people subject to Level I concentrations. Multiply this sum by 10. Assign the product as the value for this factor. Enter this value in Table 6–1.

6.3.2.3 *Level II concentrations.* Sum the number of people subject to Level II concentrations. Do not include those people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 6–1.

6.3.2.4 *Potential contamination.* Determine the number of people within each distance category of the target distance limit (see Table 6–15) who are subject to potential contamination. Do not include those people already counted under the Level I and Level II concentrations factors.

Based on the number of people present within a distance category, assign a distance-weighted population value for that distance category from Table 6–17. (Note that the distance-weighted population values in Table 6–17 incorporate the distance weights from Table 6–15. Do not multiply the values from Table 6–17 by these distance weights.)

Calculate the potential contamination factor value (PI) as follows:

$$PI = \frac{1}{10} \sum_{i=1}^{n} W_i$$

where:

W_i = Distance-weighted population from Table 6–17 for distance category i.

n = Number of distance categories.

If PI is less than 1, do not round it to the nearest integer; if PI is 1 or more, round to the nearest integer. Enter this value in Table 6–1.

6.3.2.5 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and potential contamination. Do not round this sum to the nearest integer. Assign this sum as the population factor value. Enter this value in Table 6–1.

TABLE 6–17.—DISTANCE-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FACTOR FOR AIR PATHWAY *

Distance category (miles)	Number of people within the distance category												
	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000
On a source	0	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455
Greater than 0 to ¼	0	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114
Greater than ¼ to ½	0	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153
Greater than ½ to 1	0	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119
Greater than 1 to 2	0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326
Greater than 2 to 3	0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755
Greater than 3 to 4	0	0.005	0.02	0.07	0.2	0.7	2	7	23	73	229	730	2,285

* Round the number of people present within a distance category to nearest integer. Do not round the assigned distance-weighted population value to nearest integer.

6.3 *Resources.* Evaluate the resources factor as follows:

- Assign a value of 5 if one or more of the following resources are present within one-half mile of a source at the site having an air

migration containment factor value greater than 0:

–Commercial agriculture.
–Commercial silviculture.
–Major or designated recreation area.

• Assign a value of 0 if none of these resources is present.

Enter the value assigned in Table 6–1.

6.3.4 *Sensitive environments.* Evaluate sensitive environments based on two factors: actual contamination and potential contamination. Determine which factor applies as follows.

If no samples meet the criteria for an observed release to air and if there is no observed release by direct observation, consider all sensitive environments located, partially or wholly, within the target distance limit to be subject to potential contamination.

If one or more samples meet the criteria for an observed release to air or if there is an observed release by direct observation, determine the most distant location (that is, sample location or direct observation location) that meets the criteria for an observed release:

• If the most distant location meeting the criteria for an observed release is within the 4-mile target distance limit, identify the distance category from Table 6–15 in which it is located:

–Consider sensitive environments located, partially or wholly, anywhere within this distance category or anywhere within a distance category closer to a source at the site as subject to actual contamination.
–Consider all other sensitive environments located, partially or wholly, within the target distance limit as subject to potential contamination.

• If the most distant location meeting the criteria for an observed release is beyond the 4-mile target distance limit, identify the distance at which it is located:

–Consider sensitive environments located, partially or wholly, anywhere within a distance from the sources at the site equal to the distance to this location to be subject to actual contamination and include all such sensitive environments in the evaluation.
–Do not include any sensitive environments as subject to potential contamination.

6.3.4.1 *Actual contamination.* Determine those sensitive environments subject to actual contamination (i.e., those located partially or wholly within a distance category subject to actual contamination). Assign value(s) from Table 4–23 (section 4.1.4.3.1.1) to each sensitive environment subject to actual contamination.

For those sensitive environments that are wetlands, assign an additional value from Table 6–18. In assigning a value from Table 6–18, include only those portions of wetlands located within distance categories subject to actual contamination. If a wetland is located partially in a distance category subject to actual contamination and partially in one subject to potential contamination, then solely for purposes of Table 6–18, count the portion in the distance category subject to potential contamination under the potential contamination factor in section 6.3.4.2. Determine the total acreage of wetlands within those distance categories subject to actual contamination and assign a value from Table 6–18 based on this total acreage.

Calculate the actual contamination factor value (EA) as follows:

$$EA = WA + \sum_{i=1}^{n} S_i$$

where:

WA = Value assigned from Table 6–18 for wetlands in distance categories subject to actual contamination.
S_i = Value(s) assigned from Table 4–23 to sensitive environment i.
n = Number of sensitive environments subject to actual contamination.

Enter the value assigned in Table 6–1.

TABLE 6–18.—WETLANDS RATING VALUES FOR AIR MIGRATION PATHWAY [a]

Wetland area (acres)	Assigned value
Less than 1	0
1 to 50	25
Greater than 50 to 100	75
Greater than 100 to 150	125
Greater than 150 to 200	175
Greater than 200 to 300	250
Greater than 300 to 400	350
Greater than 400 to 500	450
Greater than 500	500

[a] Wetlands as defined in 40 CFR section 230.3.

6.3.4.2 *Potential contamination.* Determine those sensitive environments located, partially or wholly, within the target distance limit that are subject to potential contamination. Assign value(s) from Table 4–23 to each sensitive environment subject to potential contamination. Do not include those sensitive environments already counted for Table 4–23 under the actual contamination factor.

For each distance category subject to potential contamination, sum the value(s) assigned from Table 4–23 to the sensitive environments in that distance category. If a sensitive environment is located in more than one distance category, assign the sensitive environment only to that distance category having the highest distance weighting value from Table 6–15.

For those sensitive environments that are wetlands, assign an additional value from Table 6–18. In assigning a value from Table 6–18, include only those portions of wetlands located within distance categories subject to potential contamination, as specified in section 6.3.4.1. Treat the wetlands in each separate distance category as separate sensitive environments solely for purposes of applying Table 6–18. Determine the total acreage of wetlands within each of these distance categories and assign a separate value from Table 6–18 for each distance category.

Calculate the potential contamination factor value (EP) as follows:

$$EP = \frac{1}{10} \sum_{j=1}^{m} ([W_j + S_j]D_j)$$

Where:

$$S_j = \sum_{i=1}^{n} S_{ij}$$

S_{ij} = Value(s) assigned from Table 4–23 to sensitive environment in distance category j.
n = Number of sensitive environments subject to potential contamination.
W_j = Value assigned from Table 6–18 for wetland area in distance category j.
D_j = Distance weight from Table 6–15 for distance category j.
m = Number of distance categories subject to potential contamination.

If EP is less than 1, do not round it to the nearest integer; if EP is 1 or more, round to the nearest integer. Enter the value assigned in Table 6–1.

6.3.4.3 *Calculation of sensitive environments factor value.* Sum the factor values for actual contamination and potential contamination. Do not round this sum, designated as EB, to the nearest integer.

Because the pathway score based solely on sensitive environments is limited to a maximum of 60, use the value EB to determine the value for the sensitive environments factor as follows:

• Multiply the values assigned to likelihood of release (LR), waste characteristics (WC), and EB. Divide the product by 82,500.

–If the result is 60 or less, assign the value EB as the sensitive environments factor value.
–If the result exceeds 60, calculate a value EC as follows:

$$EC = \frac{(60)(82{,}500)}{(LR)(WC)}$$

Assign the value EC as the sensitive environments factor value. Do not round this value to the nearest integer.

Enter the value assigned for the sensitive environments factor in Table 6–1.

6.3.5 *Calculation of targets factor category value.* Sum the nearest individual, population, resources, and sensitive environments factor values. Do not round this sum to the nearest integer. Assign this sum as the targets factor category value. Enter this value in Table 6–1.

6.4 *Calculation of air migration pathway score.* Multiply the values for likelihood of release, waste characteristics, and targets, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum value of 100, as the air migration pathway score (S_a). Enter this score in Table 6–1.

7.0 Sites Containing Radioactive Substances.

In general, radioactive substances are hazardous substances under CERCLA and should be considered in HRS scoring. Releases of certain radioactive substances are, however, excluded from the definition of "release" in section 101(22) of CERCLA, as amended, and should not be considered in HRS scoring.

Evaluate sites containing radioactive substances using the instructions specified in sections 2 through 6, supplemented by the instructions in this section. Those factors denoted with a "yes" in Table 7-1 are evaluated differently for sites containing radioactive substances than for sites containing only nonradioactive hazardous substances, while those denoted with a "no" are not evaluated differently and are not addressed in this section.

TABLE 7-1.—HRS FACTORS EVALUATED DIFFERENTLY FOR RADIONUCLIDES

Ground water pathway	Status [a]	Surface water pathway	Status [a]	Soil exposure pathway	Status [a]	Air pathway	Status [a]
Likelihood of Release		**Likelihood of Release**		**Likelihood of Exposure**		**Likelihood of Release**	
Observed Release	Yes	Observed Release	Yes	Observed Contamination	Yes	Observed Release	Yes
Potential to Release	No	Potential to Release	No	Attractiveness/Accessibility to Nearby Residents	No	Gas Potential to Release	No
Containment	No	Overland Flow Containment.	No			Gas Containment	No
Net Precipitation	No	Runoff	No	Area of Contamination	No	Gas Source Type	No
Depth to Aquifer	No	Distance to Surface Water	No			Gas Migration Potential	No
Travel Time	No	Flood Frequency	No			Particulate Potential to Release	No
		Flood Containment	No			Particulate Containment	No
						Particulate Source Type	No
						Particulate Migration Potential.	No
Waste Characteristics		**Waste Characteristics**		**Waste Characteristics**		**Waste Characteristics**	
Toxicity	Yes	Toxicity/Ecotoxicity	Yes/Yes	Toxicity	Yes	Toxicity	Yes
Mobility	No	Persistence/Mobility	Yes/No	Hazardous Waste Quantity	Yes	Mobility	No
Hazardous Waste Quantity	Yes	Bioaccumulation Potential	No			Hazardous Waste Quantity	Yes
		Hazardous Waste Quantity	Yes				
Targets		**Targets**		**Targets**		**Targets**	
Nearest Well	Yes [b]	Nearest Intake	Yes [b]	Resident Individual	Yes [b]	Nearest Individual	Yes [b]
Population	Yes [b]	Drinking Water Population	Yes [b]	Resident Population	Yes [b]	Population	Yes [b]
Resources	No	Resources	No	Workers	No	Resources	No
Wellhead Protection Area	No	Sensitive Environments	Yes [b]	Resources	No	Sensitive Environments	No
		Human Food Chain Individual.	Yes [b]	Terrestrial Sensitive Environments.	No		
		Human Food Chain Population.	Yes [b]				
				Nearby Individual	No		
				Population Within 1 Mile	No		

[a] Factors evaluated differently are denoted by "yes"; factors not evaluated differently are denoted by "no."
[b] Difference is in the determination of Level I and Level II concentrations.

In general, sites containing mixed radioactive and other hazardous substances involve more evaluation than sites containing only radionuclides. For sites containing mixed radioactive and other hazardous substances, HRS factors are evaluated based on considerations of both the radioactive substances and the other hazardous substances in order to derive a single set of factor values for each factor category in each of the four pathways. Thus, the HRS score for these sites reflects the combined potential hazards posed by both the radioactive and other hazardous substances.

Section 7 is organized by factor category, similar to sections 3 through 6. Pathway-specific differences in evaluation criteria are specified under each factor category, as appropriate. These differences apply largely to the soil exposure pathway and to sites containing mixed radioactive and other hazardous substances. All evaluation criteria specified in sections 2 through 6 must be met, except where modified in section 7.

7.1 *Likelihood of release/likelihood of exposure.* Evaluate likelihood of release for the three migration pathways and likelihood of exposure for the soil exposure pathway as specified in sections 2 through 6, except: establish an observed release and observed contamination as specified in section 7.1.1. When an observed release cannot be established for a migration pathway, evaluate potential to release as specified in section 7.1.2. When observed contamination cannot be established, do not evaluate the soil exposure pathway.

7.1.1 *Observed release/observed contamination.* For radioactive substances, establish an observed release for each migration pathway by demonstrating that the site has released a radioactive substance to the pathway (or watershed or aquifer, as appropriate); establish observed contamination for the soil exposure pathway as indicated below. Base these demonstrations on one or more of the following, as appropriate to the pathway being evaluated:

- Direct observation:
  - –For each migration pathway, a material that contains one or more radionuclides has been seen entering the atmosphere, surface water, or ground water, as appropriate, or is known to have entered ground water or surface water through direct deposition, or
  - –For the surface water migration pathway, a source area containing radioactive substances has been flooded at a time that radioactive substances were present and one or more radioactive substances were in contact with the flood waters.
- Analysis of radionuclide concentrations in samples appropriate to the pathway (that is, ground water, soil, air, surface water, benthic, or sediment samples):
  - –For radionuclides that occur naturally and for radionuclides that are ubiquitous in the environment:
    - –Measured concentration (in units of activity, for example, pCi per kilogram [pCi/kg], pCi per liter [pCi/l], pCi per cubic meter [pCi/m^3]) of a given radionuclide in the sample are at a level that:
      - –Equals or exceeds a value 2 standard deviations above the mean site-specific background concentration for that

radionuclide in that type of sample, or

- - - Exceeds the upper-limit value of the range of regional background concentration values for that specific radionuclide in that type of sample.

- - Some portion of the increase must be attributable to the site to establish the observed release (or observed contamination), and

- - For the soil exposure pathway only, the radionuclide must also be present at the surface or covered by 2 feet or less of cover material (for example, soil) to establish observed contamination.

- For man-made radionuclides without ubiquitous background concentrations in the environment:

- - Measured concentration (in units of activity) of a given radionuclide in a sample equals or exceeds the sample quantitation limit for that specific radionuclide in that type of media and is attributable to the site.

- - However, if the radionuclide concentration equals or exceeds its sample quantitation limit, but its release can also be attributed to one or more neighboring sites, then the measured concentration of that radionuclide must also equal or exceed a value either 2 standard deviations above the mean concentration of that radionuclide contributed by those neighboring sites or 3 times its background concentration, whichever is lower.

- - If the sample quantitation limit cannot be established:

- - - If the sample analysis was performed under the EPA Contract Laboratory Program, use the EPA contract-required quantitation limit (CRQL) in place of the sample quantitation limit in establishing an observed release (or observed contamination).

- - - If the sample analysis is not performed under the EPA Contract Labatory Program, use the detection limit in place of the sample quantitation limit.

- - For the soil exposure pathway only, the radionuclide must also be present at the surface or covered by 2 feet or less of cover material (for example, soil) to establish observed contamination.

• Gamma radiation measurements (applies only to observed contamination for the soil exposure pathway):

- The gamma radiation exposure rate, as measured in microroentgens per hour (μR/hr) using a survey instrument held 1 meter above the ground surface (or 1 meter away from an aboveground source), equals or exceeds 2 times the site-specific background gamma radiation exposure rate.

- Some portion of the increase must be attributable to the site to establish observed contamination. The gamma-emitting radionuclides do not have to be within 2 feet of the surface of the source.

For the three migration pathways, if an observed release can be established for the pathway (or aquifer or watershed, as appropriate), assign the pathway (or aquifer or watershed) an observed release factor value of 550 and proceed to section 7.2. If an observed release cannot be established, assign an observed release factor value of 0 and proceed to section 7.1.2.

For the soil exposure pathway, if observed contamination can be established, assign the likelihood of exposure factor for resident population a value of 550 if there is an area of observed contamination in one or more locations listed in section 5.1; evaluate the likelihood of exposure factor for nearby population as specified in section 5.2.1; and proceed to section 7.2. If observed contamination cannot be established, do not evaluate the soil exposure pathway.

At sites containing mixed radioactive and other hazardous substances, evaluate observed release (or observed contamination) separately for radionuclides as described in this section and for other hazardous substances as described in sections 2 through 6.

For the three migration pathways, if an observed release can be established based on either radionuclides or other hazardous substances, or both, assign the pathway (or aquifer or watershed) an observed release factor value of 550 and proceed to section 7.2. If an observed release cannot be established based on either radionuclides or other hazardous substances, assign an observed release factor value of 0 and proceed to section 7.1.2.

For the soil exposure pathway, if observed contamination can be established based on either radionuclides or other hazardous substances, or both, assign the likelihood of exposure factor for resident population a value of 550 if there is an area of observed contamination in one or more locations listed in section 5.1; evaluate the likelihood of exposure factor for nearby population as specified in section 5.2.1; and proceed to section 7.2. If observed contamination cannot be established based on either radionuclides or other hazardous substances, do not evaluate the soil exposure pathway.

7.1.2 *Potential to release.* For the three migration pathways, evaluate potential to release for sites containing radionuclides in the same manner as specified for sites containing other hazardous substances. Base the evaluation on the physical and chemical properties of the radionuclides, not on their level of radioactivity.

For sites containing mixed radioactive and other hazardous substances, evaluate potential to release considering radionuclides and other hazardous substances together. Evaluate potential to release for each migration pathway as specified in sections 3, 4, or 6, as appropriate.

7.2 *Waste characteristics.* For radioactive substances, evaluate the human toxicity factor, the ecosystem toxicity factor, the surface water persistence factor, and the hazardous waste quantity factor as specified in the following sections. Evaluate all other waste characteristic factors as specified in sections 2 through 6.

7.2.1 Human toxicity. For radioactive substances, evaluate the human toxicity factor as specified below, not as specified in section 2.4.1.1.

Assign human toxicity factor values to those radionuclides available to the pathway based on quantitative dose-response parameters for cancer risks as follows:

• Evaluate radionuclides only on the basis of carcinogenicity and assign all radionuclides to weight-of-evidence category A.

• Assign a human toxicity factor value from Table 7-2 to each radionuclide based on its slope factor (also referred to as cancer potency factor).

- For each radionuclide, use the higher of the slope factors for inhalation and ingestion to assign the factor value.
- If only one slope factor is available for the radionuclide, use it to assign the toxicity factor value.
- If no slope factor is available for the radionuclide, assign that radionuclide a toxicity factor value of 0 and use other radionuclides for which a slope factor is available to evaluate the pathway.

• If all radionuclides available to a particular pathway are assigned a human toxicity factor value of 0 (that is, no slope factor is available for all the radionuclides), use a default human toxicity factor value of 1,000 as the human toxicity factor value for all radionuclides available to the pathway.

At sites containing mixed radioactive and other hazardous substances, evaluate the toxicity factor separately for the radioactive and other hazardous substances and assign each a separate toxicity factor value. This applies regardless of whether the radioactive and other hazardous substances are physically separated, combined chemically, or simply mixed together. Assign toxicity factor values to the radionuclides as specified above and to the other hazardous substances as specified in section 2.4.1.1.

At sites containing mixed radioactive and other hazardous substances, if all radionuclides available to a particular pathway are assigned a human toxicity factor value of 0, use a default human toxicity factor value of 1,000 for all those radionuclides even if nonradioactive hazardous substances available to the pathway are assigned human toxicity factor values greater than 0. Similarly, if all nonradioactive hazardous substances available to the pathway are assigned a human toxicity factor value of 0, use a default human toxicity factor value of 100 for all these nonradioactive hazardous substances even if radionuclides available to the pathway are assigned human toxicity factor values greater than 0.

7.2.2 *Ecosystem toxicity.* For the surface water environmental threat (see sections 4.1.4 and 4.2.4), assign an ecosystem toxicity factor value to radionuclides (alone or combined chemically or mixed with other hazardous substances) using the same slope factors and

procedures specified for the human toxicity factor in section 7.2.1, except: use a default of 100, not 1,000, if all radionuclides eligible to be evaluated for ecosystem toxicity receive an ecosystem toxicity factor value of 0.

TABLE 7-2.—TOXICITY FACTOR VALUES FOR RADIONUCLIDES

Cancer slope factor [a] (SF) $(pCi)^{-1}$	Assigned value
$3\times10^{-11} \leq SF$	10,000
$3\times10^{-12} \leq SF < 3\times10^{-11}$	1,000
$SF < 3\times10^{-12}$	100
SF not available for the radionuclide	0

[a] Radionuclide slope factors are estimates of age-averaged, individual lifetime total excess cancer risk per picocurie of radionuclide inhaled or ingested.

At sites containing mixed radioactive and other hazardous substances, evaluate the ecosystem toxicity factor separately for the radioactive and other hazardous substances and assign each a separate ecosystem toxicity factor value. This applies regardless of whether the radioactive and other hazardous substances are physically separated, combined chemically, or simply mixed together. Assign ecosystem toxicity factor values to the radionuclides as specified above and to the other hazardous substances as specified in sections 4.1.4.2.1.1 and 4.2.4.2.1.1. If all radionuclides available to a particular pathway are assigned an ecosystem toxicity factor value of 0, use a default ecosystem toxicity factor value of 100 for all these radionuclides even if nonradioactive hazardous substances available to the pathway are assigned ecosystem toxicity factor values greater than 0. Similarly, if all nonradioactive hazardous substances available to the pathway are assigned an ecosystem toxicity factor value of 0, use a default ecosystem toxicity factor value of 100 for all these nonradioactive hazardous substances even if radionuclides available to the pathway are assigned ecosystem toxicity factor values greater than 0.

7.2.3 *Persistence.* For radionuclides, evaluate the surface water persistence factor based solely on half-life; do not include sorption to sediments in the evaluation as is done for nonradioactive hazardous substances. Assign a persistence factor value from Table 4-10 (section 4.1.2.2.1.2) to each radionuclide based on half-life ($t_{1/2}$) calculated as follows:

$$t_{1/2} = \frac{1}{\frac{1}{r} + \frac{1}{v}}$$

where:

r = Radioactive half-life.
v = Volatilization half-life.

If the volatilization half-life cannot be estimated for a radionuclide from available data, delete it from the equation. Select the portion of Table 4-10 to use in assigning the persistence factor value as specified in section 4.1.2.2.1.2.

At sites containing mixed radioactive and other hazardous substances, evaluate the persistence factor separately for each radionuclide and for each nonradioactive hazardous substance, even if the available data indicate that they are combined chemically. Assign a persistence factor value to each radionuclide as specified in this section and to each nonradioactive hazardous substance as specified in section 4.1.2.2.1.2. When combined chemically, assign a single persistence factor value based on the higher of the two values assigned (individually) to the radioactive and nonradioactive components.

7.2.4 *Selection of substance potentially posing greatest hazard.* For each migration pathway (threat, aquifer, or watershed, as appropriate), select the radioactive substance or nonradioactive hazardous substance that potentially poses the greatest hazard based on its toxicity factor value, combined with the applicable mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values. Combine these factor values as specified in sections 2, 3, 4, and 6. For the soil exposure pathway, base the selection on the toxicity factor alone (see sections 2 and 5).

7.2.5 *Hazardous waste quantity.* To calculate the hazardous waste quantity factor value for sites containing radioactive substances, evaluate source hazardous waste quantity (see section 2.4.2.1) using only the following two measures in the following hierarchy (these measures are consistent with Tiers A and B for nonradioactive hazardous substances in sections 2.4.2.1.1 and 2.4.2.1.2):

- Radionuclide constituent quantity (Tier A).
- Radionuclide wastestream quantity (Tier B).

7.2.5.1 *Source hazardous waste quantity for radionuclides.* For each migration pathway, assign a source hazardous waste quantity value to each source having a containment factor value greater than 0 for the pathway being evaluated. For the soil exposure pathway, assign a source hazardous waste quantity value to each area of observed contamination, as applicable to the threat being evaluated. Allocate hazardous substances and hazardous wastestreams to specific sources (or areas of observed contamination) as specified in section 2.4.2.

7.2.5.1.1 *Radionuclide constituent quantity (Tier A).* Evaluate radionuclide constituent quantity for each source (or area of observed contamination) based on the activity content of the radionuclides allocated to the source (or area of observed contamination) as follows:

- Estimate the net activity content (in curies) for the source (or area of observed contamination) based on:
  - –Manifests, or
  - –Either of the following equations, as applicable:

$$N = 9.1\times10^{-7}(V)\sum_{i=1}^{n} AC_i$$

where:

N = Estimated net activity content (in curies) for the source (or area of observed contamination).
V = Total volume of material (in cubic yards) in a source (or area of observed contamination) containing radionuclides.
AC_i = Activity concentration above the respective background concentration (in pCi/g) for each radionuclide i allocated to the source (or area of observed contamination).
n = Number of radionuclides allocated to the source (or area of observed contamination) above the respective background concentrations.

or,

$$N = 3.8\times10^{-12}(V)\sum_{i=1}^{n} AC_i$$

where:

N = Estimated net activity content (in curies) for the source (or area of observed contamination).
V = Total volume of material (in gallons) in a source (or area of observed contamination) containing radionuclides.
AC_i = Activity concentration above the respective background concentration (in pCi/l) for each radionuclide i allocated to the source (or area of observed contamination).
n = Number of radionuclides allocated to the source (or area of observed contamination) above the respective background concentrations.

- –Estimate volume for the source (or volume for the area of observed contamination) based on records or measurements.
- –For the soil exposure pathway, in estimating the volume for areas of observed contamination, do not include more than the first 2 feet of depth, except: for those types of areas of observed contamination listed in Tier C of Table 5-2 (section 5.1.2.2), include the entire depth, not just that within 2 feet of the surface.

- Convert from curies of radionuclides to equivalent pounds of nonradioactive hazardous substances by multiplying the activity estimate for the source (or area of observed contamination) by 1,000.
- Assign this resulting product as the radionuclide constituent quantity value for the source (or area of observed contamination).

If the radionuclide constituent quantity for the source (or area of observed

contamination) is adequately determined (that is, the total activity of all radionuclides in the source and releases from the source [or in the area of observed contamination] is known or is estimated with reasonable confidence), do not evaluate the radionuclide wastestream quantity measure in section 7.2.5.1.2. Instead, assign radionuclide wastestream quantity a value of 0 and proceed to section 7.2.5.1.3. If the radionuclide constituent quantity is not adequately determined, assign the source (or area of observed contamination) a value for radionuclide constituent quantity based on the available data and proceed to section 7.2.5.1.2.

7.2.5.1.2 *Radionuclide wastestream quantity (Tier B).* Evaluate radionuclide wastestream quantity for the source (or area of observed contamination) based on the activity content of radionuclide wastestreams allocated to the source (or area of observed contamination) as follows:

- Estimate the total volume (in cubic yards or in gallons) of wastestreams containing radionuclides allocated to the source (or area of observed contamination).
- Divide the volume in cubic yards by 0.55 (or the volume in gallons by 110) to convert to the activity content expressed in terms of equivalent pounds of nonradioactive hazardous substances.
- Assign the resulting value as the radionuclide wastestream quantity value for the source (or area of observed contamination).

7.2.5.1.3 *Calculation of source hazardous waste quantity value for radionuclides.* Select the higher of the values assigned to the source (or area of observed contamination) for radionuclide constituent quantity and radionuclide wastestream quantity. Assign this value as the source hazardous waste quantity value for the source (or area of observed contamination). Do not round to th nearest integer.

7.2.5.2 *Calculation of hazardous waste quantity factor value for radionuclides.* Sum the source hazardous waste quantity values assigned to all sources (or areas of observed contamination) for the pathway being evaluated and round this sum to the nearest integer, except: if the sum is greater than 0, but less than 1, round it to 1. Based on this value, select a hazardous waste quantity factor value for this pathway from Table 2–6 (section 2.4.2.2).

For a migration pathway, if the radionuclide constituent quantity is adequately determined (see section 7.2.5.1.1) for all sources (or all portions of sources and releases remaining after a removal action), assign the value from Table 2–6 as the hazardous waste quantity factor value for the pathway. If the radionuclide constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action), assign a factor value as follows:

- If any target for that migration pathway is subject to Level I or Level II concentration (see section 7.3), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway.
- If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:
  - –If there has been no removal action, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.
  - –If there has been a removal action:
    - –Determine values from Table 2–6 with and without consideration of the removal action.
    - –If the value that would be assigned from Table 2–6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.
    - –If the value that would be assigned from Table 2–6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

For the soil exposure pathway, if the radionuclide constituent quantity is adequately determined for all areas of observed contamination, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the radionuclide constituent quantity is not adequately determined for one or more areas of observed contaminstion, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

7.2.5.3 *Calculation of hazardous waste quantity factor value for sites containing mixed radioactive and other hazardous substances.* For each source (or area of observed contamination) containing mixed radioactive and other hazardous substances, calculate two source hazardous waste quantity values—one based on radionuclides as specified in sections 7.2.5.1 through 7.2.5.1.3 and the other based on the nonradioactive hazardous substances as specified in sections 2.4.2.1 through 2.4.2.1.5 (that is, determine each value as if the other type of substance was not present). Sum the two values to determine a combined source hazardous waste quantity value for the source (or area of observed contamination). Do not round this value to the nearest integer.

Use this combined source hazardous waste quantity value to calculate the hazardous waste quantity factor value for the pathway as specified in section 2.4.2.2, except: if either the hazardous constituent quantity or the radionuclide constituent quantity, or both, are not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action) or for one or more areas of observed contamination, as applicable, assign the value from Table 2–6 or the default value applicable for the pathway, whichever is greater, as the hazardous waste quantity factor value for the pathway.

7.3 *Targets.* For radioactive substances, evaluate the targets factor category as specified in section 2.5 and sections 3 through 6, except: establish Level I and Level II concentrations at sampling locations as specified in sections 7.3.1 and 7.3.2.

For all pathways (and threats), use the same target distance limits for sites containing radioactive substances as is specified in sections 3 through 6 for sites containing nonradioactive hazardous substances. At sites containing mixed radioactive and other hazardous substances, include all sources (or areas of observed contamination) at the site in identifying the applicable targets for the pathway.

7.3.1 *Level of contamination at a sampling location.* Determine whether Level I or Level II concentrations apply at a sampling location (and thus to the associated targets) as follows:

- Select the benchmarks from section 7.3.2 applicable to the pathway (or threat) being evaluated.
- Compare the concentrations of radionuclides in the sample (or comparable samples) to their benchmark concentrations for the pathway (or threat) as specified in section 7.3.2. Treat comparable samples as specified in section 2.5.1.
- Determine which level applies based on this comparison.
- If none of the radionuclides eligible to be evaluated for the sampling location have an applicable benchmark, assign Level II to the actual contamination at that sampling location for the pathway (or threat).
- In making the comparison, consider only those samples, and only those radionuclides in the sample, that meet the criteria for an observed release (or observed contamination) for the pathway, except: tissue samples from aquatic human food chain organisms may also be used for the human food chain threat of the surface water pathway as specified in sections 4.1.3.3 and 4.2.3.3.

7.3.2 *Comparison to benchmarks.* Use the following media specific benchmarks (expressed in activity units, for example, pCi/l for water, pCi/kg for soil and for aquatic human food chain organisms, and pCi/m^3 for air) for making the comparisons for the indicated pathway (or threat):

- Maximum Contaminant Levels (MCLs)—ground water migration pathway and drinking water threat in surface water migration pathway.
- Uranium Mill Tailings Radiation Control Act (UMTRCA) standards—soil exposure pathway only.
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures (air migration pathway) or for oral exposures (ground water migration pathway; drinking water or human food chain threats in surface water migration pathway; and soil exposure pathway).
  - –For the soil exposure pathway, include two screening concentrations for cancer—one for ingestion of surface materials and one for external radiation exposures from gamma-emitting radionuclides in surface materials.

Select the benchmark(s) applicable to the pathway (or threat) being evaluated. Compare the concentration of each radionuclide from the sampling location to its benchmark concentration(s) for that pathway (or threat). Use only those samples and only those radionuclides in the sample that meet the criteria for an observed release (or observed contamination) for the pathway, except: tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of any applicable radionuclide from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations for that pathway (or threat). If more than one benchmark applies to the radionuclide, assign Level I if the radionuclide concentration equals or exceeds the lowest applicable benchmark concentration. In addition, for the soil exposure pathway, assign Level I concentrations at the sampling location if measured gamma radiation exposure rates equal or exceed 2 times the background level (see section 7.1.1).

If no radionuclide individually equals or exceeds its benchmark concentration, but more than one radionuclide either meets the criteria for an observed release (or observed contamination) for the sample or is eligible to be evaluated for a tissue sample (see sections 4.1.3.3 and 4.2.3.3), calculate a value for index I for these radionuclides as specified in section 2.5.2. If I equals or exceeds 1, assign Level I to the sampling location. If I is less than 1, assign Level II.

At sites containing mixed radioactive and other hazardous substances, establish the level of contamination for each sampling location considering radioactive substances and nonradioactive hazardous substances separately. Compare the concentration of each radionuclide and each nonradioactive hazardous substance from the sampling location to its respective benchmark concentration(s). Use only those samples and only those substances in the sample that meet the criteria for an observed release (or observed contamination) for the pathway except: tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of one or more applicable radionuclides or other hazardous substances from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations. If more than one benchmark applies to a radionuclide or other hazardous substance, assign Level I if the concentration of the radionuclide or other hazardous substance equals or exceeds its lowest applicable benchmark concentration.

If no radionuclide or other hazardous substance individually exceed a benchmark concentration, but more than one radionuclide or other hazardous substance either meets the criteria for an observed release (or observed contamination) for the sample or is eligible to be evaluated for a tissue sample, calculate an index I for both types of substances as specified in section 2.5.2. Sum the index I values for the two types of substances. If the value, individually or combined, equals or exceeds 1, assign Level I to the sample location. If it is less than 1, calculate an index J for the nonradioactive hazardous substances as specified in section 2.5.2. If J equals or exceeds 1, assign Level I to the sampling location. If J is less than 1, assign Level II.

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[EPA–HQ–SFUND–2010–1086; FRL–9956–58–OLEM]

RIN 2050–AG67

Addition of a Subsurface Intrusion Component to the Hazard Ranking System

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is adding a subsurface intrusion (SsI) component to the Hazard Ranking System (HRS), which is the principal mechanism that EPA uses to evaluate sites for placement on the National Priorities List (NPL). The NPL is a list of national priorities among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the United States. Sites on the NPL are priorities for further investigation to determine if further response actions are warranted. The subsurface intrusion component (this addition) expands the number of available options for EPA and state and tribal organizations performing work on behalf of EPA to evaluate actual and potential threats to public health from releases of hazardous substances, pollutants, or contaminants. This addition enables EPA to directly consider human exposure to hazardous substances, pollutants, or contaminants that enter regularly occupied structures through subsurface intrusion in assessing a site's relative risk, and thus, enable sites with subsurface intrusion contamination to be evaluated for placement on the NPL.

DATES: This final rule is effective February 8, 2017.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–SFUND–2010–1086. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov* or in hard copy at the EPA Docket Center Reading Room (see *https://www.epa.gov/dockets/epa-docket-center-reading-room* for more information).

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SUPPLEMENTARY INFORMATION: The information presented in this preamble is organized as follows:

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L. Congressional Review Act (CRA)

I. Statutory Authority for Regulatory Change

EPA has revised the HRS, the principal mechanism for placing sites on the NPL, to add a component for evaluating the threat or potential threat posed by subsurface intrusion to protect human health and the environment. Without an evaluation of threats posed by subsurface intrusion contamination, the HRS is not a complete assessment because it omits a known pathway of human exposure to contamination. The addition of subsurface intrusion to the HRS is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 105(a)(8)(A), which requires EPA to prioritize sites based on ''the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems. This addition to the HRS also improves the agency's ability to identify priority sites for further investigation and enhances EPA's ability, in dialogue with other federal agencies and the states and tribes, to determine the most appropriate state or federal authority to address sites. For information on alternatives to this rulemaking that were considered for addressing subsurface intrusion contamination, please see the

preamble to the proposed HRS SsI Addition [81 FR 10372, February 29, 2016].

Additionally, the Government Accountability Office (GAO) stated in its May 2010 report [1]:

> EPA may not be listing some sites that pose health risks that are serious enough that the sites should be considered for inclusion on the NPL. While EPA is assessing vapor intrusion contamination at listed NPL sites, EPA does not assess the relative risks posed by vapor intrusion when deciding which sites to include on the NPL. By not including these risks, states may be left to remediate those sites without federal assistance, and given states' constrained budgets, some states may not have the ability to clean up these sites on their own . . . However, if these sites are not assessed and, if needed, listed on the NPL, some seriously contaminated hazardous waste sites with unacceptable human exposure may not otherwise be cleaned up.

The authority for these technical modifications to the HRS is in section 105(a)(8)(A) of CERCLA enacted in 1980. Under CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300) must include criteria for determining priorities among releases or threatened releases for the purpose of taking remedial or removal actions. Section 105(a)(8)(A) of CERCLA required EPA to establish:

> [C]riteria for determining priorities among releases or threatened releases [of hazardous substances] throughout the United States for the purpose of taking remedial action and, to the extent practicable, taking into account the potential urgency of such action, for the purpose of taking removal action. Criteria and priorities . . . shall be based upon relative risk or danger to public health or welfare or the environment. . .taking into account to the extent possible the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems. . . .

To meet this requirement and provide criteria to set priorities, EPA adopted the HRS as Appendix A to the NCP (47 FR 31180, July 16, 1982). The HRS was last revised on December 14, 1990 (55 FR 51532) to include the evaluation of additional threats to ensure a complete assessment of the relative risk that a site may pose to the public. Section 105(a)(8)(B) of CERCLA requires that the statutory criteria described in section 105(a)(8)(A) be used to prepare a list of national priorities among the known releases, or threatened releases throughout the United States. The NPL is Appendix B of the NCP (40 CFR 300, Appendix B).

In 1986, Congress passed the Superfund Amendments and Reauthorization Act (SARA) (Pub. L. 99–499), which added section 105(c)(1) to CERCLA, requiring EPA to amend the HRS to assure ''to the maximum extent feasible, that the hazard ranking system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review.'' In addition, CERCLA section 115 authorizes EPA to promulgate any regulations necessary to carry out the provisions of CERCLA.

Furthermore, the Congressional Conference Report on SARA included the absolute standard against which HRS revisions could be assessed:

> This standard is to be applied within the context of the purpose for the National Priorities List; *i.e.,* identifying for the States and the public those facilities and sites which appear to warrant remedial actions. * * * This standard does not, however, require the Hazard Ranking System to be equivalent to detailed risk assessments, quantitative or qualitative, such as might be performed as part of remedial actions. The standard requires the Hazard Ranking System to rank sites as accurately as the Agency believes is feasible using information from preliminary assessments and site inspections * * * Meeting this standard does not require long-term monitoring or an accurate determination of the full nature and extent of contamination at sites or the projected levels of exposure such as might be done during remedial investigations and feasibility studies. This provision is intended to ensure that the Hazard Ranking System performs with a degree of accuracy appropriate to its role in expeditiously identifying candidates for response actions. [H.R. Rep. No. 962, 99th Cong., 2nd Sess. at 199–200 [1986]]

When the HRS was last revised in 1990, the technology to detect and evaluate subsurface intrusion threats was not sufficiently developed. For example, there were no health-based benchmark concentration values for residences or standardized technologies for sampling indoor air, precision of analytical equipment prior to computerization was limited, and associations between contaminated ground water and soil vapors were not well understood. However, it is now possible for subsurface intrusion threats to be evaluated in a more comprehensive manner. Therefore, it is now appropriate, given the potential that subsurface intrusion presents for direct human contact, to add to the HRS the consideration of threats due to subsurface intrusion.

This final rule ensures the HRS does not omit a known pathway of human exposure to contamination due to subsurface intrusion of released hazardous substances and provides a mechanism for assessing subsurface intrusion threats and identifying sites for placement on the NPL. Furthermore, these sites are now eligible for Superfund-financed remedial actions.

II. Background

The HRS is a crucial part of the agency's program for determining which sites are a priority for further remedial investigation and possible cleanup under CERCLA. To understand the importance of this rulemaking it is necessary to understand the role of the HRS in identifying sites for the NPL, the role of the HRS in the overall site assessment and Superfund remedial process, and this final rule's impacts on current and future Superfund activities. In addition, it is also necessary to understand the impact of adding the SsI component to the HRS.

A. The Hazard Ranking System

The HRS is a scoring system used to assess the relative risk associated with actual or potential releases of hazardous substances from a site based on the information that can be collected in a preliminary assessment (PA) and site inspection (SI). The HRS is not a tool for conducting a quantitative risk assessment and was designed to be a measure of relative risk among sites rather than absolute site-specific risk. As required by CERCLA, EPA has designed the Superfund program to focus its resources on the priority sites. Consequently, the initial studies—the PA and SI—which are performed on a large number of sites, are relatively modest in scope and cost compared to the remedial investigations and feasibility studies subsequently performed on NPL sites.

Because of the need to expeditiously perform PAs and SIs, Congress placed certain constraints on the data requirements for an HRS evaluation. The required HRS data should be information that, for most sites, can be collected during a screening level site inspection or that are already available. Thus, the HRS does not rely on data that require extensive sampling or repeated sampling over extended periods of time. However, EPA allows for the expansion of the typical SI to allow for additional data collection for more complex sites that cannot be adequately characterized using standard SI methodologies. The HRS has also been designed so that it can be applied consistently to a wide variety of sites, enabling sites to be

[1] EPA's Estimated Costs to Remediate Existing Sites Exceed Current Funding Levels, and More Sites are Expected to Be Added to the National Priorities List, GAO Report to Congressional Requesters, GAO–10–380, May 2010.

ranked relative to each other with respect to actual or potential hazards.

Based on the state of the science, site specific data may be collected beyond that which is normally available after a typical site inspection. In these situations, the HRS in general, and the SsI component, can incorporate that data into the HRS evaluation. For example, the SsI component can use site-specific data as follows:

• Determination of the Hazardous Waste Quantity Factor Value—If the mass of all hazardous substances can be adequately determined (*i.e.,* is known or can be estimated with reasonable confidence), the HRS requires this estimate (identified as a Tier A estimate) be used to assign the hazardous waste quantity for all regularly occupied structures in an area of exposure (AOE) for which this information is available. See section 2.4.2 and 5.2.1.2.2 of the HRS.

• Determining the extent of an ASC—If sufficient data are available and state of the science shows there is no unacceptable risk due to subsurface intrusion into a regularly occupied structure located within an ASC, that structure or subunit can be excluded from the ASC. Therefore, such structures would not be included in the evaluation of the Hazardous Waste Quantity Factor or in the determination of other factors evaluated based on structures or subunits within an ASC. See section 5.2.0 of the HRS.

• Populations within the ASC—If sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to populations in a regularly occupied structure in an ASC, those populations are not included in the evaluation of the Targets Factor Category. See section 5.2.1.3 of the HRS.

EPA notes that if other site-specific information is available that clearly demonstrates that the site does not pose an unacceptable risk to human health via subsurface intrusion, there are points during the PA or SI process, where further evaluation of the site for the subsurface intrusion threat by the Superfund program can be terminated. Please see section B. of this preamble for further information on the Site Assessment process.

As EPA explained when it originally adopted the HRS, ''the HRS is a means for applying uniform technical judgment regarding the potential hazards presented by a facility relative to other facilities. It does not address the feasibility, desirability, or degree of cleanup required.'' (47 FR 31220, July 16, 1982).

The HRS uses a structured value analysis approach to scoring sites. This approach assigns values to factors related to or indicative of risk. The basic elements of the HRS are factors that are based on information that can be collected in a limited screening assessment. A scale of numerical rating values is provided for each factor and a value is assigned to each factor based on conditions at the site. Individual values are then weighted. The factors are grouped into three factor categories—observed release/route characteristics, waste characteristics, and targets—and are combined to obtain factor category scores. Each factor category has a maximum value, as does each of the component factors within the category. The relevant factor category scores are multiplied together within each pathway and normalized to obtain a pathway score. The pathway scores are combined using a root-mean-square approach to calculate the overall site score; that is, the final HRS score is the square root of the sum of the squares of the pathway scores divided by the square root of the number of HRS pathways. If all pathway scores are low, the HRS score will be low. However, the final score will be relatively high even if only one pathway score is high. EPA considers this an important requirement for the HRS scoring because some extremely dangerous sites pose threats through only one migration mode. For example, at a site, leaking drums of hazardous substances may be contaminating drinking water wells, thereby posing a significant threat via the groundwater migration pathway. But if the drums are buried deeply enough and the hazardous substances are not very volatile, the drums may not release any hazardous substances and not pose a threat to the air or to surface water.

EPA emphasizes that the HRS score is a number between 0 and 100, which reflects relative risk amongst candidate NPL sites. An HRS site score is not a measure of actual site-specific risk.

B. Site Assessment and the Superfund Remedial Process

EPA's Superfund remedial site assessment process evaluates sites to ascertain if further investigation is needed for determining whether an unacceptable risk is present.

The majority of sites evaluated through the EPA's site assessment program do not meet the criteria for possible placement on the NPL and are ''screened out'' of the Superfund Remedial process. (See Figure 1. Status of EPA's Site Assessments). Since EPA adopted the HRS, 52, 859 sites have been assessed under EPA's Superfund program. Of those sites, 1,782 were placed on the NPL, as of September 2016.

Site Assessment Strategy

The site assessment process is structured as a series of limited investigations which may include: (1) A Pre-CERCLA screening assessment; (2) a preliminary assessment; and (3) a site inspection or expanded site inspection (Figure 2. Site Assessment Process, below, illustrates this process). If a site progresses through the site assessment process for further investigation, the requirements for documenting risk become increasingly rigorous. The following includes a summary of the major phases of the site assessment process.

• A Pre-CERCLA Screening is an initial review of existing information on a possible Superfund site. If a release of a hazardous substance has occurred or if the potential of a hazardous substance to release exists the site may be eligible for further remedial evaluation under CERCLA authority. If further evaluation is warranted the site should be entered into the remedial assessment active site inventory for further assessment.

• The PA decision process parallels an HRS analysis, but makes environmental ''worst-case'' assumptions of possible significant risk regarding transport of contamination to receptors based on minimal available information and professional judgment.

• The SI collects information to confirm the accuracy of the PA assumptions. The information should be sufficient to support an HRS evaluation with minimal further investigation.

• If placement on the NPL is pursued, the information collected during the SI provides the basis for supporting the HRS scoring scenario.

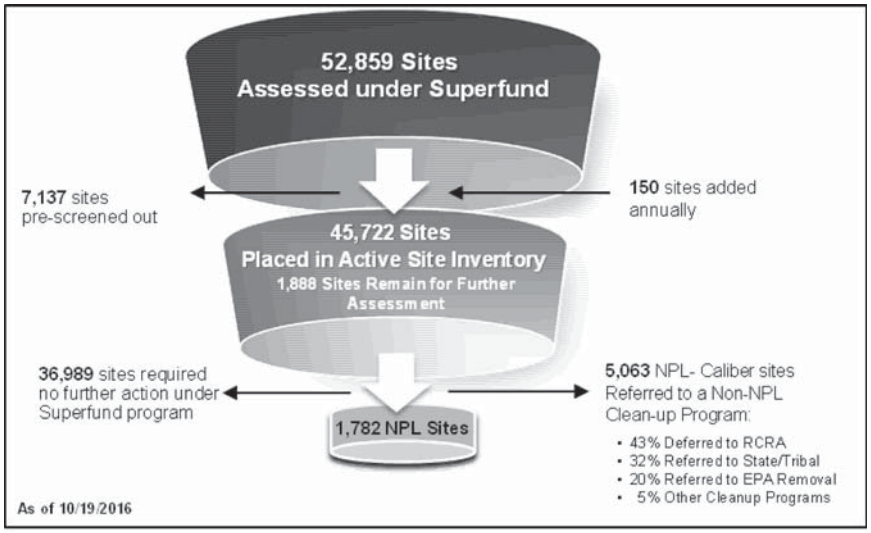


Figure 1. Status of EPA Site Assessments

The following discussion provides further information on each of these phases.

Pre-CERCLA Screening Assessment

A Pre-CERCLA Screening is used to establish whether:

- A release or potential release of a hazardous substance has occurred at a site;
- The site is eligible for further remedial assessment under CERCLA authority;
- The site needs further attention under Superfund or another cleanup program; and
- The site warrants entry into the federal Superfund program's active site inventory for further assessment or response.

Determining whether releases of hazardous substances, pollutants, or contaminants can be addressed by CERCLA requires the application of site-specific facts to CERCLA statutory requirements and EPA policy. The initial determination as to whether a site warrants further investigation is based on three site-specific facts including: (1) Evidence of an actual release or potential to release; (2) targets impacted by a release of contamination at the site; and (3) documentation that a target has been exposed to a hazardous substance released from the site. Examples of targets include populations, drinking water wells, drinking water surface intakes, municipal wells, fisheries and sensitive environments.

Preliminary Assessment

A PA uses readily available data to determine if there is evidence of a release that poses an unacceptable possible threat as specified in the NCP (40 CFR 300.420).

- The PA is a limited-scope investigation performed by States and/or EPA on every CERCLA site
- The PA may include the collection of readily available information and an on- or off-site reconnaissance may be conducted
- The PA distinguishes, based on already existing information, between sites that appear to pose little or no threat to human health and the environment and sites that require further investigation to determine if the threat to human health and the environment is unacceptable.

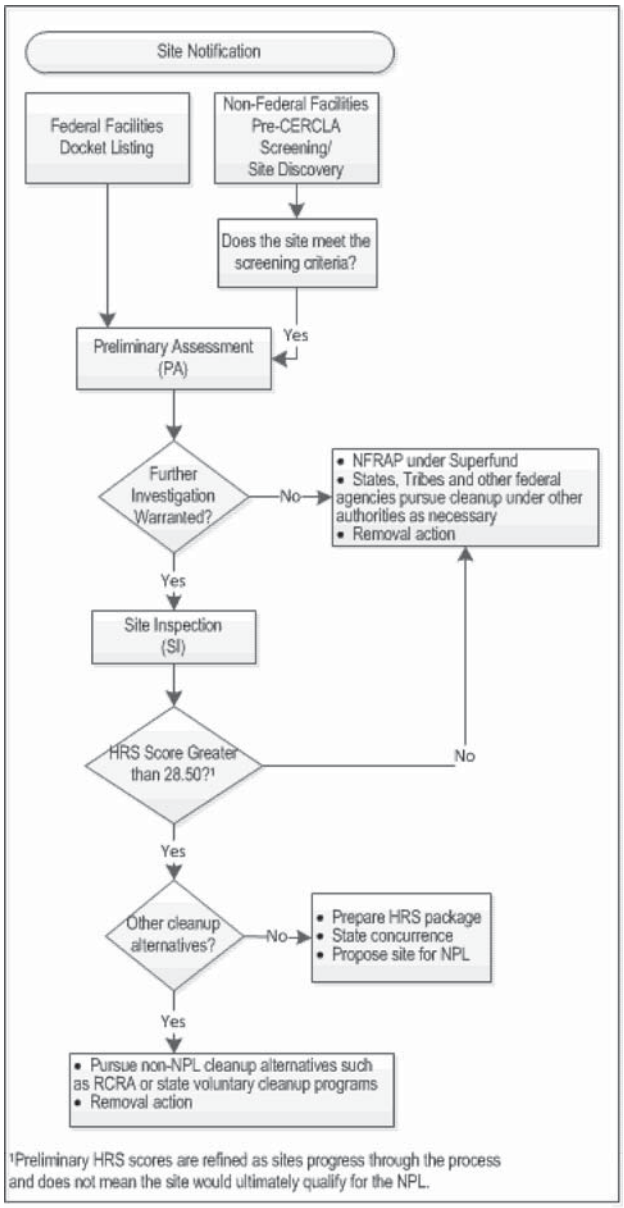


Figure 2. Site Assessment Process

If based on the results of a PA, EPA determines that a site warrants further screening under the CERCLA remedial program, the agency initiates a site inspection

Site Inspection

The purpose of the SI is to collect the data necessary to perform an HRS evaluation. An SI determines if a release of a hazardous substance poses an actual or potential threat to human health or the environment, to determine if there is an immediate threat to people or the environment in the area, and to collect sufficient data to enable the site to be scored using the HRS. EPA may expand the site inspection scope as needed. This expanded site inspection (ESI) collects additional data beyond what is collected in the standard site inspection to evaluate sites for HRS scoring. ESIs are reserved for more complex sites that cannot be adequately characterized using standard site inspection methods.

- SI investigators typically collect waste and environmental samples to determine the substances present at a site and whether they are being released to the environment, as well as other information to perform an HRS evaluation.
- EPA distinguishes, based on the information collected during the SI, between sites that appear to pose little or no threat to human health and the environment and sites that require further investigation to determine if the threat to human health and the environment exists.
- If the information indicates a threat, EPA determines the best approach for addressing the threat, which can be placement on the NPL or use of an alternative authority.

If at any time in this site assessment process, EPA determines that sufficient information indicates the site poses no unacceptable risk, or if it can be addressed under alternative authorities it can be removed from the process. Also, if an imminent or substantial endangerment to public health is identified, EPA can initiate CERCLA removal actions.

The NPL Rulemaking Process

The NPL is a list of national priorities for further investigation amongst the known or threatened releases of hazardous substances, pollutants or contaminants throughout the United States. The list, which is appendix B of the NCP (40 CFR part 300), is required under section 105(a)(8)(B) of CERCLA, as amended. Section 105(a)(8)(B) defines the NPL as a list of ''releases'' and the highest priority ''facilities'' and requires that the NPL be revised at least annually. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances, pollutants or contaminants. The NPL is of only limited significance, however, as it does not assign liability to any party or to the owner of any specific property. Also, placing a site on the NPL does not mean that any remedial or removal action necessarily need be taken.

For purposes of listing, the NPL includes two sections, one of sites that are generally evaluated and cleaned up by the EPA (the ''General Superfund section'') and one of sites that are owned or operated by other federal agencies (the ''Federal Facilities section''). With respect to the Federal Facilities sites, these sites are generally being addressed by other federal agencies. Under Executive Order 12580 (52 FR 2923, January 29, 1987) and CERCLA section 120, each federal agency is responsible for carrying out most response actions at facilities under its own jurisdiction, custody or control, although the EPA is responsible for preparing a Hazard Ranking System (''HRS'') score and determining whether the facility is placed on the NPL and having oversight authority at the sites for further actions.

NPL Site Selection Process

The NPL is required to be revised annually and it is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances, pollutants or contaminants. This selection process is illustrated in figure 3, below. Sites with HRS scores of 28.50 or greater are eligible for placement on the NPL. Only non-Federal Facility sites on the NPL are eligible for Superfund-financed remedial actions. Once a site is determined to be NPL-caliber and a decision has been made that the federal Superfund program should manage the site cleanup, EPA regions apply a strong initial presumption in favor of placement on the NPL.

Once the site is proposed for the NPL (*i.e.,* announced in the **Federal Register**), a 60-day comment period is initiated to allow the public to comment on the proposal. EPA responds to all public comments, and depending on the results of the public comment period, the site could be removed from consideration for placement of the NPL; re-proposed in the future due to public comments; or placed on the NPL. Once the site is placed on the NPL, the rulemaking can be challenged in court under the Administrative Procedure Act (APA). If no challenge is made or if the court finds the rulemaking consistent with APA requirements, it is then eligible for further investigation under the Superfund remedial program. (Figure 3. Process for Placing a Site on the NPL).

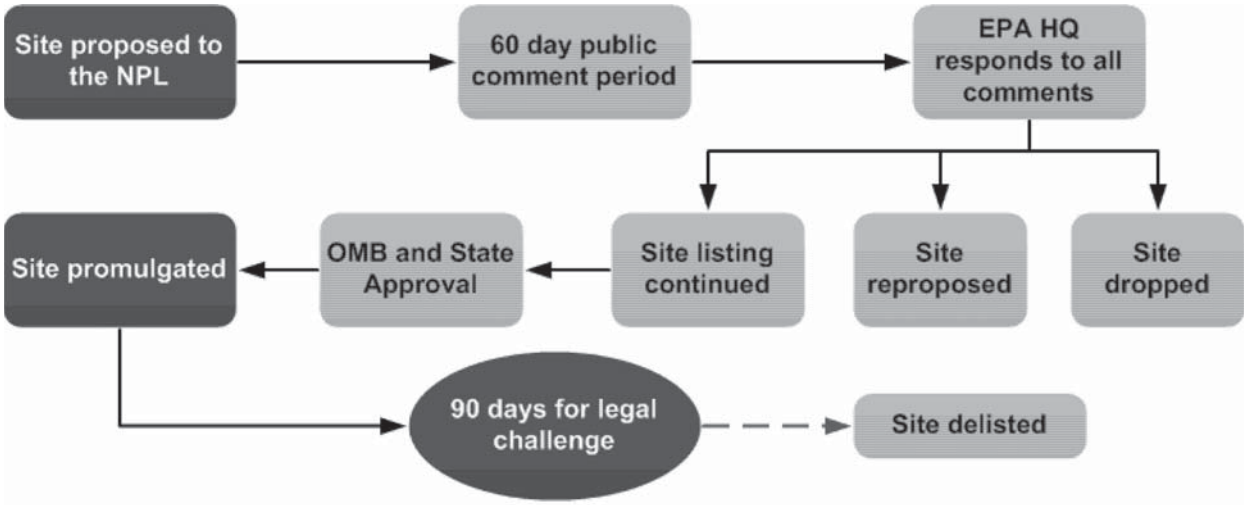


Figure 3. Process for Placing a Site on the NPL

C. Impact of the SsI Addition on Current Cleanup Programs, Resources and Cost

This SsI addition to the HRS will have the most significant impact on EPA's Superfund cleanup program. This regulatory change expands available options for EPA and organizations performing work on behalf of EPA (state and tribal partners) to evaluate actual and potential threats to public health and the environment from subsurface intrusion contamination. This modification to the HRS, by itself, only augments the criteria for applying the HRS. It has no effect on small businesses.

This final rule will not affect the status of sites currently on or proposed to the NPL. Sites that are currently on or proposed to the NPL have already been evaluated under another pathway (*i.e.,* ground water migration, air migration, surface water migration, or soil exposure) and have been shown to or are projected to qualify for placement on the NPL. The method selected for including the SsI evaluation in the HRS site score can only result in an increase in a site score, Therefore, all sites qualifying for the NPL based on its HRS site score prior to this final rule will continue to do so. It is consistent with section 105(c)(3) of CERCLA, as amended, that these sites will not be re-evaluated. This final rule will not disrupt EPA's placement of sites on the NPL.

The possible impact on federal agencies other than EPA performing Superfund actions will be less than that on private sites being addressed by EPA. Federal agencies currently address subsurface intrusion issues as part of their environmental programs and authorities. Executive Order 12580 delegates broad CERCLA authority to federal agencies for responding to actual and potential releases of hazardous substances where a release is either on, or the sole source of the release is from, any facility or vessel under the jurisdiction, custody, or control of the federal agency. Federal agencies are required to exercise this authority consistent with the requirements of CERCLA section 120, as amended, and implement regulations under the NCP, for both NPL and non-NPL sites. Therefore, federal agencies are in a position to proactively identify and respond to risks posed by subsurface intrusion of hazardous substances into regularly occupied structures for all populations who live and work in areas where the subsurface environment may create exposures. If it is determined that releases of hazardous substances pose immediate threats to public health and the environment, EPA fully expects that the appropriate federal agency will continue to undertake response actions to address such threats. Many federal agencies, including EPA, have developed or are developing new or updated agency-specific policy and guidance documents to address subsurface intrusion threats.

As a result of federal agency existing environmental programs and authorities, this rulemaking is not anticipated to have a significant impact to the resources and costs to federal cleanup programs.

Since EPA's overall appropriated Superfund budget as well EPA's cooperative agreement budget for performing site assessments will continue to remain relatively steady, EPA anticipates that this final rule will not result in additional site assessments nor the placement of more sites on the NPL during any particular interval, but rather a shift in the make-up of the type of sites included on the NPL. EPA will continue to review sites as part of Superfund remedial site assessment to determine whether sites are eligible for further remedial evaluation under CERCLA authorities and prioritize sites that pose the highest risk. This is not a change to how EPA currently evaluates and prioritizes sites for the NPL. Because the level of effort required to evaluate a site, regardless of pathway, varies on a site-by-site basis, depending on the size and extent of contamination at the site, it cannot be predicted with any certainly that there will be an increase in cost or level of effort for any particular site due to this rulemaking.

This rulemaking, which could lead to the inclusion of a site on the NPL that did not qualify for the NPL previously, does not itself impose any costs on outside parties; it does not establish that EPA will necessarily undertake response actions, nor does it require any action by a private party or determine liability for site response costs. Costs are limited to screening relevant sites for subsurface intrusion contamination during site inspections and the resulting HRS evaluation and documentation record preparation. Costs that arise from site remedial responses are the result of site-specific decisions made post-listing, not directly from the act of listing itself. These costs are a result of a release of hazardous substances and would not be incurred if hazardous substances had not been released.

Later Superfund-related decisions that consider information collected under the HRS SsI Addition could separately have specific economic costs and benefits (*e.g.,* remediation costs and reduced risk), but these impacts are contingent upon a series of separate and sequential actions after listing a site on the NPL. Therefore, addition of subsurface intrusion to the HRS is several regulatory steps removed from imposing costs on private entities.

This rulemaking does not impose any requirements on small entities, and therefore can be certified as no Significant Economic Impact on a Substantial Number of Small Entities (SISNOSE). With the exception of other federal agencies, site assessments are performed by EPA and on behalf of EPA by states and tribes in cooperative agreement partnerships with EPA. Under section 601 of the Regulatory Flexibility Act, federal agencies do not fit under the definition of small business, small entity, small organization or small governmental jurisdiction.

D. Impact of the Subsurface Intrusion Addition on the Hazard Ranking System

This final rule, with the addition of a subsurface intrusion component, does not change the purpose of the HRS, its fundamental structure or its application. It does not change the balance between the pathways or calculation of the overall HRS site score and the same cutoff score to qualify a site for the NPL is maintained. The current approach for scoring the ground water, surface water, and air migration pathways is not being altered by the addition of a subsurface intrusion component. EPA added the subsurface intrusion threat as a component to the present soil exposure pathway because its structure already focuses on populations actually or potentially coming into direct contact with hazardous substances. The re-structured pathway is called the ''Soil Exposure and Subsurface Intrusion'' pathway and now allows for the consideration of the threat posed by subsurface contaminant intrusion. The Soil Exposure and Subsurface Intrusion pathway retains the existing two soil exposure threats (resident population and nearby population) in the pathway as one component, with subsurface intrusion as the second component.

The narrow technical modifications resulting from this Final Rule reflect the agency's actions to encompass additional risks posed by releases of hazardous substances and to address the SARA statutory requirement that EPA amend the HRS to assure ''to the maximum extent feasible, that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites subject to review.'' Thus, the fundamental purpose and structure of the HRS approach has not changed with this amendment to the HRS to include the consideration of subsurface intrusion.

III. Overview of the Final Rule

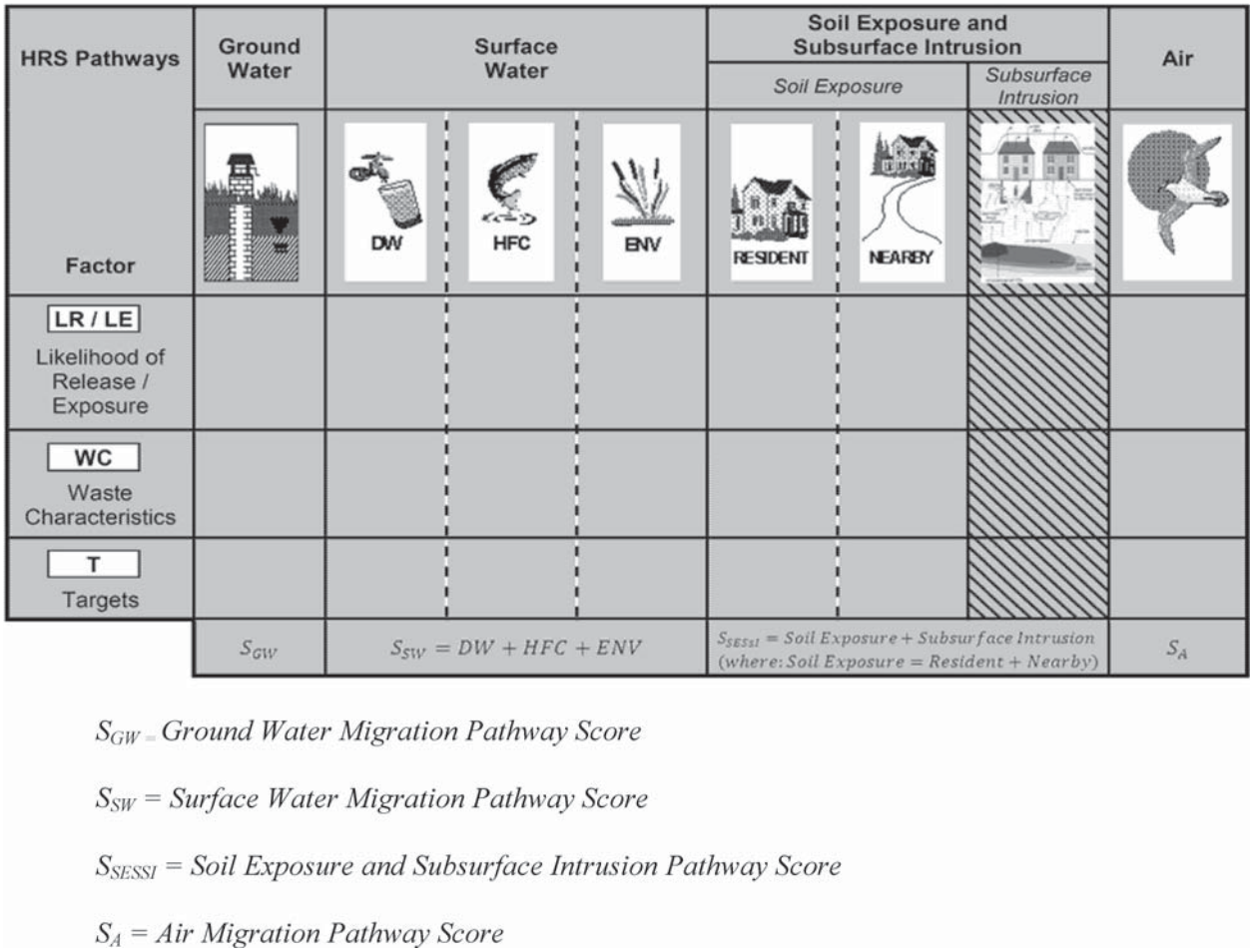
This final rule revises the 1990 HRS to include a component for evaluating the threats posed from subsurface intrusion. The following sections discuss the structure of the HRS, the subsurface intrusion component within the HRS, the major factors of the subsurface intrusion addition, and how the evaluation will be performed using a structure consistent with the other threats, components, and pathways in the HRS, but taking into account the unique parameters impacting the probability of exposure to subsurface intrusion. All sites that qualified for the NPL under the 1990 HRS, would still qualify for the NPL under this revised HRS. For a more comprehensive description and rationale of changes, see the February 29, 2016 Proposed Rule [81 FR 10372, February 29, 2016].

A. HRS Structure With the Subsurface Intrusion Component

EPA added the evaluation of the relative risk posed by subsurface intrusion of hazardous substances into regularly occupied structures by restructuring the soil exposure pathway from the 1990 HRS to include subsurface intrusion. The soil exposure pathway has been renamed the soil exposure and subsurface intrusion pathway to reflect both components of

the new pathway. No changes are included in the other three HRS pathways, with the exception of the use of a reference concentration instead of a reference dose to determine a hazardous substance's health-based benchmark in the air migration pathway. See Figure 4 for a depiction of how the promulgated addition fits into the HRS structure.

Figure 4. HRS Structure with Subsurface Intrusion Addition



As explained in the preamble to the proposed HRS SsI addition, the subsurface intrusion component is added as a new component of the soil exposure and subsurface intrusion pathway. The soil exposure pathway included in the 1990 HRS is retained as one component of the Soil Exposure and Subsurface Intrusion pathway. The scoring of the soil exposure component remains unaltered, but the score is assigned as the soil exposure component score, not the pathway score. (See section 5.1 of the HRS). As discussed in greater detail below, the SsI component has the same basic structure, scoring, and weighting as other parts of the HRS.

The score for the soil exposure and subsurface intrusion pathway is based on a combination of the two component scores—soil exposure and subsurface intrusion but the pathway score is capped at the same value as other HRS pathways. The soil exposure component score is added to the subsurface intrusion component score to determine the pathway score. The two component scores are additive to reflect that populations may be exposed via both routes: The soil exposure component reflects exposures to people when outside a structure and focuses on ingestion, and the subsurface intrusion component reflects exposures inside a structure and focuses on inhalation. Hence, the addition of the two component scores reflects the potential cumulative risk of multiple exposure routes and is not double counting the same relative risk.

A maximum pathway score is not contingent on scoring both the soil exposure and subsurface intrusion components. It is possible for a site to have only one component evaluated and still reach the maximum pathway score. Because the scoring of the soil exposure component is not being altered, this component would contribute the same score to the overall site score absent the addition of subsurface intrusion.

B. SsI Component Addition

The structure of the HRS is fundamentally the same for all individual pathways, components, and/or threats. The design of the HRS reflects a conceptual understanding of how hazardous substance releases from CERCLA sites can result in risks to public health and welfare and the environment. The risk scenario at these sites is a function of:

- The probability of exposure to (or releases to a medium in a migration pathway of) hazardous substances,
- The expected magnitude and duration of the releases or exposures,
- The toxicity or other potential adverse effects to a receptor associated with a target from the releases,

• For the three migration pathways, the probability that the release will reach a target and the expected change in the concentration of hazardous substances during the movement from the location of the contamination to the targets. For the exposure pathway, the probability a receptor will be exposed at the target location,

• The expected dose to the receptor, and

• The expected number and type of the receptors.

The above considerations are addressed in three factor categories: Likelihood of exposure (or release), waste characteristics, and targets.

The following subsections describe the structure of the subsurface intrusion component and how this structure is consistent conceptually with the existing structure of the other HRS pathways and components: (1) New definitions, (2) delineation of areas of subsurface intrusion, (3) likelihood of exposure, (4) waste characteristics, (5) targets, and (6) calculating and incorporating the subsurface intrusion component score into the HRS site score.

1. New Definitions—See Section 1.1 of the HRS [2]

EPA has added 15 new definitions to the HRS, section 1.1, along with updated nomenclature to existing definitions. EPA received no comments on the 14 proposed new definitions to the rule; therefore, EPA is finalizing the new definitions as proposed with the following change: The term surficial ground water has been changed to shallow ground water for clarity. In addition, EPA has added the term non-aqueous phase liquid (NAPL) to the definition section because EPA added consideration of NAPLs to the assignment of degradation factor values and the weighting of targets in the area of subsurface contamination (ASC).

2. Delineation of Areas of Subsurface Intrusion—See Section 5.2.0 of the HRS

EPA has included in the subsurface intrusion component evaluation two areas in which exposure due to subsurface intrusion contamination exists or is likely to exist: (1) Areas of observed exposure—areas in which contaminant intrusion into regularly occupied structures has been documented, and (2) areas of subsurface contamination—areas in which subsurface contamination underlying regularly occupied structures (such as in shallow ground water or soil vapor) has been documented, but at which either sampling of indoor air has not documented that subsurface contamination has entered a regularly occupied structure or no sampling of indoor air has been undertaken.

a. Area of Observed Exposure (AOE) (See Section 5.2.0 of the HRS)

An area (or areas) of observed exposure at a site is identified based on the location of regularly occupied structures with a documented significant increase in hazardous substance concentrations above background levels resulting at least in part from subsurface intrusion attributable to the site being evaluated. The area encompassed by such structures constitutes the area of observed exposure (AOE). Other regularly occupied structures within this encompassed area (or areas) are also inferred to be in the AOE unless available information indicates otherwise.

b. Area of Subsurface Contamination (ASC)—See Section 5.2.0 of the HRS

An area (or areas) of subsurface contamination is identified as an area outside that of the AOE, at which subsurface contamination has been documented at levels meeting observed release criteria (contamination at levels significantly above background and the significant increase can be attributed at least in part to the site). The contamination would be present in subslab or semi-enclosed or enclosed crawl space samples or in a subsurface sample. (See section 2.3 of the HRS for observed exposure criteria.) In addition, EPA is limiting the delineation of an ASC to be based on the location of subsurface contamination meeting the criteria for observed exposure or observed release and has a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol. The populations in an ASC are assigned a weighting value ranging from 0.1 to 0.9 depending on such factors as the distance of subsurface contamination to a regularly occupied structure's foundation, the sample media, and the presence of a non-aqueous phase liquid (NAPL).

3. Likelihood of Exposure—See Section 5.2.1.1 of the HRS

A key factor considered in the HRS relative risk ranking is whether any exposure to a hazardous substance via subsurface intrusion has occurred, or if not, whether there is a probability that exposure could occur in a regularly occupied structure. This is termed the likelihood of exposure for the subsurface intrusion component.

a. Observed Exposure—See Section 5.2.1.1.1 of the HRS

For HRS purposes, an observed exposure is established if it can be documented that a hazardous substance from the site being evaluated has moved through the subsurface and has entered at least one regularly occupied structure.

b. Potential for Exposure—See Section 5.2.1.1.2 of the HRS

When an observed exposure has not been established, the potential for exposure can be determined for any regularly occupied structure located in an ASC.

The evaluation of the potential for exposure for the subsurface intrusion component uses the same concept and framework used to estimate the potential to release in other pathways. This involves predicting the probability of exposure in an area of subsurface contamination based on structural containment features of the regularly occupied structure and a hazardous substance's physical and chemical properties and the physical subsurface properties that influence the probability that intrusion is occurring. These factor values include:

• Structure Containment

• Depth to Contamination

• Vertical Migration

• Vapor Migration Potential

Consistent with potential to release determinations in the HRS, the potential for exposure for this component is calculated by summing depth to contamination, vertical migration and vapor migration potential factor values and multiplying the sum by the containment factor value to determine a potential for exposure factor value.

c. Calculation of the Likelihood of Exposure Factor Category Value—See Section 5.2.1.1.3 of the HRS

As in all HRS pathways and components, the likelihood of exposure factor category value is assigned based on the higher of the observed exposure (or release) value or the potential for exposure (or release) value. The maximum value assigned for the likelihood of exposure factor category is 550 and is assigned if observed exposure is documented. If observed exposure is not documented, the value assigned when evaluating potential for exposure ranges between 0 and 500.

[2] *For references to a specific section of the HRS addition, please refer to the regulatory text of the rulemaking.*

4. Waste Characteristics—See Section 5.2.1.2 of the HRS

The waste characteristics factor category is based on factors that are related to the relative risk considerations included in the basic HRS structure. The factors considered in determining the waste characteristics factor category value are the toxicity of the hazardous substances, the ability of the hazardous substance to degrade, and an estimate of the quantity of the hazardous substances to which occupants could be exposed.

a. Toxicity/Degradation—See Section 5.2.1.2.1 of the HRS

The combined toxicity/degradation factor includes consideration of both the toxicity and the possibility for degradation of hazardous substances being evaluated for HRS purposes. The toxicity factor in the overall HRS structure reflects the toxicity of a hazardous substance associated with a source, release or exposure at a site, and is assigned the same factor value for all the pathways and components in the HRS. Any hazardous substance identified in an observed exposure within the AOE or meeting the observed release criteria in either the AOE or ASC will be assigned a toxicity factor value.

The degradation factor represents the possibility for a substance to degrade in the subsurface prior to intruding into a regularly occupied structure. The subsurface intrusion component evaluates degradation based on the substance being evaluated, the depth to contamination, and the presence of a NAPL. It also assumes the presence of biologically active soil unless information indicates otherwise. If it has been documented that a hazardous substance has been found to have entered a regularly occupied structure, regardless of the substance or the site conditions, the degradation value is assigned to reflect the likelihood that the substance is not significantly degrading in the subsurface. Additionally, any eligible hazardous substance present in the subsurface below an AOE or ASC as a NAPL at depth less than 30 feet is assigned a degradation value to reflect the likelihood that the substance will not significantly degrade in the subsurface environment.

The toxicity and degradation factors are multiplied together to assign a combined factor value. If multiple substances are present, the highest combined factor value is selected for use in determining the waste characteristics factor category value, as discussed below.

b. Hazardous Waste Quantity—See Section 5.2.1.2.2 of the HRS

The waste quantity factor value for this component reflects only the amount of hazardous substances that people are exposed to, that is, the amount in regularly occupied structures. EPA has retained a four-tiered hierarchical approach consistent with the HRS as well as minimum waste quantity factors. The estimation of waste quantity for the subsurface intrusion component considers the regularly occupied structures located within the AOE and ASC. For sites at which the component waste quantity (the sum waste quantities for all regularly occupied structures in the AOE and ASC) is below 10, a minimum factor of 10 would apply, the same as in other pathways and components. The minimum waste quantity factors are included because of insufficient information at many sites to adequately estimate waste quantity with confidence.

c. Calculation of the Waste Characteristics Factor Category Value—See Section 5.2.1.2.3 of the HRS

As in all HRS pathways and components, the waste characteristics category value is the product of the waste characteristics factor values (*e.g.,* toxicity/degradation factor value) for the SsI component and the hazardous waste quantity factor value, all of which are scaled so as to be weighted consistently in all pathways. Similar to the likelihood of exposure factor category, the waste characteristics factor category is subject to a maximum value to maintain the balance between factor categories. This approach is consistent with the 1990 HRS structure.

5. Targets—See Section 5.2.1.3 of the HRS

The targets factor is based upon estimates of the expected dose to each receptor associated with a target and the number and type of receptors present at each target. In assessing human risk, it is critical to understand the nature and extent of exposure to individuals, populations, and resources.

a. Identification of Eligible Targets—See Section 5.2.1.3 of the HRS

The soil exposure and subsurface intrusion pathway uses the same target categories used in the HRS soil exposure pathway, including exposed individual, resident populations, workers, and resources. However, unlike the HRS soil exposure pathway, workers are to be evaluated as exposed individuals and as part of the population within an area of subsurface contamination instead of being evaluated under a separate worker factor value.

b. Exposed Individual and Levels of Exposure—See Section 5.2.1.3.1 of the HRS

i. Identifying Levels of Exposure and Benchmarks for Subsurface Intrusion

In the SsI component, targets in the AOE are considered actually contaminated, whereas, those in the ASC are considered potentially contaminated. The targets in an AOE are further divided into Level I and II, based on whether the hazardous substance concentrations are at or above identified health-based benchmarks.

The targets within an ASC are categorized based on the type of sample (*e.g.,* gas, soil, water), the distance of the sample from the targets (*e.g.,* the depth of the sample below the structure), and whether a NAPL is present. Weighting factors ranging from 0.1 to 0.9 are then assigned accordingly.

ii. Exposed Individual—See Section 5.2.1.3.1 of the HRS

The evaluation of exposed individuals in the SsI component includes individuals living, attending school or day care, or working in a regularly occupied structure. Individuals in the eligible target population are expected to be exposed to the highest concentration of the hazardous substance in question for a significant time.

c. Population—See Section 5.2.1.3.2 of the HRS

The population factor for the SsI component includes all populations qualifying as exposed individuals, including residents, students, workers, and those attending day care. Workers are weighted slightly differently than other exposed individuals to reflect that a worker's exposure is limited to the time present in a workplace. The number of workers present in a structure or subunit is adjusted by an appropriate factor reflecting whether or not they are a full-time or part-time worker.

i. Weighting of Targets in the Area of Observed Exposure (AOE)—See Sections 5.2.1.3.2.1 and 5.2.1.3.2.2 of the HRS

Consistent with the weighting of populations throughout the HRS, the subsurface intrusion component will weight targets in an AOE subject to Level I contaminant concentrations by a factor of 10 and weight targets subject to Level II contaminant concentrations by a factor of 1. Eligible populations include individuals living, working, and

attending school or day care in regularly occupied structures.

Within the AOE, those populations in regularly occupied structures for which observed exposures have not been established but the structures are surrounded by regularly occupied structures in which observed exposures have been identified, are also considered as actually contaminated unless evidence indicates otherwise. Targets inferred to be exposed to this contamination will be weighted as Level II as there are no actual sample results to compare against benchmarks.

In the case of multi-story/multi-subunit structures, all regularly occupied subunits on a level with an observed exposure and all levels below are considered to be within an AOE, unless available information indicates otherwise. For multi-story/multi-subunit structures located within an AOE, but where an observed exposure has not been documented, only those regularly occupied spaces on the lowest level are considered to be within an AOE, unless available information indicates otherwise.

ii. Weighting of Targets in the Area of Subsurface Contamination (ASC)—See Section 5.2.1.3.2.3 of the HRS

Due to the variability in subsurface intrusion rates, the potential weighting factor values for targets within an ASC range from 0.1 to 0.9 and depend on where the subsurface contamination has been found and whether a NAPL is present.

Potential targets are weighted to reflect the distance to or the depth at which contamination is found and whether a NAPL is present. The weighting factors applied to populations being evaluated based on the presence of subsurface contamination containing a NAPL reflects greater subsurface source concentrations and an increased probability that contaminant intrusion into a regularly occupied structure from the subsurface will result in a concentration significantly above background levels for the site. In the case of multi-story/multi-subunit structures, all regularly occupied subunits on a level above one where an observed exposure has been documented or inferred, or where a gaseous indoor air sample meeting observed release criteria is present, are considered to be located within an ASC, unless available information indicates otherwise. For multi-story/multi-subunit structures located only within an ASC, only those regularly occupied subunits within the lowest level are considered in an HRS evaluation.

Eligible populations in an ASC include individuals living in, attending school or day care, and working in regularly occupied structures. However, the number of workers is adjusted to reflect that their exposure is limited to the time they are in a workplace.

d. Resources—See Section 5.2.1.3.3 of the HRS

Resources for this component include regularly occupied structures that are located within a defined AOE or ASC and in which populations may be exposed to contamination due to subsurface intrusion. Libraries, recreational facilities, and religious or tribal structures used by individuals may qualify as eligible resources.

e. Calculation of the Targets Factor Category Value—See Section 5.2.1.3.4 of the HRS

The Target Factor Category Value is the sum of all the Target Factor values.

6. Calculation and Incorporation of the SsI Component Score Into the HRS Site Score

The following subsections summarize the calculation of the subsurface intrusion component score, how the component score is used in the calculation of the soil exposure and subsurface intrusion pathway score, and how, in turn, the pathway score is subsequently incorporated into the HRS site score.

a. Calculation of the SsI Component Score—See Section 5.2.2 of the HRS

The SsI Component score is the product of the likelihood of exposure factor category value, the waste characteristics factor category value, and the targets factor category value; that value is divided by a weighting factor so that it has equal magnitude to other component scores (subject to a maximum value).

b. Incorporation of the SsI Component Score into the Soil Exposure and Subsurface Intrusion Pathway Score—See Section 5.3 of the HRS

The Soil Exposure and Subsurface Intrusion pathway score is a combination of the two component scores.

c. Incorporation of the Soil Exposure and Subsurface Intrusion Pathway Score Into a Site Score—See Section 2.1.1 of the HRS

EPA did not change the methodology used to assign an overall site score due to the addition of the subsurface intrusion component to the soil exposure pathway and renaming that pathway the soil exposure and subsurface intrusion pathway. The overall site score remains a function of four pathway scores and the same weighting is given to each pathway score as in the 1990 HRS.

C. Testing the SsI Component

The SsI component was tested extensively throughout the development of this rule, using multiple methods. The main goals of testing the component included:

- Ensuring the addition of the SsI component to the soil exposure pathway did not change relative contribution to the site score as the other HRS pathways and maintained the same relative risk of a site with a similar threshold for qualifying for the NPL.
- Ensuring the number of targets subject to actual contamination needed to achieve a site score sufficient for NPL proposal remained consistent across pathways.
- Ensuring that applying the SsI component as part of an HRS evaluation would not result in identification of sites with a low level of risk or would not identify sites with a high level of risk.

These goals were met by using conceptual simulations to project the effectiveness and appropriateness for factor values, by developing and testing numerous example site scenarios to refine the model and by applying the model to test sites to determine its efficacy. The following information provides details on the approaches used to test the SsI component.

1. Conceptual Site Model/Sensitivity Analysis

Sensitivity analyses were performed during development of the rule to test the SsI component and identify and assign the relative magnitude of the factors having the greatest impact on the HRS site score. The analyses illustrated the types of sites that would qualify for the NPL considering subsurface intrusion contamination, and sites that would qualify for the NPL considering the contribution of subsurface intrusion contamination to other pathways. The scenarios illustrate different site characteristics and different factor value weightings. An initial conceptual site scenario evaluation was developed with varying likelihood of intrusion levels, zone of contamination, waste characteristics and levels of contamination. The conceptual site scenario evaluation was varied to reflect possible ranges in the factors considered in the HRS evaluation.

The first phase of testing estimated site scores based on options considered

for identifying eligible targets and delineating target areas. The testing was conducted using factor values, factor category values, and scoring algorithms consistent with other parts of the HRS. This ensured relative risk was evaluated and consistently weighted among pathways. A second phase was conducted for identifying target areas delineated by AOEs and ASCs of various site scenarios to test the HRS addition and to illustrate the features of sites that would qualify for the NPL considering vapor intrusion contamination. To illustrate the subsurface intrusion component and contribution of weighting of factor values, three comprehensive site scoring scenarios were evaluated: A site would not qualify for placement on the NPL (score below 28.50), a site would marginally qualify for the NPL (score of or about 28.50), and a site would exceed the scoring criterion for the NPL (site score considerably above 28.50). Based on this final rule, the results revealed that sites without areas of observed exposures and a typical waste characteristic value would require a minimum of 685 receptors living, working or attending school or daycare above an area of subsurface contamination to receive a score of 28.50 based on shallow subsurface sampling. Sites with documented subsurface intrusion into an occupied structure, a typical waste characteristic value and indoor air samples below health-based benchmarks would require a minimum of 223 receptors to receive a score of 28.50. This illustrates that this final rule will not result in a large number of sites qualifying for the NPL as it is unlikely this number of receptors in an area of subsurface contamination will commonly occur. This is the similar number of receptors needed for a site to qualify for the NPL in other pathways.

2. Test Sites (Tier 1)

To support the final rulemaking, EPA conducted a screening-level assessment of sites with identified subsurface intrusion threats. As a first step in collecting the list of sites potentially affected by the final rule, EPA consulted with site assessment experts that work in Superfund to identify potential site candidates. EPA also reached out to state counterparts, in particular to state programs that were known to have taken a more thorough investigation of the subsurface intrusion pathway at sites. Through this process, EPA identified approximately 1,073 sites. These sites are not currently on the NPL, and all have a potential or identified SsI threat. Within the group of sites potentially affected by the HRS SsI Addition, EPA defined four categories:

1. Tier 4: Sites identified as having a suspected SsI threat based on EPA's Superfund database and Agency for Toxic Substances and Disease Registry keyword searches, as well as EPA or state self-identification, but for which no sampling data were obtained;

2. Tier 3: Sites identified as having characteristics or evidence that indicate SsI may have occurred or will occur;

3. Tier 2: Sites identified as having an SsI threat documented by subslab, crawl space, or indoor air samples, but insufficient HRS-required evaluation factors to qualify for the NPL; and

4. Tier 1: Sites identified as having an SsI threat with documented actual exposure of a sufficient number of targets with enough other HRS-required evaluation factors to suggest the site may qualify for the NPL.

EPA selected the Tier 1 sites for use in testing the SsI component evaluation process. The 11 Test Sites had documentation of indoor contamination due to subsurface intrusion based on actual sampling data and other typically HRS-required data. Of the 11 sites scored, 9 were projected to score 28.50 or higher using only the SsI component. 1 site was projected to score 28.50 or higher only by including both the scores from the SsI component evaluation and the ground water migration pathway evaluation in the site score. It was unknown whether these sites would qualify for the NPL when they were chosen as Test Sites, as the SsI scoring process had not been developed. The Test Site with a projected score below 28.50 did not qualify for the NPL even though the site was located in a mixed-used residential and industrial area, illustrating that not all sites in an urban area will qualify for the NPL.

That 10 of the 11 Test Sites have a projected HRS site score of 28.50 or greater using the SsI component is not an indication that the addition of the SsI component will result in a large number of SsI sites qualifying for the NPL; this would be a possible projection if the Test Sites were chosen randomly so as to represent a typical SsI site. The Test Sites were not randomly chosen, but instead were specifically chosen because they have a documented subsurface intrusion threats at the sites and sufficient available data to test all parts of the SsI component. The Test Sites all had areas of observed exposure; most had more than 38 structures at the site (some with hundreds of structures), and all but two Test Sites had at least 50 targets (more than half had over 100 targets). Each site was also associated with volatile hazardous substances that are considered hazardous to human health at low concentrations. Appendix B of the Technical Support Document (TSD) for this final rulemaking provides a summary of these scoring evaluations.

3. Pilot Study

The main purpose of the Pilot Study was to identify sites currently being evaluated for SsI by the EPA regions with a suspected subsurface intrusion threat and determine whether an SI would provide enough information to score a site under the new component. Additional goals of the Pilot Study were to gather data and determine if design of the SsI model is practical and gives expected results; identify a range for the cost of a projected SsI site assessment; and assist in developing future guidelines for SsI assessments. A total of 10 sites were identified across 5 of the 10 EPA Regions. The pilot studies were not intended to identify sites for placement on the NPL, and not all sites considered for the pilot studies achieved an HRS score greater than (or equal to) 28.50. However, collecting actual data for the purposes of generating an SsI component score, ensured the HRS was considering subsurface intrusion threats appropriately. Ultimately, the pilot studies were used to proof the concept and validate the SsI component in terms of the application of selected weighting factor values and the efficacy for accurately identifying sites with significant relative risk.

IV. Summary of Changes to the HRS

Comments on the Proposed Rule were received from 15 organizations/individuals. The commenters included state and federal agencies, industry associations, community groups, consultants, and private citizens. No major conceptual or structural changes were necessary based on comments received during the public comment period. While many of the comments focused on the structure of the SsI component, there was not sufficient rationale for making major changes to the basic structure of the SsI component. There were minor revisions made based on comments, which help refine the mechanics of assigning an HRS site score. As a result, the SsI component better reflects current science and better aligns with underlying concepts in the *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air* (VI Guide). These changes had no impact on the overall structure of the SsI component and do not impact the relative weighting among the HRS

pathways or the level of risk required to qualify for the NPL.

A. Changes Since Proposal

1. Consideration of Contaminated Ground Water Intrusion

Section 5.2 was revised to clarify that areas of subsurface contamination are only delineated based on the presence of hazardous substances meeting the criteria for observed exposure or observed release and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol. However, if samples indicate intrusion of liquids containing hazardous substances has occurred into regularly occupied structures, the samples of that liquid are still used in delineating an Area of Observed Exposure to reflect the threat to targets. These revisions were made to correct a seeming inconsistency in wording between the discussion in the preamble to the proposed rule and the proposed regulatory language.

2. Consideration of Non-Aqueous Phase Liquids (NAPLs) in Weighting of Targets in an ASC

Table 5–21, Weighting Factor Values for Populations within an Area of Subsurface Contamination, of the HRS was revised to include consideration of the presence of NAPLs identified in an area of subsurface contamination. These additions increase the weighting of the population in an area of subsurface contamination to the SsI component score. These revisions were in response to comments that the proposed addition did not reflect the magnitude of contaminant concentrations in the evaluation of targets in the area of subsurface contamination. While EPA considers it unlikely that the actual aerial distribution and magnitude of contaminant concentrations can be determined in an area of observed contamination during a site inspection, if NAPLs are identified as present, EPA agrees that there is a greater risk to receptors than if no NAPL is present.

3. Modifications to the Determination of Degradation Factor Values

Section 5.2.1.2.1.2 of the HRS was revised to make it easier for the reader to determine degradation factor values and to add consideration of the presence of NAPLs. Commenters asserted that the text was difficult to follow and that the presence of NAPLs was a major factor in the impact of degradation. A new table, Table 5–18 of the HRS, simplifying the assignment of degradation factor values based on the depth to contamination and a substance's half-life was inserted to replace proposed text. Additionally, if no half-life information is available for a hazardous substance and the substance is not already assigned a degradation factor value of 1, a value of 1 will be assigned. This modification further simplifies the degradation evaluation and is also protective of human health, for if no half-life information is available for a hazardous substance, EPA cannot assume that degradation will occur. In addition, parent-daughter relationships between substances are no longer considered in the assignment of the degradation factor value, in part to simplify the assignment and in part to reflect the variation in rates of degradation due to site-specific subsurface conditions. Even if degradation occurs, if a contaminant is at high enough concentration to exist as a NAPL at depths less than or equal to 30 feet, it is more likely to pose a threat to populations in overlying structure.

4. Modifications Made to Section 5.2.1.1.2.1, Structure Containment and Table 5–12

Section 5.2.1.1.2.1 and Table 5–12 of the HRS were revised in response to comments on the rationale for assigning containment values to individual structures. The assignment of a structure containment factor value assigned to structures in Table 5–12 with vapor mitigation systems or other response actions was revised. These revisions were made in response to a comment questioning why response actions taken by federal, state, and tribal authorities are treated differently than those taken by private entities in determining containment for a structure. The language regarding treatment of removals by federal, state, and tribal authorities has been removed from Table 5–12 and the corresponding containment value was assigned a 1. This change allows a consideration of public and private removal actions to be evaluated in a consistent manner.

Section 5.2.1.1.2.1 and Table 5–12 of the HRS was also revised to remove from the table the direction of the assignment of a structure containment value for a regularly occupied structure with unknown containment features. This direction, which assigns a value of ''greater than zero'' to this situation, was moved to the text in section 5.2.1.1.2.1 of the HRS. This revision was made in response to a comment questioning the rationale for the various containment values and was made to improve the continuity of the table, which directs the assignment of values when containment features of the structure are known. A structure with a containment factor value of greater than zero cannot be used in assigning a potential for exposure factor value. EPA considers it appropriate that the potential for exposure factor value should be based on actual field observations. However a structure with a structure containment value of greater than zero allows the structure to be evaluated for assigning waste characteristics values (*e.g.,* a hazardous waste quantity factor value) and for assigning target factor values. EPA considers the inclusion of structures with unknown containment features in the calculation of waste characteristics and targets values appropriate as it reflects that very few structures are built to be sufficiently air tight to prevent subsurface intrusion.

5. Consideration of Hydraulic Conductivity in Vertical Migration

Table 5–14 of the HRS was revised to allow assignment of an effective porosity/permeability factor value based on site-specific measurements of hydraulic conductivity, if known. This addition was made in response to a comment suggesting the rule be modified to allow use of site-specific information for this purpose when available.

6. Changes to Definitions

The term surficial ground water was re-named shallow ground water and was changed to be consistent with current EPA usage.

EPA has added the term non-aqueous phase liquid (NAPL) to the definition section. EPA added consideration of the identification of concentrations of hazardous substances high enough to indicate the presence of NAPLs in the subsurface during a site inspection to the assignment of degradation factor values and the weighting of targets in the ASC. The presence of NAPLs in the subsurface demonstrates the hazardous substances will be present at high concentrations for a significant time period at that location and the high concentration is not a transient situation.

B. Summary of Updates to the HRS (Sections 2, 5, 6, and 7)

1. Addition of an SsI Component to the HRS (Sections 2, 5, and 7)

a. The addition of a subsurface intrusion component is added to the 1990 Soil Exposure pathway as section 5.2 in Chapter 5 of the 2016 Revised HRS. The new pathway name is the soil exposure and subsurface intrusion pathway. The existing method for evaluating the soil exposure threat will remain unchanged.

b. Chapter 2: Evaluations Common to All Pathways is updated to reflect the

addition of the subsurface intrusion component to the renamed the soil exposure and subsurface intrusion pathway. The evaluations for the migration pathways and the soil exposure component remain unchanged. A parallel structure was added for the subsurface intrusion component.

c. Chapter 7: Sites Containing Radioactive Substances is updated to reflect how radioactive substances are evaluated using the added subsurface intrusion component.

2. Terminology Updates Affecting Specific Sections of the HRS (Sections 2, 5 & 6)

The following terms are updated to reflect current terminology and procedures used by EPA in performing risk assessments.

a. Ambient Water Quality Criteria: Ambient Water Quality Criteria (AWQC) are now identified also as National Recommended Water Quality Criteria (NRWQC). In addition, the acute AWQC are now identified as the Criterion Maximum Concentration (CMC) and the chronic criteria are referred to as the Criterion Continuous Concentration (CCC). (See section 1.1 of the HRS.) These criteria are used to determine the level of threat to environmental targets.

b. Reference Concentrations: For inhalation exposures, EPA is adopting the use of Reference Concentrations (RfCs) instead of Reference Doses (RfDs) when determining non-cancer-related risk levels. RfCs are used in determining the level of threat to human targets due to possible inhalation and when determining the toxicity of the substances.

c. Cancer Unit Risk: For inhalation exposures, EPA is adopting the use of Inhalation Unit Risk (IUR) instead of cancer slope factors in determining cancer-related risk levels. IURs are used in determining the level of threat to human targets due to possible inhalation and when determining the toxicity of the substances.

d. Weight-of-Evidence Groupings: The 2005 EPA weight-of-evidence groupings supporting the designation of a substance as a human carcinogen have been incorporated into the HRS algorithm for assigning the toxicity factor value. (The former EPA weight-of-evidence categories included as part of the 1990 HRS have been retained as EPA has not yet completed assigning all substances to the revised categories and are doing so at the time the EPA substance literature reviews are updated.)

V. Discussion of Major Comments

Comments on the Proposed Rule were received from 15 organizations/individuals. The commenters included state and federal agencies, industry associations, community groups, consultants, and private citizens. This section discusses the major issues raised by commenters, which are summarized, and EPA's summary of responses. In addition, EPA solicited and received input from commenters on three technical questions posed in the Preamble to the Proposed Rule.

A support document, Response to Comments on the 2016 Revisions to the Hazard Ranking System (HRS), that includes all issues raised during the public comment period, comments received on the questions posed in the preamble to the proposed rule and EPA's more comprehensive response to each issue, is available in the docket for this rulemaking.

A. Responses to Comments on EPA Questions Posed in the Proposed Rule

Question 1: Is there a way to determine the presence and extent of biologically active soil at a site during a limited site investigation? If so, what soil characteristics should EPA consider to determine whether biologically active soil is documented to be present?

EPA received multiple comments in response to this question. One commenter suggested that this activity is beyond the scope of the site assessment process, while another commenter suggested that EPA consider measuring specific compounds or other factors reflecting biological activity when conducting soil vapor analysis. A third commenter remarked that half-lives faster than 100 days are presumably due to aerobic biodegradation and that most vadose zone soils that are not grossly impacted are considered biologically active. A commenter also suggested using soil characteristics reflected in soil surveys to reflect the possibility that biologically active soil could be present. No commenter suggested practical methods to determine site-specific biological activity throughout a site or over time.

The HRS SsI addition was revised to clarify the assumption of the presence of biologically soil in evaluating the degradation factor unless evidence indicates otherwise (see section 5.2.1.2.1.2 of the HRS).

Question 2: How could EPA further take into account the difference in dilution and air exchange rates in large industrial buildings as compared to smaller residential and commercial structures when calculating the hazardous waste quantity for the HRS SsI Addition?

EPA received multiple comments in response to this question. One commenter suggested developing intrusion screening values based on exposure scenarios for ''most sensitive individual'' and ''industrial'' models. One commenter indicated that there is not a dependable way to account for the differences between large commercial/industrial structures and smaller residential/commercial structures. Another commenter noted that there are several parameters (*e.g.,* building energy efficiency) that would impact the differences in dilution and air exchange rates and which are generally unavailable during an initial assessment. A commenter discussed developing a sliding scale based on the size of the building and the building's general use to account for the differences in contaminant clearance rates.

EPA did not make any changes to the final rule based on the comments received as the type of information requested in these responses is generally not available during a typical site inspection. The HRS has also been designed so that it can be applied consistently to a wide variety of sites. The HRS is not a tool for conducting quantitative risk assessment and was designed to be a measure of relative risk among sites rather than absolute site-specific risk.

Question 3: The HRS SsI addition considers source strength in delineating ASCs and AOEs, in scoring in likelihood of exposure, in assigning waste quantity specifically when estimating hazardous constituent quantity and in weighting targets in an ASC. The HRS algorithm for all pathways incorporates the consideration of source strength in determining an HRS site score. Could EPA further take into account source strength in performing an HRS evaluation?

EPA received multiple comments in response to this question. One commenter suggested that EPA assign a higher score when the contaminant concentration is high (*e.g.,* when a non-aqueous phase liquid is present) to account for source strength. Comments were also received that reflected the difficulty of accessing large low concentration sources and how to account for that in considering source strength. Another commenter remarked that there may be a large ground water plume without a discrete source that would cause an increased risk of vapor intrusion; and that a large diffuse source is different from having a concentrated discrete source. One commenter

provided a copy of the proposed rule with their suggested edits reflecting the evaluation of source strength in assigning HRS specific factors.

The assignment of a degradation factor value (see section 5.2.1.2.1.2 of the HRS) and the weighting factors for targets in an area of subsurface contamination (see Table 5–21 of the HRS) were revised to include consideration of source strength; specifically in the situation where NAPLs are present.

B. Major Comment Theme Summaries and Responses

Statutory Authority and Rationale for the Proposed HRS Addition

Justification for Revising the HRS

EPA received comments suggesting that sufficient justification or rationale for the need to revise the HRS has not been provided and that a revision to the HRS is unnecessary because the 1990 HRS adequately evaluates the relative risk posed by a site and identifies those priority sites for further investigation.

The rationale for revising the HRS to add a subsurface intrusion component is EPA's statutory authority. Specifically, CERCLA 105(a)(8)(A), requires EPA to amend the HRS ''to assure to the maximum extent feasible, that the HRS accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review.'' Contamination due to subsurface intrusion is a known risk to human health and the ability to evaluate those risks is consistent with the CERCLA 105 mandate. The 1990 HRS did not evaluate the risk posed by subsurface intrusion when evaluating sites for the NPL. As part of the development of this rule, EPA identified high priority sites with significant contamination due to SsI that could not be evaluated using the 1990 HRS for possible placement on the NPL. With the addition of the SsI component to the HRS, sites can now be evaluated more comprehensively to consider the relative risk posed by a site.

Priority for Drinking Water Sites

EPA received comments suggesting that the proposed HRS SsI addition conflicts with CERCLA's statutory mandate regarding prioritizing drinking water sites.

The revision to the HRS to add a subsurface intrusion component is not in conflict with the CERCLA 105 mandate to prioritize drinking water sites. The priority given by EPA under CERCLA to sites with a high risk of populations exposed to hazardous substances in drinking water has not decreased with the addition of a subsurface intrusion component to the HRS. In fact, the score for some sites with contaminated drinking water supplies may increase because sites with contaminated drinking water may also be associated with subsurface intrusion contamination and the combination of the ground water migration pathway score and the SsI component score may increase the overall site score. Furthermore, EPA notes that drinking water is a priority identified by CERCLA, but it is not the only priority identified in CERCLA 105, which also mandates the prioritization of dangers of direct human contact, for which SsI is one example.

The addition of the SsI component does not change the priority given to drinking water sites. It does not change the scoring of contaminated drinking water supplies under the HRS, reduce in anyway the overall HRS score for any site based on drinking water contamination (or any other threat due to exposure to released hazardous substances in the HRS), or change the site score of 28.50 being the HRS score that qualifies sites for placement on the NPL. If a site qualifies for placement on the NPL based on its HRS score reflecting drinking water contamination prior to the addition of the SsI component, it will continue to do so. Adding an evaluation of the SsI component can only increase an overall site score. The algorithm used to combine pathways scores to obtain an overall site score results in an increase in the overall site score with the evaluation of additional pathways, components and threats scored. In fact, the SsI addition may raise the overall site score at some sites with ground water drinking water contamination from below the 28.50 cut-off score to above it. This may occur because, as stated above, a site's HRS score can increase with the scoring of additional threats. Sites with ground water contaminated by volatile substances and used for drinking water are also sites at which the ground water contamination may volatilize and intrude into overlying regularly occupied structures. Thus, a site at which ground water contamination has occurred but does not have an HRS score above 28.50 based only on the ground water threat, may have an overall HRS site score above 28.50 based on the combination of the scores for the contaminated drinking water and SsI threats.

Furthermore, EPA notes that CERCLA 118 refers to CERCLA sections104 and 108, which address activities that occur pre- or post-NPL-listing, and not to the section of CERCLA that addresses site ranking using the HRS, which is addressed in CERCLA section 105. CERCLA Section 105 and specifically 105(a)(8)(A) requires EPA to prioritize sites based on ''the population at risk, the hazard potential of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact [and] the potential for destruction of sensitive ecosystems.'' Since subsurface intrusion contamination is a direct human contact threat, the addition of a subsurface intrusion component, which addresses this threat, is mandated by CERCLA.

Resource Impacts of the Proposed HRS Addition

Increased Cost and Level of Effort

EPA received comments suggesting that contrary to EPA's suggestion that the HRS SsI addition may not result in more site assessments per year and only minimal cost increases, commenters claimed that there will be substantial increases in cost and level of effort for states and federal agencies, due to the complexity in assessing subsurface intrusion sites.

EPA acknowledges that in some cases the scope of a typical site inspection (SI) may need to be expanded to collect the information necessary to evaluate the SsI threat present at a site. EPA also acknowledges that sites that did not qualify previously for the NPL, may now do so. The number of samples and level of effort required to evaluate a site using the 1990 HRS pathways or components already varies on a site-by-site basis depending on the size and extent of contamination at the site. Therefore, it cannot be predicted with certainty that there will be an overall increase in cost or level of effort for any particular site due to the HRS SsI addition. However, the overall budget for performing site assessments per year is not expected to change significantly. EPA's budget for site assessment is dependent on Congressional appropriation and EPA does not expect the rulemaking to impact the appropriation. EPA's budget for site assessment has remained relatively constant for the last several years. Hence, EPA expects that the allocation of available resources may be changed to reflect this rulemaking but will continue to be optimized by EPA, its state and tribal partners, and with other federal agencies to evaluate priority sites. However, the number of site assessments or NPL proposals conducted each year will not significantly increase.

Potential Limitations With Implementing the HRS SsI Addition

Scope of Site Inspection

EPA received comments stating that the type and amount of information available for collection during a time-limited site inspection would be insufficient to properly evaluate a site using the HRS SsI addition and would be beyond the scope of site evaluations typically conducted at the preliminary assessment or site inspection stage.

During development of the HRS SsI addition EPA considered the type of information that could be collected during a time-limited site inspection when selecting the factors to include in an evaluation of the subsurface intrusion component. The purpose of the site inspection (NCP 300.420(c)) is to determine if a release of a hazardous substance poses an actual or potential threat to human health or the environment, to determine if there is an immediate threat to people or the environment, and to collect sufficient data to enable the site to be scored using the HRS. EPA also notes that neither the NCP nor the HRS requires a certain number of samples be collected during an SI, because the number of samples required to evaluate a site varies on a site-by-site basis and the possible risk pathways being evaluated. However, to properly evaluate the subsurface intrusion component, additional information may be required beyond that collected during a typical current site inspection may be required; this is consistent with the need to collect data on the threat posed by a different pathway. In these instances, as stated in EPA's Guidance for Performing Site Inspections under CERCLA (September 1992), an expanded site inspection (ESI) may be required. The objective of the ESI is to collect data that was not collected during an initial site inspection. Furthermore, EPA found that information required for an SsI evaluation was available based on a pilot study which included several candidate NPL sites. The pilot study was performed in part to demonstrate the availability of the necessary data from screening level investigations. Therefore, EPA considers that the information required to properly evaluate the subsurface intrusion component can be obtained during the site assessment process.

Need for Guidance

EPA received comments questioning or requesting additional information or guidance regarding the type and amount of data to collect, data collection methods, and how to apply the subsurface intrusion component to a site. Commenters also suggested it was difficult to properly evaluate and comment on the proposed HRS SsI addition without a thorough understanding of how the SsI component would be implemented and that promulgation should be delayed until guidance is developed.

The HRS does not provide prescriptive methods for performing site investigations for any HRS pathway evaluation because the methods used during the collection and analysis of environmental samples depend on site conditions and could not be written to cover all possible situations and could also become outdated in the future. Additionally, it is outside the scope of the HRS to identify and describe methods for conducting a subsurface intrusion screening for HRS purposes. The sampling and data collection information in the EPA OSWER VI Guide, (particularly in section 6 of the guide) are an appropriate resource for gathering data for HRS purposes. For example, Section 6.4 of the guide identifies basic principles, methods and procedures for indoor air sampling. In addition, states, federal agencies, and private contractors have considerable experience in VI investigations and collecting VI-related data. Guidance on implementation of the proposed SsI addition is not necessary for evaluating the SsI component, which is a scoring mechanism not procedures for data collection. Any guidance developed will provide details on collecting data to support an HRS SsI evaluation. EPA also notes that to delay addressing sites that may pose a significant human health risk until all necessary guidance documents have been developed would not be consistent with EPA's mandate to protect human health. Therefore, EPA does not agree that promulgation of the HRS SsI addition needs to be delayed until guidance documents related to its implementation have been developed.

Roles of the HRS SsI Addition and the 2015 OSWER VI Guide

EPA received comments suggesting that the HRS SsI addition is not consistent with the VI Guide, published in June 2015 and will create confusion when evaluating sites for SsI.

The VI Guide and HRS SsI rule work in concert to establish national consistency in the evaluation of SsI threats. The HRS SsI addition and the OSWER VI Guide both address the threat posed by vapor intrusion and use the same principles, sampling procedures and concepts to characterize the threat posed by vapor intrusion as the sites. However, the HRS SsI addition and the OSWER VI Guide serve different purposes and support different phases of EPA's site remediation process with different data quality requirements and different enabling legislations.

The purpose of the OSWER VI Guide is to guide the investigation and assessment of the threat posed by vapor intrusion into structures from all sources under all Office of Land and Emergency Management (OLEM, formerly OSWER) programs, particularly actions taken under CERCLA and RCRA. This guidance is used to support decisions by EPA on whether vapor intrusion is posing an unacceptable risk to human health based on sufficient site specific data. It contains principles for making such a decision, as well as procedures and guidance for collecting the information necessary to make these decisions.

The HRS and the SsI addition is part of the NCP, (the regulations implementing CERCLA) required by CERCLA to identify priority sites for further investigation based on screening level information (Such sites are identified for the public by placing the sites on the NPL, a separate rulemaking process). This prioritization is based on the possible cumulative relative risk amongst all candidate sites posed by releases of hazardous substances to human health and the environment by either migration to receptors or by direct contact with the contamination, such as by subsurface intrusion. The HRS is only a method for assigning a relative score to candidate sites. It is not a method for determining site specific risk. The HRS SsI addition is not guidance. The HRS SsI addition does not address such subjects as data collection and sampling procedures: Many of the procedures and many of the guidelines in the OSWER VI Guide are also applicable for HRS purposes if they can be implemented as part of a screening level assessment.

Given that the purposes for the two documents are considerably different and based on different levels of information, it is not an issue that decision criteria are different in the two documents. It is certainly possible that, based on an HRS evaluation, EPA may determine a site warrants further investigation, and that after further investigation is performed EPA may decide no remediation is necessary. However until further information is collected during a remedial investigation, such an outcome cannot be predicted. Furthermore, such a situation is not an indication the results of the HRS evaluation was incorrect.

Application of HRS SsI Component

Inferring Contamination

EPA received comments suggesting that by inferring contamination between sampling locations, the extent of the risk is overstated. The commenters considered identifying targets as actually or potentially exposed based on inference to inflate the HRS site score. It was also suggested that this method conflicts with the other HRS pathways.

The HRS is not a quantitative risk assessment. Instead, the HRS SsI addition score reflects the possible threat posed by subsurface intrusion at one site relative to other sites. By inferring contamination in an AOE or an ASC between sampling locations, it is not assumed that all populations within the two areas are exposed to contamination from the subsurface. Inferring contamination also allows sites with large populations within the two areas to be ranked higher than sites with smaller populations. If the HRS scoring required sampling every structure a sufficient number of times to assure that all exposed targets were accounted for, the scope of the sampling effort would be beyond that of a screening tool and more consistent with the scope of a remedial investigation.

Inference of contamination between sampling locations is also assumed in other HRS pathways. The other pathways allow the inference of contamination based on the location of samples documenting the presence of contamination attributable to the site being investigated. For example, in the soil exposure component, inference of contamination is done by drawing AOC boundaries based on sample locations and inferring that those targets associated with the properties within the boundaries are actually exposed.

In the SsI component, unless site-specific information indicates otherwise, when delineating an AOE or an ASC, populations in occupied structures within an AOE are inferred to be actually exposed, and, populations in occupied structures within an ASC are inferred to likely be exposed to contamination.

Purpose of Hazardous Waste Quantity

Commenters noted that as explained in the TSD for the proposed HRS SsI Addition, the hazardous waste quantity factor serves as a surrogate for the contaminant dose that populations may be exposed to. Commenters asserted that the hazardous waste quantity factor is not adequately reflective of this dose to be used as a surrogate.

The commenters appear to be confusing consideration of waste quantity as a surrogate for dose in an HRS evaluation with the calculation of a site-specific risk level based on the ratio of waste quantity to receptors. EPA is not projecting a specific risk level based on the waste quantity alone when it performs an HRS evaluation. Other HRS factors such as the population associated with the structures, the probability of a release into the occupied structures, the possibility of degradation, and the toxicity of the substances are also considered,

The decision to include waste quantity as a surrogate for dose in all pathways and components in the HRS algorithm was made when the HRS was last revised in 1990 (see Section V.3 of the proposed 1988 HRS, 53 FR 51692, December 23, 1988; Section III.C of the 1990 HRS, 55 FR 51542, December 14, 1990). The decision was based on the concept that determining an accurate dose that receptors would be exposed to was beyond the scope of information available after a site inspection. It is not possible to accurately predict the hazardous substance concentration that receptors would be exposed to over a representative exposure period based on information collected during a site inspection due to the variability in exposure levels over time and space. Instead, hazardous waste quantity is used as a surrogate for dose in the sense that the quantity of the hazardous substances is at least qualitatively correlated to the magnitude of the exposure. If there is no waste quantity, there will be no exposure; as the waste quantity increases, the greater the possibility of exposure to hazardous substances that a receptor may come in contact with. EPA agrees this is not a perfect correlation, and has built into the HRS four order of magnitude ranges for assigning factor values that reflect the imperfection of this correlation.

In addition, the inclusion of hazardous waste quantity in the subsurface intrusion component is consistent with its inclusion in all the other existing HRS pathway evaluations and is consistent with the goal that the scoring of the new component not impact the balance built into overall HRS site scoring algorithm among the HRS pathways.

Furthermore, for determining waste quantity for the SsI component, EPA made a specific alteration to how waste quantity is calculated as compared to other HRS pathway. EPA decided to only include the amount of hazardous substance that actually enters into or that could enter into occupied structures, not the total amount in the release to the environment, based on the rationale that at least some of the original release in the subsurface would vent directly to the atmosphere. Therefore only the amount of hazardous substances that has entered into occupied structures or the amount located under structures is reflected in the estimate. This was achieved by not estimating the waste quantity based on the area or the volume of the contaminated media in the subsurface, but instead on the volume of the structures, or the basal area if the volume cannot be determined.

Finally, no comments were received that provided a viable alternative to the proposed method of estimating hazardous waste quantity. Commenters stated the amount of exposure was overestimated for large buildings because in general larger buildings have lower air exchange rates and suggested that this consideration be built into the estimation methods for all structures. However, the commenters did not present data to document this generality nor suggest how to determine the air exchange rate for all structures if it is not provided by the building owner. EPA notes that if air exchange rates are available, the present estimation method (which has not changed since proposal) allows for a hazardous waste quantity estimate using that information (see, HRS section 5.2.1.2.2 Tier B, hazardous wastestream quantity).

While some commenters suggested procedures for determining a more accurate hazardous waste quantity for specific situations they did not suggest how the hazardous waste quantity calculated for these situations could be relatively ranked against sites where equivalent information was not available. When developing a hazardous waste quantity factor in 1988, EPA performed studies that showed this level of information was not available at all sites, and was not likely to be collectible during a limited screening assessment. Therefore, EPA considers it inappropriate to incorporate the suggested procedures into the HRS.

In addition, EPA proposed the present hazardous waste quantity estimation process as part of the revision of the HRS in 1988. At that time EPA requested the Science Advisory Board's (SAB's) assistance on the use of concentration data in determining the hazardous waste quantity factor as part of the overall SAB peer review of the HRS changes. The current method for use of concentration data in determining the hazardous waste quantity factor is based on the SAB's recommendation.

Establishment of Attribution

Commenters noted that establishing that indoor air contamination is

attributable to subsurface intrusion will be very complex to demonstrate given all other possible origins of the indoor contamination (*e.g.,* outdoor air, consumer products).

The HRS SsI addition, just as in other HRS pathways and components, does not require absolute proof that the significant increase in indoor contaminant concentrations is due to subsurface intrusion. It only requires at least part of the significant increase be attributable to subsurface intrusion. EPA expects to use multiple lines-of-evidence in meeting the attribution requirement as discussed in various comments. The VI Guide outlines use of multiple lines-of-evidence and provides guidance on how to distinguish subsurface intrusion from other sources of vapor intrusion. As is done for other HRS pathways and components, the HRS standard for establishing attribution is to establish a reasoned explanation that is not shown to be incorrect during public review of placement of a proposed site on the NPL.

Establishing Observed Exposure

EPA received comments suggesting that the criteria for establishing background for the SsI component is too complex given the variability in sampling for SsI and that a significant difference between the background level and release concentration is not an adequate measure for establishing an observed exposure in a regularly occupied structure.

EPA agrees that establishing a background level for indoor air can be difficult. However, it does not mean that the HRS criteria for establishing actual exposure should not be used. Methods for establishing background levels are too site-specific to be discussed in the HRS regulation, which is a scoring methodology. Instead, as occurred after the 1990 HRS was promulgated, criteria for establishing background was refined based on actual experience gained as sites were being scored. EPA expects the same to occur for the HRS SsI component.

Comparison of background levels and indoor air concentrations are used only to establish that the contaminant level in a structure is elevated (*i.e.,* significantly different). This is only the first step in establishing observed exposure. The second step is to attribute at least a part of the significant increase to subsurface intrusion.

The argument that vapor intrusion rates are too variable to justify the use of the same procedure for establishing observed releases or exposures as in other parts of the HRS is invalid. Hazardous substance concentrations are unpredictably variable temporally and spatially for all HRS pathways and SsI variability is no different in that regard. For example, in the surface water migration pathway overland flow threat, the hazardous substance may only be entering surface water via runoff due to rain events. No runoff occurs if it is not raining. The amount entering surface water in this situation has been shown to vary with the length of time between rains, which impacts the amount of material deposited and available for entrainment into the runoff. Runoff also varies with the portion of each rain cycle whether the sample is collected at the beginning, middle or end of a rain event. At the beginning of a rain event all erodible materials are present and available. During the middle or during a high intensity period of rain, the force of the rain drops can dislodge and entrain hazardous substances at greater rates that during low intensity periods. At the end of a rain event, it may be that much of the hazardous substances have already been washed away. In continuous air releases, the contaminant concentration can vary by order of magnitudes with distance from the source, with wind direction and wind speed all of which can cause differences in concentrations spatially due to the three dimensionality of the atmosphere, and cannot be predicted or accounted for based on a screening assessment. Even in ground water contamination, the contaminant plume's concentration can vary spatially depending on the rate of ground water movement from the original spill concentrations. It is not possible to account for these factors that can drastically impact the contaminant concentration at a sampling location, based on screening level information.

For example, variation in the occurrence of releases is no greater in the SsI component than would be expected in point-source air releases or spills to surface water.

Degradation

Commenters suggested changes in how the degradation factor value for the subsurface intrusion component is assigned. Other comments dealt with conditions associated with assigning different degradation factor values based on the depth of biologically active soil and the half-lives of individual hazardous substances. In addition, commenters suggested moving the consideration of degradation from the waste characteristics factor category value calculations to the likelihood of exposure factor category value calculations.

After evaluation of the comments, EPA modified the assignment of the degradation factor to simplify the evaluation and to consider the presence of non-aqueous phase liquids (NAPLs); other changes suggested by commenters were not implemented. Some changes were not made because a sufficient rationale was not provided to justify a change. Regarding the placement of the degradation factor in the HRS equation, the consideration of an individual substance's characteristics in the waste characteristics factor category is consistent with other HRS pathways and components. Furthermore, whether the degradation factor is put in the likelihood of release or waste characteristic factor category, the impact of the factor on the score would be similar.

Targets

EPA received comments on the weightings assigned to targets in both the AOE and ASC. Commenters suggested that the weightings reflect the strength of the attribution argument that the significant increase in indoor air concentrations is due to subsurface intrusion and also reflect the concentration of the contaminants in the subsurface.

After consideration of these comments, EPA has changed the weightings of targets in the ASC to reflect the presence of NAPLs (*i.e.,* to reflect contaminant concentrations in the subsurface). EPA did not incorporate any changes into the weightings of targets based on the strength of attribution or concentration of contaminants in the subsurface. Regarding the strength of an attribution argument, the HRS does not recognize gradations of attribution in any other pathway or component and therefore for consistency, will not in this component. EPA notes that with the limited sampling that occurs during an SI, it is not reasonable to project the concentration of contaminants in the subsurface over time or distance.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is a significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review. This action may raise novel

legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the EO. Any changes made in response to OMB recommendations have been documented in the docket.

EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, Addition of a Subsurface Intrusion (SsI) Component to the Hazard Ranking System (HRS): Regulatory Impact Analysis is available in the docket for this action.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control number 2050–0095.

This regulatory change will only affect how EPA and organizations performing work on behalf of EPA (state or tribal partners) conduct site assessments and HRS scoring at sites where certain environmental conditions exist. This regulatory change will result in data collection at these types of sites to allow evaluation under the HRS. EPA expects that the total number of site assessments performed and the number of sites added to the NPL per year will not increase, but rather expects that there will be a realignment and reprioritization of its internal resources and state cooperative agreement funding.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. This regulatory change enables the HRS evaluation to directly consider human exposure to hazardous substances that enter building structures through subsurface intrusion. This addition to the HRS would not impose direct impacts on any other entities. For additional discussion on this subject, see section 4.9 of the Regulatory Impact Analysis (see the docket for this action).

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action imposes no enforceable duty on any state, local, or tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175. EPA's evaluation of a site using the HRS does not impose any costs on a tribe (except those already in a cooperative agreement relationship with EPA). Thus, Executive Order 13175 does not apply to this action.

Although Executive Order 13175 does not apply to this action, EPA consulted with tribal officials through meetings and correspondence, including a letter sent to all federally recognized tribes asking for comment on the ''Notice of Opportunity for Public Input'' that was published in the **Federal Register** on January 31, 2011 (76 FR 5370), and public listening sessions regarding the decision to proceed with the development of this action. All tribal comments indicated support for this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that EPA has reason to believe may disproportionately affect children, per the definition of ''covered regulatory action'' in section 2–202 of the Executive Order. This action is not subject to Executive Order 13045 because it does not concern an environmental health risk or safety risk.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. The site assessment activities affected by this rule are limited in scope and number and rely on existing energy distribution systems. Further, we have concluded that this rule would not significantly expand the energy demand for site assessments, and would not require an entity to conduct any action that would require significant energy use, that would significantly affect energy supply, distribution, or usage. Thus, Executive Order 13211 does not apply to this action.

I. National Technology Transfer and Advancement Act

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes the human health or environmental or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on, low-income or indigenous populations. The results of this evaluation are contained in section 4.3 (and all subsections) of the Regulatory Impact Analysis for this rulemaking. A copy of the Addition of a Subsurface Intrusion (SsI) Component to the Hazard Ranking System (HRS): Regulatory Impact Analysis is available in the docket for this action.

K. Executive Order 12580—Superfund Implementation

Executive Order 12580, section 1(d), states that revisions to the NCP shall be made in consultation with members of the National Response Team (NRT) prior to publication for notice and comment. Revisions shall also be made in consultation with the Director of the Federal Emergency Management Agency (FEMA) and the Nuclear Regulatory Commission (NRC) to avoid inconsistent or duplicative requirements in the emergency planning responsibilities of those agencies. Executive Order 12580 delegates responsibility for revision of the NCP to EPA.

The agency has complied with Executive Order 12580 to the extent that it is related to the addition of a new component to the HRS, through consultation with members of the NRT.

L. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 300

Environmental protection, Air pollution control, Chemicals, Hazardous substances, Hazardous waste, Intergovernmental relations, Natural resources, Oil pollution, Penalties, Reporting and recordkeeping

requirements, Superfund, Water pollution control, Water supply.

Dated: December 7, 2016.

Gina McCarthy,

Administrator.

For the reasons set out in the preamble, Title 40, Chapter 1 of the Code of Federal Regulations is amended as follows:

PART 300—NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN

■ 1. The authority citation for part 300 continues to read as follows:

Authority: 33 U.S.C. 1321(d); 42 U.S.C. 9601–9657; E.O. 13626, 77 FR 56749, 3 CFR, 2013 Comp., p. 306; E.O. 12777, 56 FR 54757, 3 CFR, 1991 Comp., p. 351; E.O. 12580, 52 FR 2923, 3 CFR, 1987 Comp., p. 193.

■ 2. Amend Appendix A to Part 300:
■ a. In section 1.1 by:
■ i. Removing the definition heading ''Ambient Water Quality Criteria (AWQC) and adding ''Ambient Water Quality Criteria (AWQC)/National Recommended Water Quality Criteria'', in its place; and removing the text ''maximum acute or chronic toxicity'' and adding ''maximum acute (Criteria Maximum Concentration or CMC) or chronic (Criterion Continuous Concentration or CCC) toxicity.'' in its place;
■ ii. Adding in alphabetical order the definition ''Channelized flow'';
■ iii. Revising the definition ''Chronic toxicity'';
■ iv. Adding in alphabetical order the definition ''Crawl space'';
■ v. Revising the definitions ''Distance weight'' and ''Half-life'';
■ vi. Amending the definition ''HRS pathway'' by removing the word ''soil,'' and adding ''soil exposure and subsurface intrusion,'' in its place;
■ vii. Adding in alphabetical order the definitions ''Indoor air'', ''Inhalation Unit Risk (IUR)'', ''Non-Aqueous Phase Liquid (NAPL)'', ''Preferential subsurface intrusion pathways'', and ''Reference concentration (RfC)'';
■ viii. Revising the definition ''Reference dose (RfD)'';
■ ix. Adding in alphabetical order the definition ''Regularly occupied structures'';
■ x. Revising the definition ''Screening concentration'';
■ xi. Adding in alphabetical order the definition ''Shallow ground water'';
■ xii. Revising the definition ''Slope factor (also referred to as cancer potency factor)'';
■ xiii. Adding in alphabetical order the definitions ''Soil gas'', ''Soil porosity'', ''Subslab'', ''Subsurface intrusion'', ''Unit risk'', and ''Unsaturated zone''; and
■ xiv. Revising the definition ''Weight-of-evidence''.
■ b. Revising section 2.0;
■ c. Revising section 5.0;
■ d. In section 6.0 by revising Table 6–14; and
■ e. In section 7.0 by:
■ i. Revising Table 7–1;
■ ii. Under Table 7–1, the second undesignated paragraph, revising the third sentence;
■ iii. Revising sections 7.1, 7.1.1, and 7.1.2; 7.2.1; 7.2.3; 7.2.4; 7.2.5.1, 7.2.5.1.1 through 7.2.5.1.3; 7.2.5.2; 7.2.5.3; 7.3, 7.3.1, and 7.3.2; and
■ iv. Adding section 7.3.3.

The revisions and additions read as follows:

Appendix A to Part 300—Hazard Ranking System

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1.1 Definitions

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Channelized flow: Natural geological or manmade features such as karst, fractures, lava tubes, and utility conduits (*e.g.,* sewer lines), which allow ground water and/or soil gas to move through the subsurface environment more easily.

Chronic toxicity: Measure of toxicological responses that result from repeated exposure to a substance over an extended period of time (typically 3 months or longer). Such responses may persist beyond the exposure or may not appear until much later in time than the exposure. HRS measures of chronic toxicity include Reference Dose (RfD) and Reference Concentration (RfC) values.

* * * * *

Crawl space: The enclosed or semi-enclosed area between a regularly occupied structure's foundation (*e.g.,* pier and beam construction) and the ground surface. Crawl space samples are collected to determine the concentration of hazardous substances in the air beneath a regularly occupied structure.

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Distance weight: Parameter in the HRS air migration pathway, ground water migration pathway, and the soil exposure component of the soil exposure and subsurface intrusion pathway that reduces the point value assigned to targets as their distance increases from the site. *[unitless].*

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Half-life: Length of time required for an initial concentration of a substance to be halved as a result of loss through decay. The HRS considers five decay processes for assigning surface water persistence: Biodegradation, hydrolysis, photolysis, radioactive decay, and volatilization. The HRS considers two decay processes for assigning subsurface intrusion degradation: Biodegradation and hydrolysis.

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Indoor air: The air present within a structure.

Inhalation Unit Risk (IUR): The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent (*i.e.,* hazardous substance) at a concentration of 1µg/m^3 in air.

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Non-Aqueous Phase Liquid (NAPL): Contaminants and substances that are water-immiscible liquids composed of constituents with varying degrees of water solubility.

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Preferential subsurface intrusion pathways: Subsurface features such as animal burrows, cracks in walls, spaces around utility lines, or drains through which a hazardous substance moves more easily into a regularly occupied structure.

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Reference concentration (RfC): An estimate of a continuous inhalation exposure to the human population that is likely to be without an appreciable risk of deleterious effects during a lifetime.

Reference dose (RfD): An estimate of a daily oral exposure to the human population that is likely to be without an appreciable risk of deleterious effects during a lifetime.

Regularly occupied structures: Structures with enclosed air space, where people either reside, attend school or day care, or work on a regular basis, or that were previously occupied but vacated due to a site-related hazardous substance(s). This also includes resource structures (*e.g.,* library, church, tribal structure).

* * * * *

Screening concentration: Media-specific benchmark concentration for a hazardous substance that is used in the HRS for comparison with the concentration of that hazardous substance in a sample from that media. The screening concentration for a specific hazardous substance corresponds to its reference concentration for inhalation exposures or reference dose for oral exposures, as appropriate, and, if the substance is a human carcinogen with either a weight-of-evidence classification of A, B, or C, or a weight-of-evidence classification of carcinogenic to humans, likely to be carcinogenic to humans or suggestive evidence of carcinogenic potential, to that concentration that corresponds to its 10^{-6} individual lifetime excess cancer risk for inhalation exposures or for oral exposures, as appropriate.

Shallow ground water: The uppermost saturated zone, typically unconfined.

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Slope factor (also referred to as cancer potency factor): Estimate of the probability of response (for example, cancer) per unit intake of a substance over a lifetime. The slope factor is typically used to estimate upper-bound probability of an individual developing cancer as a result of exposure to a particular level of a human carcinogen with either a weight-of-evidence classification of A, B, or C, or a weight-of-evidence classification of carcinogenic to humans, likely to be carcinogenic to humans or having suggestive evidence of carcinogenic potential. [$(mg/kg\text{-}day)^{-1}$ for non-radioactive substances and $(pCi)^{-1}$ for radioactive substances].

Soil gas: The gaseous elements and compounds in the small spaces between particles of soil.

Soil porosity: The degree to which the total volume of soil is permeated with pores or cavities through which fluids (including air or gas) can move. It is typically calculated as the ratio of the pore spaces within the soil to the overall volume of the soil.

* * * * *

Subslab: The area immediately beneath a regularly occupied structure with a basement foundation or a slab-on-grade foundation. Subslab samples are collected to determine the concentration of hazardous substances in the soil gas beneath a home or building.

Subsurface intrusion: The migration of hazardous substances from the unsaturated zone and/or ground water into overlying structures.

* * * * *

Unit risk: The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent (*i.e.,* hazardous substance) at a concentration of 1 µg/L in water, or 1 µg/m^3 in air.

Unsaturated zone: The portion of subsurface between the land surface and the zone of saturation. It extends from the ground surface to the top of the shallowest ground water table (excluding localized or perched water).

* * * * *

Weight-of-evidence: EPA classification system for characterizing the evidence supporting the designation of a substance as a human carcinogen. The EPA weight-of-evidence, depending on the date EPA updated the profile, includes either the groupings:

- Group A: Human carcinogen—sufficient evidence of carcinogenicity in humans.
- Group B1: Probable human carcinogen—limited evidence of carcinogenicity in humans.
- Group B2: Probable human carcinogen—sufficient evidence of carcinogenicity in animals.
- Group C: Possible human carcinogen—limited evidence of carcinogenicity in animals.
- Group D: Not classifiable as to human carcinogenicity—applicable when there is no animal evidence, or when human or animal evidence is inadequate.
- Group E: Evidence of noncarcinogenicity for humans.

Or the descriptors:

- Carcinogenic to humans.
- Likely to be carcinogenic to humans.
- Suggestive evidence of carcinogenic potential.
- Inadequate information to assess carcinogenic potential.
- Not likely to be carcinogenic to humans.

2.0 Evaluations Common to Multiple Pathways

2.1 *Overview.* The HRS site score (S) is the result of an evaluation of four pathways:

- Ground Water Migration (S_{gw}).
- Surface Water Migration (S_{sw}).
- Soil Exposure and Subsurface Intrusion (S_{sessi}).
- Air Migration (S_a).

The ground water and air migration pathways use single threat evaluations, while the surface water migration and soil exposure and subsurface intrusion pathways use multiple threat evaluations. Three threats are evaluated for the surface water migration pathway: Drinking water, human food chain, and environmental. These threats are evaluated for two separate migration components—overland/flood migration and ground water to surface water migration. Two components are evaluated for the soil exposure and subsurface intrusion pathway: Soil exposure and subsurface intrusion. The soil exposure component evaluates two threats: Resident population and nearby population, and the subsurface intrusion component is a single threat evaluation.

The HRS is structured to provide a parallel evaluation for each of these pathways, components, and threats. This section focuses on these parallel evaluations, starting with the calculation of the HRS site score and the individual pathway scores.

2.1.1 *Calculation of HRS site score.* Scores are first calculated for the individual pathways as specified in sections 2 through 7 and then are combined for the site using the following root-mean-square equation to determine the overall HRS site score, which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2}{4}}$$

2.1.2 *Calculation of pathway score.* Table 2–1, which is based on the air migration pathway, illustrates the basic parameters used to calculate a pathway score. As Table 2–1 shows, each pathway (component or threat) score is the product of three ''factor categories'': Likelihood of release, waste characteristics, and targets. (The soil exposure and subsurface intrusion pathway uses likelihood of exposure rather than likelihood of release.) Each of the three factor categories contains a set of factors that are assigned numerical values and combined as specified in sections 2 through 7. The factor values are rounded to the nearest integer, except where otherwise noted.

2.1.3 *Common evaluations.* Evaluations common to all four HRS pathways include:

- Characterizing sources.
  - —Identifying sources (and, for the soil exposure and subsurface intrusion pathway, areas of observed contamination, areas of observed exposure and/or areas of subsurface contamination [see sections 5.1.0 and 5.2.0]).
  - —Identifying hazardous substances associated with each source (or area of observed contamination, or observed exposure, or subsurface contamination).
  - —Identifying hazardous substances available to a pathway.

TABLE 2–1—SAMPLE PATHWAY SCORESHEET

Factor category	Maximum value	Value assigned
Likelihood of Release		
1. Observed Release	550	
2. Potential to Release	500	
3. Likelihood of Release (higher of lines 1 and 2)	550	
Waste Characteristics		
4. Toxicity/Mobility	(a)	
5. Hazardous Waste Quantity	(a)	
6. Waste Characteristics	100	
Targets		
7. Nearest Individual		
7a. Level I	50	
7b. Level II	45	
7c. Potential Contamination	20	
7d. Nearest Individual (higher of lines 7a, 7b, or 7c)	50	
8. Population	(b)	
8a. Level I	(b)	
8b. Level II	(b)	

TABLE 2–1—SAMPLE PATHWAY SCORESHEET—Continued

Factor category	Maximum value	Value assigned
8c. Potential Contamination	(b)	
8d. Total Population (lines 8a+8b+8c)		
9. Resources	5	
10. Sensitive Environments	(b)	
10a. Actual Contamination	(b)	
10b. Potential Environments	(b)	
10c. Sensitive Environments (lines 10a+10b)	(b)	
11. Targets (lines 7d+8d+9+10c)	(b)	
12. Pathway Score is the product of Likelihood of Release, Waste Characteristics, and Targets, divided by 82,500. Pathway scores are limited to a maximum of 100 points.		

[a] Maximum value applies to waste characteristics category. The product of lines 4 and 5 is used in Table 2–7 to derive the value for the waste characteristics factor category.

[b] There is no limit to the human population or sensitive environments factor values. However, the pathway score based solely on sensitive environments is limited to a maximum of 60 points.

- Scoring likelihood of release (or likelihood of exposure) factor category.
  - —Scoring observed release (or observed exposure or observed contamination).
  - —Scoring potential to release when there is no observed release.
- Scoring waste characteristics factor category.
  - —Evaluating toxicity.
    - Combining toxicity with mobility, persistence, degradation and/or bioaccumulation (or ecosystem bioaccumulation) potential, as appropriate to the pathway (component or threat).
    - Evaluating hazardous waste quantity.
  - —Combining hazardous waste quantity with the other waste characteristics factors.
    - Determining waste characteristics factor category value.
- Scoring targets factor category.
  - —Determining level of contamination for targets.

These evaluations are essentially identical for the three migration pathways (ground water, surface water, and air). However, the evaluations differ in certain respects for the soil exposure and subsurface intrusion pathway.

Section 7 specifies modifications that apply to each pathway when evaluating sites containing radioactive substances.

Section 2 focuses on evaluations common at the pathway, component, and threat levels. Note that for the ground water and surface water migration pathways, separate scores are calculated for each aquifer (see section 3.0) and each watershed (see sections 4.1.1.3 and 4.2.1.5) when determining the pathway scores for a site. Although the evaluations in section 2 do not vary when different aquifers or watersheds are scored at a site, the specific factor values (for example, observed release, hazardous waste quantity, toxicity/mobility) that result from these evaluations can vary by aquifer and by watershed at the site. This can occur through differences both in the specific sources and targets eligible to be evaluated for each aquifer and watershed and in whether observed releases can be established for each aquifer and watershed. Such differences in scoring at the aquifer and watershed level are addressed in sections 3 and 4, not section 2.

2.2 *Characterize sources.* Source characterization includes identification of the following:

- Sources (and areas of observed contamination, areas of observed exposure, or areas of subsurface contamination) at the site.
- Hazardous substances associated with these sources (or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination).
- Pathways potentially threatened by these hazardous substances.

Table 2–2 presents a sample worksheet for source characterization.

2.2.1 *Identify sources.* For the three migration pathways, identify the sources at the site that contain hazardous substances. Identify the migration pathway(s) to which each source applies. For the soil exposure and subsurface intrusion pathway, identify areas of observed contamination, areas of observed exposure, and/or areas of subsurface contamination at the site (see sections 5.1.0 and 5.2.0).

Table 2–2—Sample Source Characterization Worksheet

Source: ____

A. Source dimensions and hazardous waste quantity.

Hazardous constituent quantity: ____

Hazardous wastestream quantity: ____

Volume: ____

Area: ____

Area of observed contamination: ____

Area of observed exposure: ____

Area of subsurface contamination: ____

B. Hazardous substances associated with the source.

Hazardous substance	Available to pathway								
	Air		Ground Water (GW)	Surface Water (SW)		Soil Exposure/Subsurface Intrusion (SESSI)			
						Soil exposure		Subsurface Intrusion	
	Gas	Particulate		Overland/ flood	GW to SW	Resident	Nearby	Area of observed exposure	Area of subsurface contamination

2.2.2 *Identify hazardous substances associated with a source.* For each of the three migration pathways, consider those hazardous substances documented in a source (for example, by sampling, labels, manifests, oral or written statements) to be

associated with that source when evaluating each pathway. In some instances, a hazardous substance can be documented as being present at a site (for example, by labels, manifests, oral or written statements), but the specific source(s) containing that hazardous substance cannot be documented. For the three migration pathways, in those instances when the specific source(s) cannot be documented for a hazardous substance, consider the hazardous substance to be present in each source at the site, except sources for which definitive information indicates that the hazardous substance was not or could not be present.

For an area of observed contamination in the soil exposure component of the soil exposure and subsurface intrusion pathway, consider only those hazardous substances that meet the criteria for observed contamination for that area (see section 5.1.0) to be associated with that area when evaluating the pathway.

For an area of observed exposure or area of subsurface contamination (see section 5.2.0) in the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, consider only those hazardous substances that:

- Meet the criteria for observed exposure, or
- Meet the criteria for observed release in an area of subsurface contamination and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol, or
- Meet the criteria for an observed release in a structure within, or in a sample from below, an area of observed exposure and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol.

2.2.3 *Identify hazardous substances available to a pathway.* In evaluating each migration pathway, consider the following hazardous substances available to migrate from the sources at the site to the pathway:

- Ground water migration.
  - —Hazardous substances that meet the criteria for an observed release (see section 2.3) to ground water.
  - —All hazardous substances associated with a source with a ground water containment factor value greater than 0 (see section 3.1.2.1).
- Surface water migration—overland/flood component.
  - —Hazardous substances that meet the criteria for an observed release to surface water in the watershed being evaluated.
  - —All hazardous substances associated with a source with a surface water containment factor value greater than 0 for the watershed (see sections 4.1.2.1.2.1.1 and 4.1.2.1.2.2.1).
- Surface water migration—ground water to surface water component.
  - —Hazardous substances that meet the criteria for an observed release to ground water.
  - —All hazardous substances associated with a source with a ground water containment factor value greater than 0 (see sections 4.2.2.1.2 and 3.1.2.1).
- Air migration.
  - —Hazardous substances that meet the criteria for an observed release to the atmosphere.
  - —All gaseous hazardous substances associated with a source with a gas containment factor value greater than 0 (see section 6.1.2.1.1).
  - —All particulate hazardous substances associated with a source with a particulate containment factor value greater than 0 (see section 6.1.2.2.1).
- For each migration pathway, in those instances when the specific source(s) containing the hazardous substance cannot be documented, consider that hazardous substance to be available to migrate to the pathway when it can be associated (see section 2.2.2) with at least one source having a containment factor value greater than 0 for that pathway.

In evaluating the soil exposure and subsurface intrusion pathway, consider the following hazardous substances available to the pathway:

- Soil exposure component—resident population threat.
  - —All hazardous substances that meet the criteria for observed contamination at the site (see section 5.1.0).
- Soil exposure component—nearby population threat.
  - —All hazardous substances that meet the criteria for observed contamination at areas with an attractiveness/accessibility factor value greater than 0 (see section 5.1.2.1.1).
- Subsurface intrusion component.
  - —All hazardous substances that meet the criteria for observed exposure at the site (see section 5.2.0).
  - —All hazardous substances with a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol that meet the criteria for an observed release in an area of subsurface contamination (see section 5.2.0).
  - —All hazardous substances that meet the criteria for an observed release in a structure within, or in a sample from below, an area of observed exposure (see section 5.2.0).

2.3 *Likelihood of release.* Likelihood of release is a measure of the likelihood that a waste has been or will be released to the environment. The likelihood of release factor category is assigned the maximum value of 550 for a migration pathway whenever the criteria for an observed release are met for that pathway. If the criteria for an observed release are met, do not evaluate potential to release for that pathway. When the criteria for an observed release are not met, evaluate potential to release for that pathway, with a maximum value of 500. The evaluation of potential to release varies by migration pathway (see sections 3, 4 and 6).

Establish an observed release either by direct observation of the release of a hazardous substance into the media being evaluated (for example, surface water) or by chemical analysis of samples appropriate to the pathway being evaluated (see sections 3, 4 and 6). The minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site. Use the criteria in Table 2–3 as the standard for determining analytical significance. (The criteria in Table 2–3 are also used in establishing observed contamination for the soil exposure component and for establishing areas of observed exposure and areas of subsurface contamination in the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, see section 5.1.0 and section 5.2.0). Separate criteria apply to radionuclides (see section 7.1.1).

TABLE 2–3—OBSERVED RELEASE CRITERIA FOR CHEMICAL ANALYSIS

Sample Measurement < Sample Quantitation Limit.[a]
No observed release is established.
Sample Measurement ≥ Sample Quantitation Limit.[a]
An observed release is established as follows:
• If the background concentration is not detected (or is less than the detection limit), an observed release is established when the sample measurement equals or exceeds the sample quantitation limit.[a]
• If the background concentration equals or exceeds the detection limit, an observed release is established when the sample measurement is 3 times or more above the background concentration.

[a] If the sample quantitation limit (SQL) cannot be established, determine if there is an observed release as follows:
—If the sample analysis was performed under the EPA Contract Laboratory Program, use the EPA contract-required quantitation limit (CRQL) in place of the SQL.
—If the sample analysis is not performed under the EPA Contract Laboratory Program, use the detection limit (DL) in place of the SQL.

2.4 *Waste characteristics.* The waste characteristics factor category includes the following factors: Hazardous waste quantity, toxicity, and as appropriate to the pathway or threat being evaluated, mobility, persistence, degradation, and/or

bioaccumulation (or ecosystem bioaccumulation) potential.

2.4.1 *Selection of substance potentially posing greatest hazard.* For all pathways (components and threats), select the hazardous substance potentially posing the greatest hazard for the pathway (component or threat) and use that substance in evaluating the waste characteristics category of the pathway (component or threat). For the three migration pathways (and threats), base the selection of this hazardous substance on the toxicity factor value for the substance, combined with its mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values, as applicable to the migration pathway (or threat). For the soil exposure component of the soil exposure and subsurface intrusion pathway, base the selection on the toxicity factor alone. For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, base the selection on the toxicity factor value for the substance, combined with its degradation factor value. Evaluation of the toxicity factor is specified in section 2.4.1.1. Use and evaluation of the mobility, persistence, degradation, and/or bioaccumulation (or ecosystem bioaccumulation) potential factors vary by pathway (component or threat) and are specified under the appropriate pathway (component or threat) section. Section 2.4.1.2 identifies the specific factors that are combined with toxicity in evaluating each pathway (component or threat).

2.4.1.1 *Toxicity factor.* Evaluate toxicity for those hazardous substances at the site that are available to the pathway being scored. For all pathways and threats, except the surface water environmental threat, evaluate human toxicity as specified below. For the surface water environmental threat, evaluate ecosystem toxicity as specified in section 4.1.4.2.1.1.

Establish human toxicity factor values based on quantitative dose-response parameters for the following three types of toxicity:

- Cancer—Use slope factors (also referred to as cancer potency factors) combined with weight-of-evidence ratings for carcinogenicity for all exposure routes except inhalation. Use inhalation unit risk (IUR) for inhalation exposure. If an inhalation unit risk or a slope factor is not available for a substance, use its ED_{10} value to estimate a slope factor as follows:

$$\text{Slope factor} = \frac{1}{6\ (ED_{10})}$$

- Noncancer toxicological responses of chronic exposure—use reference dose (RfD) or reference concentration (RfC) values as applicable.
- Noncancer toxicological responses of acute exposure—use acute toxicity parameters, such as the LD_{50}.

Assign human toxicity factor values to a hazardous substance using Table 2–4, as follows:

- If RfD/RfC and slope factor/inhalation unit risk values are available for the hazardous substance, assign the substance a value from Table 2–4 for each. Select the higher of the two values assigned and use it as the overall toxicity factor value for the hazardous substance.
- If either an RfD/RfC or slope factor/inhalation unit risk value is available, but not both, assign the hazardous substance an overall toxicity factor value from Table 2–4 based solely on the available value (RfD/RfC or slope factor/inhalation unit risk).
- If neither an RfD/RfC nor slope factor/inhalation unit risk value is available, assign the hazardous substance an overall toxicity factor value from Table 2–4 based solely on acute toxicity. That is, consider acute toxicity in Table 2–4 only when both RfD/RfC and slope factor/IUR values are not available.
- If neither an RfD/RfC, nor slope factor/inhalation unit risk, nor acute toxicity value is available, assign the hazardous substance an overall toxicity factor value of 0 and use other hazardous substances for which information is available in evaluating the pathway.

TABLE 2–4—TOXICITY FACTOR EVALUATION

	Assigned value
Chronic Toxicity (Human)	
Reference dose (RfD) (mg/kg-day):	
RfD < 0.0005	10,000
0.0005 ≤ RfD < 0.005	1,000
0.005 ≤ RfD < 0.05	100
0.05 ≤ RfD < 0.5	10
0.5 ≤ RfD	1
RfD not available	0
Reference concentration (RfC) (mg/m^3):	
RfC < 0.0001	10,000
0.0001 ≤ RfC < 0.006	1,000
0.006 ≤ RfC < 0.2	100
0.2 ≤ RfC < 2.0	10
2.0 ≤ RfC	1
RfC not available	0

Carcinogenicity (human)			
A or Carcinogenic to humans	B or Likely to be carcinogenic to humans	C or Suggestive evidence of carcinogenic potential	Assigned value
Weight-of-evidence[a]/Slope factor (mg/kg-day)$^{-1}$			
0.5 ≤ SF[b]	5 ≤ SF	50 ≤ SF	10,000
0.05 ≤ SF < 0.5	0.5 ≤ SF < 5	5 ≤ SF < 50	1,000
SF < 0.05	0.05 ≤ SF < 0.5	0.5 ≤ SF < 5	100
	SF < 0.05	SF < 0.5	10
Slope factor not available	Slope factor not available	Slope factor not available	0
Weight-of-evidence[a]/Inhalation unit risk (μg/m^3)			
0.00004 ≤ IUR[c]	0.0004 ≤ IUR	0.004 ≤ IUR	10,000
0.00001 ≤ IUR < 0.00004	0.0001 ≤ IUR < 0.0004	0.001 ≤ IUR < 0.004	1,000
IUR < 0.00001	0.00001 ≤ IUR < 0.0001	0.0001 ≤ IUR < 0.001	100
	< 0.00001	IUR < 0.0001	10
Inhalation unit risk not available	Inhalation unit risk not available	Inhalation unit risk not available	0

[a] A, B, and C, as well as Carcinogenic to humans, Likely to be carcinogenic to humans, and Suggestive evidence of carcinogenic potential refer to weight-of-evidence categories. Assign substances with a weight-of-evidence category of D (inadequate evidence of carcinogenicity) or E (evidence of lack of carcinogenicity), as well as inadequate information to assess carcinogenic potential and not likely to be carcinogenic to humans a value of 0 for carcinogenicity.

[b] SF = Slope factor.

[c] IUR = Inhalation Unit Risk.

Acute Toxicity (human)				
Oral LD_{50} (mg/kg)	Dermal LD_{50} (mg/kg)	Dust or mist LC_{50} (mg/l)	Gas or vapor LC_{50} (ppm)	Assigned value
LD_{50} < 5	LD_{50} < 2	LC_{50} < 0.2	LC_{50} < 20	1,000

Acute Toxicity (human)				
Oral LD_{50} (mg/kg)	Dermal LD_{50} (mg/kg)	Dust or mist LC_{50} (mg/l)	Gas or vapor LC_{50} (ppm)	Assigned value
$5 \leq LD_{50} < 50$	$2 \leq LD_{50} < 20$	$0.2 \leq LC_{50} < 2$	$20 \leq LC_{50} < 200$	100
$50 \leq LD_{50} < 500$	$20 \leq LD_{50} < 200$	$2 \leq LC_{50} < 20$	$200 \leq LC_{50} < 2{,}000$	10
$500 \leq LD_{50}$	$200 \leq LD_{50}$	$20 \leq LC_{50}$	$2{,}000 \leq LC_{50}$	1
LD_{50} not available	LD_{50} not available	LC_{50} not available	LC_{50} not available	0

If a toxicity factor value of 0 is assigned to all hazardous substances available to a particular pathway (that is, insufficient toxicity data are available for evaluating all the substances), use a default value of 100 as the overall human toxicity factor value for all hazardous substances available to the pathway. For hazardous substances having usable toxicity data for multiple exposure routes (for example, inhalation and ingestion), consider all exposure routes and use the highest assigned value, regardless of exposure route, as the toxicity factor value. For HRS purposes, assign both asbestos and lead (and its compounds) a human toxicity factor value of 10,000.

Separate criteria apply for assigning factor values for human toxicity and ecosystem toxicity for radionuclides (see sections 7.2.1 and 7.2.2).

2.4.1.2 *Hazardous substance selection.* For each hazardous substance evaluated for a migration pathway (or threat), combine the human toxicity factor value (or ecosystem toxicity factor value) for the hazardous substance with a mobility, persistence, and/or bioaccumulation (or ecosystem bioaccumulation) potential factor value as follows:

- Ground water migration.
  —Determine a combined human toxicity/mobility factor value for the hazardous substance (see section 3.2.1).
- Surface water migration—overland/flood migration component.
  —Determine a combined human toxicity/persistence factor value for the hazardous substance for the drinking water threat (see section 4.1.2.2.1).
  —Determine a combined human toxicity/persistence/bioaccumulation factor value for the hazardous substance for the human food chain threat (see section 4.1.3.2.1).
  —Determine a combined ecosystem toxicity/persistence/bioaccumulation factor value for the hazardous substance for the environmental threat (see section 4.1.4.2.1).
- Surface water migration—ground water to surface water migration component.
  —Determine a combined human toxicity/mobility/persistence factor value for the hazardous substance for the drinking water threat (see section 4.2.2.2.1).
  —Determine a combined human toxicity/mobility/persistence/bioaccumulation factor value for the hazardous substance for the human food chain threat (see section 4.2.3.2.1).
  —Determine a combined ecosystem toxicity/mobility/persistence/bioaccumulation factor value for the hazardous substance for the environmental threat (see section 4.2.4.2.1).
- Air migration.
  —Determine a combined human toxicity/mobility factor value for the hazardous substance (see section 6.2.1).

Determine each combined factor value for a hazardous substance by multiplying the individual factor values appropriate to the pathway (or threat). For each migration pathway (or threat) being evaluated, select the hazardous substance with the highest combined factor value and use that substance in evaluating the waste characteristics factor category of the pathway (or threat).

For the soil exposure and subsurface intrusion pathway, determine toxicity and toxicity/degradation factor values as follows:

- Soil exposure and subsurface intrusion—soil exposure component.
  —Select the hazardous substance with the highest human toxicity factor value from among the substances that meet the criteria for observed contamination for the threat evaluated and use that substance in evaluating the waste characteristics factor category (see section 5.1.1.2.1).
- Soil exposure and subsurface intrusion—subsurface intrusion component.
  —Determine a combined human toxicity/degradation factor value for each hazardous substance being evaluated that:
    - Meets the criteria for observed exposure, or
    - Meets the criteria for observed release in an area of subsurface contamination and has a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol, or
    - Meets the criteria for an observed release in a structure within, or in a sample from below, an area of observed exposure and has a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol.
  —Select the hazardous substance with the highest combined factor value and use that substance in evaluating the waste characteristics factor category (see sections 5.2.1.2.1 and 5.2.1.2).

2.4.2 *Hazardous waste quantity.* Evaluate the hazardous waste quantity factor by first assigning each source (or area of observed contamination, area of observed exposure, or area of subsurface contamination) a source hazardous waste quantity value as specified below. Sum these values to obtain the hazardous waste quantity factor value for the pathway being evaluated.

In evaluating the hazardous waste quantity factor for the three migration pathways, allocate hazardous substances and hazardous wastestreams to specific sources in the manner specified in section 2.2.2, except: Consider hazardous substances and hazardous wastestreams that cannot be allocated to any specific source to constitute a separate ''unallocated source'' for purposes of evaluating only this factor for the three migration pathways. Do not, however, include a hazardous substance or hazardous wastestream in the unallocated source for a migration pathway if there is definitive information indicating that the substance or wastestream could only have been placed in sources with a containment factor value of 0 for that migration pathway.

In evaluating the hazardous waste quantity factor for the soil exposure component of the soil exposure and subsurface intrusion pathway, allocate to each area of observed contamination only those hazardous substances that meet the criteria for observed contamination for that area of observed contamination and only those hazardous wastestreams that contain hazardous substances that meet the criteria for observed contamination for that area of observed contamination. Do not consider other hazardous substances or hazardous wastestreams at the site in evaluating this factor for the soil exposure component of the soil exposure and subsurface intrusion pathway.

In evaluating the hazardous waste quantity factor for the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, allocate to each area of observed exposure or area of subsurface contamination only those hazardous substances and hazardous wastestreams that contain hazardous substances that:

- Meet the criteria for observed exposure, or
- Meet the criteria for observed release in an area of subsurface contamination and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol, or
- Meet the criteria for an observed release in a structure within, or in a sample from below, an area of observed exposure and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol.

Do not consider other hazardous substances or hazardous wastestreams at the site in evaluating this factor for the subsurface intrusion component of the soil exposure and subsurface intrusion pathway. When determining the hazardous waste quantity for multi-subunit structures, use the procedures identified in section 5.2.1.2.2.

2.4.2.1 *Source hazardous waste quantity.* For each of the three migration pathways, assign a source hazardous waste quantity

value to each source (including the unallocated source) having a containment factor value greater than 0 for the pathway being evaluated. Consider the unallocated source to have a containment factor value greater than 0 for each migration pathway.

For the soil exposure component of the soil exposure and subsurface intrusion pathway, assign a source hazardous waste quantity value to each area of observed contamination, as applicable to the threat being evaluated.

For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, assign a source hazardous waste quantity value to each regularly occupied structure within an area of observed exposure or an area of subsurface contamination that has a structure containment factor value greater than 0. If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion into a regularly occupied structure located within an area of subsurface contamination, that structure can be excluded from the area of subsurface contamination.

For determining all hazardous waste quantity calculations except for an unallocated source or an area of subsurface contamination, evaluate using the following four measures in the following hierarchy:

- Hazardous constituent quantity.
- Hazardous wastestream quantity.
- Volume.
- Area.

For the unallocated source, use only the first two measures. For an area of subsurface contamination, evaluate non-radioactive hazardous substances using only the last two measures and evaluate radioactive hazardous substances using hazardous wastestream quantity only. See also section 7.0 regarding the evaluation of radioactive substances.

Separate criteria apply for assigning a source hazardous waste quantity value for radionuclides (see section 7.2.5).

2.4.2.1.1 *Hazardous constituent quantity.* Evaluate hazardous constituent quantity for the source (or area of observed contamination) based solely on the mass of CERCLA hazardous substances (as defined in CERCLA section 101(14), as amended) allocated to the source (or area of observed contamination), except:

- For a hazardous waste listed pursuant to section 3001 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6901 *et seq.,* determine its mass for the evaluation of this measure as follows:

—If the hazardous waste is listed solely for Hazard Code T (toxic waste), include only the mass of constituents in the hazardous waste that are CERCLA hazardous substances and not the mass of the entire hazardous waste.

—If the hazardous waste is listed for any other Hazard Code (including T plus any other Hazard Code), include the mass of the entire hazardous waste.

- For a RCRA hazardous waste that exhibits the characteristics identified under section 3001 of RCRA, as amended, determine its mass for the evaluation of this measure as follows:

—If the hazardous waste exhibits only the characteristic of toxicity (or only the characteristic of EP toxicity), include only the mass of constituents in the hazardous waste that are CERCLA hazardous substances and not the mass of the entire hazardous waste.

—If the hazardous waste exhibits any other characteristic identified under section 3001 (including any other characteristic plus the characteristic of toxicity [or the characteristic of EP toxicity]), include the mass of the entire hazardous waste.

Based on this mass, designated as C, assign a value for hazardous constituent quantity as follows:

- For the migration pathways, assign the source a value for hazardous constituent quantity using the Tier A equation of Table 2–5.
- For the soil exposure and subsurface intrusion pathway—soil exposure component, assign the area of observed contamination a value using the Tier A equation of Table 5–2 (section 5.1.1.2.2).
- For the soil exposure and subsurface intrusion pathway—subsurface intrusion component, assign the area of observed exposure a value using the Tier A equation of Table 5–19 (section 5.2.1.2.2).

If the hazardous constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination or area of observed exposure] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below. Instead assign these other three measures a value of 0 for the source (or area of observed contamination or area of observed exposure) and proceed to section 2.4.2.1.5.

If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination or area of observed exposure) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2.

TABLE 2–5—HAZARDOUS WASTE QUANTITY EVALUATION EQUATIONS

Tier	Measure	Units	Equation for assigning value [a]
A	Hazardous constituent quantity (C)	lb	C
B [b]	Hazardous wastestream quantity (W)	lb	W/5,000
C [b]	Volume (V)		
	Landfill	yd^3	V/2,500
	Surface impoundment	yd^3	V/2.5
	Surface impoundment (buried/backfilled)	yd^3	V/2.5
	Drums [c]	gallon	V/2.5
	Tanks and containers other than drums	yd^3	V/2.5
	Contaminated soil	yd^3	V/2,500
	Pile	yd^3	V/2.5
	Other	yd^3	V/2.5
D [b]	Area (A).		
	Landfill	ft^2	A/3,400
	Surface impoundment	ft^2	A/13
	Surface impoundment (buried/backfilled)	ft^2	A/13
	Land treatment	ft^2	A/270
	Pile [d]	ft^2	A/13
	Contaminated soil	ft^2	A/34,000

[a] Do not round to nearest integer.
[b] Convert volume to mass when necessary: 1 ton = 2,000 pounds = 1 cubic yard = 4 drums = 200 gallons.
[c] If actual volume of drums is unavailable, assume 1 drum = 50 gallons.
[d] Use land surface area under pile, not surface area of pile.

2.4.2.1.2 *Hazardous wastestream quantity.* Evaluate hazardous wastestream quantity for the source (or area of observed contamination or area of observed exposure) based on the mass of hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants (as defined in CERCLA section 101[33], as amended) that are allocated to the source (or area of

observed contamination or area of observed exposure). For a wastestream that consists solely of a hazardous waste listed pursuant to section 3001 of RCRA, as amended or that consists solely of a RCRA hazardous waste that exhibits the characteristics identified under section 3001 of RCRA, as amended, include the mass of that entire hazardous waste in the evaluation of this measure.

Based on this mass, designated as W, assign a value for hazardous wastestream quantity as follows:

• For the migration pathways, assign the source a value for hazardous wastestream quantity using the Tier B equation of Table 2–5.

• For the soil exposure and subsurface intrusion pathway—soil exposure component, assign the area of observed contamination a value using the Tier B equation of Table 5–2 (section 5.1.1.2.2).

• For the soil exposure and subsurface intrusion pathway—subsurface intrusion component, assign the area of observed exposure a value using the Tier B equation of Table 5–19 (section 5.2.1.2.2).

Do not evaluate the volume and area measures described below if the source is the unallocated source or if the following condition applies:

• The hazardous wastestream quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined—that is, total mass of all hazardous wastestreams and CERCLA pollutants and contaminants for the source and releases from the source (or for the area of observed contamination) is known or is estimated with reasonable confidence.

If the source is the unallocated source or if this condition applies, assign the volume and area measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5. Otherwise, assign the source (or area of observed contamination) a value for hazardous wastestream quantity based on the available data and proceed to section 2.4.2.1.3.

2.4.2.1.3 *Volume.* Evaluate the volume measure using the volume of the source (or the volume of the area of observed contamination, area of observed exposure, or area of subsurface contamination). For the soil exposure and subsurface intrusion pathway, restrict the use of the volume measure to those areas of observed contamination, areas of observed exposure, or areas of subsurface contamination as specified in sections 5.1.1.2.2 and 5.2.1.2.2.

Based on the volume, designated as V, assign a value to the volume measure as follows:

• For the migration pathways, assign the source a value for volume using the appropriate Tier C equation of Table 2–5.

• For the soil exposure and subsurface intrusion pathway—soil exposure component, assign the area of observed contamination a value for volume using the appropriate Tier C equation of Table 5–2 (section 5.1.1.2.2).

• For the soil exposure and subsurface intrusion pathway—subsurface intrusion component, assign the value based on the volume of the regularly occupied structures within the area of observed exposure or area of subsurface contamination using the Tier C equation of Table 5–19 (section 5.2.1.2.2).

If the volume of the source (or volume of the area of observed contamination, area of observed exposure, or area of subsurface contamination, if applicable) can be determined, do not evaluate the area measure. Instead, assign the area measure a value of 0 and proceed to section 2.4.2.1.5. If the volume cannot be determined (or is not applicable for the soil exposure and subsurface intrusion pathway), assign the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination) a value of 0 for the volume measure and proceed to section 2.4.2.1.4.

2.4.2.1.4 *Area.* Evaluate the area measure using the area of the source (or the area of the area of observed contamination, area of observed exposure, or area of subsurface contamination). Based on this area, designated as A, assign a value to the area measure as follows:

• For the migration pathways, assign the source a value for area using the appropriate Tier D equation of Table 2–5.

• For the soil exposure and subsurface intrusion pathway—soil exposure component, assign the area of observed contamination a value for area using the appropriate Tier D equation of Table 5–2 (section 5.1.1.2.2).

• For the soil exposure and subsurface intrusion pathway—subsurface intrusion component, assign a value based on the area of regularly occupied structures within the area of observed exposure or area of subsurface contamination using the Tier D equation of Table 5–19 (section 5.2.1.2.2).

2.4.2.1.5 *Calculation of source hazardous waste quantity value.* Select the highest of the values assigned to the source (or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination) for the hazardous constituent quantity, hazardous wastestream quantity, volume, and area measures. Assign this value as the source hazardous waste quantity value. Do not round to the nearest integer.

2.4.2.2 *Calculation of hazardous waste quantity factor value.* Sum the source hazardous waste quantity values assigned to all sources (including the unallocated source) or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination for the pathway being evaluated and round this sum to the nearest integer, except: If the sum is greater than 0, but less than 1, round it to 1. Based on this value, select a hazardous waste quantity factor value for the pathway from Table 2–6.

TABLE 2–6—HAZARDOUS WASTE QUANTITY FACTOR VALUES

Hazardous waste quantity value	Assigned value
0	0
1 [a] to 100	[b] 1
Greater than 100 to 10,000	100
Greater than 10,000 to 1,000,000	10,000
Greater than 1,000,000	1,000,000

[a] If the hazardous waste quantity value is greater than 0, but less than 1, round it to 1 as specified in text.

[b] For the pathway, if hazardous constituent quantity is not adequately determined, assign a value as specified in the text; do not assign the value of 1.

For a migration pathway, if the hazardous constituent quantity is adequately determined (see section 2.4.2.1.1) for all sources (or all portions of sources and releases remaining after a removal action), assign the value from Table 2–6 as the hazardous waste quantity factor value for the pathway. If the hazardous constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action) assign a factor value as follows:

• If any target for that migration pathway is subject to Level I or Level II concentrations (see section 2.5), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway.

• If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:

—If there has been no removal action, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.

—If there has been a removal action:

- Determine values from Table 2–6 with and without consideration of the removal action.
- If the value that would be assigned from Table 2–6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.
- If the value that would be assigned from Table 2–6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

For the soil exposure component of the soil exposure and subsurface intrusion pathway, if the hazardous constituent quantity is adequately determined for all areas of observed contamination, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the hazardous constituent quantity is not adequately determined for one or more areas of observed contamination, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, if the hazardous constituent

quantity is adequately determined for all areas of observed exposure, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the hazardous constituent quantity is not adequately determined for one or more areas of observed exposure, assign either the value from Table 2–6 or assign a factor value as follows:

• If any target for the subsurface intrusion component is subject to Level I or Level II concentrations (see section 2.5), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for this component.

• If none of the targets for the subsurface intrusion component is subject to Level I or Level II concentrations and if there has been a removal or other temporary response action that does not permanently interrupt target exposure form subsurface intrusion, assign a factor value as follows:

—Determine the values from Table 2–6 with and without consideration of the removal or other temporary response action.

—If the value that would be assigned from Table 2–6 without consideration of the removal or other temporary response action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the component.

—If the value that would be assigned from Table 2–6 without consideration of the removal or other temporary response action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the component.

• Otherwise, if none of the targets for the subsurface intrusion component is subject to Level I or Level II concentrations and there has not been a removal action, assign a value from Table 2–6 or a value of 10, whichever is greater.

2.4.3 *Waste characteristics factor category value.* Determine the waste characteristics factor category value as specified in section 2.4.3.1 for all pathways and threats, except the surface water-human food chain threat and the surface water-environmental threat. Determine the waste characteristics factor category value for these latter two threats as specified in section 2.4.3.2.

2.4.3.1 *Factor category value.* For the pathway (component or threat) being evaluated, multiply the toxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from section 2.4.2.2, subject to a maximum product of $1x10^8$. Based on this waste characteristics product, assign a waste characteristics factor category value to the pathway (component or threat) from Table 2–7.

TABLE 2–7—WASTE CHARACTERISTICS FACTOR CATEGORY VALUES

Waste characteristics product	Assigned value
0	0
Greater than 0 to less than 10	1
10 to less than $1x10^2$	2
$1x10^2$ to less than $1x10^3$	3
$1x10^3$ to less than $1x10^4$	6
$1x10^4$ to less than $1x10^5$	10
$1x10^5$ to less than $1x10^6$	18
$1x10^6$ to less than $1x10^7$	32
$1x10^7$ to less than $1x10^8$	56
$1x10^8$ to less than $1x10^9$	100
$1x10^9$ to less than $1x10^{10}$	180
$1x10^{10}$ to less than $1x10^{11}$	320
$1x10^{11}$ to less than $1x10^{12}$	560
$1x10^{12}$	1,000

2.4.3.2 *Factor category value, considering bioaccumulation potential.* For the surface water-human food chain threat and the surface water-environmental threat, multiply the toxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from section 2.4.2.2, subject to:

• A maximum product of $1x10^{12}$, *and*

• A maximum product exclusive of the bioaccumulation (or ecosystem bioaccumulation) potential factor of $1x10^8$.

Based on the total waste characteristics product, assign a waste characteristics factor category value to these threats from Table 2–7.

2.5 *Targets.* The types of targets evaluated include the following:

• Individual (factor name varies by pathway, component, and threat).

• Human population.

• Resources (these vary by pathway, component, and threat).

• Sensitive environments (included for the surface water migration pathway, air migration pathway, and soil exposure component of the soil exposure and subsurface intrusion pathway).

The factor values that may be assigned to each type of target have the same range for each pathway for which that type of target is evaluated. The factor value for most types of targets depends on whether the target is subject to actual or potential contamination for the pathway and whether the actual contamination is Level I or Level II:

• Actual contamination: Target is associated either with a sampling location that meets the criteria for an observed release (or observed contamination or observed exposure) for the pathway or with an observed release based on direct observation for the pathway (additional criteria apply for establishing actual contamination for the human food chain threat in the surface water migration pathway, see sections 4.1.3.3 and 4.2.3.3). Sections 3 through 6 specify how to determine the targets associated with a sampling location or with an observed release based on direct observation. Determine whether the actual contamination is Level I or Level II as follows:

—Level I:

▪ Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway and are at or above media-specific benchmark values. These benchmark values (see section 2.5.2) include both screening concentrations and concentrations specified in regulatory limits (such as Maximum Contaminant Level (MCL) values), or

▪ For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms are at or above benchmark values. Such tissue samples may be used in addition to media-specific concentrations only as specified in sections 4.1.3.3 and 4.2.3.3.

—Level II:

▪ Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway, but are less than media-specific benchmarks. If none of the hazardous substances eligible to be evaluated for the sampling location has an applicable benchmark, assign Level II to the actual contamination at the sampling location, or

▪ For observed releases or observed exposures based on direct observation, assign Level II to targets as specified in sections 3, 4, 5, and 6, or

▪ For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms, when applicable, are below benchmark values.

—If a target is subject to both Level I and Level II concentrations for a pathway (component or threat), evaluate the target using Level I concentrations for that pathway (component or threat).

• Potential contamination: Target is subject to a potential release (that is, target is not associated with actual contamination for that pathway or threat).

Assign a factor value for individual risk as follows (select the highest value that applies to the pathway, component or threat):

• 50 points if any individual is exposed to Level I concentrations.

• 45 points if any individual is exposed to Level II concentrations.

• Maximum of 20 points if any individual is subject to potential contamination. The value assigned is 20 unless reduced by a distance or dilution weight appropriate to the pathway. Assign factor values for population and sensitive environments as follows:

• Sum Level I targets and multiply by 10. (Level I is not used for sensitive environments in the soil exposure component of the soil exposure and subsurface intrusion and air migration pathways.)

• Sum Level II targets.

• Multiply potential targets in all but the soil exposure and subsurface intrusion pathway by distance or dilution weights appropriate to the pathway, sum, and divide by 10. Distance or dilution weighting accounts for diminishing exposure with increasing distance or dilution within the different pathways. For targets within an area

of subsurface contamination in the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, multiply by a weighting factor as directed in section 5.2.1.3.2.3.

• Sum the values for the three levels.

In addition, resource value points are assigned within all pathways for welfare-related impacts (for example, impacts to agricultural land), but do not depend on whether there is actual or potential contamination.

2.5.1 *Determination of level of actual contamination at a sampling location.* Determine whether Level I concentrations or Level II concentrations apply at a sampling location (and thus to the associated targets) as follows:

• Select the benchmarks applicable to the pathway (component or threat) being evaluated.

• Compare the concentrations of hazardous substances in the sample (or comparable samples) to their benchmark concentrations for the pathway (component or threat), as specified in section 2.5.2.

• Determine which level applies based on this comparison.

• If none of the hazardous substances eligible to be evaluated for the sampling location has an applicable benchmark, assign Level II to the actual contamination at that sampling location for the pathway (component or threat).

In making the comparison, consider only those samples, and only those hazardous substances in the sample, that meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway, except: Tissue samples from aquatic human food chain organisms may also be used as specified in sections 4.1.3.3 and 4.2.3.3 of the surface water-human food chain threat. If any hazardous substance is present in more than one comparable sample for the sampling location, use the highest concentration of that hazardous substance from any of the comparable samples in making the comparisons.

Treat sets of samples that are not comparable separately and make a separate comparison for each such set.

2.5.2 *Comparison to benchmarks.* Use the following media-specific benchmarks for making the comparisons for the indicated pathway (or threat):

• Maximum Contaminant Level Goals (MCLGs)—ground water migration pathway and drinking water threat in surface water migration pathway. Use only MCLG values greater than 0.

• Maximum Contaminant Levels (MCLs)—ground water migration pathway and drinking water threat in surface water migration pathway.

• Food and Drug Administration Action Level (FDAAL) for fish or shellfish—human food chain threat in surface water migration pathway.

• EPA Ambient Water Quality Criteria (AWQC/National Recommended Water Quality Criteria) for protection of aquatic life—environmental threat in surface water migration pathway.

• EPA Ambient Aquatic Life Advisory Concentrations (AALAC)—environmental threat in surface water migration pathway.

• National Ambient Air Quality Standards (NAAQS)—air migration pathway.

• National Emission Standards for Hazardous Air Pollutants (NESHAPs)—air migration pathway. Use only those NESHAPs promulgated in ambient concentration units.

• Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures (air migration pathway or subsurface intrusion component of the soil exposure and subsurface intrusion pathway) or for oral exposures (ground water migration pathway; drinking water and human food chain threats in surface water migration pathway; and soil exposure and subsurface intrusion pathway).

• Screening concentration for noncancer toxicological responses corresponding to the RfC for inhalation exposures (air migration pathway and subsurface intrusion component of the soil exposure and subsurface intrusion pathway) or RfD for oral exposures (ground water migration pathway; drinking water and human food chain threats in surface water migration pathway; and soil exposure and subsurface intrusion pathway).

Select the benchmark(s) applicable to the pathway (component or threat) being evaluated as specified in sections 3 through 6. Compare the concentration of each hazardous substance from the sampling location to its benchmark concentration(s) for that pathway (component or threat). Use only those samples and only those hazardous substances in the sample that meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway, except: Tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of any applicable hazardous substance from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations for that pathway (or threat). If more than one benchmark applies to the hazardous substance, assign Level I if the concentration of the hazardous substance equals or exceeds the lowest applicable benchmark concentration.

If no hazardous substance individually equals or exceeds its benchmark concentration, but more than one hazardous substance either meets the criteria for an observed release (or observed contamination or observed exposure) for the sample (or comparable samples) or is eligible to be evaluated for a tissue sample (see sections 4.1.3.3 and 4.2.3.3), calculate the indices I and J specified below based on these hazardous substances.

For those hazardous substances that are carcinogens (that is, those having either a carcinogen weight-of-evidence classification of A, B, or C or a weight-of-evidence classification of carcinogenic to humans, likely to be carcinogenic to humans, or suggestive evidence of carcinogenic potential), calculate an index I for the sample location as follows:

$$I = \sum_{i=1}^{n} \frac{C_i}{SC_i}$$

Where:

C_i = Concentration of hazardous substance i in sample (or highest concentration of hazardous substance i from among comparable samples).

SC_i = Screening concentration for cancer corresponding to that concentration that corresponds to its 10^{-6} individual cancer risk for applicable exposure (inhalation or oral) for hazardous substance i.

n = Number of applicable hazardous substances in sample (or comparable samples) that are carcinogens and for which an SC_i is available.

For those hazardous substances for which an RfD or RfC is available, calculate an index J for the sample location as follows:

$$I = \sum_{j=1}^{m} \frac{C_j}{CR_j}$$

Where:

C_j = Concentration of hazardous substance j in sample (or highest concentration of hazardous substance j from among comparable samples).

CR_j = Screening concentration for noncancer toxicological responses corresponding to RfD or RfC for applicable exposure (inhalation or oral) for hazardous substance j.

m = Number of applicable hazardous substances in sample (or comparable samples) for which a CR_j is available.

If either I or J equals or exceeds 1, consider the sampling location to be subject to Level I concentrations for that pathway (component or threat). If both I and J are less than 1, consider the sampling location to be subject to Level II concentrations for that pathway (component or threat). If, for the sampling location, there are sets of samples that are not comparable, calculate I and J separately for each such set, and use the highest calculated values of I and J to assign Level I and Level II.

See sections 7.3.1 and 7.3.2 for criteria for determining the level of contamination for radioactive substances.

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5.0 Soil Exposure and Subsurface Intrusion Pathway

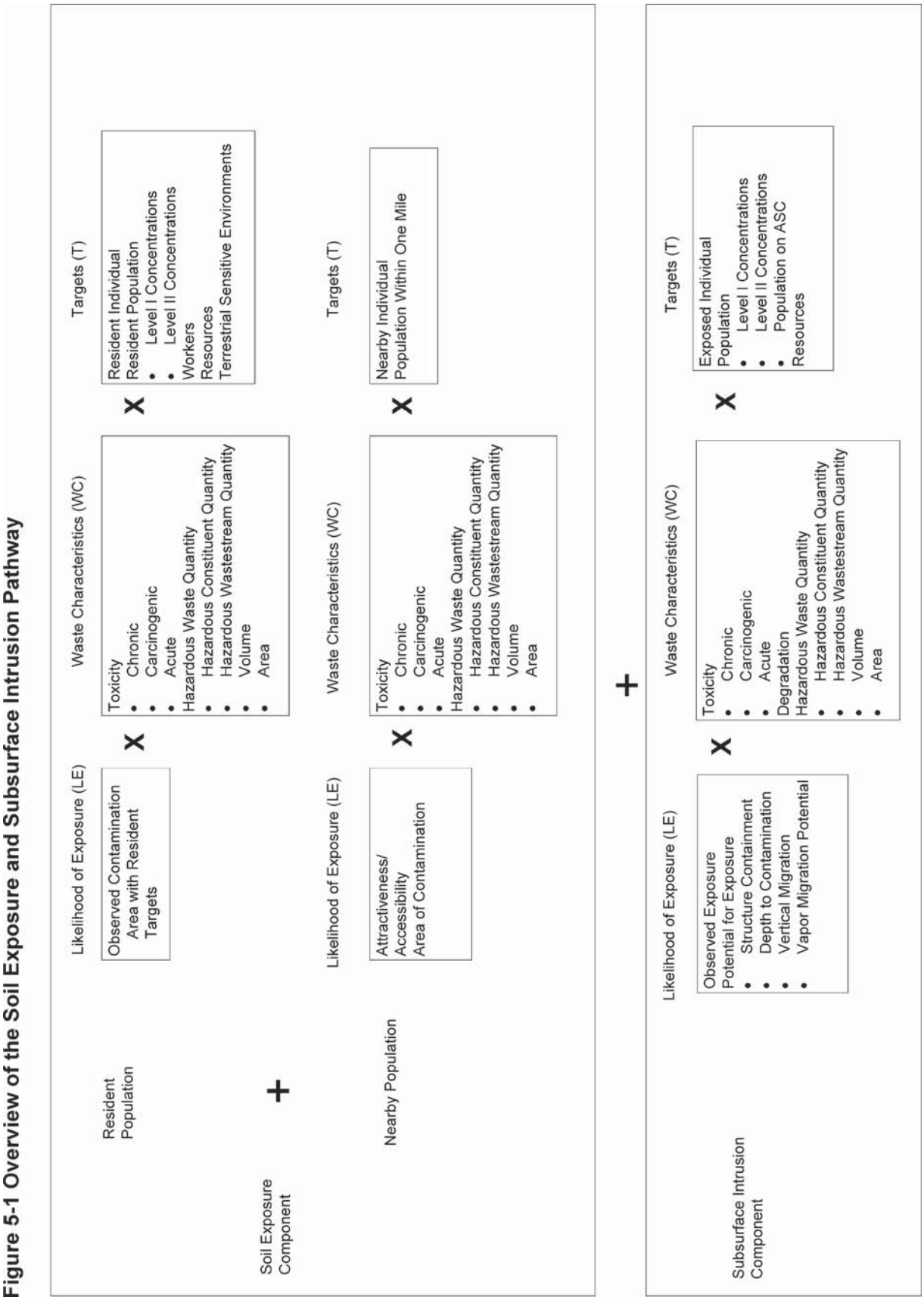
5.0.1 *Exposure components.* Evaluate the soil exposure and subsurface intrusion pathway based on two exposure components:

• Soil exposure component (see section 5.1).

• Subsurface intrusion component (see section 5.2).

Score one or both components considering their relative importance. If only one component is scored, assign its score as the soil exposure and subsurface intrusion pathway score. If both components are scored, sum the two scores and assign it as the soil exposure and subsurface intrusion pathway score, subject to a maximum of 100.

Figure 5-1 Overview of the Soil Exposure and Subsurface Intrusion Pathway



5.1 *Soil exposure component.* Evaluate the soil exposure component based on two threats: Resident population threat and nearby population threat. Evaluate both threats based on three factor categories: Likelihood of exposure, waste characteristics,

and targets. Figure 5–1 indicates the factors included within each factor category for each type of threat.

Determine the soil exposure component score (S_{se}) in terms of the factor category values as follows:

$$S_{se} = \frac{\sum_{i=1}^{2}(LE_i)(WC_i)(T_i)}{SF}$$

Where:

LE_i = Likelihood of exposure factor category value for threat i (that is, resident population threat or nearby population threat).

WC_i = Waste characteristics factor category value for threat i.

T_i = Targets factor category value for threat i.

SF = Scaling factor.

Table 5–1 outlines the specific calculation procedure.

TABLE 5–1—SOIL EXPOSURE COMPONENT SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Resident Population Threat		
Likelihood of Exposure:		
1. Likelihood of Exposure	550	
Waste Characteristics:		
2. Toxicity	[a]	
3. Hazardous Waste Quantity	[a]	
4. Waste Characteristics	100	
Targets:		
5. Resident Individual	50	
6. Resident Population:.		
6a. Level I Concentrations	[b]	
6b. Level II Concentrations	[b]	
6c. Resident Population (lines 6a + 6b)	[b]	
7. Workers	15	
8. Resources	5	
9. Terrestrial Sensitive Environments	[c]	
10. Targets (lines 5 + 6c + 7 + 8 + 9)	[b]	
Resident Population Threat Score:		
11. Resident Population Threat (lines 1 × 4 × 10)	[b]	
Nearby Population Threat		
Likelihood of Exposure:		
12. Attractiveness/Accessibility	100	
13. Area of Contamination	100	
14. Likelihood of Exposure	500	
Waste Characteristics:		
15. Toxicity	[a]	
16. Hazardous Waste Quantity	[a]	
17. Waste Characteristics	100	
Targets:		
18. Nearby Individual	1	
19. Population Within 1 Mile	[b]	
20. Targets (lines 18 + 19)	[b]	
Nearby Population Threat Score:		
21. Nearby Population Threat (lines 14 × 17 × 20)	[b]	
Soil Exposure Component Score:		
22. Soil Exposure Component Score [d] (S_{se}), (lines [11 + 21]/82,500, subject to a maximum of 100)	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum of 60.
[d] Do not round to nearest integer.

5.1.0 *General considerations.* Evaluate the soil exposure component based on areas of observed contamination:

- Consider observed contamination to be present at sampling locations where analytic evidence indicates that:

—A hazardous substance attributable to the site is present at a concentration significantly above background levels for the site (see Table 2–3 in section 2.3 for the criteria for determining analytical significance), *and*

—This hazardous substance, if not present at the surface, is covered by 2 feet or less of cover material (for example, soil).

- Establish areas of observed contamination based on sampling locations at which there is observed contamination as follows:

—For all sources except contaminated soil, if observed contamination from the site is present at any sampling location within the source, consider that entire source to be an area of observed contamination.

—For contaminated soil, consider both the sampling location(s) with observed contamination from the site and the area lying between such locations to be an area of observed contamination, unless available information indicates otherwise.

- If an area of observed contamination (or portion of such an area) is covered by a permanent, or otherwise maintained, essentially impenetrable material (for example, asphalt) that is not more than 2 feet thick, exclude that area (or portion of the area) in evaluating the soil exposure component.

- For an area of observed contamination, consider only those hazardous substances that meet the criteria for observed contamination for that area to be associated with that area in evaluating the soil exposure component (see section 2.2.2).

If there is observed contamination, assign scores for the resident population threat and the nearby population threat, as specified in sections 5.1.1 and 5.1.2. If there is no observed contamination, assign the soil exposure component of the soil exposure and subsurface intrusion pathway a score of 0.

5.1.1 *Resident population threat.* Evaluate the resident population threat only if there is an area of observed contamination in one or more of the following locations:

- Within the property boundary of a residence, school, or day care center *and* within 200 feet of the respective residence, school, or day care center, or
- Within a workplace property boundary *and* within 200 feet of a workplace area, or
- Within the boundaries of a resource specified in section 5.1.1.3.4, or
- Within the boundaries of a terrestrial sensitive environment specified in section 5.1.1.3.5.

If not, assign the resident population threat a value of 0, enter this value in Table 5–1, and proceed to the nearby population threat (section 5.1.2).

5.1.1.1 *Likelihood of exposure.* Assign a value of 550 to the likelihood of exposure factor category for the resident population threat if there is an area of observed contamination in one or more locations listed in section 5.1.1. Enter this value in Table 5–1.

5.1.1.2 *Waste characteristics.* Evaluate waste characteristics based on two factors: toxicity and hazardous waste quantity. Evaluate only those hazardous substances that meet the criteria for observed contamination at the site (see section 5.1.0).

5.1.1.2.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in section 2.4.1.1. Use the hazardous substance with the highest toxicity factor value to assign the value to the toxicity factor for the resident population threat. Enter this value in Table 5–1.

5.1.1.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value as specified in section 2.4.2. In estimating the hazardous waste quantity, use Table 5–2 and:

- Consider only the first 2 feet of depth of an area of observed contamination, except as specified for the volume measure.
- Use the volume measure (see section 2.4.2.1.3) only for those types of areas of observed contamination listed in Tier C of Table 5–2. In evaluating the volume measure for these listed areas of observed contamination, use the full volume, not just the volume within the top 2 feet.
- Use the area measure (see section 2.4.2.1.4), not the volume measure, for all other types of areas of observed contamination, even if their volume is known.

Enter the value assigned in Table 5–1.

TABLE 5–2—HAZARDOUS WASTE QUANTITY EVALUATION EQUATIONS FOR SOIL EXPOSURE COMPONENT

Tier	Measure	Units	Equation for assigning value [a]
A	Hazardous Constituent Quantity (C)	lb	C.
B [b]	Hazardous Wastestream Quantity (W)	lb	W/5,000.
C [b]	Volume (V).		
	Surface Impoundment [c]	yd^3	V/2.5.
	Drums [d]	gallon	V/500.
	Tanks and Containers Other Than Drums	yd^3	V/2.5.
D [b]	Area (A).		
	Landfill	ft^2	A/34,000.
	Surface Impoundment	ft^2	A/13.
	Surface Impoundment (Buried/backfilled)	ft^2	A/13.
	Land treatment	ft^2	A/270.
	Pile [e]	ft^2	A/34.
	Contaminated Soil	ft^2	A/34,000.

[a] Do not round nearest integer.
[b] Convert volume to mass when necessary: 1 ton = 2,000 pounds = 1 cubic yard = 4 drums = 200 gallons.
[c] Use volume measure only for surface impoundments containing hazardous substances present as liquids. Use area measures in Tier D for dry surface impoundments and for buried/backfilled surface impoundments.
[d] If actual volume of drums is unavailable, assume 1 drum = 50 gallons.
[e] Use land surface area under pile, not surface area of pile.

5.1.1.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 5–1.

5.1.1.3 *Targets.* Evaluate the targets factor category for the resident population threat based on five factors: Resident individual, resident population, workers, resources, and terrestrial sensitive environments.

In evaluating the targets factor category for the resident population threat, count only the following as targets:

- Resident individual—a person living or attending school or day care on a property with an area of observed contamination *and* whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination.
- Worker—a person working on a property with an area of observed contamination *and* whose workplace area is on or within 200 feet of the area of observed contamination.
- Resources located on an area of observed contamination, as specified in section 5.1.1.
- Terrestrial sensitive environments located on an area of observed contamination, as specified in section 5.1.1.

5.1.1.3.1 *Resident individual.* Evaluate this factor based on whether there is a resident individual, as specified in section 5.1.1.3, who is subject to Level I or Level II concentrations.

First, determine those areas of observed contamination subject to Level I concentrations and those subject to Level II concentrations as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 5–3 in determining the level of contamination. Then assign a value to the resident individual factor as follows:

- Assign a value of 50 if there is at least one resident individual for one or more areas subject to Level I concentrations.
- Assign a value of 45 if there is no such resident individuals, but there is at least one resident individual for one or more areas subject to Level II concentrations.
- Assign a value of 0 if there is no resident individual.

Enter the value assigned in Table 5–1.

5.1.1.3.2 *Resident population.* Evaluate resident population based on two factors: Level I concentrations and Level II concentrations. Determine which factor applies as specified in sections 2.5.1 and 2.5.2, using the health-based benchmarks from Table 5–3. Evaluate populations subject to Level I concentrations as specified in section 5.1.1.3.2.1 and populations subject to Level II concentrations as specified in section 5.1.1.3.2.2.

TABLE 5–3—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN SOILS

Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for oral exposures.	
Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for oral exposures.	

Count only those persons meeting the criteria for resident individual as specified in section 5.1.1.3. In estimating the number of people living on property with an area of observed contamination, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

5.1.1.3.2.1 *Level I concentrations.* Sum the number of resident individuals subject to Level I concentrations and multiply this sum by 10. Assign the resulting product as the value for this factor. Enter this value in Table 5–1.

5.1.1.3.2.2 *Level II concentrations.* Sum the number of resident individuals subject to Level II concentrations. Do not include those people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 5–1.

5.1.1.3.2.3 *Calculation of resident population factor value.* Sum the factor values for Level I concentrations and Level II concentrations. Assign this sum as the resident population factor value. Enter this value in Table 5–1.

5.1.1.3.3 *Workers.* Evaluate this factor based on the number of workers that meet the section 5.1.1.3 criteria. Assign a value for these workers using Table 5–4. Enter this value in Table 5–1.

TABLE 5–4—FACTOR VALUES FOR WORKERS

Number of workers	Assigned value
0	0
1 to 100	5
101 to 1,000	10
Greater than 1,000	15

5.1.1.3.4 *Resources.* Evaluate the resources factor as follows:

• Assign a value of 5 to the resources factor if one or more of the following is present on an area of observed contamination at the site:

—Commercial agriculture.
—Commercial silviculture.
—Commercial livestock production or commercial livestock grazing.

• Assign a value of 0 if none of the above are present.

Enter the value assigned in Table 5–1.

5.1.1.3.5 *Terrestrial sensitive environments.* Assign value(s) from Table 5–5 to each terrestrial sensitive environment that meets the eligibility criteria of section 5.1.1.3.

Calculate a value (ES) for terrestrial sensitive environments as follows:

$$ES = \sum_{i=1}^{n} S_i$$

Where:

S_i = Value(s) assigned from Table 5–5 to terrestrial sensitive environment i.
n = Number of terrestrial sensitive environments meeting section 5.1.1.3 criteria.

Because the pathway score based solely on terrestrial sensitive environments is limited to a maximum of 60, determine the value for the terrestrial sensitive environments factor as follows:

TABLE 5–5—TERRESTRIAL SENSITIVE ENVIRONMENTS RATING VALUES

Terrestrial sensitive environments	Assigned value
Terrestrial critical habitat [a] for Federal designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument.	
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species	75
National Preserve (terrestrial)	
National or State Terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	
Terrestrial areas utilized for breeding by large or dense aggregations of animals [b].	
Terrestrial habitat known to be used by State designated endangered or threatened species	50
Terrestrial habitat known to be used by species under review as to its Federal designated endangered or threatened status	
State lands designated for wildlife or game management	25
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities.	

[a] Critical habitat as defined in 50 CFR 424.02.
[b] Limit to vertebrate species.

• Multiply the values assigned to the resident population threat for likelihood of exposure (LE), waste characteristics (WC), and ES. Divide the product by 82,500.

—If the result is 60 or less, assign the value ES as the terrestrial sensitive environments factor value.
—If the result exceeds 60, calculate a value EC as follows:

$$EC = \frac{(60)(82{,}500)}{(LE)(WC)}$$

Assign the value EC as the terrestrial sensitive environments factor value. Do not round this value to the nearest integer.

Enter the value assigned for the terrestrial sensitive environments factor in Table 5–1.

5.1.1.3.6 *Calculation of resident population targets factor category value.* Sum the values for the resident individual, resident population, workers, resources, and terrestrial sensitive environments factors. Do not round to the nearest integer. Assign this sum as the targets factor category value for the resident population threat. Enter this value in Table 5–1.

5.1.1.4 *Calculation of resident population threat score.* Multiply the values for likelihood of exposure, waste characteristics, and targets for the resident population threat, and round the product to the nearest integer. Assign this product as the resident population threat score. Enter this score in Table 5–1.

5.1.2 *Nearby population threat.* Include in the nearby population only those individuals who live or attend school within a 1-mile travel distance of an area of observed contamination at the site and who do not meet the criteria for resident individual as specified in section 5.1.1.3.

Do not consider areas of observed contamination that have an attractiveness/accessibility factor value of 0 (see section

5.1.2.1.1) in evaluating the nearby population threat.

5.1.2.1 *Likelihood of exposure.* Evaluate two factors for the likelihood of exposure factor category for the nearby population threat: attractiveness/accessibility and area of contamination.

5.1.2.1.1 *Attractiveness/accessibility.* Assign a value for attractiveness/accessibility from Table 5–6 to each area of observed contamination, excluding any land used for residences. Select the highest value assigned to the areas evaluated and use it as the value for the attractiveness/accessibility factor. Enter this value in Table 5–1.

5.1.2.1.2 *Area of contamination.* Evaluate area of contamination based on the total area of the areas of observed contamination at the site. Count only the area(s) that meet the criteria in section 5.1.0 and that receive an attractiveness/accessibility value greater than 0. Assign a value to this factor from Table 5–7. Enter this value in Table 5–1.

TABLE 5–6—ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of observed contamination	Assigned value
Designated recreational area	100
Regularly used for public recreation (for example, fishing, hiking, softball)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements, for example, gravel road), with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement), with some public recreation use	25
Accessible, with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

TABLE 5–7—AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned value
Less than or equal to 5,000	5
Greater than 5,000 to 125,000	20
Greater than 125,000 to 250,000	40
Greater than 250,000 to 375,000	60
Greater than 375,000 to 500,000	80
Greater than 500,000	100

5.1.2.1.3 *Likelihood of exposure factor category value.* Assign a value from Table 5–8 to the likelihood of exposure factor category, based on the values assigned to the attractiveness/accessibility and area of contamination factors. Enter this value in Table 5–1.

TABLE 5–8—NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

Area of contamination factor value	Attractiveness/accessibility factor value						
	100	75	50	25	10	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

5.1.2.2 *Waste characteristics.* Evaluate waste characteristics based on two factors: toxicity and hazardous waste quantity. Evaluate only those hazardous substances that meet the criteria for observed contamination (see section 5.1.0) at areas that can be assigned an attractiveness/accessibility factor value greater than 0.

5.1.2.2.1 *Toxicity.* Assign a toxicity factor value as specified in section 2.4.1.1 to each hazardous substance meeting the criteria in section 5.1.2.2. Use the hazardous substance with the highest toxicity factor value to assign the value to the toxicity factor for the nearby population threat. Enter this value in Table 5–1.

5.1.2.2.2 *Hazardous waste quantity.* Assign a value to the hazardous waste quantity factor as specified in section 5.1.1.2.2, except: consider only those areas of observed contamination that can be assigned an attractiveness/accessibility factor value greater than 0. Enter the value assigned in Table 5–1.

5.1.2.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 5–1.

5.1.2.3 *Targets.* Evaluate the targets factory category for the nearby population threat based on two factors: nearby individual and population within a 1-mile travel distance from the site.

5.1.2.3.1 *Nearby individual.* If one or more persons meet the section 5.1.1.3 criteria for a resident individual, assign this factor a value of 0. Enter this value in Table 5–1.

If no person meets the criteria for a resident individual, determine the shortest travel distance from the site to any residence or school. In determining the travel distance, measure the shortest overland distance an individual would travel from a residence or school to the nearest area of observed contamination for the site with an attractiveness/accessibility factor value greater than 0. If there are no natural barriers to travel, measure the travel distance as the shortest straight-line distance from the residence or school to the area of observed contamination. If natural barriers exist (for example, a river), measure the travel distance as the shortest straight-line distance from the residence or school to the nearest crossing point and from there as the shortest straight-

line distance to the area of observed contamination. Based on the shortest travel distance, assign a value from Table 5–9 to the nearest individual factor. Enter this value in Table 5–1.

TABLE 5–9—NEARBY INDIVIDUAL FACTOR VALUES

Travel distance for nearby individual (miles)	Assigned value
Greater than 0 to ¼	[a] 1
Greater than ¼ to 1	0

[a] Assign a value of 0 if one or more persons meet the section 5.1.1.3 criteria for resident individual.

5.1.2.3.2 *Population within 1 mile.* Determine the population within each travel distance category of Table 5–10. Count residents and students who attend school within this travel distance. Do not include those people already counted in the resident population threat. Determine travel distances as specified in section 5.1.2.3.1.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located.

Based on the number of people included within a travel distance category, assign a distance-weighted population value for that travel distance from Table 5–10.

Calculate the value for the population within 1 mile factor (PN) as follows:

$$PN = \frac{1}{10}\sum_{i=1}^{3} W_i$$

Where:

W_i=Distance-weighted population value from Table 5–10 for travel distance category i.

If PN is less than 1, do not round it to the nearest integer; if PN is 1 or more, round to the nearest integer. Enter this value in Table 5–1.

5.1.2.3.3 *Calculation of nearby population targets factor category value.* Sum the values for the nearby individual factor and the population within 1 mile factor. Do not round this sum to the nearest integer. Assign this sum as the targets factor category value for the nearby population threat. Enter this value in Table 5–1.

TABLE 5–10—DISTANCE WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT [a]

Travel distance category (miles)	Number of people within the travel distance category											
	0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000
Greater than 0 to ¼	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034
Greater than ¼ to ½	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517
Greater than ½ to 1	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258

[a] Round the number of people present within a travel distance category to nearest integer. Do not round the assigned distance-weighted population value to nearest integer.

5.1.2.4 *Calculation of nearby population threat score.* Multiply the values for likelihood of exposure, waste characteristics, and targets for the nearby population threat, and round the product to the nearest integer. Assign this product as the nearby population threat score. Enter this score in Table 5–1.

5.1.3 *Calculation of soil exposure component score.* Sum the resident population threat score and the nearby population threat score, and divide the sum by 82,500. Assign the resulting value, subject to a maximum of 100, as the soil exposure component score (S_{se}). Enter this score in Table 5–1.

5.2 *Subsurface intrusion component.* Evaluate the subsurface intrusion component based on three factor categories: likelihood of exposure, waste characteristics, and targets. Figure 5–1 indicates the factors included within each factor category for the subsurface intrusion component.

Determine the component score (S_{ssi}) in terms of the factor category values as follows:

$$S_{ssi} = \frac{(LE)(WC)(T)}{SF}$$

Where:

LE=Likelihood of exposure factor category value.

WC=Waste characteristics factor category value.

T=Targets factor category value.

SF=Scaling factor.

Table 5–11 outlines the specific calculation procedure.

TABLE 5–11—SUBSURFACE INTRUSION COMPONENT SCORESHEET

Factor categories and factors	Maximum value	Value assigned
Subsurface Intrusion Component:		
Likelihood of Exposure:		
1. Observed Exposure	550	
2. Potential for Exposure.		
2a. Structure Containment	10	
2b. Depth to contamination	10	
2c. Vertical Migration	15	
2d. Vapor Migration Potential	25	
3. Potential for Exposure (lines 2a * (2b + 2c + 2d), subject to a maximum of 500)	500	
4. Likelihood of Exposure (higher of lines 1 or 3)	550	
Waste Characteristics:		
5. Toxicity/Degradation	(a)	
6. Hazardous Waste Quantity	(a)	
7. Waste Characteristics (subject to a maximum of 100)	100	
Targets:		
8. Exposed Individual	50	
9. Population:.		
9a. Level I Concentrations	(b)	
9b. Level II Concentrations	(b)	
9c. Population within an Area of Subsurface Contamination	(b)	
9d. Total Population (lines 9a + 9b + 9c)	(b)	

TABLE 5–11—SUBSURFACE INTRUSION COMPONENT SCORESHEET—Continued

Factor categories and factors	Maximum value	Value assigned
10. Resources	5	
11. Targets (lines 8 + 9d + 10)	(b)	
Subsurface Intrusion Component Score:		
12. Subsurface Intrusion Component (lines 4 × 7 × 11)/82,500 [c] (subject to a maximum of 100)	100	
Soil Exposure and Subsurface Intrusion Pathway Score:		
13. Soil Exposure Component + Subsurface Intrusion Component (subject to a maximum of 100)	100	

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to the nearest integer.

5.2.0 *General considerations.* The subsurface intrusion component evaluates the threats from hazardous substances that have or could intrude into regularly occupied structures from the subsurface. Evaluate the subsurface intrusion component based on the actual or potential intrusion of hazardous substances into all regularly occupied structures that have structure containment values greater than zero and meet the criteria identified in the section below as being either in an area of observed exposure or in an area of subsurface contamination. These structures may or may not have subunits. Subunits are partitioned areas within a structure with separate heating, ventilating, and air conditioning (HVAC) systems or distinctly different air exchange rates. Subunits include regularly occupied partitioned tenant spaces such as office suites, apartments, condos, common or shared areas, and portions of residential, commercial or industrial structures with separate heating, ventilating, and air conditioning (HVAC) systems.

In evaluating the subsurface intrusion component, consider the following:

• Area(s) of observed exposure: An area of observed exposure is delineated by regularly occupied structures with documented contamination meeting observed exposure criteria; an area of observed exposure includes regularly occupied structures with samples meeting observed exposure criteria or inferred to be within an area of observed exposure based on samples meeting observed exposure criteria (see section 5.2.1.1.1 *Observed exposure*). Establish areas of observed exposure as follows:

—For regularly occupied structures that have no subunits, consider both the regularly occupied structures containing sampling location(s) meeting observed exposure criteria for the site and the regularly occupied structure(s) in the area lying between such locations to be an area of observed exposure (*i.e.,* inferred to be in an area of observed exposure), unless available information indicates otherwise.

—In multi-story, multi-subunit, regularly occupied structures, consider all subunits on a level with sampling locations meeting observed exposure criteria from the site and all levels below, if any, to be within an area of observed exposure, unless available information indicates otherwise.

—In multi-tenant structures, that do not have a documented observed exposure, but are located in an area lying between locations where observed exposures have been documented, consider only those regularly occupied subunits, if any, on the lowest level of the structure, to be within an area of observed exposure (*i.e.,* inferred to be in an area of observed exposure, unless available information indicates otherwise.

• Area(s) of subsurface contamination: An area of subsurface contamination is delineated by sampling locations meeting observed release criteria for subsurface intrusion, excluding areas of observed exposure (see Table 2–3 in section 2.3). The area within an area of subsurface contamination includes potentially exposed populations. If the significant increase in hazardous substance levels cannot be attributed at least in part to the site, and cannot be attributed to other sites, attribution can be established based on the presence of hazardous substances in the area of subsurface contamination. Establish areas of subsurface contamination as follows:

—Exclude those areas that contain structures meeting the criteria defined as an area of observed exposure.

—Consider both the sampling location(s) with subsurface contamination meeting observed release criteria from the site and the area lying between such locations to be an area of subsurface contamination (*i.e.,* inferred to be in an area of subsurface contamination). If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion into a regularly occupied structure located within an area of subsurface contamination, that structure can be excluded from the area of subsurface contamination.

Evaluate an area of subsurface contamination based on hazardous substances that:

- Meet the criteria for observed exposure of a chemical that has a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol, or
- Meet the criteria for observed release in an area of subsurface contamination and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol, or
- Meet the criteria for an observed release in a structure within, or in a sample from below, an area of observed exposure and have a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol.

—Evaluate all structures with no subunits that have containment factor values greater than zero, and not documented to meet observed exposure criteria to be in an area of subsurface contamination if they are lying between locations of subsurface intrusion samples meeting observed release criteria.

—Evaluate multi-subunit structures as follows:

- If an observed exposure has been documented based on a gaseous indoor air sample, consider all regularly occupied subunit(s), if any, on the level immediately above the level where an observed exposure has been documented (or has been inferred to be within an area of observed exposure), to be within an area of subsurface contamination. If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion on the level immediately above the level where an observed exposure has been documented (or has been inferred to be within an area of observed exposure) that level can be excluded from the area of subsurface contamination.
- If observed release criteria have been met based on a gaseous indoor air sample collected from a level not regularly occupied, consider all regularly occupied subunit(s), if any, on the level immediately above the level where the observed release criteria has been documented, to be within an area of subsurface contamination. If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion on the level immediately above the level where the observed release criteria has been documented that level can be excluded from the area of subsurface contamination.
- If any regularly occupied multi-subunit structure is inferred to be in an area of subsurface contamination, consider only those regularly occupied subunit(s), if any, on the lowest level, to be within an area of subsurface contamination. If sufficient data is available and state of the science shows there is no unacceptable risk due to subsurface intrusion on the lowest level, that structure can be excluded from the area of subsurface contamination.

See Section 7.0 for establishing an area of subsurface contamination based on the

presence of radioactive hazardous substances.

If there is no area of observed exposure and no area of subsurface contamination, assign a score of 0 for the subsurface intrusion component.

5.2.1 *Subsurface intrusion component.* Evaluate this component only if there is an area of observed exposure or area of subsurface contamination:

• Within or underlying a residence, school, day care center, workplace, or

• Within or underlying a resource specified in section 5.2.1.3.3.

5.2.1.1 *Likelihood of exposure.* Assign a value of 550 to the likelihood of exposure factor category for the subsurface intrusion component if there is an area of observed exposure in one or more locations listed in section 5.2.1. Enter this value in Table 5–11.

5.2.1.1.1 *Observed exposure.* Establish observed exposure in a regularly occupied structure by demonstrating that a hazardous substance has been released into a regularly occupied structure via the subsurface. Base this demonstration on either of the following criteria:

• Direct observation:

—A solid, liquid, or gaseous material that contains one or more hazardous substances attributable to the site has been observed entering a regularly occupied structure through migration via the subsurface or is known to have entered a regularly occupied structure via the subsurface, or

—When evidence supports the inference of subsurface intrusion of a material that contains one or more hazardous substances associated with the site into a regularly occupied structure, demonstrated adverse effects associated with that release may be used to establish observed exposure.

• Chemical analysis:

—Analysis of indoor samples indicates that the concentration of hazardous substance(s) is significantly above the background concentration for the site for that type of sample (see section 2.3).

—Some portion of the significant increase above background must be attributable to the site to establish the observed exposure. Documentation of this attribution should account for possible concentrations of the hazardous substance(s) in outdoor air or from materials found in the regularly occupied structure, and should provide a rationale for the increase being from subsurface intrusion.

If observed exposure can be established in a regularly occupied structure, assign an observed exposure factor value of 550, enter this value in Table 5–11, and proceed to section 5.2.1.1.3. If no observed exposure can be established, assign an observed exposure factor value of 0, enter this value in Table 5–11, and proceed to section 5.2.1.1.2.

5.2.1.1.2 *Potential for exposure.* Evaluate potential for exposure only if an observed exposure cannot be established, but an area of subsurface contamination has been delineated. Evaluate potential for exposure based only on the presence of hazardous substances with a vapor pressure greater than or equal to one torr or a Henry's constant greater than or equal to 10^{-5} atm-m^3/mol. Evaluate potential for exposure for each area of subsurface contamination based on four factors: Structure containment (see section 5.2.1.1.2.1), depth to contamination (see section 5.2.1.1.2.2), vertical migration (see section 5.2.1.1.2.3) and vapor migration potential (see section 5.2.1.1.2.4). For each area of subsurface contamination, assign the highest value for each factor. If information is insufficient to calculate any single factor value used to calculate the potential for exposure factor values at an identified area of subsurface contamination, information collected for another area of subsurface contamination at the site may be used when evaluating potential for exposure. Calculate the potential for exposure value for the site as specified in section 5.2.1.1.2.5.

5.2.1.1.2.1 *Structure containment.* Calculate containment for eligible hazardous substances within this component as directed in Table 5–12 and enter this value into Table 5–11. Assign each regularly occupied structure within an area of subsurface contamination the highest appropriate structure containment value from Table 5–12 and use the regularly occupied structure at the site with the highest structure containment value in performing the potential for exposure calculation. For all regularly occupied structures with unknown containment features assign a structure containment value of greater than zero for the purposes of evaluating targets (see section 5.2.1.3).

TABLE 5–12—STRUCTURE CONTAINMENT

No.	Evidence of structure containment	Assigned value
1.	Regularly occupied structure with evidence of subsurface intrusion, including documented observed exposure or sampling of bio or inert gases, such as methane and radon.	10
2.	Regularly occupied structure with open preferential subsurface intrusion pathways (*e.g.,* sumps, foundation cracks, unsealed utility lines).	10
3.	Regularly occupied structure with an engineered vapor migration barrier system that does not address all preferential subsurface intrusion pathways.	7
4.	Regularly occupied structure with an engineered passive vapor mitigation system *without* documented institutional controls (*e.g.,* deed restrictions) or evidence of regular maintenance and inspection.	6
5.	Regularly occupied structure with no visible open preferential subsurface intrusion pathways from the subsurface (*e.g.,* sumps, foundation cracks, unsealed utility lines).	4
6.	Regularly occupied structure with an engineered passive vapor mitigation system (*e.g.,* passive venting) *with* documented institutional controls (*e.g.,* deed restrictions) or evidence of regular maintenance and inspection.	3
7.	Regularly occupied structure with an engineered, active vapor mitigation system (*e.g.,* active venting) *without* documented institutional controls (*e.g.,* deed restrictions) and funding in place for on-going operation, inspection and maintenance.	2
8.	Regularly occupied structure with a permanent engineered, active vapor mitigation system (*e.g.,* active venting) *with* documented institutional controls (*e.g.,* deed restrictions) and funding in place for on-going operation, inspection and maintenance.	1
9.	Regularly occupied structure with a foundation raised greater than 6 feet above ground surface (*e.g.,* structure on stilts) or structure that has been built, and maintained, in a manner to prevent subsurface intrusion.	0

5.2.1.1.2.2 *Depth to contamination.* Assign each area of subsurface contamination a depth to contamination based on the least depth to either contaminated crawl space or subsurface media underlying a regularly occupied structure. Measure this depth to contamination based on the distance between the lowest point of a regularly occupied structure to the highest known point of hazardous substances eligible to be evaluated. Use any regularly occupied structure within an area of subsurface contamination with a structure containment factor value greater than zero. Subtract from the depth to contamination the thickness of any subsurface layer composed of features that would allow channelized flow (*e.g.,* karst, lava tubes, open fractures, as well as manmade preferential pathways such as utility conduits or drainage systems).

Based on this calculated depth, assign a factor value from Table 5–13. If the necessary information is available at multiple locations, calculate the depth to contamination at each location. Use the location having the least depth to contamination to assign the factor value. Enter this value in Table 5–11.

TABLE 5–13—DEPTH TO CONTAMINATION

Depth range [1] [2]	Depth to contamination assigned value
0 to <10 ft (Including subslab and semi-enclosed or enclosed crawl space contamination)	10
>10 to 20 ft	8
>20 to 50 ft	6
>50 to 100 ft	4
>100 to 150 ft	2
>150 ft	0

[1] If any part of the subsurface profile has channelized flow features, assign that portion of the subsurface profile a depth of 0.

[2] Measure elevation below any regularly occupied structure within an area of subsurface contamination at a site. Select the regularly occupied structure with the least depth to contamination below a structure.

5.2.1.1.2.3 *Vertical migration.* Evaluate the vertical migration factor for each area of subsurface contamination based on the geologic materials in the interval between the lowest point of a regularly occupied structure and the highest known point of hazardous substances in the subsurface. Use any regularly occupied structure either within an area of subsurface contamination or overlying subsurface soil gas or ground water contamination. Assign a value to the vertical migration factor as follows:

• If the depth to contamination (see section 5.2.1.1.2.2) is 10 feet or less, assign a value of 15.

• If the depth to contamination is greater than 10 feet, do not consider layers or portions of layers within the first 10 feet of the depth to contamination (as assigned in section 5.2.1.1.2.2).

• If, for the interval between the lowest point of a regularly occupied structure and the highest point of hazardous substances in the subsurface, all layers that underlie a portion of a regularly occupied structure at the site are karst or otherwise allow channelized flow, assign a value of 15.

• Otherwise:

—Select the lowest effective porosity/permeability layer(s) from within the interval identified above. Consider only layers at least 1 foot thick.—Assign a value for individual layers from Table 5–14 using the hydraulic conductivity of the layer, if available. If the hydraulic conductivity is not available, assign a value based on the type of material in the selected layer.

—If more than one layer has the same assigned porosity/permeability value, include all such layers and sum their thicknesses. Assign a thickness of 0 feet to a layer with channelized flow features found within any area of subsurface contamination at the site.

—Assign a value from Table 5–15 to the vertical migration factor, based on the thickness and assigned porosity/permeability value of the lowest effective porosity/permeability layer(s).

Determine vertical migration only at locations within an area of subsurface contamination at the site. If the necessary subsurface geologic information is available at multiple locations, evaluate the vertical migration factor at each location. Use the location having the highest vertical migration factor value to assign the factor value. Enter this value in Table 5–11.

TABLE 5–14—EFFECTIVE POROSITY/PERMEABILITY OF GEOLOGIC MATERIALS

Type of material	Hydraulic conductivity (cm/sec)	Assigned porosity/permeability value
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites.	Greater than or equal to 1×10^{-3}.	1
Sand; sandy clays; sandy loams; loamy sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks.	Less than 1×10^{-3}	2
Silt; loams; silty loams; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks.	Less than 1×10^{-5}	3
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks.	Less than 1×10^{-7}	4

TABLE 5–15—VERTICAL MIGRATION FACTOR VALUES [a]

Assigned porosity/permeability value	Thickness of lowest porosity layer(s) [b] (feet)					
	0 to 5	Greater than 5 to 10	Greater than 10 to 20	Greater than 20 to 50	Greater than 50 to 100	Greater than 100 to 150
1	15	15	14	11	8	6
2	15	14	12	9	6	4
3	15	13	10	7	5	2
4	15	12	9	6	3	1

[a] If depth to contamination is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the structure at the site are karst or have other channelized flow features, assign a value of 15.

[b] Consider only layers at least 1 foot thick.

5.2.1.1.2.4 *Vapor migration potential.* Evaluate this factor for each area of subsurface contamination as follows:

• If the depth to contamination (see section 5.2.1.1.2.2) is 10 feet or less, assign a value of 25.

• Assign a value for vapor migration potential to each of the gaseous hazardous substances associated with the area of subsurface contamination (see section 2.2.2) as follows:

—Assign values from Table 5–16 for both vapor pressure and Henry's constant to each hazardous substance. If Henry's constant cannot be determined for a hazardous substance, assign that hazardous substance a value of 2 for the Henry's constant component.

—Sum the two values assigned to each hazardous substance.

—Based on this sum, assign each hazardous substance a value from Table 5–17 for vapor migration potential.

• Assign a value for vapor migration potential to each area of subsurface contamination as follows:

—Select the hazardous substance associated with the area of subsurface contamination

with the highest vapor migration potential value and assign this value as the vapor migration potential factor value for the area of subsurface contamination.
Enter this value in Table 5–11.

TABLE 5–16—VALUES FOR VAPOR PRESSURE AND HENRY'S CONSTANT

Vapor pressure (torr)	Assigned value
Greater than 10	3
1 to 10	2
Less than 1	0
Henry's constant (atm-m^3/mol)	**Assigned value**
Greater than 10^{-3}	3
Greater than 10^{4} to 10^{-3}	2
10^{-5} to 10^{-4}	1
Less than 10^{-5}	0

TABLE 5–17—VAPOR MIGRATION POTENTIAL FACTOR VALUES FOR A HAZARDOUS SUBSTANCE

Sum of values for vapor pressure and Henry's constant	Assigned value
0	0
1 or 2	5
3 or 4	15
5 or 6	25

5.2.1.1.2.5 *Calculation of potential for exposure factor value.* For each identified area of subsurface contamination, sum the factor values for depth to contamination, vertical migration, and vapor migration potential, and multiply this sum by the factor value for structure containment. Select the highest product for any area of subsurface contamination and assign this value as the potential for exposure factor value for the component. Enter this value in Table 5–11.

5.2.1.1.3 *Calculation of likelihood of exposure factor category value.* If observed exposure is established for the site, assign the observed exposure factor value of 550 as the likelihood of exposure factor category value for the site. Otherwise, assign the potential for exposure factor value for the component as the likelihood of exposure value. Enter the value assigned in Table 5–11.

5.2.1.2 *Waste characteristics.* Evaluate waste characteristics based on two factors: toxicity/degradation and hazardous waste quantity.

5.2.1.2.1 *Toxicity/degradation.* For each hazardous substance, assign a toxicity factor value, a degradation factor value and a combined toxicity/degradation factor value as specified in sections 2.2.3, 2.4.1.2 and 5.2.1.2.1.1 through 5.2.1.2.1.3.

5.2.1.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in sections 2.2.2 and 2.4.1.1.

5.2.1.2.1.2 *Degradation.* Assign a degradation factor value to each hazardous substance as follows:

- For any hazardous substance that meets the criteria for an observed exposure, or if a NAPL is present in the subsurface below an area of observed exposure or area of subsurface contamination at a depth less than or equal to 30 feet, assign that substance a degradation factor value of 1.
- For all other situations, assign a degradation factor value using Table 5–18. Assign the depth to contamination as directed in section 5.2.1.1.2.2, except if evidence indicates that biologically active soil is not present throughout the depth beneath any regularly occupied structure. In this situation, subtract any thickness of non-biologically active soil from the estimated depth to contamination.

TABLE 5–18—DEGRADATION FACTOR VALUE TABLE

Depth to contamination (feet) [a]	Half-life		
	>100 Days	>30 days and ≤100 days	≤30 days
<10	1	1	1
10 to ≤30	1	1	0.1
>30	1	0.5	0.1

[a] When determining the depth to contamination do not include layers of non-biologically-active soil, nor subsurface intervals with channelized flow (*e.g.,* karst, lava tubes, open fractures, and manmade preferential pathways as directed in section 5.2.1.1.2.2).

Calculate the half-life for each hazardous substance that meets subsurface intrusion observed release criteria as follows:

The half-life of a substance in the subsurface is defined for HRS purposes as the time required to reduce the initial concentration of the substance in the subsurface by one-half as a result of the combined decay processes of two components: Biodegradation and hydrolysis.

Estimate the half-life ($t_{1/2}$) of a hazardous substance as follows:

$$t_{1/2} = \frac{1}{1/h + 1/b}$$

Where:
h=Hydrolysis half-life.
b=Biodegradation half-life.

If either of these component half-lives cannot be estimated for the hazardous substance from available data, delete that component half-life from the above equation.

If no half-life information is available for a hazardous substance and the substance is not already assigned a value of 1, unless information indicates otherwise, assign a value of 1.

5.2.1.2.1.3 *Calculation of toxicity/degradation factor value.* Assign each substance a toxicity/degradation value by multiplying the toxicity factor value by the degradation factor value. Use the hazardous substance with the highest combined toxicity/degradation value to assign the factor value to the toxicity/degradation factor for the subsurface intrusion threat. Enter this value in Table 5–11.

5.2.1.2.2 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value as specified in section 2.4.2. Consider only those regularly occupied structures or subunits with a non-zero structure containment value. Also include all regularly occupied structures or subunits that have had mitigation systems installed as part of a removal or other temporary response action. If sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to populations in a regularly occupied structure or subunit in an area of subsurface contamination, that structure or subunit is not included in the hazardous waste quantity evaluation. In estimating the hazardous waste quantity, use Tables 2–5 and 5–19 and:

- For Tier A, hazardous constituent quantity, use the mass of constituents found in the regularly occupied structure(s) where the observed exposure has been identified.
  —For multi-subunit structures, when calculating Tier A, use the mass of constituents found in the regularly occupied subunit space(s) where the observed exposure has been identified.
- For Tier B, hazardous wastestream quantity, use the flow-through volume of the regularly occupied structures where the observed exposure has been identified.
  —For multi-subunit structures, when calculating Tier B, use the flow-through volume of the regularly occupied subunit spaces where the observed exposure has been identified.
- For Tier C, volume, use the volume divisor listed in Tier C of Table 5–19. Volume is calculated for those regularly occupied structures located within areas of observed exposure with observed or inferred

intrusion and within areas of subsurface contamination.

—In evaluating the volume measure for these listed areas of observed exposure and areas of subsurface contamination based on a gaseous/vapor intrusion or the potential for gaseous/vapor intrusion, consider the following:

- Calculate the volume of each regularly occupied structure based on actual data. If unknown, use a ceiling height of 8 feet.
- For multi-subunit structures, when calculating Tier C, calculate volume for those subunit spaces with observed or inferred exposure and all other regularly occupied subunit spaces on that level, unless available information indicates otherwise. If the structure has multiple stories, also include the volume of all regularly occupied subunit spaces below the floor with an observed exposure and one story above, unless evidence indicates otherwise.
- For multi-subunit structures within an area of subsurface contamination and no observed or inferred exposure, consider only the volume of the regularly occupied subunit spaces on the lowest story, unless available information indicates otherwise.

• For Tier D, area, if volume is unknown, use the area divisor listed in Tier D of Table 5–19 for those regularly occupied structures within areas of observed exposure with observed or inferred intrusion and within areas of subsurface contamination.

—In evaluating the area measure for these listed areas of observed exposure and areas of subsurface contamination, calculate the area of each regularly occupied structure (including multi-subunit structures) or subunit based on actual footprint area data.

- If the actual footprint area of the structure(s) is unknown, use an area of 1,740 square feet for each structure (or subunit space).
- For multi-subunit structures, when calculating Tier D, calculate area for those subunit spaces with observed or inferred exposure and all other regularly occupied subunit spaces on that level, unless available information indicates otherwise. If the structure has multiple stories, also include the area of all regularly occupied subunit spaces below the floor with an observed exposure and one story above, unless evidence indicates otherwise.
- For multi-subunit structures within an area of subsurface contamination and no observed or inferred exposure, consider only the area of the regularly occupied subunit spaces on the lowest story, unless available information indicates otherwise.

TABLE 5–19—HAZARDOUS WASTE QUANTITY EVALUATION EQUATIONS FOR SUBSURFACE INTRUSION COMPONENT

Tier	Measure	Units	Equation for assigning value [a]
A	Hazardous Constituent Quantity (C)	Lb	C
B[b]	Hazardous Wastestream Quantity (W)	Lb	W/5,000
C[b,c]	Volume (V).		
	Regularly occupied structure(s) in areas of observed exposure or subsurface contamination	yd^3	V/2.5
D[b,d]	Area (A).		
	Regularly occupied structure(s) in areas of observed exposure or subsurface contamination	ft^2	A/13

[a] Do not round to the nearest integer.
[b] Convert volume to mass when necessary: 1 ton=2,000 pounds=1 cubic yard=4 drums=200 gallons.
[c] Calculate volume of each regularly occupied structure or subunit space in areas of observed exposure and areas of subsurface contamination—Assume 8-foot ceiling height unless actual value is known.
[d] Calculate area of the footprint of each regularly occupied structure in areas of observed exposure and areas of subsurface contamination. If the footprint area of a regularly occupied structure is unknown, use 1,740 square feet as the footprint area of the structure or subunit space.

For the subsurface intrusion component, if the hazardous constituent quantity is adequately determined for all areas of observed exposure, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the hazardous constituent quantity is not adequately determined for one or more areas of observed exposure or if one or more areas of subsurface contamination are present, assign either the value from Table 2–6 or assign a factor value as follows:

• If any target for the subsurface intrusion component is subject to Level I or Level II concentrations (see section 2.5), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for this component.

• If none of the targets for the subsurface intrusion component is subject to Level I or Level II concentrations and if there has been a removal action that does not permanently interrupt target exposure from subsurface intrusion, and if an area of subsurface contamination exists, assign a factor value as follows:

—Determine the values from Table 2–6 with and without consideration of the removal action.

—If the value that would be assigned from Table 2–6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the component.

—If the value that would be assigned from Table 2–6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the component.

• Otherwise, if none of the targets for the subsurface intrusion component is subject to Level I or Level II concentrations and there has not been a removal action, assign a value from Table 2–6 or a value of 10, whichever is greater.

Enter the value assigned in Table 5–11.

5.2.1.2.3 *Calculation of waste characteristics factor category value.* Multiply the toxicity/degradation and hazardous waste quantity factor values, subject to a maximum product of 1×10^8. Based on this product, assign a value from Table 2–7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 5–11.

5.2.1.3 *Targets.* Evaluate the targets factor category for the subsurface intrusion threat based on three factors: Exposed individual, population, and resources in regularly occupied structures with structure containment factors greater than 0. Evaluate only those targets within areas of observed exposure and areas of subsurface contamination (see section 5.2.0).

In evaluating the targets factor category for the subsurface intrusion threat, count only the following as targets:

• Exposed individual—a person living, attending school or day care, or working in a regularly occupied structure with observed exposure or in a structure within an area of observed exposure or within an area of subsurface contamination.

• Population—exposed individuals in a regularly occupied structure within an area of observed exposure or within an area of subsurface contamination.

• Resources—located within an area of observed exposure or within an area of subsurface contamination as specified in section 5.2.1.3.3.

If a formerly occupied structure has been vacated due to subsurface intrusion attributable to the site, count the initial targets as if they were still residing in the structure. In addition, if a removal or temporary response action has occurred that has not completely mitigated the release, count the initial targets as if the removal or temporary response action has not permanently interrupted target exposure from subsurface intrusion. Evaluate those targets based on conditions at the time of removal of temporary response action.

For populations residing in or working in a multi-subunit structure with multiple stories in an area of observed exposure or area of subsurface contamination, count these targets as follows:

• If there is no observed exposure within the structure, include in the evaluation only those targets, if any, in the lowest occupied level. If sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to targets in the lowest level, those targets are not included in the evaluation.

• If there is an observed exposure in any level, include in the evaluation those targets in that level, the level above and all levels below. (The weighting of these targets is specified in Section 5.2.1.3.2.) If sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to targets in the level above where the observed exposure has been documented, those targets are not included in the evaluation.

5.2.1.3.1 *Exposed individual.* Evaluate this factor based on whether there is an exposed individual, as specified in sections 2.5.1, 2.5.2 and 5.2.1.3, who is subject to Level I or Level II concentrations.

First, determine those regularly occupied structures or partitioned subunit(s) within structures in an area of observed exposure subject to Level I concentrations and those subject to Level II concentrations as specified as follows (see section 5.2.0):

• Level I Concentrations: For contamination resulting from subsurface intrusion, compare the hazardous substance concentrations in any sample meeting the observed exposure by chemical analysis criteria to the appropriate benchmark. Use the health-based benchmarks from Table 5–20 to determine the level of contamination.

—If the sample is from a structure with no subunits and the concentration equals or exceeds the appropriate benchmark, assign Level I concentrations to the entire structure.

—If the sample is from a subunit within a structure and the concentration from that subunit equals or exceeds the appropriate benchmark, assign Level I concentrations to that subunit.

• Level II Concentrations: Structures, or subunits within structures, with one or more samples that meet observed exposure by chemical analysis criteria but do not equal or exceed the appropriate benchmark; structures, or subunits, that have an observed exposure by direct observation; and structures inferred to be in an area of observed exposure based on samples meeting observed exposure, are assigned Level II concentrations.

—For all regularly occupied structures, or subunits in such structures, in an area of observed exposure that are not assigned Level I concentrations, assign Level II concentrations.

Then assign a value to the exposed individual factor as follows:

• Assign a value of 50 if there is at least one exposed individual in one or more regularly occupied structures subject to Level I concentrations.

• Assign a value of 45 if there are no Level I exposed individuals, but there is at least one exposed individual in one or more regularly occupied structures subject to Level II concentrations.

• Assign a value of 20 if there is no Level I or Level II exposed individual but there is at least one individual in a regularly occupied structure within an area of subsurface contamination. Enter the value assigned in Table 5–11.

5.2.1.3.2 *Population.* Evaluate population based on three factors: Level I concentrations, Level II concentrations, and population within an area of subsurface contamination. Determine which factors apply as specified in section 5.2.1.3.1, using the health-based benchmarks from Table 5–20. Evaluate populations subject to Level I and Level II concentrations as specified in section 2.5.

TABLE 5–20—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN THE SUBSURFACE INTRUSION COMPONENT

Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk using the inhalation unit risk. For oral exposures use the oral cancer slope factor.
Screening concentration for noncancer toxicological responses corresponding to the reference dose (RfD) for oral exposure and the reference concentration (RfC) for inhalation exposures.

Count only those persons meeting the criteria for population as specified in section 5.2.1.3. In estimating the number of individuals in structures in an area of observed exposure or area of subsurface contamination if the actual number of residents is not known, multiply each residence by the average number of persons per residence for the county in which the residence is located.

5.2.1.3.2.1 *Level I concentrations.* Assign the population subject to Level I concentrations as follows:

1. Identify all exposed individuals regularly present in an eligible structure with a structure containment value greater than zero, or if the structure has subunits, identify those regularly present in each subunit, located in an area of observed exposure subject to Level I concentrations as described in sections 5.2.0 and 5.2.1.3.1. Identify only once per structure those exposed individuals that are using more than one eligible subunit of the same structure (*e.g.,* using a common or shared area and other parts of the same structure).

2. For each structure or subunit count the number of individuals residing in or attending school or day care in the structure or subunit.

3. Count the number of full-time and part-time workers in the structure or subunit(s) subject to Level I concentrations. If information is unavailable to classify a worker as full- or part-time, evaluate that worker as being full-time. Divide the number of full-time workers by 3 and the number of part-time workers by 6, and then sum these products with the number of other individuals for each structure or subunit.

4. Sum this combined value for all structures, or subunits, within areas of observed exposure and multiply this sum by 10.

Assign the resulting product as the combined population factor value subject to Level I concentrations for the site. Enter this value in line 9a of Table 5–11.

5.2.1.3.2.2 *Level II concentrations.* Assign the population subject to Level II concentrations as follows:

1. Identify all exposed individuals regularly present in an eligible structure with a structure containment value greater than zero, or if the structure has subunits, identify those regularly present in each subunit, located in an area of observed exposure subject to Level II concentrations as described in sections 5.2.0 and 5.2.1.3.1. Identify only once per structure those exposed individuals that are using more than one eligible subunit of the same structure (*e.g.,* using a common or shared area and other parts of the same structure).

2. Do not include exposed individuals already counted under the Level I concentrations factor.

3. For each structure or subunit(s), count the number of individuals residing in or attending school or day care in the structure, or subunit, subject to Level II concentrations.

4. Count the number of full-time and part-time workers in the structure or subunit(s) subject to Level II concentrations. If information is unavailable to classify a worker as full- or part-time, evaluate that worker as being full-time. Divide the number of full-time workers by 3 and the number of part-time workers by 6, and then sum these products with the number of other individuals for each structure or subunit.

5. Sum the combined population value for all structures within the areas of observed exposure for the site.

Assign this sum as the combined population factor value subject to Level II concentrations for this site. Enter this value in line 9b of Table 5–11.

5.2.1.3.2.3 *Population within area(s) of subsurface contamination.* Assign the population in area(s) of subsurface contamination factor value as follows. If sufficient structure-specific concentration data is available and state of the science shows there is no unacceptable risk of exposure to populations in a regularly occupied structure in an area of subsurface contamination, those populations are not included in the evaluation. (see sections 5.2.0 and 5.2.1.3.1):

1. Identify the regularly occupied structures with a structure containment value greater than zero and the eligible population associated with the structures or portions of structures in each area of subsurface contamination:

• For each regularly occupied structure or portion of a structure in an area of subsurface contamination, sum the number of all individuals residing in or attending school or day care, in the structure or portion of the structure in the area of subsurface contamination.

• Count the number of full-time and part-time workers regularly present in each

structure or portion of a structure in an area of subsurface contamination. If information is unavailable to classify a worker as full- or part-time, evaluate that worker as being full-time. Divide the number of full-time workers by 3 and the number of part-time workers by 6. Sum these products with the number of individuals residing in or attending school or day care in the structure.

• Use this sum as the population for the structure.

2. Estimate the depth or distance to contamination at each regularly occupied structure within an area of subsurface contamination based on available sampling data, and categorize each eligible structure based on the depth or distance to contamination and sample media as presented in Table 5–21. Weight the population in each structure using the appropriate weighting factors in Table 5–21. If samples from multiple media are available, use the sample that results in the highest weighting factor.

3. Sum the weighted population in all structures within the area(s) of subsurface contamination and assign this sum as the population within an area of subsurface contamination factor value. Enter this value in line 9c of Table 5–11.

TABLE 5–21—WEIGHTING FACTOR VALUES FOR POPULATIONS WITHIN AN AREA OF SUBSURFACE CONTAMINATION

Eligible populations [a] in structures [b] within an area of subsurface contamination	Population weighting factor
Samples From Within Structures or in Crawl Spaces	
1. Population in a structure with levels of contamination in a semi-enclosed or enclosed crawl space sample meeting observed release criteria or Population in a subunit of a multi-story structure within an area of subsurface contamination located directly above a level in an area of observed exposure or a gaseous indoor air sample meeting observed release criteria or Population within a structure where a mitigation system has been installed as part of a removal or other temporary response action.	0.9
2. Population in a structure where levels of contaminants meeting observed release criteria are inferred based on semi-enclosed or enclosed crawl space samples in surrounding structures, and a NAPL is present in those samples	0.8
3. Population in a structure where levels of contaminants meeting observed release criteria are inferred based on semi-enclosed or enclosed crawl space samples in surrounding structures, but no NAPL is present	0.4
Subsurface Samples From Less Than or Equal to 5 Feet From a Foundation	
4. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on any sampling media at or within five feet horizontally or vertically of the structure foundation, and a NAPL is present within that depth	0.8
5. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on any sampling media at or within five feet horizontally or vertically of the structure foundation, but no NAPL is present within that depth	0.4
Subsurface Samples From Greater Than 5 Feet But Less Than or Equal to 30 Feet Depth	
6. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on any underlying non-ground water subsurface sample at a depth greater than 5 feet but less than or equal to 30 feet from a structure foundation and a NAPL is present within that depth	0.4
7. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on any underlying non-ground water subsurface sample at a depth greater than 5 feet but less than or equal to 30 feet, but no NAPL is present within that depth	0.2
8. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on underlying ground water samples greater than 5 feet from the structure foundation but less than or equal to 30 feet, and a NAPL is present in those samples	0.2
9. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on underlying ground water samples greater than 5 feet from the structure foundation but less than or equal to 30 feet, but no NAPL is present in those samples	0.1
Subsurface Samples From Greater Than 30 Feet Depth	
10. Population in a structure where levels of contaminants meeting observed release criteria are found or inferred based on any underlying sample at depths greater than 30 feet	0.1

[a] Eligible populations include residents (including individuals living in, or attending school or day care in the structure), and workers in regularly occupied structures (see HRS Section 5.2.1.3).

[b] Eligible structures may include single- or multi-tenant structures where eligible populations reside, attend school or day care, or work. These structures may also be mixed use structures.

5.2.1.3.2.4 *Calculation of population factor value.* Sum the factor values for Level I concentrations, Level II concentrations, and population within the area(s) of subsurface contamination. Assign this sum as the population factor value. Enter this value in line 9d of Table 5–11.

5.2.1.3.3 *Resources.* Evaluate the resources factor as follows:

• Assign a value of 5 if a resource structure (*e.g.,* library, church, tribal facility) is present and regularly occupied within either an area of observed exposure or area of subsurface contamination.

• Assign a value of 0 if there is no resource structure within an area of observed exposure or area of subsurface contamination.

Enter the value assigned in Table 5–11.

5.2.1.3.4 *Calculation of targets factor category value.* Sum the values for the exposed individual, population, and resources factors. Do not round to the nearest integer. Assign this sum as the targets factor category value for the subsurface intrusion component. Enter this value in Table 5–11.

5.2.2 *Calculation of subsurface intrusion component score.* Multiply the factor category values for likelihood of exposure, waste characteristics, and targets and round the product to the nearest integer. Divide the product by 82,500. Assign the resulting value, subject to a maximum of 100, as the

subsurface intrusion component score and enter this score in Table 5–11.

5.3 *Calculation of the soil exposure and subsurface intrusion pathway score.* Sum the soil exposure component score and subsurface intrusion component score. Assign the resulting value, subject to a maximum of 100, as the soil exposure and subsurface intrusion pathway score (S_{sessi}). Enter this score in Table 5–11.

6.0 Air Migration Pathway

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TABLE 6–14—HEALTH-BASED BENCHMARKS FOR HAZARDOUS SUBSTANCES IN AIR

- Concentration corresponding to National Ambient Air Quality Standard (NAAQS).
- Concentration corresponding to National Emission Standards for Hazardous Air Pollutants (NESHAPs).
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures.
- Screening concentration for noncancer toxicological responses corresponding to the Reference Concentration (RfC) for inhalation exposures.

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7.0 Sites Containing Radioactive Substances

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TABLE 7–1—HRS FACTORS EVALUATED DIFFERENTLY FOR RADIONUCLIDES

Ground water pathway	Status [a]	Surface water pathway	Status [a]	Soil exposure component of SESSI pathway	Status [a]	Subsurface intrusion component of SESSI pathway	Status [a]	Air pathway	Status [a]
Likelihood of Release		*Likelihood of Release.*		*Likelihood of Exposure.*		*Likelihood of Exposure.*		*Likelihood of Release.*	
Observed Release	Yes	Observed Release.	Yes	Observed Contamination.	Yes	Observed Exposure.	Yes	Observed Release.	Yes.
Potential to Release	No	Potential to Release.	No	Attractiveness/Accessibility to Nearby Residents.	No	Potential for Exposure.	Yes	Gas Potential to Release.	No.
Containment	No	Overland Flow Containment.	No	Area of Contamination.	No	Structure Containment.	No	Gas Containment.	No.
Net Precipitation	No	Runoff	No	Area of Observed Exposure.	No	Depth to Contamination.	Yes	Gas Source Type.	No.
Depth to Aquifer	No	Distance to Surface water.	No	Area of Subsurface Contamination.	No	Vertical migration.	No	Gas Migration Potential.	No.
Travel Time	No	Flood Frequency.	No			Vapor Migration Potential.	No	Particulate Potential to Release.	No.
		Flood Containment.	No					Particulate Containment.	No.
								Particulate Source Type.	No.
								Particulate Migration Potential.	No.
Waste Characteristics		*Waste Characteristics.*		*Waste Characteristics.*		*Waste Characteristics.*		*Waste Characteristics.*	
Toxicity	Yes	Toxicity/Ecotoxicity.	Yes/Yes.	Toxicity	Yes	Toxicity/Degradation.	Yes/Yes.	Toxicity	Yes.
Mobility	No	Persistence/Mobility	Yes/No	Hazardous Waste Quantity.	Yes	Hazardous Waste Quantity.	Yes	Mobility	No.
Hazardous Waste Quantity	Yes	Bioaccumulation Potential.	No					Hazardous Waste Quantity.	Yes.
		Hazardous Waste Quantity.	Yes						
Targets		*Targets*		*Targets*		*Targets*		*Targets*	
Nearest Well	Yes.[b] ...	Nearest Intake.	Yes.[b] ...	Resident Individual.	Yes.[b] ...	Exposed ..... Individual	Yes.[b] ...	Nearest Individual.	Yes.[b]

TABLE 7–1—HRS FACTORS EVALUATED DIFFERENTLY FOR RADIONUCLIDES—Continued

Ground water pathway	Status [a]	Surface water pathway	Status [a]	Soil exposure component of SESSI pathway	Status [a]	Subsurface intrusion component of SESSI pathway	Status [a]	Air pathway	Status [a]
Population	Yes.[b]	Drinking Water Population.	Yes.[b]	Resident Population.	Yes.[b]	Population	Yes.[b]	Population	Yes.[b]
Resources	No	Resources	No	Workers	No	Resources	No	Resources	No
Wellhead Protection Area	No	Sensitive Environments.	Yes.[b]	Resources	No			Sensitive Environments.	No
		Human Food Chain Individual.	Yes.[b]	Terrestrial Sensitive Environments.	No				
		Human Food Chain Population.	Yes.[b]	Nearby Individual.	No				
				Population Within 1 Mile.	No				

[a] Factors evaluated differently are denoted by ''yes''; factors not evaluated differently are denoted by ''no''.
[b] Difference is in the determination of Level I and Level II concentrations.

* * * * *

* * * These differences apply largely to the soil exposure and subsurface intrusion pathway and to sites containing mixed radioactive and other hazardous substances.
* * *

7.1 *Likelihood of release/likelihood of exposure.* Evaluate likelihood of release for the three migration pathways and likelihood of exposure for the soil exposure and subsurface intrusion pathway as specified in sections 2 through 6, except: establish an observed release, observed contamination, and/or observed exposure as specified in section 7.1.1. When an observed release or exposure cannot be established for a migration pathway or the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, evaluate potential to release as specified in section 7.1.2. When observed contamination cannot be established, do not evaluate the soil exposure component of the soil exposure and subsurface intrusion pathway.

7.1.1 *Observed release/observed contamination/observed exposure.* For radioactive substances, establish an observed release for each migration pathway by demonstrating that the site has released a radioactive substance to the pathway (or watershed or aquifer, as appropriate); establish observed contamination or observed exposure for the soil exposure and subsurface intrusion pathway as indicated below. Base these demonstrations on one or more of the following, as appropriate to the pathway being evaluated:

• Direct observation:

—For each migration pathway, a material that contains one or more radionuclides has been seen entering the atmosphere, surface water, or ground water, as appropriate, or is known to have entered ground water or surface water through direct deposition, or

—For the surface water migration pathway, a source area containing radioactive substances has been flooded at a time that radioactive substances were present and one or more radioactive substances were in contact with the flood waters.

—For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, a material that contains one or more radionuclides has been observed entering a regularly occupied structure via the subsurface or is known to have entered a regularly occupied structure via the subsurface. Also, when evidence supports the inference of subsurface intrusion of a material that contains one or more radionuclides by the site into a regularly occupied structure, demonstrated adverse effects associated with that release may also be used to establish observed exposure by direct observation.

• Analysis of radionuclide concentrations in samples appropriate to the pathway (that is, ground water, soil, air, indoor air, soil gas, surface water, benthic, or sediment samples):

—For radionuclides that occur naturally and for radionuclides that are ubiquitous in the environment:

▪ Measured concentration (in units of activity, for example, pCi per kilogram [pCi/kg], pCi per liter [pCi/L], pCi per cubic meter [pCi/m3]) of a given radionuclide in the sample are at a level that:

○ Equals or exceeds a value 2 standard deviations above the mean site-specific background concentration for that radionuclide in that type of sample, or

○ Exceeds the upper-limit value of the range of regional background concentration values for that specific radionuclide in that type of sample.

▪ Some portion of the increase must be attributable to the site to establish the observed release (or observed contamination or observed exposure), and

▪ For the soil exposure component of the soil exposure and subsurface intrusion pathway only, the radionuclide must also be present at the surface or covered by 2 feet or less of cover material (for example, soil) to establish observed contamination.

—For man-made radionuclides without ubiquitous background concentrations in the environment:

▪ Measured concentration (in units of activity) of a given radionuclide in a sample equals or exceeds the sample quantitation limit for that specific radionuclide in that type of media and is attributable to the site.

▪ However, if the radionuclide concentration equals or exceeds its sample quantitation limit, but its release can also be attributed to one or more neighboring sites, then the measured concentration of that radionuclide must also equal or exceed a value either 2 standard deviations above the mean concentration of that radionuclide contributed by those neighboring sites or 3 times its background concentration, whichever is lower.

▪ If the sample quantitation limit cannot be established:

○ If the sample analysis was performed under the EPA Contract Laboratory Program, use the EPA contract-required quantitation limit (CRQL) in place of the sample quantitation limit in establishing an observed release (or observed contamination or observed exposure).

○ If the sample analysis is not performed under the EPA Contract Laboratory Program, use the detection limit in place of the sample quantitation limit.

▪ For the soil exposure component of the soil exposure and subsurface intrusion pathway only, the radionuclide must also be present at the surface or covered by 2 feet or less of cover material (for example, soil) to establish observed contamination.

• Gamma radiation measurements (applies only to observed contamination or observed exposure in the soil exposure and subsurface intrusion pathway):

—The gamma radiation exposure rate, as measured in microroentgens per hour (μR/hr) using a survey instrument held 1 meter above the ground surface or floor or walls of a structure (or 1 meter away from an aboveground source for the soil exposure component), equals or exceeds 2 times the site-specific background gamma radiation exposure rate.

—Some portion of the increase must be attributable to the site to establish observed contamination or observed exposure. The gamma-emitting radionuclides do not have to be within 2 feet of the surface of the source.

For the three migration pathways and for the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, if an observed release or observed exposure can be established for the pathway (or component, threat, aquifer, or watershed, as appropriate), assign the pathway (or component, threat, aquifer, or watershed) an observed release or observed exposure factor value of 550 and proceed to section 7.2. If an observed release or observed exposure cannot be established, assign an observed release or observed exposure factor value of 0 and proceed to section 7.1.2.

For the soil exposure component of the soil exposure and subsurface intrusion pathway, if observed contamination can be established, assign the likelihood of exposure factor for resident population a value of 550 if there is an area of observed contamination in one or more locations listed in section 5.1.1; evaluate the likelihood of exposure factor for nearby population as specified in section 5.1.2.1; and proceed to section 7.2. If observed contamination cannot be established, do not evaluate the soil exposure component of the soil exposure and subsurface intrusion pathway.

At sites containing mixed radioactive and other hazardous substances, evaluate observed release (or component, observed contamination or observed exposure) separately for radionuclides as described in this section and for other hazardous substances as described in sections 2 through 6.

For the three migration pathways and the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, if an observed release or observed exposure can be established based on either radionuclides or other hazardous substances, or both, assign the pathway (or threat, aquifer, or watershed) an observed release or observed exposure factor value of 550 and proceed to section 7.2. If an observed release or observed exposure cannot be established based on either radionuclides or other hazardous substances, assign an observed release or observed exposure factor value of 0 and proceed to section 7.1.2.

For the soil exposure component of the soil exposure and subsurface intrusion pathway, if observed contamination can be established based on either radionuclides or other hazardous substances, or both, assign the likelihood of exposure factor for resident population a value of 550 if there is an area of observed contamination in one or more locations listed in section 5.1.1; evaluate the likelihood of exposure factor for nearby population as specified in section 5.1.2.1; and proceed to section 7.2. If observed contamination cannot be established based on either radionuclides or other hazardous substances, do not evaluate the soil exposure component of the soil exposure and subsurface intrusion pathway.

7.1.2 Potential to release/potential for exposure. For the three migration pathways and the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, evaluate potential to release or potential for exposure for sites containing radionuclides in the same manner as specified for sites containing other hazardous substances. Base the evaluation on the physical and chemical properties of the radionuclides, not on their level of radioactivity. For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, if the potential for exposure is based on the presence of gamma emitting radioactive substances, assign a potential for exposure factor value of 500 only if the contamination is found within 2 feet beneath a regularly occupied structure, otherwise assign a potential for exposure factor value of 0.

For sites containing mixed radioactive and other hazardous substances, evaluate potential to release or potential for exposure considering radionuclides and other hazardous substances together. Evaluate potential to release for each migration pathway and the potential for exposure for the subsurface intrusion component of the soil exposure and subsurface intrusion pathway as specified in sections 3 through 6, as appropriate.

* * * * *

7.2.1 Human Toxicity. For radioactive substances, evaluate the human toxicity factor as specified below, not as specified in section 2.4.1.1.

Assign human toxicity factor values to those radionuclides available to the pathway based on quantitative dose-response parameters for cancer risks as follows:

- Evaluate radionuclides only on the basis of carcinogenicity and assign all radionuclides to weight-of-evidence category A, or weight-of-evidence category ''Carcinogenic to Humans''.
- Assign a human toxicity factor value from Table 7–2 to each radionuclide based on its slope factor (also referred to as a cancer potency factor).

—For each radionuclide, use the higher of the slope factors for inhalation and ingestion to assign the factor value.

—If only one slope factor is available for the radionuclide use it to assign the toxicity factor value.

—If no slope factor is available for the radionuclide, assign that radionuclide a toxicity factor value of 0 and use other radionuclides for which a slope factor is available to evaluate the pathway.

- If all radionuclides available to a particular pathway are assigned a human toxicity factor value of 0 (that is, no slope factor is available for all the radionuclides), use a default human toxicity factor value of 1,000 as the human toxicity factor value for all radionuclides available to the pathway.

At sites containing mixed radioactive and other hazardous substances, evaluate the toxicity factor separately for the radioactive and other hazardous substances and assign each a separate toxicity factor value. This applies regardless of whether the radioactive and other hazardous substances are physically separated, combined chemically, or simply mixed together. Assign toxicity factor values to the radionuclides as specified above and to the other hazardous substances as specified in section 2.4.1.1.

At sites containing mixed radioactive and other hazardous substances, if all radionuclides available to a particular pathway are assigned a human toxicity factor value of 0, use a default human toxicity factor value of 1,000 for all those radionuclides even if nonradioactive hazardous substances available to the pathway are assigned human toxicity factor values greater than 0. Similarly, if all nonradioactive hazardous substances available to the pathway are assigned a human toxicity factor value of 0, use a default human toxicity factor value of 100 for all these nonradioactive hazardous substances even if radionuclides available to the pathway are assigned human toxicity factor values greater than 0.

* * * * *

7.2.3 *Persistence/Degradation.* In determining the surface water persistence factor for radionuclides, evaluate this factor based solely on half-life; do not include sorption to sediments in the evaluation as is done for nonradioactive hazardous substances. Assign a persistence factor value from Table 4–10 (section 4.1.2.2.1.2) to each radionuclide based on half-life ($t_{1/2}$) calculated as follows:

$$t_{1/2} = \frac{1}{\frac{1}{r}+\frac{1}{v}}$$

Where:

r = Radioactive half-life.
V = Volatilization half-life.

If the volatilization half-life cannot be estimated for a radionuclide from available data, delete it from the equation. Select the portion of Table 4–10 to use in assigning the persistence factor value as specified in section 4.1.2.2.1.2.

At sites containing mixed radioactive and other hazardous substances, evaluate the persistence factor separately for each radionuclide and for each nonradioactive hazardous substance, even if the available data indicate that they are combined chemically. Assign a persistence factor value to each radionuclide as specified in this section and to each nonradioactive hazardous substance as specified in section 4.1.2.2.1.2. When combined chemically, assign a single persistence factor value based on the higher of the two values assigned (individually) to the radioactive and nonradioactive components.

In determining the subsurface intrusion degradation factor for radionuclides, when evaluating this factor based solely on half-life, assign a degradation factor value from section 5.2.1.2.1.2 to each radionuclide based on half-life ($t_{1/2}$) calculated as follows:

$$t_{1/2} = \frac{1}{\frac{1}{r}}$$

Where:

r=Radioactive half-life.

If no radioactive half-life information is available for a radionuclide and the substance is not already assigned a value of 1, unless information indicates otherwise, assign a value of 1.

At sites containing mixed radioactive and other hazardous substances, evaluate the degradation factor separately for each radionuclide and for each nonradioactive hazardous substance, even if the available data indicate that they are combined chemically. Assign a degradation factor value to each radionuclide as specified in this section and to each nonradioactive hazardous substance as specified in section 5.2.1.2.1.2. If no radioactive half-life information is available for a radionuclide and the substance is not already assigned a value of 1, unless information indicates otherwise, assign a value of 1. Similarly, if no half-life information is available for a nonradioactive substance, and the substance is not already assigned a value of 1, unless information indicates otherwise, assign a value of 1. When combined chemically, assign a single persistence or degradation factor value based on the higher of the two values assigned (individually) to the radioactive and nonradioactive components.

7.2.4 *Selection of substance potentially posing greatest hazard.* For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway and each migration pathway (or threat, aquifer, or watershed, as appropriate), select the radioactive substance or nonradioactive hazardous substance that potentially poses the greatest hazard based on its toxicity factor value, combined with the applicable mobility, persistence, degradation and/or bioaccumulation (or ecosystem bioaccumulation) potential factor values. Combine these factor values as specified in sections 2 through 6. For the soil exposure component of the soil exposure and subsurface intrusion pathway, base the selection on the toxicity factor alone (see sections 2 and 5).

* * * * *

7.2.5.1 *Source hazardous waste quantity for radionuclides.* For each migration pathway, assign a source hazardous waste quantity value to each source having a containment factor value greater than 0 for the pathway being evaluated. For the soil exposure component of the soil exposure and subsurface intrusion pathway, assign a source hazardous waste quantity value to each area of observed contamination, as applicable to the threat being evaluated. For the subsurface intrusion component, assign a source hazardous waste quantity value to each regularly occupied structure located within areas of observed exposure or areas of subsurface contamination. Allocate hazardous substances and hazardous wastestreams to specific sources (or areas of observed contamination, areas of observed exposure or areas of subsurface contamination) as specified in sections 2.4.2 and 5.2.0.

7.2.5.1.1 *Radionuclide constituent quantity (Tier A).* Evaluate radionuclide constituent quantity for each source (or area of observed contamination or area of observed exposure) based on the activity content of the radionuclides allocated to the source (or area of observed contamination or area of observed exposure) as follows:

• Estimate the net activity content (in curies) for the source (or area of observed contamination or area of observed exposure) based on:

—Manifests, or

—Either of the following equations, as applicable:

$$N = 9.1x10^{-7}(V)\sum_{i=1}^{n} AC_i$$

Where:

N=Estimated net activity content (in curies) for the source (or area of observed contamination or area of observed exposure).

V=Total volume of material (in cubic yards) in a source (or area of observed contamination or area of observed exposure) containing radionuclides.

AC_i=Activity concentration above the respective background concentration (in pCi/g) for each radionuclide i allocated to the source (or area of observed contamination or area of observed exposure).

n=Number of radionuclides allocated to the source (or area of observed contamination or area of observed exposure) above the respective background concentrations.

or,

$$N = 3.8x10^{-12}(V)\sum_{i=1}^{n} AC_i$$

Where:

N=Estimated net activity content (in curies) for the source (or area of observed contamination or area of observed exposure).

V=Total volume of material (in gallons) in a source (or area of observed contamination or area of observed exposure) containing radionuclides.

AC_i=Activity concentration above the respective background concentration (in pCi/1) for each radionuclide i allocated to the source (or area of observed contamination or area of observed exposure).

n=Number of radionuclides allocated to the source (or area of observed contamination or area of observed exposure) above the respective background concentrations.

—Estimate volume for the source (or volume for the area of observed contamination or area of observed exposure) based on records or measurements.

—For the soil exposure component of the soil exposure and subsurface intrusion pathway, in estimating the volume for areas of observed contamination, do not include more than the first 2 feet of depth, except: for those types of areas of observed contamination listed in Tier C of Table 5–2 (section 5.1.1.2.2), include the entire depth, not just that within 2 feet of the surface.

—For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, in estimating the volume for areas of observed exposure, only use the volume of air in the regularly occupied structures where observed exposure has been documented.

• Convert from curies of radionuclides to equivalent pounds of nonradioactive hazardous substances by multiplying the activity estimate for the source (or area of observed contamination or area of observed exposure) by 1,000.

• Assign this resulting product as the radionuclide constituent quantity value for the source (or area of observed contamination or area of observed exposure).

If the radionuclide constituent quantity for the source (or area of observed contamination or area of observed exposure) is adequately determined (that is, the total activity of all radionuclides in the source and releases from the source [or in the area of observed contamination or area of observed exposure] is known or is estimated with reasonable confidence), do not evaluate the radionuclide wastestream quantity measure in section 7.2.5.1.2. Instead, assign radionuclide wastestream quantity a value of 0 and proceed to section 7.2.5.1.3. If the radionuclide constituent quantity is not adequately determined, assign the source (or area of observed contamination or area of observed exposure) a value for radionuclide constituent quantity based on the available data and proceed to section 7.2.5.1.2.

7.2.5.1.2 Radionuclide wastestream quantity (Tier B). Evaluate radionuclide wastestream quantity for the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination) based on the activity content of radionuclide wastestreams allocated to the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination) as follows:

• Estimate the total volume (in cubic yards or in gallons) of wastestreams containing radionuclides allocated to the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination).

• Divide the volume in cubic yards by 0.55 (or the volume in gallons by 110) to convert to the activity content expressed in terms of equivalent pounds of nonradioactive hazardous substances.

• Assign the resulting value as the radionuclide wastestream quantity value for the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination).

• For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, estimate the total wastestream volume for all regularly occupied structures that have a containment value >0 and that are located within areas of observed exposure with observed or inferred intrusion, and

within areas of subsurface contamination. Calculate the volume of each regularly occupied structure based on actual data. If unknown, use a ceiling height of 8 feet.

7.2.5.1.3 Calculation of source hazardous waste quantity value for radionuclides. Select the higher of the values assigned to the source (or area of observed contamination, area of observed exposure, and/or area of subsurface contamination) for radionuclide constituent quantity and radionuclide wastestream quantity. Assign this value as the source hazardous waste quantity value for the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination). Do not round to the nearest integer.

7.2.5.2 Calculation of hazardous waste quantity factor value for radionuclides. Sum the source hazardous waste quantity values assigned to all sources (or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination) for the pathway being evaluated and round this sum to the nearest integer, except: if the sum is greater than 0, but less than 1, round it to 1. Based on this value, select a hazardous waste quantity factor value for this pathway from Table 2–6 (section 2.4.2.2).

For a migration pathway, if the radionuclide constituent quantity is adequately determined (see section 7.2.5.1.1) for all sources (or all portions of sources and releases remaining after a removal action), assign the value from Table 2–6 as the hazardous waste quantity factor value for the pathway. If the radionuclide constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action), assign a factor value as follows:

- If any target for that migration pathway is subject to Level I or Level II concentrations (see section 7.3), assign either the value from Table 2–6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway.
- If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:

—If there has been no removal action, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.

—If there has been a removal action:

- Determine values from Table 2–6 with and without consideration of the removal action.
- If the value that would be assigned from Table 2–6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2–6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.
- If the value that would be assigned from Table 2–6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

For the soil exposure component of the soil exposure and subsurface intrusion pathway, if the radionuclide constituent quantity is adequately determined for all areas of observed contamination, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the radionuclide constituent quantity is not adequately determined for one or more areas of observed contamination, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, if the radionuclide constituent quantity is adequately determined for all areas of observed exposure, assign the value from Table 2–6 as the hazardous waste quantity factor value. If the radionuclide constituent quantity is not adequately determined for one or more areas of observed exposure, assign either the value from Table 2–6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

7.2.5.3 Calculation of hazardous waste quantity factor value for sites containing mixed radioactive and other hazardous substances. For each source (or area of observed contamination, area of observed exposure, or area of subsurface contamination) containing mixed radioactive and other hazardous substances, calculate two source hazardous waste quantity values—one based on radionuclides as specified in sections 7.2.5.1 through 7.2.5.1.3 and the other based on the nonradioactive hazardous substances as specified in sections 2.4.2.1 through 2.4.2.1.5, and sections 5.1.1.2.2, 5.1.2.2.2 and 5.2.1.2.2 (that is, determine each value as if the other type of substance was not present). Sum the two values to determine a combined source hazardous waste quantity value for the source (or area of observed contamination, area of observed exposure, or area of subsurface contamination). Do not round this value to the nearest integer.

Use this combined source hazardous waste quantity value to calculate the hazardous waste quantity factor value for the pathway as specified in section 2.4.2.2, except: if either the hazardous constituent quantity or the radionuclide constituent quantity, or both, are not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action) or for one or more areas of observed contamination or areas of observed exposure, as applicable, assign the value from Table 2–6 or the default value applicable for the pathway, whichever is greater, as the hazardous waste quantity factor value for the pathway.

7.3 Targets. For radioactive substances, evaluate the targets factor category as specified in section 2.5 and sections 3 through 6, except: Establish Level I and Level II concentrations at sampling locations as specified in sections 7.3.1 and 7.3.2 and establish weighting factors for populations associated with an area of subsurface contamination in the subsurface intrusion component of the soil exposure and subsurface intrusion pathway as specified in section 7.3.3.

For all pathways (components and threats), use the same target distance limits for sites containing radioactive substances as is specified in sections 3 through 6 for sites containing nonradioactive hazardous substances. At sites containing mixed radioactive and other hazardous substances, include all sources (or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination) at the site in identifying the applicable targets for the pathway.

7.3.1 *Level of contamination at a sampling location.* Determine whether Level I or Level II concentrations apply at a sampling location (and thus to the associated targets) as follows:

- Select the benchmarks from section 7.3.2 applicable to the pathway (or component or threat) being evaluated.
- Compare the concentrations of radionuclides in the sample (or comparable samples) to their benchmark concentrations for the pathway (or component or threat) as specified in section 7.3.2. Treat comparable samples as specified in section 2.5.1.
- Determine which level applies based on this comparison.
- If none of the radionuclides eligible to be evaluated for the sampling location have an applicable benchmark, assign Level II to the actual contamination at that sampling location for the pathway (or component or threat).
- In making the comparison, consider only those samples, and only those radionuclides in the sample, that meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway, except: Tissue samples from aquatic human food chain organisms may also be used for the human food chain threat of the surface water pathway as specified in sections 4.1.3.3 and 4.2.3.3.

7.3.2 *Comparison to benchmarks.* Use the following media specific benchmarks (expressed in activity units, for example, pCi/l for water, pCi/kg for soil and for aquatic human food chain organisms, and pCi/m3 for air) for making the comparisons for the indicated pathway (or threat):

- Maximum Contaminant Levels (MCLs)—ground water migration pathway and drinking water threat in surface water migration pathway.
- Uranium Mill Tailings Radiation Control Act (UMTRCA) standards—soil exposure component of the soil exposure and subsurface intrusion pathway only.
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10^{-6} individual cancer risk for inhalation exposures (air migration pathway and subsurface intrusion component of the soil exposure and subsurface intrusion pathway) or for oral exposures (ground water migration pathway; drinking water or human food chain threats in surface water migration pathway; and soil exposure and subsurface intrusion pathway).

—For the soil exposure component of the soil exposure and subsurface intrusion pathway, include two screening concentrations for cancer—one for ingestion of surface materials and one for external radiation exposures from gamma-emitting radionuclides in surface materials.

Select the benchmark(s) applicable to the pathway (component or threat) being

evaluated. Compare the concentration of each radionuclide from the sampling location to its benchmark concentration(s) for that pathway (component or threat). Use only those samples and only those radionuclides in the sample that meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway, except: Tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of any applicable radionuclide from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations for that pathway (component or threat). If more than one benchmark applies to the radionuclide, assign Level I if the radionuclide concentration equals or exceeds the lowest applicable benchmark concentration. In addition, for the soil exposure and subsurface intrusion pathway, assign Level I concentrations at the sampling location if measured gamma radiation exposure rates equal or exceed 2 times the background level (see section 7.1.1).

If no radionuclide individually equals or exceeds its benchmark concentration, but more than one radionuclide either meets the criteria for an observed release (or observed contamination or observed exposure) for the sample or is eligible to be evaluated for a tissue sample (see sections 4.1.3.3 and 4.2.3.3), calculate a value for index I for these radionuclides as specified in section 2.5.2. If I equals or exceeds 1, assign Level I to the sampling location. If I is less than 1, assign Level II.

At sites containing mixed radioactive and other hazardous substances, establish the level of contamination for each sampling location considering radioactive substances and nonradioactive hazardous substances separately. Compare the concentration of each radionuclide and each nonradioactive hazardous substance from the sampling location to its respective benchmark concentration(s). Use only those samples and only those substances in the sample that meet the criteria for an observed release (or observed contamination or observed exposure) for the pathway except: Tissue samples from aquatic human food chain organisms may be used as specified in sections 4.1.3.3 and 4.2.3.3. If the concentration of one or more applicable radionuclides or other hazardous substances from any sample equals or exceeds its benchmark concentration, consider the sampling location to be subject to Level I concentrations. If more than one benchmark applies to a radionuclide or other hazardous substance, assign Level I if the concentration of the radionuclide or other hazardous substance equals or exceeds its lowest applicable benchmark concentration.

If no radionuclide or other hazardous substance individually exceed a benchmark concentration, but more than one radionuclide or other hazardous substance either meets the criteria for an observed release (or observed contamination or observed exposure) for the sample or is eligible to be evaluated for a tissue sample, calculate an index I for both types of substances as specified in section 2.5.2. Sum the index I values for the two types of substances. If the value, individually or combined, equals or exceeds 1, assign Level I to the sample location. If it is less than 1, calculate an index J for the nonradioactive hazardous substances as specified in section 2.5.2. If J equals or exceeds 1, assign Level I to the sampling location. If J is less than 1, assign Level II.

7.3.3 Weighting of targets within an area of subsurface contamination. For the subsurface intrusion component of the soil exposure and subsurface intrusion pathway, assign a weighting factor as specified in section 5.2.1.3.2.3 except when a structure in an area of subsurface contamination is delineated or inferred to be delineated by gamma radiation exposure rates meeting observed release criteria with a depth to contamination of 2 feet or less. For those populations residing, working, or attending school or day care in a structure delineated or inferred to be delineated by gamma radiation exposure rates meeting observed release criteria with a depth to contamination of 2 feet or less, assign a weighting factor of 0.9.

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Superfund Chemical Data Matrix (SCDM) Query

Last Update: July 2018

Report URL:
https://www.epa.gov/superfund/superfund%2Dchemical%2Ddata%2Dmatrix%2Dscdm%2Dquery?substanceAuto=&c=007440%2D38%2D2&c=000056%2D55%2D3&c=000050%2D32%2D8&c=007440%2D43%2D9&c=007440%2D47%2D3&c=00(

Substance: Arsenic [CASRN 007440-38-2]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Arsenic [CASRN 007440-38-2]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	500
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10
Toxicity, Saltwater	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	500

Factor Values: Subsurface Intrusion Component
Arsenic [CASRN 007440-38-2]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Arsenic [CASRN 007440-38-2]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1E-02	mg/L
MCLG	--	--
Cancer Risk	5.1E-05	mg/L
Non-Cancer Risk	6E-03	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	2.7E-03	mg/kg
Non-Cancer Risk	4E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	3.4E+02	µg/L
Acute, Saltwater CMC	6.9E+01	µg/L
Chronic, Freshwater CCC	1.5E+02	µg/L
Chronic, Saltwater CCC	3.6E+01	µg/L

Benchmarks: Subsurface Intrusion Component
Arsenic [CASRN 007440-38-2]

Parameter	Value	Unit
Cancer Risk	6.5E-07	mg/m^3
Non-Cancer Risk	1.5E-05	mg/m^3

Substance: Benz(a)anthracene [CASRN 000056-55-3]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Benz(a)anthracene [CASRN 000056-55-3]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Benz(a)anthracene [CASRN 000056-55-3]

Parameter	Value
Toxicity	100
Vapor Migration Potential	5
SsI Overall Half-life (days)	680
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Benz(a)anthracene [CASRN 000056-55-3]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	2E-04	mg/L
Non-Cancer Risk	--	--
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	4E-02	mg/kg
Non-Cancer Risk	--	--
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Benz(a)anthracene [CASRN 000056-55-3]

Parameter	Value	Unit
Cancer Risk	1E-05	mg/m^3
Non-Cancer Risk	--	--

Substance: Benzo(a)pyrene [CASRN 000050-32-8]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Benzo(a)pyrene [CASRN 000050-32-8]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Benzo(a)pyrene [CASRN 000050-32-8]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	--
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	No

Benchmarks: Surface Water Pathway
Benzo(a)pyrene [CASRN 000050-32-8]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	2E-04	mg/L
MCLG	--	--
Cancer Risk	2E-05	mg/L
Non-Cancer Risk	6E-03	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	4E-03	mg/kg
Non-Cancer Risk	4E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Benzo(a)pyrene [CASRN 000050-32-8]

Parameter	**Value**	**Unit**
Cancer Risk	1E-06	mg/m^3
Non-Cancer Risk	2E-06	mg/m^3

Substance: Cadmium [CASRN 007440-43-9]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Cadmium [CASRN 007440-43-9]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Cadmium [CASRN 007440-43-9]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Cadmium [CASRN 007440-43-9]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	5E-03	mg/L
MCLG	5E-03	mg/L
Cancer Risk	--	--
Non-Cancer Risk	1E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	7E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	2.0E+00	µg/L
Acute, Saltwater CMC	4.0E+01	µg/L
Chronic, Freshwater CCC	2.5E-01	µg/L
Chronic, Saltwater CCC	8.8E+00	µg/L

Benchmarks: Subsurface Intrusion Component
Cadmium [CASRN 007440-43-9]

Parameter	**Value**	**Unit**
Cancer Risk	1.5E-06	mg/m^3
Non-Cancer Risk	1E-05	mg/m^3

Substance: Chromium [CASRN 007440-47-3]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Chromium [CASRN 007440-47-3]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	500
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	500

Factor Values: Subsurface Intrusion Component
Chromium [CASRN 007440-47-3]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Chromium [CASRN 007440-47-3]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1E-01	mg/L
MCLG	1E-01	mg/L
Cancer Risk	--	--
Non-Cancer Risk	6E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	4E+00	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Chromium [CASRN 007440-47-3]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	8E-06	mg/m^3

Substance: Chrysene [CASRN 000218-01-9]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Chrysene [CASRN 000218-01-9]

DRINKING WATER	
Parameter	**Value**
Toxicity	10
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	5
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1000
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5000
Bioaccumulation, Saltwater	5000

Factor Values: Subsurface Intrusion Component
Chrysene [CASRN 000218-01-9]

Parameter	Value
Toxicity	10
Vapor Migration Potential	--
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	No

Benchmarks: Surface Water Pathway
Chrysene [CASRN 000218-01-9]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	2E-02	mg/L
Non-Cancer Risk	--	--
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	4E+00	mg/kg
Non-Cancer Risk	--	--
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Chrysene [CASRN 000218-01-9]

Parameter	Value	Unit
Cancer Risk	1E-03	mg/m^3
Non-Cancer Risk	--	--

Substance: Copper [CASRN 007440-50-8]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Copper [CASRN 007440-50-8]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1000
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Copper [CASRN 007440-50-8]

Parameter	Value
Toxicity	100
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Copper [CASRN 007440-50-8]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1.3E+00	mg/L
MCLG	1.3E+00	mg/L
Cancer Risk	--	--
Non-Cancer Risk	8E-01	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	6E+01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	2.3E+00	µg/L
Acute, Saltwater CMC	4.8E+00	µg/L
Chronic, Freshwater CCC	1.4E+00	µg/L
Chronic, Saltwater CCC	3.1E+00	µg/L

Benchmarks: Subsurface Intrusion Component
Copper [CASRN 007440-50-8]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Substance: Cyanide [CASRN 000057-12-5]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Cyanide [CASRN 000057-12-5]

DRINKING WATER	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.4
Persistence, Lake	0.07
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.4
Persistence, Lake	0.07
Bioaccumulation, Freshwater	0.5
Bioaccumulation, Saltwater	0.5
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1000
Toxicity, Saltwater	1000
Persistence, River	0.4
Persistence, Lake	0.07
Bioaccumulation, Freshwater	0.5
Bioaccumulation, Saltwater	0.5

Factor Values: Subsurface Intrusion Component
Cyanide [CASRN 000057-12-5]

Parameter	Value
Toxicity	1000
Vapor Migration Potential	25
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Cyanide [CASRN 000057-12-5]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	1E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	9E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	2.2E+01	µg/L
Acute, Saltwater CMC	1.0E+00	µg/L
Chronic, Freshwater CCC	5.2E+00	µg/L
Chronic, Saltwater CCC	1.0E+00	µg/L

Benchmarks: Subsurface Intrusion Component
Cyanide [CASRN 000057-12-5]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	8E-04	mg/m^3

Substance: Dichloroethylene, 1,2-cis- [CASRN 000156-59-2]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Dichloroethylene, 1,2-cis- [CASRN 000156-59-2]

DRINKING WATER	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.07
Persistence, Lake	0.4
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	0
Toxicity, Saltwater	0
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50

Factor Values: Subsurface Intrusion Component
Dichloroethylene, 1,2-cis- [CASRN 000156-59-2]

Parameter	Value
Toxicity	1000
Vapor Migration Potential	25
SsI Overall Half-life (days)	31
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Dichloroethylene, 1,2-cis- [CASRN 000156-59-2]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	7E-02	mg/L
MCLG	7E-02	mg/L
Cancer Risk	--	--
Non-Cancer Risk	4E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	3E+00	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Dichloroethylene, 1,2-cis- [CASRN 000156-59-2]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Substance: Dichloroethylene, 1,2-trans- [CASRN 000156-60-5]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Dichloroethylene, 1,2-trans- [CASRN 000156-60-5]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	0.07
Persistence, Lake	0.4
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1
Toxicity, Saltwater	1
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50

Factor Values: Subsurface Intrusion Component
Dichloroethylene, 1,2-trans- [CASRN 000156-60-5]

Parameter	Value
Toxicity	100
Vapor Migration Potential	25
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Dichloroethylene, 1,2-trans- [CASRN 000156-60-5]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1E-01	mg/L
MCLG	1E-01	mg/L
Cancer Risk	--	--
Non-Cancer Risk	4E-01	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	3E+01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Dichloroethylene, 1,2-trans- [CASRN 000156-60-5]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	8E-01	mg/m^3

Substance: Lead [CASRN 007439-92-1]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Lead [CASRN 007439-92-1]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5000
Bioaccumulation, Saltwater	5000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1000
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	5000

Factor Values: Subsurface Intrusion Component
Lead [CASRN 007439-92-1]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Lead [CASRN 007439-92-1]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1.5E-02	mg/L
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	--	--
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	--	--
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	6.5E+01	µg/L
Acute, Saltwater CMC	2.1E+02	µg/L
Chronic, Freshwater CCC	2.5E+00	µg/L
Chronic, Saltwater CCC	8.1E+00	µg/L

Benchmarks: Subsurface Intrusion Component
Lead [CASRN 007439-92-1]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Substance: Manganese [CASRN 007439-96-5]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Manganese [CASRN 007439-96-5]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	100
Toxicity, Saltwater	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Manganese [CASRN 007439-96-5]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Manganese [CASRN 007439-96-5]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	2.8E+00	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	2.1E+02	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Manganese [CASRN 007439-96-5]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	5E-05	mg/m^3

Substance: Mercury (elemental) [CASRN 007439-97-6]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Mercury (elemental) [CASRN 007439-97-6]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Mercury (elemental) [CASRN 007439-97-6]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Mercury (elemental) [CASRN 007439-97-6]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	2E-03	mg/L
MCLG	2E-03	mg/L
Cancer Risk	--	--
Non-Cancer Risk	3.2E-03	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	1E+00	ppm
Cancer Risk	--	--
Non-Cancer Risk	2.4E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	1.4E+00	µg/L
Acute, Saltwater CMC	1.8E+00	µg/L
Chronic, Freshwater CCC	7.7E-01	µg/L
Chronic, Saltwater CCC	9.4E-01	µg/L

Benchmarks: Subsurface Intrusion Component
Mercury (elemental) [CASRN 007439-97-6]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	3E-04	mg/m^3

Substance: Nickel [CASRN 007440-02-0]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Nickel [CASRN 007440-02-0]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	5
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	100
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	5

Factor Values: Subsurface Intrusion Component
Nickel [CASRN 007440-02-0]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Nickel [CASRN 007440-02-0]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	4E-01	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	3E+01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	4.7E+02	µg/L
Acute, Saltwater CMC	7.4E+01	µg/L
Chronic, Freshwater CCC	5.2E+01	µg/L
Chronic, Saltwater CCC	8.2E+00	µg/L

Benchmarks: Subsurface Intrusion Component
Nickel [CASRN 007440-02-0]

Parameter	**Value**	**Unit**
Cancer Risk	5.8E-06	mg/m^3
Non-Cancer Risk	9E-05	mg/m^3

Substance: Selenium [CASRN 007782-49-2]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Selenium [CASRN 007782-49-2]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	500
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	1000
Toxicity, Saltwater	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	500

Factor Values: Subsurface Intrusion Component
Selenium [CASRN 007782-49-2]

Parameter	Value
Toxicity	100
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Selenium [CASRN 007782-49-2]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	5E-02	mg/L
MCLG	5E-02	mg/L
Cancer Risk	--	--
Non-Cancer Risk	1E-01	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	7E+00	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	2.9E+02	µg/L
Acute, Saltwater CMC	2.9E+02	µg/L
Chronic, Freshwater CCC	5.0E+00	µg/L
Chronic, Saltwater CCC	7.1E+01	µg/L

Benchmarks: Subsurface Intrusion Component
Selenium [CASRN 007782-49-2]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	2E-02	mg/m^3

Substance: Silver [CASRN 007440-22-4]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Silver [CASRN 007440-22-4]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10000
Toxicity, Saltwater	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Silver [CASRN 007440-22-4]

Parameter	Value
Toxicity	100
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Silver [CASRN 007440-22-4]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	1E-01	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	7E+00	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	3.2E+00	µg/L
Acute, Saltwater CMC	1.9E+00	µg/L
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Silver [CASRN 007440-22-4]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Substance: Thallium [CASRN 007440-28-0]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Thallium [CASRN 007440-28-0]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	50
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	100
Toxicity, Saltwater	1000
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	50

Factor Values: Subsurface Intrusion Component
Thallium [CASRN 007440-28-0]

Parameter	**Value**
Toxicity	10000
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Thallium [CASRN 007440-28-0]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	2E-03	mg/L
MCLG	5E-04	mg/L
Cancer Risk	--	--
Non-Cancer Risk	2E-04	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	1E-02	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Thallium [CASRN 007440-28-0]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Substance: Trichloroethylene [CASRN 000079-01-6]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Trichloroethylene [CASRN 000079-01-6]

DRINKING WATER	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.07
Persistence, Lake	0.4
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	1000
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	100
Toxicity, Saltwater	10
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50

Factor Values: Subsurface Intrusion Component
Trichloroethylene [CASRN 000079-01-6]

Parameter	Value
Toxicity	1000
Vapor Migration Potential	25
SsI Overall Half-life (days)	171
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Trichloroethylene [CASRN 000079-01-6]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	5E-03	mg/L
MCLG	--	--
Cancer Risk	1.1E-03	mg/L
Non-Cancer Risk	1E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	9.0E-02	mg/kg
Non-Cancer Risk	7E-01	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Trichloroethylene [CASRN 000079-01-6]

Parameter	Value	Unit
Cancer Risk	4E-04	mg/m^3
Non-Cancer Risk	2E-03	mg/m^3

Substance: Vinyl Chloride [CASRN 000075-01-4]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Vinyl Chloride [CASRN 000075-01-4]

DRINKING WATER	
Parameter	**Value**
Toxicity	10000
Persistence, River	0.0007
Persistence, Lake	0.07
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10000
Persistence, River	0.0007
Persistence, Lake	0.07
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	5
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	0
Toxicity, Saltwater	0
Persistence, River	0.0007
Persistence, Lake	0.07
Bioaccumulation, Freshwater	5
Bioaccumulation, Saltwater	5

Factor Values: Subsurface Intrusion Component
Vinyl Chloride [CASRN 000075-01-4]

Parameter	Value
Toxicity	10000
Vapor Migration Potential	25
SsI Overall Half-life (days)	171
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Vinyl Chloride [CASRN 000075-01-4]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	2E-03	mg/L
MCLG	--	--
Cancer Risk	2.1E-05	mg/L
Non-Cancer Risk	6E-02	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	5.7E-03	mg/kg
Non-Cancer Risk	4E+00	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Vinyl Chloride [CASRN 000075-01-4]

Parameter	Value	Unit
Cancer Risk	1.6E-04	mg/m^3
Non-Cancer Risk	1E-01	mg/m^3

Substance: Xylenes [CASRN 001330-20-7]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Xylenes [CASRN 001330-20-7]

DRINKING WATER	
Parameter	**Value**
Toxicity	100
Persistence, River	0.07
Persistence, Lake	0.4
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	100
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	100
Toxicity, Saltwater	100
Persistence, River	0.07
Persistence, Lake	0.4
Bioaccumulation, Freshwater	50
Bioaccumulation, Saltwater	50

Factor Values: Subsurface Intrusion Component
Xylenes [CASRN 001330-20-7]

Parameter	Value
Toxicity	100
Vapor Migration Potential	25
SsI Overall Half-life (days)	28.0
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Xylenes [CASRN 001330-20-7]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	1E+01	mg/L
MCLG	1E+01	mg/L
Cancer Risk	--	--
Non-Cancer Risk	4E+00	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	3E+02	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	--	--
Acute, Saltwater CMC	--	--
Chronic, Freshwater CCC	--	--
Chronic, Saltwater CCC	--	--

Benchmarks: Subsurface Intrusion Component
Xylenes [CASRN 001330-20-7]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	1E-01	mg/m^3

Substance: Zinc
[CASRN 007440-66-6]

Query Accessed: 8/1/2018

Factor Values: Surface Water Pathway
Zinc [CASRN 007440-66-6]

DRINKING WATER	
Parameter	**Value**
Toxicity	10
Persistence, River	1
Persistence, Lake	1
HUMAN FOOD CHAIN	
Parameter	**Value**
Toxicity	10
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	500
Bioaccumulation, Saltwater	50000
ENVIRONMENTAL	
Parameter	**Value**
Toxicity, Freshwater	10
Toxicity, Saltwater	100
Persistence, River	1
Persistence, Lake	1
Bioaccumulation, Freshwater	50000
Bioaccumulation, Saltwater	50000

Factor Values: Subsurface Intrusion Component
Zinc [CASRN 007440-66-6]

Parameter	Value
Toxicity	10
Vapor Migration Potential	15
SsI Overall Half-life (days)	--
Radioactive Half-life (days)	--
SsI Volatile	Yes

Benchmarks: Surface Water Pathway
Zinc [CASRN 007440-66-6]

DRINKING WATER		
Parameter	**Value**	**Unit**
MCL	--	--
MCLG	--	--
Cancer Risk	--	--
Non-Cancer Risk	6E+00	mg/L
HUMAN FOOD CHAIN		
Parameter	**Value**	**Unit**
FDAAL	--	--
Cancer Risk	--	--
Non-Cancer Risk	4E+02	mg/kg
ENVIRONMENTAL		
Parameter	**Value**	**Unit**
Acute, Freshwater CMC	1.2E+02	µg/L
Acute, Saltwater CMC	9.0E+01	µg/L
Chronic, Freshwater CCC	1.2E+02	µg/L
Chronic, Saltwater CCC	8.1E+01	µg/L

Benchmarks: Subsurface Intrusion Component
Zinc [CASRN 007440-66-6]

Parameter	**Value**	**Unit**
Cancer Risk	--	--
Non-Cancer Risk	--	--

Superfund Site Information

MAGNA METALS (EPA ID: NYD001394881)

Site Information

Site Info | Aliases | Operable Units | **Contaminants | Contacts**
Administrative Records | Reports and Documents

Site Name:	MAGNA METALS
Street:	510 Furnace Dock Road
City / State / ZIP:	CORTLANDT, NY 10567
NPL Status:	Not on the NPL
Non-NPL Status:	Site Reassessment Ongoing
EPA ID:	NYD001394881
EPA Region:	02
County:	WESTCHESTER
Latitude:	+41.274500
Longitude:	-73.870400
Federal Facility Flag:	Not a Federal Facility

Return to Search Results Return to Search Superfund Sites

APRIL 26, 2018

EPA United States Environmental Protection Agency

Superfund Site Information

MAGNA METALS (EPA ID: NYD001394881)

Site Info | Aliases | Operable Units | **Contaminants** | **Contacts**
Administrative Records | **Reports and Documents**

Alias Name / Street / City / State / ZIP
MAGNA METALS FURNACE DOCK RD PEEKSKILL, NY 10566

Return to Search Results Return to Search Superfund Sites

APRIL 26, 2018

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

MOHEGAN LAKE QUADRANGLE
NEW YORK
7.5-MINUTE SERIES

Approximate Site Location

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 18T
10 000-foot ticks: New York Coordinate System of 1983 (east zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, August 2013
Roads..... U.S. Census Bureau, 2015 - 2016
Names.....GNIS, 2016
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 1999
Boundaries.....Multiple sources; see metadata file 1972 - 2016

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

UTM GRID AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
WL XL
Grid Zone Designation
18T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.19

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

ADJOINING QUADRANGLES
1 West Point
2 Oscawana Lake
3 Lake Carmel
4 Peekskill
5 Croton Falls
6 Haverstraw
7 Ossining
8 Mount Kisco

MOHEGAN LAKE, NY
2016

NSN. 7643016386922
NGA REF NO. USGSX24K70934

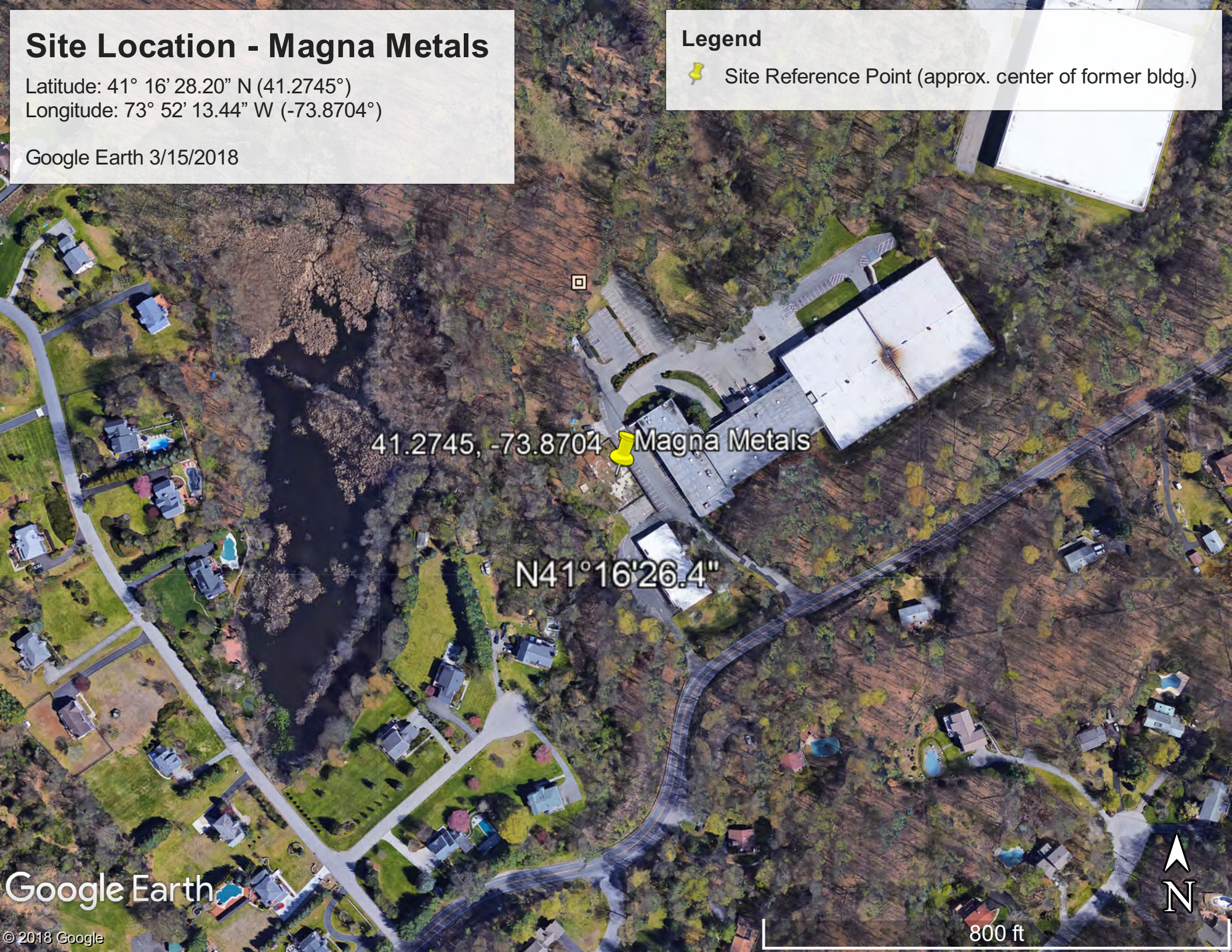
Site Location - Magna Metals

Latitude: 41° 16’ 28.20” N (41.2745°)
Longitude: 73° 52’ 13.44” W (-73.8704°)

Google Earth 3/15/2018

Legend

Site Reference Point (approx. center of former bldg.)



RECORD OF DECISION

Magna Metals
State Superfund Project
Cortlandt, Westchester County
Site No. 360003
June 2011



Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - RECORD OF DECISION

Magna Metals
State Superfund Project
Cortlandt, Westchester County
Site No. 360003
June 2011

Statement of Purpose and Basis

This document presents the remedy for the Magna Metals site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Magna Metals site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. This will include pre-design work required including delineating how much soil and sediment must he removed in accordance with the ROD. Green remediation principals and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Demolition of the Magna Metals building. The building is dilapidated and sample data has not been collected underneath the building due to the building condition. After the demolition of the building, further soil sampling would be undertaken to define the limits of the contamination beneath the building footprint.

3. On-site soils identified in the former Magna Metals building footprint and areas adjacent to the former building and in the associated leach fields will be excavated and transported off-site for proper disposal. Excavation will extend to all soil which exceeds the commercial use soil cleanup objectives (SCOs) for, lead, mercury and zinc or the lower of the commercial use or protection of groundwater SCOs for the VOC COCs and arsenic, chromium, copper, cyanide, nickel and selenium. The excavation limits will be determined by confirmatory samples. Silver, barium, cadmium, and polyaromatic hydrocarbons (PAHs) are co-located with the other metals listed above and will be addressed by remediated the metals listed above.

4. Prior to backfilling the on-site excavation area, an application of permanganate (or other appropriate oxidizer) will be applied to the bottom of the excavation for the purpose of treating residual VOC contamination located within underlying bedrock fractures. The concentration and volume of oxidizer will be determined during per-design activities. Following the one-time application of the oxidizer the excavation will be backfilled with fill which meets the requirements of 6NYCRR 375-6.7(d), to establish the designed grades at the site. The excavated areas will be stabilized with vegetation.

5. A site cover will be required to allow for commercial use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. Soils located off-site in areas downgradient of the former Magna Metals building and leach pits, which exceed the unrestricted use SCOs will be excavated and transported off-site for disposal. Approximately 11,000 cubic yards of soil will be removed. Fill and topsoil which meets the requirements of 6NYCRR 375-6.7(d) for unrestricted use, will be brought in to replace the excavated soil and establish the designed grades at the site. The sampling of the excavation will include confirmatory samples.

Off-site areas will be restored and re-vegetated with appropriate native species. Trees will be replaced using a one-to-one DBH (diameter breast height) ratio. For example, if a 12-inch diameter tree must be removed, it will be replaced with two (2) six-inch diameter trees or three (3) four-inch diameter trees.

7. Installation of a soil vapor mitigation system beneath the approximately 18,000 sq. feet of

floor slab beneath the portion of the building currently occupied by Polymedco/Laboratory.

8. Excavation and off-site disposal of sediments from the unnamed tributary, Furnace Brook, and associated wetlands with analytical concentrations above pre-release/background conditions or New York State Lowest Effect Levels (LELs) for metals, whichever is higher. The average concentrations of nickel, copper, and zinc, from background sediment sample locations are to be used as pre-release levels. Additional investigation will be performed during the remedial design to determine the areal and vertical extent of contamination. Confirmatory sampling will be performed following remediation. Approximately 16,000 cubic yards of sediment are estimated to be excavated. Excavated wetland substrate will be restored with similar clean material which meets the unrestricted use requirements of 6NYCRR 375-6.7(d). All excavation areas associated with the streams and wetlands will be restored consistent with 6 NYCRR Parts 608 and 663. Wetlands and aquatic environments will be restored to original contours. Soil and sediment backfill in these areas will meet applicable sediment criteria from the Department's; Technical Guidance for Screening Contaminated Sediments. Trees will be replaced using a one-to-one DBH ratio as described above.

9. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Westchester County DOH;

d. prohibits agriculture or vegetable gardens on the controlled property;

e. requires compliance with a Department approved Site Management Plan;

10. A Site Management Plan is required, which includes the following:

a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: the Environmental Easement discussed in Paragraph 9 above.
Engineering Controls: the sub-slab depressurization system discussed in Paragraph7 above.

This plan includes, but is not limited to:
i. Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

ii. descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
iii. provisions for the management and inspection of the identified engineering controls;
iv. maintaining site access controls and Department notification; and
v. the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but not be limited to:
i. monitoring of groundwater, surface water, and sediments to assess the performance and effectiveness of the remedy;
ii. a schedule of monitoring and frequency of submittals to the Department;
iii. restored areas will be monitored one year after the Department's determination of substantial completion of site remediation. The restored areas will be inspected for erosion, settlement and growth of plantings, and repaired and restored as directed by the Department;
iv. monitoring wells will be placed around the oxidation treatment area to monitor the treated groundwater. The number, location, and specifications of the monitoring wells will be determined during the design;
v. surface water and sediment in Furnace Brook, the unnamed pond and the unnamed tributary will be monitored. Details of the monitoring program will be included in the Site Management Plan.
vi. provision for evaluation of the potential for soil vapor intrusion should the on-site warehouse building become occupied and for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion.
vii. monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required pursuant to item 7 above.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

June 20, 2011

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

RECORD OF DECISION

Magna Metals
Cortlandt, Westchester County
Site No. 360003
June 2011

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: SITE DESCRIPTION AND HISTORY

Location: Magna Metals is at 510 Furnace Dock Road in the Town of Cortlandt in Westchester County near the intersection of Furnace Dock Road and Maple Avenue. Nearby towns include Peekskill and Croton–on-Hudson. The Hudson River is located three miles west of the site.

Site Features: The entire parcel is currently owned by Baker Capital Limited Partnership, has three buildings, and is used for offices, a laboratory, and warehousing. It was previously owned by ISC Properties, Inc. Residential areas are located around the facility. A wetland area, Furnace Brook, an unnamed tributary, and an unnamed pond are located near the site. The portion of the parcel that includes the waste handling and disposal areas, referred to as "the site" encompasses the unoccupied dilapidated Magna Metals building and the north and westerly leach pits; a building used to warehouse paper; and a portion of the PolyMedco building, used for offices, a laboratory. The building and pits (on-site) and "off-site" were investigated as part of the remedial investigation.

Current Zoning/Use: The site is zoned MD industrial and is surrounded by residentially zoned property.

Historic Use: Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operations, iron, lead, copper, nickel, zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethene (TCE) was allegedly discharged to the septic system. Previous investigations and actions were performed by the Department and the Westchester County Health Department starting in 1978.

Site Geology and Hydrogeology: The primary characteristics of the subsurface at the site and surrounding area consist of a sandy to silty sand overburden unit, approximately 2 to 18 feet thick, overlying Hornblende bedrock. In the leach pit area it is presumed that much of the overburden material is fill resulting from the installation of the leach pits. The inferred depth is approximately 7 to 10 feet thick. Metal and lamp parts were found buried in this area.

Overburden groundwater exists in the form of a very shallow water-bearing unit (typically less than five feet thick). Overburden groundwater flow direction is to the west toward the unnamed tributary, the wetland area, and the confluence of the unnamed tributary and Furnace Brook. Bedrock groundwater flows in a similar direction and some may discharge into the overburden water units.

A site location map is attached as Figure 1.

SECTION 3: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

ISC Properties, Inc.

Lightron Residential Lighting, Inc.

Magna Metals Finishing Corporation

Lightron Corporation

Baker Capital Limited Partnership

As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site on the Registry of Inactive Hazardous Waste Disposal Sites in New York in December 1985. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

The Department and the ISC Properties, Inc. entered into a Consent Order in May 1996. The Order obligates the responsible parties to implement a remedial investigation and feasibility study only. After the remedy is selected, the Department will approach the PRPs to implement the selected remedy.

SECTION 5: SITE CONTAMINATION

5.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

5.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of

concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

5.1.2: RI Information

The analytical data collected on this site includes data for:

- groundwater
- surface water
- soil
- sediment
- soil vapor
- indoor air

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

arsenic	cyanides(soluble cyanide salts)
cadmium	1,1,2,2-tetrachloroethane
chromium	xylene (mixed)
copper	benzo(a)pyrene
lead	benzo[k]fluoranthene
nickel	chrysene
selenium	barium
zinc	mercury
tetrachloroethylene (pce)	silver
trichloroethene (tce)	dichloroethylene

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- surface water
- soil
- sediment
- indoor air

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

5.3: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not contaminated by the site. Access to the site is unrestricted, however, contact with contaminated soil or groundwater is unlikely unless they dig below the ground surface. Concentrations of site-related contaminants in sediments and surface water are not at levels that represent a health concern. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Soil vapor intrusion sampling identified impacts to indoor air quality. This impact is limited to one on-site building and represents a health concern.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

Nature and Extent of Contamination: Soil is contaminated with metals, cyanide, and lows levels of polyaromatic hydrocarbons (PAHs). This includes levels of PAHs up to 2.5 parts per million (ppm) and the metal contaminants of concern (COCs) arsenic up to 1,190 ppm, barium up to 721 ppm, cadmium up to 19.2 ppm, chromium up to 5,050 ppm, copper up to 34,700 ppm, cyanide up to 25,000 ppm, lead up to 1,030 ppm, mercury up to 1.1 ppm, nickel up to 63,700 ppm, selenium up to 1,410 ppm, silver up to 9 ppm, and zinc up to 37,300 ppm. These higher levels were found in and around the leaching pits, up to 12 feet below ground surface.

Groundwater is contaminated with volatile organic compounds (VOCs), cyanide, and metals. This includes tetrachloroethene up to 14 (parts per billion) ppb, trichloroethene up to 910 ppb, cis-1,2-dichloroethene up to 8.1 ppb, arsenic up to 133 ppb, barium up to 1,140 ppb, beryllium up to 5.6 ppb, chromium up to 139 ppb, copper up to 240 ppb, cyanide up to 560 ppb, nickel up

to 108 ppb, selenium up to 131 ppb, thallium up to 14.4 ppb. These levels were detected up to 20 feet below ground surface, on the overburden/bedrock interface.

Surface water samples were collected downgradient of the site. Five VOCs were detected in at least one of the surface water samples. Cis-1,2-dichloroethene and trichoroethylene were present in 9 of 11 samples, with cis-1,2-dichloroethene present up to 18 ppb. Trichloroethene's maximum concentration was 5.5 ppb. Twenty metals and cyanide were detected in at least one of the surface water samples collected during the investigation and four metals plus cyanide were present at concentrations greater than their applicable surface water criteria. Concentrations of the majority of metals were greater in the downgradient tributary and/or wetlands surface water samples in comparison to the upstream samples.

Sediment is contaminated with arsenic up to 19.3 ppm, cadmium up to 1.4 ppm, chromium up to 166 ppm, copper up to 2,330 ppm, lead up to 112 ppm, mercury up to 0.25 ppm, nickel up to 835 ppm, silver up to 1.4 ppm, zinc up to 1,890 ppm. These samples were collected in the upper two feet of sediment downgradient of the site. Surface drainage from the site in the vicinity of the former Magna Metals building is directed into adjoining wetlands and streams. Site-related contaminants such as copper, nickel, and zinc are present in sediments at concentrations above background and above lowest effects and severe effect levels for sediment quality criteria in the adjoining streams and wetlands. The the wetlands east of Furnace Brook and the unnamed tributary are impacted. Laboratory toxicity testing confirmed impacts to benthic aquatic life.

The site presents a significant environmental threat due to the ongoing releases of contaminants from source areas (leach pits) into groundwater, sediments, surface water, and soil vapor.

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Exhibit B. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study (FS) report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit C. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit D.

6.1: Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

6.2: Elements of the Remedy

The basis for the Department's remedy is set forth at Exhibit E.

The estimated present worth cost to implement the remedy is $10,242,000. The cost to construct the remedy is estimated to be $9,212,000 and the estimated average annual cost is $62,000.

The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. This will include pre-design work required including delineating how much soil and sediment must he removed in accordance with the ROD. Green remediation principals and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Demolition of the Magna Metals building. The building is dilapidated and sample data has not been collected underneath the building due to the building condition. After the

demolition of the building, further soil sampling would be undertaken to define the limits of the contamination beneath the building footprint.

3. On-site soils identified in the former Magna Metals building footprint and areas adjacent to the former building and in the associated leach fields will be excavated and transported off-site for proper disposal. Excavation will extend to all soil which exceeds the commercial use soil cleanup objectives (SCOs) for, lead, mercury and zinc or the lower of the commercial use or protection of groundwater SCOs for the VOC COCs and arsenic, chromium, copper, cyanide, nickel and selenium. The excavation limits will be determined by confirmatory samples. Silver, barium, cadmium, and polyaromatic hydrocarbons (PAHs) are co-located with the other metals listed above and will be addressed by remediated the metals listed above.

4. Prior to backfilling the on-site excavation area, an application of permanganate (or other appropriate oxidizer) will be applied to the bottom of the excavation for the purpose of treating residual VOC contamination located within underlying bedrock fractures. The concentration and volume of oxidizer will be determined during per-design activities. Following the one-time application of the oxidizer the excavation will be backfilled with fill which meets the requirements of 6NYCRR 375-6.7(d), to establish the designed grades at the site. The excavated areas will be stabilized with vegetation.

5. A site cover will be required to allow for commercial use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

6. Soils located off-site in areas downgradient of the former Magna Metals building and leach pits, which exceed the unrestricted use SCOs will be excavated and transported off-site for disposal. Approximately 11,000 cubic yards of soil will be removed. Fill and topsoil which meets the requirements of 6NYCRR 375-6.7(d) for unrestricted use, will be brought in to replace the excavated soil and establish the designed grades at the site. The sampling of the excavation will include confirmatory samples.

Off-site areas will be restored and re-vegetated with appropriate native species. Trees will be replaced using a one-to-one DBH (diameter breast height) ratio. For example, if a 12-inch diameter tree must be removed, it will be replaced with two (2) six-inch diameter trees or three (3) four-inch diameter trees.

7. Installation of a soil vapor mitigation system beneath the approximately 18,000 sq. feet of floor slab beneath the portion of the building currently occupied by Polymedco/Laboratory.

8. Excavation and off-site disposal of sediments from the unnamed tributary, Furnace Brook, and associated wetlands with analytical concentrations above pre-release/background conditions or New York State Lowest Effect Levels (LELs) for metals, whichever is higher. The average concentrations of nickel, copper, and zinc, from background sediment sample locations are to be used as pre-release levels. Additional investigation will be performed during the remedial design to determine the areal and vertical extent of contamination. Confirmatory sampling will be performed following remediation. Approximately 16,000 cubic yards of sediment are estimated to be excavated. Excavated wetland substrate will be restored with similar clean material which meets the unrestricted use requirements of 6NYCRR 375-6.7(d). All excavation areas associated with the streams and wetlands will be restored consistent with 6 NYCRR Parts 608 and 663. Wetlands and aquatic environments will be restored to original contours. Soil and sediment backfill in these areas will meet applicable sediment criteria from the Department's; Technical Guidance for Screening Contaminated Sediments. Trees will be replaced using a one-to-one DBH ratio as described above.

9. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or Westchester County DOH;

d. prohibits agriculture or vegetable gardens on the controlled property;

e. requires compliance with a Department approved Site Management Plan;

10. A Site Management Plan is required, which includes the following:

a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: the Environmental Easement discussed in Paragraph 9 above.
Engineering Controls: the sub-slab depressurization system discussed in Paragraph7 above.

This plan includes, but is not limited to:
i. Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

ii. descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
iii. provisions for the management and inspection of the identified engineering controls;
iv. maintaining site access controls and Department notification; and
v. the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but not be limited to:
i. monitoring of groundwater, surface water, and sediments to assess the performance and effectiveness of the remedy;
ii. a schedule of monitoring and frequency of submittals to the Department;
iii. restored areas will be monitored one year after the Department's determination of substantial completion of site remediation. The restored areas will be inspected for erosion, settlement and growth of plantings, and repaired and restored as directed by the Department;
iv. monitoring wells will be placed around the oxidation treatment area to monitor the treated groundwater. The number, location, and specifications of the monitoring wells will be determined during the design;
v. surface water and sediment in Furnace Brook, the unnamed pond and the unnamed tributary will be monitored. Details of the monitoring program will be included in the Site Management Plan.
vi. provision for evaluation of the potential for soil vapor intrusion should the on-site warehouse building become occupied and for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion.
vii. monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required pursuant to item 7 above.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1.2, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting groundwater, soil, surface water, sediment and soil vapor.

Wastes are defined in 6 NYCRR Part 375-1.2 and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375. Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Source areas were identified at the site within the former leach pits and former Magna Metals plating building. The building is standing but is very dilapidated and the leach pits remain in the ground but are not used. Soils contaminated with metals (arsenic, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc) and cyanide were found in the leach pits. Groundwater contaminated with VOCs was in the vicinity of the Magna Metals building and leach pits. Figures 2 and 3 show the leach pits and the Magna Metal building

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from overburden and top-of-bedrock monitoring wells and sampled for VOCs, SVOCs, PCBs, and inorganics. The samples were collected to assess groundwater conditions on and off-site. The results indicate that contamination in shallow groundwater at the site exceeds the SCGs for volatile organic compounds (VOCs), cyanide and metals. Contaminant levels in bedrock groundwater also exceeded the SCG values for VOCs and inorganics. Off-site monitoring wells in the vicinity of the site were sampled and no site related contamination was found. Table 1-1 shows the ranges of concentrations found in the monitoring wells.

Table 1-1 – Groundwater Frequency Exceedance			
Detected Constituents	**Concentration Range Detected (ppb)**	**SCG[a] (ppb)**	**Frequency Exceeding SCG**
Volatile Organic Compounds			
cis-1,2-Dichloroethene	1.3 J to 8.1	5	3/7
Tetrachloroethene	2.2 J to 14	5	5/8
Trichloroethene	4.5 J to 910 D	5	9/10
Inorganics			
Aluminum	52.0 J to 46,900	NC	NA
Arsenic	4.8 J to 133	25	1/ 4
Barium	68.9 J to 1,140	1,000	1/8
Beryllium	0.10 J to 5.6	3	1/5
Calcium	20,400 to 127,000	NC	NA
Chromium	2.5 J to 139	50	1/7
Cobalt	1.1 J to 40.8 J	NC	NA
Copper	8.4 J to 240	200	1/5
Cyanide	27 J to 560	200	1/3
Iron	33.2 J to 37,200	300	7/8
Lead	3.1 to 13.2	25	0/5
Magnesium	14,600 to 74,700	35,000	6/8
Manganese	29.4 – 9,500	300	4/8
Mercury	0.26	0.7	0/1
Nickel	8.2 J to 108	100	1/8
Potassium	2,230 J to 17,100 J	NC	NA
Selenium	1.6 J to 131	10	5/6
Sodium	12,700 J to 264,000 J	20,000	7/8
Thallium	8.3 J to 14.4	0.5	4/4
Vanadium	1.8 J to 72.2	NC	NA
Zinc	4.3 J to 150 J	2,000	0/7

[a]SCG - Standard Criteria or Guidance – Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), and 6 NYCRR Part 703, Surface Water and
D – from a Diluted sample
J – Estimated
NA – Not Applicable
NC – No Criteria

The primary groundwater contaminants are the VOCs, specifically tetrachloroethylene, trichloroethene and cis-1,2-dichloroethene; and the inorganics, specifically arsenic, chromium, copper, nickel, and selenium, and cyanide. As noted on Figure 4, the primary groundwater contamination is associated with the leach pits and former Magna Metals building.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are VOCs and metals.

Soil

Surface and subsurface soil samples were collected at the site during the RI. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of 2 - 14 feet to assess soil contamination. The results indicate that soils at the site exceed the unrestricted SCGs for two VOCs, semi-volatile organics (SVOCs), cyanide and metals. The results indicate that soils also exceed the restricted commercial SCGs for VOCs, SVOCs, and metals.

Table 1-2 shows the ranges of concentrations found in the soils.

Table 1-2 – Soil Frequency Exceedance

Detected Constituents	Concentration Range Detected (ppm)	Unre-stricted SCG[a] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Commercial SCG[b] (ppm)	Frequency Exceeding Restricted Commercial SCG
Volatile Organic Compounds					
1,1,2.2-Tetrachloroethane	0.003 J	NC	NA	NC	NA
2-Butane	0.004 J	0.12	0/1	0/12	0/1
2-Hexanone	0.005 J	NC	NA	NC	NA
4-Methyl-2-pentanone	0.004 J	NC	NA	NC	NA
Acetone	0.005 JB – 0.040	0.05	0/11	0.05	0/11
Benzene	0.0085 J	0.06	0/1	0.06	0/1
cis-1,2-Dichloroethene	0.0072 J to 0.023 J	0.25	0/2	0.25	0/2
Ethyl Benzene	0.160 J	1	0/1	1	0/1
m/p-Xylene	.0055 J to 1.6 JD	0.26	1/3	0.26	1/3
Methylene chloride	0.004 JB to 0.033 J	0.05	0/12	0.05	0/12
o-Xylene	0.73 JD	0.26	1/1	0.26	1/1
Toluene	0.0031 J to 0.12 J	0.7	0/3	0.07	0/3
Trichloroethene	0.017 J to 0.018	0.47	0/10	0.47	0/10
Semi-Volatile Organic Compounds					
1,1-Biphenyl	3.3 J	NC	NA	NC	NA
2-Methylphenol	0.004 J to 0.039 J	NC	NA	NC	NA
Acenaphthylene	0.15 J	20	0/1	20	0/1
Anthracene	0.004 J to 0.061 J	100	0/3	500	0/3
Benzo(a)anthracene	0.013 J to 1.3 J	1	2/15	1	2/15
Benzo(a)pyrene	0.018 J to 1.9 J	1	3/12	1	3/12
Benzo(b)fluoranthene	0.021 J to 2.5 J	1	3/13	1.7	2/13
Benzo(g,h,i)perylene	0.046 J to 1.2 J	100	0/7	500	0/7
Benzo(k)fluoranthene	0.026 J to 1.3 J	0.8	1/6	1.7	0/6
Bis(2-ethylhexyl)phthalate	0.012 J to 13 JD	NC	NA	NC	NA
Butylbenzylphthalate	0.013 J to 0.36 J	NC	NA	NC	NA
Chrysene	0.019 J to 1.7 J	1	2/11	1	2/11
Dibenz(a,h)anthracene	0.089 J to 0.35 J	0.33	1/2	0.56	0/2
Diethylphthalate	0.013 J to 0.051 J	NC	NA	NC	NA
Di-n-butylphthalate	0.012 JB to 0.66 B	NC	NA	NC	NA
Di-n-octylphthalate	0.013 J	NC	NA	NC	NA
Fluoranthene	0.008 J to 2.9 J	100	0/21	500	0/21
Indeno(1,2,3-cd)pyrene	0.022 J to 1.1 J	0.5	2/7	5/6	0/7
Phenanthrene	0.006 J to 1.6 J	100	0/18	500	0/18

Pyrene	0.008 J to 2.3 J	100	0/22	500	0/22
Inorganics					
Aluminum	2,260 to 21,295	NC	NA	NC	NA
Antimony	0.34 J to 22 J	NC	NA	NC	NA
Arsenic	0.506 J to 1,190 J	13	24/60	13	24/60
Barium	20.1 J to 721	350	5/61	400	5/61
Beryllium	0.114 J to 0.85	7.2	0/56	10	0/56
Cadmium	0.16 J to 19.2 J	2.5	6/29	4	6/29
Calcium	664 B to 18,200 J	NC	NA	NC	NA
Chromium	2.2 B to 5050	30	22/52	41	19/52
Cobalt	2.3 B to 86.6 J	NC	NA	NC	NA
Copper	12.8 to 34,700 JD	50	40/61	50	40/61
Cyanide	0.577 to 25,000 J	27	21/42	27	21/42
Iron	4.350 to 39,900	NC	NA	NC	NA
Lead	1.1 to 1,030 J	63	19/61	63	19/61
Magnesium	970 B to 12,700	NC	NA	NC	NA
Manganese	83 J to 864 J	1,600	0/61	1,600	0/61
Mercury	0.008 J to 1.1 J	0.18	10/33	0.18	10/33
Nickel	6.7 B to 63,700 JD	30	36/61	30	38/61
Potassium	267 B to 6,994 J	NC	NA	NC	NA
Selenium	0.63 J to 1,410 J	3.9	24/45	3.9	24/45
Silver	0.87 J to 9	2	12/19	2	12/19
Sodium	50 B to 11,900 J	NC	NA	NC	NA
Thallium	1.8 J to 38.8	NC	NA	NC	NA
Vanadium	2.8 J to 69	NC	NA	NC	NA
Zinc	10.3 to 37.300 J	109	37/61	109	37/61
Pesticides					
4,4'-DDD	0.0098 JP to 0.01	0.0033	4/5	17	0/5
4,4'-DDE	0.0071 JPN to 0.008	0.0033	3/3	47	0/3
4,4'-DDT	0.00092JP to 0.0089	0.0033	7/9	14	0/9
Alpha-BHC	0.00005 JP	0.02	0/1	0.02	0/1
Alpha-Chlordane	0.00027JP to 0.021 P	0.094	0/3	1.3	0/3
Dieldrin	0.00028 JP	0.005	0/1	0.006	0/1
Endosulfan I	0.00032 JP	2.4	0/1	102	0/1
Endosulfan II	0.00015 JP	2.4	0/1	102	0/1
Gamma-Chlordane	0.015 JP	NC	NA	NC	NA
Hepachlor	0.00019 JP	0.042	0/1	0.14	0/1
Polychlorinated Biphenyls (PCBs)					
Aroclor 1254	0.024 JP to 1.5 JC	0.1	5/10	1	1/10
Aroclor 1260	0.0072 J to 0.08	0.1	0/6	1	0/6
Total Organic Carbon (TOC)					
Total Organic Carbon	806 to 8,600 J	NC	NA	NC	NA

[a] SCG: Standard Criteria or Guidance – Part 375-6.8(a). Unrestricted Soil Cleanup Objectives
[b] SCG: Standard Criteria or Guidance - Part 375-6.8(b). Restricted Commercial (Protection of Public Health–Commercial, Protection of Ecological Resources, and Protection of Groundwater) Solid Cleanup Objectives.

B (organic) - Present in associated blank sample.
B (inorganic) - Concentration above method detection limit but below reporting limit.
D - From a diluted sample J – Estimated
N - Presumptively present NA – Not Applicable NC – No Criteria
P - Compound had >25% difference for the detected concentration values between two gas chromatograph columns.

The primary soil contaminants are SVOCs (benzo(b)fluoranthene and benzo(a)pyrene), cyanide, and the metals arsenic, chromium, copper, lead, mercury, nickel, selenium and zinc. Figure 5 shows where soil contaminant levels exceed SCOs; the primary soil contamination is associated with the leach pits. The metals contamination identified above is the result of past operations at the site.

Surface soils on the site (in the vicinity of the Magna Metals building and leach pits) generally exceed the NYSDEC Restricted Commercial Use SCOs. Surface soil samples SS-06 through SS-09 were collected off-site but physically and hydrogeologically downgradient of the site. The concentrations of site related metals in these samples generally significantly exceed the unrestricted SCGs. North of the building there are several off-site surface soil samples (SS-04, SS-13, SS-14, SS-15, SS-801, SS-802, and SS-803) that contain levels of chromium, lead, and silver that are only slightly higher than unrestricted. It appears that those latter slightly elevated concentrations are not due to disposal of hazardous waste at the site but occur naturally in the background.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are arsenic, chromium, copper, lead, mercury, nickel, selenium, and zinc, and cyanide.

Surface Water

Surface water samples were collected downgradient of the site: four surface water samples from the tributary, one sample after the confluence of the stream and tributary, one sample from the confluence of the stream and pond, two samples from the pond, one sample at the drainage culvert from the pond along Cross Roads Ave., two samples in the wetlands area, and one upgradient sample from the stream.

Five VOCs were detected in at least one of the surface water samples. Cis-1,2-dichloroethene and trichoroethene were present in 9 of 11 samples, with cis-1,2-dichloroethene present up to 18 ppb. Trichloroethene's maximum concentration was 5.5 ppb. Six SVOCs were detected in the surface water samples at concentrations less than 4 ppb. Only one SVOC (bis(2-ethylhexyl)phthalate) was present in the upstream sample.

Twenty metals and cyanide were detected in at least one of the surface water samples collected during the investigation. Four of those metals (copper, iron, mercury, and zinc) plus cyanide were present at concentrations greater than their applicable surface water criteria. Concentrations of the majority of metals were greater in the downgradient tributary and/or wetlands surface water samples in comparison to the upstream samples. Aluminum, barium, copper, iron, manganese, nickel, and selenium were detected above chronic screening values from the NYSDEC Ambient water quality standards guidance. Copper and zinc were detected above the acute screening values from the NYSDEC Ambient water quality standards guidance.

Sediments

Sediment samples from 0-2 feet were collected during the RI from the off-site wetland and at locations upstream, adjacent and downstream of the site and analyzed for VOCs, SVOCs, PCBs, and inorganics. The samples were collected to assess the potential for impacts to wetland sediment from the site. The results indicate that sediment in the off-site wetland exceeds the Department's SCGs for sediments for several metals. Tables 1-3 and 1-4 show the extent of contamination in the collected sediment samples.

Figure 6 shows the area affected by contaminants from the site, particularly copper, which is indicative of the primary sediment contamination. The primary sediment contaminants are nickel, copper and zinc. The metals are associated with historic disposal of wastes in the leach pits at the Magna Metals site, as shown in Figure 3. Limited surface water and sediment toxicity testing was performed and impacts to benthic aquatic life were observed in indigenous and laboratory based analyses.

Several of the other metals shown in Tables 1-3 and 1-4 were also found in the upstream sediment samples, are naturally occurring and appear to be associated with background levels. Therefore, iron, magnesium, and manganese in sediment are not considered site specific contaminants of concern.

Table 1-3 – Sediment (Organics) Frequency Exceedance

Detected Constituents	Concentration Range Detected (ppm)	SCG[a] (ppm)	Frequency Exceeding SCG	Site-Derived Value[b] (ppm)	Frequency Exceeding Derived Value
Semi-Volatile Organic Compounds					
Anthracene	0.2 J	NC	NA	NC	NA
Benzo(a)anthracene	0.1 J to 0.47	1/3[c]	0/6	110.97[c]	0/6
Benzo(a)pyrene	0.12 J to 0.66 J	1.3[c]	0/6	110.97[c]	0/6
Benzo(b)fluoranthene	0.76 J to 1.2 J	1.3[c]	0/7	110.97[c]	0/7
Benzo(g,h,i)peryene	0.15 J to 0.22 J	NC	NA	NC	NA
Benzo(k)fluoranthene	0.085 J to 0.6 J	1.3[c]	0/5	110.97[c]	0/5
Chrysene	0.071 J to 0.65 J	1.3[c]	0/7	110.97[c]	0/7
Fluoranthese	0.16 J to 1.4 J	1,020[d]	0/9	87,069.24[d]	0/9
Fluorene	0.07 J	NC	NA	NC	NA
Indeno(1,2,3-cd)pyrene	0.048 J	1.3[c]	0/1	110.97[c]	0/1
Phenanthrene	0.08 J to 0.9	120[c]	0/7	10,243.44[d]	0/7
Pyrene	0.12 J to 1.3 J	NC	NA	NC	NA
Total Organic Carbon (TOC)					
Total Organic Carbon	1,700 J to 140,000 J	NC	NA	NC	NA

[a]SCG - Standard Criteria or Guidance: New York State Department of Environmental Conservation's "Technical Guidance for Screening Contaminated Sediments"
[b]SCG formalized using site-specific TOC values
[c]Value for Human Health Bioaccumulation
[d]Value for Benthic Aquatic Life Chronic Toxicity
J – Estimated
NA – Not Applicable

NC – No Criteria

Table 1-4 – Sediment (Inorganics) Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**Lowest Effect Level SCG[a] (ppm)**	**Frequency Exceeding Lowest Effect Level SCG**	**Severe Effect Level SCG (ppm)**	**Frequency Exceeding Severe Effect Level SCG**
Inorganics					
Aluminum	2,920 to 19,800 J	NC	NA	NC	NA
Arsenic	1.1 B to 19.3 J	6	10/22	33	0/22
Barium	32.6 J to 604 J	NC	NA	NC	NA
Beryllium	0.17 J to 1.6 J	NC	NA	NC	NA
Cadmium	0.31 J to 1.4 J	0.6	10/12	9	0/12
Calcium	882 B to 16,400	NC	NA	NC	NA
Chromium	11.4 J to 166 J	26	19/22	110	22/28
Cobalt	4.6 B to 58.8 J	NC	NA	NC	NA
Copper	4.4 J to 2,300 J	16	26/28	110	22/28
Iron	2,130 to 23,400 J	20,000 (2%)	11/28	40,000 (4%)	0/28
Lead	3 to 112 J	31	14/28	110	1/28
Magnesium	2,130 to 23,400 J	NC	NA	NC	NA
Manganese	87 to 958 J	460	8/21	1100	0/21
Mercury	0.01 J to 0.25 J	0.15	7/15	1.3	0/15
Nickel	17 to 835 J	16	28/28	50	23/28
Potassium	207 B to 1,970 J	NC	NA	NC	NA
Selenium	0.61 B to 68.2 J	NC	NA	NC	NA
Silver	0.19 J to 1.4 J	1	2/8	2.2	0/8
Sodium	59.8 J to 770 J	NC	NA	NC	NA
Thallium	3.4 J	NC	NA	NC	NA
Vanadium	5.8 B to 61 J	NC	NA	NC	NA
Zinc	29.3 J to 1,890	120	20/28	270	6/28

[a]SCG - Standard Criteria or Guidance: New York State Department of Environmental Conservation's "Technical Guidance for Screening Contaminated Sediments"
J – Estimated NA – Not Applicable NC – No Criteria

Based on the findings of the RI, the disposal of hazardous has resulted in the contamination of wetland sediment. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of sediment to be addressed by the remedy selection process are nickel, copper and zinc.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. Due to the presence of buildings in the impacted area, sub-slab soil vapor and indoor air samples were collected to evaluate whether soil actions are needed to address exposures related to soil vapor intrusion (SVI).

Soil vapor samples were collected from beneath the occupied commercial structure located adjacent to the Magna Metals building. Indoor air and outdoor air samples were also collected at this time. The sampling results indicate trichloroethene (TCE) was detected in on-site sub-slab soil vapor and in the indoor air of the structure. The highest concentration of TCE was found under the southwestern portion of the building (location SV-12), in sub-slab soil vapor at 110,000 ug/m3. The highest concentration of TCE detected in the indoor air was 5.1 ug/m3 at location IA-12.

Figure 7 shows the indoor air, outdoor air, and subslab sample locations. The Magna Metals building was not sampled since it is uninhabitable (dilapidated). The environmental data indicates there is no need for off-site soil vapor sampling as no groundwater contamination was found near any off-site structures.

Based on the concentration detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, the primary soil vapor contaminant is trichloroethene (TCE) which is associated with the plating operations at Magna Metals. As noted on Figure 7, the primary soil vapor contamination is found under the southwestern corner of the building. Therefore, mitigation is necessary for that portion of the building, which is currently occupied by the PolyMedco Office/Laboratory.

Exhibit B

SUMMARY OF THE REMEDIATION OBJECTIVES

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial objectives for this site are:

Soil

- Prevent ingestion/direct contact with contaminated soil
- Prevent migration of contaminants that would result in groundwater or surface water contamination
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain
- Remove the source of soil contamination, to the extent practicable

Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater
- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable
- Prevent the discharge of contaminants to surface water
- Remove the source of groundwater contamination

Sediments

- Prevent direct contact with contaminated sediments
- Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of ambient water quality criteria
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain
- Remove the source of sediment contamination

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the site.

Exhibit C

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Exhibit B) to address the contaminated media identified at the site as described in Exhibit A.

The potential remedies, Alternative S-3 and S-4, were considered to address the site-related impacted soils. The potential remedies, Alternatives GW-2, GW-3, and GW-4 were considered to address the site-related impacted groundwater. The potential remedies, Alternatives SD-3A, SD-3B, and SD-3C were considered to address the site-related impacted sediments and wetlands. The NYSDEC determined that an evaluation of surface water remedial alternatives was not needed because once the contaminant sources and affected environmental media are remediated surface water is expected to substantially improve over time.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Site Management

The Site Management Alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement to restrict the use of the site to commercial/industrial and to prohibit the use of groundwater for potable purposes on-site or in the adjacent community, and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

SOIL

Alternative S-3: Building Demolition and Removal of Soil above Soil Cleanup Objectives

This alternative includes the excavation and removal of contaminants of concern (COCs) in overburden soils to achieve either the NYSDEC soil cleanup objectives (SCOs) for the protection of human health (commercial) for metals which have not impacted groundwater, protection of groundwater for metals and VOCs which have impacted groundwater and protection of ecological resources SCOs in the off-site area downgradient of the leach pits. Included in this alternative is the demolition and removal of the former Magna Metals building to access the soil contamination to be excavated and associated leach pits.

The footprint and vertical extent of overburden soil removal would be defined by occurrences of COC concentrations in excess of the appropriate SCOs identified above, as determined during a pre-design investigation, as well as from post-excavation sampling during implementation of remedial activities. Figure 8 shows the approximate extent of soil removal based on the relevant

SCOs. Overburden soil removal would extend vertically to approximately 10 to 15 feet below ground surface (bgs) (the approximate depth to bedrock). An estimated volume of 7,000 cubic yards (cy) of soil would be removed. If the pre-design sampling and/or remedial activities identify additional contamination associated with the leach pits extending off-site, the excavation will be extended as necessary to address the highly contaminated subsurface soils. This alternative does not include removal of COCs in excess of NYSDEC SCOs in off-site soils that are considered background samples (SS-04 and SS-13 through 15, SS-801 through SS-803).

The alternative includes demolition of the former Magna Metals building and leach pits and post-demolition sampling of subsurface conditions. This alternative includes a contingency for the potential removal of contaminated soils above NYSDEC Restricted Commercial Use SCOs or above the NYSDEC protection of groundwater SCOs, whichever is lower, below the building floor to an extent of approximately 10 to 15 feet bgs. The volume of soil to be removed from beneath the former Magna Metals building is estimated to be approximately 3,900 cy.

Shoring and/or sheet piling may be needed for this alternative for slope stability and safety, as well as for dewatering purposes since the excavation proceeds below the water table.

A site cover will be required to allow for commercial use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer.

Post-remediation sampling will be performed to ensure that remedial action objectives have been met.

This alternative would also include preparing and implementing a Site Management Plan (SMP), employing institutional controls in the form of an EE to control and/or prohibit access to remaining contaminated soils on-site, and periodic reviews to assess the continued effectiveness of the remedy.

Present Worth: $3,752,000
Capital Cost: $3,696,000
Annual Costs: $20,000

Alternative S-4: Building Demolition and Removal of Soil above Unrestricted Use Soil Cleanup Objectives

This alternative includes the excavation and removal of COCs in overburden soils to NYSDEC unrestricted SCOs and demolition and removal of the former Magna Metals building and leach pits.

The footprint and vertical extent of overburden soil removal would be defined by occurrences of COC concentrations in excess of the NYSDEC unrestricted use SCOs as determined during a pre-design investigation, as well as from post-excavation sampling during implementation of remedial activities. Overburden soil removal would extend vertically to approximately 10 to 15 feet bgs (the approximate depth to bedrock). An estimated volume of 36,000 cubic yards (cy) of soil would be removed. If the pre-design (i.e., design stage) sampling investigation and/or remedial activities identify additional contamination associated with the leach pits extending off-site, the excavation will be extended as necessary to address highly contaminated subsurface soils. This alternative does not include removal of COCs in excess of NYSDEC SCOs in off-site soils that are considered background samples (SS-04, SS-13 through 15, and SS-801 through 803).

The alternative includes demolition of the former Magna Metals building and post-demolition sampling of subsurface conditions is included. The volume of soil to be removed from beneath the former Magna Metals building is estimated to be approximately 3,900 cy.

Shoring and/or sheet piling may be needed for this alternative for slope stability and safety, as well as for dewatering purposes since the excavation proceeds below the water table.

Post-remediation sampling will be performed to ensure that remedial action objectives have been met.

This alternative would not include employing institutional controls to control access to soils at the property.

Present Worth: $11,819,000
Capital Cost: $11,819,000
Annual Costs: $0

Groundwater

Alternative GW-2: Groundwater Monitoring and Sub-Slab Vapor Mitigation

This alternative includes monitoring of groundwater in conjunction with the removal of contaminated soil during implementation of either Alternatives S-3 or S-4, and installation of a sub slab depressurization system.

A sub-slab depressurization system (SSDS) would be installed beneath approximately 18,000 square feet of floor slab of the Polymedco Office/Laboratory, as shown on Figure 8. The proposed system consists of a series of collection pipes and one or more fans/blowers, which will draw air from beneath the building, and will actively vent it outside. As part of the proposed SSDS , the floor slab of the Polymedco Office/Laboratory may need to be sealed (i.e., no cracks, gaps, etc. in the slab). After system start-up, if pressure testing indicates a negative pressure field has not been established, the SSDS would be expanded.

A Site Management Plan (SMP) would be developed and implemented. The SMP would include a monitoring program to verify ongoing reduction of remaining groundwater contamination. Both new and existing monitoring wells would be incorporated within the monitoring network.

This alternative would include institutional controls in the form of an EE to prohibit the use of groundwater for potable purposes on-site or in the adjacent community, provision to evaluate the potential for vapor intrusion for any buildings developed on the site including provision for mitigation of any impacts identified, provision to evaluate the potential for soil vapor intrusion for existing buildings if building use changes significantly or if a vacant building become occupied, provision to monitor for vapor intrusion for any buildings occupied or developed on the site, and periodic reviews to assess the continued effectiveness of the remedy.

Present Worth: $927,000
Capital Cost: $250,000
Annual Costs: $60,000

Alternative GW-3: In-Situ Treatment of Groundwater and Sub-Slab Vapor Mitigation

This alternative provides for *in situ* treatment of contaminated groundwater to significantly reduce or eliminate residual contaminants in groundwater, groundwater monitoring, and installation of a sub slab depressurization system.

In situ chemical oxidation would be performed by injection of a chemical reagent (e.g., Fenton's reagent) into the subsurface through injection points located on-site. *In situ* chemical oxidation could be effective for organic contaminants in groundwater. The amount of reagent needed, spacing of injection points, injection point requirements and the frequency of addition to achieve cleanup goals would be determined during pre-design investigation activities.

Monitoring wells, located downgradient of the injection locations, would be used to monitor the treated groundwater. The location and requirements of downgradient monitoring wells would be determined during design activities.

A sub slab depressurization system (SSDS) would be installed beneath approximately 18,000 square feet of floor slab of the Polymedco Office/Laboratory and SMP developed, similar to GW-2 above as shown on Figure 8.

This alternative would include institutional controls in the form of an EE to prohibit the use of groundwater for potable purposes on-site or in the adjacent community and other provisions as described in Alternative GW-2, and periodic reviews to assess the continued effectiveness of the remedy.

Present Worth: $2,167,000
Capital Cost: $1,490,000
Annual Costs: $60,000

Alternative GW-4: Limited Permanganate Addition, Groundwater Monitoring and Sub-Slab Vapor Mitigation

This alternative provides for a single, one-time application of permanganate within the soil excavation area in conjunction with alternatives S-3 or S-4. This alternative also includes groundwater monitoring and installation of a sub slab vapor depressurization system.

Prior to backfilling the excavation, permanganate would be applied at the bottom of the excavation area for the purpose of oxidizing residual groundwater contamination located within underlying bedrock. The concentration and volume of permanganate would be determined during pre-design investigation activities. Permanganate would enter the bedrock through any existing cracks or fissures such as fractures. Following the one-time application of the permanganate, the excavation area would be backfilled.

Monitoring wells, located downgradient of the injection locations, would be used to monitor the treated groundwater. The location and requirements of downgradient monitoring wells would be determined during design activities.

A sub slab depressurization system (SSDS) would be installed beneath approximately 18,000 square feet of floor slab of the Polymedco Office/Laboratory and SMP developed, similar to GW-2 above as shown on Figure 8.

This alternative would include institutional controls in the form of an EE to prohibit the use of groundwater for potable purposes on-site or in the adjacent community and periodic reviews to assess the continued effectiveness of the remedy.

Present Worth: $1,054,000
Capital Cost: $377,000
Annual Costs: $60,000

Sediment

Alternative SD-3A: Sediment Removal to Concentrations below Habitat Based Preliminary Remedial Goals (PRGs)

Alternative SD-3A would include the removal of wetland sediments with contaminant concentrations above the Preliminary Remedial Goals (PRGs) developed during the Habitat assessment (as part of the RI). Sediments have been grouped into two separate areas (referred to as "sediment systems") based on location and the areas of concern established in the Habitat Assessment. The first is the Furnace Brook/Unnamed Pond sediment system; the second is the Unnamed Tributary system. This alternative also includes post-remedial monitoring of surface water to monitor the effectiveness of sediment remediation on surface water.

This alternative would involve removal of sediments from the Furnace Brook/Unnamed Pond sediment system with concentrations of nickel and copper above 200 mg/kg and 415 mg/kg,

respectively (PRGs developed during the RI), and sediments from the Unnamed Tributary sediment system with concentrations of nickel and copper above 143 mg/kg and 107 mg/kg, respectively (PRGs). In the Habitat Assessment, no toxicity was observed attributable to zinc in sediments, and therefore, a PRG was not developed for zinc for this alternative.

In addition, COCs in excess of NYSDEC ecological SCOs will be removed from off-site surface soils in the locations of SS-06 through 10. These soils are downgradient of the leaching pits and have been affected by disposal in the leach pits. The soils are easily accessible and also erodible, meaning they can migrate into the wetlands. Surface soils in these wetland locations are included with this sediment alternative. The approximate areas of sediments and surface soils to be removed under this alternative can be seen in Figure 4-4A.

During pre-design activities, additional investigation will be performed to determine the vertical extent of contamination. In addition, post excavation sampling will be performed following remediation. For estimating purposes, materials will be removed to a depth of approximately two (2) feet bgs and replaced with comparable materials to pre-existing grade to re-establish the sediment ecosystem. Excavation beyond 2 feet bgs to meet PRGs for this alternative is not proposed, as ecological exposures to deeper contamination is not considered a significant exposure pathway.

The quantity of off-site sediment and surface soil to be removed and replaced under this alternative is approximately 3,840 CY. The areal extent is estimated to be approximately 1.2 acres. Excavated wetland substrate will be restored with similar clean material, matching the organic content to existing. In the submerged aquatic excavation areas, clean sand or similar material will be used. All excavation areas will be revegetated in kind through replanting and reseeding. Wetlands and aquatic environments will be restored to original contours, ensuring little to no change in drainage patterns and ensuring re-establishment of vegetation.

A Site Management Plan (SMP) would be developed and implemented. This alternative also includes post-remedial monitoring of surface water to monitor the effectiveness of sediment remediation on surface water. Furnace Brook, the unnamed pond, and the unnamed tributary would be sampled periodically and compared to regulatory criteria. Surface water data would be included in periodic site reviews.

This alternative includes institutional controls (i.e., an environmental easement) and periodic reviews to assess the continued effectiveness of the remedy.

Present Worth: $1,815,000
Capital Cost: $1,427,000
Annual Costs: $44,000

Alternative SD-3B: Sediment Removal to Concentrations below Background

Alternative SD-3B would include the removal of sediments with analytical concentrations above background levels. The average concentrations of nickel, copper, and zinc from background

sediment sample locations SD-27 through SD-31 were used to establish the goals. The average background concentrations of nickel, copper, and zinc from these locations are 24.1, 13.7, and 54.1 mg/kg respectively. Sediment will be removed from off-site areas in locations exceeding these conditions. This alternative also includes post-remedial monitoring of surface water to monitor the effectiveness of sediment remediation on surface water.

In addition off-site surface soils in the locations of SS-06 through 10 will be addressed the same as in SD-3B
The quantity of sediment to be removed and replaced under this alternative is approximately 16,000 CY. Excavated wetland substrate will be restored with similar clean material, matching the organic content to existing. In the submerged aquatic excavation areas, clean sand or similar will be used. All excavation areas will be revegetated in kind through replanting and reseeding, Wetlands and aquatic environments will be restored to original contours, ensuring little to no change in drainage patterns and ensuring re-establishment of vegetation.

A Site Management Plan (SMP) and ICs will also be similar to SD-3B.

Present Worth: $5,467,000
Capital Cost: $5,079,000
Annual Costs: $44,000

Alternative SD-3C: Sediment Removal to Concentrations below LELs

Alternative SD-3C includes the removal of sediments with analytical results above NYSDEC Lowest Effect Levels (LELs) for inorganic COCs in sediment. NYSDEC Sediment Cleanup Criteria Lowest Effect Level (LEL) for both nickel and copper is 16 mg/kg. The NYSDEC LEL for zinc is 120 mg/kg. Sediment locations with analytical results of nickel, copper, and zinc exceeding LEL criteria will be removed from the off-site areas as part of this alternative. This alternative also includes post-remedial monitoring of surface water to monitor the effectiveness of sediment remediation on surface water.

In addition, COCs in excess of NYSDEC Ecological SCOs will be removed from off-site surface soils in the locations of SS-06 through 10, wetland restoration, the SMP and ICs will be addressed as outlined in SD-3A

Present Worth: $5,436,000
Capital Cost: $5,048,000
Annual Costs: $44,000

Exhibit D
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	$0	$0	$0
Limited Action	$39,000	$20,000	$95,000
S-3 (**Building Demolition and Removal of Soil above NYSDEC Restricted Commercial Use Soil Cleanup Objectives**)	$3,696,000	$20,000	$3,752,000
S-4 (**Building Demolition and Removal of Soil above NYSDEC Unrestricted Use Soil Cleanup Objectives**)	$11,819,000	$0	$11,819,000
GW-2 (**Groundwater Monitoring and Sub-Slab Vapor Mitigation**)	$250,000	$60,000	$927,000
GW-3 (**In-Situ Treatment of Groundwater and Sub-Slab Vapor Mitigation**)	$1,490,000	$60,000	$2,167,000
GW-4 (**Limited Permanganate Addition, Groundwater Monitoring and Sub-Slab Vapor Mitigation**)	$377,000	$60,000	$1,054,000
SD-3a (**Sediment Removal to Concentrations below Habitat Based PRGs**)	$1,427,000	$42,000	$1,815,000
SD-3b (**Sediment Removal to Concentrations below Background**)	$5,079,000	$42,000	$5,467,000

SD-3c (**Sediment Removal to Concentrations below LELs**)	$5,048,000	$42,000	$5,436,000

Exhibit E

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing **Alternatives S-3, GW-4, and SD-3C, Building Demolition and Removal of Soil above NYSDEC Soil Cleanup Objectives**, **Limited Permanganate Addition, Groundwater Monitoring and Sub-Slab Vapor Mitigation**, **and Sediment Removal to Concentrations below LELs** as the remedy for this site. The elements of this remedy are described in Section 7.2. The proposed remedy is depicted in Figures 8 and 9.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives.

Alternatives S-3, GW-4, and SD-3C are being proposed because, as described below, they satisfy the threshold criteria and provide the best balance of the balancing criterion described in Exhibit C. They would achieve the remediation goals for the site by removing contaminated soils in the source area, treating groundwater near the source area, preventing indoor air exposures by installing a mitigation system, and removing off-site sediments that were contaminated by on-site disposal. Alternative GW-4 does not completely address groundwater contamination, but does offer a cost effective and feasible treatment option for that area.

Protection of Human Health and the Environment

The No Action Alternative, Alternative 1, would not be protective of public health or the environment since it would not achieve remediation goals described in Exhibit B. Alternative 2 does not comply with this threshold criterion inasmuch as administrative controls alone would not be effective. Alternative S-4, by removing all soil contaminated above the "Unrestricted" soil cleanup objective, meets the threshold criteria. Alternative S-3 meets this threshold criterion since it would be protective for the intended use of the site. All groundwater alternatives would be protective of health by protecting against vapor intrusion on-site with the installation of a sub slab depressurization system and by restricting groundwater use on site. Groundwater alternative GW-2 would not offer any improvement to the groundwater contamination as it would only monitor the groundwater. Alternatives GW-3 and GW-4 could improve groundwater. Sediment alternative SD-3A would not be protective of public health and the environment since it would not achieve remediation goals described in Exhibit B. Alternative SD-3A, removal of off-site contaminated sediments and surface soils to site derived remediation goals, would reduce the potential for migration of contaminants and potential for exposure. However, significant contamination would remain behind, potentially impacting public health and the environment. As stated earlier, concentrations of contaminants in the sediments in some cases are significantly above the LELs. These wetlands and adjacent soils are used by flora and fauna. Additionally, the resource is used by people in the area. The concentrations of contaminants in the sediments

in some cases are significantly above the LELs. These wetlands and adjacent soils are not only used by flora and fauna but by people in the area as well. Sediment alternatives SD-3B and SD-3C would eliminate that potential exposure and be protective of public health and the environment.

Compliance with New York State Standards, Criteria, and Guidance (SCGs)

The No Action Alternative, Alternative 1, would not meet this threshold criterion since it would not meet the SCGs for soil, groundwater, indoor air, or sediment criteria. Alternative 2 (Limited Action) would similarly not achieve SGCs for the above-mentioned environmental media. Since Alternatives 1 and 2 would not satisfy the two threshold criteria, they are not considered further in this evaluation.

Alternatives S-3 would achieve applicable SGCs based on site use, while S-4 would achieve unrestricted use. Construction activities would be conducted in accordance with action- and location-specific SCGs. Wastes generated would be managed, transported, and treated in accordance with applicable local, State, and Federal requirements.

Implementation of Alternative GW-2 would be performed in compliance with action- and location-specific SCGs but would take no active measures to achieve chemical-specific SCGs. Groundwater concentrations may slowly reduce over time. Implementation of GW-3 and GW-4 are expected to reduce impacts to groundwater and soil vapor more quickly than alternative GW-2. Residual concentrations of inorganics in groundwater are possible and likely. Activities associated with these alternatives would be performed in accordance with applicable location and action-specific SCGs.

Alternative SD-3A, excavating sediments to site derived PRGs, would not comply with Department SCGs. The SD-3A goals are not adequate to protect the environment. Since Alternative SD-3A would not satisfy the two threshold criteria, it is not considered further in this evaluation. During Alternatives SD-3B and SD-3C removal and restoration activities would be performed in accordance with all applicable action- and location-specific SCGs. Mitigation of wetlands would also be performed as required based on the disturbed wetlands within the sediment system areas. Alternatives SD-3B and SD-3C would comply with chemical-specific SCGs. Removal and restoration activities would be performed in accordance with applicable action- and location-specific SCGs. Mitigation of wetlands would also be performed as required based on the disturbed wetlands within the sediment system areas. Because Alternatives S-3 and S-4; GW-2, GW-3, and GW-4; and SD-3B and SD-3C satisfy the two threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

Short-term Effectiveness

Alternatives S-3 and S-4 would have comparable short term impacts to each other. These alternatives would involve extensive on-site remedial activities to remove contaminated soils, demolition of the former Magna Metals building, and installation of monitoring wells. There would be risks typically associated with construction activities, including movement of heavy

equipment through areas adjacent to roads and residential properties. These risks would be addressed by developing and implementing a health and safety plan (HASP) and community air monitoring plan (CAMP) to provide protection for workers and the surrounding community. All of the alternatives mentioned in this paragraph would take 6-12 months or less.

Alternatives GW-2, GW-3, and GW-4 would have comparable, minor short term impacts related to mobilizing to sample wells and perform chemical additions for groundwater treatment.

Alternatives SD-3B and SD-3C would have comparable short term impacts. SD-3A would involve an on-site construction effort to remove contaminated sediment and surface soils. There would be risk of exposure to contaminants that are mobilized during these activities. There would also be risks typically associated with construction activities, including movement of heavy equipment. These risks would be addressed by developing and implementing a health and safety plan (HASP) and community air monitoring plan (CAMP) to provide protection for workers and the surrounding community. In addition, appropriate engineering controls (i.e., controlling access, controlling transport of contaminants to surface water bodies, etc.) would be needed. The timeframe required for implementation of Alternative SD-3A is estimated to be approximately 6-12 months, for alternatives SD-3B and SD-3C the estimated time required is approximately 12 to 18 months. There would be significant short-term damage to the wetlands adjacent to the property during remediation for all three sediment alternatives. Restoration, including returning soils and similar vegetation and trees, would be done as part of the remedy but it would take time for the wetland to return its pre-remediation state.

Long-term Effectiveness and Permanence

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils and sediments. Since most of the soil contamination is concentrated on-site near the leach pits, it would be effective to remove that contamination above the Department's restricted use SCOs (Alternative S-3). This alternative would be effective and permanent over the long-term. Limited controls would be implemented to manage remaining contamination, specifically, restricting future use to commercial activities.

Removing all the on-site soil exceeding Unrestricted SCOs (Alternative S-4) would be effective and have greater permanence, as the maximum removal of contaminated materials is performed under this alternative. However, removal of soil over the entire site to Unrestricted SCGs, which are very low and perhaps below background levels, could result in a very large and expensive excavation that removes large quantities of soil that is not significantly contaminated but is above the Unrestricted SCOs. Alternative S-3 would remove all soils above applicable restricted use SCOs on site and Unrestricted SCOs off site, which would remove significant quantities of contaminated material.

None of the groundwater alternatives would effectively cleanup the groundwater to meet standards in the near term. Alternative GW-2 would not provide any additional long term effectiveness. GW-3 and GW-4 would both treat volatile organic chemicals in groundwater to some extent and reduce the amount of contamination (in groundwater and soil vapor) in the long

term. The oxidative treatment described in GW-3 and GW-4 would not treat the metals in groundwater.

Of the sediment alternatives, SD-3B and SD-3C would have the most long term effectiveness as most contamination would be removed. These two alternatives are virtually identical; SD-3B and SD-3C would each require 16,000 cubic yards (cy) and 15,900 cy of sediment be removed, respectively.

Reduction of Toxicity, Mobility or Volume

Alternative S-4, removal of COCs exceeding Unrestricted Use SCOs from the Site would eliminate the potential for exposure and migration of site-related impacts. Alternative S-3, removal of COCs in overburden soil and source areas above Restricted Commercial Use SCOs, would significantly reduce the potential for exposure and migration of contaminants. Treatment at the off-site disposal facility would substantially reduce the toxicity and/or volume of contaminated soil.

Alternative GW-2 by itself would not involve any containment, removal, treatment, or disposal of the contaminated groundwater. Therefore, this alternative would not result in any immediate reduction in the toxicity, mobility, or volume of contaminants in groundwater or soil vapor. Over time, organic contaminant concentrations in the groundwater may eventually decline to be in compliance with Class GA standards resulting in a reduction in toxicity of the contaminated groundwater and/or a reduction in the dissolved phase plume volume.

Alternative GW-4 would involve oxidation of contaminated groundwater largely in bedrock in combination with the selected soil alternative. The toxicity of groundwater would be reduced by the oxidation of contaminants. In addition, the volume of contaminated groundwater (specifically overburden) would be reduced as a result of the removal of contaminants in groundwater during dewatering activities associated with soil removal. Local groundwater is not used for drinking and monitoring wells installed beyond the wetlands have not been contaminated. Alternative GW-3 would also reduce the amount and toxicity of the groundwater and hence, soil vapor.

Alternative SD-3B and SD-3C, removal and disposal of contaminated sediments to background levels or LELs, respectively, would significantly reduce the potential for migration of contaminants and potential for exposure. The amount of material removed by these two latter remedies, as mentioned above, is very similar. Alternative SD-3C would remove material that is above the lowest effect levels (LELs). Alternative SD-3B (removal to background) would remove slightly more material because background levels are slightly lower than LELs, but would not provide any additional ecological or environmental benefit since achieving LELs would mean removing all contaminants that would have a pejorative effect. Treatment of removed sediments at the off-site disposal facility could potentially reduce the mobility, toxicity and/or volume of contaminated sediment.

Implementability

For soil excavation alternatives S-3 and S-4 there are no major technical feasibility concerns with these alternatives. Demolition, excavation, transportation, and disposal are conventional technologies that are typically easy to implement. Excavation is not anticipated to extend below approximately 15 feet below ground surface (bgs); therefore, significant technical challenges are not anticipated and conventional equipment can be used. Subsurface structures (i.e., leach pits, septic tanks, and PVC piping) would be removed prior to soil excavation. Based on historic information, subsurface utilities are not present within the excavation area; however, a utility mark-out is required before any intrusive activities. Dewatering using well points outside the excavation area may be required.

However, removal of soil to Unrestricted SCGs could result in a very large and expensive excavation that remove large quantities of soil that is only slightly above unrestricted SCOs, but not actually contaminated by the activities at the site.

For all of the groundwater alternatives, there are no feasibility issues with installing a sub slab depressurization system. That is a standard, readily available technology. Alternative GW-2 and GW-4 are implementable. Alternative GW-3 may be more difficult. The installation of injection points and can be readily implemented using conventional technologies. However, due to the limited aquifer depth and limited hydraulic conductivities, getting the oxidants to contact the contaminated groundwater through in-situ treatment would be extremely difficult. Also, the shallower groundwater flows in the direction of the wetland; Alternatives GW-3 and GW-4 both address this shallower groundwater to some degree, by removing contaminated soils and treating the shallow groundwater. However, some of the groundwater contamination is in bedrock, making it very difficult to find and to more difficult treat. Small amounts of contaminated groundwater move through fissures and cracks that are difficult at best to treat, but may be impossible to treat.

For the sediment alternatives, there are technical feasibility concerns with these alternatives. For all the sediment alternatives, excavation, transportation, and disposal are conventional remedial technologies that are typically easy to implement. If the excavation doesn't extend below two feet bgs conventional equipment can be used. However for Alternatives SD-3B and SD-3C, significant degradation of the existing wooded wetland system is likely to occur, resulting from the expansive excavation footprint created by attaining LEL levels. Trees would have to be worked around and/or removed. Native habitats would be destroyed and extensive wetland restoration would be required.

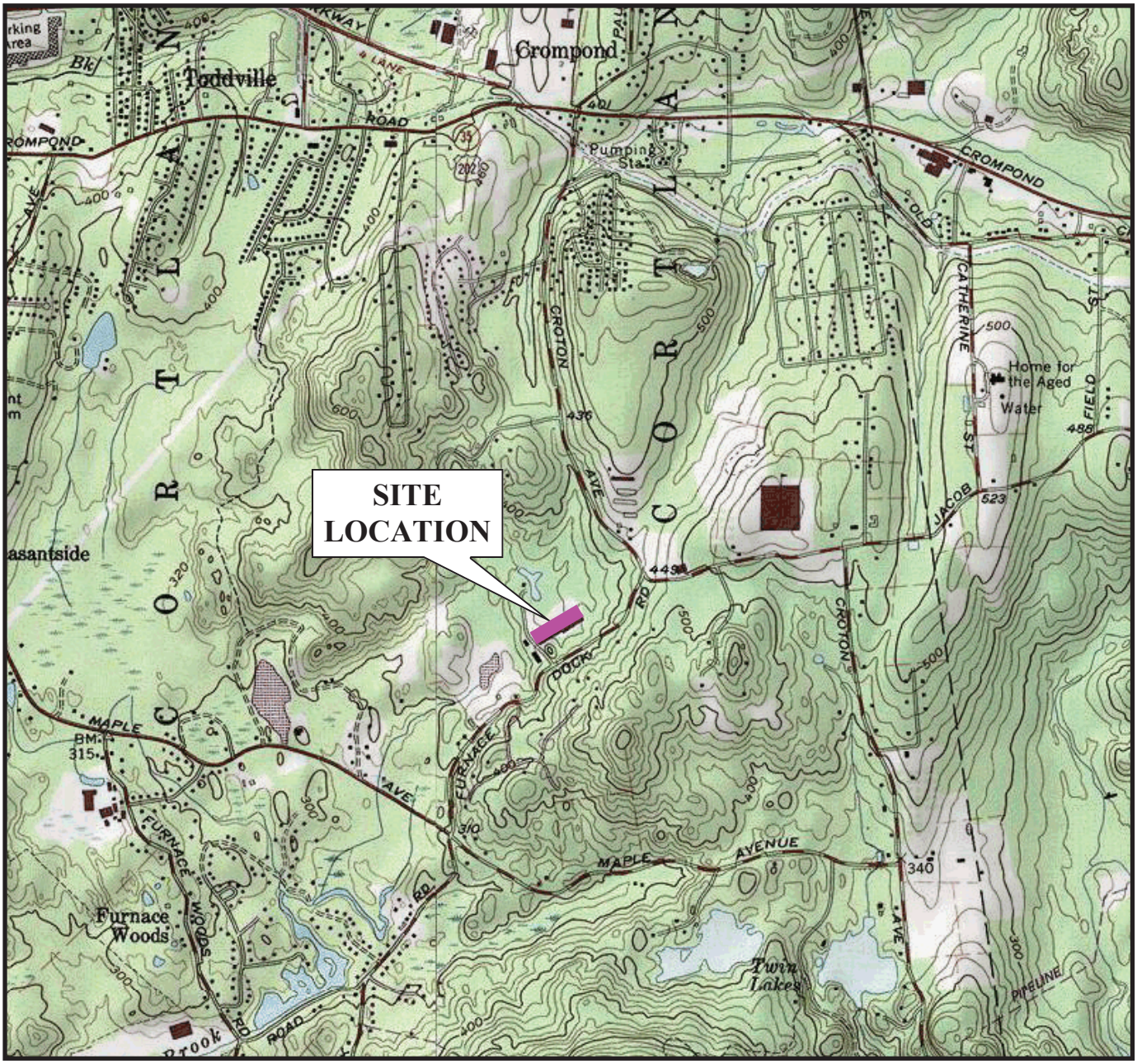
Cost-Effectiveness

The costs of the alternatives vary significantly. Soil Alternative S-3 is protective of public health and the environment for the use of the property and off-site the property as well; this is estimated to cost approximately $3.7 million (present value). Alternative S-4 has costs that are significantly higher than Alternative S-3 and, as stated above, may result in a large excavation with substantial costs to remove material that, while slightly above unrestricted SCOs, was not contaminated by the waste disposal at Magna Metals. The cost difference between the two

alternatives is approximately $8 million dollars. Given this information and all the information above, the Department proposes Alternative S-3.

Alternative GW-4 will be an effective remedy for improving groundwater quality at the site and groundwater and surface water downgradient of the site. Alternative GW-2 will not improve groundwater quality in any way. GW-4 is more expensive but comparable to the cost of GW-2; Alternative GW-4 ($377,000) is approximately $130,000 more than GW-2 ($250,000). Alternative GW-3 is significantly more expensive than the former two alternatives, estimated at $1,490,000, but is not feasible, making it a poor but choice regardless of cost. Alternative GW-3 costs approximately $1.2 million more than GW-4. Give this information, it is appropriate to recommend Alternative GW-4.

The costs of the sediment alternatives SD-3B and SD-3C are virtually the same, $5,079,000 and $5,048,000, respectively. Alternative SD-3B may be slightly more expensive but offer no substantially improved public health or environmental benefit over Alternative SD-3C. Given the above information, the Department is proposing Alternative SD-3C be selected in conjunction with the soils and groundwater alternatives to remediate the site. The estimated present worth cost to implement the remedy is $10,242,000.





SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’



SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

Magna Metals
Site No. 360003
510 Furnace Dock Road
Cortlandt New York

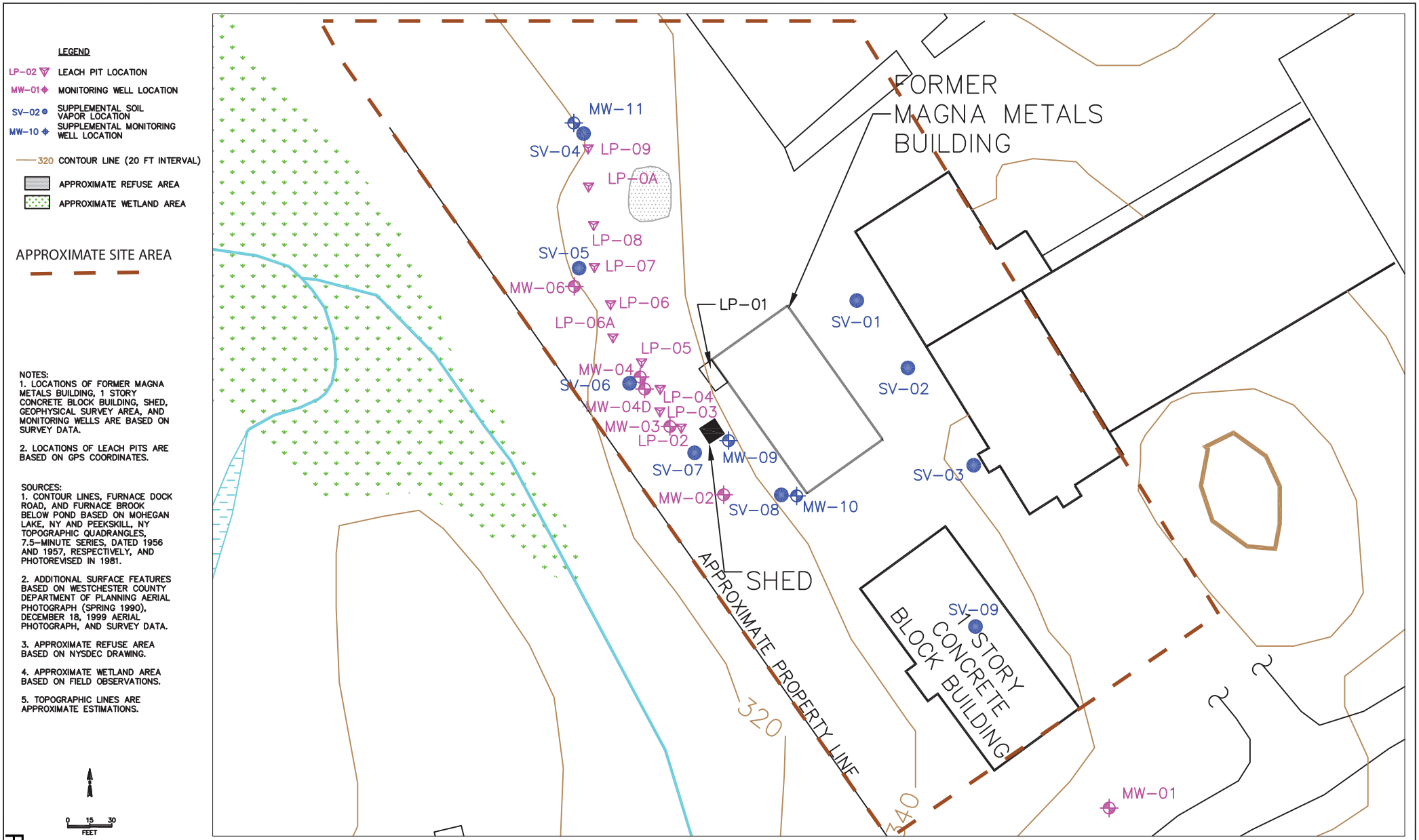
PROJECT SITE LOCATION

AKRF

Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE	1.08.06
PROJECT No.	40256
SCALE	AS SHOWN
FIGURE	1

© 2007 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\Figures\40256 Fig 1 loc map.pub

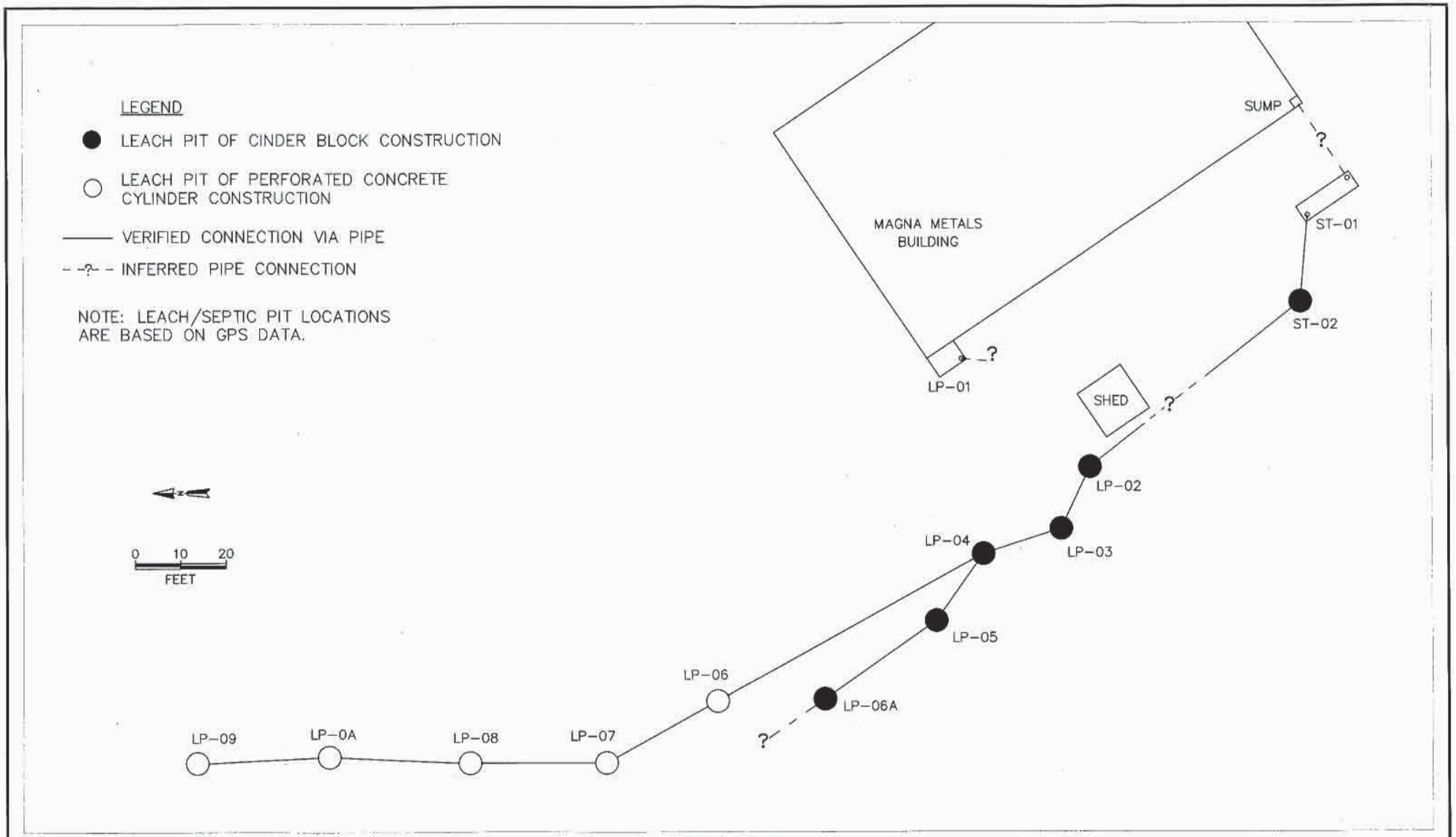


TETRA TECH EC, INC.

TITLE:
Soil Vapor Samples, Sub–Slab Vapor Sample, and Monitoring Well Locations
Supplemental RI/FS – September 2005 Work Plan Addendum
Magna Metals, Cortlandt, New York

DWN: CTS	DES.: CTS	PROJECT NO.: 106–1172	
CHKD: DPC	APPD:	FIGURE NO.: 2	
DATE: 08/21/2007	REV.: 0		

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 2–4 082107.DWG

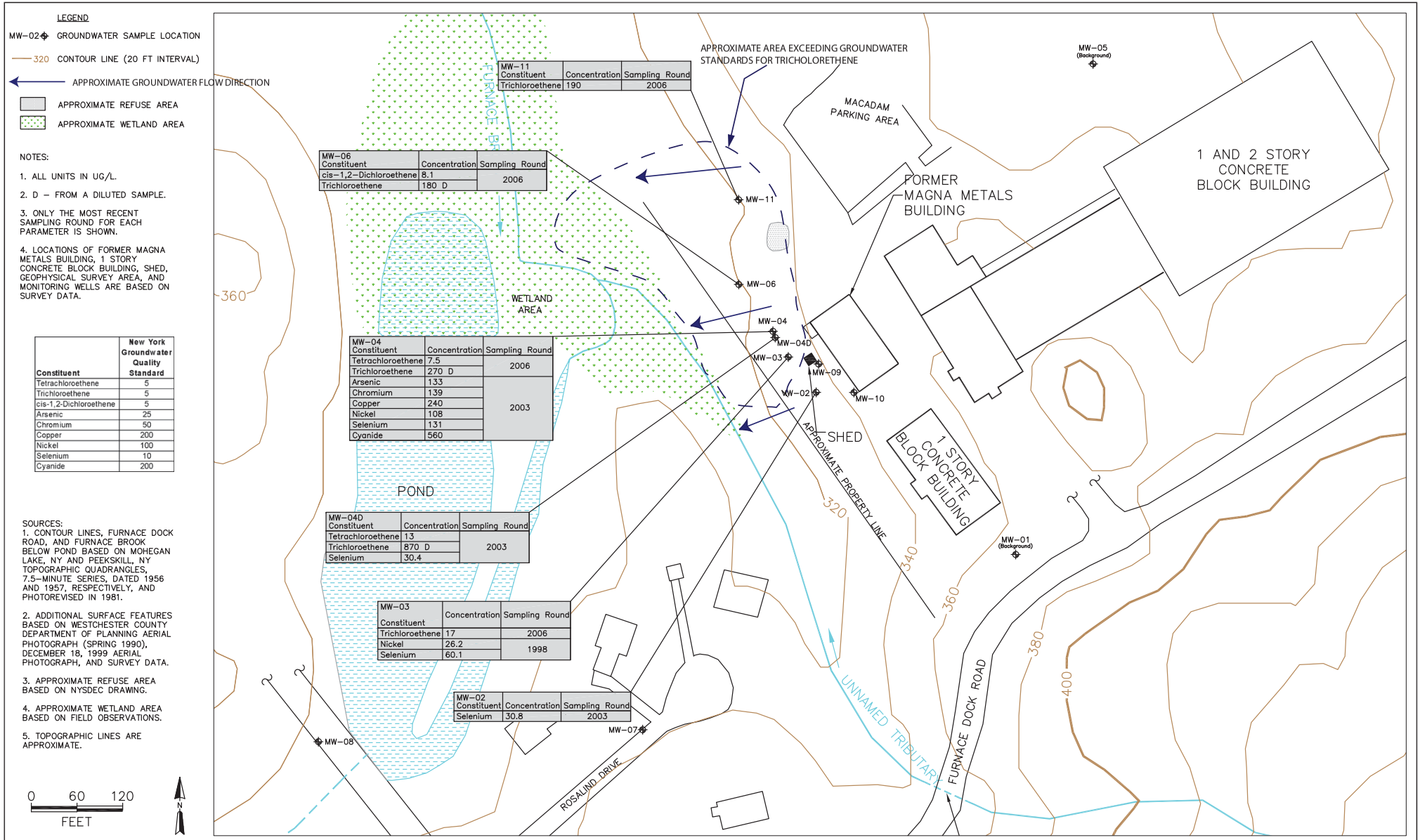


TETRA TECH EC, INC

TITLE: Leach/Septic Pit Location Map – 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN.: CTS	DATE: 08/21/07	PROJECT NO.: 106-1172	
CHKD:	REV.: 0	FIGURE NO.: 3	
DES.: DPC	APPD:		

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 2-3 082107.DWG

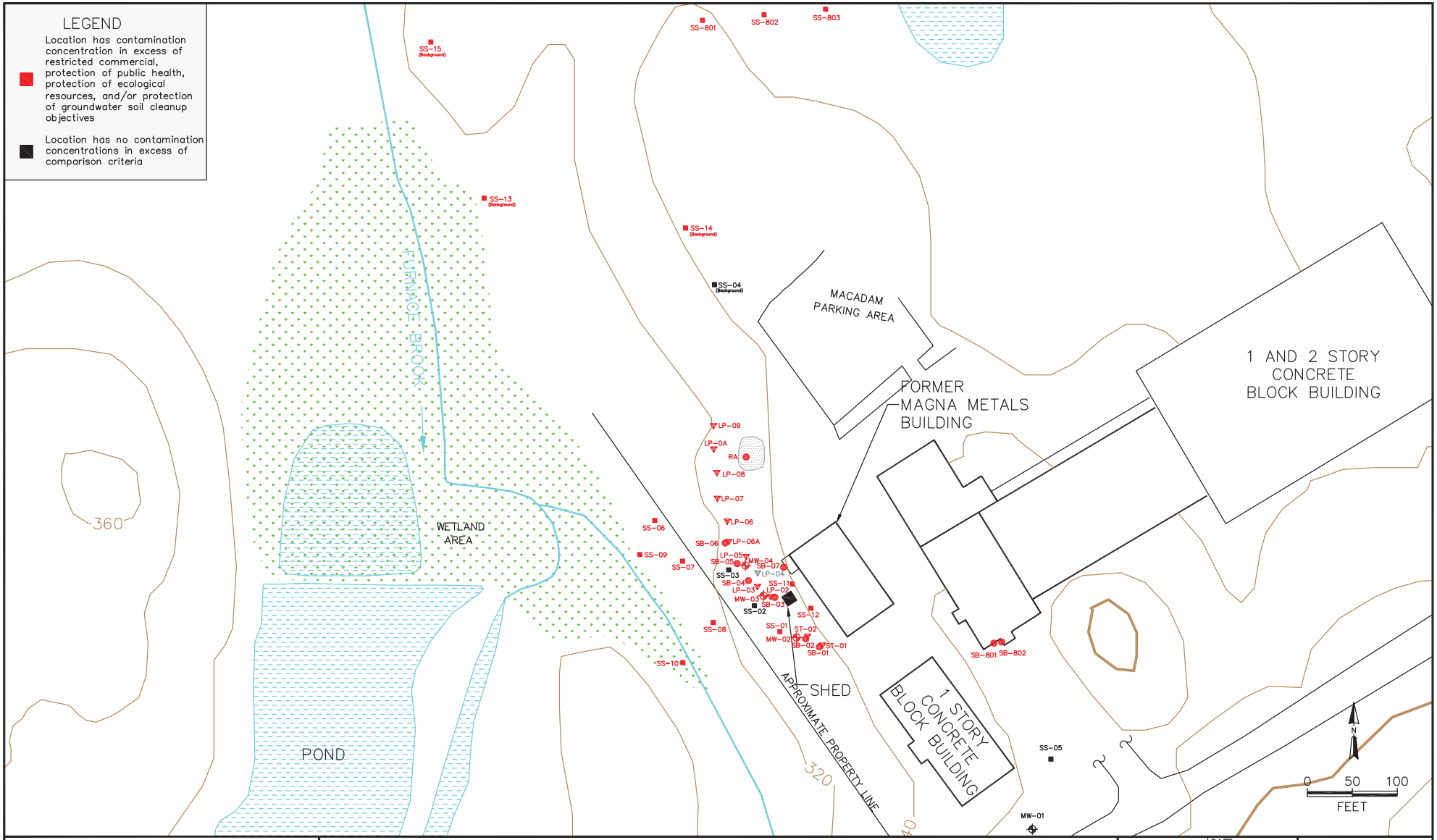


TETRA TECH EC, INC.

TITLE:
Contaminants of Concern in Excess of Class GA Groundwater Quality Criteria
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		4
DATE:	REV.:	
12/10/09	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-3 GW 121009.DWG



TETRA TECH EC, INC.

TITLE:
Exceedances of Comparison Criteria in Soil (Inorganics)
Magna Metals
Cortlandt, New York

DWN.: LMC	DATE: 12/09/10	PROJECT NO.: 106-1172	
CHKD: RC	REV.: 0		
DES.: LMC	APPD: RC	FIGURE NO.: 5	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 1-1 N&E OF SOIL INORGANICS 120910.DWG

LEGEND

SD-18 ◆ 220 SEDIMENT SAMPLE LOCATION COPPER CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

1. THE PRE-RELEASE REMEDIAL GOAL FOR COPPER IS 13.7 MG/KG.

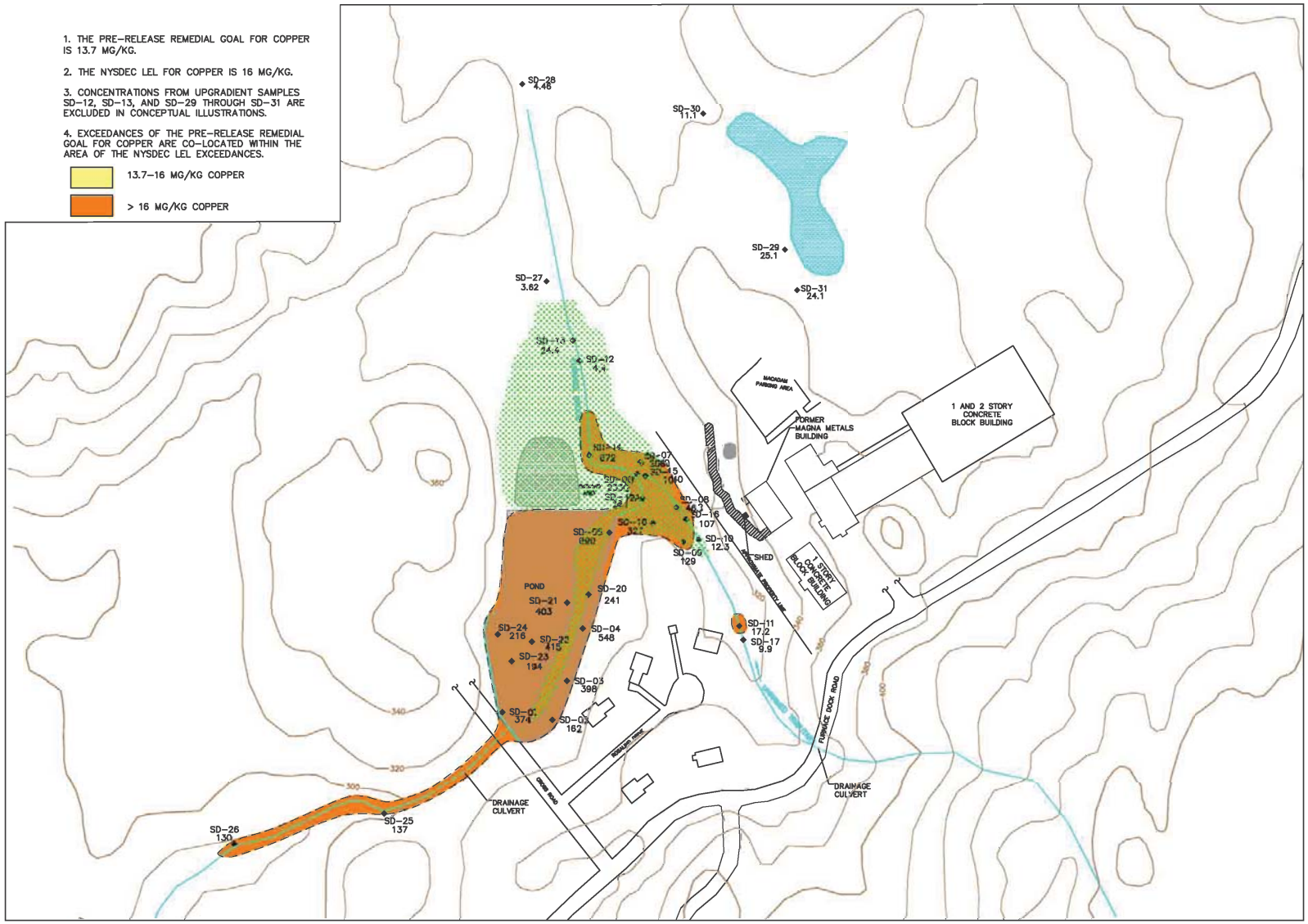
2. THE NYSDEC LEL FOR COPPER IS 16 MG/KG.

3. CONCENTRATIONS FROM UPGRADIENT SAMPLES SD-12, SD-13, AND SD-29 THROUGH SD-31 ARE EXCLUDED IN CONCEPTUAL ILLUSTRATIONS.

4. EXCEEDANCES OF THE PRE-RELEASE REMEDIAL GOAL FOR COPPER ARE CO-LOCATED WITHIN THE AREA OF THE NYSDEC LEL EXCEEDANCES.

13.7-16 MG/KG COPPER

> 16 MG/KG COPPER



0 125 250
FEET

N

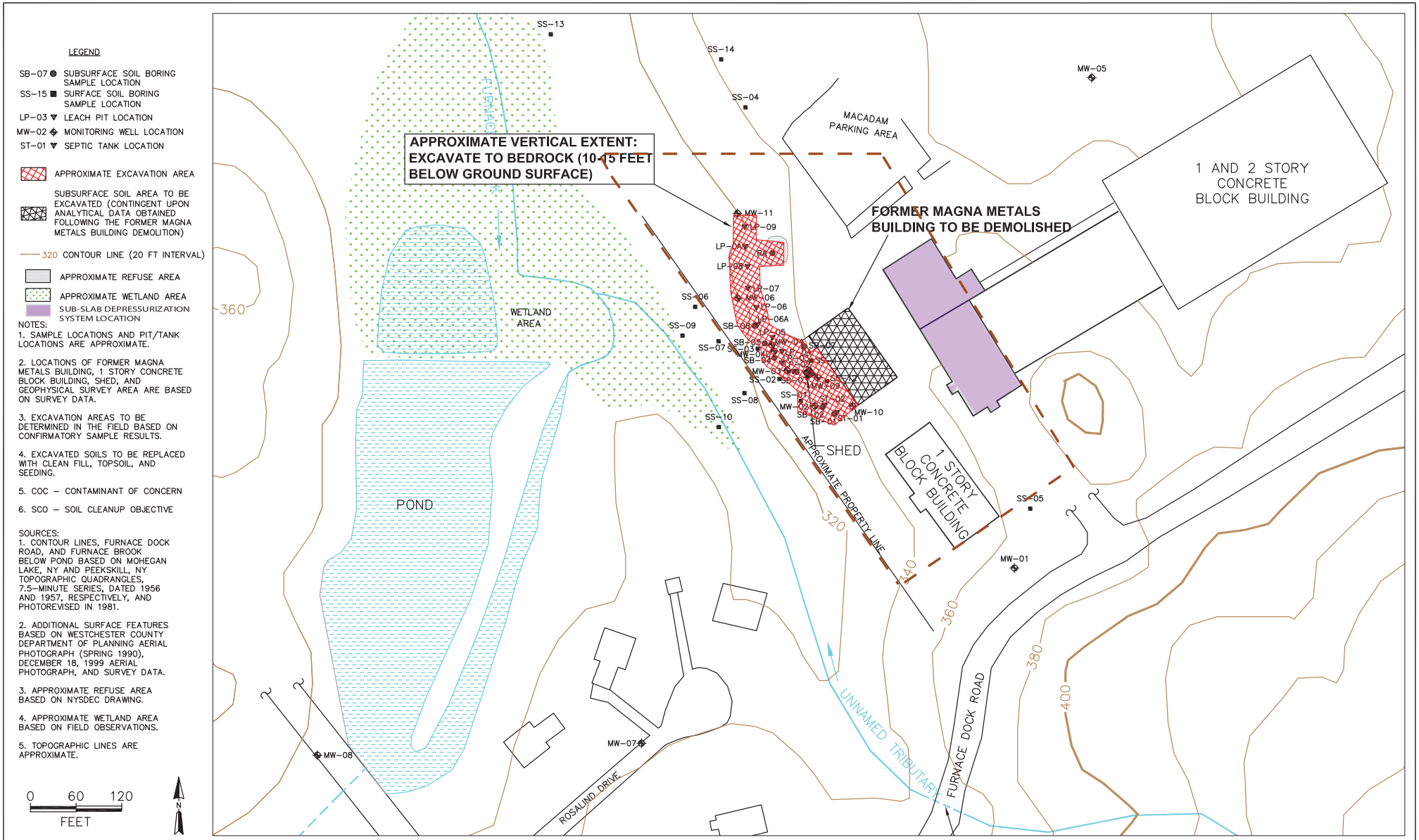
TETRA TECH EC, INC.

TITLE:
Copper in Off-Site Sediment Above Pre-Release Conditions and LELs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		6
DATE:	REV.:	
12/10/09	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-6 COPPER SED PRE-RELEASE AND LEL 121009.DWG

SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.
2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.
3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.
subslab and indoor air concentrations in ug/m3
LEGEND:
SV-14 SUBSLAB VAPOR SAMPLING LOCATION
IA-11 INDOOR AIR SAMPLING LOCATIONS
AA-1 OUTDOOR AIR SAMPLING LOCATION
320 CONTOUR LINE (20 FT INTERVAL)
NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.
0' 30' 60' 120'
SCALE IN FEET
INTERNATIONAL PUCHASING SYSTEMS
POLYMEDCO WAREHOUSE
MOTION LABS
COPY ROOM
POLYMEDCO OFFICE/LABORATORY
EMPTY OFFICE
AA-1
AA-2
IA-15
SV-15
IA-14
SV-14
IA-13 SECOND FLOOR
SV-13
IA-12
SV-12
IA-10
IA-11
SV-11
2007 Subslab Indoor Air TCE 0.43U 0.21U DCE 0.63U 0.32U
2007 Subslab Indoor Air TCE 0.46U 0.21U DCE 0.63U 0.32U
2007 Subslab Indoor Air TCE 4.8 1.4 DCE 3.2U 0.32U
2010 Subslab Indoor Air TCE 110,000 5.1 DCE 3.2U 0.32U
2010 Subslab Indoor Air TCE 860 4.5 DCE 87 0.36
SITE PLAN SHOWING SAMPLING LOCATIONS
MAGNA METALS
CORTLANDT, NEW YORK
DATE 5.02.08
PROJECT NO. 40256
SCALE 1"=60'
FIGURE 7
AKRF Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601
©2008 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\SVS 07-08 Heating Season\Report\Figures\40256 fig 2 Site Plan Sample locs.dwg

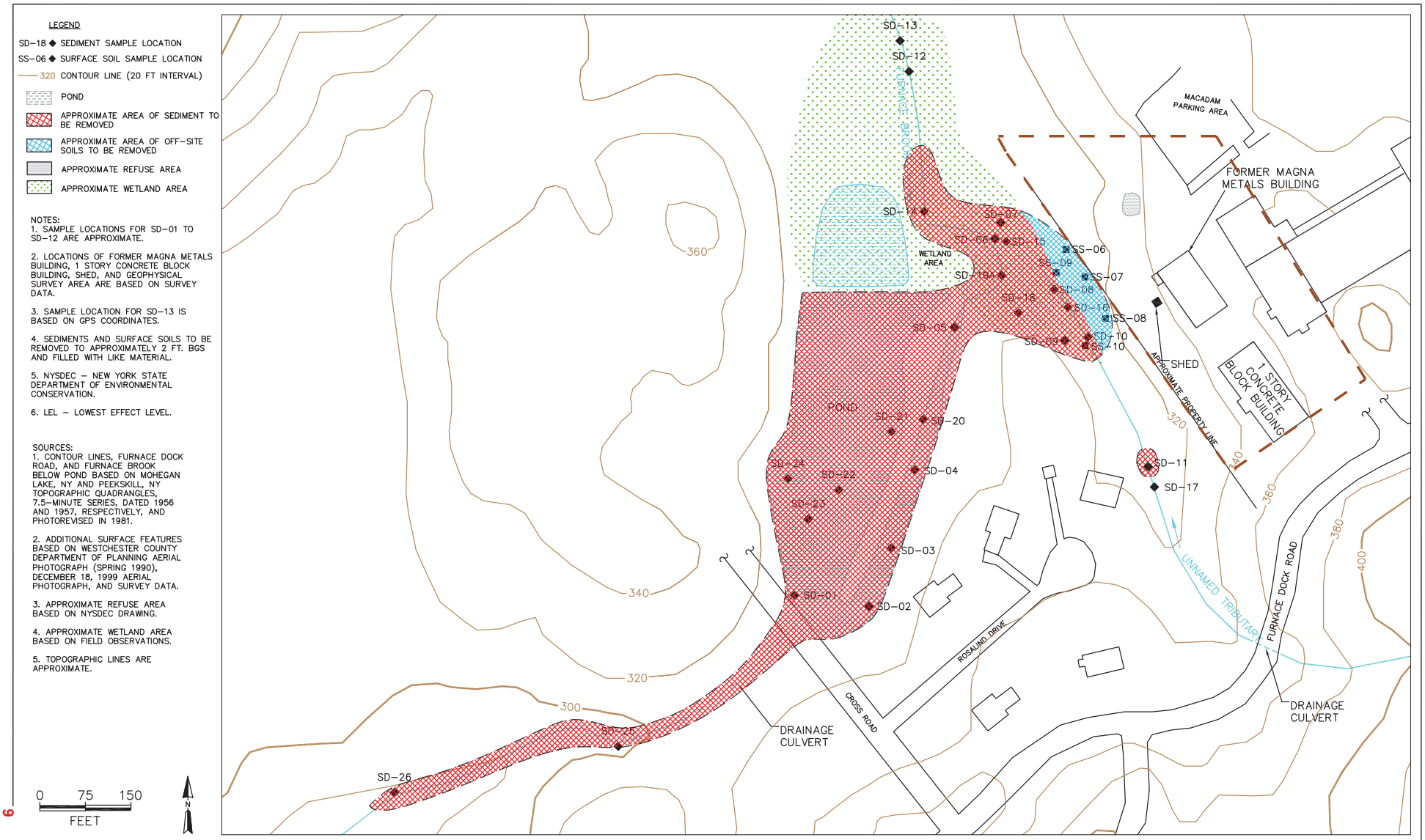


TETRA TECH EC, INC.

TITLE:
Alternative S-3: Removal of COCs in Soil Exhibiting Concentration in Excess of NYSDEC Restricted Use Commercial SCOs and Building Demolition
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		8
DATE:	REV.:	
12/09/10	1	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 4-1 ALTERNATIVE S-3 120910.DWG



TETRA TECH EC, INC.

TITLE:
Alternative SD-3C: Off-Site Removal of Metals - Impacted Sediments Above NYSDEC LELs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		9
DATE:	REV.:	
05/20/10	1	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 4-4C SEDS ABOVE LELS 052010.DWG

9

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Magna Metals

State Superfund Project

Town of Cortlandt, Westchester County, New York

Site No. 360003

The Proposed Remedial Action Plan (PRAP) for the Magna Metals site, was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 24, 2011. The PRAP outlined the remedial measure proposed for the contaminated soil, sediment, surface water, soil vapor, and groundwater at the Magna Metals site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 14, 2011, which included a presentation of the remedial investigation/feasibility study (RI/FS) for the Magna Metals as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period was to have ended on March 25, 2011, however it was extended to April 25, 2011 at the request of the public.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

Comments from March 14, 2011 Public Meeting

COMMENT 1: Were the leaching pits you describe illegal back in 1955?

RESPONSE 1: The Department has not researched the "legality" issue as the outcome of that question does not obviate the legal responsibilities to address the contamination by the responsible parties.

COMMENT 2: What years were the iterated samples taken?

RESPONSE 2: Samples were collected during the Remedial Investigation in 1996, 1997, 1998, 2003, 2004, 2005, 2006, 2008, 2010, and 2011.

COMMENT 3: Where were the off-site soil test locations?

RESPONSE 3: Samples were collected on the site and from offsite areas including in the

wetland area, Furnace Brook, an unnamed tributary, and an unnamed pond. All on-site and off-site test locations are illustrated in the final Remedial Investigation Report, located in the document repositories.

COMMENT 4: Did you find acid in the samples, did you look for acid while sampling?

RESPONSE 4: The Department did not request sampling specifically for acids because disposal occurred several years before the Remedial Investigation. Acids degrade quickly in the environment. Instead, the investigation focused on contaminants that would have been left behind from typical metals plating operations.

COMMENT 5: Were the spoil piles ever tested?

RESPONSE 5: The Department is not clear on what "spoils piles" are being referenced. The Remedial Investigation Report, available in the document repository, shows all the sampling which targeted potential areas of disposal on and off site as part of this investigation.

COMMENT 6: I see nothing in the PRAP that says the sewers you highlighted were flushed?

RESPONSE 6: The Department is not aware that the local sewers were flushed and the remedy does not include a requirement for flushing.

COMMENT 7: Has the soil under the onsite building been tested? Has the soil under my office building been tested [Polymedco]?

RESPONSE 7: Soil under the buildings has not been tested. The soil under the Magna Metals building that is in the source area will be tested when the building is taken down. The soil vapor was tested below the Polymedco building. Based on soil vapor and indoor air concentrations a sub-slab depressurization system will be installed in the Polymedco building as part of the remedy.

COMMENT 8: Will you test water and sediment downgradient? Since it wasn't in the responsible party's interest to expand the site, and since their consultant did the work, it is essential to go further downstream. Both the nature of fractured bedrock and the heavy water runoff this site experiences indicate that further downstream testing should be done. It is also recommended that additional sediment sampling be done in deposition zones (ponds) in Furnace Brook between the site and the Hudson. It also maybe a good idea to sample after a rain event.

RESPONSE 8: The areas sampled were as directed by the Department as part of the approved Remedial Investigation Work Plan. The plan included surface water and sediment sampling downgradient of the site. Further, additional sampling will occur before and after the sediment removal. The sampling of the areas immediately adjacent to the site and further downgradient of the site indicate contaminant levels decrease with distance from the site. Because contaminant levels downstream of Cross Road are very close to standards, criteria and guidance values for protecting wildlife and close to background levels, the Department does not expect the contamination has traveled further. It is noted that, typically, volatile organic compounds

volatilize quickly from surface water or are degraded in the wetland environment, while metals remain in the sediments.

COMMENT 9: I don't believe the consultant tested the Furnace Pond sediments sufficiently. We have always had heavy pulses of rain water which over the years could have moved contaminants downstream, where it would collect in other areas/ponds between the site and the river, especially recreation areas, the park, the school, and the Railroad pond- which is heavily sedimented.

RESPONSE 9: Please see response #8.

COMMENT 10: Testing should also occur during rain events, so you can gauge just how much contamination can be moved downstream.

RESPONSE 10: Sampling of surface water during rain events is not planned. Please see Response #8.

COMMENT 11: We need to know more about downstream pond contamination. Just last week, they had to close the elementary school down-gradient because of flooding.

RESPONSE 11: Please see response #8.

COMMENT 12: It appears the extent of contamination hasn't been defined in Furnace Brook downstream of the site. What if contamination is found further downstream?

RESPONSE 12: Please see response #8.

COMMENT 13: Where did they test for pelagic creatures?

RESPONSE 13: The term "pelagic" should not have been used in the PRAP in this instance. Rather, laboratory toxicity tests were performed on sediments and surface water collected from the unnamed tributary, Furnace Brook, and the wetland. Also, a benthic macroinvertebrate survey was performed to assess impacts from contaminated sediments on local invertebrate communities. The ROD corrects this information.

COMMENT 14: Over the time of the iterated sampling events, did the sampling show improvements?

RESPONSE 14: Typically the iterative samples were in different locations than previous sampling locations and therefore would not show trends over time. Volatile organic compounds found in MW-4 did not decrease between the 2003 and 2006 sampling events. Also, subslab vapor concentrations under the Polymedco Building did not vary substantially over the last several years.

COMMENT 15: What is the difference between sediment and soil?

RESPONSE 15: Generally speaking, sediments are associated with aquatic environments such as lakes, streams, and wetlands, while soils are associated with upland environments. Because fish and wildlife exposures are not necessarily the same in aquatic and upland environments, the Department has separate guidance for assessing aquatic versus upland substrates.

COMMENT 16: You've talked about human exposures, what about exposures to the fish and other critters? Downstream, people eat the fish that come out of this water.

RESPONSE 16: A Fish and Wildlife Impact Analysis (FWIA) was completed during the Remedial Investigation. The FWIA evaluated potential exposure pathways. Based on the FWIA impacts to ecological receptors are expected via direct contact with contaminated sediments in the water bodies adjacent to the Magna Metals site. Although fish tissues were not analyzed, food chain effects are unlikely considering the contaminants associated with the site.

The Department recommends that the public follow any fish advisories regarding the eating of local fish. The most up-to-date information can be found at http://www.nyhealth.gov/fish.

COMMENT 17: Do heavy metals biomagnify?

RESPONSE 17: Some metals are known to bioaccumulate and even biomagnify. Examples include lead and methyl mercury. The metals with the highest concentrations at the Magna Metals site (copper, nickel, and zinc) which pose more of a risk via direct exposure to wildlife rather than by biomagnifying up the food chain.

COMMENT 18: The fish and amphibians in downstream ponds should also be checked. Don't metals bio-accumulate in them? Your document says that cyanide and arsenic are metals. I don't think that is correct.

RESPONSE 18: Fish and amphibian tissue sampling was not conducted during the FWIA and is not planned for the future. For the protection of fish and other wildlife, the remedy includes removal of contaminated sediments exceeding the Lowest Effect Level (LEL) sediment criteria.

Although arsenic is technically a "metalloid" arsenic is included on the list of "metals" tested for using standard "metals" analytical methods. For that reason, arsenic is grouped with metals herein. Cyanide is not a metal and that correction has been made in the ROD.

COMMENT 19: Were other buildings, on site and/or off-site tested for soil vapor?

RESPONSE 19: At the request of the Department, soil vapor between the three buildings on the Magna Metals site was sampled and analyzed. The consultant also sampled the soil vapor underneath the slabs (i.e., the "subslab vapor") of the occupied building on site, the Polymedco Bldg. (See Figure 7). Neither soil vapor nor subslab vapor samples were collected off-site.

COMMENT 20: Does soil vapor dissipate quickly?

RESPONSE 20: It is difficult to answer this question in a general sense. In the soils, soil vapor contamination will persist absent removal or remediation of a source area. Vapors dissipate quickly upon entering the ambient air.

COMMENT 21: There is a test spot shown in the cul-de-sac, what was the test for and what was the finding there?

RESPONSE 21: A groundwater monitoring well was installed and sampled in the cul-de-sac. This sample was not contaminated with site related VOCs or metals.

COMMENT 22: Did you get soil vapor samples on the other side of the stream?

RESPONSE 22: No. The geology of the area suggested that shallow groundwater from the Magna Metals side of the stream would not flow across the stream, rather it would flow alongside the stream or into the stream. As a precaution, we installed a monitoring well on the opposite side of the stream and found no contamination in the groundwater. Soil vapor contamination is related to contaminated groundwater. Since the groundwater monitoring well on the opposite side of the stream shows no contamination, there is no need to test for soil vapor contamination on the opposite side of the stream

COMMENT 23: Magna Metals was the only industry between the site and the river, so if any contaminants are found further downstream, it should be traceable to them. Magna Metals is the only industry in the Town of Cortlandt, so anything you find that exceeds background level, would be attributed to this site.

RESPONSE 23: The Department has not investigated all potential sources of contamination in the Town of Cortlandt, nor in downstream areas. There are other potential sources of contamination in the area including gasoline stations, storm water and road runoff, which would not be attributable to industrial sources.

COMMENT 24: Has there been a survey to determine whether the surrounding and down gradient properties are using well water?

RESPONSE 24: Yes, the Town was contacted and questioned about public water during the Remedial Investigation. The Town indicated that all houses in the vicinity of the site are on public water.

COMMENT 25: The site is actually not zoned commercial as stated in the PRAP, but has an MD industrial designation.

RESPONSE 25: That is correct. This information is corrected in the ROD. However, this does not change the remedial goal of achieving a cleanup consistent with commercial or industrial use.

COMMENT 26: If you remediate the soil just to commercial standards, won't that limit the further use of the site? What if the Town would want to put a park there someday?

RESPONSE 26: The future use of the site would be limited to industrial or commercial uses as defined in the Department's regulations. Please note that the commercial use category allows passive recreational use.

COMMENT 27: On page 28 of the PRAP, the figure is unclear, how much soil will be removed?

RESPONSE 27: It is estimated that the amount of on-site soil to be removed is approximately 10,900 cubic yards.

COMMENT 28: What are the remedial costs?

RESPONSE 28: A comparison of the costs of all proposed alternatives is shown in Exhibit D of the Record of Decision. The remedy selected by the Department has an estimated present value cost of $10,242,000.

COMMENT 29: I work at Polymedco, and am very concerned as to how the remediation will affect the business: Will we be told to shut down, will access to our property be limited, does the Soil gas go westward? How will our building have to be retrofitted to deal with the SV? How many vents are we talking about? Depending on the size of the trucks used, we are talking up to 1,600 truckloads of stuff going out (contaminated soil) and coming in (clean fill). That can adversely affect both our business and the surrounding community.

RESPONSE 29: A subslab depressurization system (SSDS) will be installed in the Polymedco building to address soil vapor issues. A SSDS basically consists of a fan or blower which draws air from the soil beneath a building and discharges it to the atmosphere through a series of collection and discharge pipes. SSDSs are a proven, effective, and economical means for intercepting subsurface vapors that would otherwise infiltrate into a structure of concern. These systems have been successfully installed and operated in residential, commercial, and school buildings throughout New York and other states. The size and configuration of the SSDS will be determined during the design and testing phase.

The Department will endeavor to ensure that all remedial activities take place in a manner such that any disturbance to local businesses and the community will be minimized.

COMMENT 30: Will the sediment and soil removal be done consecutively, or concurrently?

RESPONSE 30: That decision has not been made yet. It will be made during the remedial design phase.

COMMENT 31: Will there be quality control to assure that the air monitoring systems put in place are actually working?

RESPONSE 31: A community air monitoring plan (CAMP) will be in place during all ground intrusive work that will be protective of the surrounding community.

COMMENT 32: Is there a chance that during remediation, you will be blasting bedrock?

RESPONSE 32: There is nothing in the remedy that would require blasting bedrock.

COMMENT 33: After the sediment is removed, will the wetlands be restored so they are functional wetlands?

RESPONSE 33: Yes

COMMENT 34: At this time, is there even a remote idea as to when actual implementation will begin?

RESPONSE 34: The remedial action will likely start in a year or two. First, the Department is required by law to offer responsible parties the option to implement and pay for the remedial action. If the responsible parties opt to do that, the Department and the responsible parties will have to negotiate a consent order and work plan. If the responsible parties decide not to do the work, the Department will hire a consultant and contractors to do the work and seek to recover those cleanup costs from the responsible parties.

COMMENT 35: If there is a delay with implementation of the remedy, and testing shows that an environmental problem like air vapor contamination increases, will there also be a delay in addressing that specific problem?

RESPONSE 35*:* Yes.

COMMENT 36: If you live in a house adjacent to this site, what are we supposed to do to protect our families? Is my only option just to knock the house down and move away?

RESPONSE 36: Soil and sediment contamination is currently limited to on-site and in the brook and pond downstream of the site. Groundwater contamination is not present underneath the adjacent homes nor is soil vapor contamination, based on downgradient monitoring well data. Outdoor air tested near the site has not been affected. Testing has not indicated a health concern for the adjacent houses.

COMMENT 37: What is an institution control?

RESPONSE 37: "Institutional control" means any non-physical means of enforcing a restriction on the use of real property that limits human or environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of operation, maintenance, or monitoring activities at or pertaining to a remedial site.

COMMENT 38: Will there be a deed restriction on the land as to future use? Is it the same as an environmental easement? Page 27 of the PRAP refers to a conservation easement; will that be built into the plan?

RESPONSE 38: There will be an "environmental easement" on the property that will limit the future use of the site as follows: the site cannot be used for residential purpose nor can the groundwater be used for drinking without explicit approval of the NYS Department of Health or Westchester County Health Department.

COMMENT 39: When this site was put on the registry? Who was notified and when?

RESPONSE 39: The site was put on the NYS Registry of Inactive Hazardous Waste Sites in December 1985. At that time it was typical that the site owner and operator(s) were notified as well as all adjacent property owners immediately after the determination was made to put it on the Registry.

COMMENT 40: Some of us here never got the fact sheet until this evening. Now we only have 10 days to submit comments? In fairness, the comment period should be extended.

RESPONSE 40: The comment period was extended thirty days.

COMMENT 41: The Town of Cortlandt has an official paper, is it on your contact list?

RESPONSE 41: .We've been advised that the official paper of the Town is the "Gazette". This weekly publication was not on the original mailing list. The following addition has been made to the list for future mailings: City Editor, The Gazette, P.O. Box 810, Cortlandt NY, 10520

COMMENT 42: Is the resident at 6 Roslyn Court on your mailing list?

RESPONSE 42: Yes.

COMMENT 43: Were town residents notified/informed during the remedial investigation?

RESPONSE 43: The Department routinely issues a fact sheet prior to the start of the remedial investigation.

COMMENT 44: Some attendees were not aware of the public meeting or comment period until very recently.

RESPONSE 44: The Fact Sheets were mailed as soon as the meeting was scheduled. Prior to the fact sheet being mailed, a site contact list was developed which included 25 media outlets, 19 local/elected officials, 13 environmental groups, 40 adjacent property owners and other interested parties of whom we were aware. For the mailing that announced the extension of the comment period, the mailing list was substantially increased to reflect those in attendance at the public meeting and others who provided comments during the initial comment period. As the remedial process continues, it is expected that the mailing list will expand to include others who express an interest in the ongoing activities. In the future, computerized mailing lists (listservs) will also be used as a means of communicating with the public. Interested parties are encouraged to sign up for electronic notifications at this time: see www.dec.ny.gov/chemical/61092.html.

COMMENT 45: What level of outreach was performed in the past; was the Town notified?

RESPONSE 45: In 1996, at the beginning of the remedial investigation, a Fact Sheet was developed by the Foster Wheeler Environmental group titled: "NYSDEC To Begin Field Sampling Program For a Remedial Investigation/Feasibility Study at the Former Magna Metals Site". Fact sheets for this site were to be sent to the public contact list developed by NYSDEC. In addition to the names of the "Neighboring Property Owners" provided by the Tax Assessor office, there were 42 media entries and 10 Environmental Groups included. This list also included: 2 US Senators; one Congresswoman, a State Senator, State Assemblyperson, County Executive, County Clerk, County Legislature Chairman, County Legislature Clerk, Town of Cortlandt Supervisor, Town of Cortlandt Clerk, Town of Cortlandt Comptroller, and four Town of Cortlandt Councilpersons. The most recent fact sheet was disseminated in February 2011, a public meeting was held in mid March 2011, and a subsequent mailing was sent out extending the PRAP comment period in late March 2011.

Karen Jescavage-Bernard submitted a letter dated March 14, 2011 which included the following comments:

COMMENT 46: The scope of the RI is too limited by defining the on-site as: the derelict Magna Metals building, the north and west leach pits, the building currently used to warehouse paper, the office portion of the Polymedco building, the laboratory, and an undefined "offsite" area (page 3).

RESPONSE 46: The site was defined to represent the portion of the entire parcel where disposal activities were believed to have taken place. The Department did not request sampling of the entire 26 acre parcel because it was not suspected that hazardous waste was disposed of on the entire site based on the historic industrial/commercial activities. The definition of “off-site” is not limited to any specific area, it is any area not on site and hence, by definition its boundaries are undefined.

COMMENT 47: The plan overlooks the crucial fact that the Furnace Brook, which receives and carries most of the contaminated water and sediments from the site, flows for approximately three miles downhill to the Hudson River. En route, it passes through school grounds and through private and public ponds. Do local school children use the ponds and/or streams for recreation or science projects? Certainly the ponds are used for recreation, including fishing. One of these ponds is in a county park (the McAndrews' estate). Another (Railroad Pond) is about to be purchased by the Town of Cortlandt. No testing has been done in these areas or along the course of the Furnace Brook.

RESPONSE 47: See response # 8.

COMMENT 48: It's clear from the section of the report describing the topography and hydrogeology of the Magna Metals site, that contaminated water and sediments continue to flow through this stream and pond system, as they have been flowing for the 56 years since the plant

began operations. Testing must be done along the Furnace Brook between the Magna Metals site and the Hudson River.

RESPONSE 48: Please see response No. 8.

COMMENT 49: The scope of the proposed remediation has been based on SCGs for commercial use. These standards preclude any other future use of the land by the Town of Cortlandt.

RESPONSE 49: Commercial cleanup goals allow for passive recreational use. These commercial goals would apply to the site proper, i.e., the 3.3 acre area. The cleanup goals for off-site are for unrestricted use. There are procedures for a change of use if in the future a less restrictive use is desired (e.g., residential use), which procedures may require additional activities to ensure the protectiveness of the remedy.

COMMENT 50: Given the fact that the potential downgradient contamination impacts an enormous number of local residents, including those drawn to existing and/or planned recreational amenities and attractions focused on the Furnace Brook and the ponds through which it flows, that a remediation plan based on SCGs for commercial reuse of the site is grossly inadequate and incomplete.

RESPONSE 50: The remedy selected by the Department calls for different cleanup criteria for the on-site (approximately 3.3 acres) and for off-site areas adjacent to the site and along Furnace Brook. Off-site sediments will be cleaned to the Lowest Effect Levels criteria for sediments and off-site soils will be cleaned to the unrestricted soil cleanup objectives. On-site soils will be remediated to Commercial Use and Groundwater Protection soil cleanup objectives. It is expected that the site will not continue to contribute contamination to groundwater post-cleanup. Therefore, the remedy is appropriate.

Susan McDonnell on behalf of Cortlandt WATCH submitted an e-mail dated March 26, 2011 with the following comments:

COMMENT 51: The Clean Water Act became law in 1972. It focused on Point Source Pollution, that which had a definite starting point, such as the Magna Metals plant. This plant operated from 1955 to 1979. 1955 to 1972 is 17 years. Seventeen years when environmental degradation took place unheeded and unregulated. How much chemical waste was let loose into the stream? When was the testing done? Who did it, who disposed of the test materials, is there a paper trail leading to the last deposit of the materials?'

RESPONSE 51: The Department (NYSDEC) does not know how much material was released into the stream. Beyond the testing mentioned above (response #2) other previous investigations include the following: A water pollution investigation was performed in October 1978 by the Westchester County Health Department; the leaching pits were emptied in 1980; the NYSDEC collected additional samples from the leach pits in 1982; in 1983 a pollution investigation conducted by the Westchester County Department of Health revealed significant quantities of solvents in the leach pits, in tanks on site, and in adjacent streams and sediment; and in May 1984 the NYSDEC collected additional environmental samples. This is discussed in

more detail in the Remedial Investigation in the document repository.

Regarding the collection and disposal of analytical samples, those samples would've been collected by the parties mentioned above or their contractor/consultant. Samples are disposed of by the laboratory that did the analysis. The quantity of material collected for each sample is typically small: a few ounces to a quart of water for a water sample, 4-8 oz. per soil sample. Each individual lab would have records regarding sample disposal.

COMMENT 52: The configuration of the brook - steep downhill gradient, twisty, rocky, variably shallow, with great seasonal variation in depth and flow, make it VERY unlikely that metals precipitated out close to the Magna Metals plant and nearby site.

RESPONSE 52: The Department respectfully disagrees. Please see Response #8.

COMMENT 53: WATCH asks for more testing, especially the areas downstream from the previous testing sites. The site is approximately 440 feet above sea level. Therefore the water as it travels approximately 3 miles to the Hudson it also lowers by 400 or more feet.

RESPONSE 53: Please see response #8.

COMMENT 54: WATCH asks for a full report on the results, especially in places where the public accesses water bodies for fishing and recreation such as Furnace Brook Lake.

RESPONSE 54: All work plans and reports, including testing results are available in the public repository and will continue to be available to the public.

COMMENT 55: WATCH asks for notification to homeowners whose homes have been built since the testing was done (since 1985).

RESPONSE 55*:* Please see Response #44. Also, the Department encourages all neighbors and interested party to sign up for the listservs or contact the project manager to be added to the site's mailing list. See www.dec.ny.gov/chemical/61092.html.

COMMENT 56: As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site on the Registry of Inactive Hazardous Waste Disposal Sites in New York in December 1985. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

These higher levels were found in and around the leaching pits, up to 12 feet below ground surface. Groundwater is contaminated with volatile organic compounds (VOCs), cyanide, and metals. Concentrations of the majority of metals were greater in the downgradient tributary and/or wetlands surface water samples in comparison to the upstream samples.

The building is dilapidated and sample data has not been collected underneath the building due

to the building condition. After the demolition of the building, further soil sampling would be undertaken to define the limits of the contamination beneath the building footprint.

RESPONSE 56: Comments acknowledged.

COMMENT 57: I found the description of the "Green Remediation" on page 10 impressive.

RESPONSE 57: Comment acknowledged.

COMMENT 58: Where will the residue [excavated material] be taken, a protected land fill?

RESPONSE 58: The exact disposal facility has not yet been determined. The excavated material must be properly disposed of off-site at a facility permitted to accept the waste material.

COMMENT 59: It's good to know that there will be a conservation easement that is written and will be monitored as CE should be!

RESPONSE 59: Comment acknowledged. However, as discussed in response to Comment #38, the mechanism used to control access to the site will be an environmental easement.

COMMENT 60: The tables were unreadable due to blurring.

RESPONSE 60: The Department apologizes for the inconvenience and will rectify this issue for the next printing.

COMMENT 61: Considering you found contaminants as described it would seem sensible to go to areas where NO contaminants are found before declaring "that's that".

RESPONSE 61: Prior to the start of the soil and sediment removal actions, further sampling and investigation will be performed to ensure the limits of contamination are clearly understood. The "pre-design" studies are mentioned specifically as part of the remedy. Also, after soil and sediments have been excavated further sampling will occur to verify that cleanup objectives have been obtained.

COMMENT 62: Considering the Town of Cortlandt is poised to take ownership of Furnace Brook Pond, will there be a cost to the town for this and/ or will there be a continuing cost? There is a yearly estimated cost of $44, 000. Will there be a fund to cover this from a source other than our town taxes?

RESPONSE 62: The commenter most likely means Furnace Brook Lake, which is approximately 2.8 miles from the site. The Department is not considering monitoring of this lake.

The Town of Cortlandt submitted a letter dated March 23, 2011 with the following comments:

COMMENT 63: [Extend the] public comment period for at least another thirty days from March 25, 2011.

RESPONSE 63: The comment period was extended 30 days.

COMMENT 64: Submit a copy of [the Department's] complete file of this site and test results to the Town.

RESPONSE 64: The Department responded to the Town's request thru the Freedom of Information Law (FOIL).

COMMENT 65: Expand the testing area to include soil and water body testing in a larger area than what is now being considered by [the NYSDEC].

RESPONSE 65: Please see response #8.

COMMENT 66: This is a NYSDEC reclamation project from a company that no longer owns the property. The NYSDEC was only established in 1970 and the federal EPA in 1972. Therefore, in the 1950's and 1960's when the company was in full operation there were unfortunately NO strong environmental laws or agencies to scrutinize the waste and byproducts of these types of industries. The NYSDEC is only now (2011) holding a public hearing to proceed with the clean-up plans decades later and have never officially notified the Town about the significance or urgency of this situation.

RESPONSE 66: Please see response #43 and #45.

COMMENT 67: [The Department] claims they sent one letter in 1998 but we have no record of that being sent to us nor any letter in our files. However, now that we are aware of this potential Superfund site we are taking action and requesting additional tests be done and to receive copies of all of the [the Department's] records in their files and to allow for a longer comment period of time for our community to make their statements and to ask questions.

RESPONSE 67: Please see responses #40, #43, and #45.

Don Duthaler of Baker Capital submitted a letter dated April 20, 2011 with the following comments:

COMMENT 68: The property is owned by Baker Capital Limited Partnership, not Baker Properties. Baker Capital purchased the property from ISC Properties, Inc. in 1982.

RESPONSE 68: Comment acknowledged and corrected.

Nick Ward-Willis of Keane & Beane, P.C., received May 9, 2011 with the following comments:

COMMENT 69: Section 3 of the PRAP incorrectly identifies the prior owners of the subject property. ISC Corporation and Lightron Corp. were never owners of the subject property. ISC Properties, Inc. was a prior owner that sold the subject property to Baker Properties in November, 1982.

RESPONSE 69: That is correct. Based upon available information, ISC Properties, Inc., a wholly-owned subsidiary of Griffon Corporation (formerly named Instrument Systems Corporation), owned the Site until it sold in November 1992, and although Lightron Corporation conducted plating operations on the Site, it never owned the Site. Our records have been revised accordingly.

COMMENT 70: Section 5 of the PRAP fails to identify Baker Properties, Inc. ("Baker") as a potentially responsible party ("PRP"). Baker is the present owner of the subject property and has owned it since 1982. The Department should identify Baker as a PRP.

RESPONSE 70: Comment acknowledged and corrected.

COMMENT 71: NYSDEC approved the November 2010 Feasibility Study (FS) Report in which Alternative SD-3A was recommended for the remediation of sediment impacts. However, the February 2011 PRAP proposes Alternative SD-3C for the remediation of sediments. The information in the FS supported the selection of Alternative SD-3A, which-is protective of human health and the environment, as the preferred alternative. What is NYDSEC's rationale for proposing Alternative SD-3C in the PRAP?

RESPONSE 71: The Department's rational is discussed at length in the PRAP dated March 2011 and this ROD. Alternative SD-3C provides the best balance of remedy selection criteria as set forth in 6 NYCRR 375-1.8.

COMMENT 72: The NYSDEC "Technical Guidance for Screening Contaminated Sediments" indicates that remediation of contaminated sediments should not be based solely on exceedance of LEL/SEL criteria, which is the basis of Alternative SD-3C. NYSDEC recommends that a site-specific evaluation procedure be used to quantify the level of risk, establish remediation goals, and determine the appropriate risk management actions. The use of site specific studies is also endorsed for identification of remediation areas and cleanup goals as part of the Fish and Wildlife Impact Analysis (FWIA) for hazardous waste sites. The Remedial Investigation Report for the site presented a number of site-specific studies that used biological and toxicological characteristics of the surface water, sediments, and aquatic communities present at the Site. The results of these site-specific analyses were used to develop the ecological PRGs identified in the FS, and were the basis for Alternative SD-3A. The site-specific studies indicate that Alternative SD-3A is protective of the environment. Their development integrated observed biological, toxicological and bioavailability results, and cleanup to these goals was considered to be protective of the ecological communities present on the Site. However, the PRAP indicates that SD-3A is not protective. Why is NYSDEC recommending Alternative SD-3C when the site-specific data support implementation of SD-3A as recommended in the FS?

RESPONSE 72: An FWIA was completed during the RI and included site-specific studies as mentioned in the above comment, however the Department has repeatedly disputed the responsible party's interpretation of data used in support of their site-specific cleanup goals. The Department considered local background concentrations and has incorporated those into alternative SD-3C. Further, the Department considered the footprint of removing only those sediments with higher metals concentrations (e.g., exceeding SEL criteria), and found the remedial footprint to be nearly identical, further supporting Alternative SD-3C.

COMMENT 73: Alternative SD-3C would be much more disruptive to local home owners and the public, as the number of residential properties that would be disturbed is much greater than for Alternative SD-3A. There will also be a significantly greater number of trucks transporting material off site and returning with clean fill in order to implement Alternative SD-3C, resulting in a greater potential exposure to the public. Has NYSDEC adequately considered these short-term risks versus the incremental long-term risk reduction that may be achieved by implementing Alternative SD-3C, since Alternative SD-3A would result in less risk during implementation, and has also been shown to be protective of human health and the environment?

RESPONSE 73: There will be some disturbance to the community and the Department will explore avenues during design to ensure the disruptions are kept to a minimum. As stated in the feasibility study prepared by the responsible party's consultant, "Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material from the site to an appropriate disposal facility." Also, access issues will be thoroughly vetted with affected property owners. Regarding the last sentence, please se*e comment 71. The levels of protection between Alternatives SD-3A and SD-3C are not equivalent. The sediments proposed for removal exceed Severe Effect Levels (SELs) and are "considered to be severely impacted"*.

COMMENT 74: Alternative SD-3C is estimated to cost $5.4 million dollars, roughly 3 times more than the estimated cost of $1.8 million for Alternative SD-3A. Since both alternatives are protective of human health and the environment, is this cost differential justified for the removal of a large quantity of sediments containing little contamination that does not exhibit a negative ecological or human health impact?

RESPONSE 74: The Department believes, upon consideration of all the remedy selection criteria, that SD-3C is the appropriate remedy. The cost was considered but not controlling.

COMMENT 75: Alternative SD-3A was shown to be protective of human health and ecological resources, and it achieves habitat assessment-based cleanup goals that were demonstrated during the remedial investigation to be protective of ecological receptors under site-specific conditions. Alternative SD-3C would remove additional sediment with low levels of contamination and result in less residual contamination however, this would be achieved through a significantly larger disturbance of natural habitats, including wetlands, a pond and streams that extend onto multiple third party properties. Since Alternative SD-3A removes contamination to below levels that were demonstrated in the remedial investigation to be protective of ecological

resources, it is not clear why the NYSDEC would advocate significant additional disturbance of natural habitats and private properties to implement Alternative SD-3C.

RESPONSE 75: Please see responses #71, #72, and #73.

COMMENT 76: Based on the above comments, the Department's selection of Alternative SD-3C is without support in the Remediation Investigation and Feasibility Study Reports. Rather, the Department should select Alternative SD-3A as recommended in the approval and accepted Feasibility Study.

RESPONSE 76: Please see responses #71, #72, and #73.

APPENDIX B

Administrative Record

Magna Metals
State Superfund Project
Town of Cortlandt, Westchester County, New York
Site No. 360003

Proposed Remedial Action Plan for the Magna Metals site dated February 2011, prepared by the Department.

Order on Consent, Index No. W3-0010-81-01 between the Department and ISC Properties, Inc. executed on May 21, 1996.

"Citizen Participation Plan for the Magna Metals Site" dated March 1995 prepared by Foster Wheeler Environmental Corporation.

"Work Plan for Phase II Investigation at The Former ISC Property (Magna Metals)" dated September 1986, prepared by EBASCO Services Incorporated.

"Supplemental Remedial Investigation/Feasibility Study Work Plan Addendum for the Magna Metals Site Lightron Corporation" dated March 2003 prepared by Foster Wheeler Environmental Corporation.

"Magna Metals Site Soil Vapor Investigation Work Plan (Revised)" dated February 2007 prepared by AKRF, Inc.

"Magna Metals Site Soil Vapor Monitoring Plan" dated August 2009 prepared by AKRF, Inc.

"Remedial Investigation/Feasibility Study Report for the Magna Metals Site" dated November 1998 prepared by Foster Wheeler Environmental Corporation.

"Final Remedial Investigation Report for the Magna Metals Site Volume 1 of 2" dated August 2007 prepared by Tetra Tech EC, Inc.

"Final Remedial Investigation Report for the Magna Metals Site Volume 2 of 2" dated August 2007 prepared by Tetra Tech EC, Inc.

"Additional Data Collection Data Summary Report for Magna Metals Site" dated January 2009 prepared by Tetra Tech EC, Inc.

"Soil Vapor Investigation Report" dated June 2007 prepared by AKRF, Inc.

"Soil Vapor Investigation Report" dated May 2008 prepared by AKRF, Inc.

"Soil Vapor Investigation Report" dated June 2009 prepared by AKRF, Inc.

"Soil Vapor Investigation Report" dated April 2010 prepared by AKRF, Inc.

"Feasibility Study Report for the Former Magna Metals Site" dated November 2010 prepared by Tetra Tech Engineering Corporation.

15 (12/75)

DGY - Pls change the appropriate [illegible] document to file in

New York State Department of Environmental Conservation

MEMORANDUM

TO: Dave Knowles - Chief, Remediation Unit, Bureau of Hazardous Waste - Albany
FROM: Jack Doty - ~~Region 3~~ Toxics Unit - White Plains
SUBJECT: #360003 MAGNA METALS
DATE: January 16, 1981

JD.

Westchester Co. Reg #3

On September 18, 1980 Dick Paccione of Westchester County Department of Health and I inspected the Magna Metals facility and their leaching system. Mr. James Boyle, V.P. of Operations and Jim Yetman an employee of Lightron Residential Lighting (parent company) escorted us and provided the following information.

Magna Metals ceased their metal plating operation in June, 1979 and has relocated in Rockland County. During December, 1979, January and February, 1980 Lightron contracted with Frontier Chemical Waste to clean up and remove all drummed waste and the contents of the leaching pits (invoice attached). During our inspection all (9) leaching pits were clean except the first and second pits from the building, which we were told receive cooling water from the TCE bath and the buildings floor drains. There are an additional two septic tanks which receive sanitary waste. The downgradient area of the leaching pits, where the vegetation had succumbed to the waste flow, has established new growth. Although there may remain some residual contamination of the soil, groundwater, or small wetland area, the source of the problem has been eliminated and the remoteness of the facility would further limit any impact. It has further been determined that this region's water unit will follow up regarding the currently existing discharges. For the purposes of the In-Place Toxic Program, and based on this inspection and information, this site should be reclassified to F.

JD:mbw
cc: Jack Harrison
Gil Burns
Cesare Manfredi
Dick Paccione

RECEIVED
JAN 1 9 1981
BUREAU OF HAZARDOUS WASTE MANAGEMENT PROGRAMS

#364. Magna, Lightron Division

CODE NO.	DESCRIPTION	DISPOSAL CHARGE
364-01	Muriatic Acid	$25.00/drum
364-02	Potash Cleaners	(see -08 material
364-03	Nitric Acid	$34.00/drum
364-04	Copper Cyanide	(see -08 material
364-05	Nickel Plating Bath	$36.00/drum
364-06	Electro-Plack Cyanide	(see -08 material
364-07	Leaching Pit Waste	(see -08 materia
364-08	Combination of -02, -04, -06 & -07	$.077/lb.

OFF SPEC CHARGES: All disposal charges are based upon information and/or samples submitted to Frontier. Wastes which deviate substantially from this data may result in off-spec charges if such deviation requires additional processing.

FREIGHT: (Drum) $875.00 per truckload of 80 drums or less
$500.00 per truckload of 40 drums or less
(Bulk) $2.10/hundredweight (minimum 40,000 lbs.) plus $50.00/hr while on site.

FUEL SURCHARGE: Will appear on invoice as separate line item as per current I.C.C. regulations. Subject to change without notice. (Currently 4%).

DELAY/DETENTION TIME: 1½ hours loading time is included in the above full drum rate of 80 drums or less, and 1 hour loading time for partial load of 40 drums. Additional loading time, wherein the customer is the cause of the delay, will be billed at $23.50/hour.

MISCODED DRUMS: Improperly coded drums are both a hazard and a cause of additional handling and analysis. Any drums which are improperly coded will result in all additional costs being passed on to the customer.

EXCESSIVE SOLIDS: Settleable solids which remain in the drum after pumping present an additional disposal problem. Such solids will result in additional charges when they exceed 10% by volume.

WEIGH STATION TOLL: $3.00 per pickup (bulk loads only)

SCHEDULING: When possible, pickups should be scheduled at least 48 hours in advance by calling Mr. Bob Oleszko at (716) 285-8208.

TERMS: Net 30 days. (7% Sales Tax).

November 13, 1979

#364. Magna, Lightron Division

CODE NO.	DESCRIPTION	DISPOSAL CHARGE
364-09	Waste Trichlorethylene (max. 10% Water)	$24.00/drum
364-10	Contaminated Paint Thinners (no chlorine; 10% settleable solids)	$20.00/drum

OFF SPEC CHARGES: All disposal charges are based upon information and/or samples submitted to Frontier. Wastes which deviate substantially from this data may result in off-spec charges if such deviation requires additional processing.

FREIGHT: $875.00 per truckload of 80 drums or less
$500.00 per truckload of 40 drums or less (when picked up in conjunction with another area pickup).

FUEL SURCHARGE: Will appear on invoice as separate line item as per current I.C.C. regulations. Subject to change without notice. (Currently 4%).

DELAY/DETENTION TIME: 1½ hours loading time is included with the full drums rate of 80 drums or less. 1 hour loading time is included with partial load of 40 drums or less. Additional loading time, wherein the customer is the cause of the delay, will be billed at $23.50/hour.

MISCODED DRUMS: Improperly coded drums are both a hazard and a cause of additional handling and analysis. Any drums which are improperly coded will result in all additional costs being passed on to the customer.

EXCESSIVE SOLIDS: Settleable solids which remain in the drum after pumping present an additional disposal problem. Such solids will result in additional charges when they exceed 10% by volume.

SCHEDULING: When possible, pickups should be scheduled at least 48 hours in advance by calling Mr. Bob Oleszko at (716) 285-2808.

TERMS: Net 30 days. 7% Sales Tax.

Quote valid for 30 days unless otherwise stipulated.

December 19, 1979

WARNING - HAZARDOUS MATERIAL - BILL OF LADING

3583

INVOICE

DATE 12-6-79

Taxable

FRONTIER
CHEMICAL WASTE PROCESS INC.
526 Royal Avenue, Niagara Falls, N.Y. 14303 (716) 285-8208

Magna Lightron Div.
Furnace Dock Road
P.O. BOX 23

Peekskill, NY 10566

Vac- A.M. P/U with 50 ft. hose
Jim Yetman

O. NO.	DRIVER	TRACTOR	TRAILER
	VERN	1	142

QUANTITY	PROD. CODE	DESCRIPTION	UNIT PRICE	HAZARD CLASS	AMOUNT
49,730	364-08	Corrosive Liquid, N.O.S. (Caustic and Cyanide)	.077/lb	Corrosive	$3,833.06

REQ'D ORDER PRICES

88 2/27 92960 92

OFF SPEC REPORT & CHARGES

8/14/80 PD $1000.00 CR# 14184 Bal due 3782.25

See attached off spec charges on the attached sheet: 635.50

SHIPMENTS PICKED UP PER CUSTOMER SPECIFICATION

WEIGHTS	RATE	REQUIRED D.O.T. PLACARDS	
22580 - weight loaded		Corrosive	
32800 - weight unloaded	2.10 cwt.		1,045.38
49730 - load	9% fuel surcharge	FREIGHT CHARGES	41.82
	$50.00/hr while on site	(5¼ hrs)	262.50

LOADING TIME		UNLOADING TIME	
OUT 2:25	OUT 4:15	IN	
11:50	IN 4:15	OUT	
EXPLAIN DELAY		EXPLAIN DELAY	
		PUMPING CHARGE	
		WEIGHTS TOLL	3.00
DELAY CHARGES RATE		AMOUNT TOTAL	

4/17/80 PD ck #12937 $1000.00 Bal due $3782.25

4/3/80 PD ck #12782 $500.00 Bal due 5782.25

4/10/80 PD ck #12842 $500.00 Bal due $5282.25

COMMENTS

CHARGES	5,871.26
TAX	410.99
TOTAL	6,282.25
NET 30 DAYS	6,282.25

SHIPPER'S CERTIFICATION.
THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION

[signature] 12/1/79
RELEASED BY DATE

Magna Lightron Div.
Furnace Dock Road
P.O. BOX 23
Peekskill, NY 10566

Date of P/U 12-6-79
Billing Date 12-11-79
B/L# 3583

OFF SPEC CHARGES:

Shipment contained approx. 400 gallons of extraneous solids (dirt, sticks, paperts, etc.) requiring manual removal from truck, drumming of solids and burial in a secure chemical landfill.

LABOR: (to remove & drum solids) 14 man hrs. @ $18.00/hr	252.00
LABOR: (to repair 2 clogged pumps) 2 3/4 hrs. @ $18.00/hr	49.50
Drum cost 8 drs. @ $8.00/dr.	64.00
Disposal 8 drs. @ $10.00/dr	320.00
	$685.50 (off spec charges)

WARNING - HAZARDOUS MATERIAL - BILL OF LADING

4036

FRONTIER Taxable
CHEMICAL WASTE PROCESS INC.
[illegible] Royal Avenue [illegible] (716) 285 8208

INVOICE

DATE 1-31-80

Magna Lightron
Furnace Dock Road, P.O. BOX 23
Peekskill NY 10566

O. NO.	DRIVER	TRACTOR	TRAILER
	PAUL	17	108

QUANTITY	PROD. CODE	DESCRIPTION	UNIT PRICE	HAZARD CLASS	AMOUNT
5	364-09	drums WASTE Tri Chlorethylene			
6	" -10	Paint Thinners			
2	" -03	} Acids.			
2	" 05				
1	01				
36	Total				

92960 92

REC'D ____ CK ____ EXT. ____
PRICES ____ CK ____ PKG BY ____

OF SPEC REPORT & CHARGES				
1 drum	364-01	25.00		25.00
2 drums	PPD -03	34.00		68.00
2 drums	-05	36.00		72.00
4 drums	DISC. -09	24.00		96.00
24 drums	-10	20.00		430.00
Off Spec Charges - See Attached Sheet			CK	601.00

SHIPMENTS PICKED UP PER CUSTOMER SPECIFICATION

WEIGHTS	RATE	REQUIRED D.O.T. PLACARDS	
	$500.00/40 drums		500.00
	5% fuel surcharge	FREIGHT CHARGES	25.00

LOADING TIME		UNLOADING TIME	
T 8:30 AM	OUT 1:30 PM	IN	
11:00 am	IN	OUT	
PLAIN DELAY Slow loading at 12:00 PM		EXPLAIN DELAY	
ent to lunch.			
		PUMPING CHARGE	
		WEIGHTS TOLL	
AY CHARGES RATE 1½ hrs. @ 23.50/hr.		AMOUNT TOTAL	35.25

MMENTS

CHARGES	$1902.25
TAX	133.15
TOTAL	$2035.40
NET 30 DAYS	$2035.[illegible]

PER'S CERTIFICATION
[illegible] THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, [illegible] PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR [illegible]NSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF [illegible]PORTATION

[illegible] 1/31/80

RELEASED BY DATE

OFF-SPEC REPORT - DRUMS

DATE RECEIVED: 2/5/80

CUSTOMER: Magna Lightron

QUANTITY RECEIVED: 36 drums

PICKUP ORDER NO: 4036

FRONTIER INVOICE #: 4036

FRONTIER INVOICE DATE: 2/12/80

CUSTOMER P.O. #:

NATURE OF CHARGES	ADDITIONAL CHARGE
2 drums coded 364-05 contained approx. 45% residual solids in drum after pumping. Additional handling and disposal charge $22.00 per drum	44.00
1 drum coded 364-09 contained aqueous contam. with chlorinated aqueous (no code assigned, Disposal charge $39.00 per drum	39.00
19 drums coded 364-10 contained approx. 50% residual solids in drum after pumping. Additional handling and disposal charge $22.00 per drum	418.00
2 drums coded 364-10 contained 100% solids (no code assigned). Disposal charge $45.00 per drum	90.00
1 drum coded 364-09 should be coded 364-10. Additional charge $5.00 per drum	5.00
1 drum coded 364-10 should be coded 364-09. Additional charge $5.00 per drum	5.00

COMMENTS:

TOTAL NET OFF SPEC CHARGES: $601.00

SIGNED: Peter Hessinger (ph)

Hardesty Chem File

New York State Department of Environmental Conservation
Division of Environmental Enforcement
202 Mamaroneck Avenue Room 304
White Plains, N.Y. 10601-5381

Henry G. Williams
Commissioner

May 27, 1987

Edward S. Wactlar, Esq.
Blau, Kramer, Wactlar & Lieberman, P.C.
Attorneys at Law
100 Jericho Quadrangle
Jericho, New York 11753

NO COMMENTS MADE SINCE PRP ATTORNEY ALREADY HAS CO
MLP
6/10/87

CERTIFIED MAIL/RRR

Re: ISC PROPERTIES, INC.
ORDER ON CONSENT
Site # 360003

Dear Ed:

Enclosed please find two copies of the Order on Consent for the field investigation to be conducted by ISC Properties, Inc. at the former Magna Metals site in Westchester County. I believe the terms of the proposed Order conform to the agreements we reached.

Should the proposed Order meet with your approval, please have an authorized official of ISC Properties sign both copies before a Notary Public and return both copies to me. I will send you a fully executed Consent Order when it has been signed by the Commissioner.

In addition, please include a map of the site, which will be incorporated in the Order as Appendix "A", and the Approved Phase II Work Plan, which will be incorporated in the Order as Appendix "D". As we discussed, the Approved Phase II Work Plan consists of the following documents:

- The work plan submitted by EBASCO Associates in September 1986.
- The revised pages, as transmitted by Dr. Horzempa to myself on January 13, 1987. These pages are: 12, 13, 20, 21, 22, 30, B-20, B-21 and D-17.

When I receive the signed Orders, I will have the following documents attached as appendices:

- The Department's determination, based on the 1982 field investigation (Appendix B).

- The laboratory analysis results of the 1983 and 1984 sampling (Appendix C).

- The approval of the Phase II Work Plan, contained in my letter to you, dated February 17, 1987 (Appendix E).

Thank you for your continuing courtesy and cooperation in this matter. Please feel free to call me if you have any questions.

Very truly yours

Louis A Evans

Louis A. Evans
Assoc. Attorney

LE/jg

Encl.

cc: Vance Bryant
Richard Gardineer
Marsden Chen
Femi Falade
Ron Tramontano
Dr. Lewis Horzempa

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of a Field Investigation,to Identify Any Threat to the Environment Caused by the Disposal of Industrial and Hazardous Wastes, to be Developed and Implemented By

ISC PROPERTIES, INC.,

Respondent

ORDER ON CONSENT

Index # TO092286

WHEREAS,

1. The New York State Department of Environmental Conservation (the "Department") is responsible for the enforcement of Article 27, Title 13, of the Environmental Conservation Law of the State of New York (the "ECL"), entitled "Inactive Hazardous Waste Disposal Sites".

2. Respondent is a corporation, incorporated under the laws of the State of New York, with offices in Jericho, New York and is doing business in the State of New York.

3. Respondent formerly owned real property in the Town of Cortlandt, County of Westchester, State of New York (the "Site"). The Site is presently owned by a company known as Baker Properties, Inc. A map of the Site is attached hereto and is hereby incorporated into this Order as Appendix "A".

4. The Site was formerly occupied by a company known as Magna Metals, Inc. ("Magna"). Magna conducted industrial plating operations at the Site until approximately June 1979. In the course of its operations, Magna installed nine pits (the "Leaching Pits") at the Site for the purpose of receiving industrial and hazardous waste and depositing said waste into the ground and groundwaters.

5. The Site is an inactive hazardous waste disposal site, as that term is defined in ECL Section 27-1301(2).

6. Pursuant to ECL Section 27-1313(3)(a), whenever the Commissioner of Environmental Conservation (the "Commissioner") "finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment, he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program, subject to the approval of the department, at such site, and (ii) to implement such program within reasonable time limits specified in the order."

7. In July 1982, Respondent and the Department entered into an Order on Consent, pursuant to which Respondent conducted a field investigation program to determine whether concentrations of heavy metals in the Leaching Pits had resulted in a significant threat to the environment at the Site. In November 1982,

following Respondent's submission of its report on said field investigation program, the Department determined that no significant threat to the environment had resulted from the disposal of heavy metals at the Site. A copy of the Department's determination is annexed hereto as Appendix "B".

8. Sampling and analysis conducted by the Department in 1983 and 1984 indicated the presence of elevated concentrations of solvents in, inter alia, an on-site distribution tank; in sediment and water in Furnace Brook, which is located immediately to the west of the Site; and in sediment from a marsh adjoining Furnace Brook. Said solvents included: trichloroethylene; acetone; trans-1,2-dichloroethene; xylenes; and ethylbenzene, as more particularly set forth in the test results annexed hereto as Appendix "C".

9. The Department and Respondent acknowledge that the goals of this Order shall be that Respondent shall develop and implement a field investigation program to:

(i) determine the nature of the wastes and the areal extent and vertical distribution of the wastes disposed of at the Site;

(ii) identify any past, current and/or potential future releases or migration of hazardous waste, as that term is defined in ECL Section 27-1301(1), and/or industrial waste, from

the site to other on-Site and off-Site areas;

(iii) evaluate the on-Site and off-Site impacts of such migration upon the environment; and

(iv) enable the Commissioner to determine whether hazardous wastes at the site constitute a significant threat to the environment.

10. Respondent, having waived its right to a hearing herein as provided by law, and having consented to the issuance and entry of this Order, agrees to be bound by provisions, terms and conditions hereof.

NOW, having considered this matter and being duly advised, **IT IS ORDERED THAT:**

I. Respondent shall undertake to conduct a field investigation on Site and certain off-Site areas (the "Field Investigation").

II. All investigations, proposals, reports, plans, remedial programs, and supplements and revisions thereto required by this Order shall be prepared, designed and performed in accordance with Requisite Technology. As used in this Order, Requisite Technology means engineering, scientific and construction principles and practices subject to the Department's approval, which (a) are technologically feasible, and (b) will most effectively identify any present or potential future threat

to the environment posed by the disposal of hazardous and industrial wastes at and in the vicinity of the Site. As used herein, "hazardous wastes" shall mean hazardous wastes, any hazardous constituents thereof, and any toxic degradation products of such wastes and of such constituents.

III. Respondent has submitted to the Department, and the Department has approved in writing, a written proposal outlining and defining the nature and extent of the work which is to be performed in conducting the field investigation (the "approved Phase II Work Plan"). Copies of the Phase II Work Plan and the Department's written approval thereof are annexed hereto and incorporated into this Order as Appendices "D" and "E", respectively.

IV. Within thirty (30) days after Respondent's receipt of a fully executed copy of this Order, Respondent shall undertake to conduct the field investigation in accordance with the approved Phase II Work Plan.

V. Within sixty (60) days after the completion of the field investigation, Respondent shall submit to the Department for its approval a field investigation report (the "Report"), based on the work performed. The Report shall be prepared in accordance with the approved Phase II Work Plan, and shall include, but not be limited to, all data generated, and all other information obtained during the field investigation. The Report shall also

identify, and provide the rationale for, all deviations from the approved Phase II Work Plan.

VI. If within sixty (60) days after its receipt of the Report the Department shall notify the Respondent that it is disapproving the Report, the Respondent shall have the right to dispute in whole or in part, the Department's determination in this regard, and/or within a reasonable time thereafter, not to exceed sixty (60) days, resubmit a revised Report in accordance with the Department's specifically delineated objections. The approved Report shall be incorporated in and made a part hereof as Appendix "F".

VII. If, as a result of reviewing data generated by the field investigation or as a result of reviewing other data or facts, the Department determines that further off-Site investigation may be necessary, the Department reserves the right to seek to compel the Respondent to modify and/or expand the field investigation to address such specific off-Site areas. Correspondingly, Respondent reserves the right to oppose, in whole or in part, the modification and/or expansion of the field investigation sought by the Department on the mutually exclusive grounds that the modification and/or expansion is unnecessary, unwarranted, inappropriate and/or unfeasible.

VIII. The Department shall review the Report and shall use

the Report as the basis of the development of the Site Hazard Ranking Score assigned to the Site for State Superfund Site ranking purposes.

IX. The Department shall have the right to obtain "split samples" or "duplicate samples", at the Department's option, of all substances and materials sampled by Respondent pursuant to this Order. As used herein: "split samples" shall mean whole samples divided into aliquots; "duplicate samples" shall mean multiple samples, collected at the same time from exactly the same location, using the same sampling apparatus, collected into identical containers prepared identically, filled to the same volume, and thereafter identically handled and preserved.

X. Respondent shall provide notice to the Department of any field work, including, but not limited to, excavating, drilling or sampling to be conducted pursuant to the terms of this Order at least five (5) working days in advance of such activities.

XI. Respondent shall permit any duly designated officer, employee, consultant, contractor or agent of the Department to enter upon the Site or areas in the vicinity of the Site which may be under the control of Respondent, and any areas necessary to gain access thereto, for inspection purposes and for the purpose of making or causing to be made such sampling and tests as

the Department deems necessary, and for ascertaining Respondent's compliance with the provisions of this Order.

XII. Respondent shall exercise its best efforts to obtain whatever permits, easements, rights-of-way, rights-of-entry, approvals or authorizations which are necessary in order to perform the Field Investigation and all of Respondent's other obligations pursuant to this Order, and the Department shall cooperate with and otherwise assist the Respondent in this regard.

XIII. Respondent has retained EBASCO Services Incorporated to perform the technical, engineering and analytical obligations required by this Order. The Department acknowledges that EBASCO Services Incorporated is qualified to perform the technological, engineering and analytical obligations required by this Order.

XIV. Respondent shall not suffer any penalty under any of the provisions, terms and conditions hereof, or be subject to any proceedings or actions for any remedy or relief, if it cannot comply with any requirements of the provisions hereof because of an act of God, war, riot, or other condition as to which negligence or willful misconduct on the part of Respondent was not a proximate cause, provided, however, that Respondent shall immediately notify the Department in writing when it obtains knowledge of any such condition and request an appropriate extension or modification of the provisions hereof.

XV. Respondent shall bear all of its own costs incurred in the management and implementation of the Field Investigation Program and in the preparation of the Report.

XVI. Respondent's consent to this Order and its agreement to undertake the Phase II Field Investigation Program shall in no way be construed or deemed to constitute an admission of liability, culpability or responsibility on its part or an acknowledgement of the accuracy, authority, materiality or relevancy of any of the Department's findings or of the contentions made herein.

XVII. Respondent's failure to fulfill a material obligation imposed by this Order shall constitute a default and violation of this Order.

XVIII. Nothing contained in this Order shall be construed as barring, diminishing, adjudicating or in any way affecting (1) any legal or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the Department may have against anyone other than Respondent, its directors, officers, employees, servants, agents, successors and assigns; (2) the Department's right to enforce, at law or in equity, the terms and conditions of this Order against Respondent, its directors, officers, employees, servants, agents, successors and assigns in the event that Respondent shall fail to fulfill any of the provisions hereof; and (3) the Department's right to bring any

action, at law or in equity against Respondent, its directors, officers, employees, servants, agents, successors and assigns with respect to areas or resources that may have been affected or contaminated as a result of the release or migration of hazardous or industrial wastes from the Site or from areas in the vicinity of the Site. Nothing herein shall be construed as affecting the Department's right to commence any action or proceeding to which it may be entitled in connection with, relating to, or arising out of Respondent's disposal of hazardous or industrial wastes at the Site.

XIX. The terms of this Order shall not be construed to prohibit the Commissioner or his duly authorized representative from exercising any summary abatement powers, either at common law or as granted pursuant to statute or regulation.

XX. Respondent shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of the provisions hereof by Respondent, its directors, officers, employees, servants, agents, successors or assigns.

XXI. The effective date of this Order shall be the date this Order is signed by the Commissioner or his designee.

XXII. If, for any reason, Respondent desires that any provision of this Order be changed, Respondent shall make timely written application therefor to the Commissioner, setting forth reasonable grounds for the relief sought. No modification of this Order will be effective unless signed by the Commissioner.

XXIII. A. All communication required hereby to be made between the Department and Respondent shall be made in writing and transmitted by United States Postal Service return receipt requested or hand delivered to the addresses in paragraph B hereinunder.

B. Communication to be made from Respondent to the Department shall be made as follows:

1. Two copies to the Division of Solid and Hazardous Waste, Room 212, 50 Wolf Road, Albany, New York 12233.

2. Two copies to the Division of Environmental Enforcement, White Plains Field Unit, 202 Mamaroneck Avenue, Room 304, White Plains, New York 10601-5381.

3. Two copies to the Regional Director, Region 3, 21 South Putt Corners Road, New Paltz, New York 12561.

4. Two copies to the New York State Department of Health, Bureau of Toxic Substances Assessment, Empire State Plaza, Corning Tower Building, Albany, New York 12237, Attn: Ronald Tramontano, P.E.

C. Communication to be made from the Department to Respondent shall be made as follows:

ISC Properties, Inc.
100 Jericho Quadrangle
Jericho, New York 11753
Attention: Allen Kaden

Copy to:

Edward S. Wactlar, Esq.
Blau, Kramer, Wactlar & Lieberman, P.C.
100 Jericho Quadrangle
Jericho, New York 11753

D. The Department and Respondent respectively reserve the right to designate other or different addresses on notice to the other.

XXIV. The provisions of this Order shall be deemed to bind Respondent, its officers, directors, agents, servants, employees, successors and assigns.

XXV. Nothing herein shall be construed to bind any entity not specifically bound by the terms of this Order.

XXVI. The provisions hereof shall constitute the complete and entire Order between Respondent and the Department concerning the Site. No terms, conditions, understandings or agreements purporting to modify or vary the terms hereof shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestions or comments by the

Department regarding reports, proposals, plans, specifications, schedules or any submission by Respondent shall be construed as relieving Respondent to its obligations to obtain such formal approvals as may be required by this Order.

DATED: Albany, New York
, 1987

HENRY G. WILLIAMS
Commissioner
New York State Department of
Environmental Conservation

TO: Edward S. Wactlar, Esq.
Blau, Kramer, Wactlar & Lieberman, P.C.
100 Jericho Quadrangle
Jericho, New York 11753

CONSENT BY RESPONDENT

ISC PROPERTIES, INC.

Respondent hereby consents to the issuing and entering of the foregoing Order, waives its right to a hearing herein as provided by law, and agrees to be bound by the provisions, terms, and conditions contained herein.

ISC PROPERTIES, INC.

By: _____

Title: _____

Date: _____

STATE OF NEW YORK)
)s.s.:
COUNTY OF)

On this day of , 1987, before me personally came to me known, who, being by me duly sworn, did depose and say that he/she is of ISC Properties, Inc., the respondent described in the foregoing instrument, and that he/she signed his/her name as duly authorized.

_____

Notary Public

FINAL REMEDIAL INVESTIGATION REPORT

FOR THE

FORMER MAGNA METALS SITE

(NYSDEC Site No. 360003)
TOWN OF CORTLANDT
WESTCHESTER COUNTY, NEW YORK

August 2007

PREPARED BY:

Tetra Tech EC, Inc.
1000 The American Road
Morris Plains, New Jersey 07950

INCORPORATING:

REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT
November 1998

DRAFT SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
June 2004

DATA FINDINGS FROM THE ADDITIONAL DATA COLLECTION LETTER REPORT
June 2006

VOLUME 1 OF 2

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1.0 INTRODUCTION

Presented herein is the Final Remedial Investigation (RI) Report for the Magna Metals Site, Town of Cortlandt, New York. The RI media of concern have been soils, sediments, surface water, and groundwater. This document has been prepared for ISC Properties, Inc. (ISCP) and incorporates the previous RI reports submitted by ISCP to the New York State Department of Environmental Conservation (NYSDEC) which include the November 1998 RI/FS, August 2004 Draft Supplemental RI, and the June 2006 Data Findings From the Additional Data Collection Activities, June 2006. For completeness, this report also includes a brief summary of soil gas and indoor air investigation activity performed in 2007.

1.1 Purpose and Objective

The purpose of the this Final RI/FS is to capture in a single document, the extensive studies performed over multiple RI sampling events, which document the horizontal and vertical delineation of soil and water contamination at the site and provide a comprehensive set of RI data for development of the Final Feasibility Study so that remedial action can be conducted at the site. A Feasibility Study was previously submitted (i.e., RI/FS November 1998). Due to subsequent additional delineation work performed, the parameters of the Feasibility Study considerations require modification; specifically, the scope of soils to be remediated in and around the leach pit area, and in the wetland sediments adjacent to the site. Secondly, treatment considerations for groundwater have significantly changed since 1998. With NYSDEC concurrence on RI completion, submittal of the FS is planned for the Fall of 2007.

1.2 Site Background

Minimal information regarding past practices exists. Metal plating, polishing, and lacquering operations were conducted at the Magna Metals Site from 1955 to 1979. During operation, it was reported that iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits.

1.2.1 Site Location and Description

The Magna Metals Site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. Nearby towns include Peekskill, two miles northeast, and Croton-on-Hudson, five miles southwest (see Figure 1-1 Site Location Map). The Hudson River is located three miles west of the site. Locally, the site is part of a larger commercial property owned by Baker Properties. Baker Properties acquired the property from ISCP in 1982, and has leased it to various tenants. The identity of these tenants and their use of the property has varied over time. Residential areas are located around the facility. A wetland area stream and pond are located near the site.

1.2.2 WCHD Department of Health and NYSDEC Sampling History

A water pollution investigation was performed in October 1978 by the Westchester County Health Department (WCHD). Minimal information exists with respect to actual locations of samples. However, number of samples and reported values are known. Five standing water/wastewater samples were collected on October 3, 1978 and analyzed for pH, iron, copper,

zinc, cadmium, chromium, cyanide, lead, manganese, and nickel. Concentrations of iron, copper, zinc, chromium, cyanide, and nickel exceeded groundwater standards. Lead concentrations also exceeded groundwater standards in one sample; however, the detection limit used in the lead analysis was higher than the groundwater standard. Results of this sampling event are shown in Table 1-1. Soil and bottom sediment samples were collected on the site and upstream and downstream of the site at unknown locations, respectively, on October 13, 1978. These samples were analyzed for the same parameters as the water samples collected earlier in the month. Copper and zinc were the only metals present at concentrations above the common range maximum for native soils and/or the oral exposure health-based criteria. These metals were found in the two soil samples downslope of the wastewater overflow, or effluent from the site. The results from this sampling event are presented in Table 1-2.

WCHD returned to the site on December 15, 1978, with personnel from the NYSDEC. At this time, five core samples were collected from the sewage overflow area (exact location unknown), and the analytical results of this sampling are shown in Table 1-3. These samples were analyzed for iron, copper, zinc, chromium, and manganese. Copper concentrations exceeded the common range maximum for native soils in two samples. Zinc concentrations were also above the common range maximum for native soils in two samples.

On August 19, 1982, leaching pit samples were collected for analyses of selected trace metals, cyanide, chlorides, phenolics, sulfates, and nitrates by General Testing Corporation (see Table 1-4). The specific leach pits sampled are unknown. The results of an EP toxicity analysis for four samples indicated no apparent metal leaching problems. Sulfates, nitrates and chlorides were present at concentrations less than their New York State (NYS) Ambient Water Quality Standards of 250, 10 and 250 mg/l, respectively (NYSDEC, 1991). In addition, these inorganics generally have low toxicity and are present as background constituents.

In 1982, NYSDEC determined that hazardous wastes disposed of at the site did not constitute a significant threat to the environment. Accordingly, no remedial action was required and the site classification was changed to Code “F”.

The NYSDEC collected four samples (locations unknown) on November 16, 1982, for EP toxicity analysis by RECRA Environmental Laboratory. The results for this 1982 sampling event are also shown in Table 1-4.

On December 29, 1982; February 1 and 2, 1983; and March 15, 1983, the WCHD conducted additional water pollution investigations on the site property and in Furnace Brook immediately to the west of the property. The results for the February and March 1983 sampling events are displayed in Tables 1-5, 1-6 and 1-7. Except for aesthetic considerations of iron and manganese concentrations, trace metals were not found to be elevated in the surface waters (i.e., when compared to NYS Ambient Water Quality Standards). However, as shown in Tables 1-6 and 1-7, several chlorinated volatile organics were detected in Furnace Brook. Of concern were the levels of trichloroethene (TCE) detected in the samples from the septic tank, from the leaching pit off the septic tank, and from the downstream sample locations along Furnace Brook and the unnamed tributary.

On May 15, 1984, the NYSDEC Division of Environmental Enforcement sampled at the site for metals and volatile organic compounds. Water samples were also analyzed for pesticides and PCBs. Surface water samples were collected from locations along Furnace Brook/tributary, from the septic tank, and from leaching pit A. Four sediment and two sludge samples were also collected at this time, from the Brook/tributary and from leaching pits. The sample results are summarized in Tables 1-8, 1-9, and 1-10 for metals, and in Tables 1-11 and 1-12 for volatile organics.

Analyses conducted in 1984 for 12 of the 13 priority pollutant metals analyzed in the surface water samples consistently resulted in low concentrations (i.e., generally less than detection limits). Water samples from the septic tank (sample 05) and leaching pit (sample 08) contained elevated concentrations of arsenic, selenium, copper, nickel, and zinc. Trace metals in sediment samples indicated similar trends, i.e., the 12 priority pollutants were essentially present at background levels; copper was slightly elevated. Sludge samples collected from leaching pits 4 (sample 06) and 2 (sample 07); however, contained elevated arsenic, selenium, cadmium, chromium, copper, nickel, silver, and zinc. Pesticides and PCBs were not detected in any of the water samples. EP Toxicity tests for the two sludge samples (Table 1-10) resulted in concentrations below the allowable maximum EP toxicity concentration and generally less than detection limits.

The results for the volatile organic analyses of the May 15, 1984 NYSDEC water samples indicated elevated trichloroethene levels in the septic tank (15,000 ppb) and in leaching pit 4 (190 ppb). Trans-1,2-dichloroethene was also detected in the surface water samples, with concentrations in the downstream and in the septic tank samples (see Table 1-11). Sediment and sludge samples contained detectable concentrations of six volatile organic compounds. Acetone, trans-1,2-dichloroethene, trichloroethene, and vinyl chloride were present in the brook sediments, while trichloroethene, xylenes, and ethylbenzene were detected in the sludge samples collected from leaching pits; see Table 1-12.

NYSDEC had determined that ISCP was the responsible party for operation at the Magna Metals facility. ISCP developed and submitted a RI/FS Work Plan in August of 1995. ISCP entered into an order on consent with the NYSDEC in May 1996, thereby initiating RI/FS activities.

1.3 RI Activity Chronological Summary

Extensive RI studies have been performed on the former Magna Metals Site. During the course of the RI/FS study, data gaps were identified by ISCP's consultant and NYSDEC in the 1998 and 2004 reports which required additional RI activity. Below is a chronological summary of the RI activities, including comment, response, plan and report submittals, and field work.

Activity	Approximate Date
RI/FS Work Plan Submitted	August, 1995
Order on Consent	May, 1996
RI/FS Field Investigation Activities	September 1996 to May 1998
RI/FS Report Submitted	November 1998
NYSDEC RI/FS Comments	July 1999
Response to RI/FS Comments	August 1999
NYSDEC Additional RI/FS Comments	January 2000
NYSDEC Soils RI Approval	January 2000
Response to NYSDEC Comment 1/00	February 2000
NYSDEC RI/FS Disapproval	March 2001
Draft Supplemental RI Work Plan Submitted	December 2001
NYSDEC Comments	April 2002
NYSDEC Additional Historic Documentation Turnover	September 2002
NYSDEC Comments Addendum	September 2002
Response Letter	October 2002
Revised Supplemental Work Plan Submitted	November 2002
NYSDEC Comments	December 2002
Supplemental Work Plan Re-submitted	January 2003
NYSDEC Comments	February 2003
Supplemental Work Plan Re-submitted	March 2003
NYSDEC Approval Supplemental RI Work Plan	April 2003
Supplemental RI Field Activity	Jul 2003-April 2004
Draft Supplemental RI Report Submitted	August 2004
NYSDEC Draft Supplemental RI Comment Letter	April 2005
Response to Supplemental Draft RI Comments	June 2005
ISCP/NYSDEC/DOH Site Visit	August 2005
Draft Additional Data Collection Work Plan Submitted	September 2005
Draft Final Submitted	October 2005
NYSDEC Approval Additional Data Collection Work Plan	November 2005
Additional Data Collection Field Activity	January–February 2006
Additional Data Collection Findings Report Submitted	June 2006
NYSDEC Comments	November 2006
Indoor Air and Sub Slab Work Plan Submitted*	February 2007
Indoor Air and Sub Slab Field Activity*	March-April 2007
Draft Indoor Air Report Submitted*	July 2007
Draft Final RI Submitted	August 2007

* Subslab Vapor and Indoor Air Quality Work and Reporting submitted under separate cover by AKRF July 2007.

Table 1-1

Westchester County Department of Health
Water Pollution Investigation on 10/3/78

Concentrations presented in ug/L.

Parameter	Groundwater Standards	1	2	3	4	5
pH	--	10.9	10.3	11.3	9.5	7.8
Iron	300	10,000	5,900	9,300	4,000	3,800
Copper	200	150,000	320,000	170,000	87,000	76,000
Zinc	300	49,000	18,000	46,000	10,000	8,900
Cadmium	10	(5)	(5)	(5)	(5)	(5)
Chromium	50	2,800	3,600	3,100	(30)	(30)
Cyanide	100	1,700,000	640,000	2,700,000	210,000	170,000
Lead	25	(30)	(30)	(30)	(30)	60
Manganese		120	110	120	90	110
Nickel	700	66,000	33,000	93,000	18,000	10,000

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION
1	Ponded liquid near 1st leaching pit.
2	Influent wastewater to industrial disposal system.
3	Overflow or effluent from industrial disposal system.
4	Influent wastewater.
5	Overflow or effluent wastewater.

Table 1-2

Metals Analyses from Westchester County Department of Health
Water Pollution Investigation Soils and Bottom Sediment
Sampling on 10/13/78

Concentrations presented in mg/kg.

Parameter	Common Range in Soil	Oral Exposure Health-Based Criteria	A	B	1	2	3
Iron	5,000-50,000		70	160	110	640	330
Copper	1-100		2.3	13	60	270	115
Zinc	10-300		2.9	95	240	980	320
Cadmium	0.01-0.7		(0.2)	(0.2)	0.2	0.7	0.4
Chromium	1-1000		0.2	0.6	23	24	7.7
Cyanide		300	0.7	9.2	38	14	20
Lead	2-200		(1.2)	(1.2)	5.8	3.3	(1.2)
Manganese	200-10,000		78	70	46	67	115
Nickel	5-500	300	15	35	75	31	80

NOTES:
(#) Concentration less than detection limit shown in parenthesis.

SAMPLE	LOCATION
A	100 yards upstream of Magna Metals building.
B	300 yards downstream of Magna Metals building in pond.
1	Base of slope.
2	150 feet from overflow site.
3	250 feet from overflow site.

Table 1-3

Metal Analyses from Westchester County Department of Health and New York State Department of Environmental Conservation Core Sampling Below (West of) Former Outflow/Overflow Area (Last Leaching Pit) on 12/15/78

Concentrations presented in mg/kg.

Parameter	Common Range in Soil	Core 1A	Core 1B	Core 1C	Core 2A	Core 2B	Core 3A	Core 3B
Iron	5,000-50,000	1,200	230	680	1,320	170	700	70
Copper	1-100	520	30	160	100	10	60	10
Zinc	10-300	300	6	70	1,500	10	630	20
Chromium	1-1,000	10	0.6	3	25	0.6	10	1
Manganese	200-10,000	40	20	20	140	25	90	10

SAMPLE	LOCATION
Core 1A	Top inch
Core 1B	6"-7"
Core 1C	9"-10"
Core 2A	Top inch
Core 2B	7"-8"
Core 3A	Top inch
Core 3B	6"-7"

Table 1-4

New York State Department of Environmental Conservation
EP Toxicity Extracts Taken on 8/19/82 and 11/16/82, Respectively

Concentrations presented in mg/L.

Parameter	TCL	Pit A	Pit 1	Pit 2	Pit 4	Pit 5	R001201	R001202	R001203EX	R001203
pH		7.9	9.4	8.2	6.4	6.9	8.89			7.22
Iron		5.5	0.9	(0.05)	(0.05)	0.82	1.9			37,000
Copper		3.66	23.9	176	38.4	0.60	16.8			490
Zinc		50	0.42	75	81	14	0.60			360
Cadmium	1.0	(0.025)	0.03	(0.025)	(0.025)	(0.025)	(0.004)		(0.004)	2.2
Chromium	5.0	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)				490
Chromium, Hex		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.004		(0.004)	130
Cyanide		0.54	0.42	2.3	0.91	0.38		23		36
Lead	5.0	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	9.4		0.017	6,500
Manganese		3.3	0.04	1.52	1 .73	1.9	0.05			470
Nickel		10.4	4.2	26.6	94	8.3	4.1			500
Chlorides		4	62	44	9	3	42		2.9	88
Phenolics		0.015	0.009	0.015	0.010	0.012		0.07		3.1
Sulfates		(5)	42	134	182	(10)	40			
Nitrates		12.4	0.67	1.29	4.5	0.94	9.0		1.3	1.6
Arsenic	5.0						26		(0.005)	
Selenium	1.0						(20)		(0.005)	0.085
Mercury	0.2						(0.9)		(0.002)	
Barium	100.0						0.82		1.7	130
Silver	5.0						0.010		(0.004)	0.38

NOTES:
(#) Concentration less than detection limit shown in parenthesis.

COSULICH COLLECTED

SAMPLE	LOCATION
Pit A	Manhole cover, sand
Pit 1	Water only
Pit 2	Soil, sludge
Pit 4	Soil mix
Pit 5	Sand

NYSDEC COLLECTED

SAMPLE	LOCATION OR DESCRIPTION
R001201	Pit 1 Extraction
R001202	Pit 1 Extraction
R001203	Pit 5 Extraction
R001203EX	Pit 5 Extraction

Table 1-5

Metals Analyses from Westchester County Health Department
Water Pollution Investigation on 2/1/83 and 2/2/83

Concentrations presented in ug/L.

	NYS AWQ Standard[1]		2/1/83					2/2/83			
Parameter	**Human Health**	**Aquatic Life**	**1**	**2**	**3**	**4**	**5**	**3**	**4A**	**6**	**7**
Iron	300	300	330	400	210	280	320	300	340	700	580
Copper	200	*	20	(20)	(20)	(20)	(20)	90	100	(20)	70
Zinc	300	30	(50)	(50)	(50)	(50)	(50)	(50)	50	(50)	(50)
Cadmium	10	*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Chromium	50	*	(10)	(10)	(10)	(10)	10)	(10)	(10)	(10)	(10)
Cyanides	100	*	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Lead	50	*	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Manganese	300	-	80	60	50	60	80	70	30	52	70
Nickel	-	5.2	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

NOTES:
[1] Human health-based and aquatic life-based New York State (NYS) Ambient Water Quality (AWQ) Standards for surface water (fresh).
* Aquatic life-based NYS AWQ Standard or Guidance Value is dependent on water hardness.
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
1	Maple Ave.
2	Field pond outlet.
3	100’ above field pond.
4	Where Furnace Brook and brooklet meet.
4A	In brooklet southwest of pits.
5	Along brooklet 30’ from where Furnace Brook and brooklet meet.
6	Tributary behind Magna Metals building.
7	Furnace brook above all Magna Metals Site drainage.

Table 1-6

Volatile Organic Analyses from Westchester County Health Department
Water Pollution Investigation on 2/1/83 and 2/2/83

Concentrations presented in ug/L.

		2/1/83					2/2/83			
Parameter	**Groundwater Standards**	**1**	**2**	**3**	**4**	**5**	**3**	**4A**	**6**	**7**
Trichloroethene	5	7	90	50	30	(1)	130	65	11	(1)
cis-1,2-Dichloroethene	5	1.5	20	8	7	(1)	15	7	4	(1)
1,1,1-Trichloroethane	5	(1)	(1)	(1)	1.0	(1)	43	(1)	(1)	(1)

NOTES:
(#) Concentration less than detection limit shown in parentheses

SAMPLE	LOCATION OR DESCRIPTION
1	Maple Ave.
2	Field pond outlet.
3	100’ Above field pond.
4	Where Furnace Brook & brooklet meet.
4A	In brooklet southwest of pits.
5	Along brooklet 30’ from where brook & brooklet meet.
6	Tributary behind Magna Metals building.
7	Furnace Brook above all Magna Metals Site drainage.

Table 1-7

Volatile Analyses from Westchester County Health Department
Water Pollution Investigation on 3/15/83

Concentrations presented in ug/l, except for Sample P2 and Health Based Criteria presented in mg/kg.

Parameter	Groundwater Standard	2	3	4	4A	4B	8	10	ST	11	P2 (mg/kg)	Health Based Criteria (mg/kg) (Sample P2 only)
Trichloroethene	5	32	10.5	1.9	31	1.4	(1)	8.8	1,400	(1)	110	32
cis-1,2-Dichloroethene	5	12	13	1.1	3.1	(1)	(1)	3	(1)	(1)		
1,1,1 Trichloroethane	5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	110	61

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
2	Field pond outlet.
3	100’ above field pond.
4	Where Furnace Brook & brooklet meet.
4A	In brooklet southwest of pits.
4B	200’ above #4.
8	Well supply house, #480 Furnace Dock Road.
10	Pond off Maple Ave.
11	Drainage Channel in front of #480.
ST	Septic Tank.
P2	Soil-Leachate Pit 2.

Table 1-8

Summary of Total Metal Analyses from
NYSDEC Surface Water Sampling on 5/15/84

Concentrations presented in ug/L.

	NYS AWQ Standard [1]		Sample No.						
Parameter	Human Health	Aquatic Life	01	02	03	04	05	08	Detection Limit
pH				5	5-6	5	6-7	6	
Arsenic	50	190	(10)	(10)	(10)	(10)	550	(10)	10
Antimony	3[2]	-	(10)	(10)	(10)	(10)	(10)	(10)	10
Selenium	10	1.0	(10)	(10)	(10)	(10)	237	91	10
Thallium	4[2]	8	(10)	(10)	(10)	(10)	(10)	(10)	10
Mercury	2	0.2[2]	(0.4)	(0.2)	(0.2)	(0.4)	(0.2)	0.2	0.2-0.4
Beryllium	3[3]	11 or 1,100	(1)	(1)	(1)	(1)	(1)	(1)	1
Cadmium	10	*	(10)	(10)	(10)	11	(10)	(10)	10
Chromium	50	*	(4)	(4)	(4)	(4)	4.2	4	4
Copper	200	*	(4)	(4)	(4)	6.9[b]	7,810[b]	670[b]	4
Nickel	-	*	(15)	(15)	(15)	(15)	610	508	15
Silver	50	0.1	(3)	(3)	(3)	(3)	(3)	(3)	3
Zinc	300	30	21[b]	(10)[b]	(10[b])	17[b]	261	1,570[b]	10

NOTES:

[b] Blank corrected.

1 Human health-based and aquatic life-based NYS Ambient Water Quality (AWQ) Standards are for surface water (fresh).

2 Guidance Value.

* Aquatic life-based AWQ Standard or Guidance Value is dependent on water hardness.

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream, north of Magna Metals.
02	Mid-stream, west of Magna Metals.
03	Marsh area southwest.
04	Downstream southwest.
05	Distribution tank adjacent to building.
08	Leaching Pit A.

Table 1-9

Summary of Total Metal Analyses from
NYSDEC Sediment/Sludge Sampling on 5/15/84

Concentrations presented in mg/kg.

Parameter [1]	Global Median Soil Concentration [2]	Detection Limit	01	02	03	04	06 (Sludge)	07 (Sludge)
Arsenic	6	0.5	(0.5)	0.65	(0.5)	(0.5)	27.5	5.0
Antimony	1	0.5	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Selenium	0.4	0.5	(0.5)	1.8	0.61	(0.5)	7.55	13.0
Thallium	0.2	0.5	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Mercury	0.06	0.1	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Beryllium	0.3	0.1	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Cadmium	0.35	1.0	(1)	(1)	1.2	(1)	3.1	1.6
Chromium	70	0.4	7.5	8.6	21.9	16.9	223	5.7
Copper	30	0.4	5.7[b]	115	36.5	100[b]	3,690[b]	15,800[b]
Nickel	50	1.5	30.1	40.3	56.2	39.8	27,500	13,800
Silver	0.05	0.3	0.30	(0.3)	(0.3)	(0.3)	0.81	0.70
Zinc	90	1.0	22.3[b]	28.2[b]	37.3	39.9	8,310[b]	9,500[b]

NOTES:

[b] Blank corrected.

1 Iron, lead, manganese, barium, chlorides, sulfates, and nitrates were not detected.

2 Bowen (1979).

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals - Sediment.
02	Mid-stream west of Magna Metals - Sediment.
03	Marsh area southwest - Sediment.
04	Downstream southwest - Sediment.
06	Leaching pit 4 - Sludge.
07	Leaching pit 2 - Sludge.

Table 1-10

New York State Department of Environmental Conservation
Division of Environmental Enforcement
EP Toxicity Extracts of 5/15/84

Concentrations presented in mg/L.

Parameter	Detection Limit	EP Toxicity Maximum Concentration	06	07
Arsenic	0.01	5.0	0.100	0.037
Barium	0.5	100.0	(0.5)	(0.5))
Cadmium	0.1	1.0	(0.1)	(0.1)
Chromium	0.2	5.0	(0.2)	(0.2)
Lead	0.5	5.0	(0.5)	(0.5)
Mercury	0.002	0.2	(0.002)	(0.002)
Selenium	0.01	1.0	0.220	0.180
Silver	0.01	5.0	(0.01)	(0.01)

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
06	Leaching Pit 4 - Sludge.
07	Leaching Pit 2 - Sludge.

Table 1-11

Summary of Volatile Organic Analyses from
NYSDEC Surface Water Sampling on 5/15/84

Concentrations presented in ug/L.

Parameter [1]	01	02	03	04	05	08
Acetone	(5)	(5)	(5)	(5)	(5)	(5)
trans-1,2-Dichloroethene	(5)	(5)	(5)	25	(5)	16
Trichloroethene	(5)	6.6	16	62	15,000	190
Vinyl chloride	(10)	(10)	(10)	(10)	(10)	(10)
Total xylenes	(5)	(5)	(5)	(5)	(5)	(5)
Ethylbenzene	(5)	(5)	(5)	(5)	(5)	(5)

NOTES:
[1] Only those volatile compounds detected are listed.
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals.
02	Mid-stream west of Magna Metals.
03	Marsh area southwest.
04	Downstream southwest.
05	Distribution septic tank adjacent to building.
08	Leaching Pit A.

Table 1-12

Summary of Volatile Organic Analyses from
NYSDEC Sediment/Sludge Sampling on 5/15/84

Concentrations presented in ug/L.

Parameter [1]	01	02	03	04	06	07
Acetone	(5)	(5)	190	1,400	(5)	(5)
trans-1,2-Dichloroethene	(5)	(5)	300	(5)	(5)	(5)
Trichloroethene	(5)	(5)	30	2,700	680	2,600
Vinyl chloride	(10)	(10)	(10)	(5)	(10)	(10)
Total xylenes	(5)	(5)	(5)	(5)	42	7,100
Ethylbenzene	(5)	(5)	(5)	(5)	(5)	3,300

NOTES:
[1] Only those volatile compounds detected are listed.
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals - Sediment.
02	Mid-stream west of Magna Metals - Sediment.
03	Marsh area southwest - Sediment.
04	Downstream southwest - Sediment.
06	Leaching Pit 4 - Sludge.
07	Leaching Pit 2 - Sludge.

2.0 SCOPE OF INVESTIGATION

2.1 Introduction

This section describes the soil, sediment, surface water, and groundwater RI activities performed and previously reported in the 1998, 2004, and 2006 NYSDEC deliverables. Descriptions of the field methods, approved by NYSDEC, were detailed in the August 1995, April 2003, and September 2005 Work Plans. For completeness, a brief summary of the 2007 Subslab Vapor and Indoor Air Quality activities is included. A more detailed report encompassing vapor and air can be found in the February 2007 Soil Vapor Intrusion Work Plan and July 2007 Soil Vapor Investigation Report by AKRF.

2.2 Pit Location Survey

In the 1998 RI/FS, seven each pit/tank were positively identified. Four of the known structures (historically identified by WCHD/NYSDEC as Pits C, D, E, and F on Figure 2-1) are concrete cinderblock construction and were apparently used for leaching solids from the electroplating process water. The fifth structure (Pit G, Figure 2-1) is a concrete tank with internal baffles believed to increase the flow path of water through the tank and promote the settling of solids. This tank is located on the northwest corner of the Magna Metals building and was apparently the first tank in the series of settling tanks/leach pits. The sixth structure (Pit A, Figure 2-1) is a small concrete tank that appears to be a septic system distribution or storage tank, but it may have also served as part of the leaching system. During brush clearing activities, a fifth concrete, cinderblock pit (Pit B, Figure 2-1), similar to pits C, D, E, and F, (Figure 2-1) was located.

However, historical documentation, contained in NYSDEC files and provided to ISCP September 2002 showed that two septic tanks and up to nine drainage structures existed on the Magna Metals site at one time (Appendix A). Commencement of field work occurred July 2003 to search for additional structures beyond those presented in the 1998 RI.

Based on field observations and field interpretation of the pit structures, Pit A and Pit G, were renamed septic tank ST-01, and leach pit LP-01, respectively for the 2004 report. These appear to be the first in the series of settling tanks/leach pits at the site (Figure 2-2). In the 2004 supplemental RI report Pit B was also renamed ST-02, and Pits C, D, E, and F were renamed to LP-02, LP-03, LP-04, and LP-05, respectively.

Operations, to find and excavate additional leach pits beyond those presented in the 1998 RI, were conducted from August through October 2003. A total of 13 leach pits/septic tanks, which includes the 7 previously found structures during the 1998 RI, were identified during of the 2003 excavation activities (see Figure 2-3).

The results of the 2004 Supplemental RI report investigatory excavation work are described herein. Photographs documenting the findings are presented in Appendix B. On August 11th and 25th, 2003, RI field personnel hand excavated targets identified by the geophysics subcontractor. The targets were excavated to depths ranging from 1.5 to 2.5 feet below ground surface (bgs). This effort did not result in the discovery of any additional pits.

After excavation of targets, field personnel began excavations tracing pipes connecting known leach pits. By tracing the pipes, three leach pits (LP-06, LP-07, and LP-08) were discovered (photos 2 – 4 in Appendix B). These three leach pits are of prefabricated concrete construction similar to leach pits LP-0A and LP-09. Prior to performing the geophysical survey, field reconnaissance and brush clearing activities were performed during July and August of 2003. Leach pits (LP-09 and LP-0A on Figure 2-2) are of prefabricated concrete construction with side-walls perforated by approximately 1-inch diameter holes. The pits appear to have gravel bottoms and gravel packing around the tank sides to facilitate the filtration of water away from the pits. One inlet pipe enters and one outlet pipe exits leach pit LP-0A. LP-09 contains only an inlet pipe and therefore appears to be the terminus of the leach pit series.

The pipes traced off of the known leach pits were perforated and of PVC or composite plastic construction. A photograph displaying the type of inter connecting pipes is provided as photo 5 in Appendix B.

Using polyethylene tubing fed through the pipes observed to enter/exit leach pits, field personnel confirmed that leach pits LP-04, LP-06 through LP-09 and LP-0A are directly connected, with no pits believed to be in-between these pits (Figure 2-2). This method was also used to confirm a connection between leach pits LP-02 through LP-05 (Figure 2-2). Several attempts were made to verify a connection between ST-02 and LP-02. Each attempt failed as the tubing appeared to encounter an obstruction approximately 25 feet to the north of ST-02. Based on historic drawings, this obstruction may be another leach pit.

A pipe leading from leach pit LP-05 was excavated on August 26, 2003. The effort was terminated approximately 7 ft north of the leach pit opening at 4 feet bgs, the greatest depth that could be reached by hand digging methods.

On October 9th and 10th, 2003, with the use of a Bobcat Model 325 Mini-excavator, the pipe leading to the north from leach pit LP-05 was further traced and another leach pit (LP-06A) was uncovered (photo 6 in Appendix B). Leach pit LP-06A, is of concrete cinderblock construction, similar to pits LP-02 through LP-05 (Table 2-1), and contains one inlet pipe on the southern wall and one pipe exiting the pit on the northern side. The existing pipe has been blocked and apparently sealed off using a tarred tin coffee can (photo 7 in Appendix B). Utilizing polyethylene tubing, it was determined that leach pit LP-06A is connected to leach pit LP-05. The pipe leading north from of leach pit LP-06A was traced approximately 11 feet north of the leach pit and to a depth of approximately 7.5 feet bgs, the maximum depth able to be reached with the mini-excavator. The pipe appeared to continue to the north, but could not be followed further due to the pipe depth.

The mini-excavator was also used to excavate the remaining targets identified by geophysics. Five targets that appeared to be inline with the pipe leading north from leach pit LP-06A were excavated to depths ranging from approximately 2.8 to 4 feet bgs. The excavation of these targets did not result in discovery or any additional pits.

Ten of the 13 leach pits were observed to contain sludge cake. The sludge cake in pits ST-02, LP-02, LP-03 and LP-05, which had been left open to the elements, after historic operations ceased, was moist. Sludge cake in pits LP-06A, LP-07, LP-08, LP-09 and LP-0A, which had

been covered until discovery during the Supplemental RI field work, were desiccated. The desiccated sludge cake in LP-06 is shown in photo 7 of Appendix B. Table 2-1 identifies the approximate thickness of sludge cake observed in each leach pit/septic tank.

2.2.1 Geophysical Survey

Two geophysical surveys were performed in order to verify the number of pits/tanks on site and the sampling of those pits; November 20 and 21, 1996 and August 5 and 11, 2003.

During the 1996 survey, ground penetrating radar (GPR) data were collected along 34 mutually orthogonal lines. Lines parallel to the former Magna Metals building (roughly east-west) were spaced 10 feet apart. Multiple GPR lines were collected over locations of known subsurface pits to identify the characteristic GPR signature of these features. The GPR data indicated seven subsurface structures.

A second survey was performed on August 4th and 11th, 2003. Based on the historical documents, provided to ISP by NYSDEC in 2003, an area north of the known pits, approximately 30 feet by 165 feet in size, was identified for study. On March 29th and 30th, 2004, the area surveyed was presented and on Figure 2-2.

Two geophysical methods; electromagnetic terrain conductivity (EM) and ground penetrating radar (GPR) were used to conduct the 2003 survey. EM data was collected at approximately two-foot intervals along parallel lines spaced approximately 2.5 feet apart. GPR data was also collected along parallel lines spaced no greater than 2.5 feet apart to aid in the identification of subsurface anomalies.

Based on the results of the 2003 geophysical survey, six relatively large, flat-topped subsurface anomalies were detected. The size and shape of these targets were determined to be consistent with potential leach/septic pits. Additionally, some smaller flat reflectors that could represent smaller leach/septic pits and general areas of buried metal and apparent conductive anomalies were detected (see Appendix C, Figure 5).

Based on the results of the geophysical survey, locations of potential leach/septic structures were marked in the field with flags. A photograph of the geophysical area with flagged targets is provided as photo 1 in Appendix B of this report.

A complete record of the two geophysical reports are provided in Appendix C.

2.3 Holding Tank/Septic Tank/Leaching Pit/Refuse Area Sampling

One septic tank, Pit A, and one leach pit, Pit G, were sampled on May 14 and 22, 1997. Please note that these structures were later renamed as ST-01 and LP-01 respectively in the 2004 report as further field information was obtained. Standing water from both pits were collected, and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, and cyanide. In addition, a sludge sample was collected from Pit A; no sample could be collected from Pit G due to an absence of sludge. The Pit A sludge

sample was analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide and total organic carbon (TOC).

A light track rig was used for drilling soil borings adjacent (approximately two feet away) to the septic tanks/leach pits. The seven soil borings were advanced on December 10 and 11, 1996 using hollow-stem auger and continuous 2-inch split-spoon drilling methods. The targeted sampling depth was the interval extending from the elevation of the bottom of the structure to two feet below the bottom of the structure.). Soil samples were collected from the interval equivalent to the bottom of the tank/pit. The samples were field screened visually, and with an organic vapor analyzer (OVA) and a combustible gas indicator (CGI). A total of seven samples and one duplicate were collected, and the soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, and cyanide. Soils were classified according to Burmeister Soil Classification System. Organic vapors in the soil were monitored with a Foxboro OVA 128. Logs for the soil borings, including soil descriptions, field instrumentation readings, observations, and analytical sampling intervals, are provided in Appendix D.

Sampling of the leach pits/septic tanks took place on July 30th, August 26th, September 5th and October 10th, 2003. Eleven pits were sampled: LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09, LP-0A, ST-01 and ST-02. Samples were collected using decontaminated stainless-steel hand-augers, bowls, and spoons.

When possible, two samples were collected from each pit, one of the sludge-cake materials and a second of the soil immediately below the sludge-cake. The sludge-cake materials contained fine laminations of a variety of colors including greens, grays, maroons, pinks, browns, yellows and blues (photo 8 in Appendix B). The southern septic tank ST-01 had an apparent concrete bottom, and therefore only a sludge sample was collected from this pit. Pits LP-0A and LP-09 contained only trace amounts of sludge above the soil. As such, only one sample was collected from each of these pits. The samples collected from leach pits LP-0A and LP-09 were a combination of soil and the overlying sludge cake.

A total of 19 samples and two duplicate samples were collected and analyzed for TCL, VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide and TOC. Sludge materials, when present, were described and soils were classified according to the Unified Soil Classification System (USCS).

No sample was collected from LP-01 as the pit has and apparent concrete/solid bottom with no sludge present. Leach pit LP-04 could not be sampled as this pit has been filled with asphalt pieces, glass bottles and other debris.

One sample was collected from 2.5 to 3.0 feet bgs in the apparent refuse area located north of the former Magna Metals building (soil boring RA on Figure 2-2). A decontaminated stainless steel hand auger, bowl and spoon were used to collect the sample. The sample was analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide and TOC.

2.4 Surface Water and Sediment Sampling

A total of 12 surface water samples (and one duplicate) were collected by grab at the Magna Metals site on May 12, 14 and 22, 1997. Locations were as follows: four surface water samples

from the tributary, one sample after the confluence of the stream and tributary; one sample from the confluence of the stream and pond; two samples from the pond; one sample at the drainage culvert from the pond along Cross Roads Avenue; two samples in the wetlands area; and one upgradient sample from the stream. Surface water sampling locations are presented on Figure 2-2. Samples were collected prior to sediment samples and by moving in an upstream direction. Field analyses of pH, specific conductance, and temperature were taken at each sampling location with a Hydac water quality meter. The surface water samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (three locations), TAL metals, cyanide, and hardness.

Twelve surface sediment samples (and one duplicate) were collected at the same locations in 1997; see Figure 2-2. A stainless steel scoop was used to obtain those sediment samples with only standing water less than four inches deep. When the water above the sediments was flowing or was greater than four inches in depth, a corer was used to collect the sediment sample so that washing of the sample was minimized. Sediment samples were collected moving in an upstream direction and after then surface water samples were collected. The sediment samples were field screened visually and with a photoionization (HNu) instrument. Samples for volatile analysis were collected without homogenization. The sediment samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (three locations), TAL metals, cyanide, and TOC.

Benthic samples were collected from 7 locations on March 29th and 30th, 2004. Sediment for toxicity and supplemental analyses (TAL metals, PAH, TOC and acid volatile sulfide and soluble extractable metals) were collected March 30th through April 3rd, 2004. Surface water samples for TAL metals and toxicity analyses were collected on March 29, 2004.

Sample locations were surveyed using a Trimble Pro XRS GPS. GPS data was collected March 25th through April 3rd, 2004. GPS data is presented on Figure 2-2.

Analyses and reporting of the surface water and sediment data used in the ecological analysis is presented in Section 5 of this report.

2.5 Surface Soil Sampling

Five surface soil samples and one duplicate were collected at the locations displayed on Figure 2-2 on April 11, 1997. An additional surface soil sample was collected from location SS-2 on November 17, 1997. Samples SS-1, SS-2 and SS-3 were collected downgradient of the on-site tanks/pits. Samples SS-4 and SS-5 are upgradient background surface soils. A material classification using the Burmeister Classification system was performed at each sampling location, and the soil descriptions are presented on logs in Appendix D. In addition, the surface soil samples were field screened visually and with a photoionization (HNu) instrument.

A stainless steel soil coring device/silver bullet sampler was used to obtain the surface (i.e., 0 to 12 inches in depth) samples. Volatile samples were collected first without homogenization, from the 6 to 12-inch interval. The April 1997 surface soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, and cyanide. The November 1997 surface soil sample was also analyzed for TOC.

On July 29th and 30th, 2003, ten additional surface soil samples were collected from the 0 to 2-inch bgs interval. The samples were collected using a stainless steel spoon and bowl and were analyzed for TCL VOCs, TAL metals and cyanide. The surface soil sample locations were surveyed using a Trimble Pro XRS GPS. GPS data was collected on July 30, 2003 and February 27, 2004 and sample locations are presented on Figure 2-2.

2.6 Subsurface Soil Sampling

Soil borings were drilled in conjunction with the monitoring well installation program at the site on November 17 through 21, 1997, utilizing hollow stem augers. Split spoon sampling was performed continuously from the surface to the bottom of the boring to provide a continuous boring log. These logs are provided in Appendix D and include the following:

- Physical characteristics and grain size distribution of samples (using the Burmeister Soil Classification System);
- Blow counts for driving the sampler (standard penetration resistance);
- Presence of any visible contaminants;
- Color changes;
- Groundwater level;
- Thickness of individual units; and
- Any other conditions encountered during drilling.

A total of seven samples and one duplicate were analyzed for volatile organics, TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (one sample) and TAL metals, cyanide, and total organic carbon. Soil samples were collected continuously at all test borings. Two samples were collected for analysis at each location wherever possible. Sample intervals were from surface (0 to 2'), at the water table interface (approximately 6 to 8 feet below ground surface [bgs]) and at the midpoint of the screened interval (10 to 12 feet bgs).

2.7 Monitoring Well Installation

1998 RI/FS

The RI monitoring well program was designed to provide groundwater sampling points immediately downgradient of the potential source area (leach pits and tanks), and a sampling point upgradient to provide background data for comparative analytical purposes. Downgradient wells were positioned to intercept groundwater flow from the disposal area in the overburden aquifer. Since the site area contains a large topographic low area which consists of wetlands, groundwater flow is anticipated in this direction. Therefore, three monitoring wells, MW-2, MW-3, and MW-4, were installed southwest (downgradient) of the tanks/leach pits to intercept groundwater flow. Monitoring well MW-1 was installed at a location upgradient/sidegradient of the sources. The locations of the monitoring wells are shown in Figure 2-2.

On November 17 through 21, 1997, the monitoring wells were installed in the overburden aquifer to screen the water table. Monitoring well borings were drilled utilizing hollow stem augers. Wells were constructed in the boreholes using two-inch diameter PVC riser and No. 20 slot PVC screens. Well development was conducted until the well responded to water level changes in the formation and produced clear, sediment-free water to the extent possible. The

wells were developed with a goal of producing water of not more than 10% variation between successive field parameters.

2004 Supplemental RI

On August 26 through 28, 2003, monitoring wells MW-05, MW-06, and MW-08 (Figure 2-2) were installed in the overburden. Monitoring well MW-05 was installed upgradient of the leach pit area for the collection of background groundwater chemistry samples. Monitoring well MW-06 was installed in the leach pit area to assist in defining the northerly extent of groundwater contamination detected in samples collected from monitoring well MW-04 in May 1998. Monitoring well MW-08 was installed to assist in delineation the horizontal extent of groundwater contamination downgradient of the leach pit area.

Overburden monitoring well borings were drilled with 4 ¼ inner-diameter hollow stem augers (HSA). The boreholes were completed as monitoring wells and screened across the water table using two-inch Schedule 40 PVC riser and 10 slot Schedule 40, slotted PVC screen. Sand packs were constructed with No. 1 silica sand. Boring logs and monitoring well construction diagrams are provided in Appendix D.

Well development was conducted by pumping and surging until the well responded to water level changes in the formation and produced clear, sediment-free water to the extent possible. The wells were developed with a goal of producing water of not more than 10% variation between successive field parameters.

Bedrock monitoring wells MW-04D and MW-07 (Figure 2-2) were installed on August 22 through September 3, 2003. Bedrock monitoring well borings were drilled with 4 ¼ HSA in the overburden and a 5 5/8-inch roller bit in bedrock. MW-04D was installed immediately adjacent to MW-04 to determine if contamination of the overburden aquifer had migrated into the underlying bedrock aquifer. MW-07 was installed approximately 600 feet in the general downgradient direction of MW-04 along Rosalind Drive. MW-07 was initially planned as an overburden well to assist in determining the downgradient edge of the plume; however bedrock was encountered at 2 feet bgs, thus the well was completed as a bedrock well. Boring logs and monitoring wells construction diagrams are provided in Appendix D.

The bedrock monitoring wells were developed following the same procedures as for the overburden monitoring wells. Monitoring well development data sheets for the bedrock wells are provided in Appendix D.

2006 Data Findings Letter Report

A third phase of monitoring well installation and sampling were performed in 2005. The proposed additional activities were requested by NYSDEC to provide a more comprehensive view of volatile organic contamination in the groundwater occurring at the site.

Three additional monitoring wells were installed in the overburden water-bearing zone as specified during the August 31, 2005 NYSDEC/NYSDOH site meeting. The locations of the three additional monitoring wells are shown on Figure 2-2.

Monitoring wells MW-09 and MW-10 were installed west (downgradient) of the Site building to evaluate groundwater quality and to provide a more comprehensive assessment on the source of groundwater contamination. MW-11 was installed on the north side of Leach Pit LP-09 and within the terrace on which the leach pits are situated, to supplement delineation of the volatile organic groundwater contamination. Monitoring well depths and screened intervals were selected based on the elevation of the water table, the screen intervals being placed across the water table.

2.8 Groundwater Contamination Delineation

1998 RI/FS

The 1998 RI/FS groundwater sampling program was designed to provide information (1) for a more precise understanding of overburden groundwater at the site, and (2) on the presence, nature and extent of a contamination plume. One round of sampling was performed on May 11 and 12, 1998, at the four installed monitoring wells (see Figure 2-2). The wells were sampling using NYSDEC approved USEPA Low Flow Sampling Procedures. Specific conductance, pH, and temperature were measured at the start of purging operations and after each purged volume. Stabilization of these parameters of ± 10 percent from successive purged volumes indicated that the groundwater within the well was at equilibrium. Groundwater samples were obtained by using a stainless steel or Teflon bailer suspended on stainless steel Teflon coated wire. Wells were sampled for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals and cyanide.

2004 Supplemental RI

The groundwater sampling program was designed to provide additional information for a more precise understanding of overburden and bedrock water bearing units at the site, and to further define the presence, nature and extent of a contamination plume. One round of sampling was performed on October 6 through 8, 2003. Groundwater samples were collected from seven of the nine site monitoring wells (MW-01, MW-02, MW-04, MW-04D, MW-05, MW-07, and MW-08) The collected samples were analyzed for TCL VOCs, TAL metals and cyanide.

All wells, except MW-04, were sampled using NYSDEC-approved USEPA Low Flow Sampling Procedures. Groundwater samples were collected using a 2-inch stainless steel Grundfos pump with Teflon-lined tubing.

Specific conductance, pH, dissolved oxygen, oxidation-reduction potential, turbidity and temperature were measured at the start of purging operations and periodically (approximately every 3 minutes) during purging. Stabilization of these parameters (pH: ± 0.1; conductivity: ± 3%; dissolved oxygen: ± 10%; oxidation-reduction potential: ± 10 mV; turbidity: >50 NTU or ±10%) over three consecutive readings indicated that the groundwater within the well was at equilibrium. Well purge data sheets are presented in Appendix D.

Due to a low volume of water in MW-04, this well was bailed dry using a 1" diameter Teflon bailer and then allowed to recharge. Once the well had recharged, samples were collected using a Teflon bailer. Due to the small volume of water extracted from the well during purging (approximately 0.25 gallons), water quality measurements were not collected.

No sample could be collected from monitoring wells MW-03 and MW-06. MW-03 was dry and MW-06 was bailed but contained only mud and sediment. As such, no sample was collected. These wells demonstrated the limited water-bearing zone beneath the site area.

2006 Data Findings

Three (3) newly installed monitoring wells (MW-9 through MW-11) and previously installed monitoring wells MW-02, MW-03, MW-04, and MW-06 were sampled in accordance with approved work plan procedures. In addition, one (1) field blank, one (1) duplicate, and one (1) MS/MSD was collected. One (1) trip blank was collected for each day of sampling. Groundwater samples were analyzed for Target Compound List Volatile Organic Analytes (TCL VOAs) only.

2.9 Hydraulic Conductivity Testing

Instantaneous displacement tests or slug tests were conducted at four Magna Metals site monitoring wells on May 11 and 12, 1998. These tests were conducted in order to provide a general indication of relative hydraulic conductivity in the shallow unconsolidated aquifer.

Each slug test was conducted by dropping a sealed PVC cylinder (i.e., slug) into the well and measuring the resultant water level displacement. First, the static water level was measured with a hand-held instrument from the top of the casing prior to the test. The slug was then dropped into the well and completely submerged within a few seconds. Water levels were measured by hand-held instrument at regular intervals after displacement by the slug. Measurements were continued until approximately 90 percent recovery had occurred. After recovery from the first test was achieved, the slug was removed within a few seconds and recovering water levels were again monitored with a hand-held instrument.

Detailed analyses of the slug tests from the 1998 RI are presented in Appendix E.

2.10 Homeowner Survey

On August 8, 2003, officials at the Cortlandt Town Hall were contacted regarding potential private wells in the area. Based on discussions with Mickey Foster in the Town Water Department, it was concluded that all residents are currently on town water. Some town residents still have private wells, but these properties are either not in the area of the site. Private wells are upgradient of the former Magna Metals property by at least ¼ to ½ mile.

2.11 Monitoring Well Survey

The monitoring well locations were surveyed. Horizontal control was referenced to the New York State Plane coordinate system using the North American Datum of 1983 (NAD83). Vertical control was referenced to the North American Vertical Datum of 1988 (NAVD88). The survey was performed on March 29th and 30th, 2004.

2.12 Groundwater Level Measurements and Surface Water Survey

A synoptic round of water levels was collected on March 30, 2004 in coordination with a survey of five surface water elevation locations. Water levels were collected using a Solinst interface probe. The surface water elevations were also surveyed. Horizontal control was referenced to the New York State Plane coordinate system using the North American Datum of 1983 (NAD83). Vertical control was referenced to the North American Vertical Datum of 1988 (NAVD88). The results of the synoptic round of water level measurements are displayed in Table 2-2.

2.13 Building Interior Sampling

As a result of a proposed building demolition by Baker Properties, sampling beneath the building slab of the former Magna Metals building was planned. However, sampling was not performed because the building was not demolished prior to the field work. The structure is considered physically unsafe to enter. During remediation activities, the derelict building should be taken down and soils should be sampled for potential removal.

2.14 Investigation Derived Waste

Prior to the start of investigative work related to the supplemental RI, investigation derived waste (IDW) from the 1998 investigation was removed from the site (July 25, 2003). IDW resulting from work performed as part of the supplemental RI/FS work was stored on site in 55-gallon steel drums. Following the completion of supplemental RI investigative activities, a second IDW removal event occurred (May 3, 2004). No investigation waste remained at the conclusion of the 2005 field work. All investigation waste was removed from the site.

2.15 Soil Vapor Survey (2006)

Following submittal and NYSDEC review of the Draft Supplemental RI Report dated August 2004, the additional work was required to address the potential for soil gas at the site.

Eight (8) soil vapor and one (1) sub-slab vapor samples and one field duplicate were collected. Locations of the soil and sub-slab vapor (SV) locations are presented on Figure 2-4 and were agreed upon by representatives of NYSDEC and NYSDOH. Soil vapor and sub-slab vapor sampling was performed to confirm the absence of a vapor intrusion pathway.

Soil vapor and sub-slab vapor samples were analyzed at an ELAP-certified laboratory. Vapor samples were analyzed by United States Environmental Protection Agency (USEPA) Method TO-15 for volatile organic compounds with a reporting limit of 1 $\mu g/m^3$.

Soil vapor horizontal locations were surveyed using a Global Positioning System (GPS) unit with 3-foot accuracy. The sub-slab vapor implant location was measured from corners of the building in which the location is located. The relevant external corners of the building were located using a GPS unit.

2.16 AKRF Vapor Intrusion Assessment (2007)

In November 2006, the NYSDEC issued correspondence requiring the sampling of sub-slab soil vapor from the on-site office/warehouse building to the case of the Magna Metals building to confirm the presence or absence of soil vapor intrusion. NYSDEC's sampling requirement was in response to a TCE concentration of 59 micrograms per cubic meter in one soil vapor sample (SV-03) that was collected next to the office/warehouse building. A Soil Vapor Investigation Work Plan dated February 2007 (prepared by AKRF, Inc.) was approved by the NYSDEC in March 2007.

On March 16, 2007, the soil vapor sampling program was initiated with the completion of a presampling survey of the site building. A NYSDOH Indoor Air Quality Questionnaire and Building Inventory form for each occupant was used to document the detailed results of the survey.

On March 24, 2007, five interior soil-gas sampling points (SV-11 through SV-15), were installed within the Polymedco office, the Motion Laboratory, the Polymedco warehouse, and the International Purchasing Systems warehouse. Sample locations are presented in Figure 2-5.

On April 5, 2007, five sub-slab soil gas and six indoor air samples were collected using six-liter Summa canisters over an 8-hour sampling period. The samples were analyzed for VOCs by EPA Method TO-15.

Table 2-1
Leach/Septic Pit IDs, Sludge Thickness, and Construction Details
Magna Metals - Cortlandt, New York

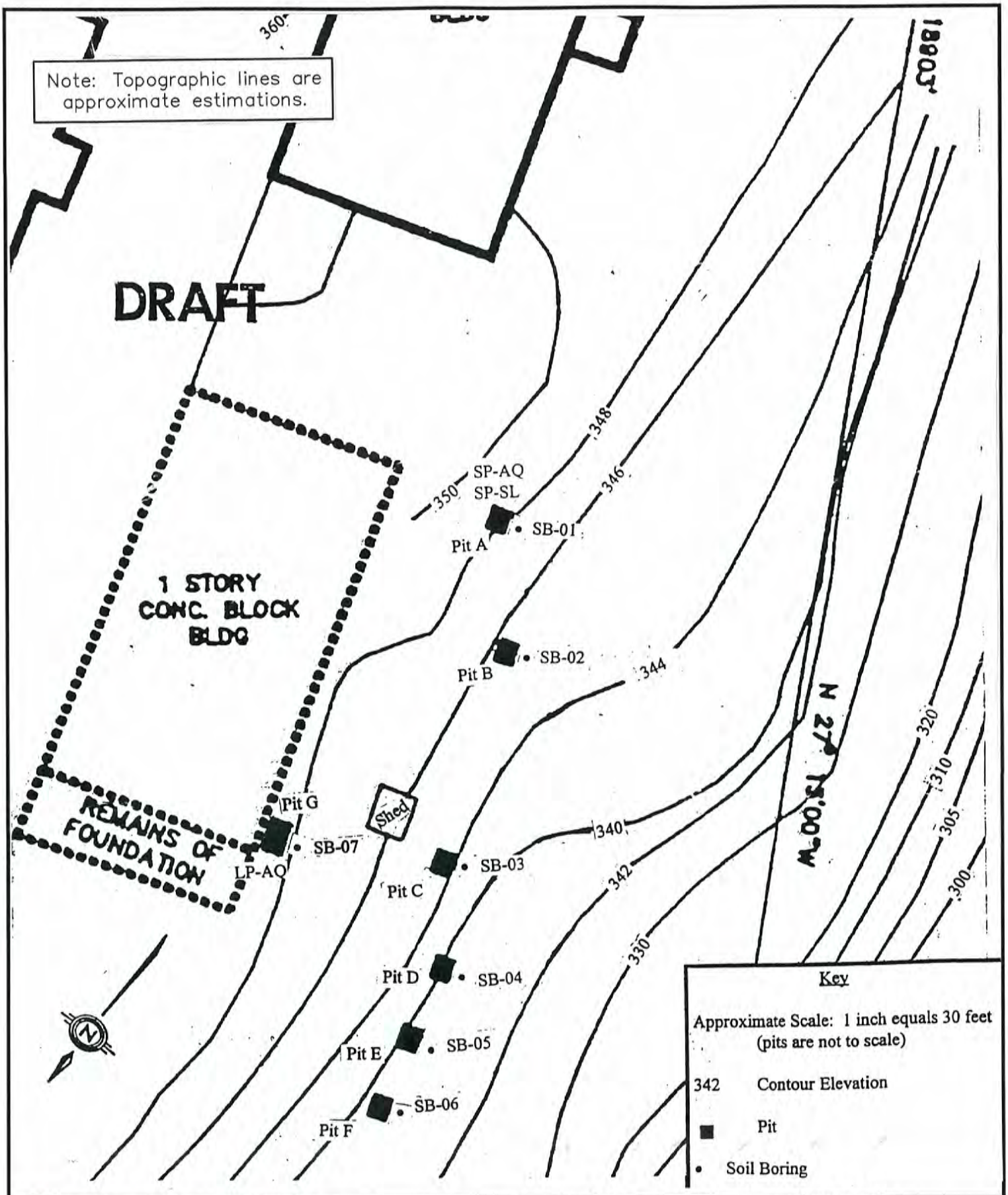
Current Pit ID	Previous Pit ID	Approximate Depth to Sludge (feet)*	Approximate Depth to Soil (feet)*	Approximate Sludge Thickness (feet)	Leach Pit Construction
ST-01	Pit A	6	-	NE	Rectangular shape with concrete walls and bottom
ST-02	Pit B	7	7.6	0.6	Cinderblock
LP-01	Pit G	NE	NE	NE	Rectangular shape, concrete walls with internal baffles
LP-02	Pit C	7	7.75	0.75	Cinderblock
LP-03	Pit D	7	8.3	1.3	Cinderblock
LP-04	Pit E	-	-	-	Cinderblock
LP-05	Pit F	7	8	1.0	Cinderblock
LP-06	**	7	7.3	0.3	Pre-fabricated
LP-06A	**	7	8	1.0	Cinderblock
LP-07	**	7	7.1	0.1	Pre-fabricated
LP-08	**	7	7.02	0.02	Pre-fabricated
LP-09	**	7	NE	<0.02	Pre-fabricated
LP-0A	**	7	NE	<0.02	Pre-fabricated

* Depths measured in feet below pit opening
** Leach pit discovered during 2004 field effort.
- Not able to measure
NE - Not estimated
Cinderblock - Cylindrical shape with concrete cinderblock construction
Pre-fabricated - Cylindrical, pre-fabricated concrete construction with 1" diameter perforations along sidewalls
All pits except ST-01and LP-01 are approximately 6' in diameter.
LP-04 is filled with debris, depth could not be measured

Table 2-2
Groundwater and Surface Water Elevations
March 30, 2004
Magna Metals - Cortlandt, New York

Location	Northing (feet)	Easting (feet)	Measuring Point Elevation (feet msl)	Depth to Water (feet)	Water Elevation (feet msl)
MW-01	889547.12	665389.57	367.94	6.85	361.09
MW-02	889760.21	665127.51	346.57	14.81	331.76
MW-03	889806.63	665090.97	341.92	16.67	325.25
MW-04D	889832.07	665073.80	339.61	14.9	324.71
MW-04	889840.26	665070.73	338.03	13.47	324.56
MW-05	890191.50	665491.01	343.40	11.71	331.69
MW-06	889901.83	665025.92	336.97	16.14	320.83
MW-07	889316.93	664899.66	334.73	8.48	326.25
MW-08	889301.20	664474.00	317.54	6.48	311.06
SWEL-1	889844.39	664863.44	309.86	0.00	309.86
SWEL-2	889797.07	664799.56	309.83	0.00	309.83
SWEL-3	890262.07	664686.03	309.97	0.00	309.97
SWEL-4	890099.19	664725.83	309.93	0.00	309.93
SWEL-5	889492.49	665113.99	316.31	0.00	316.31

msl - Mean Sea Level
Horizontal Datum North American Datum of 1983 (NAD83 New York State Plane Coordinates Zone 3101)
Vertical Datum is North American Vertical Datum of 1988 (NAVD88)



TETRA TECH EC, INC.	TITLE: Leach Pit Location Map – 1998 RI Summary Magna Metals Cortlandt, New York	DWN: LMB	DES.:	PROJECT NO.: 106–1172
		CHKD:	APPD:	
		DATE: 08/22/07	REV.: 0	FIGURE NO.: 2–1

LEGEND

- SS-01 ▲ PHASE I SURFACE SOIL LOCATION
- SW/SD-01 ● PHASE I SURFACE WATER AND SEDIMENT LOCATION
- SB-01 ● PHASE I SOIL BORING LOCATION
- LP-02 ▽ LEACH PIT LOCATION
- MW-01 ⊕ MONITORING WELL LOCATION
- SW-15 ⊕ SUPPLEMENTAL RI SURFACE WATER SAMPLE OR ELEVATION LOCATION
- SD-15 ◆ SUPPLEMENTAL RI SEDIMENT SAMPLE LOCATION
- SS-08 ■ SUPPLEMENTAL RI SURFACE SOIL SAMPLE LOCATION
- RA ● SUPPLEMENTAL RI SOIL BORING LOCATION
- 320 CONTOUR LINE (20 FT INTERVAL)
- CROSS-SECTION A – A'
- GEOPHYSICAL SURVEY
- APPROXIMATE REFUSE AREA
- APPROXIMATE WETLAND AREA

NOTES:
1. PHASE I SAMPLE LOCATIONS AND SUPPLEMENTAL RI SOIL BORINGS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

3. LOCATIONS OF LEACH PITS AND SUPPLEMENTAL RI SURFACE WATER SAMPLES, SEDIMENT SAMPLES, AND SURFACE SOIL SAMPLES ARE BASED ON GPS COORDINATES.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

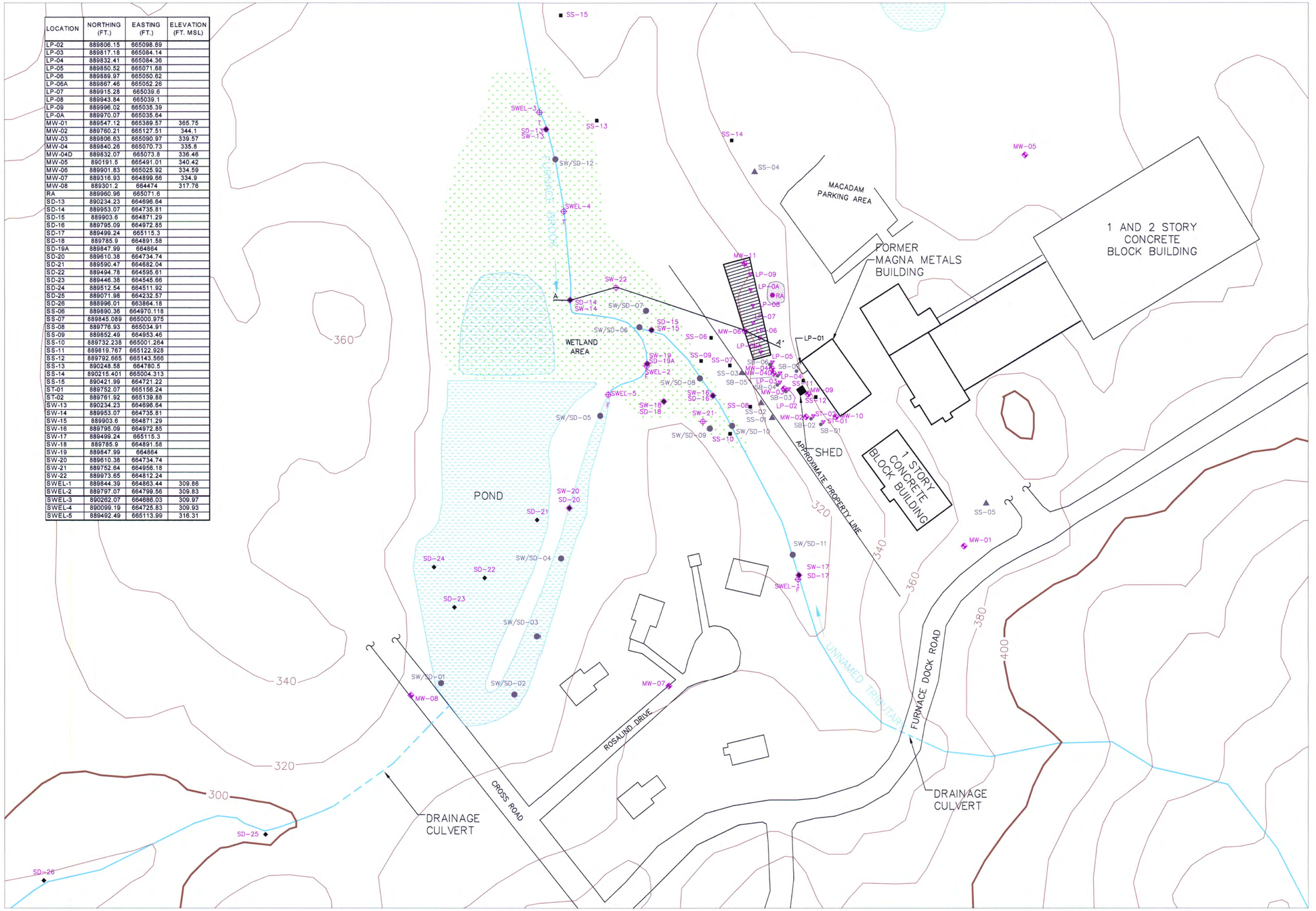
3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

0 40 80
FEET

LOCATION	NORTHING (FT.)	EASTING (FT.)	ELEVATION (FT. MSL)
LP-02	889806.15	665098.69	
LP-03	889817.18	665084.14	
LP-04	889832.41	665084.36	
LP-05	889850.52	665071.68	
LP-06	889889.97	665050.62	
LP-06A	889867.46	665052.26	
LP-07	889915.28	665039.6	
LP-08	889943.84	665039.1	
LP-09	889996.02	665035.39	
LP-0A	889970.07	665035.64	
MW-01	889547.12	665389.57	365.75
MW-02	889760.21	665127.51	344.1
MW-03	889806.63	665090.97	339.57
MW-04	889840.26	665070.73	335.8
MW-04D	889832.07	665073.8	336.46
MW-05	890191.5	665491.01	340.42
MW-06	889901.83	665025.92	334.59
MW-07	889316.93	664899.66	334.9
MW-08	889301.2	664474	317.76
RA	889960.96	665071.6	
SD-13	890234.23	664696.64	
SD-14	889953.07	664735.81	
SD-15	889903.6	664871.29	
SD-16	889795.09	664972.85	
SD-17	889499.24	665115.3	
SD-18	889785.9	664891.58	
SD-19A	889847.99	664864	
SD-20	889610.38	664734.74	
SD-21	889590.47	664682.04	
SD-22	889494.78	664595.61	
SD-23	889446.38	664545.66	
SD-24	889512.54	664511.92	
SD-25	889071.98	664232.57	
SD-26	888996.01	663864.18	
SS-06	889890.36	664970.118	
SS-07	889845.089	665000.975	
SS-08	889776.93	665034.91	
SS-09	889852.49	664953.46	
SS-10	889732.238	665001.264	
SS-11	889819.767	665122.928	
SS-12	889792.665	665143.566	
SS-13	890248.58	664780.5	
SS-14	890215.401	665004.313	
SS-15	890421.99	664721.22	
ST-01	889752.07	665156.24	
ST-02	889761.92	665139.88	
SW-13	890234.23	664696.64	
SW-14	889953.07	664735.81	
SW-15	889903.6	664871.29	
SW-16	889795.09	664972.85	
SW-17	889499.24	665115.3	
SW-18	889785.9	664891.58	
SW-19	889847.99	664864	
SW-20	889610.38	664734.74	
SW-21	889752.64	664956.18	
SW-22	889973.65	664812.24	
SWEL-1	889844.39	664863.44	309.86
SWEL-2	889797.07	664799.56	309.83
SWEL-3	890262.07	664686.03	309.97
SWEL-4	890099.19	664725.83	309.93
SWEL-5	889492.49	665113.99	316.31



TETRA TECH EC, INC.

TITLE:
Site Plan with Sample, Pit and Monitoring Well Locations
Magna Metals
Cortlandt, New York

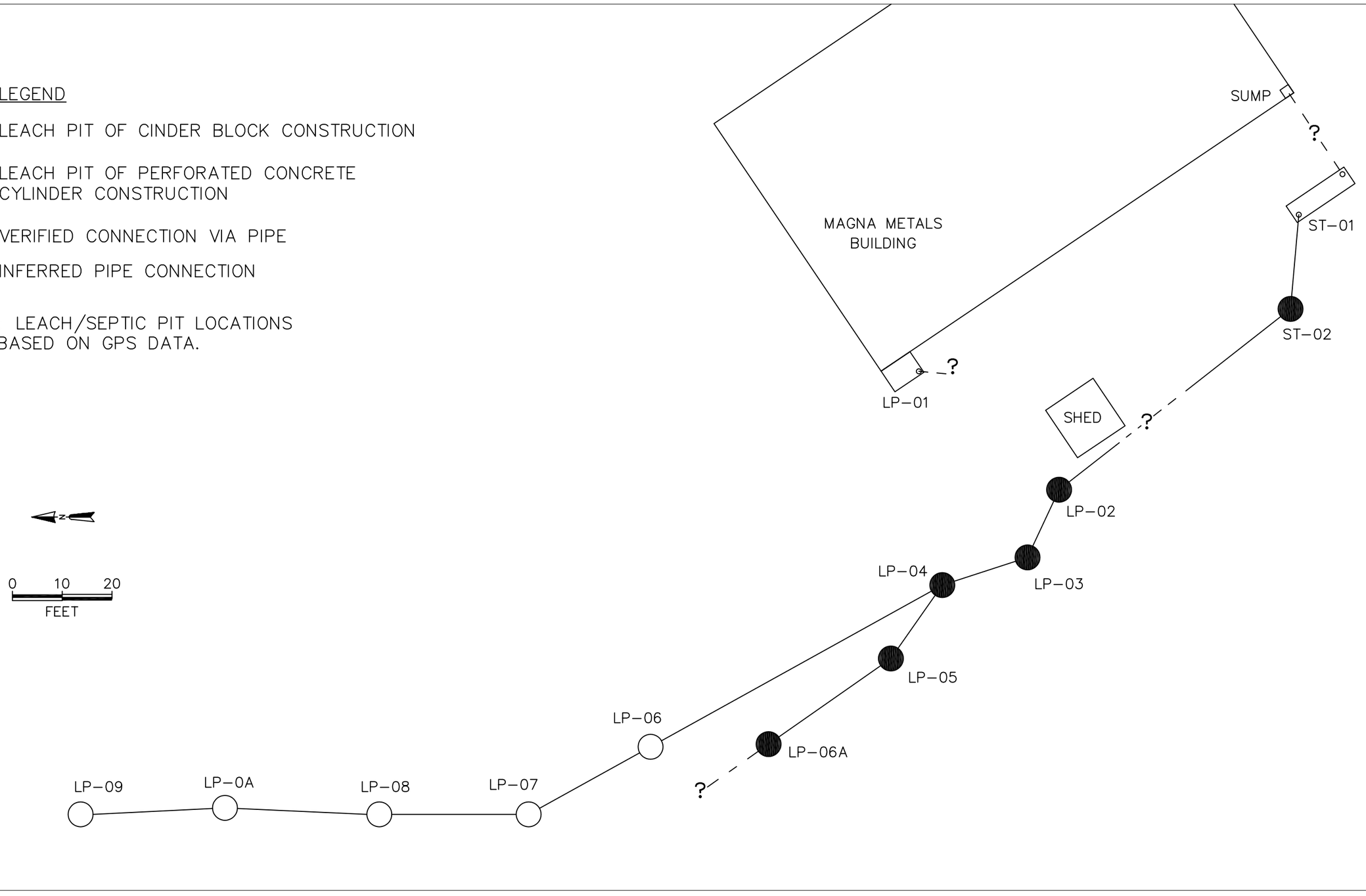
DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
		2-2
DATE: 08/21/07	REV.: 0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 2-2 082107.DWG

LEGEND

- LEACH PIT OF CINDER BLOCK CONSTRUCTION
- LEACH PIT OF PERFORATED CONCRETE CYLINDER CONSTRUCTION
- ——— VERIFIED CONNECTION VIA PIPE
- – –?– – INFERRED PIPE CONNECTION

NOTE: LEACH/SEPTIC PIT LOCATIONS ARE BASED ON GPS DATA.



TETRA TECH EC, INC	TITLE: Leach/Septic Pit Location Map – 2004 Supplemental RI Magna Metals Cortlandt, New York	DWN.: CTS	DATE: 08/21/07	PROJECT NO.: 106–1172
		CHKD:	REV.: 0	FIGURE NO.: 2–3
		DES.: DPC	APPD:	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 2-3 082107.DWG

LEGEND

LP–02 LEACH PIT LOCATION

MW–01 MONITORING WELL LOCATION

SV–02 SUPPLEMENTAL SOIL VAPOR LOCATION

MW–10 SUPPLEMENTAL MONITORING WELL LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. LOCATIONS OF LEACH PITS ARE BASED ON GPS COORDINATES.

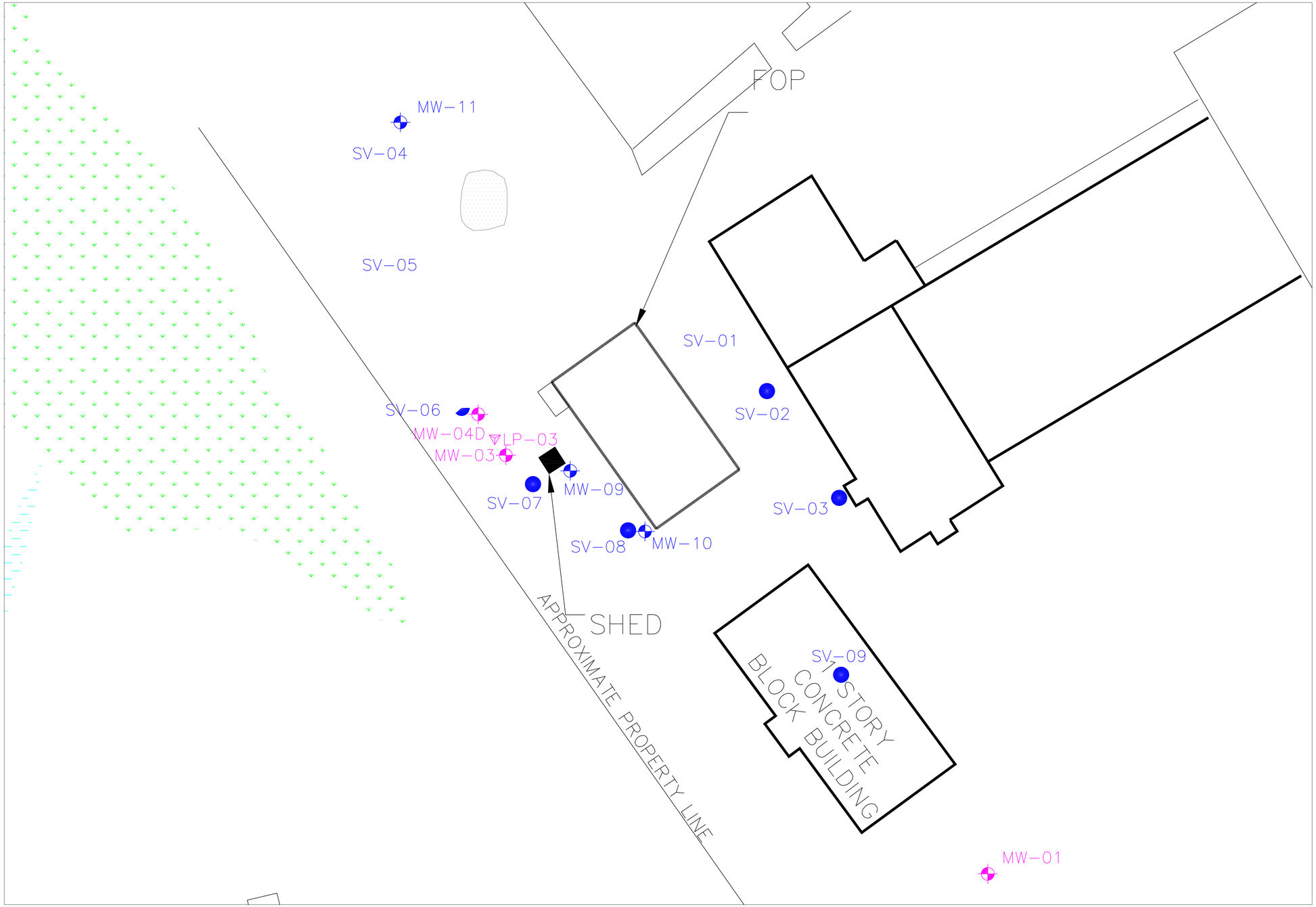
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

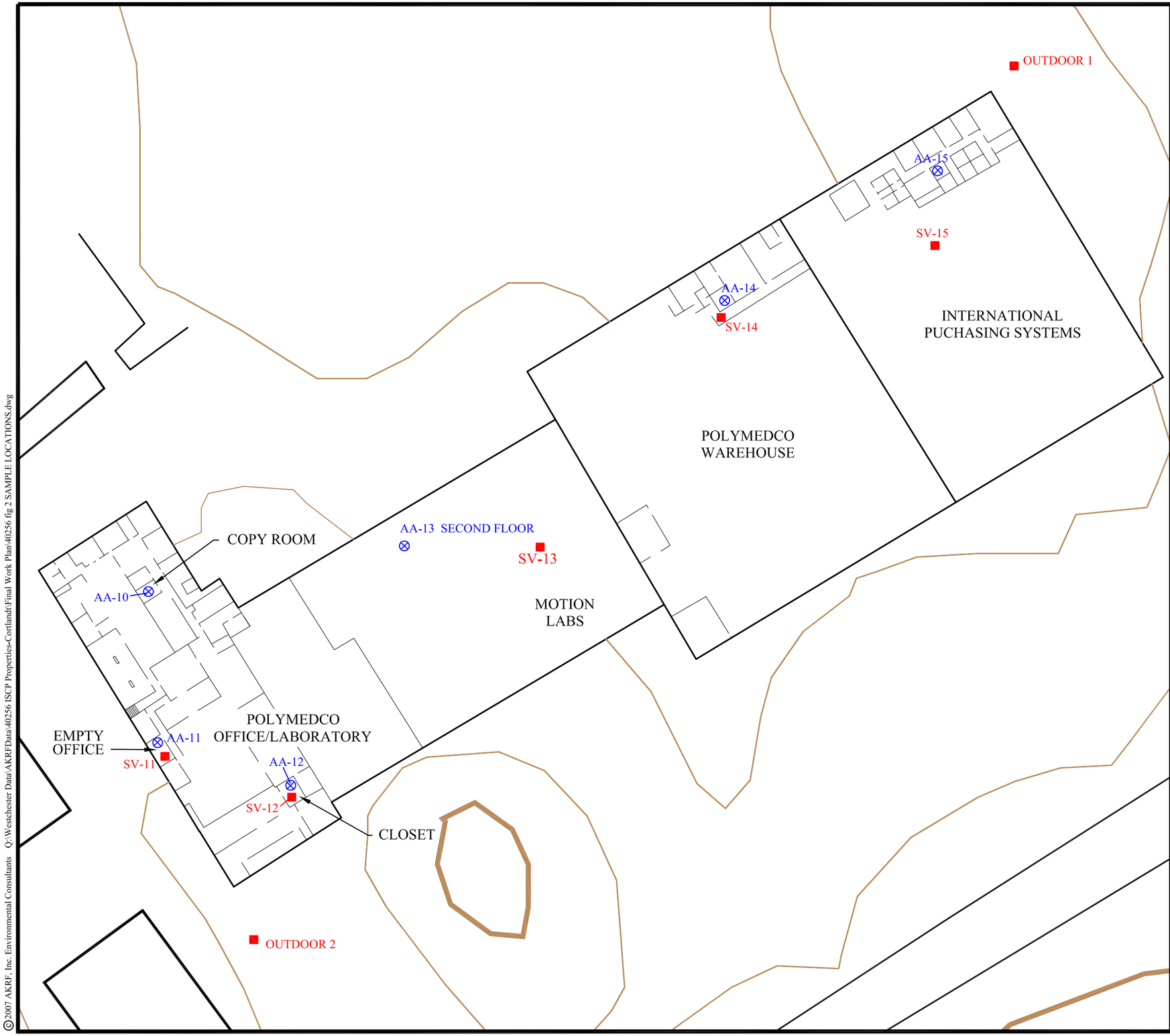


TETRA TECH EC, INC.

TITLE:
Soil Vapor Samples, Sub–Slab Vapor Sample, and Monitoring Well Locations
Supplemental RI/FS – September 2005 Work Plan Addendum
Magna Metals, Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106–1172
CHKD:	APPD:	
DPC		FIGURE NO.:
DATE:	REV.:	2–4
08/21/2007	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 2–4 082107.DWG



SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-14 — SUBSLAB VAPOR SAMPLING LOCATION

⊗ — INDOOR AIR SAMPLING LOCATIONS

320 — CONTOUR LINE (20 FT INTERVAL)

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 30' 60' 120'
SCALE IN FEET

N

AKRF Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGMA METALS
CORTLANDT, NEW YORK

SAMPLING LOCATIONS

DATE
05.25.07

PROJECT NO.
40256

SCALE
1"=60'

FIGURE
2-5

© 2007 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortland\Final Work Plan\40256 fig 2 SAMPLE LOCATIONS.dwg

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

Topography is fairly steep throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (msl). On the former Magna Metals Site, topography ranges from 360 feet msl along the eastern site boundary, to 320 feet msl along the western site boundary. The topography decrease is fairly steep. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area. Figure 3-1 depicts the site drainage pattern.

Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary of Furnace Brook and a large wetland area. The unnamed tributary flows north to Furnace Brook, which it joins approximately 150 feet northwest of the Magna Metals Site boundary. Furnace Brook, a Class C stream, flows south/southwest through the wetland area and discharges into a pond located approximately 250 feet downgradient (west) of the site. The wetlands are not classified as New York State regulated wetlands. Based on the homeowner survey (Section 2.2), there are no drinking water aquifers in the vicinity of the site.

3.1 Site Geology

The primary geologic characteristics of the subsurface conditions at the site and surrounding area consists primarily of a sandy to silty sand overburden unit, approximately 2 to 18 feet thick, overlying Hornblende bedrock, which is a associated with the New England Upland geologic unit. Figure 3-2 presents Cross-Section A-A', which shows the relationship of the units. The transect of Cross Section A-A' is depicted on Figure 2-2.

In the leach pit area, it is presumed that much of the overburden material is fill resulting from the installation of the leach pits. Based on boring logs (Appendix D), it is inferred that the fill material extends at least as deep as the bottoms of the leach pits. This depth appears to range from approximately 7 to 10 feet bgs across the site. The geophysics indicated areas on the site of apparent conductive anomalies as well as areas of buried metal. Excavation efforts in the leach pit area confirmed the presence of buried debris consisting mostly metal lamp parts and some pieces of lamp glass and other lamp associated debris. A photograph of the lamp debris uncovered is provided as photo 9 in Appendix B.

Bedrock was encountered at depths of 2 to 18 feet bgs at the site. The bedrock was found to be generally hard with fresh weathering. Rock quality designations (RQDs) of the bedrock ranged from 47% to 100%. At the MW-07 location, a fracture zone was present in the bedrock at 9 to 15 feet bgs.

3.2 Site Hydrology

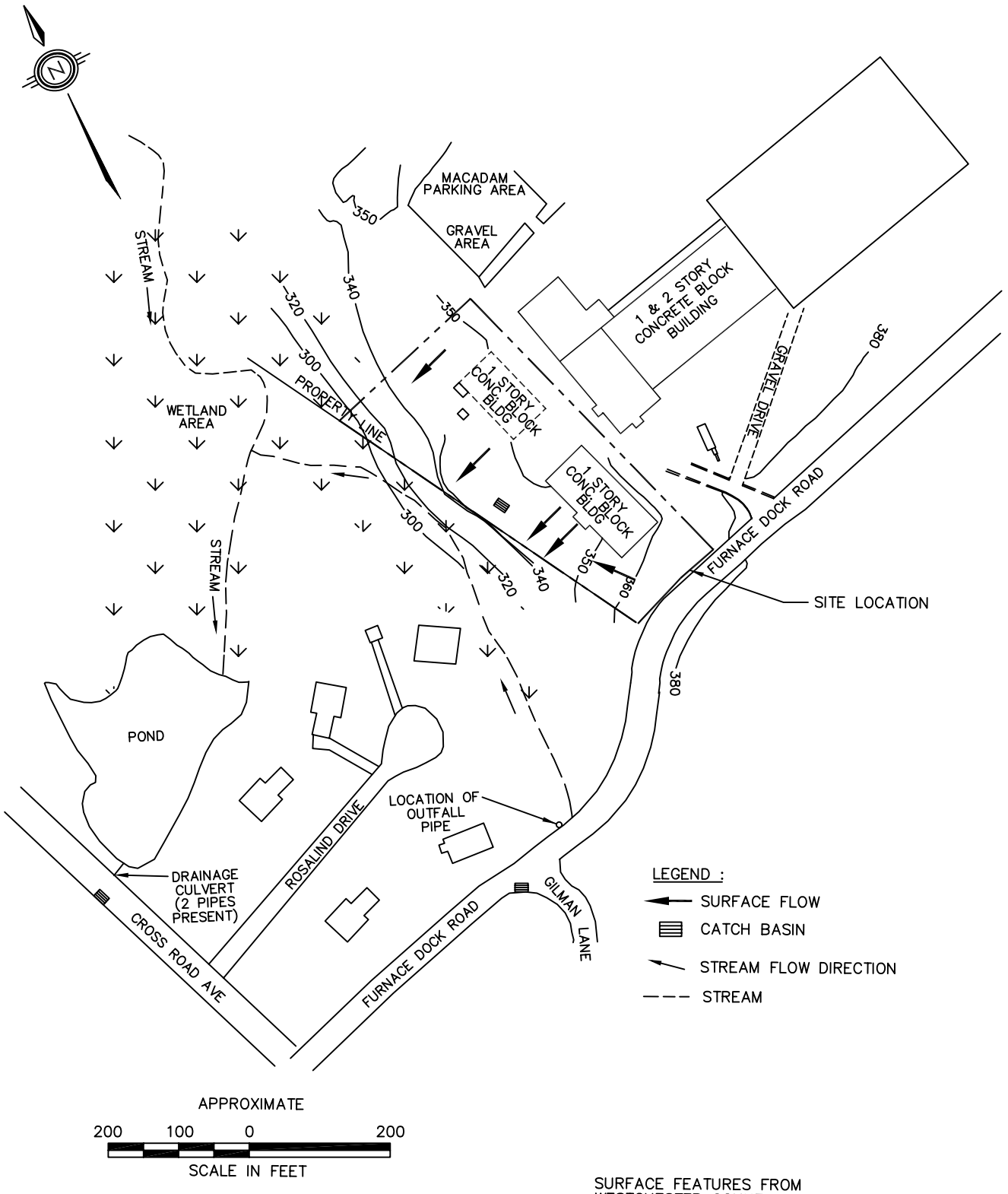
Overburden groundwater exists in the form of a very shallow water-bearing unit (i.e., typically less than five feet in thickness). Based on water level measurements collected on March 30, 2004 (Table 2-2), overburden groundwater elevations ranged across the site and nearby vicinity from 311.06 ft msl (MW-08) to 361.09 ft msl (MW-01). Overburden groundwater flow direction is to the west toward the unnamed tributary, the wetland area, and the confluence of the unnamed tributary and Furnace Brook. Overburden groundwater likely discharges to the unnamed

tributary, Furnace Brook, and the local wetlands. Figure 3-3 displays groundwater flow as interpreted from the March 30, 2004 data. Based on Figure 3-3, the hydraulic gradient in the overburden between the site and the unnamed tributary and wetland area is approximately 0.1 ft/ft.

Bedrock groundwater elevations ranged from 324.71 ft msl (MW-04D) to 326.25 ft msl (MW-07). Based on the March 30, 2004 groundwater data collected from monitoring wells MW-04 and MW-04D, there is a slightly upward vertical hydraulic gradient between the bedrock and overburden water bearing units.

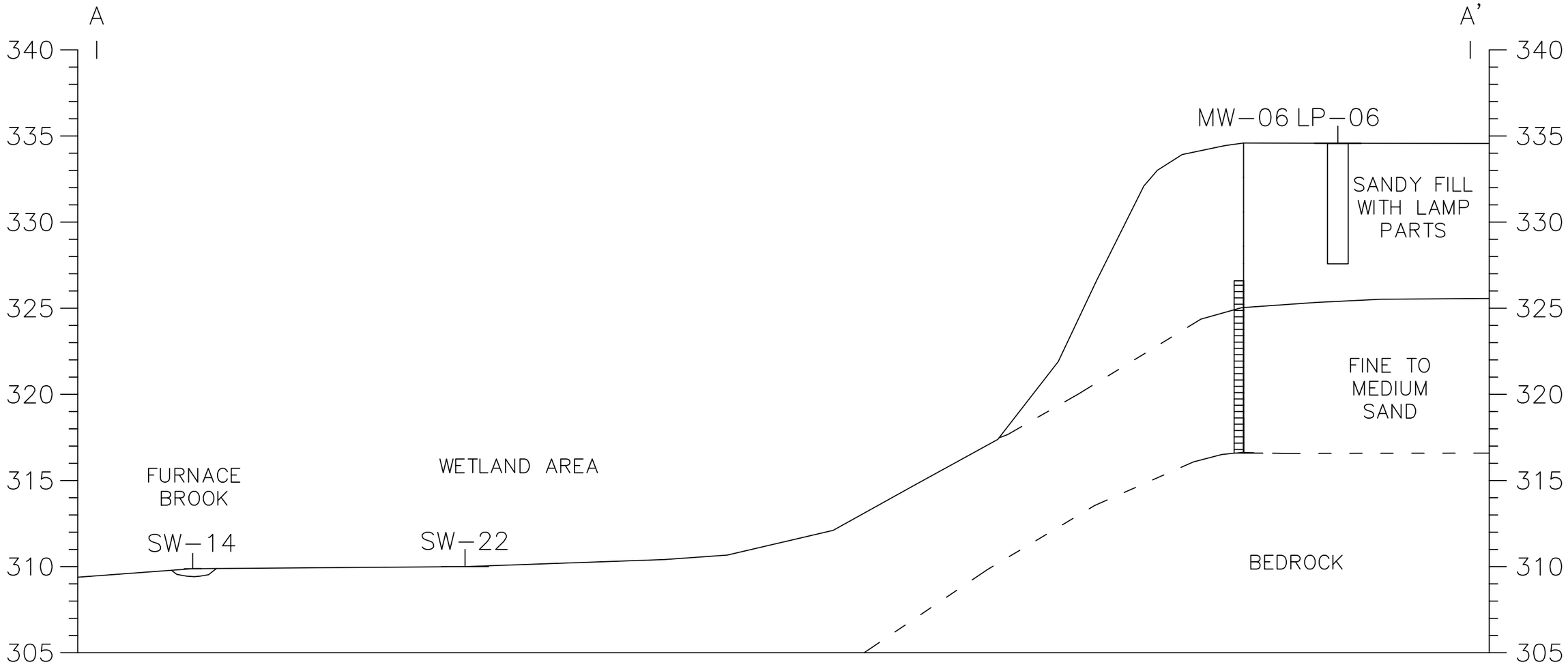
3.3 Cross Section

Cross section (A-A') (Figure 3-2) extends from the leach pit area, through the wetland area, and to Furnace Brook. The cross-section was prepared to depict the relationship of the fill, native overburden, and bedrock, to the potential source area (the leach pit area) and to potential environmental receptors (wetlands, Furnace Brook, and the unnamed tributary). Cross Section A-A' runs approximately perpendicular to groundwater and topographic contour lines and therefore roughly parallels the groundwater flow and surface water runoff flow directions. The topography of the native soil roughly mimics the topography of the underlying bedrock, with the relief of the surface topography having been enhanced in the Leach Pit Area with the addition of fill to cover the leach pits. Surface runoff follows the dip of the land surface and runs from the leach pit area into the wetland area. Overburden groundwater is not depicted in the vicinity of MW-06 because this well was dry during groundwater sampling. However, water table groundwater flow likely discharges to the wetland area and eventually to Furnace Brook and the unnamed tributary.



TETRA TECH EC, INC.	TITLE: Drainage Map – 1998 RI Summary Magna Metals Cortlandt, New York	DWN: LMB	DES.:	PROJECT NO.: 106-1172
		CHKD:	APPD:	
		DATE: 08/21/2007	REV.: 1	FIGURE NO.: 3-1

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 3-1 082107.DWG



TETRA TECH EC, INC.	TITLE: Cross–Section A – A' – 2004 Supplemental RI Magna Metals Cortlandt, New York	DWN.: CTS	DATE: 08/21/07	PROJECT NO.: 1172.0003
		CHKD:	REV.: 0	FIGURE NO.: 3–2
		DES.: DPC	APPD:	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 3–2 082107.DWG

LEGEND

MW-01 MONITORING WELL LOCATION

SW-15 SURFACE WATER SAMPLE OR ELEVATION LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

320 GROUNDWATER CONTOUR

GROUNDWATER FLOW

GEOPHYSICAL SURVEY

APPROXIMATE WETLAND AREA

NOTES:
1. MW-04D AND MW-07 WERE NOT INCLUDED IN THE CONTOURING BECAUSE THEY ARE SCREENED IN BEDROCK.

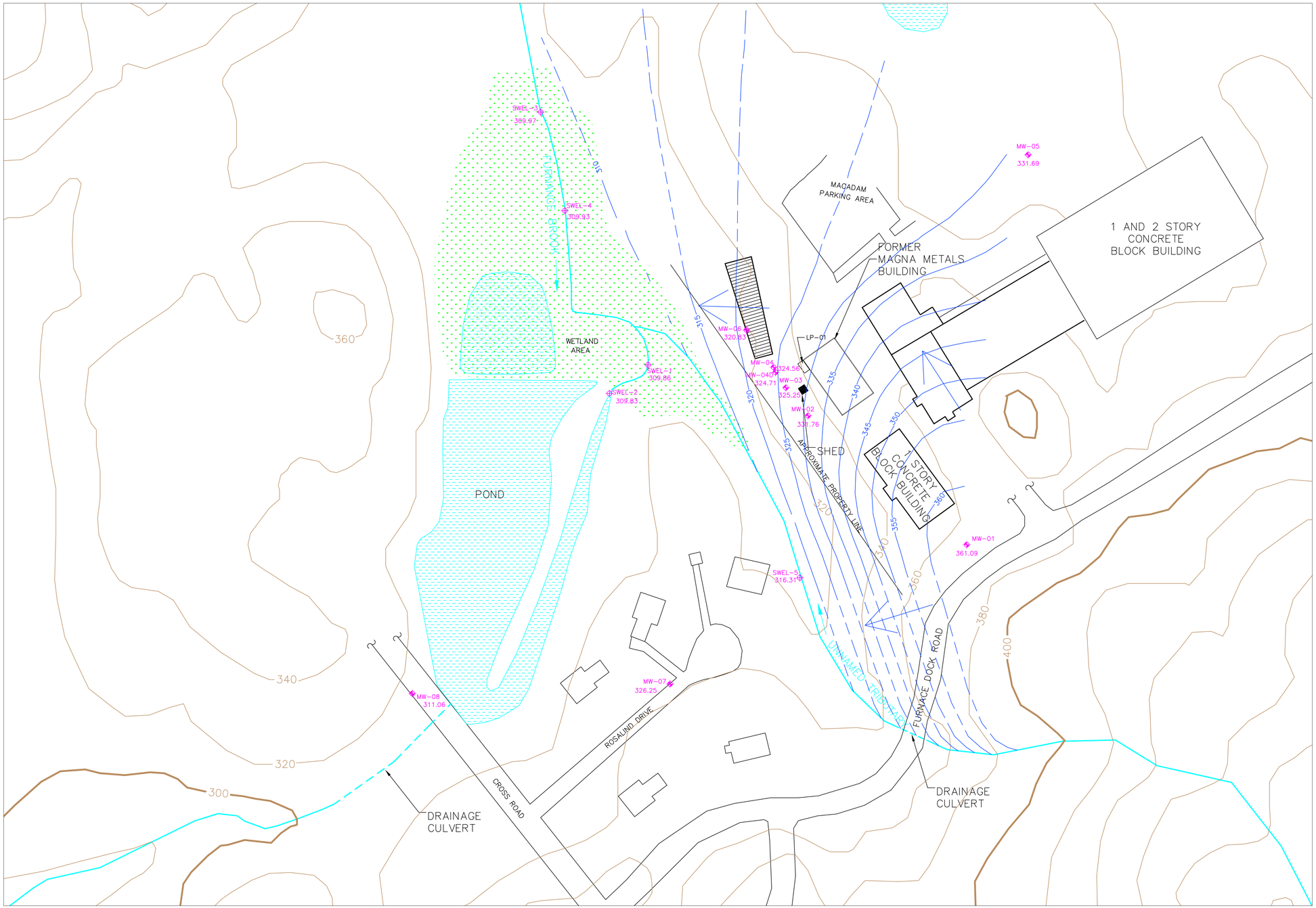
2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

4. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.



0 40 80
FEET

TETRA TECH EC, INC.

TITLE:
Overburden Groundwater Contours – 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 08/21/07	REV.: 0	3-3

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 3-3 082107.DWG

4.0 ENVIRONMENTAL SAMPLING RESULTS

4.1 Introduction

The Magna Metals RI/FS Site investigation was an extensive and comprehensive multimedia environmental sampling and analysis program which included the collection and analysis of septic tank/leach pit water and sludge samples, surface water and sediment samples, surface and subsurface soil samples, groundwater samples, and soil gas to determine the presence, nature and extent of contamination at the site. In addition, sub slab vapor and indoor air samples have been collected and the data results have been presented in the AKRF Soil Vapor Investigation Report, July 2007. For completeness, a brief summary of those results are presented herein.

The environmental samples were analyzed by methods stated in the NYSDEC-Analytical Services Protocol (ASP) and included the following analyses:

- Target Compound List (TCL) Volatile Organic Compounds (VOCs);
- TCL Semi-Volatile Organic Compounds (SVOCs);
- TCL Pesticides and Polychlorinated Biphenyls (PCBs);
- Target Analyte List (TAL) Metals;
- Cyanide; and
- Total Organic Carbon

The results of the 1998, 2004, and 2006 reports sampling investigation are summarized by environmental medium in Appendices F, G, H, respectively.

Data qualifiers are noted throughout the text and tables to indicate concentrations which are undetected (designated with a "U", "ND" or "--"); estimated ("J"); and/or rejected ("R"). A "B" found in the organics data indicates that the compound was also detected in an associated laboratory blank, possibly showing inter-laboratory contamination. In contrast, a "B" found in the inorganics data indicates that the element was detected above the instrument detection limit but below the method-specific and matrix-specific quantitation limit.

4.2 Holding Tank/Septic Tank/Leaching Pit Analytical Results

4.2.1 1998 RI/FS

One sludge and one water tank sample were collected from one Septic Tank, Pit A. In addition, a water sample was collected from one leach pit, Pit G, during the May 1997 site investigation. Please note that these two pits were renamed as LP-01 (G) and ST-01 (A). The samples were analyzed for TCL organics, TAL metals and cyanide, and/or TOC (sludge only). A summary of the detected constituents presented in 1998 Report can be found in Table 4-1 and on Figure 4-1. Analytical results from the 1998 RI/FS are presented in Tables F-2 through F-6 of Appendix F.

Three VOC constituents were present in the septic tank sludge samples. 2-Butanone, toluene and xylenes were detected at concentrations of 37 ug/kg, 14 ug/kg and 30 ug/kg, respectively. The water sampled from the septic tank contained none of these VOCs. 1,4-Dichlorobenzene was detected in SP-AQ at a concentration of 0.76 ug/L. Analysis of sample LP-AQ from Pit G

indicated concentrations of three chlorinated aliphatics (chlorine-substituted hydrocarbon compounds). These detected compounds were vinyl chloride at 2.2 ug/L, cis-1,2-dichloroethene at 4.8 ug/L, and trichloroethene at 0.92 ug/L.

The septic tank sludge in Pit A contained occurrences of eleven SVOCs, of which eight were polycyclic aromatic hydrocarbons (PAHs). Concentrations for the PAH constituents ranged from 200 ug/kg (benzo(a)pyrene) to 1,500 ug/kg (2-methylnaphthalene). The other three detected SVOCs were 1,4-dichlorobenzene at 4,200 ug/kg, bis(2-ethylhexyl)phthalate at 12,000 ug/kg, and di-n-octylphthalate at 330 ug/kg. The water samples from the septic tank (SP-AQ) and from the leach pit (LP-AQ) both contained bis(2-ethylhexyl)phthalate at concentrations of 2 ug/L. PAH compounds generally consist of two or more fused benzene rings, and occur from the burning of oils, wood, coal, gas, etc.; from wood processing and treating operations; and from the manufacture of plastics, chemicals and dyes. 1,4-Dichlorobenzene is utilized as a disinfectant, deodorant and chemical intermediate. The manufacture of plastics and rubber materials use phthalate compounds. It is noted that the existence of the PAH compounds is not typical of bi-products found in metals plating waste stream.

One pesticide and two PCBs were detected in the septic tank sludge. Sample SP-SL contained 11 ug/kg of 4,4'-DDE, 150 ug/kg of Aroclor-1248 and 72 ug/kg of Aroclor-1260. The septic tank water and the leach pit water samples contained no detectable levels of pesticide or PCB constituents.

Analysis of the septic tank sludge indicated detectable occurrences of 20 metals. Concentrations ranged from 0.49 mg/kg for mercury to 30,400 mg/kg for iron. In addition, cyanide was detected in the sludge at a concentration of 2,420 mg/kg. The septic tank water sample contained 18 inorganics (17 metals and cyanide), at concentrations up to 22,000 ug/L. Thirteen metal analytes and cyanide were detected in LP-AQ. Concentrations for the leach pit sample ranged from 1.4 ug/L (vanadium) to 9,500 ug/L (calcium). The concentration of TOC in the septic tank sludge was 52,000 mg/kg.

4.2.2 2004 Supplemental RI

Samples were collected from 11 leach pits at the Magna Metals Site. The 11 pits sampled were the southern septic tank (ST01), the northern septic tank (ST02), leach pit LP-02, LP-03, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-09 and LP-0A. Samples were analyzed for TAL metals, TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TOC and cyanide. The results of these analyses are discussed below. Analytical results are presented in Table 4-2 and the distribution of exceedances are presented on Figure 4-2.

Of the soil/sludge samples collected from the eleven pits, all had metals results that exceeded the NYSDEC Recommended Soil Clean-up Criteria. Generally speaking, the samples collected below the sludge cake material had fewer exceedances and/or metals concentrations that were significantly lower than those of the overlying sludge material sampled from the same pit. The results of the soil samples were still in exceedance by many magnitudes. Depending on the analyte, metals results exceeded the NYSDEC Recommended Soil Clean-up Criteria.

One leach pit sample (ST-01 which was previously labeled Pit A in the 1998 RI/FS) had a volatiles exceedance. This sample exceeded the NYSDEC Recommended Clean-up Criteria for m/p-Xylenes.

Six of the leach pit samples (LP-02, LP-05, LP-07, LP-09, LP-0A, ST-02) had semi-volatile results that exceeded the NYSDEC Recommended Soil Clean-up Criteria. Of these six samples, three samples were of the sludge material, and the underlying soil samples from the corresponding leach pit had no semi-volatile exceedances. The exceedance samples collected from LP-0A and LP-09 contained both sludge cake material and underlying soil, as the sludge layer was very thin in these leach pits. A sample of the underlying soils from the northern septic tank (ST-02) was found to have semi-volatile results exceeding the NYSDEC Recommended Soil Clean-up Criteria. This sample was the only soil sample of underlying soils to contain semi-volatile compounds that were above the NYSDEC Recommended Soil Clean-up Criteria. Depending on the analyte, semi-volatile results for leach pit samples exceeded the NYSDEC Recommended Soil Clean-up Criteria.

Of the leach pit samples, no analytical results for PCBs or pesticides exceeded the NYSDEC Recommended Soil Clean-up Criteria.

4.3 Refuse Area Analytical Results

4.3.1 2004 Supplemental RI

One soil samples was collected from the apparent refuse area. The soil sample (RA) was collected from a depth of 2.5 – 3.0' below ground surface (bgs) and was analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide, and TOC.

The refuse area soil sample had no volatile, semi-volatile, pesticide or PCB results that exceeded the NYSDEC Recommended Soil Clean-up Criteria.

Soil sampled from the former refuse area had metals results that were in excess of the NYSDEC Soil Clean-up Criteria. Depending on the analyte, metals results in the refuse area soil sample exceeded the NYSDEC Recommended Soil Clean-up Criteria.

4.4 Surface Water Analytical Results

4.4.1 1998 RI/FS

Twelve surface water samples and one duplicate sample were collected from the following locations: four surface water samples from the tributary, one sample after the confluence of the stream and tributary, one sample from the confluence of the stream and pond, two samples from the pond, one sample at the drainage culvert from the pond along Cross Roads Avenue, two samples in the wetlands area, and one upgradient sample from the stream. All of the surface water samples were analyzed for full NYSDEC-ASP TCL/TAL constituents and hardness. Results for these analyses are provided in Appendix F. Table 4-3 presents a summary of the detected constituents and their range of concentrations in the surface water samples. Constituents from the 1998 RI/FS report exceeding applicable criteria levels are plotted on Figure 4-1.

Five VOC compounds were detected in at least one of the surface water samples, and with the exception of the upstream background location (SW-12), every surface water sample contained at least one of the chlorinated aliphatic VOCs. Cis-1,2-dichloroethene and trichloroethene were present in a majority of the downgradient surface water samples (9 of 11 samples, or 82 percent). Concentrations for the VOCs ranged up to 18 ug/L (cis-1,2-dichloroethene in SW-9 from the wetlands). With the exception of trichloroethene, maximum concentrations for the VOCs were present in samples from the wetlands to the west of the site or the tributary to the south. Trichloroethene's maximum concentration (5.5 ug/L), in comparison, was detected in the furthest downgradient sample, the drainage culvert, SW-1.

Six SVOCs were detected in the surface water samples, at concentrations less than 4 ug/L. Bis(2-ethylhexyl)phthalate was the only SVOC constituent present in the upstream sample, SW-12, and this sample contained the maximum concentration of this constituent (3 ug/L). 4-Methylphenol, fluoranthene and pyrene were only detected in one of the two wetland surface water samples. One sample from each of the tributary, pond and drainage culvert locations contained diethylphthalate and hexachlorobenzene.

None of the surface water samples analyzed for pesticides and PCBs contained detectable levels of these constituents.

Twenty metals and cyanide were detected in at least one of the surface water samples collected during the investigation, and five inorganics (copper, iron, mercury, zinc, and cyanide) were present at concentrations greater than their respective applicable criteria levels. With the exception of iron, which exceeded in 10 of 12 sampled locations, criteria exceedances for the inorganics were generally located in the tributary, wetlands and drainage culvert samples. Concentrations of a majority of metals were greater, in the downgradient tributary (SW-6 specifically) and/or wetlands (SW-7 and SW-9) surface water samples in comparison to the upstream sample (SW-12).

Hardness of the surface water samples ranged from approximately 102 mg/L (SW-11) to 479 mg/L (SW-9); see Table F-11 of Appendix F. With the exception of location SW-9, the hardness concentrations were greater in comparison to the upstream sample. Analysis of the surface water sample from SW-9 indicated a concentration of hardness higher than the background. As stated above, this location contained elevated levels of numerous metals, and had calcium (40,600 ug/L) and magnesium (68,600 ug/L) concentrations which were greater than background (see Table 4-3.

4.5 Sediment Analytical Results

4.5.1 1998 RI/FS

Twelve sediment samples and one duplicate sample were collected from the same locations as the surface water samples. The sediment samples were analyzed for NYSDEC-ASP TCL organics, TAL inorganics and/or TOC. Results for these analyses are provided in Appendix F. A summary of the detected constituents and their range of concentrations in the sediment samples is presented in Table 4-5. Constituents present at concentrations exceeding applicable criteria levels are plotted on Figure 4-1.

The sediment samples contained occurrences of ten VOCs, as shown in Table 4-5. Of these ten, two of the chlorinated volatiles (vinyl chloride and trichloroethene) were also detected during the surface water investigation. The concentration of vinyl chloride from sample SD-9 (25 ug/kg) was greater than its normalized sediment criteria level. The surface water from this wetlands location had contained the maximum concentration for vinyl chloride (2.5 ug/L).

Twenty-three SVOCs were detected in the sediments, and there were 18 PAH compounds, three phthalate compounds, one phenolic compound, and one chlorinated aliphatic compound (see Table 4-5). The PAHs were detected at concentrations less than 2,701 ug/kg, in all of the sediment samples, with the exception of the upstream location SD-12. As presented on Table 4-5 and Figure 4-2, six PAHs (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene) were present at concentrations exceeding applicable criteria levels. These exceedances occurred in 64 percent of the locations (i.e., 7 of 11). A majority of the maximum concentrations (16 of 18, or 89 percent) for all of the PAH compounds occurred in the sediment sample collected from the drainage culvert near Cross Road Avenue (SD-1). Since these levels are greater than those upgradient, there is a strong potential that road runoff acts as a contributor. As shown on Table 4-5, the three phthalate compounds were generally detected below 1,000 ug/kg, and were present in the further downstream sediment samples (SD-6 through SD-1). Analysis of pond sediment sample SD-3 indicated 160 ug/kg of 4-chloro-3-methylphenol, which exceeds its normalized sediment criteria level of 50.5 ug/kg. Location SD-10 contained hexachloroethane at 960 ug/kg. No other detections of these two SVOCs were found during the sediment investigation.

Alpha-chlordane and gamma-chlordane were detected in tributary sediment sample SD-10, as presented in Table 4-5. Concentrations for these two pesticides were 3.5 ug/kg and 3.4 ug/kg, respectively, and both are greater than applicable criteria levels. No detections of pesticides or PCBs were found in the downgradient samples analyzed (SD-1DUP and SD-4).

Twenty-one of the 24 TAL inorganics were detected in at least one of the sediment locations (see Table 4-5). Chromium, copper, nickel, and zinc had concentrations that exceeded their respective guidance sediment criteria values. As present on Figure 4-1, the exceedance for chromium occurred at SD-9 (144 mg/kg), while those for zinc were at SD-5 (441 mg/kg), SD-6 (938 mg/kg) and SD-7 (1,890 mg/kg). Both copper and nickel were detected above criteria at locations SD-1 through SD-7 and SD-9 (see Figure 4-1). Exceedance concentrations for copper and nickel were found greater than criteria. As with the surface water investigation, numerous metals were present in locations SD-6 (tributary), SD-7 (wetlands) and SD-9 (wetlands) at more elevated concentrations in comparison to upgradient levels. Concentrations for these samples were greater than the SD-12 samples, as shown in Table 4-5.

Total organic carbon for the sediments ranged considerably in concentration (Appendix F). The upstream background sample contained 2,590 mg/kg. TOC concentrations ranged from 2,510 mg/kg to 160,000 mg/kg for the samples directly to the west, southwest and south of the site (SD-5 through SD-11). Analysis of the further downgradient sediment samples indicated TOC from 38,100 mg/kg to 169,000 mg/kg.

4.5.2 2004 Supplemental RI

Fourteen sediment samples and one duplicate sample were collected and analyzed for PAHs and TAL metals. PAH analytical results for sediment samples are presented in Table 4-6A, and metals analytical results for sediment samples are presented in Table 4-6B. The distribution of exceedances in sediment samples is presented in Figure 4-3.

Six of the 14 samples contained PAH compounds that were in excess of the NYSDEC sediment criteria. The distribution of PAHs in sediments is presented in Figure 4-3. Depending on the analyte, PAH results in sediments exceeded applicable criteria.

PAHs were not detected in sediment samples SD-13 and SD-14, collected upgradient of the confluence of Furnace Brook and the unnamed tributary. However PAHs were detected in sediment samples collected in the unnamed tributary and downgradient of the confluence of Furnace Brook and the unnamed tributary, including sediment sample SD-17 which was collected upgradient of the site. It is possible that PAHs detected in sediment samples have been transported by stormwater runoff from Furnace Dock Road, which crosses the unnamed tributary upgradient of sediment sample location SD-17.

Metals results exceeded criteria in 13 of the 14 sediment samples (Table 4-6B). Metals were not detected in the upgradient sample SD-17 collected in the unnamed tributary. Only one metal, nickel, was detected at approximately 1.26 times the criterion in the sediment sample SD-13, collected upgradient of the site in Furnace Brook. Metals found to be above criteria were chromium, copper, lead, nickel and zinc. The distribution of metals exceedances in sediment samples is presented in Figure 4-3. Depending on the analyte, metals results exceeded criteria.

4.6 Surface Soil Analytical Results

4.6.1 1998 RI/FS

Five surface (i.e., 0 to 12 inches in depth) soil samples and one duplicate were collected on April 11, 1997, and one surface soil sample was collected on November 17, 1997. Samples SS-1, SS-2 and SS-3 were collected to the west and downgradient of the on-site tanks/pits. Samples SS-4 and SS-5 are upgradient background surface soils, collected north and southeast of the site, respectively. The surface soil samples were analyzed for NYSDEC-ASP TCL/TAL constituents and/or TOC. Results for these analyses are provided in Appendix F. Table 4-7 presents a summary of the detected constituents and their range of concentrations in the surface soil samples, and Figure 4-1 plots the constituents detected at concentrations exceeding applicable criteria levels.

No volatile organics were detected in the surface soils (Appendix F).

As shown in Table 4-7, the surface soils collected from the three on-site locations (SS-1, SS-2 and SS-3) contained concentrations of 14 SVOCs, including 11 PAH and 3 phthalate compounds. Detected levels ranged from 8 ug/kg (anthracene) to 4,900 ug/kg (bis(2-ethylhexyl)phthalate). Benzo(a)pyrene was the only SVOC to exceed its applicable criteria value, and it was present at 97 ug/kg in SS-1 (see Figure 4-1). The concentrations of di-n-butylphthalate and bis(2-ethylhexyl)phthalate may not be related to site activities, as these

constituents were present in associated blank samples. Analysis of the off-site surface soils indicated concentrations of ten SVOCs, of which nine were also detected in the on-site samples. In general, the on-site concentrations were relatively equivalent or less than the off-site concentrations.

Three pesticides and two PCBs, as presented in Table 4-7, were detected in the on-site and/or off-site surface soil locations. 4,4'-DDE and 4,4'-DDT were present in 4 and 5 samples, respectively, at relatively equivalent concentrations for both the on-site (detected range: 5 ug/kg to 10 ug/kg) and off-site (detected range: 4.3 ug/kg to 8.9 ug/kg) surface soils. Sample SS-2 also contained 7.1 ug/kg of 4,4'-DDD. PCB analysis of the surface soils indicated Aroclor-1254 and Aroclor-1260 in the surface soils from locations SS-1 and SS-2. As shown on Table 4-7, concentrations ranged up to 62 ug/kg for Aroclor-1254 and up to 46 ug/kg for Aroclor-1260.

Analysis of the surface soils indicated concentrations of 18 metals (see Table 4-7). Fourteen of these analytes were present at levels of equal or lesser magnitude on-site in comparison to off-site samples. Calcium, copper, potassium and zinc were detected at concentrations greater than background/applicable criteria levels. Exceedance concentrations of calcium and potassium occurred in all three on-site locations, and ranged from 1,280 mg/kg to 1,540 mg/kg for calcium and from 526 mg/kg to 768 mg/kg for potassium. Copper was 177 mg/kg in SS-1 (with a duplicate of 51.7 mg/kg) and 39 mg/kg in SS-2. These two locations also contained exceedance concentrations of zinc, 124 mg/kg in SS-1 and 68.7 mg/kg in SS-2. Sample SS-3 had a zinc concentration of 41.5 mg/kg, exceeds its criteria level of 41.1 mg/kg.

Total organic carbon content of the SS-2 surface soils is 8,760 mg/kg. Results for TOC are presented in Appendix F.

4.6.2 2004 Supplemental RI

Ten surface soil samples (SS-06 through SS-15) were collected at the Magna Metals Site. Surface soil samples were collected from a depth of 0 to 2–inches bgs and were analyzed for TCL VOCs, TAL metals and cyanide. A summary of the surface soil results is provided in Table 4-8, and the distribution of exceedances in surface soil samples is presented in Figure 4-2.

None of the surface soil samples had volatile results that exceeded the NYSDEC Recommended Soil Clean-up Criteria.

Seven of the surface soil samples collected from the Magna Metals Site had metals results that exceeded the NYSDEC Recommended Soil Clean-up Criteria. Depending on the analyte, metals results in the surface soil samples exceeded the criteria.

4.7 Subsurface Soil Analytical Results

4.7.1 1998 RI/FS

Seven soil borings (SB-1 through SB-7) were drilled adjacent to the septic tanks/leach pits on December 10 and 11, 1996. Soil samples were collected from the interval equivalent to the bottom of the tank/pit. A total of seven samples and one duplicate were collected, and the soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, and TAL

metals and cyanide. Additional subsurface soil samples were collected during the installation of the monitoring wells on November 17 through 19, 1997. Boring MW-1 was located sidegradient to the site as background. Locations MW-1 through MW-4 were sampled from the 6 to 8-foot and/or 12 to 14-foot bgs depth intervals. Seven subsurface soil samples and one duplicate were analyzed for TCL/TAL constituents and/or TOC. Results for these analyses are provided in Appendix F. A summary of the detected constituents and their range of concentrations in the subsurface soil samples is presented in Table 4-9. Figure 4-1 plots the constituents detected at concentrations exceeding applicable criteria levels.

Seven VOCs were detected in the subsurface soils collected from the site, and the analytical results are presented in Table 4-9. Methylene chloride and/or acetone were present in a majority of the samples (i.e., almost 79 percent for methylene chloride and 50 percent for acetone), including the background boring MW-1. Due to their widespread occurrence, their presence in associated blank samples, and their laboratory and decontamination use, these constituents are likely not related to site activities. Four VOCs (2-butanone, 4-methyl-2-pentanone, 2-hexanone and 1,1,2,2-tetrachloroethane) were detected at concentrations less than 6 ug/L, in the duplicate soil sample from MW-2 at 6 to 8 feet bgs. The 3.5 to 5.5-foot soils from SB-7, drilled to the southwest of Leach Pit G, contained trichloroethene (35 ug/kg, with a duplicate of 29 ug/kg).

Analysis of the subsurface soils indicated detectable levels of six PAHs and five phthalates (see Table 4-9). The PAHs were present from 4 feet bgs to 9.5 feet bgs, at locations SB-1, SB-2, SB-5 and MW-4. Concentrations of these constituents ranged up to only 160 ug/kg, and were below applicable criteria levels. The concentrations of diethylphthalate, di-n-butylphthalate and bis(2-ethylhexyl)phthalate may not be related to site activities, as these constituents were present in associated blank samples; see Table 4-9. The other two phthalate compounds (butylbenzylphthalate and di-n-octylphthalate) were detected at concentrations from 13 ug/kg to 43 ug/kg.

Pesticide/PCB results for the subsurface soil analyses are presented in Appendix F, and are summarized on Table 4-9. One pesticide (alpha-chlordane) was detected at 2 ug/kg in soil boring SB-4. The samples from the soil borings installed near the septic tank/leach pit area also contained Aroclor-1254. This PCB was found in SB-3 at 8 to 9.5 feet bgs (24 ug/kg), SB-4 at 6.5 to 8.5 feet bgs (160 ug/kg), and SB-7 at 3.5 to 5.5 feet bgs (280 ug/kg, with a duplicate of 240 ug/kg). In addition, as shown in Table 4-9, analysis of the 12 to 14-foot bgs soils of monitoring well boring MW-4 indicated eight pesticides. Concentrations for these pesticides ranged up to 0.98 ug/kg. The existence of pesticides on the site has no historical documentation.

Eighteen of the 21 inorganics detected in the subsurface soils had concentrations that exceeded applicable criteria levels. As shown in Table 4-9, only cobalt, vanadium and cyanide were present at concentrations less than their respective criteria. Exceedance concentrations were found in all on-site locations (see Figure 4-2 and Table 4-9). Maximum concentrations for the metals and cyanide were distributed throughout the boring locations, with the highest number (8) present in SB-7 at 3.5 to 5.5 feet bgs.

Samples for TOC analysis were collected from MW-1 (12 to 14 feet bgs), MW-2 (12 to 14 feet bgs), MW-3 (6 to 8 feet bgs), and MW-4 (12 to 14 feet bgs) in November 1997. The result

concentrations were relatively equivalent, with the detected levels ranging from 806 mg/kg to 1,360 mg/kg (see Appendix F).

4.8 Groundwater Analytical Results

4.8.1 1998 RI/FS

One round of groundwater samples was obtained from the four newly installed monitoring wells in May 1998. The samples and a duplicate were analyzed for TCL organics and TAL inorganics, and tabulated results are provided in Appendix F. Sample GW-1 was collected from a sidegradient well for a background sample. Table 4-10 presents a summary of the detected groundwater constituents and their range of concentrations. Those constituents found at concentrations exceeding applicable criteria levels are plotted on Figure 4-1.

The groundwater collected from beneath the site contained trichloroethene and tetrachloroethene, two chlorinated aliphatic solvents). Trichloroethene was detected in all of the sampling locations but the background (GW-1), with concentrations ranging from 3.7 ug/L to 4,700 ug/L. As shown in Figure 4-1, it exceeded its applicable criteria level of 5 ug/L in GW-3 (68 ug/L) and GW-4 (4,700 ug/L). The subsurface soils from this location had contained 4 ug/kg of trichloroethene. Tetrachloroethene was present in the duplicate sample from location GW-4, at an exceedance concentration of 90 ug/L.

As shown in Table 4-10, bis(2-ethylhexyl)phthalate was the only identifiable SVOC detected in the groundwater (0.9 ug/L), and it was present in sample GW-5, the duplicate of GW-4. Due to its presence in associated blank samples, bis(2-ethylhexyl)phthalate is not related to site activities.

The groundwater was analyzed for pesticides/PCBs, and the results are presented in Appendix F. As shown in the summary table (Table 4-10), 11 pesticides were detected at concentrations ranging from 0.00022 ug/L to 0.11 ug/L. Three of these constituents, beta-BHC in GW-3 and GW-4, heptachlor epoxide in GW-2 and GW-3, and 4,4'-DDT in GW-3, were present at concentrations greater than the method detection levels, indicating exceedances of the groundwater criteria. The existence of pesticides in the groundwater may be related to their distribution in the surface and subsurface soils from non-point sources.

Of the 24 TAL inorganics, only four (beryllium, mercury, silver, and thallium) were not detected in the samples collected during the groundwater investigation (see Table 4-10). In general, maximum concentrations for the inorganics were located in the GW-2 sample, which is located to the south-southeast of the septic tanks/leach pits. As shown in Figure 4-1, among the detected metals, exceedances occurred for antimony, arsenic, chromium, iron, manganese, selenium, sodium, zinc, and cyanide. Only sodium had a concentration in the background sample GW-1 that also exceeded applicable criteria levels.

4.8.2 2004 Supplemental RI

Seven of the nine monitoring wells at the Magna Metals Site were sampled during the fall of 2003. Five of the monitoring wells were over burden wells (MW-01, MW-02, MW-04, MW-05, and MW-08) and two were bedrock monitoring wells (MW-04D and MW-07). All of the

groundwater samples were analyzed for TCL VOCs, TAL metals and cyanide. Samples from MW-01 and MW-04 were additionally analyzed for dissolved metals due to the turbidity of the sample. Table 4-11 provides a summary of the groundwater sample results, and the distribution of contaminant exceedances in groundwater samples is presented in Figure 4-4.

Groundwater Volatiles Results

Samples from three of the monitoring wells (MW-02, MW-04 and MW-04D) had VOC results that exceeded the NYSDEC Groundwater Quality Standards. The volatile compounds in excess included tetrachloroethene, trichloroethene and cis-1,2-dichloroethene. Depending on the analyte, volatile results in the groundwater samples exceeded the NYSDEC Groundwater Quality Standards.

Groundwater Inorganics Results

Samples all seven monitoring wells and the duplicate sample had metals results that exceeded the NYSDEC Groundwater Quality Standards. Groundwater sampled from MW-04 also had dissolved metals results that exceeded NYSDEC standards. Depending on the analyte, metals results in the groundwater samples exceeded the NYSDEC Groundwater Quality Standards.

4.8.3 2006 Additional Data Findings

Groundwater samples collected from wells MW-09 and MW-10 did not indicate elevated levels of contaminants. These wells were installed in close proximity to the former Magna Metals building due to potential concerns of source material below the structure. Monitoring well MW-11 had a concentration of 190 ppb for trichloroethene. The well was located near leach pit LP-09. As such, the result is consistent with prior conclusion drawn from the 1998 and 2004 report, that is, the leach pits are the source of soil and groundwater contamination at the site. Concurrent with sampling of the monitoring wells installed in 2005 (MW-9, MW-10, and MW-11), previously installed wells MW-02, MW-03, MW-04, and MW-06 were sampled and indicated exceedance of trichloroethene ranging from 17 ppb to 270 ppb in three of four wells and one occurrence of Tetrachloroethene of 7.5 ppb. One well, MW-02 did not indicate contamination present. The wells were located adjacent to the leach pits and the data is consistent with previous findings. Figure 4-5 and Table 4-12 presents the exceedance in groundwater.

4.9 Soil Gas (2006)

The soil gas sample results from the 2006 investigation documented that VOCs were detected at concentrations ranging from 1 to 1,900 micrograms per cubic meter (ug/m^3), an elevated level of TCE, 59 ug/m^3 at SV-03 was detected next to the office/warehouse building. Lower levels of TCE were recorded at the other two locations adjacent to the office building/warehouse. Elevated VOCs were detected in soil gas locations located along the leach pit series. The results are consistent with previously collected groundwater data, that is the leach pits are the source of contamination at the site. Figure 4-6 and Table 4-13 presents the soil vapor sample data.

Appendix K contains the indoor air quality questionnaire and building inventory.

4.10 AKRF 2007 Subslab Vapor and Indoor Air Results

Five sub-slab and six indoor air samples were collected and analyzed for VOCs as part of the 2007 investigation. The results were presented as part of the July 2007 Soil Vapor Investigation Report, AKRF. For completeness, these results are summarized herein.

For the sub-slab samples, TCE detection of 1,200 ug/m^3 and 66,000 gu/m^3 were recorded at locations SV-11 and SV-12, respectively, above the action levels in Matrix 1 in NYSDOH's *Soil Vapor Intrusion Guidance* (October 2006). For PCE, two detections of 5.5 and 7.8 ug/m^3 were both below the lowest action level of 100 ug/m^3 in Matrix 2 and also below the EPA BASE 90th percentile value of 15.9 ug/m^3. 1,1,1-trichloroethane (TCA) was not detected in any of the samples. Carbon tetrachloride was detected in one sample at a concentration of 0.53 ug/m^3, which was similar to the outdoor air samples. At location SV-12, a value of 11,000 ug/m^3 was recorded for cis-1,2-dichloroethene (DCE), a breakdown product of TCE. Toluene was detected in all samples with a maximum value of 3,300 ug/m^3 at location SV-12. Cyclohexane was detected in all but one of the samples with a maximum value of 170 ug/m^3 at location SV-11.

There were no exceedences of the NYSDOH guidance values for either PCE (1`00 ug/m^3) or TCE (5 ug/m^3) in any of the indoor air samples. Toluene was detected at all locations, with the highest values of 31 ug/m^3 and 19 ug/m^3 at locations SV-13 (Motion Labs) and SV-14 (Polymedco warehouse), respectively. The only other detection greater than 10 ug/m^3 in indoor air samples was for n-heptane, with a value of 17 ug/m^3 at location SV-13. All detections of other compounds were at levels similar to the outdoor air samples and below the EPA BASE 90th percentile values.

Table 4-14 presents the soil vapor sample data for the 2007 investigation.

TABLE 4-1
Summary of Detected Constituents
Holding Tank/Septic Tank/Leaching Pit Analytical Results
Page 1 of 2

	Septic Tank A Sludge (SP-SL)	Septic Tank A Water (SP-AQ)	Leach Pit G Water (LP-AQ)
Volatile Organic Compounds (ug/kg sludge; ug/L water)			
Vinyl Chloride	--	--	2.2
cis-1,2-Dichloroethene	NA	--	4.8
2-Butanone	37 J	R	R
Trichloroethene	--	--	0.92 J
Toluene	14 J	--	--
Xylene (total)	30 J	--	--
1,4-Dichlorobenzene	NA	0.76 J	--
Semi-Volatile Organic Compounds (ug/kg sludge; ug/L water)			
1,4-Dichlorobenzene	4,200 J	--	--
2-Methylnaphthalene	1,500 J	--	--
Fluoranthene	1,200 J	--	--
Pyrene	300 J	--	--
Benzo(a)anthracene	230 J	--	--
Chrysene	280 J	--	--
bis(2-Ethylhexyl)phthalate	12,000 JD	2 J	2 J
Di-n-octylphthalate	330 J	--	--
Benzo(b)fluoranthene	330 J	--	--
Benzo(k)fluoranthene	240 J	--	--
Benzo(a)pyrene	200 J	--	--
Pesticide/PCB Compounds (ug/kg sludge; ug/L water)			
4,4'-DDE	11 JP	--	--
Aroclor-1248	150 JP	--	--
Aroclor-1260	72 JP	--	--
Inorganics (mg/kg sludge; ug/L water)			
Aluminum	16,100 J	80.8 B	162 B
Antimony	5.9 JB	3.1 B	--
Arsenic	402 J	3.4 B	88.8
Barium	174 J	20.4 B	23.8 B
Cadmium	6.4 J	--	--
Calcium	9,760 J	22,000	9,500

TABLE 4-1
Summary of Detected Constituents
Holding Tank/Septic Tank/Leaching Pit Analytical Results

	Septic Tank A Sludge (SP-SL)	Septic Tank A Water (SP-AQ)	Leach Pit G Water (LP-AQ)
Chromium	R	2 B	--
Cobalt	34 JB	1.8 B	--
Copper	1,160 J	167	154
Iron	30,400 J	582 J	256 J
Lead	228 J	R	R
Magnesium	5,940 J	2,560 B	536 B
Manganese	815 J	72.5	28.2
Mercury	0.49 J	--	--
Nickel	10,400 J	788	45.9
Potassium	1,120 JB	2,900 JB	704 JB
Selenium	200 J	14.3	3.2 B
Silver	0.97 JB	--	--
Sodium	717 JB	4,500 B	--
Thallium	--	--	--
Vanadium	32.9 JB	1.1 B	1.4 B
Zinc	9,660 J	230 J	286 J
Cyanide	2,420 J	39.3	12.7

Notes:
-- = Constituent not detected.
J = Constituent value is estimated.
R = Constituent value is rejected and deemed unusable.
D = Constituent value is from a dilution analysis.

P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
NA = Not analyzed/not available.

Table 4-2
Leach Pit/Refuse Area Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site		NYSDEC	LP-02	LP-02	LP-03	LP-03
Sample ID		Recommended	MM-LP02-073003	MM-LP02-08260310.010	MM-LP03-073003	MM-LP13-073003
Sample Date		Soil Cleanup	7/30/2003	8/26/2003	7/30/2003	Duplicate of
Sample Depth (ft. bgs)		Criteria	10	10.75	7.75	MM-LP03-073003
Constituent						
m/p-Xylenes	(ug/kg)	1200	9UJ	3U	9.3UJ	11UJ
Benzo(a)anthracene	(ug/kg)	224	220J	35UJ	110UJ	130UJ
Benzo(a)pyrene	(ug/kg)	61	[250]J	53UJ	160UJ	190UJ
Benzo(b)fluoranthene	(ug/kg)	1100	270J	35UJ	110UJ	130UJ
Chrysene	(ug/kg)	400	220J	56UJ	180UJ	200UJ
Dibenz(a,h)anthracene	(ug/kg)	14	160UJ	53UJ	170UJ	190UJ
Aluminum	(mg/kg)	5040*	[5700]J	4450	[5340]J	4500J
Arsenic	(mg/kg)	7.5	[627]J	[9.7]	[947]J	[1190]J
Barium	(mg/kg)	300	124J	29.5	199J	222J
Beryllium	(mg/kg)	0.32*	0.14J	0.13J	[0.6]J	[0.43]J
Cadmium	(mg/kg)	1	[13.7]J	0.05U	[16.2]J	[19.2]J
Calcium	(mg/kg)	1690*	[9920]J	1380	[11000]J	[13600]J
Chromium	(mg/kg)	10	[2690]J	[34.1]J	[3980]J	[4070]J
Cobalt	(mg/kg)	30	[62.3]J	3.4J	[74.5]J	[86.6]J
Copper	(mg/kg)	25	[33500]J	[203]	[27200]J	[31300]J
Iron	(mg/kg)	10000*	[22500]J	5880	[32000]J	[35000]J
Lead	(mg/kg)	3.7*	[649]J	[6.2]	[849]J	[1030]J
Magnesium	(mg/kg)	2100*	[2910]J	1570	[4210]J	[4950]J
Manganese	(mg/kg)	250*	[610]J	83J	[713]J	[864]J
Nickel	(mg/kg)	15*	[38200]J	[226]	[53800]J	[62900]J
Potassium	(mg/kg)	864*	580J	451J	463J	405J
Selenium	(mg/kg)	2	[473]J	[13]J	[1120]J	[1410]J
Sodium	(mg/kg)	86.8*	[9060]J	[124]J	[6980]J	[8690]J
Thallium	(mg/kg)	ND*	1.8UJ	0.62U	2UJ	2.2UJ
Zinc	(mg/kg)	23.3*	[37300]J	[235]	[28900]J	[35600]J
Mercury	(mg/kg)	0.1	[0.92]J	0.01U	[0.75]J	[1.1]J

Notes:

U - Non-detect

J - Estimated

D - Dilution

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background location MW-1 as stated in the November 1998 RI/FS.

Table 4-2
Leach Pit/Refuse Area Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site		NYSDEC	LP-03	LP-05	LP-05	LP-06
Sample ID		Recommended	MM-LP03-0905031.3-2	MM-LP05-073003	MM-LP05-0905031.0-1	MM-LP06-0905030.3-0
Sample Date		Soil Cleanup	9/5/2003	7/30/2003	9/5/2003	9/5/2003
Sample Depth (ft. bgs)		Criteria	9	8.5	8.7	7.8
Constituent						
m/p-Xylenes	(ug/kg)	1200	3.8U	3.7U	2.9U	6.8UJ
Benzo(a)anthracene	(ug/kg)	224	57J	[510]J	35U	80UJ
Benzo(a)pyrene	(ug/kg)	61	67U	[500]J	52U	120UJ
Benzo(b)fluoranthene	(ug/kg)	1100	44U	550J	35U	80UJ
Chrysene	(ug/kg)	400	71U	[540]J	55U	130UJ
Dibenz(a,h)anthracene	(ug/kg)	14	67U	66UJ	52U	120UJ
Aluminum	(mg/kg)	5040*	[14700]	[9670]	4560	[7110]J
Arsenic	(mg/kg)	7.5	[103]	[37.8]	[19.4]	[376]J
Barium	(mg/kg)	300	142	104	50.4	223J
Beryllium	(mg/kg)	0.32*	[0.43]J	[0.35]J	0.20J	0.31UJ
Cadmium	(mg/kg)	1	0.7	[1.2]	0.13U	[1.3]J
Calcium	(mg/kg)	1690*	[3000]	[3620]	[3190]	[2840]J
Chromium	(mg/kg)	10	0.25R	[535]	0.20R	0.45R
Cobalt	(mg/kg)	30	0.32R	11.1	0.25R	0.57R
Copper	(mg/kg)	25	[987]	[246]	[152]	[34700]JD
Iron	(mg/kg)	10000*	[18500]	[12400]	[20000]	[22200]J
Lead	(mg/kg)	3.7*	[67.2]	[66]	[10.5]	[858]J
Magnesium	(mg/kg)	2100*	[5380]	[3150]	1770	[3560]J
Manganese	(mg/kg)	250*	229	[274]	206	[262]J
Nickel	(mg/kg)	15*	[2380]	[2070]	[340]	[63700]JD
Potassium	(mg/kg)	864*	[1430]J	654J	589J	[1050]J
Selenium	(mg/kg)	2	[184]	[16.9]	[29.8]	[178]J
Sodium	(mg/kg)	86.8*	[574]J	[699]J	[111]J	[1520]J
Thallium	(mg/kg)	ND*	0.41U	0.77U	0.33U	[23.6]J
Zinc	(mg/kg)	23.3*	[4940]	[2240]J	[693]	[15900]J
Mercury	(mg/kg)	0.1	0.1	[0.13]J	0.02	0.02UJ

Notes:

U - Non-detect

J - Estimated

D - Dilution

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background location MW-1 as stated in the November 1998 RI/FS.

Table 4-2
Leach Pit/Refuse Area Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site		NYSDEC	LP-06	LP-06A	LP-06A	LP-07
Sample ID		Recommended	MM-LP06-0905030-0.3	MM-LP06A-101003	MM-LP06A-1010032-2.5	MM-LP07-0905030-0.1
Sample Date		Soil Cleanup	9/5/2003	10/10/2003	10/10/2003	9/5/2003
Sample Depth (ft. bgs)		Criteria	7.3	11	11.5	7.1
Constituent						
m/p-Xylenes	(ug/kg)	1200	5.4U	3.5U	5.5U	24
Benzo(a)anthracene	(ug/kg)	224	180J	51J	65U	[470]
Benzo(a)pyrene	(ug/kg)	61	94U	62U	97U	[360]J
Benzo(b)fluoranthene	(ug/kg)	1100	210J	62J	65U	730
Chrysene	(ug/kg)	400	220J	66U	100U	[620]
Dibenz(a,h)anthracene	(ug/kg)	14	95U	62U	98U	[89]J
Aluminum	(mg/kg)	5040*	[10600]	[10500]	[8730]	3270
Arsenic	(mg/kg)	7.5	[10.3]	[29.3]	[609]	[79.1]
Barium	(mg/kg)	300	152	67.3	111	61.8
Beryllium	(mg/kg)	0.32*	[0.68]J	[0.37]J	0.26U	0.15U
Cadmium	(mg/kg)	1	0.23U	0.15U	[7.2]	0.14U
Calcium	(mg/kg)	1690*	[16800]	[3950]	[3550]	[1990]
Chromium	(mg/kg)	10	0.37R	[440]	[5050]	0.22R
Cobalt	(mg/kg)	30	5.8J	16.3	[34.0]	0.28R
Copper	(mg/kg)	25	[483]	[3580]	[15000]D	[9710]D
Iron	(mg/kg)	10000*	[18600]	[14100]	[18700]	8260
Lead	(mg/kg)	3.7*	[268]	[39.5]J	[279]J	[197]
Magnesium	(mg/kg)	2100*	[3450]	[3370]	[2870]	1890
Manganese	(mg/kg)	250*	[715]	[330]	[344]	135
Nickel	(mg/kg)	15*	[781]	[2940]	[23200]D	[45600]
Potassium	(mg/kg)	864*	[1640]J	607J	402J	567J
Selenium	(mg/kg)	2	[3.1]	[80.1]	[733]	[53.5]
Sodium	(mg/kg)	86.8*	[2750]	[303]J	[964]J	[544]J
Thallium	(mg/kg)	ND*	0.60U	0.39U	[8.1]	[16.9]
Zinc	(mg/kg)	23.3*	[386]	[2100]J	[8570]J	[7020]
Mercury	(mg/kg)	0.1	[0.17]	[0.15]	[0.50]	0.09

Notes:

U - Non-detect

J - Estimated

D - Dilution

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background location MW-1 as stated in the November 1998 RI/FS.

Table 4-2
Leach Pit/Refuse Area Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date** **Sample Depth (ft. bgs)**		NYSDEC Recommended Soil Cleanup Criteria	LP-07 MM-LP07-0905030.1-0 9/5/2003 7.5	LP-08 MM-LP08-0905030-0.3 9/5/2003 7.3	LP-08 MM-LP18-0905030-0.3 Duplicate of MM-LP08-0905030-0.3	LP-08 MM-LP08-0905030.3-0 9/5/2003 7.6
Constituent						
m/p-Xylenes	(ug/kg)	1200	3.0U	3.1U	3.1U	5.5J
Benzo(a)anthracene	(ug/kg)	224	44J	36U	37U	36U
Benzo(a)pyrene	(ug/kg)	61	54U	55U	55U	54U
Benzo(b)fluoranthene	(ug/kg)	1100	44J	36U	37U	36U
Chrysene	(ug/kg)	400	57U	58U	58U	57U
Dibenz(a,h)anthracene	(ug/kg)	14	54U	55U	55U	54U
Aluminum	(mg/kg)	5040*	[15300]	[5110]	4080	3760
Arsenic	(mg/kg)	7.5	[16.7]	[8.6]	[7.6]	3.8
Barium	(mg/kg)	300	116	26.7	21.9J	20.1J
Beryllium	(mg/kg)	0.32*	[0.46]J	0.20J	0.17J	0.18J
Cadmium	(mg/kg)	1	0.13U	0.13U	0.13U	0.13U
Calcium	(mg/kg)	1690*	[3300]	1460	1310	1200
Chromium	(mg/kg)	10	0.21R	0.21R	0.21R	0.21R
Cobalt	(mg/kg)	30	0.26R	0.27R	5.3J	5.3J
Copper	(mg/kg)	25	[185]	[210]	[214]	[35.3]
Iron	(mg/kg)	10000*	[19500]	7990	6680	6020
Lead	(mg/kg)	3.7*	[22.7]	[15.3]	[19.1]	2.9
Magnesium	(mg/kg)	2100*	[6700]	[2110]	1650	1680
Manganese	(mg/kg)	250*	[280]	97	89.4	97.8
Nickel	(mg/kg)	15*	[2510]	[468]	[399]	[99.3]
Potassium	(mg/kg)	864*	[1260]J	550J	442J	447J
Selenium	(mg/kg)	2	[4.7]	[2.1]	1.5	0.98
Sodium	(mg/kg)	86.8*	[289]J	[118]J	111U	108U
Thallium	(mg/kg)	ND*	0.34U	0.34U	0.35U	0.34U
Zinc	(mg/kg)	23.3*	[962]	[440]	[402]	[220]
Mercury	(mg/kg)	0.1	0.01R	0.01U	0.01U	0.01U

Notes:

U - Non-detect

J - Estimated

D - Dilution

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background location MW-1 as stated in the November 1998 RI/FS.

TABLE 4-3
Summary of Detected Constituents
Surface Water Analytical Results
Page 1 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class C)	Wetlands (SW-7, SW-9)	Tributary (SW-6, SW-8, SW-10, SW-11)	Confluence of Tributary and Stream (SW-5)	Confluence of Pond and Stream (SW-4)	Pond (SW-2, SW-3)	Drainage Culvert (SW-1, SW-1DUP)	Upsteam (SW-12)
Volatile Organics (ug/L)								
Vinyl Chloride	NC	ND - 2.5	ND - 0.91 J	--	0.7 J	--	--	--
Methylene Chloride	NC	ND - 2.3	--	--	--	--	--	--
cis-1,2-Dichloroethene	NC	ND - 18	5.1 - 9	2.1	4.5	3.2 - 3.3	3.5 - 4.2	--
Chloroform	NC	--	0.77 J - 1.6	--	--	--	--	--
Trichloroethene	11	ND - 0.73 J	ND - 1.4	2.2	2.6	2.3 - 2.4	2.7 - 5.5	--
Semi-Volatile Organics (ug/L)								
4-Methylphenol	5	ND - 0.2 J	--	--	--	--	--	--
Diethylphthalate	NC	--	ND - 0.2 J	--	--	ND - 0.2 J	ND - 0.3 J	--
Hexachlorobenzene	NC	--	ND - 0.3 J	--	--	ND - 0.3 J	ND - 0.2 J	--
Fluoranthene	NC	ND - 0.3 J	--	--	--	--	--	--
Pyrene	NC	ND - 0.3 J	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	NC	ND - 1 J	ND - 0.7 J	0.6 J	--	--	ND - 2 J	3 J
Inorganics (ug/L)								
Aluminum	NC	8,960 - 13,100	41.9 B - 2,660	178 B	103 B	126 B - 454	54.2 B - 135 B	64.8 B
Antimony	NC	ND - 4.9 B	ND - 3.5 B	3.1 B	3.5 B	--	--	3.6 B
Arsenic	360	4.1 B - 18.3	ND - 4 B	--	--	--	--	--
Barium	NC	250 - 631	52.4 B - 154 B	68 B	37.7 B	25.4 B - 33.7 B	27.2 B - 56 B	33.4 B
Cadmium	3	1.1 B - 1.7 B	--	--	--	--	--	--
Calcium	NC	18,800 - 40,600	16,300 - 21,800	23400	22600	20,700 - 21,500	22,200 - 23,500	23000
Chromium	106	69.7 - 253	ND - 39.6	1.5 B	--	1.4 B - 3.5 B	--	--
Cobalt	110	31.4 B - 32.8 B	ND - 6.7 B	1.4 B	--	--	--	--
Copper	13	95.4 - 3,960	2.8 B - 491	14.1 B	4.3 B	8 B - 14 B	4.9 B - 6.5 B	2.7 B
Iron	300	24,000 - 34,100 J	94.2 B - 7,240 J	1110 J	856 J	908 - 1,510	658 - 1,060 J	363 J
Lead	6	43.6 - 88	ND - 14.2	R	--	2 JB - 2.2 JB	--	R
Magnesium	NC	13,800 - 68,600	14,200 - 20,200	15,200	18,200	17,300 - 17,900	18,800 - 18,900	13,800
Manganese	NC	1,010 - 1,760	57.4 - 625	888	336	182 - 188	209 - 422	60.3
Mercury	0.2	ND - 0.22	--	--	--	--	--	--
Nickel	75.5	204 - 558	5.5 B - 136	15.7 B	8.9 B	4 B - 4.6 B	2.3 B - 10.6 B	3.5 B

TABLE 4-3
Summary of Detected Constituents
Surface Water Analytical Results

	NYSDEC Water Quality Standards/ Guidance Values (Class C)	Wetlands (SW-7, SW-9)	Tributary (SW-6, SW-8, SW-10, SW-11)	Confluence of Tributary and Stream (SW-5)	Confluence of Pond and Stream (SW-4)	Pond (SW-2, SW-3)	Drainage Culvert (SW-1, SW-1DUP)	Upsteam (SW-12)
Potassium	NC	2,790 JB - 5,980 J	1,510 B - 1,990 JB	2060 JB	2360 JB	2,080 B - 2,160 B	2,230 B - 2,300 JB	1970 B
Selenium	NC	3 B - 40.1	ND - 10.2	--	--	ND - 4.5 B	ND - 3.4 B	--
Sodium	NC	21,700 - 30,300	23,600 - 27,900	18800	19600	18,600 - 19,200	20,300 - 20,400	17600
Vanadium	190	25.7 B - 29.6 B	ND - 8.6 B	1.3 JB	--	ND - 1.6 B	--	--
Zinc	120	146 - 2,090 J	18.3 B - 232 J	28.1 J	17.8 B	16.7 B - 37	10.7 B - 21.8 B	27.3 J
Cyanide	22	18.7 - 858	ND - 220	--	--	--	ND - 39.6 J	--

Notes:

--/ND = Constituent not detected.

J = Constituent value is estimated.

R = Constituent value is rejected and deemed unusable.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NC = No criteria available.

NA = Not analyzed/not available.

Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Table 4-4
Surface Water Samples
Compounds Exceeding Surface Water Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date**	NYSDEC Water Quality Standards Class C*	SW-13 MM-SW13-032904 3/29/2004	SW-14 MM-SW14-032904 3/29/2004	SW-15 MM-SW15-032904 3/29/2004	SW-16 MM-SW16-032904 3/29/2004	SW-17 MM-SW17-032904 3/29/2004	SW-18 MM-SW18-032904 3/29/2004
Constituent							
Aluminum	100	[366]	[690]	[328]	[316]	[282]	[342]
Arsenic	150	4.8U	4.8U	4.8U	4.8U	4.8U	4.8U
Barium	NC	53.5J	79J	105J	99.7J	82.2J	132J
Calcium	NC	32700	35000	31000	29100	25000	31100
Chromium	132	1.2U	1.3J	1.2U	1.2U	2.2J	1.2U
Cobalt	5	2.4U	2.4U	2.4U	2.4U	2.4U	2.4U
Copper	16	0.74U	[57.6]J	0.74U	0.74U	0.74UJ	0.74U
Iron	300	[327]J	[1670]J	212J	205J	107J	[583]J
Lead	8	1.8UJ	1.8UJ	1.8UJ	1.8UJ	1.8UJ	1.8UJ
Magnesium	NC	20200	21400	30100	28200	23500	55200
Manganese	NC	73.8	234	118	112	35.2	134
Nickel	94	5.5U	24.8J	20.9J	19.9J	12.5J	16J
Potassium	NC	2940J	3130J	2990J	2700J	2360J	5140J
Selenium	4.6	5.2U	5.2U	5.2U	5.2U	5.2U	5.2U
Sodium	NC	43000J	38300J	67000J	62100J	61500J	38900J
Thallium	8	5.8U	5.8U	5.8U	5.8U	5.8U	5.8U
Vanadium	14	1.9U	1.9U	1.9U	1.9U	1.9U	1.9U
Zinc	150	8.1U	23.7J	11.5J	14.4J	13J	10.6J

Notes:
All results are in ug/l.
U - Non-detect
J - Estimated
Shading and [ ] - Indicates exceedance of criteria.
* - Criteria is based on a Class C stream class which is the most stringent for surface water.

Table 4-4
Surface Water Samples
Compounds Exceeding Surface Water Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date**	NYSDEC Water Quality Standards Class C*	SW-18 MM-SW18D-032904 Duplicate of MM-SW18-032904	SW-19 MM-SW19-032904 3/29/2004	SW-20 MM-SW20-032904 3/29/2004	SW-21 MM-SW21-032904 3/29/2004	SW-22 MM-SW22-032904 3/29/2004
Constituent						
Aluminum	100	[383]J	[728]J	[358]J	[725]J	[381]J
Arsenic	150	4.8U	4.8U	4.8U	4.8U	6.9J
Barium	NC	141J	119J	74.6J	185J	33.4J
Calcium	NC	32100	32900	30500	32400	10600
Chromium	132	1.2U	2.6J	1.2U	3.4J	26.7
Cobalt	5	2.4U	2.4U	2.4U	2.8J	[5.1]J
Copper	16	0.74UJ	[22.6]J	0.74UJ	5.5J	[772]J
Iron	300	[903]J	[2180]J	[363]J	[4790]J	[2020]J
Lead	8	1.8UJ	1.8UJ	1.8UJ	3.5J	1.8UJ
Magnesium	NC	56500	27000	25800	49700	5680
Manganese	NC	0.2R	0.2R	0.2R	0.2R	0.2R
Nickel	94	19.4J	22.4J	7J	29.9J	[161]
Potassium	NC	5400J	3910J	3140J	5000J	828J
Selenium	4.6	5.2U	5.2U	5.2U	5.2U	[8.7]J
Sodium	NC	40500J	48400J	48500J	36100J	12100J
Thallium	8	5.8U	5.8U	5.8U	6.9J	5.8U
Vanadium	14	1.9U	2J	1.9U	2J	1.9U
Zinc	150	16.8J	57.3J	9.3J	27.4J	[343]J

Notes:
All results are in ug/l.
U - Non-detect
J - Estimated
Shading and [ ] - Indicates exceedance of criteria.
* - Criteria is based on a Class C stream class which is the most stringent for surface water.

TABLE 4-5
Summary of Detected Constituents
Sediment Analytical Results

	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria ug/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
Volatile Organics (ug/kg)									
Chloromethane	NC	NC	ND - 7 J	--	--	--	--	--	--
Vinyl Chloride	0.07 HH	5.98	ND - 25 J	--	--	--	--	--	--
Acetone	NC	NC	ND - 530 J	ND - 150 J	770 J	340 J	--	--	--
Carbon Disulfide	NC	NC	--	--	--	12 J	--	--	--
2-Butanone	NC	NC	39 J - 160 J	ND - 36 J	260 J	95 J	11 J	21 - 74	--
Trichloroethene	2 HH	171	ND - 22 J	--	20 J	--	--	--	--
4-Methyl-2-Pentanone	NC	NC	--	ND - 5 J	--	--	12 J	--	--
2-Hexanone	NC	NC	--	ND - 10 J	--	--	18 J	--	--
Tetrachloroethene	0.8 HH	68.3	--	ND - 4 J	--	--	--	--	--
Toluene	NC	NC	ND - 12 J	--	--	--	--	--	--
Semi-Volatile Organics (ug/kg)									
Hexachloroethane	NC	NC	--	ND - 960	--	--	--	--	--
Naphthalene	NC	NC	--	--	--	--	--	ND - 42 J	--
4-Chloro-3-methylphenol	0.6 CTY	51.2	--	--	--	--	ND - 160 J	--	--
2-Methylnaphthalene	NC	NC	--	--	--	--	--	ND - 38 J	--
Acenaphthylene	NC	NC	--	ND - 19 J	--	--	--	ND - 180 J	--
Acenaphthene	140 CT	11,951	--	ND - 53 J	--	--	ND - 88 J	ND - 140 J	--
Dibenzofuran	NC	NC	--	ND - 29 J	--	--	--	ND - 220 J	--
Fluorene	NC	NC	--	ND - 74 J	--	--	--	ND - 540	--
Phenanthrene	120 CT	10,243	250 J - 350 J	35 J - 950 J	270 J	--	--	ND - 2,700	--
Anthracene	NC	NC	37 J - 45 J	ND - 130 J	35 J	--	--	ND - 700	--
Carbazole	NC	NC	--	ND - 120 J	--	--	--	ND - 340 J	--
Di-n-butylphthalate	NC	NC	--	ND - 97 J	92 J	85 J	--	ND - 170 J	--
Fluoranthene	1,020 CT	87,069	590 J - 650 J	71 J - 1,400 J	490 J	280 J	--	270 J - 2,400	--
Pyrene	NC	NC	640 J - 710 J	72 J - 1,500 J	390 J	220 J	ND - 180 J	220 J - 2,300	--
Butylbenzylphthalate	NC	NC	--	--	--	--	ND - 1,000 J	--	--
Benzo(a)anthracene	1.3 HH	111	260 J - 300 J	31 J - 710 J	180 J	--	--	ND - 1,200	--
Chrysene	1.3 HH	111	370 J - 410 J	46 J - 1,000 J	300 J	--	--	ND - 1,300	--

TABLE 4-5
Summary of Detected Constituents
Sediment Analytical Results
Page 2 of 3

	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria ug/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
bis(2-Ethylhexyl)phthalate	199.5 CT	17,030	--	ND - 140 J	250 J	210 J	--	ND - 300 J	--
Benzo(b)fluoranthene	1.3 HH	111	320 J - 360 J	32 J - 820 J	260 J	150 J	--	ND - 840	--
Benzo(k)fluoranthene	1.3 HH	111	300 J - 320 J	38 J - 780 J	210 J	150 J	--	ND - 950	--
Benzo(a)pyrene	1.3 HH	111	300 J - 320 J	ND - 810 J	180 J	120 J	ND - 58 J	230 J - 1,000	--
Indeno(1,2,3-cd)pyrene	1.3 HH	111	150 J - 290 J	ND - 87 J	--	--	--	ND - 110 J	--
Benzo(g,h,i)perylene	NC	NC	120 J - 250 J	ND - 51 J	--	--	--	ND - 55 J	--
Pesticides/PCBs (ug/kg)									
alpha-Chlordane	0.001 HH	0.09	NA	3.5 JP	NA	--	NA	--	NA
gamma-Chlordane	0.001 HH	0.09	NA	3.4	NA	--	NA	--	NA
	NYSDEC Sediment Criteria Severe Effect Level mg/kg								
Inorganics (mg/kg)									
Aluminum	NC		2,700 J - 14,900	4,970 - 34,090	19,800 J	10,600 J	7,770 J - 9,900	10,100 J - 11,700 J	2920
Arsenic	33		5.8 JB - 16.9 J	1.1 B - 19.3 J	7 J	9.1 J	3 B - 4.4 JB	3.2 JB - 10.6 J	--
Barium	NC		142 J - 604 J	32.6 B - 460 J	364 J	256 J	135 - 261 J	132 J - 289 J	33.8 B
Beryllium	NC		--	ND - 0.6 JB	0.62 JB	--	--	--	--
Cadmium	9		1 JB - 1.8 JB	0.31 B - 1.4 JB	1.1 JB	1 JB	0.78 J - 1.1 JB	1 JB - 1.3 JB	--
Calcium	NC		4,020 J - 11,200 J	2,590 - 13,000	7,760 J	9,530 J	4,490 J - 4,600	7,560 J - 11,500 J	882 B
Chromium	110		144 J	11.4 - 34	R	R	43 - 106 J	78.1 J	R
Cobalt	NC		20.4 J - 41.7 J	4.9 B - 24.7 JB	22.2 JB	24.6 JB	14.2 B - 37.3 J	31.9 JB - 35.6 J	4.6 B
Copper	110		129 J - 2,080 J	12.3 - 2,330 J	690 J	603 J	162 - 398 J	374 J - 493 J	4.4 B
Iron	40,000 (4%)		3,600 J - 38,600	9,820 - 20,200 J	28,000 J	19,500 J	2,160 - 27,000 J	21,100 J - 34,200 J	7,320
Lead	110		62.9 J - 63.2 J	3.9 - 48.2 J	46.2 J	29.3 J	15.4 J - 19.4	16.6 J - 29.2 J	3
Magnesium	NC		7,120 J - 9,420 J	3,950 - 7,830 J	7,000 J	8,670 J	6,160 - 21,800 J	10,700 J - 23,400 J	2,130
Manganese	1,100		220 J	841 J	321 J	167 J	R	154 J	87
Nickel	50		264 J - 494 J	26.9 - 835 J	231 J	234 J	180 - 212 J	166 J - 284 J	17.3
Potassium	NC		831 JB - 1,040 JB	413 B - 1,880 J	1,400 JB	894 JB	668 JB - 976 B	906 JB - 1,240 JB	207 B

TABLE 4-5
Summary of Detected Constituents
Sediment Analytical Results
Page 3 of 3

	NYSDEC Sediment Criteria Severe Effect Level mg/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
Selenium	NC	9.6 J - 46 J	ND - 68.2 J	19.2 J	14 J	4.8 J - 8.4	3.2 J - 14.6 J	--
Silver	2.2	ND - 0.66 JB	ND - 0.72 JB	0.66 JB	1.3 JB	ND - 0.58 JB	ND - 1.4 JB	0.26 B
Sodium	NC	311 JB - 454 JB	92.7 B - 586 JB	546 JB	343 JB	193 B - 324 JB	228 JB - 384 JB	59.8 B
Vanadium	NC	30.6 J - 49.5 J	8.1 B - 36.2 J	41.6 J	39.8 JB	25.4 - 26.9 J	23.5 J - 44.1 JB	5.8 B
Zinc	270	226 J - 1,890 J	36.8 - 938 J	441 J	209 J	133 J - 155	142 J - 180 J	29.3 J
Cyanide	NC	ND - 519 J	ND - 52.4 J	--	--	ND - 3.33 J	ND - 45.3 J	--

Notes:
--/ND = Constituent not detected.
J = Constituent value is estimated.
R = Constituent value rejected and deemed unusable.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
NA = Not analyzed/not available.
NC = No criteria available.
Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Table 4-6A
Sediment Samples
PAH Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site	Sample	NYSDEC	Sample	SD-13	Sample	SD-14	Sample	SD-15
Sample ID	Result	Sediment	Specific	MM-SD13-033004	Specific	MM-SD14-033004	Specific	MM-SD15-033004
Sample Date	Units	Criteria	Criteria	3/30/2004	Criteria	3/30/2004	Criteria	3/30/2004
Sample Depth			TOC=40,000 mg/kg	0-6 in. bgs	TOC=60,000 mg/kg	0-6 in. bgs	TOC=40,000 mg/kg	0-6 in. bgs
Constituent								
Anthracene	(ug/kg)	986 *	39440	29UJ	59160	46UJ	39440	31UJ
Benzo(a)anthracene	(ug/kg)	1.3 *	52	18UJ	78	29UJ	52	[470]J
Benzo(a)pyrene	(ug/kg)	1.3 *	52	21UJ	78	34UJ	52	[660]J
Benzo(b)fluoranthene	(ug/kg)	1.3 *	52	65UJ	78	100UJ	52	[1200]J
Benzo(ghi)perylene	(ug/kg)	NC *	NC	53UJ	NC	85UJ	NC	220J
Benzo(k)fluoranthene	(ug/kg)	1.3 *	52	42UJ	78	66UJ	52	[600]J
Chrysene	(ug/kg)	1.3 *	52	39UJ	78	62UJ	52	[650]J
Fluoranthene	(ug/kg)	1020 *	40800	17UJ	61200	27UJ	40800	1400J
Fluorene	(ug/kg)	73 *	2920	35UJ	4380	55UJ	2920	37UJ
Indeno(1,2,3-cd)pyrene	(ug/kg)	1.3 *	52	29UJ	78	47UJ	52	32UJ
Phenanthrene	(ug/kg)	120 *	4800	27UJ	7200	44UJ	4800	590J
Pyrene	(ug/kg)	8775 *	351000	22UJ	526500	35UJ	351000	1300J

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.
* - Sediment criteria in units of ug/g Organic Carbon. Sample specific criteria were calculated using the TOC results.

Table 4-6A
Sediment Samples
PAH Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site	Sample	NYSDEC	Sample	SD-16	Sample	SD-17	Sample	SD-18
Sample ID	Result	Sediment	Specific	MM-SD16-033004	Specific	MM-SD17-033104	Specific	MM-SD18-033104
Sample Date	Units	Criteria	Criteria	3/30/2004	Criteria	3/31/2004	Criteria	3/31/2004
Sample Depth			TOC=18,000 mg/kg	0-6 in. bgs	TOC=6,100 mg/kg	0-6 in. bgs	TOC=76,000 mg/kg	0-6 in. bgs
Constituent								
Anthracene	(ug/kg)	986 *	17748	17UJ	6014.6	200J	74936	37UJ
Benzo(a)anthracene	(ug/kg)	1.3 *	23.4	[140]J	7.93	[470]	98.8	[160]J
Benzo(a)pyrene	(ug/kg)	1.3 *	23.4	[190]J	7.93	[430]J	98.8	[220]J
Benzo(b)fluoranthene	(ug/kg)	1.3 *	23.4	[260]J	7.93	[670]J	98.8	[260]J
Benzo(ghi)perylene	(ug/kg)	NC *	NC	32UJ	NC	150J	NC	68UJ
Benzo(k)fluoranthene	(ug/kg)	1.3 *	23.4	[190]J	7.93	[380]J	98.8	[220]J
Chrysene	(ug/kg)	1.3 *	23.4	[190]J	7.93	[490]	98.8	[180]J
Fluoranthene	(ug/kg)	1020 *	18360	410J	6222	1300	77520	410J
Fluorene	(ug/kg)	73 *	1314	21UJ	445.3	70J	5548	44UJ
Indeno(1,2,3-cd)pyrene	(ug/kg)	1.3 *	23.4	18UJ	7.93	[48]J	98.8	38UJ
Phenanthrene	(ug/kg)	120 *	2160	190J	732	[900]	9120	170J
Pyrene	(ug/kg)	8775 *	157950	380J	53527.5	1000	666900	380J

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.
* - Sediment criteria in units of ug/g Organic Carbon. Sample specific criteria were calculated using the TOC results.

Table 4-6A
Sediment Samples
PAH Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date** **Sample Depth**	Sample Result Units	NYSDEC Sediment Criteria	Sample Specific Criteria TOC=60,000 mg/kg	SD-18 MM-SD18D-033104 Duplicate of MM-SD18-033104	Sample Specific Criteria TOC=89,000 mg/kg	SD-19A MM-SD19A-033104 3/31/2004 0-6 in. bgs	Sample Specific Criteria TOC=100,000 mg/kg	SD-20 MM-SD20-033104 3/31/2004 0-6 in. bgs
Constituent								
Anthracene	(ug/kg)	986 *	59160	41UJ	87754	52UJ	98600	87UJ
Benzo(a)anthracene	(ug/kg)	1.3 *	78	26UJ	115.7	33UJ	130	55UJ
Benzo(a)pyrene	(ug/kg)	1.3 *	78	30UJ	115.7	38UJ	130	63UJ
Benzo(b)fluoranthene	(ug/kg)	1.3 *	78	92UJ	115.7	120UJ	130	190UJ
Benzo(ghi)perylene	(ug/kg)	NC *	NC	75UJ	NC	95UJ	NC	160UJ
Benzo(k)fluoranthene	(ug/kg)	1.3 *	78	59UJ	115.7	74UJ	130	120UJ
Chrysene	(ug/kg)	1.3 *	78	55UJ	115.7	69UJ	130	120UJ
Fluoranthene	(ug/kg)	1020 *	61200	180J	90780	250J	102000	51UJ
Fluorene	(ug/kg)	73 *	4380	49UJ	6497	62UJ	7300	100UJ
Indeno(1,2,3-cd)pyrene	(ug/kg)	1.3 *	78	42UJ	115.7	53UJ	130	88UJ
Phenanthrene	(ug/kg)	120 *	7200	39UJ	10680	49UJ	12000	82UJ
Pyrene	(ug/kg)	8775 *	526500	31UJ	780975	220J	877500	65UJ

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.
* - Sediment criteria in units of ug/g Organic Carbon. Sample specific criteria were calculated using the TOC results.

Table 4-6A
Sediment Samples
PAH Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date** **Sample Depth**	Sample Result Units	NYSDEC Sediment Criteria	Sample Specific Criteria TOC=49,000 mg/kg	SD-21 MM-SD21-040304 4/3/2004 0-6 in. bgs	Sample Specific Criteria TOC=12,000 mg/kg	SD-22 MM-SD22-040304 4/3/2004 0-6 in. bgs	Sample Specific Criteria TOC=10,000 mg/kg	SD-23 MM-SD23-040304 4/3/2004 0-6 in. bgs
Constituent								
Anthracene	(ug/kg)	986 *	48314	86UJ	11832	87UJ	9860	66UJ
Benzo(a)anthracene	(ug/kg)	1.3 *	63.7	55UJ	15.6	55UJ	13	[360]J
Benzo(a)pyrene	(ug/kg)	1.3 *	63.7	62UJ	15.6	63UJ	13	[410]J
Benzo(b)fluoranthene	(ug/kg)	1.3 *	63.7	190UJ	15.6	190UJ	13	[680]J
Benzo(ghi)perylene	(ug/kg)	NC *	NC	160UJ	NC	160UJ	NC	120UJ
Benzo(k)fluoranthene	(ug/kg)	1.3 *	63.7	120UJ	15.6	120UJ	13	94UJ
Chrysene	(ug/kg)	1.3 *	63.7	110UJ	15.6	120UJ	13	[510]J
Fluoranthene	(ug/kg)	1020 *	49980	50UJ	12240	51UJ	10200	1000J
Fluorene	(ug/kg)	73 *	3577	100UJ	876	100UJ	730	78UJ
Indeno(1,2,3-cd)pyrene	(ug/kg)	1.3 *	63.7	87UJ	15.6	88UJ	13	66UJ
Phenanthrene	(ug/kg)	120 *	5880	81UJ	1440	81UJ	1200	450J
Pyrene	(ug/kg)	8775 *	429975	64UJ	105300	65UJ	87750	790J

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.
* - Sediment criteria in units of ug/g Organic Carbon. Sample specific criteria were calculated using the TOC results.

Table 4-6A
Sediment Samples
PAH Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date** **Sample Depth**	Sample Result Units	NYSDEC Sediment Criteria	Sample Specific Criteria TOC=140,000 mg/kg	SD-24 MM-SD24-040304 4/3/2004 0-6 in. bgs	Sample Specific Criteria TOC=100,000 mg/kg	SD-25 MM-SD25-040304 4/3/2004 0-6 in. bgs	Sample Specific Criteria TOC=100,000 mg/kg	SD-26 MM-SD26-040304 4/3/2004 0-6 in. bgs
Constituent								
Anthracene	(ug/kg)	986 *	138040	R	98600	13UJ	98600	14UJ
Benzo(a)anthracene	(ug/kg)	1.3 *	182	R	130	8.3UJ	130	100J
Benzo(a)pyrene	(ug/kg)	1.3 *	182	R	130	9.5UJ	130	120J
Benzo(b)fluoranthene	(ug/kg)	1.3 *	182	R	130	76J	130	[180]J
Benzo(ghi)perylene	(ug/kg)	NC *	NC	R	NC	24UJ	NC	26UJ
Benzo(k)fluoranthene	(ug/kg)	1.3 *	182	R	130	19UJ	130	85J
Chrysene	(ug/kg)	1.3 *	182	R	130	71J	130	[150]J
Fluoranthene	(ug/kg)	1020 *	142800	R	102000	160J	102000	280J
Fluorene	(ug/kg)	73 *	10220	R	7300	16UJ	7300	17UJ
Indeno(1,2,3-cd)pyrene	(ug/kg)	1.3 *	182	R	130	13UJ	130	14UJ
Phenanthrene	(ug/kg)	120 *	16800	R	12000	80J	12000	130J
Pyrene	(ug/kg)	8775 *	1228500	R	877500	120J	877500	220J

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.
* - Sediment criteria in units of ug/g Organic Carbon. Sample specific criteria were calculated using the TOC results.

Table 4-6B
Sediment Samples
Inorganic Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site	Sample	New York	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18
Sample ID	Result	State DEC	MM-SD13-033004	MM-SD14-033004	MM-SD15-033004	MM-SD16-033004	MM-SD17-033104	MM-SD18-033104
Sample Date	Units	Sediment Criteria	3/30/2004	3/30/2004	3/30/2004	3/30/2004	3/31/2004	3/31/2004
Sample Depth			0-6 in. bgs	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs
Constituent								
Aluminum	(mg/kg)	NC	9920J	13800J	10100J	9080J	4080	12700J
Arsenic	(mg/kg)	33	2.3J	8.3J	8.3J	3.7J	1.5	12J
Barium	(mg/kg)	NC	229J	334J	266J	154J	47.5	409J
Beryllium	(mg/kg)	NC	0.86J	1.2J	0.82J	0.55J	0.28J	0.98J
Calcium	(mg/kg)	NC	4940J	13400J	7130J	7190J	16200	13300J
Chromium	(mg/kg)	110	31.1J	49.1J	[158]J	43.4J	16.4J	[166]J
Cobalt	(mg/kg)	NC	14.4J	22.5J	16.5J	12.8J	5.4J	36.1J
Copper	(mg/kg)	110	24.4J	[672]J	[1040]J	107J	9.9	[327]J
Iron	(mg/kg)	40000	11500J	13600J	10900J	12400J	6590	14400J
Lead	(mg/kg)	110	23.6J	39.5J	32.2J	22.9J	6.7	88.7J
Magnesium	(mg/kg)	NC	4400J	6310J	5280J	6880J	11900	9190J
Manganese	(mg/kg)	1100	391J	598J	958J	313J	337	241J
Nickel	(mg/kg)	50	[63.5]J	[300]J	[332]J	[143]J	35.6	[460]J
Potassium	(mg/kg)	NC	444J	726J	585J	833J	560J	584J
Selenium	(mg/kg)	NC	2.1J	12J	18.2J	2J	0.42U	9.9J
Silver	(mg/kg)	2.2	0.39UJ	0.6UJ	0.42UJ	0.24UJ	0.14U	0.49UJ
Sodium	(mg/kg)	NC	281J	770J	766J	348J	127J	276J
Thallium	(mg/kg)	NC	1.2UJ	1.9UJ	1.3UJ	0.74UJ	0.44UJ	1.5UJ
Vanadium	(mg/kg)	NC	22.3J	31.2J	20.6J	22.2J	9.3	43.4J
Zinc	(mg/kg)	270	106J	146J	[528]J	139J	37.3	[290]J
Mercury	(mg/kg)	1.3	0.09J	0.12J	0.15J	0.06J	0.01J	0.17J
TOC	(mg/kg)	NC	40000J	60000J	40000J	18000J	6100	76000J
AVS/SEM	(ratio)		<1.0UJ	>1.0J	>1.0J	>1.0J	>1.0	<1.0UJ

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.

Table 4-6B
Sediment Samples
Inorganic Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site	Sample	New York	SD-18	SD-19A	SD-20	SD-21	SD-22	SD-23
Sample ID	Result	State DEC	MM-SD18D-033104	MM-SD19A-033104	MM-SD20-033104	MM-SD21-040304	MM-SD22-040304	MM-SD23-040304
Sample Date	Units	Sediment Criteria	Duplicate of	3/31/2004	3/31/2004	4/3/2004	4/3/2004	4/3/2004
Sample Depth			MM-SD18-033104	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs	0-6 in. bgs
Constituent								
Aluminum	(mg/kg)	NC	12900J	11500J	11500J	15800J	18000J	12000J
Arsenic	(mg/kg)	33	7.7J	12.2J	4.1J	2.7UJ	2.7UJ	2UJ
Barium	(mg/kg)	NC	506J	418J	283J	374J	391J	278J
Beryllium	(mg/kg)	NC	1.1J	1.3J	1.6J	0.99J	1.1J	0.74J
Calcium	(mg/kg)	NC	14600J	16400J	10700J	13600J	10600J	11600J
Chromium	(mg/kg)	110	[159]J	[133]J	62.7J	60.5J	78.3J	73.7J
Cobalt	(mg/kg)	NC	35.7J	58.8J	21.3J	34.7J	39.8J	32.4J
Copper	(mg/kg)	110	[230]J	[281]J	[241]J	[403]J	[415]J	[194]J
Iron	(mg/kg)	40000	19600J	17400J	18200J	30100J	35300J	26600J
Lead	(mg/kg)	110	76.4J	91.5J	38.9J	[112]J	53.9J	48.7J
Magnesium	(mg/kg)	NC	10300J	11000J	7400J	8620J	10600J	12400J
Manganese	(mg/kg)	1100	456J	302J	482J	735J	693J	525J
Nickel	(mg/kg)	50	[364]J	[365]J	[200]J	[180]J	[170]J	[155]J
Potassium	(mg/kg)	NC	618J	440J	747J	1460J	1970J	1440J
Selenium	(mg/kg)	NC	8.8J	10.1J	10.8J	12.4J	7.7J	6.7J
Silver	(mg/kg)	2.2	0.55UJ	0.69UJ	1.1UJ	1.2UJ	1.2UJ	0.91UJ
Sodium	(mg/kg)	NC	638J	620J	401J	427UJ	471J	490J
Thallium	(mg/kg)	NC	3.4J	2.2UJ	3.6UJ	3.8UJ	3.7UJ	2.8UJ
Vanadium	(mg/kg)	NC	42.2J	61J	28.5J	38J	44.7J	31J
Zinc	(mg/kg)	270	259J	176J	258J	191J	195J	270J
Mercury	(mg/kg)	1.3	0.16J	0.14J	0.15J	0.22J	0.25J	0.14J
TOC	(mg/kg)	NC	60000J	89000J	100000J	49000J	12000J	10000J
AVS/SEM	(ratio)		>1.0J	>1.0J	<1.0UJ	>1.0J	<1.0UJ	<1.0UJ

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.

Table 4-6B
Sediment Samples
Inorganic Compounds Exceeding Sediment Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date** **Sample Depth**	Sample Result Units	New York State DEC Sediment Criteria	SD-24 MM-SD24-040304 4/3/2004 0-6 in. bgs	SD-25 MM-SD25-040304 4/3/2004 0-6 in. bgs	SD-26 MM-SD26-040304 4/3/2004 0-6 in. bgs
Constituent					
Aluminum	(mg/kg)	NC	14400J	3310	6310
Arsenic	(mg/kg)	33	2.7UJ	0.4U	1.4J
Barium	(mg/kg)	NC	331J	65.3J	209J
Beryllium	(mg/kg)	NC	1J	0.17J	0.28J
Calcium	(mg/kg)	NC	10400J	2170	2580
Chromium	(mg/kg)	110	76.3J	81.2	75.4
Cobalt	(mg/kg)	NC	39.7J	26.7	21.5
Copper	(mg/kg)	110	[216]J	[137]J	[130]J
Iron	(mg/kg)	40000	34700J	17500	16300
Lead	(mg/kg)	110	42.2J	10.1J	18.5J
Magnesium	(mg/kg)	NC	10800J	18600	12400
Manganese	(mg/kg)	1100	338J	301	549
Nickel	(mg/kg)	50	[161]J	[149]	[121]
Potassium	(mg/kg)	NC	1500J	324J	471J
Selenium	(mg/kg)	NC	4.7J	0.53U	0.56U
Silver	(mg/kg)	2.2	1.2UJ	0.19J	0.19UJ
Sodium	(mg/kg)	NC	423UJ	119J	67.1U
Thallium	(mg/kg)	NC	3.8UJ	0.55UJ	0.6UJ
Vanadium	(mg/kg)	NC	42J	14.5J	21.8J
Zinc	(mg/kg)	270	170J	82.8	68.8
Mercury	(mg/kg)	1.3	0.2J	0.02	0.04
TOC	(mg/kg)	NC	140000J	100000	100000
AVS/SEM	(ratio)		<1.0UJ	>1.0	>1.0

Notes:
U - Non-detect
J - Estimated
R - Rejected
Shading and [ ] - Indicates exceedance of criteria.

TABLE 4-7
Summary of Detected Constituents
Surface Soil Analytical Results
Page 1 of 2

	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Downgradient (SS-1, SS-2, SS-3)	Background (SS-4, SS-5)
Semi-Volatile Organics (ug/kg)				
2-Methylphenol	100	NA	--	ND - 39 J
Phenanthrene	50,000	NA	11 J - 45 J	21 J - 55 J
Anthracene	50,000	NA	ND - 8 J	--
Di-n-butylphthalate	8,100	NA	ND - 610 JB	--
Fluoranthene	50,000	NA	19 J - 57 J	27 J - 97 J
Pyrene	50,000	NA	22 J - 86 J	66 J - 100 J
Butylbenzylphthalate	50,000	NA	ND - 370 J	--
Benzo(a)anthracene	224	NA	ND - 23 J	13 J - 39 J
Chrysene	400	NA	ND - 28 J	19 J - 62 J
bis(2-Ethylhexyl)phthalate	50,000	NA	ND - 4,900 B	--
Benzo(b)fluoranthene	1,100	NA	ND - 21 J	ND - 49 J
Benzo(k)fluoranthene	1,100	NA	ND - 26 J	ND - 48 J
Benzo(a)pyrene	61	NA	ND - 97 J	ND - 29 J
Indeno(1,2,3-cd)pyrene	3,200	NA	ND - 81 J	ND - 41 J
Benzo(g,h,i)perylene	50,000	NA	ND - 46 J	--
Semi-Volatile TICs	NA	NA	8,550 JN - 28,330 JN	14,090 JN - 15,990 JN
Pesticides/PCBs (ug/kg)				
4,4'-DDE	2,100	NA	5.3 - 10	ND - 8
4,4'-DDD	2,900	NA	ND - 7.1 JPN	--
4,4'-DDT	2,100	NA	5 JP - 6.6 JPN	4.3 - 8.9
Aroclor-1254	1,000	NA	ND - 62 J	--
Aroclor-1260	1,000	NA	ND - 46 J	--
Inorganics (mg/kg)				
Aluminum	SB	19,100	7,510 - 8,830	12,600 - 19,100
Arsenic	7.5 or SB	7.5	1.6 B - 2.5	2.9 - 3.1
Barium	300 or SB	300	42.6 B - 52	70 - 83.2
Beryllium	0.16 or SB	0.59	0.3 B - 0.35 B	0.54 B - 0.59 B

TABLE 4-7
Summary of Detected Constituents
Surface Soil Analytical Results
Page 2 of 2

	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Downgradient (SS-1, SS-2, SS-3)	Background (SS-4, SS-5)
Calcium	SB	847	1,280 - 1,540	808 B - 847 B
Chromium	10 or SB	21.1	10.5 - 19	14.1 - 21.1
Cobalt	30 or SB	30	5.2 B - 7.3 B	7.6 B - 8.5 B
Copper	25 or SB	25	18 - 177 J	12.8 - 14.8
Iron	2,000 or SB	19,100	10,900 - 13,700	14,800 - 19,100
Lead	SB	18.1	8 - 10.8	12.2 - 18.1
Magnesium	SB	3,270	2,130 - 2,880	2,380 - 3,270
Manganese	SB	241	168 - 225	161 - 241
Nickel	13 or SB	18.8	10.2 - 15	16.2 - 18.8
Potassium	SB	475	526 B - 768 B	385 B - 475 B
Selenium	2 or SB	2	1 J - 1.3 J	1.2 J - 1.6 J
Sodium	SB	96.4	74.4 B - 93.1 B	72.3 B - 96.4 B
Vanadium	150 or SB	150	ND - 18.8	24.1 - 38.8
Zinc	20 or SB	41.1	41.5 J - 124	34.2 J - 41.1 J

Notes:

--/ND = Constituent not detected.

J = Constituent value is estimated.

P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.

N = Presumptive evidence exists for the presence of the constituent.

B (organics) = Constituent also present in an associated blank sample.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NA = Not analyzed/not available.

Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Table 4-8
Surface Soil Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site	NYSDEC	SS-06	SS-07	SS-08	SS-09	SS-10	SS-11
Sample ID	Recommended	MM-SS06-073003	MM-SS07-072903	MM-SS08-072903	MM-SS09-073003	MM-SS10-073003	MM-SS11-072903
Sample Date	Soil Cleanup	7/30/2003	7/29/2003	7/29/2003	7/30/2003	7/30/2003	7/29/2003
Sample Depth (in. bgs)	Criteria	0-2	0-2	0-2	0-2	0-2	0-2
Constituent							
Arsenic	7.5	5.5	[62.7]	3.5	[14.9]	[54.7]J	1.6
Barium	300	69.4	82.4	75.3	[407]	260J	48.2
Beryllium	0.59*	0.41J	0.3J	0.23J	[0.85]	0.53J	0.21J
Calcium	5060**	1220	3470	1890	[5470]	[7210]J	3310
Chromium	70.5**	27.4	[952]	14.2	[232]	[210]J	10.8
Cobalt	30	7.8	8	6.3J	13.2	[40.3]J	6.6
Copper	25	[545]	[370]	[62.7]	[1980]	[1120]J	[30.2]
Iron	21100**	[39900]	14800	11100	12900	[34800]J	11000
Lead	91.7**	[95.3]	[96.1]	37.6	44.8	[122]J	12.1
Magnesium	7830**	2470	6220	2200	2980	[8410]J	2440
Manganese	408**	392	393	134	267	[699]J	251
Nickel	87.5**	26.4	[483]	27.3	[335]	[1360]J	11.6
Potassium	496**	381J	[575]J	402J	[886]J	[1090]J	[655]J
Selenium	2	1.3J	[18.7]	0.82J	[28.9]	[49.5]J	0.4U
Sodium	96.4*	47.3U	[969]J	52.2U	[279]J	[517]J	92.8J
Zinc	50.7**	[133]J	[3830]J	[76.9]J	[869]J	[1050]J	[250]J
Mercury	0.15**	0.12J	0.09J	[0.52]J	0.15J	[0.21]J	0.03J

Notes:

All results are in mg/kg.

U - Non-detect

J - Estimated

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background locations SS-4 and SS-5 as stated in the November 1998 RI/FS.

** - Criteria is based on the maximum site background concentration from background locations SS-13, SS-14, and SS-55 as stated in the July 2004 RI/FS.

Table 4-8
Surface Soil Samples
Compounds Exceeding Soil Cleanup Criteria
Magna Metals - Cortlandt, New York

Site	NYSDEC	SS-12	SS-13	SS-14	SS-15
Sample ID	Recommended	MM-SS12-072903	MM-SS13-072903	MM-SS14-072903	MM-SS15-072903
Sample Date	Soil Cleanup	7/29/2003	7/29/2003	7/29/2003	7/29/2003
Sample Depth (in. bgs)	Criteria	0-2	0-2	0-2	0-2
Constituent					
Arsenic	7.5	1.7	2.6	4.3	3.7
Barium	300	71.6	76.1	139	80.9
Beryllium	0.59*	0.21J	0.59J	0.26J	0.29J
Calcium	5060**	1640	5060	2630	1690
Chromium	70.5**	10.6	19.5	15.4	70.5
Cobalt	30	5.9	5J	7.7	26.5
Copper	25	[136]	22.8	21.2	22.4
Iron	21100**	9830	17900	13700	21100
Lead	91.7**	20.8	67.4	91.7	39.2
Magnesium	7830**	2280	1910	2730	7830
Manganese	408**	214	95.4	408	335
Nickel	87.5**	11.1	17.8	17.3	87.5
Potassium	496**	[651]J	387J	496J	442J
Selenium	2	0.38U	0.5U	1.1J	0.63J
Sodium	96.4*	[122]J	60.3U	54.1U	53.4U
Zinc	50.7**	[160]J	19.8J	50.7J	44.4J
Mercury	0.15**	0.01R	0.14J	0.15J	0.13J

Notes:

All results are in mg/kg.

U - Non-detect

J - Estimated

R - Rejected

Shading & [ ] - Indicates exceedance of criteria.

* - Criteria is based on the maximum site background concentration from background locations SS-4 and SS-5 as stated in the November 1998 RI/FS.

** - Criteria is based on the maximum site background concentration from background locations SS-13, SS-14, and SS-55 as stated in the July 2004 RI/FS.

TABLE 4-9
Summary of Detected Constituents
Subsurface Soil Analytical Results
Page 1 of 3

	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)
Volatile Organics (ug/kg)					
Methylene Chloride	100	NA	ND - 8 J	ND - 4 JB	ND - 5 JB
Acetone	200	NA	--	5 JB - 7 JB	5 JB - 6 JB
2-Butanone	300	NA	--	ND - 4 J	--
Trichloroethene	700	NA	ND - 35	ND - 4 J	--
4-Methyl-2-Pentanone	1,000	NA	--	ND - 4 J	--
2-Hexanone	NC	NA	--	ND - 5 J	--
1,1,2,2-Tetrachloroethane	600	NA	--	ND - 3 J	--
Volatile TICs	NC	NA	21 JN - 200 JN	--	--
Semi-Volatile Organics (ug/kg)					
Diethylphthalate	7,100	NA	--	ND - 13 JB	--
Phenanthrene	50,000	NA	ND - 19 J	--	--
Anthracene	50,000	NA	ND - 4 J	--	--
Di-n-butylphthalate	8,100	NA	ND - 660 B	12 JB - 42 JB	22 JB - 31 JB
Fluoranthene	50,000	NA	ND - 17 J	--	--
Pyrene	50,000	NA	ND - 16 J	--	--
Butylbenzylphthalate	50,000	NA	ND - 43 J	--	--
bis(2-Ethylhexyl)phthalate	50,000	NA	--	12 JB - 100 JB	ND - 43 JB
Di-n-octylphthalate	50,000	NA	--	--	--
Benzo(a)pyrene	61	NA	--	ND - 18 J	--
Benzo(g,h,i)perylene	50,000	NA	--	ND - 160 J	--
Pesticides/PCBs (ug/kg)					
alpha-BHC	110	NA	--	0.05 JP	NA
Heptachlor	100	NA	--	0.19 JP	NA
Endosulfan I	900	NA	--	0.32 JP	NA
Dieldrin	44	NA	--	0.28 JP	NA
Endosulfan II	900	NA	--	0.15 JP	NA
4,4'-DDD	2,900	NA	--	0.98 JP	NA
4,4'-DDT	2,100	NA	--	0.92 JP	NA

TABLE 4-9
Summary of Detected Constituents
Subsurface Soil Analytical Results
Page 2 of 3

	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)
alpha-Chlordane	NC	NA	ND - 2 JPN	0.27 JP	NA
Aroclor-1254	10,000	NA	ND - 280 JP	--	NA
Inorganics (mg/kg)					
Aluminum	SB	5,040	4,554.3 - 21,295	3,190 - 8,480	2,260 - 5,040
Arsenic	7.5 or SB	7.5	3.5 - 30.8 J	0.87 B - 20.4	ND - 1.6 B
Barium	300 or SB	300	34.1 B - 721	19.7 B - 434	74 - 81.9
Beryllium	0.16 or SB	0.32	ND - 0.43 B	ND - 0.4 B	0.24 B - 0.32 B
Calcium	SB	1,690	925 - 5,124.1	664 B - 5,110	1,560 - 1,690
Chromium	10 or SB	10	5.7 - 48.7	3.1 - 61.1	2.2 B - 6.8
Cobalt	30 or SB	30	3.2 B - 24.3 J	2.3 B - 20.8	3.2 B - 4.6 B
Copper	25 or SB	25	40.4 - 1,309	19.4 - 695	13.7 - 20.6
Iron	2,000 or SB	10,000	6,198.5 - 24,435	3,880 - 13,400	4,350 - 10,000
Lead	SB	3.7	2.9 - 12.9	1.1 - 5.2	2.2 - 3.7
Magnesium	SB	2,100	1,408.3 - 11,389	770 B - 5,480	1,030 B - 2,100
Manganese	SB	250	140 J - 282 J	121 - 304	171 - 250
Mercury	0.1	0.1	ND - 0.12	ND - 0.25	--
Nickel	13 or SB	15	11.9 J - 108 J	7.4 B - 39	6.7 B - 15.2
Potassium	SB	864	398 B - 6,993.6 J	267 B - 3,190	487 B - 864 B
Selenium	2 or SB	2	ND - 11.7	ND - 8.6	ND - 0.9 B
Sodium	SB	86.8	98.7 B - 485 B	52.8 B - 548 B	50 B - 86.8 B
Thallium	SB	DL	ND - 1.8 J	--	--
Vanadium	150 or SB	150	8.2 - 69	4.5 B - 37.3	7.2 B - 11.6
Zinc	20 or SB	23.3	28.7 - 764	10.3 - 39.3	11.2 - 23.3
Cyanide	NC	NA	ND - 225	ND - 19.9	--

Notes:
--/ND = Constituent not detected.
J = Constituent value is estimated.

TABLE 4-9
Summary of Detected Constituents
Subsurface Soil Analytical Results
Page 3 of 3

	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)

P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
E = Constituent value exceeded calibration range.
N = Presumptive evidence exists for the presence of the constituent.
B (organics) = Constitent also present in an associated blank sample.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
DL = Not to be detected above the detection limit for the applicable analytical method.
NC = No criteria available.
NA = Not analyzed/not available.
Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

TABLE 4-10
Summary of Detected Constituents
Groundwater Analytical Results
Page 1 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	Downgradient (GW-2, GW-3, GW-4)	Background (GW-1)
Volatile Organics (ug/L)			
Trichloroethene	5	3.7 - 4,700	--
Tetrachloroethene	5	ND - 90 E	--
Semi-Volatile Organics (ug/L)			
bis(2-Ethylhexyl)phthalate	50	ND - 0.9 JB	--
Semi-Volatile TICs	NC	ND - 13 J	--
Pesticides/PCBs (ug/L)			
beta-BHC	ND	0.00022 JP - 0.11 P	0.00078 JP
delta-BHC	ND	ND - 0.0013 JPB	0.00088 JP
gamma-BHC (Lindane)	ND	ND - 0.009 J	--
Heptachlor	ND	ND - 0.0029 J	--
Heptachlor epoxide	ND	ND - 0.035 P	0.001 JP
Dieldrin	ND	ND - 0.0038 JP	0.00072 JP
Endrin	ND	0.003 JP - 0.019 JP	--
Endosulfan II	NC	ND - 0.0044 JP	--
4,4'-DDT	ND	0.0046 JP - 0.026 P	--
alpha-Chlordane	0.1	ND - 0.004 JP	--
gamma-Chlordane	0.1	ND - 0.0063 JP	--
Inorganics (ug/L)			
Aluminum	NC	965 - 7,400	51.1 B
Antimony	3	ND - 5.1 B	--
Arsenic	25	15.7 - 64.3	--
Barium	1,000	56.5 B - 204	89.5 B
Cadmium	10	ND - 1.5 B	1.4 B
Calcium	NC	16,500 - 28,100	10,700
Chromium	50	14.5 - 112	2.2 B
Cobalt	NC	1.4 B - 20.2 B	--
Copper	200	8.3 B - 148	1.7 B
Iron	300	1,420 - 18,900	122
Lead	25	1.3 B - 3.2	1.2 B

TABLE 4-10
Summary of Detected Constituents
Groundwater Analytical Results
Page 2 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	Downgradient (GW-2, GW-3, GW-4)	Background (GW-1)
Magnesium	35,000	2,140 B - 18,300	6,980
Manganese	300	56.6 - 1,600	5.9 B
Nickel	NC	7.9 B - 262	6.1 B
Potassium	NC	1,640 B - 8,250	1,210 B
Selenium	10	60.1 - 96.8	2.5 B
Sodium	20,000	7,950 - 57,600	27,700
Vanadium	NC	2.8 B - 37.3 B	--
Zinc	300	4 B - 516	7.8 B
Cyanide	100	14 - 416	--

Notes:
--/ND = Constituent not detected.
J = Constituent value is estimated.
P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
E = Constituent value exceeded calibration range.
N = Presumptive evidence exists for the presence of the constituent.
B (organics) = Constitent also present in an associated blank sample.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
ND (criteria) = Not to be detected above the detection limit for the applicable analytical method.
NC = No criteria available.
NA = Not analyzed/not available.
Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Table 4-11
Groundwater Samples
Compounds Exceeding Groundwater Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date**	NYSDEC Groundwater Quality Standards	MW-01 MM-GWMW01-100603 10/6/2003	MW-02 MM-GWMW02-100803 10/8/2003	MW-04 MM-GWMW04-100803 10/8/2003	MW-04D MM-GWMW04D-100803 10/8/2003	MW-04D MM-GWMW05D-100803 Duplicate of MM-GWMW04D-100803
Constituent						
Tetrachloroethene	5	0.70UJ	0.70U	[13]	[13]	[14]
Trichloroethene	5	0.72U	[9.4]	[910]D	[870]D	[870]D
cis-1,2-Dichloroethene	5	0.62U	0.62U	[7.7]	4.9J	[5.5]
Arsenic	25	4.0U	4.0U	[133]	6.9J	4.8J
Barium	1000	156J	294	[1140]	395	350
Beryllium	3	0.12J	0.10U	[5.6]	0.10U	0.13J
Chromium	50	17.8	11.4	[139]	2.5J	2.0J
Copper	200	8.4J	8.8J	[240]	3.6U	3.6U
Iron	300	[1540]	[346]	[37200]	[3810]	[3510]
Magnesium	35000	14800	[48900]	[38600]	[44300]	[39400]
Manganese	300	45.3	29.4	[6400]	[9500]	[8510]
Nickel	100	18.2J	88.1	[108]	15.8J	13.8J
Selenium	10	1.3U	[30.8]	[131]	[30.4]	[23.9]
Sodium	20000	12700J	[264000]J	[76900]J	[126000]J	[111000]J
Thallium	0.5	5.3U	5.3U	[10.5]	[8.6]J	[8.3]J
Cyanide	200	10U	10U	[555]	74J	27J
Arsenic - Dissolved	25	4.0U	NS	[46.8]	NS	NS
Iron - Dissolved	300	55.0J	NS	[14300]	NS	NS
Manganese - Dissolved	300	3.2J	NS	[5810]	NS	NS
Selenium - Dissolved	10	1.3U	NS	[71.1]	NS	NS
Sodium - Dissolved	20000	12900J	NS	[77800]J	NS	NS

Notes:
All results are in ug/l.
U - Non-detect
J - Estimated
D - Dilution
NS - Not Sampled
Shading & [ ] - Indicates exceedance of criteria.

Table 4-11
Groundwater Samples
Compounds Exceeding Groundwater Criteria
Magna Metals - Cortlandt, New York

Site **Sample ID** **Sample Date**	NYSDEC Groundwater Quality Standards	MW-05 MM-GWMW05-100603 10/6/2003	MW-07 MM-GWMW07-100703 10/7/2003	MW-08 MM-GWMW08-100703 10/7/2003
Constituent				
Tetrachloroethene	5	0.70UJ	0.70UJ	0.70UJ
Trichloroethene	5	0.72U	0.72U	0.72U
cis-1,2-Dichloroethene	5	0.62U	0.62U	0.62U
Arsenic	25	7.7J	4.0U	4.0U
Barium	1000	170J	266	68.9J
Beryllium	3	0.36J	0.10U	0.10J
Chromium	50	44.8	1.4U	20.6
Copper	200	15.8J	3.6U	52.8
Iron	300	[33800]	33.2J	[3160]
Magnesium	35000	14600	[74700]	[66200]
Manganese	300	[5660]	63.4	174
Nickel	100	29.5J	8.2J	89.9
Selenium	10	1.6J	1.3U	3.5J
Sodium	20000	[62900]J	[57200]J	[36800]J
Thallium	0.5	[14.4]	5.3U	5.3U
Cyanide	200	10U	10U	10U
Arsenic - Dissolved	25	NS	NS	NS
Iron - Dissolved	300	NS	NS	NS
Manganese - Dissolved	300	NS	NS	NS
Selenium - Dissolved	10	NS	NS	NS
Sodium - Dissolved	20000	NS	NS	NS

Notes:
All results are in ug/l.
U - Non-detect
J - Estimated
D - Dilution
NS - Not Sampled
Shading & [ ] - Indicates exceedance of criteria.

Table 4-12
Detected Volatile Organic Compounds for Groundwater Samples
February 2006
Magna Metals

	Site ID	MW-02	MW-03	MW-04	MW-04
	Sample ID	MM-GWMW02-022406	MM-GWMW03-022406	MM-GWMW04-022406	MM-GWMW94-022406
	Sample Date	2/24/2006	2/24/2006	2/24/2006	Duplicate of MM-GWMW04-022406
	Units	µg/L	µg/L	µg/L	
CONSTITUENT	**NY-GWQS**				
cis-1,2-Dichloroethene	5*	--	--	2.2 J	2.2 J
Tetrachloroethene	5	--	2.6 J	**7.5 J**	**8.2 J**
Trichloroethene	5	--	**17**	**270 D**	**260 D**

Notes:
Bold values exceed criteria.
*Criteria provided for 1,2-dichloroethene (total) are the most conservative values for the cis- and trans- isomers.
-- Non-detect
D - From a diluted sample
J - Estimated
NY-GWQS - New York Ambient Water Quality Standards

References:
NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

Table 4-12
Detected Volatile Organic Compounds for Groundwater Samples
February 2006
Magna Metals

	Site ID	MW-06	MW-09	MW-10	MW-11
	Sample ID	MM-GWMW06-022306	MM-GWMW09-022406	MM-GWMW10-022406	MM-GWMW11-022306
	Sample Date	2/23/2006	2/24/2006	2/24/2006	2/23/2006
	Units	µg/L	µg/L	µg/L	µg/L
CONSTITUENT	**NY-GWQS**				
cis-1,2-Dichloroethene	5*	**8.1**	--	--	1.3 J
Tetrachloroethene	5	2.6 J	--	--	2.2 J
Trichloroethene	5	**180 D**	**--**	4.5 J	**190**

Notes:
Bold values exceed criteria.
*Criteria provided for 1,2-dichloroethene (total) are the most conservative values for the cis- and trans- isomers.
-- - Non-detect
D - From a diluted sample
J - Estimated
NY-GWQS - New York Ambient Water Quality Standards

References:
NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

Table 4-13
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-01	SV-02	SV-03	SV-04	SV-05
Sample ID	MM-SV-01-010506	MM-SV-02-010506	MM-SV-03-010506	MM-SV-04-010506	MM-SV-05-010606
Sample Date	1/5/2006	1/5/2006	1/5/2006	1/5/2006	1/6/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT					
1,1,1-Trichloroethane	1.6	--	1.1	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	12	--	--
1,2,4-Trimethylbenzene	3.9	3.3	2	--	4.8
1,2-Dichloroethene	--	--	1.5	83	2.1
1,3,5-Trimethylbenzene	1.1	--	--	11	3.4
1,3-Butadiene	18 NJ	35 NJ	8.4	38 NJ	35
1,4-Dichlorobenzene	--	--	--	--	--
1,4-Dioxane	16	--	--	--	--
2,2,4-Trimethylpentane	--	17	--	32	1.5
2-Butanone	14	29	9.1	25	29
2-Hexanone	--	--	--	190	--
Acetone	69	110	36	--	97
Benzene	8	45	19	130	54
Carbon disulfide	25	110	4.7	18	28
Chloroform	2.4 NJ	--	--	--	--
Chloromethane	0.89	5.6	--	--	7.2
cis-1,2-Dichloroethene	--	--	1.5	44	2.1
Cyclohexane	6.5	21	0.96	83	2.8
Dichlorodifluoromethane	--	--	2.2	--	--
Ethylbenzene	2.3	6.9	4.3	650	10
Isopropyl alcohol	--	--	--	--	--
(m+p)xylene	6.1	11	6.1	1900	12
Methyl tert-butyl ether	--	--	--	--	--
n-Heptane	3.7	21	4.1	780	13
n-Hexane	7.4	32	6.3	150	17
o-Xylene	2.4	4.3	2.5	380	6.5
p-Ethyltoluene	3	3.3	2.3	22	4.7
Styrene	--	4	1.7	--	3.2
Tetrachloroethene	1.2	--	8.8	--	10

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 4-13
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-01	SV-02	SV-03	SV-04	SV-05
Sample ID	MM-SV-01-010506	MM-SV-02-010506	MM-SV-03-010506	MM-SV-04-010506	MM-SV-05-010606
Sample Date	1/5/2006	1/5/2006	1/5/2006	1/5/2006	1/6/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT					
Tetrahydrofuran	--	--	--	--	--
Toluene	9	26	14	210	38
trans-1,2-Dichloroethene	--	--	--	38	--
Trichloroethene	31	11	59	64	7
Trichlorofluoromethane	--	--	--	--	2
Vinyl chloride	--	1.2	--	22	0.92
Xylene (total)	8.3	16	8.3	2200	18

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 4-13
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-06	SV-07	SV-08	SV-09
Sample ID	MM-SV-06-010606	MM-SV-07-010606	MM-SV-08-010606	MM-SV-09-010506
Sample Date	1/6/2006	1/6/2006	1/6/2006	1/5/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT				
1,1,1-Trichloroethane	0.93	28	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--
1,2,4-Trimethylbenzene	2.1	7.9	1.9	5.9
1,2-Dichloroethene	--	--	--	--
1,3,5-Trimethylbenzene	--	2.7	--	1.9
1,3-Butadiene	27	3.1 NJ	22 NJ	1.1 NJ
1,4-Dichlorobenzene	--	3	--	--
1,4-Dioxane	--	--	--	--
2,2,4-Trimethylpentane	--	3.2	--	2.2
2-Butanone	13	8	9.4	41
2-Hexanone	--	4.1	--	--
Acetone	59	29	38	52
Benzene	31	14	17	3.8
Carbon disulfide	5.3	3.1	5.3	3.7
Chloroform	1.3	--	--	--
Chloromethane	1.9	1.1	1	--
cis-1,2-Dichloroethene	--	--	--	--
Cyclohexane	1.5	9.3	1	1.4
Dichlorodifluoromethane	--	4	3.1	5.9
Ethylbenzene	4.3	7.4	2.6	3.9
Isopropyl alcohol	--	47	--	17
(m+p)xylene	7.4	23	4.8	12
Methyl tert-butyl ether	--	28	--	6.9
n-Heptane	4.5	9.8	3.9	3.8
n-Hexane	8.5	8.8	6.3	5.3
o-Xylene	2.5	7.8	1.6	--
p-Ethyltoluene	2	6.9	1.7	4.9
Styrene	1	2.1	0.85	--
Tetrachloroethene	130	4	8.1	--

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 4-13
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-06	SV-07	SV-08	SV-09
Sample ID	MM-SV-06-010606	MM-SV-07-010606	MM-SV-08-010606	MM-SV-09-010506
Sample Date	1/6/2006	1/6/2006	1/6/2006	1/5/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT				
Tetrahydrofuran	--	--	--	35
Toluene	25	22	12	15
trans-1,2-Dichloroethene	--	--	--	--
Trichloroethene	40	14	4.2	1.1
Trichlorofluoromethane	1.4	1.7	1.5	2.6
Vinyl chloride	--	--	--	--
Xylene (total)	9.6	30	6.1	11

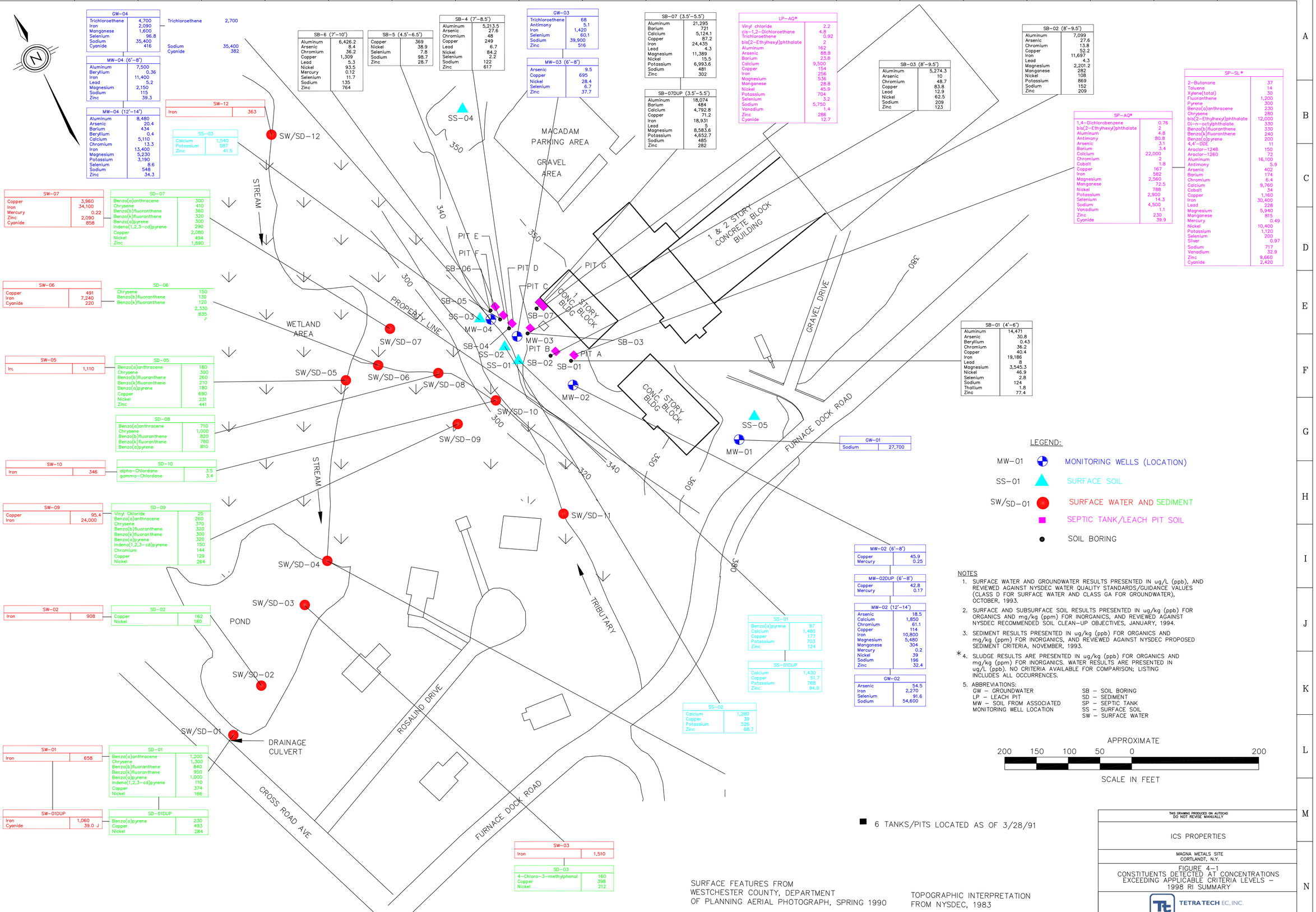
Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 4-14

Magna Metals
New York, NY
Indoor Air Analytical Results

Client ID Date Sampled Lab Sample ID Units Compound	NYSDOH Indoor Air Guidance Value (ug/m3)	EPA BASE 90th percentile (ug/m3)	OUTDOOR 1 (A.A) 4/5/2007 17:40 JTPJM1AD ug/m3	OUTDOOR 2 (A.A) 4/5/2007 18:10 JTPJR1AD ug/m3	SV-10(A.A) 4/5/2007 16:12 JTPHC1AD ug/m3	SV-11(A.A) 4/5/2007 16:07 JTPHA1AD ug/m3	SV-12(A.A) 4/5/2007 18:15 JTPHX1AD ug/m3	SV-13(A.A) 4/5/2007 17:10 JTPH71AD ug/m3	SV-14(A.A) 4/5/2007 17:20 JTPJE1AD ug/m3	SV-15(A.A) 4/5/2007 16:55 JTPJH1AD ug/m3
1,1,1-Trichloroethane	5	20.6	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1,2,2-Tetrachloroethane		20.6	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U
1,1,2-Trichloroethane		<1.5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1-Dichloroethane		<0.7	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,1-Dichloroethene		<1.4	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dibromoethane (EDB)		<1.5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane		<1.5	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U
1,2-Dichloroethane		<0.9	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane		<1.6	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene		3.7	0.39 U	0.39 U	1.2	1.2	0.78	1.7	0.7	0.71
1,3-Butadiene		<3.0	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
2,2,4-Trimethylpentane		<4.8	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
3-Chloropropene		250	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene		3.6	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Benzene		9.4	0.48	0.91	0.57	0.55	0.71	1.1	1.5	0.77
Bromodichloromethane		<6.8	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Bromoform		<6.8	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U
Bromomethane		<1.7	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	<1.3	0.51	0.66	0.56	0.53	0.51	0.47	0.77	0.54
Chloroethane		<1.1	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform		1.1	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	1.1	0.95	1.2
cis-1,2-Dichloroethene		<1.9	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
cis-1,3-Dichloropropene		<2.3	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Cyclohexane		<2.3	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	3.3	1.1	0.97
Dibromochloromethane		<2.3	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Dichlorodifluoromethane		16.5	2.2	3.2	2.6	2.3	2.2	2.1	3.6	2.2
Ethylbenzene		5.7	0.35 U	0.35 U	0.41	0.49	0.62	1.8	3.2	1.9
Methyl tert-butyl ether		22.2	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	6	1.4 U	1.4 U
m-Xylene & p-Xylene		10	0.42	0.87	1.3	1.4	1.9	5.9	7.6	4.5
n-Heptane		<3.6	0.82 U	0.94	0.82 U	1.7	0.82 U	17	1.7	4.8
n-Hexane		10.2	0.7 U	0.76	0.7 U	0.7 U	0.7 U	0.89	1	0.7 U
o-Xylene		7.9	0.35 U	0.35 U	0.48	0.6	0.59	2	2.8	1.8
Tetrachloroethene	100	15.9	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	1.3	0.61
Toluene		43	0.97	2.2	3.8	3.6	4	31	19	12
trans-1,2-Dichloroethene		43	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
trans-1,3-Dichloropropene		<1.3	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Trichloroethene	5	4.2	0.21 U	0.21 U	2.1	2.2	2.9	1.4	0.21 U	0.21 U
Trichlorofluoromethane		18.1	1.3	1.8	1.4	1.3	1.7	1.3	2.2	1.4
Vinyl bromide		3.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride		<1.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Indoor air gudiance values presented in Table 3.1 and Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.


GW-04
Trichloroethene 4,700
Iron 2,090
Manganese 1,600
Selenium 96.8
Sodium 35,400
Cyanide 416
Trichloroethene 2,700
Sodium 35,400
Cyanide 382
MW-04 (6'-8')
Aluminum 7,500
Beryllium 0.36
Iron 11,400
Lead 5.2
Magnesium 2,150
Sodium 115
Zinc 39.3
MW-04 (12'-14')
Aluminum 8,480
Arsenic 20.4
Barium 434
Beryllium 0.4
Calcium 5,110
Chromium 13.3
Iron 13,400
Magnesium 5,230
Potassium 3,190
Selenium 8.6
Sodium 548
Zinc 34.3
SW-12
Iron 363
SS-03
Calcium 1,540
Potassium 587
Zinc 41.5
SB-6 (7'-10')
Aluminum 6,426.2
Arsenic 8.4
Chromium 36.2
Copper 1,309
Lead 5.3
Nickel 93.5
Mercury 0.12
Selenium 11.7
Sodium 135
Zinc 764
SB-5 (4.5'-6.5')
Copper 369
Nickel 38.9
Selenium 7.8
Sodium 98.7
Zinc 28.7
SB-4 (7'-8.5')
Aluminum 5,213.5
Arsenic 27.6
Chromium 48
Copper 249
Lead 6.7
Nickel 84.2
Selenium 2.2
Sodium 122
Zinc 617
GW-03
Trichloroethene 68
Antimony 5.1
Iron 1,420
Selenium 60.1
Sodium 39,900
Zinc 516
MW-03 (6'-8')
Arsenic 9.5
Copper 695
Nickel 28.4
Selenium 6.7
Zinc 37.7
SB-07 (3.5'-5.5')
Aluminum 21,295
Barium 721
Calcium 5,124.1
Copper 87.2
Iron 24,435
Lead 4.3
Magnesium 11,389
Nickel 15.5
Potassium 6,993.6
Sodium 481
Zinc 302
SB-07DUP (3.5'-5.5')
Aluminum 18,074
Barium 484
Calcium 4,792.8
Copper 71.2
Iron 18,931
Lead 5
Magnesium 8,583.6
Potassium 4,652.7
Sodium 485
Zinc 282
LP-AQ*
Vinyl chloride 2.2
cis-1,2-Dichloroethene 4.8
Trichloroethene 0.92
bis(2-Ethylhexyl)phthalate 2
Aluminum 162
Arsenic 88.8
Barium 23.8
Calcium 9,500
Copper 154
Iron 256
Magnesium 536
Manganese 28.8
Nickel 45.9
Potassium 704
Selenium 3.2
Sodium 5,750
Vanadium 1.4
Zinc 286
Cyanide 12.7
SB-03 (8'-9.5')
Aluminum 5,274.3
Arsenic 10
Chromium 48.7
Copper 83.8
Lead 12.9
Nickel 62.5
Sodium 209
Zinc 123
SB-02 (8'-9.5')
Aluminum 7,099
Arsenic 27.6
Chromium 13.8
Copper 52.2
Iron 11,697
Lead 4.3
Magnesium 2,201.2
Manganese 282
Nickel 108
Potassium 869
Sodium 152
Zinc 209
SP-SL*
2-Butanone 37
Toluene 14
Xylene(total) 30
Fluoranthene 1,200
Pyrene 300
Benzo(a)anthracene 230
Chrysene 280
bis(2-Ethylhexyl)phthalate 12,000
Di-n-octylphthalate 330
Benzo(b)fluoranthene 330
Benzo(k)fluoranthene 240
Benzo(a)pyrene 200
4,4'-DDE 11
Aroclor-1248 150
Aroclor-1260 72
Aluminum 16,100
Antimony 5.9
Arsenic 402
Barium 174
Chromium 6.4
Calcium 9,760
Cobalt 34
Copper 1,160
Iron 30,400
Lead 228
Magnesium 5,940
Manganese 815
Mercury 0.49
Nickel 10,400
Potassium 1,120
Selenium 200
Silver 0.97
Sodium 717
Vanadium 32.9
Zinc 9,660
Cyanide 2,420
SP-AQ*
1,4-Dichlorobenzene 0.76
bis(2-Ethylhexyl)phthalate 2
Aluminum 4.8
Antimony 80.8
Arsenic 3.1
Barium 3.4
Calcium 22,000
Chromium 2
Cobalt 1.8
Copper 167
Iron 582
Magnesium 2,560
Manganese 72.5
Nickel 788
Potassium 2,900
Selenium 14.3
Sodium 4,500
Vanadium 1.1
Zinc 230
Cyanide 39.9
SW-07
Copper 3,960
Iron 34,100
Mercury 0.22
Zinc 2,090
Cyanide 858
SD-07
Benzo(a)anthracene 300
Chrysene 410
Benzo(b)fluoranthene 360
Benzo(k)fluoranthene 320
Benzo(a)pyrene 300
Indeno(1,2,3-cd)pyrene 290
Copper 2,080
Nickel 494
Zinc 1,890
SW-06
Copper 491
Iron 7,240
Cyanide 220
SD-06
Chrysene 150
Benzo(b)fluoranthene 130
Benzo(k)fluoranthene 120
2,330
835
SW-05
Iron 1,110
SD-05
Benzo(a)anthracene 180
Chrysene 300
Benzo(b)fluoranthene 260
Benzo(k)fluoranthene 210
Benzo(a)pyrene 180
Copper 690
Nickel 231
Zinc 441
SD-08
Benzo(a)anthracene 710
Chrysene 1,000
Benzo(b)fluoranthene 820
Benzo(k)fluoranthene 780
Benzo(a)pyrene 810
SW-10
Iron 346
SD-10
alpha-Chlordane 3.5
gamma-Chlordane 3.4
SW-09
Copper 95.4
Iron 24,000
SD-09
Vinyl Chloride 25
Benzo(a)anthracene 260
Chrysene 370
Benzo(b)fluoranthene 320
Benzo(k)fluoranthene 300
Benzo(a)pyrene 320
Indeno(1,2,3-cd)pyrene 150
Chromium 144
Copper 129
Nickel 264
SW-02
Iron 908
SD-02
Copper 162
Nickel 180
SW-01
Iron 658
SD-01
Benzo(a)anthracene 1,200
Chrysene 1,300
Benzo(b)fluoranthene 840
Benzo(k)fluoranthene 950
Benzo(a)pyrene 1,000
Indeno(1,2,3-cd)pyrene 110
Copper 374
Nickel 166
SW-01DUP
Iron 1,060
Cyanide 39.0 J
SD-01DUP
Benzo(a)pyrene 230
Copper 493
Nickel 284
SW-03
Iron 1,510
SD-03
4-Chloro-3-methylphenol 160
Copper 398
Nickel 212
SB-01 (4'-6')
Aluminum 14,471
Arsenic 30.8
Beryllium 0.43
Chromium 36.2
Copper 40.4
Iron 19,186
Lead 8
Magnesium 3,545.3
Nickel 46.9
Selenium 2.8
Sodium 124
Thallium 1.8
Zinc 77.4
GW-01
Sodium 27,700
MW-02 (6'-8')
Copper 45.9
Mercury 0.25
MW-02DUP (6'-8')
Copper 42.8
Mercury 0.17
MW-02 (12'-14')
Arsenic 18.5
Calcium 1,850
Chromium 61.1
Copper 114
Iron 10,800
Magnesium 5,480
Manganese 304
Mercury 0.2
Nickel 39
Sodium 196
Zinc 32.4
GW-02
Arsenic 54.5
Iron 2,270
Selenium 91.6
Sodium 54,600
SS-01
Benzo(a)pyrene 97
Calcium 1,480
Copper 177
Potassium 703
Zinc 124
SS-01DUP
Calcium 1,430
Copper 51.7
Potassium 768
Zinc 94.9
SS-02
Calcium 1,280
Copper 39
Potassium 526
Zinc 68.7
SW/SD-12
SW/SD-07
SW/SD-05
SW/SD-06
SW/SD-08
SW/SD-10
SW/SD-09
SW/SD-11
SW/SD-04
SW/SD-03
SW/SD-02
SW/SD-01
SS-04
SS-05
MW-01
SB-01
SB-02
SB-03
SB-07
MW-02
MW-03
MW-04
SS-01
SS-02
SS-03
SS-04
PIT A
PIT B
PIT C
PIT D
PIT E
PIT F
PIT G
SB-04
SB-05
SB-06
STREAM
STREAM
PROPERTY LINE
WETLAND AREA
MACADAM PARKING AREA
GRAVEL AREA
1 & 2 STORY CONCRETE BLOCK BUILDING
1 STORY CONC. BLOCK BLDG
1 STORY CONC. BLOCK BLDG
GRAVEL DRIVE
FURNACE DOCK ROAD
FURNACE DOCK ROAD
ROSALIND DRIVE
CROSS ROAD AVE
TRIBUTARY
POND
DRAINAGE CULVERT
300
320
340
350
360
LEGEND:
MW-01 MONITORING WELLS (LOCATION)
SS-01 SURFACE SOIL
SW/SD-01 SURFACE WATER AND SEDIMENT
SEPTIC TANK/LEACH PIT SOIL
SOIL BORING
NOTES
1. SURFACE WATER AND GROUNDWATER RESULTS PRESENTED IN ug/L (ppb), AND REVIEWED AGAINST NYSDEC WATER QUALITY STANDARDS/GUIDANCE VALUES (CLASS D FOR SURFACE WATER AND CLASS GA FOR GROUNDWATER), OCTOBER, 1993.
2. SURFACE AND SUBSURFACE SOIL RESULTS PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS, AND REVIEWED AGAINST NYSDEC RECOMMENDED SOIL CLEAN-UP OBJECTIVES, JANUARY, 1994.
3. SEDIMENT RESULTS PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS, AND REVIEWED AGAINST NYSDEC PROPOSED SEDIMENT CRITERIA, NOVEMBER, 1993.
*4. SLUDGE RESULTS ARE PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS. WATER RESULTS ARE PRESENTED IN ug/L (ppb). NO CRITERIA AVAILABLE FOR COMPARISON; LISTING INCLUDES ALL OCCURRENCES.
5. ABBREVIATIONS:
GW - GROUNDWATER
LP - LEACH PIT
MW - SOIL FROM ASSOCIATED MONITORING WELL LOCATION
SB - SOIL BORING
SD - SEDIMENT
SP - SEPTIC TANK
SS - SURFACE SOIL
SW - SURFACE WATER
APPROXIMATE
200 150 100 50 0 200
SCALE IN FEET
6 TANKS/PITS LOCATED AS OF 3/28/91
SURFACE FEATURES FROM WESTCHESTER COUNTY, DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH, SPRING 1990
TOPOGRAPHIC INTERPRETATION FROM NYSDEC, 1983
THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY
ICS PROPERTIES
MAGNA METALS SITE
CORTLANDT, N.Y.
FIGURE 4-1
CONSTITUENTS DETECTED AT CONCENTRATIONS EXCEEDING APPLICABLE CRITERIA LEVELS - 1998 RI SUMMARY
TETRA TECH EC, INC.
N:\GIS\JOBKEY\GISPROJ\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-1 082207.DWG

LEGEND

LP-02 ▽ LEACH PIT LOCATION

SS-08 ■ SUPPLEMENTAL RI SURFACE SOIL SAMPLE LOCATION

RA ● SUPPLEMENTAL RI SOIL BORING LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

GEOPHYSICAL SURVEY

APPROXIMATE WETLAND AREA

NOTES:
1. QUALIFIERS ARE DEFINED ON TABLES 4-1 and 4-3.

2. BRACKETS INDICATE AN EXCEEDANCE OF NYSDEC SOIL CLEANUP CRITERIA (NY-SCOL) OR MAXIMUM SITE BACKGROUND CONCENTRATION.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

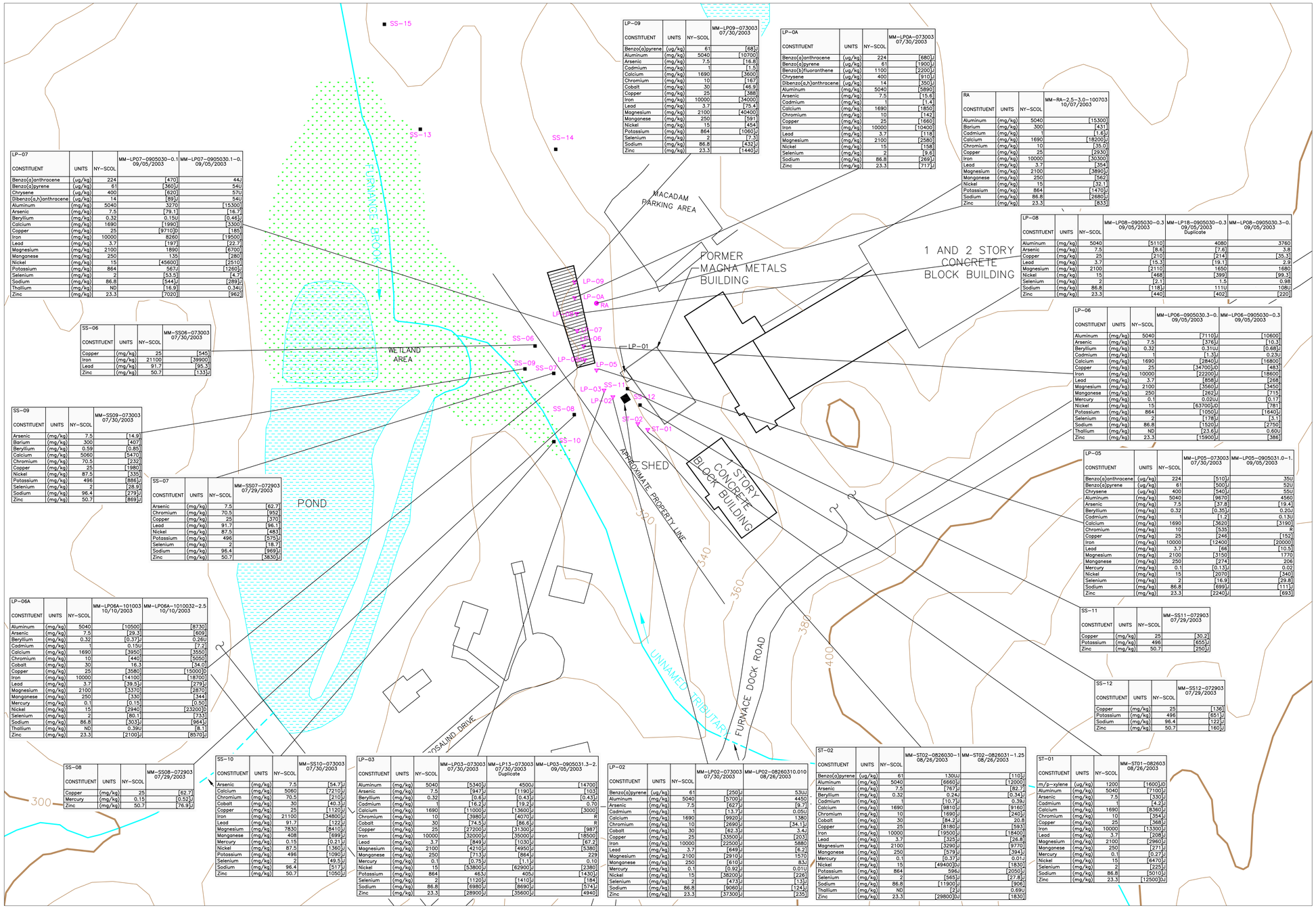
2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

4. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

N

0 40 80
FEET



LP-07 CONSTITUENT	UNITS	NY-SCOL	MM-LP07-0905030-0.1 09/05/2003	MM-LP07-0905030.1-0. 09/05/2003
Benzo(a)anthracene	(ug/kg)	224	[470]	44J
Benzo(a)pyrene	(ug/kg)	61	[360]	54U
Chrysene	(ug/kg)	400	[620]	57U
Dibenzo(a,h)anthracene	(ug/kg)	14	[89]	54U
Aluminum	(mg/kg)	5040	3270	[15300]
Arsenic	(mg/kg)	7.5	[79.1]	[16.7]
Beryllium	(mg/kg)	0.32	0.15U	[0.46]
Calcium	(mg/kg)	1690	[1990]	[3300]
Copper	(mg/kg)	25	[9710]D	[185]
Iron	(mg/kg)	10000	8260	[19500]
Lead	(mg/kg)	3.7	[197]	[22.7]
Magnesium	(mg/kg)	2100	1890	[6700]
Manganese	(mg/kg)	250	135	[280]
Nickel	(mg/kg)	15	[4560]	[2510]
Potassium	(mg/kg)	864	567J	[1260]
Selenium	(mg/kg)	2	[3.5]	[4.7]
Sodium	(mg/kg)	86.8	[544]	[289]
Thallium	(mg/kg)	ND	[16.9]	0.34U
Zinc	(mg/kg)	23.3	[7020]	[962]

SS-06 CONSTITUENT	UNITS	NY-SCOL	MM-SS06-073003 07/30/2003
Copper	(mg/kg)	25	[545]
Iron	(mg/kg)	21100	[39900]
Lead	(mg/kg)	91.7	[95.3]
Zinc	(mg/kg)	50.7	[133]

SS-09 CONSTITUENT	UNITS	NY-SCOL	MM-SS09-073003 07/30/2003
Arsenic	(mg/kg)	7.5	[14.9]
Barium	(mg/kg)	300	[407]
Beryllium	(mg/kg)	0.59	[0.85]
Calcium	(mg/kg)	5060	[5470]
Chromium	(mg/kg)	70.5	[232]
Copper	(mg/kg)	25	[1980]
Nickel	(mg/kg)	87.5	[335]
Potassium	(mg/kg)	496	[886]
Selenium	(mg/kg)	2	[28.9]
Sodium	(mg/kg)	96.4	[279]
Zinc	(mg/kg)	50.7	[869]

SS-07 CONSTITUENT	UNITS	NY-SCOL	MM-SS07-072903 07/29/2003
Arsenic	(mg/kg)	7.5	[62.7]
Chromium	(mg/kg)	70.5	[952]
Copper	(mg/kg)	25	[370]
Lead	(mg/kg)	91.7	[96.1]
Nickel	(mg/kg)	87.5	[483]
Potassium	(mg/kg)	496	[575]
Selenium	(mg/kg)	2	[18.7]
Sodium	(mg/kg)	96.4	[969]
Zinc	(mg/kg)	50.7	[3830]

LP-09 CONSTITUENT	UNITS	NY-SCOL	MM-LP09-073003 07/30/2003
Benzo(a)pyrene	(ug/kg)	61	[68]
Aluminum	(mg/kg)	5040	[10700]
Arsenic	(mg/kg)	7.5	[16.8]
Cadmium	(mg/kg)	1	[1.5]
Calcium	(mg/kg)	1690	[3600]
Chromium	(mg/kg)	10	[167]
Cobalt	(mg/kg)	30	[46.9]
Copper	(mg/kg)	25	[388]
Iron	(mg/kg)	10000	[34000]
Lead	(mg/kg)	3.7	[75.4]
Magnesium	(mg/kg)	2100	[4040]
Manganese	(mg/kg)	250	[591]
Nickel	(mg/kg)	15	[454]
Potassium	(mg/kg)	864	[1060]
Selenium	(mg/kg)	2	[7.3]
Sodium	(mg/kg)	86.8	[432]
Zinc	(mg/kg)	23.3	[1440]

LP-0A CONSTITUENT	UNITS	NY-SCOL	MM-LP0A-073003 07/30/2003
Benzo(a)anthracene	(ug/kg)	224	[680]
Benzo(a)pyrene	(ug/kg)	61	[1900]
Benzo(b)fluoranthene	(ug/kg)	1100	[2200]
Chrysene	(ug/kg)	400	[910]
Dibenzo(a,h)anthracene	(ug/kg)	14	[350]
Aluminum	(mg/kg)	5040	[5890]
Arsenic	(mg/kg)	7.5	[15.6]
Cadmium	(mg/kg)	1	[1.4]
Calcium	(mg/kg)	1690	[1850]
Chromium	(mg/kg)	10	[142]
Copper	(mg/kg)	25	[1660]
Iron	(mg/kg)	10000	[10400]
Lead	(mg/kg)	3.7	[118]
Magnesium	(mg/kg)	2100	[2580]
Nickel	(mg/kg)	15	[158]
Selenium	(mg/kg)	2	[9.6]
Sodium	(mg/kg)	86.8	[269]
Zinc	(mg/kg)	23.3	[717]

RA CONSTITUENT	UNITS	NY-SCOL	MM-RA-2.5-3.0-100703 10/07/2003
Aluminum	(mg/kg)	5040	[15300]
Barium	(mg/kg)	300	[431]
Cadmium	(mg/kg)	1	[1.6]
Calcium	(mg/kg)	1690	[18200]
Chromium	(mg/kg)	10	[35.0]
Copper	(mg/kg)	25	[2930]
Iron	(mg/kg)	10000	[30300]
Lead	(mg/kg)	3.7	[354]
Magnesium	(mg/kg)	2100	[3890]
Manganese	(mg/kg)	250	[562]
Nickel	(mg/kg)	15	[32.1]
Potassium	(mg/kg)	864	[1470]
Sodium	(mg/kg)	86.8	[2680]
Zinc	(mg/kg)	23.3	[833]

LP-08 CONSTITUENT	UNITS	NY-SCOL	MM-LP08-0905030-0.3 09/05/2003	MM-LP18-0905030-0.3 09/05/2003 Duplicate	MM-LP08-0905030.3-0. 09/05/2003
Aluminum	(mg/kg)	5040	[5110]	4080	3760
Arsenic	(mg/kg)	7.5	[8.6]	[7.6]	3.8
Copper	(mg/kg)	25	[210]	[214]	[35.3]
Lead	(mg/kg)	3.7	[15.3]	[19.1]	2.9
Magnesium	(mg/kg)	2100	[2110]	1650	1680
Nickel	(mg/kg)	15	[468]	[399]	[99.3]
Selenium	(mg/kg)	2	[2.1]	1.5	0.98
Sodium	(mg/kg)	86.8	[118]J	111U	108U
Zinc	(mg/kg)	23.3	[440]	[402]	[220]

LP-06 CONSTITUENT	UNITS	NY-SCOL	MM-LP06-0905030.3-0. 09/05/2003	MM-LP06-0905030-0.3 09/05/2003
Aluminum	(mg/kg)	5040	[7110]J	[10600]
Arsenic	(mg/kg)	7.5	[376]J	[10.3]
Beryllium	(mg/kg)	0.32	0.31U	[0.68]J
Cadmium	(mg/kg)	1	[1.3]J	0.23U
Calcium	(mg/kg)	1690	[2840]J	[16800]
Copper	(mg/kg)	25	[34700]JD	[483]
Iron	(mg/kg)	10000	[22200]J	[18600]
Lead	(mg/kg)	3.7	[858]J	[268]
Magnesium	(mg/kg)	2100	[3560]J	[3450]
Manganese	(mg/kg)	250	[262]J	[715]
Mercury	(mg/kg)	0.1	0.02UJ	[0.17]
Nickel	(mg/kg)	15	[63700]JD	[781]
Potassium	(mg/kg)	864	[1050]J	[1640]J
Selenium	(mg/kg)	2	[178]J	[3.1]
Sodium	(mg/kg)	86.8	[1520]J	[2750]
Thallium	(mg/kg)	ND	[23.6]J	0.60U
Zinc	(mg/kg)	23.3	[15900]J	[386]

LP-05 CONSTITUENT	UNITS	NY-SCOL	MM-LP05-073003 07/30/2003	MM-LP05-0905031.0-1. 09/05/2003
Benzo(a)anthracene	(ug/kg)	224	[510]J	35U
Benzo(a)pyrene	(ug/kg)	61	[500]J	52U
Chrysene	(ug/kg)	400	[540]J	55U
Aluminum	(mg/kg)	5040	[9670]	4560
Arsenic	(mg/kg)	7.5	[37.8]	[19.4]
Beryllium	(mg/kg)	0.32	[0.35]J	0.20J
Cadmium	(mg/kg)	1	[1.2]	0.13U
Calcium	(mg/kg)	1690	[3620]	[3190]
Chromium	(mg/kg)	10	[535]	R
Copper	(mg/kg)	25	[246]	[152]
Iron	(mg/kg)	10000	[12400]	[20000]
Lead	(mg/kg)	3.7	[66]	[10.5]
Magnesium	(mg/kg)	2100	[3150]	1770
Manganese	(mg/kg)	250	[274]	206
Mercury	(mg/kg)	0.1	[0.13]J	0.02
Nickel	(mg/kg)	15	[2070]	[340]
Selenium	(mg/kg)	2	[16.9]	[29.8]
Sodium	(mg/kg)	86.8	[699]J	[111]J
Zinc	(mg/kg)	23.3	[2240]J	[693]

SS-11 CONSTITUENT	UNITS	NY-SCOL	MM-SS11-072903 07/29/2003
Copper	(mg/kg)	25	[30.2]
Potassium	(mg/kg)	496	[655]J
Zinc	(mg/kg)	50.7	[250]J

SS-12 CONSTITUENT	UNITS	NY-SCOL	MM-SS12-072903 07/29/2003
Copper	(mg/kg)	25	[136]
Potassium	(mg/kg)	496	[651]J
Sodium	(mg/kg)	86.4	[122]J
Zinc	(mg/kg)	50.7	[160]J

LP-06A CONSTITUENT	UNITS	NY-SCOL	MM-LP06A-101003 10/10/2003	MM-LP06A-1010032-2.5 10/10/2003
Aluminum	(mg/kg)	5040	[10500]	[8730]
Arsenic	(mg/kg)	7.5	[29.3]	[609]
Beryllium	(mg/kg)	0.32	[0.37]J	0.26U
Cadmium	(mg/kg)	1	0.15U	[7.2]
Calcium	(mg/kg)	1690	[3950]	[3550]
Chromium	(mg/kg)	10	[440]	[5050]
Cobalt	(mg/kg)	30	16.3	[34.0]
Copper	(mg/kg)	25	[3580]	[15000]D
Iron	(mg/kg)	10000	[14100]	[18700]
Lead	(mg/kg)	3.7	[39.5]	[279]
Magnesium	(mg/kg)	2100	[3370]	[2870]
Manganese	(mg/kg)	250	[330]	[344]
Mercury	(mg/kg)	0.1	[0.15]	[0.50]
Nickel	(mg/kg)	15	[2940]	[23200]D
Selenium	(mg/kg)	2	[80.1]	[733]
Sodium	(mg/kg)	86.8	[303]	[964]
Thallium	(mg/kg)	ND	0.39U	[8.1]
Zinc	(mg/kg)	23.3	[2100]J	[8570]J

SS-08 CONSTITUENT	UNITS	NY-SCOL	MM-SS08-072903 07/29/2003
Copper	(mg/kg)	25	[62.7]
Mercury	(mg/kg)	0.15	[0.52]J
Zinc	(mg/kg)	50.7	[76.9]J

SS-10 CONSTITUENT	UNITS	NY-SCOL	MM-SS10-073003 07/30/2003
Arsenic	(mg/kg)	7.5	[54.7]J
Calcium	(mg/kg)	5060	[7210]J
Chromium	(mg/kg)	70.5	[210]J
Cobalt	(mg/kg)	30	[40.3]J
Copper	(mg/kg)	25	[1120]J
Iron	(mg/kg)	21100	[34800]J
Lead	(mg/kg)	91.7	[122]J
Magnesium	(mg/kg)	7830	[8410]J
Manganese	(mg/kg)	408	[699]J
Mercury	(mg/kg)	0.15	[0.21]J
Nickel	(mg/kg)	87.5	[1360]J
Potassium	(mg/kg)	496	[1090]J
Selenium	(mg/kg)	2	[49.5]J
Sodium	(mg/kg)	96.4	[517]J
Zinc	(mg/kg)	50.7	[1050]J

LP-03 CONSTITUENT	UNITS	NY-SCOL	MM-LP03-073003 07/30/2003	MM-LP13-073003 07/30/2003 Duplicate	MM-LP03-0905031.3-2. 09/05/2003
Aluminum	(mg/kg)	5040	[5340]J	4500J	[14700]
Arsenic	(mg/kg)	7.5	[947]J	[1190]J	[103]
Beryllium	(mg/kg)	0.32	[0.6]J	[0.43]J	0.43U
Cadmium	(mg/kg)	1	[16.2]J	[19.2]J	0.70
Calcium	(mg/kg)	1690	[11000]J	[13600]J	[3000]
Chromium	(mg/kg)	10	[398]J	[407]J	R
Cobalt	(mg/kg)	30	[74.5]J	[86.6]J	R
Copper	(mg/kg)	25	[27200]J	[31300]J	[987]
Iron	(mg/kg)	10000	[32000]J	[35000]J	[18500]
Lead	(mg/kg)	3.7	[849]J	[1030]J	[67.2]
Magnesium	(mg/kg)	2100	[4210]J	[4950]J	[5380]
Manganese	(mg/kg)	250	[713]J	[864]J	229
Mercury	(mg/kg)	0.1	0.75J	[1.1]J	0.10
Nickel	(mg/kg)	15	[53800]J	[62900]J	[2380]
Potassium	(mg/kg)	864	465J	405J	[1430]
Selenium	(mg/kg)	2	[1120]J	[1410]J	[184]
Sodium	(mg/kg)	86.8	[6980]J	[8690]J	[574]J
Zinc	(mg/kg)	23.3	[28900]J	[35600]J	[4940]

LP-02 CONSTITUENT	UNITS	NY-SCOL	MM-LP02-073003 07/30/2003	MM-LP02-08260310.010 08/26/2003
Benzo(a)pyrene	(ug/kg)	61	[250]J	53UJ
Aluminum	(mg/kg)	5040	[5700]J	4450
Arsenic	(mg/kg)	7.5	[627]J	[9.7]
Cadmium	(mg/kg)	1	[13.7]J	0.05U
Calcium	(mg/kg)	1690	[9920]J	1380
Chromium	(mg/kg)	10	[2690]J	[34.1]J
Cobalt	(mg/kg)	30	[62.3]J	3.4J
Copper	(mg/kg)	25	[33500]J	[203]
Iron	(mg/kg)	10000	[22500]J	5880
Lead	(mg/kg)	3.7	[649]J	[6.2]
Magnesium	(mg/kg)	2100	[2910]J	1570
Manganese	(mg/kg)	250	[610]J	83J
Mercury	(mg/kg)	0.1	[0.92]J	0.01U
Nickel	(mg/kg)	15	[38200]J	[226]
Selenium	(mg/kg)	2	[473]J	[13]J
Sodium	(mg/kg)	86.8	[9060]J	[124]J
Zinc	(mg/kg)	23.3	[37300]J	[235]

ST-02 CONSTITUENT	UNITS	NY-SCOL	MM-ST02-0826030-1 08/26/2003	MM-ST02-0826031-1.25 08/26/2003
Benzo(a)pyrene	(ug/kg)	61	130UJ	[110]J
Aluminum	(mg/kg)	5040	[6660]J	[12000]
Arsenic	(mg/kg)	7.5	[767]J	[82.7]
Beryllium	(mg/kg)	0.32	0.24J	[0.34]J
Cadmium	(mg/kg)	1	[10.7]J	0.39J
Calcium	(mg/kg)	1690	[9810]J	[9160]
Chromium	(mg/kg)	10	[1690]J	[240]J
Cobalt	(mg/kg)	30	[84.2]J	20.8
Copper	(mg/kg)	25	[8180]J	[593]
Iron	(mg/kg)	10000	[19500]J	[18400]
Lead	(mg/kg)	3.7	[325]J	[26.8]
Magnesium	(mg/kg)	2100	[3290]J	[9770]
Manganese	(mg/kg)	250	[579]J	[394]J
Mercury	(mg/kg)	0.1	[0.37]J	0.01U
Nickel	(mg/kg)	15	[49400]DJ	[1830]
Potassium	(mg/kg)	864	596J	[2050]J
Selenium	(mg/kg)	2	[565]J	[27.8]J
Sodium	(mg/kg)	86.8	[11900]J	[906]
Thallium	(mg/kg)	ND	[2]J	0.69J
Zinc	(mg/kg)	23.3	[29800]DJ	[1830]

ST-01 CONSTITUENT	UNITS	NY-SCOL	MM-ST01-082603 08/26/2003
m/p-xylene	(ug/kg)	1200	[1600]JD
Aluminum	(mg/kg)	5040	[7100]J
Arsenic	(mg/kg)	7.5	[330]J
Cadmium	(mg/kg)	1	[4.2]J
Calcium	(mg/kg)	1690	[8360]J
Chromium	(mg/kg)	10	[354]J
Copper	(mg/kg)	25	[368]J
Iron	(mg/kg)	10000	[13300]J
Lead	(mg/kg)	3.7	[208]J
Magnesium	(mg/kg)	2100	[2960]J
Manganese	(mg/kg)	250	[271]J
Mercury	(mg/kg)	0.1	[0.27]J
Nickel	(mg/kg)	15	[6470]J
Selenium	(mg/kg)	2	[225]J
Sodium	(mg/kg)	86.8	[5010]J
Zinc	(mg/kg)	23.3	[12500]DJ

TETRA TECH EC, INC.

TITLE:
Soil Exceedances - 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
		4-2
DATE:	REV.:	
08/21/07	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-2 0082107.DWG

LEGEND

SW-15 ⊕ SUPPLEMENTAL RI SURFACE WATER SAMPLE OR ELEVATION LOCATION

SD-15 ◆ SUPPLEMENTAL RI SEDIMENT SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

GEOPHYSICAL SURVEY

APPROXIMATE WETLAND AREA

NOTES:
1. QUALIFIERS ARE DEFINED ON TABLES 4-4 AND 4-5.

2. BRACKETS INDICATE AN EXCEEDANCE OF NYSDEC SEDIMENT CRITERIA (NY-SC) OR NYSDEC WATER QUALITY STANDARDS - CLASS B (NYS-WQS-B).

3. SEDIMENT CRITERIA FOR PAHs WERE ADJUSTED BASED ON TOC SAMPLES TAKEN AT EACH LOCATION.

4. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

0 40 80
FEET

SW-13 CONSTITUENT	UNITS	NY-WQS-B	MM-SW13-032904 03/29/2004
Aluminum	(ug/l)	100	[366]
Iron	(ug/l)	300	[327]J

SD-13 CONSTITUENT	UNITS	NY-SC	MM-SD13-033004 03/30/2004
Nickel	(mg/kg)	50	[63.5]J

SW-22 CONSTITUENT	UNITS	NY-WQS-B	MM-SW22-032904 03/29/2004
Aluminum	(ug/l)	100	[381]J
Cobalt	(ug/l)	5	[5.1]J
Copper	(ug/l)	16	[772]J
Iron	(ug/l)	300	[2020]J
Nickel	(ug/l)	94	[161]
Selenium	(ug/l)	4.6	[8.7]J
Zinc	(ug/l)	150	[343]J

SW-15 CONSTITUENT	UNITS	NY-WQS-B	MM-SW15-032904 03/29/2004
Aluminum	(ug/l)	100	[328]

SD-15 CONSTITUENT	UNITS	NY-SC	MM-SD15-033004 03/30/2004
Benzo(a)anthracene	(ug/kg)	52	[470]J
Benzo(a)pyrene	(ug/kg)	52	[660]J
Benzo(b)fluoranthene	(ug/kg)	52	[1200]J
Benzo(k)fluoranthene	(ug/kg)	52	[600]J
Chrysene	(ug/kg)	52	[650]J
Chromium	(mg/kg)	110	[158]J
Copper	(mg/kg)	110	[1040]J
Nickel	(mg/kg)	50	[332]J
Zinc	(mg/kg)	270	[528]J

SW-14 CONSTITUENT	UNITS	NY-WQS-B	MM-SW14-032904 03/29/2004
Aluminum	(ug/l)	100	[690]
Copper	(ug/l)	16	[57.6]J
Iron	(ug/l)	300	[1670]J

SD-14 CONSTITUENT	UNITS	NY-SC	MM-SD14-033004 03/30/2004
Copper	(mg/kg)	110	[672]J
Nickel	(mg/kg)	50	[300]J

SD-20 CONSTITUENT	UNITS	NY-SC	MM-SD20-033104 03/31/2004
Copper	(mg/kg)	110	[241]J
Nickel	(mg/kg)	50	[200]J

SW-20 CONSTITUENT	UNITS	NY-WQS-B	MM-SW20-032904 03/29/2004
Aluminum	(ug/l)	100	[358]J
Iron	(ug/l)	300	[363]J

SD-21 CONSTITUENT	UNITS	NY-SC	MM-SD21-040304 04/03/2004
Copper	(mg/kg)	110	[403]J
Lead	(mg/kg)	110	[112]J
Nickel	(mg/kg)	50	[180]J

SD-24 CONSTITUENT	UNITS	NY-SC	MM-SD24-040304 04/03/2004
Copper	(mg/kg)	110	[216]J
Nickel	(mg/kg)	50	[161]J

SD-23 CONSTITUENT	UNITS	NY-SC	MM-SD23-040304 04/03/2004
Benzo(a)anthracene	(ug/kg)	13	[360]J
Benzo(a)pyrene	(ug/kg)	13	[410]J
Benzo(b)fluoranthene	(ug/kg)	13	[680]J
Chrysene	(ug/kg)	13	[510]J
Copper	(mg/kg)	110	[194]J
Nickel	(mg/kg)	50	[155]J

SD-25 CONSTITUENT	UNITS	NY-SC	MM-SD25-040304 04/03/2004
Copper	(mg/kg)	110	[137]J
Nickel	(mg/kg)	50	[149]

SD-26 CONSTITUENT	UNITS	NY-SC	MM-SD26-040304 04/03/2004
Benzo(b)fluoranthene	(ug/kg)	130	[180]J
Chrysene	(ug/kg)	130	[150]J
Copper	(mg/kg)	110	[130]J
Nickel	(mg/kg)	50	[121]

SW-18 CONSTITUENT	UNITS	NY-WQS-B	MM-SW18-032904 03/29/2004	MM-SW18D-032904 03/29/2004 Duplicate
Aluminum	(ug/l)	100	[342]	[383]J
Iron	(ug/l)	300	[583]J	[903]J

SD-18 CONSTITUENT	UNITS	NY-SC	MM-SD18-033104 03/31/2004	NY-SCOL	MM-SD18D-033104 03/31/2004 Duplicate
Benzo(a)anthracene	(ug/kg)	98.8	[160]J	78	26UJ
Benzo(a)pyrene	(ug/kg)	98.8	[220]J	78	30UJ
Benzo(b)fluoranthene	(ug/kg)	98.8	[260]J	78	92UJ
Benzo(k)fluoranthene	(ug/kg)	98.8	[220]J	78	59UJ
Chrysene	(ug/kg)	98.8	[180]J	78	55UJ
Chromium	(mg/kg)	110	[166]J	110	[159]J
Copper	(mg/kg)	110	[327]J	110	[230]J
Nickel	(mg/kg)	50	[460]J	50	[364]J
Zinc	(mg/kg)	270	[290]J	270	259J

SD-22 CONSTITUENT	UNITS	NY-SC	MM-SD22-040304 04/03/2004
Copper	(mg/kg)	110	[415]J
Nickel	(mg/kg)	50	[170]J

SW-19 CONSTITUENT	UNITS	NY-WQS-B	MM-SW19-032904 03/29/2004
Aluminum	(ug/l)	100	[728]J
Copper	(ug/l)	16	[22.6]J
Iron	(ug/l)	300	[2180]J

SD-19A CONSTITUENT	UNITS	NY-SC	MM-SD19A-033104 03/31/2004
Chromium	(mg/kg)	110	[133]J
Copper	(mg/kg)	110	[281]J
Nickel	(mg/kg)	50	[365]J

SW-16 CONSTITUENT	UNITS	NY-WQS-B	MM-SW16-032904 03/29/2004
Aluminum	(ug/l)	100	[316]

SD-16 CONSTITUENT	UNITS	NY-SC	MM-SD16-033004 03/30/2004
Benzo(a)anthracene	(ug/kg)	23.4	[140]J
Benzo(a)pyrene	(ug/kg)	23.4	[190]J
Benzo(b)fluoranthene	(ug/kg)	23.4	[260]J
Benzo(k)fluoranthene	(ug/kg)	23.4	[190]J
Chrysene	(ug/kg)	23.4	[190]J
Nickel	(mg/kg)	50	[143]J

SW-21 CONSTITUENT	UNITS	NY-WQS-B	MM-SW21-032904 03/29/2004
Aluminum	(ug/l)	100	[725]J
Iron	(ug/l)	300	[4790]J

SW-17 CONSTITUENT	UNITS	NY-WQS-B	MM-SW17-032904 03/29/2004
Aluminum	(ug/l)	100	[282]

SD-17 CONSTITUENT	UNITS	NY-SC	MM-SD17-033104 03/31/2004
Benzo(a)anthracene	(ug/kg)	7.93	[470]
Benzo(a)pyrene	(ug/kg)	7.93	[430]J
Benzo(b)fluoranthene	(ug/kg)	7.93	[670]J
Benzo(k)fluoranthene	(ug/kg)	7.93	[380]J
Chrysene	(ug/kg)	7.93	[490]
Indeno(1,2,3-cd)pyrene	(ug/kg)	7.93	[48]J
Phenanthrene	(ug/kg)	732	[900]

TETRA TECH EC, INC.

TITLE:
Sediment and Surface Water Exceedances - 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
		4-3
DATE:	REV.:	
08/21/07	0	

N: \GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-3 082107.DWG

LEGEND

MW-01 ◆ MONITORING WELL LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

GEOPHYSICAL SURVEY

APPROXIMATE WETLAND AREA

NOTES:
1. ALL GROUNDWATER RESULTS ARE REPORTED IN UG/L.

2. QUALIFIERS ARE DEFINED ON TABLE 4-2.

3. BRACKETS INDICATE AN EXCEEDANCE OF NYSDEC GROUNDWATER QUALITY STANDARDS (NY-GWQS).

4. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

4. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

N

0 40 80
FEET

MW-04 CONSTITUENT	NY-GWQS	MM-GWMW04-100803 10/08/2003
cis-1,2-Dichloroethylene	5	[7.7]
Tetrachloroethylene	5	[13]
Trichloroethylene	5	[910]D
Arsenic	25	[133]
Barium	1000	[1140]
Beryllium	3	[5.6]
Chromium	50	[139]
Copper	200	[240]
Iron	300	[37200]
Magnesium	35000	[38600]
Manganese	300	[6400]
Nickel	100	[108]
Selenium	10	[131]
Sodium	20000	[76900]J
Thallium	0.5	[10.5]
Cyanide	200	[555]
Arsenic - Dissolved	25	[46.8]
Iron - Dissolved	300	[14300]
Manganese - Dissolved	300	[5810]
Selenium - Dissolved	10	[71.1]
Sodium - Dissolved	20000	[77800]J

MW-04D CONSTITUENT	NY-GWQS	MM-GWMW04D-100803 10/08/2003	MM-GWMW05D-100803 10/08/2003 Duplicate
cis-1,2-Dichloroethylene	5	4.9J	[5.5]
Tetrachloroethylene	5	[13]	[14]
Trichloroethylene	5	[870]D	[870]D
Iron	300	[3810]	[3510]
Magnesium	35000	[44300]	[39400]
Manganese	300	[9500]	[8510]
Selenium	10	[30.4]	[23.9]
Sodium	20000	[126000]J	[111000]J
Thallium	0.5	[8.6]J	[8.3]J

MW-05 CONSTITUENT	NY-GWQS	MM-GWMW05-100603 10/06/2003
Iron	300	[33800]
Manganese	300	[5660]
Sodium	20000	[62900]J
Thallium	0.5	[14.4]

MW-08 CONSTITUENT	NY-GWQS	MM-GWMW08-100703 10/07/2003
Iron	300	[3160]
Magnesium	35000	[66200]
Sodium	20000	[36800]J

MW-02 CONSTITUENT	NY-GWQS	MM-GWMW02-100803 10/08/2003
Trichloroethylene	5	[9.4]
Iron	300	[346]
Magnesium	35000	[48900]
Selenium	10	[30.8]
Sodium	20000	[264000]J

MW-01 CONSTITUENT	NY-GWQS	MM-GWMW01-100603 10/06/2003
Iron	300	[1540]

MW-07 CONSTITUENT	NY-GWQS	MM-GWMW07-100703 10/07/2003
Magnesium	35000	[74700]
Sodium	20000	[57200]J

TETRA TECH EC, INC.

TITLE:
Groundwater Exceedances - 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 08/21/07	REV.: 0	4-4

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-4 082107.DWG

LEGEND

MW-01 ◆ MONITORING WELL LOCATION

LP-02 ▽ LEACH PIT LOCATION

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

GROUNDWATER FLOW DIRECTION

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. [BRACKETS] INDICATE CONCENTRATION EQUALS OR EXCEEDS NY-GWQS.

3. NY-GWQS – NEW YORK GROUNDWATER QUALITY STANDARD.

4. ALL CONCENTRATIONS ARE IN µg/L.

5. ft bgs – FEET BELOW GROUND SURFACE

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

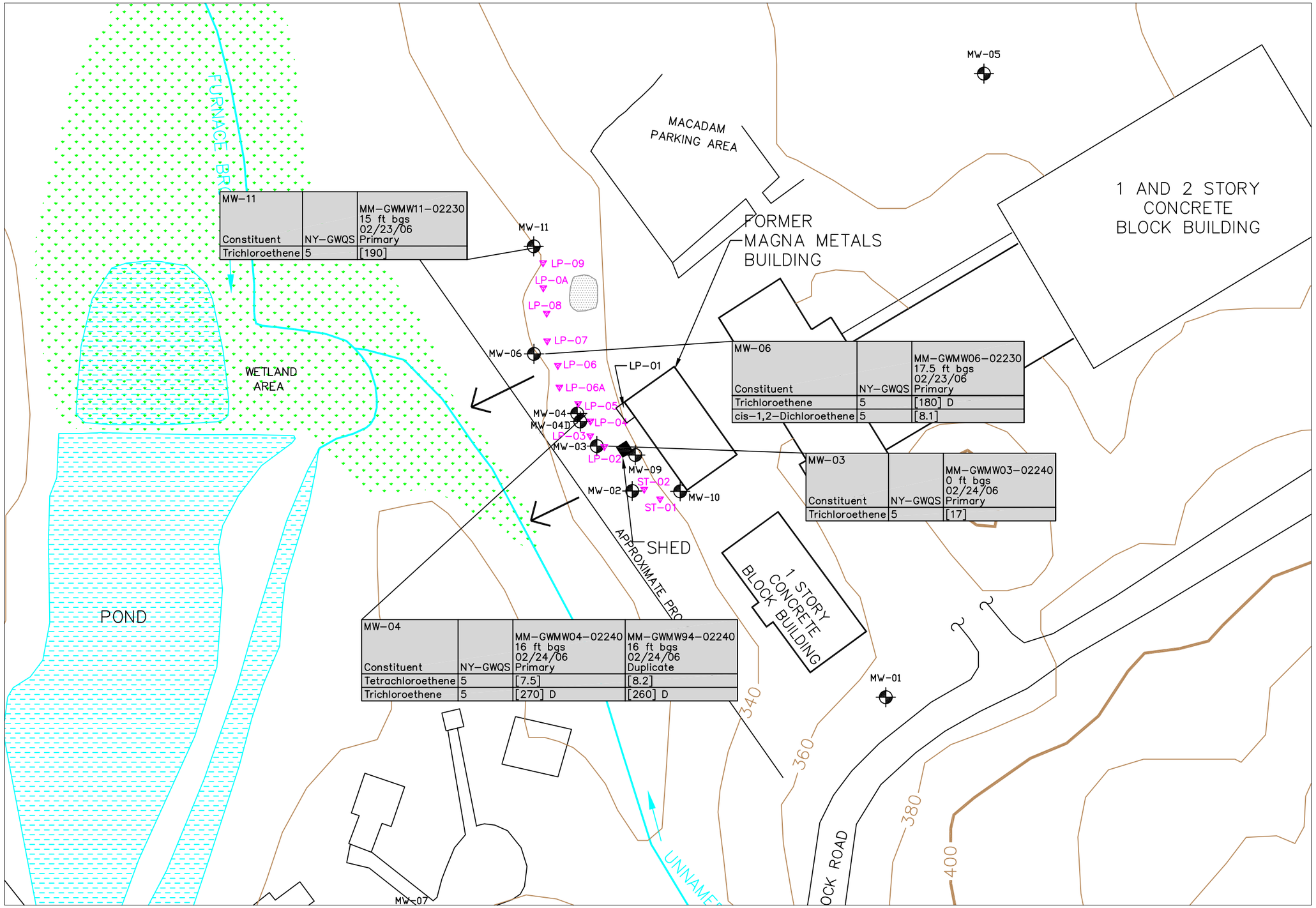
3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

N

0 50 100
FEET



MW-11		MM-GWMW11-02230 15 ft bgs 02/23/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[190]

MW-06		MM-GWMW06-02230 17.5 ft bgs 02/23/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[180] D
cis-1,2-Dichloroethene	5	[8.1]

MW-03		MM-GWMW03-02240 0 ft bgs 02/24/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[17]

MW-04		MM-GWMW04-02240 16 ft bgs 02/24/06	MM-GWMW94-02240 16 ft bgs 02/24/06
Constituent	NY-GWQS	Primary	Duplicate
Tetrachloroethene	5	[7.5]	[8.2]
Trichloroethene	5	[270] D	[260] D

TETRA TECH EC, INC.

TITLE:
Groundwater Exceedences – February 2006
Supplemental RI/FS – Additional Data Collection Summary Letter Report
Magna Metals, Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMB	CTS	1172.0003
CHKD:	APPD:	FIGURE NO.:
		4-5
DATE:	REV.:	
06/12/2006	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-5 082207.DWG

LEGEND

SV-01 ▽ SUPPLEMENTAL SOIL VAPOR LOCATION

LP-02 ▽ LEACH PIT LOCATION

APPROXIMATE REFUSE AREA

-PROXIMATE WETLAND AREA

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. ALL CONCENTRATIONS ARE IN ug/m3.

3. NJ – TENTATIVE IN IDENTIFICATION AND ESTIMATED IN VALUE.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WF

SV-05 Constituent	MM-SV-05-010606 01/06/06
1,2,4-Trimethylbenzene	4.8
1,2-Dichloroethene	2.1
1,3,5-Trimethylbenzene	3.4
1,3-Butadiene	35
2,2,4-Trimethylpentane	1.5
2-Butanone	29
Acetone	97
Benzene	54
Carbon disulfide	28
Chloromethane	7.2
cis-1,2-Dichloroethene	2.1
Cyclohexane	2.8
Ethylbenzene	10
(m+p)xylene	12
n-Heptane	13
n-Hexane	17
o-Xylene	6.5
p-Ethyltoluene	4.7
Styrene	3.2
Tetrachloroethene	10
Toluene	38
Trichloroethene	7
Trichlorofluoromethane	2
Vinyl chloride	0.92

SV-06 Constituent	MM-SV-06-010606 01/06/06
1,1,1-Trichloroethane	0.93
1,2,4-Trimethylbenzene	2.1
1,3-Butadiene	27
2-Butanone	13
Acetone	59
Benzene	31
Carbon disulfide	5.3
Chloroform	1.3
Chloromethane	1.9
Cyclohexane	1.5
Ethylbenzene	4.3
(m+p)xylene	7.4
n-Heptane	4.5
n-Hexane	8.5
o-Xylene	2.5
p-Ethyltoluene	2
Styrene	1
Tetrachloroethene	130
Toluene	25
Trichloroethene	40
Trichlorofluoromethane	1.4

SV-04 Constituent	MM-SV-04-010506 01/05/06
1,2-Dichloroethene	83
1,3,5-Trimethylbenzene	11
1,3-Butadiene	38 NJ
2,2,4-Trimethylpentane	32
2-Butanone	25
2-Hexanone	190
Benzene	130
Carbon disulfide	18
cis-1,2-Dichloroethene	44
Cyclohexane	83
Ethylbenzene	650
(m+p)xylene	1900
n-Heptane	780
n-Hexane	150
o-Xylene	380
p-Ethyltoluene	22
Toluene	210
trans-1,2-Dichloroethene	38
Trichloroethene	64
Vinyl chloride	22

SV-01 Constituent	MM-SV-01-010506 01/05/06
1,1,1-Trichloroethane	1.6
1,2,4-Trimethylbenzene	3.9
1,3,5-Trimethylbenzene	1.1
1,3-Butadiene	18 NJ
1,4-Dioxane	16
2-Butanone	14
Acetone	69
Benzene	8
Carbon disulfide	25
Chloroform	2.4 NJ
Chloromethane	0.89
Cyclohexane	6.5
Ethylbenzene	2.3
(m+p)xylene	6.1
n-Heptane	3.7
n-Hexane	7.4
o-Xylene	2.4
p-Ethyltoluene	3
Tetrachloroethene	1.2
Toluene	9
Trichloroethene	31

SV-02 Constituent	MM-SV-02-010506 01/05/06
1,2,4-Trimethylbenzene	3.3
1,3-Butadiene	35 NJ
2,2,4-Trimethylpentane	17
2-Butanone	29
Acetone	110
Benzene	45
Carbon disulfide	110
Chloromethane	5.6
Cyclohexane	21
Ethylbenzene	6.9
(m+p)xylene	11
n-Heptane	21
n-Hexane	32
o-Xylene	4.3
p-Ethyltoluene	3.3
Styrene	4
Toluene	26
Trichloroethene	11
Vinyl chloride	1.2

SV-03 Constituent	MM-SV-03-010506 01/05/06
1,1,1-Trichloroethane	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	12
1,2,4-Trimethylbenzene	2
1,2-Dichloroethene	1.5
1,3-Butadiene	8.4
2-Butanone	9.1
Acetone	36
Benzene	19
Carbon disulfide	4.7
cis-1,2-Dichloroethene	1.5
Cyclohexane	0.96
Dichlorodifluoromethane	2.2
Ethylbenzene	4.3
(m+p)xylene	6.1
n-Heptane	4.1
n-Hexane	6.3
o-Xylene	2.5
p-Ethyltoluene	2.3
Styrene	1.7
Tetrachloroethene	8.8
Toluene	14
Trichloroethene	59

SV-07 Constituent	MM-SV-07-010606 01/06/06
1,1,1-Trichloroethane	28
1,2,4-Trimethylbenzene	7.9
1,3,5-Trimethylbenzene	2.7
1,3-Butadiene	3.1 NJ
1,4-Dichlorobenzene	3
2,2,4-Trimethylpentane	3.2
2-Butanone	8
2-Hexanone	4.1
Acetone	29
Benzene	14
Carbon disulfide	3.1
Chloromethane	1.1
Cyclohexane	9.3
Dichlorodifluoromethane	4
Ethylbenzene	7.4
Isopropyl alcohol	47
(m+p)xylene	23
Methyl tert-butyl ether	28
n-Heptane	9.8
n-Hexane	8.8
o-Xylene	7.8
p-Ethyltoluene	6.9
Styrene	2.1
Tetrachloroethene	4
Toluene	22
Trichloroethene	14
Trichlorofluoromethane	1.7

SV-08 Constituent	MM-SV-08-010606 01/06/06
1,2,4-Trimethylbenzene	1.9
1,3-Butadiene	22 NJ
2-Butanone	9.4
Acetone	38
Benzene	17
Carbon disulfide	5.3
Chloromethane	1
Cyclohexane	1
Dichlorodifluoromethane	3.1
Ethylbenzene	2.6
(m+p)xylene	4.8
n-Heptane	3.9
n-Hexane	6.3
o-Xylene	1.6
p-Ethyltoluene	1.7
Styrene	0.85
Tetrachloroethene	8.1
Toluene	12
Trichloroethene	4.2
Trichlorofluoromethane	1.5

SV-09 Constituent	MM-SV-09-010506 01/05/06
1,2,4-Trimethylbenzene	5.9
1,3,5-Trimethylbenzene	1.9
1,3-Butadiene	1.1 NJ
2,2,4-Trimethylpentane	2.2
2-Butanone	41
Acetone	52
Benzene	3.8
Carbon disulfide	3.7
Cyclohexane	1.4
Dichlorodifluoromethane	5.9
Ethylbenzene	3.9
Isopropyl alcohol	17
(m+p)xylene	12
Methyl tert-butyl ether	6.9
n-Heptane	3.8
n-Hexane	5.3
p-Ethyltoluene	4.9
Tetrahydrofuran	35
Toluene	15
Trichloroethene	1.1
Trichlorofluoromethane	2.6

FORMER MAGNA METALS BUILDING

1 A
BLC

SHED

SV-09 1 STORY CONCRETE BLOCK BUILDING

APPROXIMATE PROPERTY LIN

FURNACE DOCK ROAD

CROSS ROAD

DRAINAGE CULVERT

DRAINAGE CULVERT

360 320 340 320 360 380 400

N

0 50 100
FEET

TETRA TECH EC, INC.

TITLE:
Detected Constituents in Soil Vapor Samples – January 2006
Supplemental RI/FS – Addition Data Collection Summary Letter Report
Magna Metals, Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMB	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 06/12/2006	REV.: 0	4-6

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 4-6 082207.DWG

5.0 HABITAT BASED ASSESSMENTS

In summary, the results of the 1998 RI/FS investigation indicated the following:

(1) Presence of ecological receptors in the habitats adjacent to the Magna Metals property.
(2) Presence of potential site-related contaminants in these habitats.
(3) Complete exposure pathways for receptors to be exposed to the contaminants.
(4) The observed concentrations of PAHs and metals that exceeded pertinent eco-screening level values.

These findings indicated that a toxic effect based assessment (Step IIC of the FWIA process) was warranted to collect site-specific data for assessing risk to ecological receptors and assist in remedial decision making for this site. The site-specific biological/chemical study was performed as part of the June 2004 Supplemental RI Report to reduce inherent uncertainties. The Step IIC included:

- Community level analysis using benthic macroinvertebrate studies;
- Organism level analysis using surface water and sediment toxicity testing; and
- Supplemental sediment and surface water sampling.

Presented below are the details of the ecological analysis.

5.1 Fish and Wildlife Resources and Environmental Setting (Step I)

The Step I - Site Description impact analysis was the first step of the phased approach. The objectives of the Step I - Site Description were to 1) identify fish and wildlife resources that may potentially be affected by site-related contaminants, and 2) if resources are present, provide the appropriate information for designing additional investigation studies (NYSDEC, 1994). To achieve these objectives, information regarding fish and wildlife resources is provided in the form of maps, habitat descriptions, and an evaluation of the value of such resources.

Identification of applicable fish and wildlife regulatory criteria, both contaminant-specific and site-specific, was also prepared for this Step-1 Site Description. This information was necessary to identify potential pathways of contamination migration that may affect fish and wildlife resources. The information obtained in Step I was used in subsequent phases.

5.1.1 Description of Fish and Wildlife Resources

Pursuant to the NYSDEC guidance, documented fish and wildlife resources within a two-mile radius of the site were identified as part of the Step I - Site Description. An in-office document search was performed within a two-mile radius of the site to identify documented fish and wildlife resources including, but not limited, to NYSDEC Significant Habitats; habitats supporting endangered, threatened, or rare species, species of concern; regulated wetlands; wild and scenic rivers, streams, lakes; and other major resources.

A qualitative field assessment of vegetation covertypes and habitats was performed on October 3 and 4, 1996, on the Magna Metals Site and within a 0.5 mile radius of the site perimeter. This assessment included documentation of vegetation communities and wildlife observations.

Observations at a total of eight sample stations were recorded during the investigation. Sample stations chosen were representative of vegetation throughout the general area. At each station, vegetation was identified and observations of wildlife were noted. The information obtained from this qualitative assessment was then used to identify fish and wildlife resources and habitats within a 0.5-mile radius study area.

5.1.1.1 Terrestrial Habitats

Most of the site provides little wildlife habitat, because of the impervious structures and surfaces on-site. The north, west, and east boundaries of the site consist of a broad-leaf deciduous woodland. An extensive wetland area is present to the northwest and west of the site. This wetland complex is composed of broad-leaf deciduous forest and emergent communities, which could provide habitat to a variety of wildlife species. The wetland complex comprises approximately 15 acres, including several stream channels, two ponds, and several additional small ponded areas. At the time of the 1998 RI/FS, the area was not a NYS regulated wetland area. However, per revisions made to the New York State Freshwater Wetlands Map effective July 28, 2004, regulated wetland A-48, a Class 2 wetland is adjacent to and contains a portion of the Magna Metals Site.

Wetlands and stream channels account for approximately five percent of the 0.5-mile radius. Wetlands within the study area are located in low lying or depressional areas usually associated with streams or other water bodies. Approximately 75 percent of the 0.5-mile radius is composed of broad-leaf deciduous forest habitat. Secondary growth hardwood species, i.e. black cherry (*Prunus serotina*), red and white oak (*Quercus rubra*, and *Q. alba*), shagbark hickory (*Carya ovata*), gray birch (*Betula populifolia*), American beech (*Fagus grandifolia*), and sassafras (*Sassafras albidum*) dominate the forest canopy. Ironwood (*Carpinus caroliniana*), spicebush (*Lindera benzoin*), young sassafras and black cherry dominated the shrub layer, and multiflora rose (*Rosa multiflora*), dewberry (*Rubus flagellaris*), black raspberry (*Rubus occidentalis*), ferns and violets (*Viola* sp.) make up the herbaceous layer.

Approximately 20 percent of the study area is composed of residential properties consisting of single family dwellings. Large mowed lawns and wooded lots are scattered throughout the residential areas. These areas provide limited wildlife habitat for urban/suburban species.

Several documented fish and wildlife resources are present within the two-mile radius study area, including: nine NYS regulated wetland areas, the New Croton Reservoir, and Blue Mountain Reservation County Park (Figure 5-1).

5.1.1.2 Aquatic Habitats

Within the 0.5-mile radius study area, several streams, ponds and wetland areas are present. Two streams enter this wetland area and one stream exits the pond via an outlet pipe located near the southwest end of the pond (Figure 5-3). The first stream channel, Stream #1, is located to the southwest of the Magna Metals site. The stream flows to the north into the large wetland complex. It converges with the second stream, Stream #2, and continues flowing southwest through the wetland complex into the man-made pond (Figure 5-3). The stream exits the pond via a conduit and continues flowing to the southwest. Stream #2 flows from the north into the wetland complex.

Stream #1 was approximately 1.5 feet wide and six inches deep at the center of the channel. Stream substrate consisted of silt. Chemical and physical parameters of the stream are listed in the

following table. Aquatic vegetation was not present within the stream channel. Fish and aquatic life were not observed in the stream during the field investigation. Raccoon tracks were observed along the stream banks. Limited amounts of emergent vegetation, consisting of common reed (*Phragmites australis*), white grass (*Leersia virginica*), and sedges (*Carex* spp.) were present within the channel. The stream channel was surrounded by a broad-leaf deciduous forest. The area was predominantly vegetated by red oak (*Quercus rubra*), cottonwood (*Populus deltoides*), with tuliptree (*Liriodendron tulipifera*), gray birch (*Betula populifolia*), and white oak (*Quercus alba*). Spicebush (*Lindera bezoin*), northern arrowwood (*Viburnum recognitum*), and New York fern (*Thelypteris noveboracensis*) made up the sparse understory.

Water Parameter Results Collected on October 3 and 4, 1996
Magna Metals Site
Town of Cortlandt, Westchester County, New York

Water Parameters	Stream #1	Stream #2	Pond #1	Pond #2
Water Temperature (ºC)	15	14	14	16
Dissolved Oxygen (mg/L)	8.9	8.5	9	8.4
Conductivity (mS)	0.46	0.36	0.36	0.38
Turbidity	0	0	0	0
Salinity (o/oo)	0	0	0	0

Stream #2 was approximately three feet wide and six to eight inches deep at the center of the channel. Stream substrate consisted of silty sand with leaf litter. Chemical and physical parameters of the stream are also listed. Aquatic vegetation was not present in the channel during the field investigation. Fingernail clams and caddisflies were observed during the stream characterization. Deer tracks and a buck rub were also observed along the stream banks. The stream channel is immediately surrounded by a broad-leaf deciduous wetland forest. This area was predominantly vegetated by red maple (*Acer rubrum*) and elm (*Ulmus sp.*) in the canopy layer. Within the shrub layer, alder (*Alnus sp.*), winterberry (*Ilex verticillata*), and blackhaw (*viburnum prunifolium*) were present. Skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), false nettles (*Boehmeria cylindrica*), and halberd-leaf tearthumb (*Polygonum arifolium*) made up the sparse herbaceous layer.

Streams #1 and #2 converge within the southwestern portion of the wetland complex and discharge into a man-made pond, Pond #1. The pond was approximately 2.0 acres in size. It was approximately one foot deep near the edge. Due to turbidity and distance limitations, the depth at the center of the pond could not be determined. Aquatic vegetation within the pond consisted of duckweed (*Lemna sp.*). Filamentous algae was also dominant within the pond. Emergent aquatic vegetation along the pond's shoreline consisted of purple loosestrife (*Lythrum salicaria*). Vegetation surrounding the pond was primarily composed of tree and shrub/scrub species.

Cottonwood, oaks, and willow (*Salix sp.*) were dominant in the canopy layer; and staghorn sumac (*Rhus typhina*), catalpa (*Catalpa speciosa*), alder, and red-osier dogwood (*Cornus stolonifera*) in the shrub layer. An island vegetated by scrub/shrub species was present within the center of the pond. Canada geese and mallards were observed foraging and wading on the pond.

Two pipes were located along the southern boundary of the pond. The northern pipe appeared to be an outlet discharging water from the pond. Water exiting the pond flowed southwest through the conduit under Cross Road and several private properties. It is believed that the conduit discharges into a wetland south of the pond. However, this wetland was surrounded by private properties and not accessible. The southern pipe appears to be an inlet to the pond. Stormwater runoff from Cross Road is discharged into the pond through this pipe.

A second man-made pond, Pond #2, was present within the 0.5-mile radius study area. The pond was located to the north of the Magna Metals Site on Stream #2. The stream entered the pond on the north side and exited the pond on the west side. A dam and spillway were present on the western side. The pond was approximately 2.0 acres in size. Water depth varied throughout the pond. Near the dam and spillway, the depth of the pond is approximately three feet deep. The pond substrate was composed of a thick organic layer several feet deep. The organic layer was primarily composed of leaf litter from the broad-leaf deciduous forest surrounding the pond. Dominant tree species surrounding the pond consisted of red and white oaks, gray birch, and beech. The shrub layer was composed of young shagbark hickory, and American beech. Stream #2 continued flowing west past the pond, then turned sharply to the south and converges with Stream #1. The stream channel flowed through the large wetland complex.

Percent saturation of oxygen at the measured temperature was determined by using an oxygen saturation nomogram (Wetzel, 1983). Results for the streams and ponds located within the 0.5-mile radius study area are indicated below.

Percent Oxygen Saturation for Streams and Ponds within Magna Metals Site Study Area
Town of Cortlandt, Westchester County, New York.

Water Body	Percent Saturation of Oxygen
Stream #1	88%
Stream #2	83%
Pond #1	89%
Pond #2	85%

5.1.1.3 Wetlands

Wetlands within the 0.5 mile radius are located in the north and southwest portion of the study area. These wetlands were classified as Class 2 wetlands effective July 28, 2004. The largest wetland area within the 0.5-mile radius study area is the wetland complex located to the northwest of the Magna Metals Site. The wetland complex is approximately 15 acres in size, and includes the two stream channels and ponds. Streams #1 and #2 converge within this wetland area, and Pond #1 is located within the southwest portion of the wetland complex (Figure 5-3). This wetland complex is composed of a bottomland hardwoods, surrounded to the east by a steep, fairly rocky slope, which is predominantly vegetated by a broad-leaved deciduous upland forest. The bottomland hardwood forest is composed of red maple and elm in the canopy layer; alder, winterberry, and to a lesser degree blackhaw in the shrub layer. A sparse herbaceous layer was dominated by sensitive fern, and New York fern, smartweeds (*Polygonum sp*.). Sedges were present in the open woodland areas. The two stream channels, Streams #1 and #2, flow through the forested wetland. To the west of Stream #2, within the vicinity of the Magna Metals Site, an emergent wetland is present. This

wetland is predominantly vegetated by sedges, rushes (*Juncus spp*.), smartweeds, and arrow-leaf tearthumb (*Polygonum sagittatum*). Young red maple trees are also present throughout. To the south and southwest of the emergent wetland is Pond #1.

A broad-leaf deciduous woodland composed of red and white oak, gray birch, and beech in the canopy surrounds man-made pond #2. Submergent vegetation was not observed in the pond. The pond discharges into Stream #2, which flows through a bottomland hardwood in the large wetland complex. The bottomland hardwood is predominately vegetated by red maple, elm, and green ash (*Fraxinus pennsylvanica*) in the canopy, and ironwood (*Carpinsus caroliniana*), northern arrowwood, spicebush, New York fern, and sensitive fern in the understory.

Nine NYS regulated wetland areas are present within the two-mile radius study area (Figure 5-1). The NYS regulated wetland areas have all been classified as Class 2 wetlands, with the exception of A-9, which was classified as a Class I wetland. The wetland areas identified as P-2 and P-6 are both located within the 0.5-mile radius study area. Wetland P-2 is composed of an open water/emergent wetland and surrounded by broad-leaf deciduous forest wetlands. Wetland P-6 consists of a mixed scrub/shrub and broad-leaf deciduous forest wetlands.

5.1.1.4 Fauna Expected Within Each Covertype and Aquatic Habitat

A total of ten bird species, and six mammal species, were observed within the 0.5 mile radius area of the Magna Metals site during the October 3 and 4, 1996 site investigation. The species observed within the study area are included in Table 5-1. Most of the birds observed during the October 3 and 4, 1996 field investigation of the 0.5-mile radius study area are considered year-round or winter residents. By October, most migrating birds would have departed from the area. Thus, the bird species observed during the field investigation do not accurately reflect the breeding and transient species which may also be present in the study area during the spring, summer, and fall.

Four of the ten bird species recorded were observed in the hardwood forest habitat. These species included the black-capped chickadee (*Pares articapillus*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), and wood duck (*Aix sponsa*). The gray catbird (*Dumetella carolinensis*), blue jay (*Cyanocitta cristata)* and northern cardinal (*Cardinalis cardinalis*) were observed within an ecotone, or edge habitat. An ecotone is the zone between two adjacent habitat areas. In this study area, the ecotone is generally the interface between hardwoods and more open habitats; i.e. lawns and fields. The gray catbird, blue jay, and northern cardinal typically inhabit edge habitats and open woods, feeding primarily on berries, seed stock, and insects. Other species often associated with edge habitats include the American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), brown thrasher (*Toxostoma rufum*), various warblers and sparrows.

The green heron (*Butorides striatus*), Canada goose (*Branta canadensis*), and mallard (*Anas platyrhynchos*) were observed using the open water and wetland habitats for foraging and resting. Mallards and Canada geese were observed within two ponds in the large wetland complex located to the northwest of the Magna Metals site and a ponded area located downslope to the west of the Magna Metals Site. These species were also observed in the ponds and wetlands outside of the 0.5-mile radius.

The green heron was observed within one of the ponded areas located in the large wetland complex. Mallards, Canada geese, and green herons inhabit marshes, bays, estuaries, ponds, rivers, and lakes throughout northeastern North America. The mallard and Canada geese are surface feeders, primarily herbivores with the bulk of their diets consisting of aquatic vegetation, and a limited amount of mollusks, insects, and small fish. Additional duck species, such as the American black duck (*Anas rubripes*), may also inhabit ponds and wetlands within the study area.

The green heron inhabits nearly all fresh and salt water habitats, including lakes, ponds, wetlands, wooded wetlands, and streams. Their diet is primarily carnivorous with main food sources consisting of small fish, crustaceans (mainly crayfish), frogs, salamanders, and an occasional mouse or shrew. Additional wading bird species that could be found in the wetlands, ponds, and streams within the study area include great blue heron (*Ardea herodias*), and black-crowned night-heron (*Nycticorax nycticorax*)

Several mammal species including the raccoon (*Procyon lotor*), eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), and vole (*Microtus sp*.) were observed in the hardwood forest areas near the wetlands and stream channels. A beaver lodge was observed on one of the ponded areas within the large wetland complex located to the northwest of the Magna Metals site.

The hardwood forests within the 0.5-mile radius study area provide habitat conditions suitable for the gray squirrel, and eastern chipmunk. Eastern gray squirrels are primarily arboreal, rarely venturing far from trees; and chipmunks are ground dwellers. Both species typically feed on nuts, seeds, fungi, and fruits. The large portion of nut and seed bearing trees within the study area provide a substantial food source for these species. Raccoon, white-tailed deer, and voles were also observed in the forest habitats. Tracks of the raccoon and white-tailed deer were observed in the open woodland areas and near water bodies. The mole was observed in an open woodland area. The variety of covertypes, i.e., successional fields, open woodland, and upland and bottomland forests; and presence of water sources throughout provide suitable habitat for wildlife species. These woodland areas could also provide habitat for the striped skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), woodchuck (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), and various mice (*Microtus sp*.) species.

A beaver (*Castor canadensis)* lodge was observed on the northern most ponded area in the large wetland complex. Beavers are chiefly aquatic; their habitats are usually associated with open water, i.e., slow flowing streams, rivers, lakes, and ponds. The beaver is a herbivore whose diet consists mainly of bark from deciduous trees and some herbaceous vegetation. The pond and wetland habitats within the 0.5-mile radius study area, would also provide ideal habitat for muskrats (*Ondatra zibethica*), which reside in marshes, and along open water. They are chiefly aquatic and feed on aquatic vegetation, and occasionally clams, frogs and fish.

Herpetofauna species were not encountered during the field investigation. The wetland and pond habitats throughout the 0.5-mile radius study area would provide necessary requirements for several species common throughout the Northeast, including the bullfrog (*Rana catesbeiana*), and green frog (*Rana clamitans*), snapping turtle (*Chelydra serpentina*), and stinkpot (*Sternothaerus odoratus*). Additional herpetofuana species which could utilize the upland forest and successional fields include the Eastern painted turtle (*Chrysemys picta picta*), and the common garter snake

(*Thamnophis sirtalis*). Herpetofauna species feed on a variety of food sources, from insects, small mammals, and fish, to mushrooms and berries.

5.1.2 Endangered and Threatened Species

The U.S. Fish and Wildlife Service (USFWS) and the NYSDEC were contacted to determine the presence of endangered and threatened species, or species of special concern within a two-mile radius of the Magna Metals Site. The NYSDEC, Natural Heritage Program has documented habitat for the bog turtle (*Clemmys muhlenbergii*), a New York State and Federal endangered species, within the northern portion of two-mile radius (NYSDEC, 1996). The documented habitat is located upslope from the Magna Metals site in a separate watershed. The USFWS has no documented records of endangered or threatened species within a two-mile radius of the Magna Metals Site (USFWS, 1996).

5.1.3 Observations of Stress

As part of the site investigation, vegetation and wildlife within the 0.5 mile radius were investigated for signs of stress potentially related to site contaminants. Two areas used for debris dumping were observed to the north and northwest of the site. The larger dump area was located to the north of the Magna Metals Site, within the same industrial/commercial park as the Magna Metals Site. This area was being used to dispose of building material. Several excavated underground storage tanks were also present. This dump area is not associated with the former activities of Magna Metals. A second smaller refuse area was also encountered within the commercial park. This area was observed in the woodland adjacent to the northwest portion of the Magna Metals Site. Two empty 55-gallon drums were observed at this location. A small intermittent drainage channel was noticed coming from the dump area and discharging into the large wetland complex.

Field observations related to stressed wildlife or vegetation were limited to that present on or adjacent to the Magna Metals Site. Methodology for classifying stressed vegetation included in the observation of bare areas lacking vegetation or associated with stained soils, clustering of dead or dying vegetation associated to discrete areas surrounded by healthy vegetation. For stressed wildlife observations, these included any observations of dead wildlife present on or in vicinity of the site or wildlife displaying abnormal behaviors or appearing sickly. It is important to note that none of the above characteristics were noted in the vegetation or wildlife observed on the Magna Metals Site.

The field survey for wildlife was conducted in early October, a period of time in which reptiles and amphibians may not be readily observed given the cooler temperatures. Additionally, the scope of work to complete the Step I, required a qualitative survey of fish and wildlife and as such no intensive survey for any single group of organisms was performed. The lack of reptiles and amphibian observations may be related to time of year of their reclusive habits and not to "stress" potentially related to the site. A list of herpetofuna expected to occur on the site is provided herein.

5.1.4 Description of Fish and Wildlife Resource Value

As part of a Fish and Wildlife Impact Analysis, Step I - Site Description, the habitat value for both wildlife and humans is assessed. Wildlife habitat is assessed, within the 0.5 mile study area, based on availability of food, seasonal cover, bedding areas, breeding and roosting sites, etc. For humans,

the value of habitats within the 0.5-mile study area is assessed based on the current and potential use of fish and wildlife resources. Human resources may include hunting, fishing, observation of wildlife, scientific studies, agriculture, forestry, and other recreational and economic activities.

5.1.4.1 Value of Habitat to Associated Fauna

The broad-leaf deciduous forests and bottomland hardwood wetlands provide valuable wildlife habitat within the 0.5 mile radius study area (see Figure 5-2). The stream and ponds within the study area provide important water sources for the wildlife that resides within the study area. Two NYS regulated, Class 2 wetlands, P-2 and P-6, are both located within the southwest portion of the 0.5-mile radius, documented fish and wildlife resources are not present within the 0.5-mile. Habitat for the bog turtle, State and Federal endangered species, was identified within the northern most portion of the 2.0-mile radius.

Portions of Furnace Brook and its tributaries adjacent to Magna Metals Site have been classified by NYSDEC as Class B waters and are subject to Class B New York water quality standards.

5.1.4.2 Value of Resources to Humans

For humans, the value of habitats within the 0.5 mile study area is assessed based on the current and potential use of fish and wildlife resources for such activities as hunting, fishing, observation of wildlife, agriculture, forestry, scientific study, and other recreational and economic opportunities. The 0.5-mile radius is largely forested, however, due to private ownership and steep slopes, access to much of the area is limited. Several wetland and pond areas, which could be used for recreational fishing and wildlife observation, have limited access due to private ownership of the properties and surrounding areas.

5.1.5 Identification of Applicable Fish and Wildlife Regulatory Criteria

Both contaminant-specific and site-specific criteria applicable to the remediation of fish and wildlife resources were identified for the Magna Metals Site. Contaminant-specific criteria involves reviewing NYSDEC rules, regulations, and guidance to identify regulatory compliance, permits, or standards which may be applicable to the site. Soils, sediment, and surface and ground water samples were collected on the Magna Metals Site. Sample results should be compared to the following rules, regulations, and guidances:

- Water Quality Standards and Guidance Values for the Protection of Aquatic Life (6 New York Codes, Rules, and Regulations [NYCRR] Part 701);
- Technical Guidance for Screening Contaminated Sediment;
- Division of Water, Technical and Operational Guidance Series (TOGS) 1.1.1., Ambient Water Quality Standards and Guidance Values; and
- Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels.

5.2 Pathway Analysis (Step II)

The objectives of the Step IIA-C are the 1) identification of applicable fish and wildlife regulatory criteria, for both contaminant-specific and site-specific screening analysis, 2) identification of potential pathways of contamination migration that may affect fish and wildlife resources and 3) a toxic effect analysis to determine if impacts to fish and wildlife are present.

The primary means for disposal of the wastes was by discharge to a series of leaching pits and possibly a facility septic system. The principal media to which ecological receptors may be exposed to site-related contaminants include:

- Surface soils which may have been contaminated as a result of historical operations, spills or disposal practices;
- Surface water through direct contact or consumption of contaminants through drinking; and
- Sediments through direct contact or incidental consumption of contaminants during feeding.

Upland environments, wetlands and streams located downgradient from and adjacent to the site provide limited potential to support populations of ecological receptors. The wetlands and streams located downgradient from the site receive drainage from the site and act as both potential pathways and sinks for site-related contaminants. Migratory pathways which could act as conduits for transporting site-related contaminants to areas supporting ecological receptors include:

- Mobilization of site-related contaminants via surface water runoff into the adjoining channels and wetlands;
- Introduction of site-related contaminants via groundwater to surface water discharge; and
- Deabsorption of contaminants from sediments into overlying waters.

Direct contact with groundwater and deep subsurface soils are not considered as complete exposure pathways as these media typically remain unavailable to most ecological receptors. Ecological receptors may be exposed to contaminants in groundwater if the potential migration pathway for groundwater to surface water discharge is complete. The point of exposure for ecological receptors for the groundwater to surface water discharge pathway will be considered as the surface water exposure, as this represents the exposure point for ecological receptors. If groundwater contaminants are not detected in surface waters, then the groundwater to surface water pathway will not be considered as complete for these contaminants or that the fate and transport characteristics of the contaminants do not result in significant exposure concentrations in surficial media.

The site is located within a cluster of buildings in a commercial/industrial park in Cortlandt, New York. The commercial/industrial park represents the only significant development in the surrounding area and the former Magna Metals facility is located on the outer perimeter of the developed area. Surface water drainage is directed via several small unnamed tributaries of

Furnace Brook and includes a 15-acre forested wetland to the southwest of the site. Additional forested wetland was found to the north as was undeveloped, forested uplands.

The unnamed tributaries, ponds and wetland areas adjacent to the site offer the only surface water resources within the two-mile radius which could be affected by site-related contaminants. No fish kills or wildlife mortality have been documented in the streams or wetlands within the vicinity of the site. Site-related constituents (heavy metals) were identified in surface water and sediments of the unnamed tributaries and ponds. Elevated concentrations of heavy metals and volatile organics were detected at concentrations above applicable NYSDEC groundwater standards. Additionally, elevated concentrations of metals were detected in site surface soils which were potentially susceptible to erosion into the adjacent aquatic and wetland environments.

The presence of site-related constituents in the surface soils, surface water and groundwater environments suggest that the groundwater to surface water discharge pathway and the surface water runoff pathway are complete for exposing aquatic receptors in the streams, ponds, and wetlands.

Since the surface water pathway is both the principal migratory pathway and exposure pathway for aquatic receptors, resident aquatic (i.e., benthic communities in the sediments) species would have a greater potential for adverse ecological effects than migratory species or species which have large home ranges due to longer periods of exposure. For surface soils, the principal exposure source is contaminated surficial soil material and the exposure pathway would be contacted with surface soils by ecological receptors.

Results of the site investigation revealed that both fish and wildlife resources were associated with areas adjacent to the site but that the site provides limited value for fish and wildlife resources based upon the following observations:

- The small size of the site and absence of any significant vegetation communities on the site proper;
- The majority of the site is paved and developed for storage and maintenance operations; and
- The site boundary is partially enclosed by a chain linked fence.

Surface soil, surface water and sediment contamination were evaluated as potential exposure sources for ecological receptors. The majority of the site is covered by impervious structures which would limit wildlife contact with soils. Surface soil samples were collected from the outer fringes of the developed portions of site near the on-site leach pits. The extremely limited vegetation on the site proper provides limited feeding and resting habitat for transient species, and therefore, habitation of the developed portions of the site by wildlife is not anticipated.

5.3 Criteria Specific Analysis (Step IIB)

Surface water, sediments, and surface soils were sampled. Surface water and sediment samples were obtained from two unnamed tributaries to Furnace Brook and an unnamed pond. Analytical results from surface water, sediment, and surface soil samples collected were used to compare

concentrations of contaminants to numerical criteria. Furnace Brook and its tributaries adjacent to the Magna Metals Site are subject to Class Cstandards by the NYSDEC.

Criteria for metals that were hardness dependent were normalized using sample specific hardness values. NYSDEC sediment criteria were used in screening sediment contamination. Screening the sediment data, where applicable, organic compound concentration data were normalized to sample specific TOC values. The hardness and TOC values were derived from site-specific samples obtained during the field effort. Ambient background soil concentration data and NYSDEC benchmarks were utilized for the screening of surface soils.

5.3.1 Surface Water Evaluation

Table 5-2 provides the comparisons of surface water data to applicable benchmarks. NYSDEC water quality standards were used for surface water criteria when possible. NYSDEC water quality criteria were not available for the detected VOCs. USEPA water quality criteria were available for vinyl chloride, methylene chloride, chloroform, and trichloroethene. VOCs were not detected at the background location in the surface water samples. Vinyl chloride was present in the surface water at sites SW-4, SW-9, and SW-10. Methylene chloride was detected at site SW-7. Cis-1,2-dichloroethene occurred in samples SW-1, SW-1 DUP, SW-2 through SW-6, and SW-8 through SW-10. Chloroform was found in surface water samples from sites SW-6, SW-8, SW-10, and SW-11. Trichloroethene was detected in samples SW-1, SW-1 DUP, SW-2 through SW-6, and SW-8 through SW-10. Trichloroethene exceeded USEPA water quality criteria in samples SW-1, SW-1 DUP, and SW-4. However, the detection of methylene chloride and chloroform is likely to be associated with laboratory cleaning.

Table 5-3 provides the comparison of detected semivolatile compounds to applicable benchmarks. NYSDEC water quality criteria were not available for all of the detected semi-volatile organic compounds. USEPA water quality criteria were available for the semi-volatile organic compounds diethylphthalate, hexachlorobenzene, and fluoranthene. Bis(2-ethylhexyl)phthalate was the only semi-volatile detected at the background location. It also occurred in the down-gradient samples SW-1 DUP, and SW-5 through SW-7. Fluoranthene and pyrene were present at site SW-9, and 4-methylphenol was detected at site SW-7. Hexachlorobenzene occurred in samples SW-1 DUP, SW-3, and SW-6, and diethylphthalate was present in samples SW-1, SW-3, and SW-8. Bis(2-ethylhexyl)phthalate exceed chronic in sample SW-1 DUP Hexachlorobenzene exceeded water quality criteria in samples SW-3, SW-6, and SW-8.

Table 5-4 provides the comparison of metals detected in surface water to applicable benchmarks. NYSDEC water quality criteria were not available for antimony, barium, calcium, magnesium, potassium, and sodium. Arsenic, cadmium, chromium, cobalt, mercury, selenium, vanadium, and cyanide were not detected at the background location.

Mercury was detected in only the site SW-7 sample, this level did not exceed the NYSDEC water quality standard. Arsenic, cadmium, and cobalt occurred at the down-gradient sites SW-7 and SW-9. Cobalt exceeded the NYSDEC chronic water quality criteria in samples SW6, SW7, and SW9. In addition, arsenic was also present at site SW-6, and cobalt was also present at sites SW-5 and SW-6. Selenium and cyanide were present in samples SW-1 DUP, SW-6, SW-7, and

SW-9. Selenium was also detected at sites SW-3 and SW-8. Levels of selenium exceeded the NYSDEC chronic water quality criteria at sites SW-6, SW-7, and SW-8, and exceeded the severe effects level at site SW-7. Cyanide levels were above both the NYSDEC chronic and acute water quality standards in samples SW-1 DUP, SW-6, and SW-7. Lead was detected at sites SW-2, SW-3, SW-6, SW-7, and SW-9. Data regarding the presence of lead were rejected in the background samples, SW-1 DUP, and SW-5. Lead exceeded NYSDEC chronic water quality criteria in samples SW-6, SW-7, and SW-9.

Chromium and vanadium were present at sites SW-3, SW-5 through SW-7, and SW-9. In addition, chromium also occurred at detectable levels at sites SW-2 and SW-10. Chromium exceeded NYSDEC chronic water quality criteria in sample SW-7 and vanadium exceeded chronic in samples SW-7 and SW-9. Antimony was detected at the background location and at down-gradient sites SW-4 through SW-7. The level of antimony exceeded the background level at site SW-7.

The remaining 11 metals (aluminum, barium, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc) were detected in samples from the background location and from all down-gradient sites. Concentrations of aluminum exceeded the background level at site SW-8, and exceeded the NYSDEC criteria value in samples SW-1 DUP, SW-2 through SW-7, SW-9 and SW-10. Levels of barium exceeded the background concentration in all samples but SW-1 and SW-2. Metals occurred in the following samples at a greater concentration than at the background location: calcium, SW-1 DUP, SW-5, and SW-9; copper, SW-1, SW-1 DUP, SW-2 through SW-5, SW-8, SW-10, and SW-11; magnesium, all samples except SW-7; manganese, all samples except SW-11; nickel, all samples except SW-1; potassium, SW-1,SW-1 DUP, SW-2 through SW-7, and SW-9; sodium, all samples; and zinc, SW-3, Table 5-4. SVOAs in surface SW-5, SW-6, and SW-9. The background level of iron exceeded the NYSDEC criteria as did all the down-gradient samples except SW-8 and SW-11. The concentration of copper at sites SW-5 exceeded NYSDEC chronic H_20 quality criteria. SW-6, SW-7, and SW-9 exceeded NYSDEC chronic water quality criteria. Zinc at sites SW-6 and SW-7 exceeded both the NYSDEC chronic and acute water quality criteria. Manganese exceeded the NYSDEC chronic water quality criteria in samples SW-1, SW-1 DUP, SW-2 through SW-7 and SW-9. Nickel exceeded the chronic NYSDEC water quality criteria in samples SW-6 and SW-9 and both the chronic and acute in SW-7.

5.3.2 Sediment Evaluation

Samples from 11 down-gradient sites and one background site were analyzed for the presence of VOCs. Table 5-5 provides the comparison of detected volatile organics in sediments to applicable benchmarks. Severe effects level and lowest effect level was only available for toluene. All volatile organic compounds data were rejected for site SD-3. No VOCs were detected at the background location or at site SD-11. Chloromethane and toluene were present only at site SD-7. Vinyl chloride was detected in the sample from SD-9. Carbon disulfide and tetrachloroethene were detected only at sites SD-4 and SD-10 respectively. 4-Methyl-2-pentanone and 2-Hexanone were detected at site SD-2 and SD-10. Trichloroethane was present in samples from sites SD-5 and SD-9. Acetone was found in samples from sites SD-4, SD-5, SD-8, and SD-9. 2 Butanone was found in the following samples: SD-1, SD-1 DUP, SD-2, and SD-4 through SD-9. VOC concentrations did not exceed NYSDEC sediment screening levels.

Table 5-6 provides the comparison of detected semi-volatile organics in sediments to applicable benchmarks. Semi-volatile organic compounds were not detected at the background location. 4-Chloro-3-methylphenol exceeded the lowest effect level in sample SD-3. Fluorene exceeded the lowest level effect in the sample from site SD-1. Benzo(a)anthracene exceeded the lowest level in samples SD-1 and SD-10.

The following compounds were detected at only one of the down-gradient locations: naphthalene and 2-methylnaphthalene, site SD-1; 4-chloro-3-methylphenol and butylbenzylphthalate, site SD-3; and hexachloroethane, site SD-10. Acenaphthylene, acenaphthene, dibenzofuran, fluorene, and carbazole were present at sites SD-1 and SD-8. Acenaphthene was also detected in the sample from site SD-3. Indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene were found at sites SD-1, and SD-7 through SD-11. Phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected at sites SD-1 and SD-5 through SD-11. Benzo(b)fluoranthene, and benzo(k)fluoranthene were also present in samples from site SD-4. Fluoranthene, pyrene, and benzo(a)pyrene were found in samples SD-1, SD-1 DUP, SD-4, SD-5, and SD-7 through SD-11. In addition, benzo(a)pyrene was present at site SD-2, fluoranthene was detected in samples from site SD-6, and pyrene was found at sites SD-3 and SD-6. Di-n-butylphthalate and bis-2-ethylhexyl)phthalate were present in samples SD-1 DUP, and SD-4 through SD-6. Anthracene was detected at sites SD-1, SD-5, and SD-7 through SD-11.

Table 5-7 provides the comparisons of detected pesticides/PCBs in sediments to applicable benchmarks. Samples from three down-gradient sites were tested for pesticides. The pesticides alpha-Chlordane and gamma-Chlordane were detected in the site SD-10 sample at concentrations that exceed the lowest effect level.

Table 5-8 provides the comparisons of detected TAL metals and cyanide in sediments to applicable benchmarks. No severe effects level or lowest effect level was available for aluminum, barium, beryllium, calcium, cobalt, magnesium, potassium, selenium, sodium, vanadium, and cyanide. Arsenic and cadmium were not detected at the background location, but they were detected in samples from all of the down-gradient sites. The concentration of arsenic in samples SD-1 DUP, and SD-4 through SD-7, also exceeded the lowest effect level. The concentration of cadmium exceeded the lowest effect level in samples from all sites except SD-10, SD-11, and SD-12. Beryllium, selenium, and cyanide were also not detected at the background location. Beryllium was detected in samples from three sites (SD-5, SD-6, and SD-8). Selenium was detected at all sites except SD-11, and cyanide was detected in samples SD-1 DUP, SD-3, and SD-6 through SD-8.

Aluminum, calcium, cobalt, lead, magnesium, nickel, potassium, sodium, vanadium, and zinc were detected at higher levels in all the down-gradient samples than at the background location. The lowest effect level for lead was exceeded in samples from sites SD-5 through SD-7, and SD-9. All sites, including the background, exceeded the lowest effect level for nickel. Nickel levels also exceeded the severe effects level at all down-gradient sites except SD-8, SD-10, and SD-11. The lowest effect level for zinc was exceeded in samples from all sites except SD-8, SD-10, and SD-11, and the severe effects level was exceeded at sites SD-5 through SD-7. Levels of barium were higher than at the background location in all sites but SD-10. Chromium data were rejected for samples from the background station and five down-gradient stations. The levels of chromium exceeded the lowest effect level in samples SD-1, SD-2, SD-3, SD-8, and SD-9, and levels exceeded the severe effects level at SD-9. Copper was detected at levels higher than at the background at all down-gradient locations. Levels of copper exceeded the lowest effect level at

all sites but SD-10 and exceeded the severe effects level at all sites but SD-8 and SD-11. Site SD-2 was the only down-gradient site that had lower iron levels than the background site. Iron levels exceeded lowest effect level in samples SD-1, SD-1 DUP, SD-3, SD-5 through SD-7, and SD-9. Silver was detected in samples SD-1 DUP, and SD-3 through SD-7. These levels were all higher than the level at the background location. Silver levels in samples SD-1 DUP and SD-4 also exceeded the lowest effect level.

5.3.3 Surface Soil Evaluation

Two background and three down-gradient locations were sampled for concentrations of semi-volatiles. No regional background data were available for semi-volatiles in surface soils, and benchmark criteria were available for only di-n-butylphthalate. Table 5-9 provides the comparisons of detected semi-volatiles and applicable benchmarks. The compound 2-methylphenol was detected only at the background station SS-05. Phenanthrene, fluoranthene, and pyrene were detected in all background and down-gradient samples. Down-gradient levels did not exceed the background range. Anthracene and benzo(g,h,i)perylene were present only in the sample from site SS-03. Di-n-butylphthalate and butylbenzylphthalate occurred only in samples SS-01 and SS-01 DUP from site SS-01. Levels of di-n-butylphthalate exceeded the benchmark criteria in both samples from site SS-01. Benzo(a)anthracene and chrysene were detected at both background locations and at the down-gradient site SS-03. Down-gradient levels did not exceed the background range. Bis(2-ethylhexyl)phthalate was not present in the background samples, but it did occur in the down-gradient samples SS-01, SS-01 DUP, and SS-02. Benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were detected at the background location SS-05 and at the down-gradient station SS-03. Down-gradient levels were lower than background levels. Benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were also present in the SS-01 sample at levels that exceed background levels. Semi-volatile TICs at the SS-03 site exceeded the background range.

Table 5-10 provides the comparison of detected pesticides/PCBs compared to NYSDEC background concentrations. The pesticides 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, and the PCBs Aroclor-1254 and 1260 were also detected in the surface soils. No regional background data were available for pesticides, and benchmark criteria were available only for the PCBs. 4,4'-DDE was present at the background location SS-04, and 4,4'-DDT was detected at both background sites. Levels of 4,4'-DDE in the down-gradient samples SS-01 and SS-03 did not exceed background levels. However, the SS-01 DUP sample from site SS-01 did exceed the background level. 4,4'-DDE was detected in all samples from down-gradient sites at levels below the background range. 4,4'-DDD was present only in the sample from site SS-02. Aroclor-1254 and 1260 were not detected in the background samples, but they were present in samples SS-01, SS-01 DUP, and SS-02. Levels of PCBs in these down-gradient samples exceeded the benchmark criteria.

Table 5-11 provides the comparison of detected metals compared to NYSDEC background concentrations. The following metals were detected in the surface soils: aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, and zinc. Screening levels were not available for calcium, iron, magnesium, potassium, and sodium. Regional background data were not available for calcium, copper, iron, lead, magnesium, potassium, and sodium. All metals were detected in all background and down-gradient samples with the exception of vanadium, which was not

present in the SS-01 sample from site SS-01. Calcium, copper, potassium, and zinc were at greater concentrations in the down-gradient samples than at the background locations. The remaining metals occurred in the down-gradient samples at lower levels than the background range. Levels of arsenic, barium, beryllium, cobalt, manganese, nickel from the background and down-gradient sites, did not exceed either the screening benchmarks or the regional background range. Concentrations of aluminum, chromium, selenium, and vanadium from the background and down-gradient sites, did not exceed the regional background range, but they did exceed the screening benchmark. Zinc levels were present at concentrations lower than the regional background range at the background and down-gradient sites. However, levels of zinc exceeded the screening benchmark level in samples from sites SS-01 and SS-02. Levels of copper and lead, at the background and down-gradient sites, were lower than the screening benchmark.

5.4 Analysis of Toxic Effects (Step IIC)

The results of the previous steps indicated the following: (1) Presence of ecological receptors in the habitats adjacent to the Magna Metals property, (2) Presence of potential site related contaminants in these habitats, (3) complete exposure pathways for receptors to be exposed to the contaminants, and (4) the observed concentrations of PAHs and metals that exceeded pertinent eco-screening level values. These findings indicated that a toxic effect based assessment (Step IIC of the FWIA process) was warranted to collect site-specific data for assessing risk to ecological receptors and assist in remedial decision-making for this site.

Concentrations of metals and PAHs were found to exceed sediment-screening level benchmarks in the creek and pond basin areas downstream from the Site. Surface water samples collected from three locations proximal to former leach pits exceeded background levels and the NYSDEC water quality criterion. These exceedences suggest that survival of aquatic life may be impaired by local sources or discharges of contaminants from the site.

As required by NYSDEC regulations, investigations were conducted to determine what effects (if any) were being manifested in the aquatic habitats present. A site-specific biological/chemical study was performed to reduce inherent uncertainties.

The Step IIC includes:

- Community level analysis using benthic macroinvertebrate studies;
- Organism level analysis using surface water and sediment toxicity testing; and
- Supplemental sediment and surface water sampling.

This three-study method approach was used to supplement the existing Step II A-B analysis. The data collected supplied a site-specific basis for identifying risks to ecological resources present and assisted in the identification and selection of specific remedial action alternatives for the site.

5.4.1 Areas of Concern for Ecological Receptors

Two streams receive surface water runoff and groundwater discharge from the former Magna Metals Site. Furnace Brook drains to the south into the unnamed pond located between Crossroad Avenue and the former Magna Metals site. Furnace Brook varies in width, depth and

flow. The brook was observed to be 20-25 feet wide at its widest and 2 feet deep at its deepest. Moderate water flow is evident at stations (SW/SD-13 and SW/SD 14) north of the confluence with the unnamed tributary. Furnace Brook at stations south of the confluence was wider (20-25 feet wide) and deeper (0.5-2 feet deep) with little water flow. The second stream is an unnamed tributary of Furnace Brook that drains from the northeast into Furnace Brook. The unnamed tributary channel is not as well defined as Furnace Brook. The stream is generally 2 to 6 inches deep and approximately 1-4 feet wide with a slow water flow.

The unnamed pond is an impoundment of Furnace Brook. The dimensions of the unnamed pond are approximately 100 feet wide and 300 feet long. The pond varies in depth by location ranging from observed depths of 1.0 to 5.0 feet deep.

Outflow from the pond drains into a drainage culvert that directs flow downstream via an underground conduit beneath a residential housing development. The Furnace Brook channel reemerges approximately ½ mile in linear distance from the upstream culvert entrance. Furnace Brook below the pond outlet is a well-defined stream channel with higher water velocities characteristic of a riffle-run streambed. Boulders, cobbles and medium to fine sand make up the substrates present in the streambed.

The wetland area north of the unnamed tributary (at station SW-22) is characterized by a thick stand of *Phragmites australis* observed in the area. The sediment in the wetland was saturated and small pools of standing water were present throughout the area. The wetland area south of the unnamed tributary (stations SW/SD-18 and SW-21) had a small back channel that does not connect to the unnamed tributary nor Furnace Brook. The area is a characteristic palustrine, emergent swamp with areas of iron flocculent present. This wetland is a lowland area having a saturated sediment of black silt with skunk cabbage *Symplocarpus foctidus* present throughout the area. Evidence of anthrogenic debris such as ladders, pails, and targets/shelters for paintball refuse are also present in this area.

5.4.2 Sampling Station Locations

Sample stations were chosen based on the results Step IIB Criteria Specific Analysis and historic data. These stations were chosen based upon the following data needs:

- Provide site-specific background locations for chemical and biological assessments;
- Evaluate nature and extent of chemical distribution observed in the Step IIB analysis using site-specific sediment and surface water samples;
- Support biological assessments in adjacent streams;
- Stations with high potential for biological effects as determined from the Step IIB analysis;
- Determine nature and extent of potential site related contaminants and biological assessment in the unnamed pond; and
- Evaluate the nature and extent of potential site-related contaminants below the pond.

A total of 16 sampling stations (three on Furnace Brook, two from the unnamed tributary of Furnace Brook, three in the wetland areas, four from the unnamed pond, two downgradient from

the site and two references areas) were sampled in support of the Phase IIC Toxic Effects Evaluation:

- SW/SD 13 Reference station for samples collected on Furnace Brook. Located upstream from the site;
- SW/SD 14 Located on Furnace Brook upstream from where the brook and tributary converge;
- SW/SD 15 Located on unnamed tributary of Furnace Brook upstream from where both streams converge;
- SW/SD 16 Located on unnamed tributary of Furnace Brook approximately 75 feet upstream from station SW/SD 15;
- SW/SD 17 Reference station for samples collected on unnamed tributary of Furnace Brook, and not influenced by Site activities, approximately 300 feet upstream of station SW/SD 16;
- SW/SD 18 Located in a small back channel in the wetland below unnamed tributary of Furnace Brook, approximately 250 feet southeast from the confluence of the two streams;
- SW/SD 19 Located on Furnace Brook approximately 150 feet downstream from the confluence of the two streams.
- SW/SD 20 Located on Furnace Brook approximately 100 feet downstream from station SW/SD 19;
- SW 21 Located in a small back channel in the wetland below unnamed tributary of Furnace Brook, approximately 100 feet southeast of station SW/SD 20;
- SW 22 Located north of unnamed tributary of Furnace Brook in a wetland area approximately 100 feet east from station SW/SD 14;
- SD 21 Northeastern most point of the pond situated between Cross Road Ave. and the former Magna Metals Site;
- SD 22 Located in the middle of the unnamed pond;
- SD 23 Located in the southernmost point of the unnamed pond before the drainage culvert;
- SD 24 Westernmost point of the pond, approximately 30 feet from the shore line and 100 feet from the Krishnamurthy's residence;
- SD 25 South of Cross Road Ave. downstream from the pond and drainage culvert approximately 20 feet from the point of discharge; and
- SD 26 Farther downstream from sample SW/SD 25 approximately ½ mile from the site.

The locations for the sampling stations were located and mapped using a global positioning system (GPS) and depicted in Figure 5-3.

Each Step IIC sediment sample was collected and analyzed for target analyte list (TAL) metals, polycyclic aromatic hydrocarbons (PAHs), total organic carbon (TOC), and acid volatile sulfide/soluble extractable metals (AVS/SEM). Each surface water sample was collected and analyzed for TAL metals only. Three replicate benthic samples were collected from select stations on the two streams and the two background locations for the benthic community survey.

Surface water from five locations and a background station were collected for use in a 3 brood *Ceriodaphnia dubia* toxicity test. In addition to the surface water toxicological evaluation, ten-day whole sediment toxicity tests were performed at three locations from the streams, two background stations and two stations from the unnamed pond receiving drainage from the site. The test species included the amphipod *Hyalella azteca* and the midge, *Chironomus tentans*. Survival was the primary endpoint for this test with growth as a secondary endpoint for both protocols. The sampling approach for the individual locations are summarized as follows:

5.4.3 Analytical Sampling

Sediment samples were collected from two background stations and twelve sampling stations using a petite ponar dredge. A ponar dredge was used to sample the first 0-0.5 feet below the surface of sediment at each proposed location. The sample was homogenized, iced, shipped and analyzed for TAL metals, PAHs, TOC, and AVS/SEM. Surface water samples were collected at ten stations: two background stations and eight sampling stations from Furnace Brook and its unnamed tributary. The unfiltered water samples were collected from the surface and disturbance of the sediment was avoided. Each surface water sample was collected and analyzed for TAL metals only.

5.4.4 Surface Water Toxicity Tests

Bulk water samples were collected from five locations and a background station and used in a 3 brood *Ceriodaphina dubia* toxicity test. Surface water toxicity samples were collected from the following locations:

- SW-14 Located on Furnace Brook upstream from where its confluence with the unnamed tributary;
- SW-15 Located on the unnamed tributary of Furnace Brook upstream from where its confluence with Furnace Brook;
- SW-17 Reference station for samples collected on the unnamed tributary of Furnace Brook;
- SW-19 Located on Furnace Brook downstream from where its confluence with the unnamed tributary;
- SW-21 Located in a small back channel in the wetland below the unnamed tributary, approximately 100 feet southeast of station SW/SD-20; and
- SW-22 Located north of unnamed tributary in a wetland area approximately 100 feet east from station SW/SD-14.

Methods for conducting the tests followed guidance set forth in EPA (2002) for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Results of the toxicity tests were used in conjunction with co-located surface water samples to determine if existing metal concentrations in the stream near the site have the potential to impact pelagic, aquatic life.

5.4.5 Sediment Toxicity Tests

Whole sediment toxicity testing was performed on sediment from the site to determine if elevated concentrations of contaminants are toxic to benthic organisms. Sediment toxicity tests

were performed at five stations and two background stations. Bulk sediment samples were collected using a petite ponar dredge and subsampled for chemical analysis. Bulk samples were used to perform ten-day acute tests using the amphipod *Hyalella azteca* and the midge *Chironomus tentans*. Bulk sediment samples were collected from the following locations:

- SD-13 Reference station for samples collected on Furnace Brook;
- SD-14 Located on Furnace Brook upstream from where its confluence with the unnamed tributary;
- SD-15 Located on the unnamed tributary of Furnace Brook upstream from where its confluence with Furnace Brook;
- SD-17 Reference station for samples collected on the unnamed tributary of Furnace Brook;
- SD-19 Located on Furnace Brook downstream from where its confluence with the unnamed tributary;
- SD 21 Northeastern most point of the unnamed pond situated between Cross Road Ave and the former Magna Metals Site; and
- SD 23 Located in the southernmost point of the unnamed pond before the drainage culvert.

Methods for conducting the tests followed the guidance set forth in USEPA (2000) for EPA method 100.1 for *Hyalella azteca* and method 100.2 for *Chironomus tentans*. Results of the toxicity tests were used in conjunction with co-located sediment samples to determine if the observed metal concentrations correlate to any toxic responses to representative benthic organisms.

5.4.6 Macroinvertebrate Benthic Survey

The objective of the macroinvertebrate survey was to analyze the benthic macroinvertebrate community present in Furnace Brook and the unnamed tributary. The survey was designed to determine the overall health and to assess potential risks (defined by this survey as taxa richness and density) to the benthic community subject to site related contaminants.

Sampling of the benthic macroinvertebrate community followed guidance provided in Barbour et al. (1999) and Bode et. al. (1990). Three replicate benthic macroinvertebrate samples were collected at each of seven sampling stations where co-located chemistry or toxicological evaluations were performed. Benthic surveys were performed at each of the following seven locations:

- SW/SD-13 Reference station for samples collected on Furnace Brook;
- SW/SD-14 Located on Furnace Brook upstream from where its confluence with the unnamed tributary;
- SW/SD-15 Located on the unnamed tributary of Furnace Brook upstream from where its confluence with Furnace Brook;
- SW/SD-16 Located on the unnamed tributary of Furnace Brook upstream from station SW/SD-15;
- SW/SD-17 Reference station for samples collected on the unnamed tributary of Furnace Brook;

- SW/SD-19 Located on Furnace Brook downstream from where its confluence with the unnamed tributary; and
- SW/SD-20 Located on Furnace Brook downstream from sample station SW/SD-20.

A total of 21 benthic samples (7 sample stations x 3 replicates per station) were collected. The benthic macroinvertebrate community was sampled using a petite ponar, which sampled a benthic area of 0.023 m^2/grab. The benthic grabs were sieved through a 500 μm sieve, and collected invertebrates were preserved in 70% isopropyl alcohol. Invertebrates were identified to the lowest practical taxon and enumerated by a contracted laboratory.

Identification and enumeration data were subjected to QA/QC and tabulated to determine total number of individuals, mean taxa richness by station replicate, total taxa richness (i.e., taxa richness being defined as the number of distinct invertebrate taxa present) and relative densities of benthic organisms. Trends in taxa richness and density data were compared among stations relative to the background station adjacent to the site. Using these measures, the community metrics for samples were compared to the benthic community metrics from the background areas in order to determine the effects (if any) from the Magna Metals Site.

5.4.7 Water Quality and Benthic Substrate Descriptions

Water temperature, specific conductivity, turbidity, dissolved oxygen, oxidation and reduction potential (ORP), and pH were measured at each sample station during sampling using a Horiba U-10 water quality meter (Horiba Ltd., Kyoto, Japan). Percent dissolved oxygen saturation was estimated from water temperature and dissolved oxygen concentration data using a dissolved oxygen saturation nomogram (Wetzel and Likens, 1991). The benthic substrate was described using visual observations and grain size classifications for characterizing benthic substrates provided in Barbour et al. (1999).

Water quality parameters are summarized in Table 5-12. Specific conductivity ranged from 0.184 to 1.54 mS/cm, pH ranged from 6.24 to 8.03, and temperature ranged from 6.19 to 15.28 °C. Dissolved oxygen and turbidity varied greatly among the stations. Dissolved oxygen ranged from 8.33 to 11.22 mg/l, and turbidity ranged from 0 to 80 NTUs. Salinity among the ten sampling stations ranged 0.1 to 0.6 parts per thousand (ppt) and is classified as freshwater. Dissolved oxygen ranged from 8.33 to 11.2 mg/L. None of the observed parameters appeared to have the potential to limit aquatic life in the aquatic habitats sampled. These observed water quality field parameters are typical of a warmwater environment.

During the sediment sampling, water quality parameters were also measured and revealed similar results to those observed during the surface water sampling effort. Specific conductivity ranged from 0.447 to 7.43 mS/cm, pH ranged from 5.68 to 8.18, and temperature ranged from 7.21 to 28.86 °C. Dissolved oxygen ranged from 0 to 13.63 mg/l, and turbidity ranged from 0 to 145 NTUs. The reading of 0.0 mg/L of dissolved oxygen was associated with a very shallow ponded wetland area. Salinity among the 14 sampling stations ranged 0.2 to 0.7 parts per thousand (ppt) (of 0.02 to 0.07 %). This water chemistry quality is typical of warmwater aquatic environments.

The benthic substrates by sediment sampling location are presented in Table 5-13. In general, the sediment samples collected in Furnace Brook and its unnamed tributary north of the unnamed

pond were similar. These sediments were dark brown to black silts with varying amounts of organic matter. A layer of root mat was present at stations SW/SD-19 and SW/SD-20. At SW/SD-17, light brown sand with gravel and minimal organic matter was observed. The sample collected in the southern wetland area (SW/SD-18) was generally dark brown to black silt with a lot of coarse organic matter and leaf pack. Samples from the pond (SD-21, 22, 23, and 24) generally were black fine silts with coarse organic matter and a slight odor similar to hydrogen sulfide. The two northern samples from the pond (SD-21 and 22) contained evidence of a drowned forest with fine wood chips and pieces of tree stumps in the sample grabs. The two stream samples below the pond were slightly different benthic substrates. Sample SD-25, located directly downstream from the point of discharge from the culvert, consisted of black silt with some sand and coarse organic material. Station SD-26, located further downstream from SD-25, was characterized as medium brown to black silt with fine to medium sand, intermixed with gray silt.

5.5 Data Analysis and Interpretation

5.5.1 Surface Water Screening

Detected concentrations collected from each sample location were compared to ecological screening criteria to determine if potential risks to aquatic life were present. The primary screening values and hardness derived AWQC values were calculated from NYSDEC (2004). EPA Water Quality Criteria (1999) and Efroymson et al. (1997) were used as secondary sources. Measured hardness was used to calculate the hardness dependent screening criteria for metals for each sample. Detected concentrations were screened against both acute and chronic screening values (Table 5-14). The surface water samples were analyzed for TAL metals. The samples were grouped by water body and habitat type: Furnace Brook, the unnamed tributary of Furnace Brook, the wetland South of the unnamed tributary and wetland north of the unnamed tributary. Antimony, beryllium, cadmium, mercury, and silver were undetected in all samples from the above locations.

5.5.1.1 Furnace Brook

Four samples (one background (SW-13) and three site-related samples (SW-14, SW-19, and SW-20)) were collected from Furnace Brook. From the Furnace Brook samples, aluminum, barium, chromium, copper, iron, magnesium, manganese, nickel, vanadium and zinc were detected in at least one sample. Aluminum and barium were detected in all three samples at concentrations (358 to 728 ug/L for aluminum and 74.6 to 119 ug/L for barium), all exceeding the respective chronic screening values of 87 and 4 ug/L, for aluminum and barium. No NYSDEC acute screening values were available for barium or aluminum. No acute screening values were available for iron and manganese, therefore detected concentrations were only screened against available chronic benchmarks. Iron and manganese concentrations in all three site samples and ranged between 363 to 2,180 ug/L for iron and 93.9 to 499 ug/L for manganese. Samples SW-14 and SW-19 had detected iron and manganese concentrations exceeding their respective chronic screening value. Nickel and zinc were detected in all three samples but did not exceed the acute and chronic screening values for these metals. Copper was detected in SW-14 and SW-19 at concentrations exceeding their respective chronic screening benchmarks. The copper concentration at SW-14 also exceeded its hardness derived acute criterion.

Aluminum, barium, iron, magnesium and manganese were also detected in the background Furnace Brook sample. The detected aluminum and barium concentrations in the three samples were comparable to the background concentration of 366 and 53.5 ug/L, aluminum and barium respectively, which also exceeded the chronic screening value of 100 and 4 ug/L, aluminum and barium respective. Iron and manganese were detected in the background at a concentration of 327 and 73.8 ug/L. Iron was above chronic screening value of 300 and manganese concentrations was lower than the screening value of 120 ug/L, respectively. Although screening values for magnesium were not available, the detected concentrations in the three samples were comparable to the detected concentration in the background sample.

5.5.1.2 Unnamed Tributary of Furnace Brook

Two samples (SW-15 and SW-16) and one background sample (SW-17) were collected from the unnamed tributary of Furnace Brook and analyzed for TAL metals (Table 5-15). Aluminum, barium, iron, magnesium, manganese, nickel, and zinc were detected in at least one of the two on-site samples. Acute water quality criteria were not available for aluminum, barium, iron or manganese; therefore detected concentrations were only screened against chronic criteria values. Aluminum and barium were detected at concentrations (316 and 328 ug/L for aluminum and 99.7 and 105 ug/L for barium) that exceeded their chronic screening criteria. Iron and manganese were detected in both samples, however the detected concentrations did not exceed the corresponding chronic values for these metals. Zinc and nickel were detected at low concentrations that did not exceed the acute and chronic water quality criteria for these metals.

Aluminum, barium, chromium, iron, magnesium, manganese, nickel, and zinc were detected in the unnamed tributary background sample (SW-17). Detected aluminum and barium concentrations in the background sample exceeded the chronic water quality value for these metals. Detected aluminum and barium concentrations in the two samples were comparable to the concentration detected in the background sample. Chromium was detected in the background concentration, but was undetected in the two on-site samples. The detected chromium concentration did not exceed with the acute or chronic water quality criterion. Iron and manganese were detected in the background sample at concentrations that did not exceed the screening criteria. Nickel and zinc were also detected in the background sample at concentrations that did not exceed the acute or chronic criteria for these metals. The observed trends in the concentration of metals in the unnamed tributary did not reflect an obvious point source introduction of metals from the site into this aquatic habitat.

5.5.1.3 Wetland South of the Unnamed Tributary

Three samples (SW-18, SW-18D, and SW-21) were taken in a back wetland channel area located in the wetland south of the unnamed tributary (Table 5-16). Aluminum, barium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, thallium, vanadium and zinc were detected in at least one of the three samples from this wetland. Aluminum and barium were detected at concentrations that exceeded the chronic screening values of 100 and 4 ug/L respectively. Manganese and iron concentrations in all samples exceeded the chronic screening values. Nickel and zinc were detected in both samples at concentrations below their respective screening values. Cobalt, copper, lead, thallium and vanadium were detected in SW-21, at concentrations below the chronic and acute screening values. Detected aluminum, barium, cobalt, iron, manganese, thallium and vanadium concentrations could not be screened against acute values because of the absence of acute screening values for these metals.

5.5.1.4 Wetland North of the Unnamed Tributary

One sample (SW-22) was collected in the wetland north of the unnamed tributary (Table 5-17). Aluminum, barium, cobalt, iron, manganese, and selenium concentrations were not screened against acute values because of the absence of acute screening values for these metals. Aluminum, barium, iron, cobalt. manganese, and selenium concentrations were detected at concentrations that exceeded their respective chronic criteria. Nickel was detected in SW-22 at a concentration that exceeded the chronic value, but below the acute value. Copper and zinc were detected in SW-22 at concentrations above the acute and chronic screening values.

Based upon field observations, site topography, groundwater flow direction and general water chemistry, this wetland area receives both overland surface runoff and shallow ground water discharge from the Magna Metals site. A clear divergence in water hardness was apparent at this location relative to the samples collected from Furnace Brook and the unnamed tributary. Water hardness in the two stream channels ranged from 159 to 200 mg/L $CaCO_3$ which is considered moderately hard in nature. Water hardness in shallow ground water ranges 49 to 147 mg/L $CaCO_3$ which is considered to be soft to moderately hard in nature. Water hardness in the North wetland was 49.8 mg/L $CaCO_3$ and is more characteristic of ground water than surface waters associated with either Furnace Brook or the unnamed tributary.

5.5.2 Sediment Screening

Concentrations of contaminants collected from each sample location were screened against ecological sediment screening criteria to determine if potential risks to benthic communities. The primary screening values were taken and calculated from NYSDEC (1999). Persaud et al (1993) and Efroymson et al. (1997) were used as secondary sources. Detected concentrations were compared to chronic and acute sediment screening values. The organic carbon content does influence partitioning and bioavailability of hydrophobic organic compounds in sediments. Therefore, all PAH concentrations were normalized to station specific units of organic carbon normalized concentrations of µg/g-OC. These converted PAH concentrations were then compared to µg/g OC screening values for organic compounds given in NYSDEC (1999). Sediment samples were grouped by water body for comparison purposes: Furnace Brook, unnamed tributary of Furnace Brook, wetland south of unnamed tributary and wetland north of unnamed tributary. Acenaphthene, acenaphthylene, dibenz(a,h) anthracene, naphthalene, antimony and cadmium were undetected in all sediment samples and were not assessed in the considered further in the evaluation.

5.5.2.1 Furnace Brook

Three samples (SD-14, SD-19A and SD-20) and one background sample (SD-13) were collected from Furnace Brook (Table 5-18). Fluoranthene, pyrene, aluminum, arsenic, barium, beryllium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium and zinc were all detected in at least one sample. Fluoranthene and pyrene were detected in one sample, SD-19A, at a TOC normalized concentration of 2.81 and 2.47 mg/Kg OC, which was below the OC normalized chronic value and above the undetected concentrations noted at the background sample. Nickel at all four samples exceeded both the acute and chronic screening values of 50 and 30 mg/Kg. Copper was detected in all four samples. Samples SD-14, SD-19A and SD-20 had detected concentrations that exceeded the background chronic and acute value. Lead concentrations exceeded the background and the chronic screening value, but remained

below the SEL value of 110 mg/Kg in all three samples. All three samples had zinc concentrations that exceeded the background concentration and chronic screening values of 106 and 120 mg/Kg but were below the acute value of 270 mg/Kg. Chromium and cobalt were detected at concentrations that exceeded the background and chronic screening values, but remained below the SEL value at SD-19A. The remaining two samples (SD-14 and SD-20) detected concentrations above the chronic screening values, and exceeded the detected background concentration (Table 5-18).

Detected antimony, iron, manganese, and mercury concentrations were below the acute and chronic, but above the detected background concentrations for these metals. No screening values were available for aluminum, barium, beryllium, magnesium, selenium, thallium and vanadium. Therefore detected concentrations of these analytes could not be screened against benchmarks, but could be compared to background concentrations. All detected concentrations of aluminum, barium, beryllium, magnesium, selenium, and vanadium exceeded background concentrations.

5.5.2.2 Unnamed Tributary

Two samples (SD-15 and SD-16) and one background sample (SD-17) were collected in the unnamed tributary of Furnace Brook (Table 5-19). Eleven SVOCs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, fluorene, phenanthrene, and pyrene) and 16 metals (aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc) were detected in at least one of the samples collected. Detected SVOCs were normalized to station specific TOC concentrations and compared to the NYSDEC acute and chronic screening values. Benzo(a)anthracene, benzo(a)pyrene, benzo(ghi)perylene, benzo(k)fluoranthene, and phenanthrene were detected at all three sample locations, however, only the background sample SD-17 had detected concentrations that exceeded the chronic value. Fluoranthene and pyrene were detected in all site associated samples at concentrations below acute and chronic screening values. Fluorene was only detected at the background sample (SD-17) and exceeded the chronic screening value of 8 µg/g-OC, but was below the acute value of 73 µg/g-OC. No screening values were available for chrysene, therefore detected concentrations were compared against detected background concentrations. Chrysene was detected in samples SD-15 and SD-16 at concentrations of 16.75 and 10.56 µg/g-OC, respectively, which did not exceed the background concentration of 80.33 µg/g-OC.

Nickel was detected in samples SD-15 and SD-16 exceeding the acute and chronic screening criteria of 50 and 16 mg/Kg and the background concentration (Table 5-19). The background sample had a concentration of 35.6 mg/Kg which exceeded the chronic value. Chromium, copper and zinc were detected in all three samples from the tributary. Sample SD-15 concentrations exceeded both the acute and chronic screening values as well as the background concentrations for these metals. Sample SD-16 had concentrations of copper and zinc which exceeded the chronic values and background concentrations. Mercury was also detected in all three samples from the tributary. Only SD-15 had a detected mercury concentration that exceeded the chronic value, but remained below the acute value. Detected cobalt and iron concentrations were below both screening criteria, but above the detected background concentrations. No screening values were available for aluminum, barium, beryllium, magnesium, selenium, thallium or vanadium. Therefore, detected concentrations of these analytes could not be screened with sediment

benchmarks, but were compared to background concentrations. All detected concentrations of aluminum, barium, beryllium, magnesium, selenium, and vanadium exceeded background concentrations.

5.5.2.3 South Wetland of Unnamed Tributary

Two samples (SD-18 and SD-18D) were collected in the wetland south of the unnamed tributary (Table 5-20). Eight SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene) and seventeen metals (aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, selenium, vanadium and zinc) were detected in sample SD18. Chromium, copper, nickel and zinc concentrations in the sediments at this station exceeded both the chronic and acute screening level benchmarks. Arsenic, copper, lead and mercury exceeded the chronic screening level but not the acute level at this location. No detected SVOCs exceeded corresponding sediment benchmarks.

5.5.2.4 Unnamed Pond

Four samples (SD-21, SD-22, SD-23, and SD-24) were collected in the unnamed pond adjacent to the Site (Table 5-21). Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene and pyrene) were detected in only one sample, SD-23. These detected SVOC concentrations were converted to TOC normalized concentrations and compared with acute and chronic screening criteria from the NYSDEC. All detected SVOC normalized concentrations except for chrysene remained below the chronic and acute screening values. Screening values and background concentrations were not available for chrysene; therefore the detected concentration in sample SD-23 could not be evaluated used sediment benchmarks.

Sixteen metals (aluminum, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead magnesium, manganese, mercury, nickel, selenium, vanadium, and zinc) were detected in all four samples collected from the unnamed pond. All detected nickel concentrations exceeded the chronic and acute screening criteria of 16 and 50 mg/Kg. Iron and zinc were detected in all samples and exceeded the chronic criteria, but remained below the acute screening benchmark for these metals. Copper was detected in all four samples exceeding the chronic screening criterion of 70 mg/Kg. Detected copper concentrations in sample SD-21 and SD-22 also exceeded the acute value of 110 mg/Kg. Lead was detected in all samples that exceeded the chronic screening values of 31mg/Kg. Sample SD-21 was the only sample with a detected lead concentration that also exceeded the acute screening value of 110 mg/Kg. Mercury was detected in samples SD-21, SD-22 and SD-24 at concentrations that exceeded the chronic value of 0.15 mg/Kg, but remained below the acute value of 1.3 mg/Kg. No screening values were available for aluminum, barium, beryllium, magnesium, selenium, thallium and vanadium. Therefore detected concentrations for these analytes could not be evaluated.

5.5.2.5 Furnace Brook below the Unnamed Pond

Two samples (SD-25 and SD-26) were collected in Furnace Brook below the Unnamed Pond (Table 5-22). Eight SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pryene) were detected in at least one sample. These detected SVOC concentrations were normalized to site specific TOC

concentrations. All detected SVOC normalized concentrations except for chrysene remained below the chronic and acute screening values. Screening values and background concentrations were not available for chrysene; therefore the detected concentration in sample SD-23 was not evaluated.

Sixteen metals (aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, silver, vanadium, and zinc) were detected in at least one of the two samples collected from Furnace Brook below the unnamed pond. Nickel was detected in both samples at concentrations exceeding the chronic and acute screening level benchmarks for this metal. Copper was also detected in both samples at concentrations that exceeded both the chronic and acute screening values. Chromium was detected at a concentration that exceeded the chronic value of 2.6 mg/Kg, but remained below the acute value of 110 mg/Kg at both samples. All other detected concentrations remained below the acute and chronic screening values. No screening values were available for aluminum, barium, beryllium, magnesium, selenium, thallium and vanadium. Therefore, detected concentrations for these analytes could not be evaluated.

5.5.3 Macroinvertebrate Benthic Survey

The principal exposure pathway for the benthic community in Furnace Brook and its unnamed tributary is through direct contact with contaminated sediments. A subset of sampling sites were chosen to characterize the benthic community present given their proximity to the Magna Metals Site and similarity in aquatic microhabitats. Taxa richness in the Furnace Brook and its unnamed tributary displayed a wide variation across the stations sampled. The benthic laboratory report is provided as Appendix I.

5.5.3.1 Taxa Richness

Tables 5-23 through 5-26 presents the total taxa richness, total number of individuals and relative density, for each of the four sample stations located in Furnace Brook. The total taxa, total number of individuals and relative density observed in the three samples taken from the unnamed tributary are presented in Tables 5-27 through 5-29. A non-impacted background sample (SD-13) was taken as a benthic reference sample for samples collected from Furnace Brook. Sample SD-17 was taken as a reference sample for samples taken from the unnamed tributary. A total of 72 individual benthic macroinvertebrate taxa were identified from the collected samples.

5.5.3.1.1 Furnace Brook

At the reference station SD-13 (Table 5-23), the number of taxa collected among the replicates ranged 10-16 taxa per replicate, and the total number of individuals ranged 108-208 individuals per replicate. The dominant group of taxa at this station was represented by the Tubificidae (64%) (Table 5-23). Ten to 12 taxa were collected among each replicate at station SD-14 and the total number of individuals ranged 20-64 individuals per replicate. The dominant taxa at this station were represented by Chironomidae (78%) of which almost half of this percentage was comprised of the midge genus, *Procladius* sp. (Table 5-24). At station SD-19, the number of taxa collected ranged 5-12, and the total number of individuals ranged 10-113 individuals per replicate. Similar to SD-14, the dominant group of taxa was Chironomidae (95%) dominated by

the midge genus *Chironomus* sp. which represented 62.4% of the total number of individuals present (Table 5-25). The number of taxa at SD-20 ranged 10-12 taxa and the total number of individuals collected ranged 12-38 individuals per replicate (Table 5-26). Numerical dominance was represented by Chironomidae (85%) at this station.

In looking at the total number of taxa within each sampled station, the background station demonstrated the most diverse community and taxa richness gradually decreased with increasing distance away from the background station SD13. The lowest taxa richness was observed in station SD-19 located directly downstream from where the unnamed tributary and Furnace Brook converge.

5.5.3.1.2 Unnamed Tributary of Furnace Brook

The dominant taxa at the background station SD-17, was the Chironomidae (83%). The number of taxa collected by replicate with a ranged 6-9 taxa and abundance ranged 66-174 individuals per replicate (Table 5-27). At station SD-15, 11-17 taxa per replicate and abundance of individuals ranged 51-152 individuals per replicate. The family Chironomidae (82.8%) dominated the community at this location, and was largely comprised of the genera *Thienemannimyia gr.* (30.4%) and *Orthocladius* sp. (21.6%) (Table 5-28). SD-16 produced the greatest number of taxa among the samples taken from the unnamed tributary. A range of 16-19 taxa per replicate and 84-93 individuals were observed at this station. The families Tubificidae (45.3%) and Chironomidae (44.9%) dominated the community at this location (Table 5-29).

In looking at the taxa richness at each of the sampled stations from the unnamed tributary, the background reference station SD-17 demonstrated the least diverse areas while the most diverse were stations SD-15 and SD-16, located in areas suspected to be influenced by site activities.

5.5.3.2 Relative Density

The mean number of individuals collected from the three replicates was utilized to calculate the relative density of invertebrates at each sampling station. The relative density was expressed as the total number of individuals per cubic meter. Across all the stations, mean density of individuals remained highly variable. The range in observed relative densities was 1043 to 6580 individuals/m^2 from samples taken from Furnace Brook and 5870 to 5087 individuals/m^2 from samples taken from the unnamed tributary (Table 5-30).

5.5.3.2.1 Furnace Brook

The highest relative density of 6580 individuals/m^2 was observed at the background station SD-13 and the lowest of 1043 individuals/m^2 was at site SD20, located the farthest downstream before the unnamed pond. Relative densities of individuals at the sampling stations were 6580 (SD-13 – Background station), 1609 (SD-14), 3043 (SD-19), and 1043 individuals/m^2 (SD-20). All three samples (SD-14, SD-19 and SD-20) had lower relative densities than the background station SD-13.

Due to the dominance of the Chironomidae, this family of dipterans was evaluated separately to determine if relative densities of this family in the benthic communities differed between the

Furnace Brook and the background area. In comparing the percent composition for chironomid taxa between the reference and the Furnace Brook communities, the background sample SD-13 exhibited the lowest percent composition of Chironomidae midges.

Trends in the relative densities of non-Chironomidae dipterans including crane flies, biting midges and others did not illustrate clear distributions across the sampling stations. Station SD-13 had the highest number of non-Chironomidae dipiteran taxa. No trend in the relative density of non-chironomid dipterans was observed between the Furnace Brook stations and the background community. Tubificids were observed in the highest numbers at station SD-13 (64%) and the lowest numbers at station SD-20 (0%). The percent composition of tubificids decreased with increasing distance from the background station. Coleopterans (beetles), megalopterans (dobsonflies, fishflies), and collembolans (springtails) were collected in low numbers from all sampling stations.

5.5.3.2.2 Unnamed Tributary of Furnace Brook

The highest relative density of 5087 individuals/m^2 was observed at the background station at SD-17. The remaining two stations were similar with relative densities of 4623 individuals/m^2 at station SD-15 and 3870 individuals/m^2 at station SD-16. Due to the dominance of the family Chironomidae, this family of dipterans was evaluated separately to determine if relative densities for this taxonomic family differed between the unnamed tributary and its background benthic community. Sample SD-16 had the lowest percent composition of Chironomidae, but the highest percent of Tubificida. In observing the non-chironomidae dipterans, samples SD-15 and SD-16 had similar percent compositions. The background station had the lowest percent representation of non-Chironomidae dipterans. Coleopterans (beetles), bivalves (clams), gastropods (snails), and amphipods (scuds) were collected in low numbers from all sampling stations that distinct trends in distribution could not be evaluated.

Results of the benthic community analysis revealed the following observations:

- Sampling revealed wide variation in benthic community richness and density. Benthic communities were dominated by aquatic and semi-aquatic insect taxa with a minor representation of tubificid worms;
- The benthic taxa observed from Furnace Brook and the Unnamed Tributary were representative of benthic communities indigenous to freshwater streams and community assemblages were present at all locations sampled;
- The Furnace Brook background benthic community generally displayed much wider variations in density and taxa richness than did the samples collected from Furnace Brook below the suspected site influence;
- The family Chironomidae (non-biting midges) were the dominant taxon at the Furnace Brook stations below the site while the Tubificidae was the dominant taxonomic group at the Furnace Brook background station;
- A slight trend of decreasing taxa richness and relative density with increasing distance away from the background station was observed from the samples taken from Furnace Brook;

- The observed reductions in the benthic metrics corresponded in close proximity to SD-20, the most downgradient sample collected for benthic macroinvertebrate surveys.
- In the unnamed tributary, the background station SD-17 exhibited the lowest diversity, but the highest relative density. The benthic community at this location was dominated by the family Chironomidae (98%);
- The benthic community observed at station SD-17 is characteristically different from the other stations sampled from the unnamed tributary. This may be the result of the slight difference in the benthic substrate sampled. The benthic substrate at SD-17 was characterized as a more sandy substrate, while the other two samples contained a sandy benthic substrate with a minor silt component; and
- Station SD-15 and the background station SD-17 were dominated by Chironomidae, while station SD-16 was dominated by Tubificidae (45.3%) and Chironomidae (44.9%).

Results of the benthic community survey did reveal an apparent reduction in taxa richness and density as well as an alteration in the community structure in Furnace Brook downstream from the Magna Metals Site. The most apparent decrease in these metrics was observed at SD-20 in Furnace Brook. A benthic survey of the unnamed tributary revealed no apparent decreasing trends in taxa richness or relative density relative to the Magna Metals Site.

5.5.4 Surface Water Toxicity Tests

Bulk surface water samples were collected from six sample locations situated on Furnace Brook (SW-14, SW-19), the unnamed tributary (SW-15 and SW-17 (background)), the wetland south of the unnamed tributary (SW-21) and the wetland north of the unnamed tributary, closest to the Site (SW-22). Bulk water samples were collected and used in chronic *Ceriodaphina dubia* toxicity testing from the five locations and a background station. Methods for conducting the tests followed EPA's (2002) method for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Results of the toxicological evaluations conditionally met the performance criteria for the laboratory methodology provided in EPA (2002) for the chronic *Ceriodaphnia dubia* test. Temperature, dissolved oxygen and pH were measured throughout the testing period. Two test endpoints, survival and reproduction, were recorded at the completion of the chronic test. The laboratory test report for the *Ceriodaphnia dubia* test is provided in Appendix I.

Two test endpoints, survival and reproduction, were monitored during the three brood generation testing period of six days (Table 5-31). Survival was presented as the mean percent of surviving individuals originally exposed to surface water from the Magna Metals site. Observations of the number of live or dead animals were made daily. Reproduction was monitored daily by counting the number of neonates produced by each individual female. The test was terminated when 60% of the surviving females had their third brood (at either the sixth or seventh day).

Reference stations and control data were statistically compared for both endpoints to determine if laboratory negative controls and non-impacted site-specific references were comparable to determine if surface water based effects were apparent at the background station. Sample SW-22 (wetland area North of the unnamed tributary) was the only sample that observed no survival

(0%) of test organisms exposed to surface water from this sample location. For the survival endpoint, results from sample SW-22 were noted to be significantly different from the control. In the 3-brood survival and reproduction endpoint test, results from station SW-20 and SW-22 were observed to be statistically different from the control.

Trends in the observed survival and reproduction of *Ceriodaphnia dubia* did not reveal any significant relationship with an increasing distance from the vicinity of the Magna Metals site (Figures 5-4 and 5-5). However, sample SW-22 was the closest sample that was collected from a pool of water to the suspected point of discharge from the on-site leachate pits and was not subjected to dilution from a perennial water body. Sample station SW-22 was also situated in a down slope wetland directly downgradient from the Magna Metals site. The dissolved oxygen, temperature and pH of SW-22 were similar to the results of the other samples and were not suspected to have contributed to the observed toxicity. Therefore, the significantly reduced survival at SW-22 is attributable to the presence of metals likely contributed to by historical Site activities.

5.5.5 Sediment Toxicity Tests

Bulk sediment samples were collected from seven sample locations (SD-13 (background)), SD - 14, SD- 19), the unnamed tributary (SD-15 and SD-17 background), and the unnamed pond (SD 21 and SD 23). Each bulk sample was used to perform ten-day survival and growth tests on the amphipod *Hyalella azteca* and the midge *Chironomus tentans*. Methods for conducting the tests followed the guidance set forth in USEPA (1994, 2000) for EPA method 100.1 for *Hyalella azteca* and method 100.2 for *Chironomus tentans*. Results of the toxicological evaluations conditionally met the performance criteria in part provided in EPA (1994, 2000) for both species. Temperature, dissolved oxygen and pH were measured throughout the sampling period. The primary endpoint for the test was survival and the secondary endpoint was growth for both test species. The toxicity test reports for both *H. azteca* and *C. tentans* are presented in Appendix I.

5.5.5.1 Survival and Growth of Chironomus tentans

Results of the toxicological evaluations were found to meet the performance criteria provided in EPA (1994, 2000) for the 10-day *Chironomus tentans* midge test. Two endpoints, growth and survival, were recorded at the completion of the 10-day exposure period. Survival was determined as the mean percent of surviving individuals originally exposed to Magna Metals Site related sediments. Growth was measured as the mean body weight (dry weight in milligrams) of the surviving individuals at the end of the 10-day exposure period. Statistical comparisons were completed using Dunnett's multiple comparisons test ($\alpha = 0.05$).

Reference stations and control data were statistically compared for both endpoints to determine if laboratory negative controls and non-impacted background samples remained comparable in result or if non-site related water body specific effects may be influencing the test outcomes. The negative control survival was 88.8%, lower than the survival observed from the two background samples that ranged from 90.0 – 91.25%. No statistically significant differences in survival were observed between the negative controls and the background samples from SD-13 (Furnace Brook background) and SD-17 (unnamed tributary background).

The toxicity tests revealed no statistically significant reductions in survival of *Chironomus tentans* at samples collected near the Magna Metals site compared to the their respective background sediment samples (Table 5-32). The survival observed from station SD-23 was the only station with a survival lower than the survival observed in the negative control (Table I-33). The observed survival data were compared to water specific background stations. In the unnamed tributary, station SD-15 had a survival of 91.25% compared with the 90% survival at the background station SD-17. The two Furnace Brook samples and the two unnamed pond samples were compared against the Furnace Brook background sample (SD-13). Trends in the observed survival of *Chironomus tentans* did not reveal any relationship with an increasing distance from the vicinity of the Magna Metals Site (Figure 5-6).

The growth endpoint in the 10-day test represented a less robust endpoint in observed effects than the survival endpoint. Growth was measured as the mean dry weight body mass (grams) of surviving individuals following the 10-day exposure period. The tests revealed no observed reduction in growth of *Chironomus tentans* in the samples evaluated (Table 5-7). The negative control growth was 1.07 mg and the two reference samples had similar growths of 1.04 and 1.11 mg for stations SD-13 and SD-17, respectively.

Statistical comparisons of growth between stations and their respective background stations from the unnamed tributary revealed statistically significant reductions in growth at station SD-15. Station SD-15 from the unnamed tributary observed a mean growth of 0.86 mg, which was significantly lower than that observed at the background station SD-17 (Figure 5-7). The two Furnace Brook samples and the two unnamed pond samples were compared against the Furnace Brook background sample SD-13. The two Furnace Brook (SD-14 and SD-19A) samples observed significant reductions of growth in comparison to the reference station SD-13. The observed growth from Furnace Brook was 0.68 and 0.71 mg for SD-19A and SD-14, respectively. The remaining two samples from the unnamed Pond observed a growth of 0.997 and 1.16 mg for stations SD-21 and SD-23, respectively. These two stations were not significantly different from the respective background station and negative controls. Trends in the observed growth of *Chironomus tentans* did reveal lower growth in areas immediately downgradient from the Magna Metals Site.

5.5.5.2 Survival and Growth of Hyalella azteca

Results of the toxicological evaluations were found to meet the performance criteria provided in EPA (2000) for the 10-day *Hyalella azteca* amphipod test. Two test endpoints, survival and growth, were recorded at the completion of the 10-day exposure period. Survival was expressed as the mean percent of surviving individuals originally exposed to Magna Metals sediments. Growth was measured as the mean body weight (grams) of the surviving individuals at the end of the 10-day exposure period. Statistical comparisons were completed using Dunnett's multiple comparisons test ($\alpha = 0.05$).

The two background stations (SD-13 and SD-17) and control data were statistically compared for each endpoint to determine if laboratory negative controls and non-impacted site-specific background samples remained comparable in result. Statistically significant differences in survival and growth were observed between the negative controls and the background samples from SD-13 and SD-17 (Table 5-32). The negative control survival was 90.0%, significantly

higher than the survival observed from the two background samples, which ranged from 65.0 – 66.3%.

Observed survival of *Hyalella azteca* exposed to Furnace Brook and the unnamed pond sediments remained comparable to or higher than the background station SD-13. The two Furnace Brook stations had an observed survival range between 67.5 and 87.5%. The two unnamed pond stations (SD-23 and SD-21) had a mean survival of 67.50% and 70.00%, respectively. The observed survival from these four stations was not statistically different from the survival observed in the background station SD-13 in Furnace Brook.

In the unnamed tributary, the mean survival at SD-15 for *H. azteca* was 61.25%, higher than the background station SD-17 (54%). When compared to their respective background station data, no statistically significant reductions in survival were associated any of the stations evaluated. Trends in the observed survival of *Hyalella azteca* did not reveal any relationship with distance from the vicinity of the Magna Metals Site (Figure 5-8).

The growth endpoint in the 10-day test represented a less robust endpoint in observed effects than the survival endpoint. Growth was measured as the mean body mass (milligrams) of surviving individuals following the 10-day exposure period. Statistical comparisons of growth between the negative controls and reference data sets revealed statistically significant differences. The growth for the negative control was 0.075 mg while growth for the two background stations were 0.037 and 0.063 mg. The mean growth in *H. azteca* observed from Furnace Brook and the unnamed pond were compared to the growth observed in the background station SD-13 (Figure 5-9). No statistically significant reductions in growth were observed at the Furnace Brook or pond stations. The unnamed tributary sample was compared with the unnamed tributary background station SD-17. A statistically significant reduction in growth of *Hyalella azteca* was observed at station SD-15.

5.6 Summary of Fish and Wildlife Impact Analysis

The following summary captures the major findings of the FWIA evaluation:

5.6.1 Fish and Wildlife Resources and Environmental Setting (Step I)

Both terrestrial and aquatic ecological communities are associated with the Magna Metals investigation area. These communities include a palustrine, deciduous wetland complex, two perennial streams, a small, unnamed pond and an unnamed tributary. Smaller fragmented areas of terrestrial covertypes present on the site property.

A portion of the palustrine wetlands present are NYSDEC regulated wetlands (Class 2) and Furnace Brook, the unnamed pond and the unnamed tributary are classified as Class B waters.

Ten bird species and six mammal species were observed in the habitats present within the investigation area. Observations or evidence of all the species present were associated with the terrestrial, wetland and aquatic habitats present.

No records of the occurrence of endangered, threatened or species of special concern from the site were noted. However, the presence of habitat for the endangered bog turtle (*Clemmys muhlenbergii*) was noted on the perimeter of a two-mile radius for the site.

5.6.2 Pathway Analysis and Criteria Specific Analysis (Steps IIA and IIB)

Major migration pathways for contaminants to be mobilized from historical source areas (leach pits, spills or releases to surface and subsurface soils, groundwater, etc.) include (1) erosion of contaminated soils via surface water runoff and deposition in aquatic habitats and (2) mobilization of subsurface contaminants via groundwater and subsequent discharge to surface waters; (3) Deabsorption of contaminants in contaminated sediments; (4) historical discharge of wastewater to leach pits and percolation to groundwater discharging to the on-site streams and wetlands.

Review of the ecological pathway analysis (Step IIB) for the Magna Metals Site identified the following exposure pathway/route for ecological receptors at the site:

Direct contact with or ingestion of surface soils; and
Direct contact with or ingestion of surface water and sediments.

Comparison of the surface water data to NYSDEC ambient water quality criteria revealed exceedances of copper and zinc above background and corresponding acute and chronic criteria. Other metals also exceeded the background concentration for metals in surface waters.

Comparison of the surface sediment data to NYSDEC sediment quality guidelines revealed exceedances of metals (primarily copper, nickel, and zinc) above background and corresponding acute and chronic surface water and sediment criteria.

5.6.3 Toxic Effects Analysis (Step IIC)

A multiple line of evidence approach was applied as part of the Step IIC Toxic Effects Analysis to address potential impacts to the wetland and aquatic communities present in the palustrine wetland, Furnace Brook and its unnamed tributary. The multiple lines of evidence included:

- Community level analysis using benthic macroinvertebrate studies;
- Organism level analysis using surface water and sediment toxicity testing; and
- Supplemental sediment and surface water sampling.

Results of the above lines of evidence were used to define areas where site related contaminants may be impacting ecological receptors associated with the aquatic and wetland habitats present.

Benthic macroinvertebrate surveys revealed an altered benthic community structure at locations in Furnace Brook downstream from the site. Impacts took the form of altered community structure and reductions in relative densities of invertebrates downstream from the site. Sample stations in Furnace Brook where changes in the benthic community were identified at SD-14, SD-19 and SD-20. No apparent decreasing trend in taxa richness or density was identified from the unnamed tributary sampling.

Surface water toxicity testing with *Ceriodaphnia dubia* revealed 100% survival at all locations except at SW-22 in the ponded wetland area suspected of receiving historical surface water runoff and/or shallow groundwater discharge from the site. Survival and reproduction of *C. dubia* at SW-22 was 0% for both endpoints. Reproduction of C. *dubia* was slightly impaired (a 30% reduction in progeny) at SW-20 located downstream from the site. No other effects were noted in samples from Furnace Brook or the unnamed tributary.

Whole sediment toxicity testing with the epifaunal amphipod *Hyalella azteca* and the infaunal midge *Chironomus tentans* revealed no overt effects on survival relative to background stations for Furnace Brook or its unnamed tributary. Statistically significant reductions in growth of *C. tentans* were observed at Furnace Brook stations SD-14 and SD-19 and at the unnamed tributary station SD-15. Statistically significant reductions in growth of *H. azteca* was observed at the unnamed tributary station SD-15. No other impacts were noted based upon comparison to corresponding background stations. Impaired reproduction (a 30% reduction in progeny) was observed at SW-20 located downstream from the site.

5.7 Conclusions

Impacts to pelagic and benthic aquatic life were observed in indigenous and laboratory based analyses. The primary environmental media of concern are surface waters and sediments of Furnace Brook, its unnamed tributary and the palustrine wetlands associated with the site. These media are specific to individual habitats and are not problematic in all habitats.

The benthic community expressed different degrees of community structure alteration from the stations sampled in Furnace Brook and the unnamed tributary. Subtle differences in the microhabitats sampled may have contributed to the observed changes in community structure and could not be discounted entirely from the evaluation.

Using all three lines of evidence, the following habitats, media and contaminants are identified for remedial consideration:

Habitat Area	Media and Ecological Receptor Group	Stations Impacted and Contaminants	Weight of Evidence
Wetland Area, North of Unnamed Tributary	Surface water –Pelagic Aquatic Life	SW-22, Copper and Zinc	1) Exceedance of Acute and Chronic AWQC. 2) 0% Survival and Reproduction in *C. dubia.*
Unnamed Tributary	Sediment – Benthic Communities	SD-15, Copper and Nickel	1) Exceedance of Acute and Chronic Sediment Quality Value 2) Altered Benthic Community Structure 3) Impaired Growth in *C. tentans and H. azteca.* 4) SEM/AVS Ratio is >1.0.
Furnace Brook	Sediment – Benthic Communities	SD-14 and SD-19, Copper and Nickel	1) Exceedance of Acute and Chronic Sediment Quality Value 2) Altered Benthic Community Structure 3) Impaired Growth in *C. tentans and H. azteca.* 4) SEM/AVS Ratio is >1.0.

5.7.1 Site-Specific Preliminary Remedial Goal Development (PRG)

For the above areas, the following ecological values are presented for PRG clean up objectives. The PRGs are presented by the waterbody and lines of evidence used for determination:

Furnace Brook - Sediments

COPEC	Site Specific Maximum No Observed Effect Concentration[1]		NYSDEC Acute Sediment Value	NYSDEC Chronic Sediment Value	Background Concentration Range
	(mg/Kg)	SEM/AVS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Nickel	**200.0**	**<1.0**	50.0	30.0	17.3-63.5
Copper	**415.0**	**<1.0**	390	70.0	4.4-24.4

[1] No observed impairment in survival or growth in *Hyalella azteca* and *Chironomus tentans* relative to the background location.
Bolded values are recommended site-specific preliminary remedial goals.

Unnamed Tributary - Sediments

COPEC	Site Specific Maximum No Observed Effect Concentration[1]		NYSDEC Acute Sediment Value	NYSDEC Chronic Sediment Value	Background Concentration Range
	(mg/Kg)	SEM/AVS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Nickel	**143.0**	**<1.0**	50.0	30.0	17.3-63.5
Copper	**107.0**	**<1.0**	390	70.0	4.4-24.4

[1] No observed impairment in survival or growth in *Hyalella azteca* and *Chironomus tentans* relative to the background location.
Bolded values are recommended site-specific preliminary remedial goals.

Wetland North at Base of Slope – Surface Water

COPEC	Site Specific Maximum No Observed Effect Concentration[1]	NYSDEC* Acute Water Quality Criteria	NYSDEC* Acute Water Quality Criteria	Furnace Brook Background Concentration Range
	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Copper	57.6	**6.98**	**4.94**	<0.74-2.7
Zinc	23.7	**64.9**	**46.3**	23.7-27.3

[1] No observed impairment in survival or reproduction in *Ceriodaphnia dubia* relative to the background location based upon total metal concentrations.
Ambient water quality criteria for NYSDEC **Bolded** values are recommended site-specific preliminary remedial goals based upon dissolved metals concentration.
* Dissolved Concentrations

In order to fully address the extent and toxicity of contaminated media during site remediation, the ensuing Feasibility Study (FS) will include the following additional alternatives to these proposed clean up goals presented herein. Specifically,

- An alternative that would result in pre-release conditions for all areas impacted by Magna Metals; and
- An alternative to remediate to Lowest Effect Level (LEL) concentrations for metals.

Table 5-1

Wildlife Species Observed in the Magna Metals Site Study Area
Town of Cortlandt, Westchester County, New York

BIRDS

Common Name	Scientific Name
Black-capped Chickadee	*Pares articapillus*
Red-tailed Hawk	*Buteo jamaicensis*
Blue Jay	*Cyanocitta cristata*
Green-backed Heron	*Butorides striatus*
Wood Duck	*Aix sponsa*
Mallard	*Anas platyrhynchos*
Canada Goose	*Branta canadensis*
American Crow	*Corvus brachyrhynchos*
Gray Catbird	*Dumetella carolinensis*
Northern Cardinal	*Cardinalis cardinalis*

MAMMALS

Raccoon	*Procyon lotor*
Eastern Chipmunk	*Tamias striatus*
Gray Squirrel	*Sciurus carolinensis*
White-tail Deer	*Odocoileus virginianus*
Beaver	*Castor canadensis*
Vole	*Microtus* sp.

Table 5-2
Magna Metals Site
Surface Water Screening Assessment

Furnace Brook

		Sample Name:		SW-12 (background)				SW-1				SW-1-DUP			
		Sample Date:		5/22/97				5/22/97				5/22/97			
Chemical Group	Analyte	Cas No.	Units	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit
VOC	Vinyl Chloride	75-01-4	ug/L	2		U	1	2		U	1	2		U	1
VOC	Methylene Chloride	75-09-2	ug/L	4.6		U	2	4.6		U	2	4.6		U	2
VOC	cis-1,2-Dichloroethene	156-59-2	ug/L	NC		U	1	NC	3.5		1	NC	4.2		1
VOC	Chloroform	67-66-3	ug/L	5.7		U	1	5.7		U	1	5.7		U	1
VOC	Trichlorothene	79-01-6	ug/L	2.5		U	1	2.5	**5.5**		1	2.5	**2.7**		1

Note
Since there is no NYSDEC criteria for class C aquatic life for these anayltes, the US EPA water quality(2002) criteria was used.
BOLD Detected concentration exceeds the federal screening concentration
Detected concentration exceeds the detected background concentration

Table 5-2
Magna Metals Site
Surface Water Screening Assessment

Furnace Brook

		Sample Name:		SW-2				SW-3				SW-4			
		Sample Date:		5/22/97				5/22/97				5/22/97			
Chemical Group	Analyte	Cas No.	Units	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit
VOC	Vinyl Chloride	75-01-4	ug/L	2		U	1	2		U	1	2	0.7	J	1
VOC	Methylene Chloride	75-09-2	ug/L	4.6		U	2	4.6		U	2	4.6		U	2
VOC	cis-1,2-Dichloroethene	156-59-2	ug/L	NC	3.2		1	NC	3.3		1	NC	4.5		1
VOC	Chloroform	67-66-3	ug/L	5.7		U	1	5.7		U	1	5.7		U	1
VOC	Trichlorothene	79-01-6	ug/L	2.5	2.4		1	2.5	2.3		1	2.5	**2.6**		1

Table 5-2
Magna Metals Site
Surface Water Screening Assessment

Furnace Brook

Chemical Group	Analyte	Cas No.	Units	Sample Name: SW-5 Sample Date: 5/22/97 Criteria	Rslt	Val qual	Det Limit	SW-6 5/22/97 Criteria	Rslt	Val qual	Det Limit	SW-7 5/22/97 Criteria	Rslt	Val qual	Det Limit
VOC	Vinyl Chloride	75-01-4	ug/L	2		U	1	2		U	1	2		U	1
VOC	Methylene Chloride	75-09-2	ug/L	4.6		U	2	4.6		U	2	4.6	2.3		2
VOC	cis-1,2-Dichloroethene	156-59-2	ug/L	NC	2.1		1	NC	5.1		1	NC		U	1
VOC	Chloroform	67-66-3	ug/L	5.7		U	1	5.7	0.79	J	1	5.7		U	1
VOC	Trichlorothene	79-01-6	ug/L	2.5	2.2		1	2.5	0.97	J	1	2.5		U	1

Table 5-2
Magna Metals Site
Surface Water Screening Assessment

Furnace Brook

		Sample Name:		SW-8				SW-9				SW-10				SW-11			
		Sample Date:		5/22/97				5/22/97				5/22/97				5/22/97			
Chemical Group	Analyte	Cas No.	Units	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit	Criteria	Rslt	Val qual	Det Limit
VOC	Vinyl Chloride	75-01-4	ug/L	2		U	1	2	**2.5**		1	2	0.91	J	1	2		U	1
VOC	Methylene Chloride	75-09-2	ug/L	4.6		U	2	4.6		U	2	4.6		U	2	4.6		U	2
VOC	cis-1,2-Dichloroethene	156-59-2	ug/L	NC	7.4		1	NC	18		1	NC	9		1	NC		U	1
VOC	Chloroform	67-66-3	ug/L	5.7	0.77	J	1	5.7		U	1	5.7	0.89	J	1	5.7		U	1
VOC	Trichlorothene	79-01-6	ug/L	2.5	1.4		1	2.5	0.73	J	1	2.5	1		1	2.5		U	1

Table 5-3
Magna Metals Site
Surface Water Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SW-12 (background)					SW-1					SW-1-DUP				
		Sample Date:		5/13/97					5/12/97					5/12/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	4-Methylphenol	106-44-5	ug/L	NC	NC		U	20	NC	NC		U	6	NC	NC		U	5
SVOC	Diethylphtalate	84-66-2	ug/L		17000*		U	5		17000*	0.3	J	6		17000*		U	5
SVOC	Hexachlorobenzene	118-74-1	ug/L		0.00028*		U	5		0.00028*		U	6		0.00028*	0.2	J	5
SVOC	Fluoranthene	206-44-0	ug/L		130*		U	5		130*		U	6		130*		U	5
SVOC	Pyrene	129-00-0	ug/L	42	4.6		U	5	42	4.6		U	6	42	4.6		U	5
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/L		0.6	**3**	J	5		0.6		UJ	6		0.6	**2**	J	5

Note:
*Since no NYSDEC criteria for class C aquatic life for these anayltes, the US EPA water quality(2002) criteria was used.
BOLD Detected concentration exceeds the chronic screening concentration
Detected concentration exceeds the detected background concentration

Table 5-3
Magna Metals Site
Surface Water Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SW-2					SW-3					SW-4				
		Sample Date:		5/12/97					5/12/97					5/14/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	2-Methylphenol	95-48-7	ug/L	NC	NC		U	6	NC	NC		U	6	NC	NC		U	5
SVOC	Diethylphtalate	84-66-2	ug/L		17000*		U	6		17000*		U	6		17000*		U	5
SVOC	Hexachlorobenzene	118-74-1	ug/L		0.00028*		U	6		0.00028*	**0.2**	J	6		0.00028*		U	5
SVOC	Fluoranthene	206-44-0	ug/L		130*		U	6		130*	0.3	J	6		130*		U	5
SVOC	Pyrene	129-00-0	ug/L	42	4.6		U	6	42	4.6		U	6	42	4.6		U	5
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/L		0.6		UJ	6		0.6		UJ	6		0.6		UJ	5

Note:

*Since no NYSDEC criteria for class C aquatic life for these anayltes, the US EPA water quality(2002) criteria was used.

BOLD Detected concentration exceeds the chronic screening concentration

Detected concentration exceeds the detected background concentration

Table 5-3
Magna Metals Site
Surface Water Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SW-5					SW-6					SW-7				
		Sample Date:		5/14/97					5/14/97					5/14/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	2-Methylphenol	95-48-7	ug/L	NC	NC		U	5	NC	NC		U	5	NC	NC	0.2	J	6
SVOC	Diethylphtalate	84-66-2	ug/L		17000*		U	5		17000*		U	5		17000*		U	6
SVOC	Hexachlorobenzene	118-74-1	ug/L		0.00028*		U	5		0.00028*	**0.3**	J	5		0.00028*		U	6
SVOC	Fluoranthene	206-44-0	ug/L		130*		U	5		130*		U	5		130*		U	6
SVOC	Pyrene	129-00-0	ug/L	42	4.6	0.6	J	5	42	4.6	0.7	J	5	42	4.6		U	6
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/L		0.6		UJ	5		0.6		UJ	5		0.6		UJ	6

Note:

*Since no NYSDEC criteria for class C aquatic life for these anayltes, the US EPA water quality(2002) criteria was used.

BOLD Detected concentration exceeds the chronic screening concentration

Detected concentration exceeds the detected background concentration

Table 5-3
Magna Metals Site
Surface Water Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SW-8					SW-9					SW-10					SW-11				
		Sample Date:		5/12/97					5/12/97					5/12/97					5/12/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	2-Methylphenol	95-48-7	ug/L	NC	NC		U	6	NC	NC		U	6	NC	NC		U	6	NC	NC		U	5
SVOC	Diethylphtalate	84-66-2	ug/L		17000*		U	6		17000*		U	6		17000*		U	6		17000*		U	5
SVOC	Hexachlorobenzene	118-74-1	ug/L		0.00028*	**0.2**	J	6		0.00028*		U	6		0.00028*		U	6		0.00028*		U	5
SVOC	Fluoranthene	206-44-0	ug/L		130*		U	6		130*	0.3	J	6		130*		U	6		130*		U	5
SVOC	Pyrene	129-00-0	ug/L	42	4.6		U	6	42	4.6	0.3	J	6	42	4.6		U	6	42	4.6		U	5
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/L		0.6		UJ	6		0.6		UJ	6		0.6		UJ	6		0.6		UJ	5

Note:

*Since no NYSDEC criteria for class C aquatic life for these anayltes, the US EPA water quality(2002) criteria was used.

BOLD Detected concentration exceeds the chronic screening concentration

Detected concentration exceeds the detected background concentration

Table 5-4
Magna Metals Site
Surface Water Screening Assessment
Metals Results

Furnace Brook

		Sample Name:		SW12 (Background)					SW1					SW1-DUP				
		Sample Date:		5/12/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	64.8	B		NC	100	54.2	B		NC	100	**135**	B	
METAL	Antimony	7440-36-0	ug/L	NC	NC	3.6	B	3	NC	NC		U	3	NC	NC		U	3
METAL	Arsenic	7440-38-2	ug/L	340	150		U	3	340	150		U	3	340	150		U	3
METAL	Barium	7440-39-3	ug/L	NC	NC	33.4	B		NC	NC	27.2	B		NC	NC	56	B	
METAL	Cadmium[1]	7440-43-9	ug/L	4.46	4.16		U	1	5.31	4.7		U	1	5.44	4.76		U	1
METAL	Calcium	7440-70-2	ug/L	NC	NC	23000			NC	NC	22200			NC	NC	23500		
METAL	Chromium[1]	7440-47-3	ug/L	323.78	73.03		U	1	367.26	82.83		U	1	373.65	84.27		U	1
METAL	Cobalt	7440-48-4	ug/L	NC	5		U	1	NC	5		U	1	NC	5		U	1
METAL	Copper[1]	7440-50-8	ug/L	16.81	12.86	2.7	B		19.43	14.66	4.9	B		19.82	14.93	6.5	B	
METAL	Iron	7439-89-6	ug/L	NC	300	**363**	J		NC	300	**658**			NC	300	**1060**	J	
METAL	Lead[1]	7439-92-1	ug/L	112.25	4.37		R	2	132.57	5.17		U	2	135.62	5.28		R	2
METAL	Magnesium	7439-95-4	ug/L	NC	NC	13800			NC	NC	18900			NC	NC	18800		
METAL	Manganese	7439-96-5	ug/L	NC	NC	60.3			NC	NC	209			NC	NC	422		
METAL	Mercury	7439-97-6	ug/L	1.4	0.77		U	0.2	1.4	0.77		U	0.2	1.4	0.77		U	0.2
METAL	Nickel[1]	7440-02-0	ug/L	370.36	57.69	3.5	B	1	421.85	65.71	2.3	B	1	429.42	66.89	10.6	B	1
METAL	Potassium	7440-09-7	ug/L	NC	NC	1970	JB		NC	NC	2230	B		NC	NC	2300	B	
METAL	Selenium	7782-49-2	ug/L	NC	4.6		U	3	NC	4.6		U	3	NC	4.6	3.4	B	3
METAL	Sodium	7440-23-5	ug/L	NC	NC	17600		1	NC	NC	20300		1	NC	NC	20400		1
METAL	Vanadium	7440-62-2	ug/L	NC	14		U	1	NC	14		U	1	NC	14		U	1
METAL	Zinc[1]	7440-66-6	ug/L	117.2	103.316	27.3	J		133.52	117.7	10.7	B		135.93	119.82	21.8	J	
METAL	Cyanide	57-12-5	ug/L	22	5.2		U	10	22	5.2		U	10	22	5.2	**39.6**	J	10

Note:
Surface water screening values from NYSDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from Furnance Brook
Shaded — Detected concentration exceeds acute screening concentration
BOLD — Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC — No Criteria

Table 5-4
Magna Metals Site
Surface Water Screening Assessment
Metals Results

Furnace Brook

		Sample Name:		SW2					SW3					SW4				
		Sample Date:		5/12/1997					5/12/1997					5/14/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	**126**	B		NC	100	**454**			NC	100	**103**	B	
METAL	Antimony	7440-36-0	ug/L	NC	NC		U	3	NC	NC		U	3	NC	NC	3.5	B	3
METAL	Arsenic	7440-38-2	ug/L	340	150		U	3	340	150		U	3	340	150		U	3
METAL	Barium	7440-39-3	ug/L	NC	NC	25.4	B		NC	NC	33.7	B		NC	NC	37.7	B	
METAL	Cadmium[1]	7440-43-9	ug/L	4.85	4.41		U	1	5.05	4.53		U	1	5.22	4.65		U	1
METAL	Calcium	7440-70-2	ug/L	NC	NC	20700			NC	NC	21500			NC	NC	22600		
METAL	Chromium[1]	7440-47-3	ug/L	343.77	77.54	1.4	B	1	353.97	79.84	3.5	B	1	363	81.87		U	1
METAL	Cobalt	7440-48-4	ug/L	NC	5		U	1	NC	5		U	1	NC	5		U	1
METAL	Copper[1]	7440-50-8	ug/L	18.01	13.69	8	B		18.63	14.11	14	B		19.17	14.49	4.3	B	
METAL	Iron	7439-89-6	ug/L	NC	300	**908**			NC	300	**1510**			NC	300	**856**	J	
METAL	Lead[1]	7439-92-1	ug/L	121.5	4.73	2.2	JB	2	126.29	4.92	2	JB	2	130.55	5.09		U	2
METAL	Magnesium	7439-95-4	ug/L	NC	NC	17300			NC	NC	17900			NC	NC	18200		
METAL	Manganese	7439-96-5	ug/L	NC	NC	188			NC	NC	182			NC	NC	336		
METAL	Mercury	7439-97-6	ug/L	1.4	0.77		U	0.2	1.4	0.77		U	0.2	1.4	0.77		U	0.2
METAL	Nickel[1]	7440-02-0	ug/L	394	61.38	4.6	B	1	406.08	63.26	4	B	1	416.8	64.93	8.9	B	1
METAL	Potassium	7440-09-7	ug/L	NC	NC	2080	B		NC	NC	2160	B		NC	NC	2360	JB	
METAL	Selenium	7782-49-2	ug/L	NC	4.6		U	3	NC	4.6	4.5	B	3	NC	4.6		U	3
METAL	Sodium	7440-23-5	ug/L	NC	NC	18600		1	NC	NC	19200		1	NC	NC	19600		1
METAL	Vanadium	7440-62-2	ug/L	NC	14		U	1	NC	14	1.6	B	1	NC	14		U	1
METAL	Zinc[1]	7440-66-6	ug/L	124.7	109.92	16.7	B		128.53	113.3	37			131.92	116.29	17.8	B	
METAL	Cyanide	57-12-5	ug/L	22	5.2		U	10	22	5.2		U	10	22	5.2		UJ	10

Note:
Surface water screening values from NYSDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from Furnance Brook
Shaded — Detected concentration exceeds acute screening concentration
BOLD — Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC — No Criteria

Table 5-4
Magna Metals Site
Surface Water Screening Assessment
Metals Results

Furnace Brook

		Sample Name:		SW5					SW6					SW7				
		Sample Date:		5/14/1997					5/14/1997					5/14/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	**178**	B		NC	100	**2660**			NC	100	**13100**		
METAL	Antimony	7440-36-0	ug/L	NC	NC	3.1	B	3	NC	NC	3.5	B	3	NC	NC	4.9	B	3
METAL	Arsenic	7440-38-2	ug/L	340	150		U	3	340	150	4	B	3	340	150	18.3	B	3
METAL	Barium	7440-39-3	ug/L	NC	NC	68	B		NC	NC	154	B		NC	NC	**250**	B	
METAL	Cadmium[1]	7440-43-9	ug/L	4.76	4.36		U	1	5.5	4.82		U	1	4	3.86	1.7	B	1
METAL	Calcium	7440-70-2	ug/L	NC	NC	23400			NC	NC	21800			NC	NC	18800		
METAL	Chromium[1]	7440-47-3	ug/L	339.39	76.54	1.5	B	1	377.06	85.04	39.6		1	299.23	67.49	**253**		1
METAL	Cobalt	7440-48-4	ug/L	NC	5	1.4	B	1	NC	5	**6.7**	B	1	NC	5	**32.8**	B	1
METAL	Copper[1]	7440-50-8	ug/L	17.75	13.5	**14.1**	B		20.03	15.07	**491**			15.35	11.84	**3960**		
METAL	Iron	7439-89-6	ug/L	NC	300	**1110**	J		NC	300	**7240**	J		NC	300	**34100**	J	
METAL	Lead[1]	7439-92-1	ug/L	119.47	4.66		R	2	137.25	5.35	**14.2**		2	101.11	3.94	**88**		2
METAL	Magnesium	7439-95-4	ug/L	NC	NC	15200			NC	NC	20200			NC	NC	13800		
METAL	Manganese	7439-96-5	ug/L	NC	NC	888			NC	NC	625			NC	120	**1010**		
METAL	Mercury	7439-97-6	ug/L	1.4	0.77		U	0.2	1.4	0.77		U	0.2	1.4	0.77	0.22		0.2
METAL	Nickel[1]	7440-02-0	ug/L	388.83	60.57	15.7	B	1	433.48	67.53	**136**		1	341.39	53.18	**558**		1
METAL	Potassium	7440-09-7	ug/L	NC	NC	2060	JB		NC	NC	1990	JB		NC	NC	2790	JB	
METAL	Selenium	7782-49-2	ug/L	NC	4.6		U	3	NC	4.6	**10.2**		3	NC	4.6	**40.1**		3
METAL	Sodium	7440-23-5	ug/L	NC	NC	18800		1	NC	NC	27000		1	NC	NC	21700		1
METAL	Vanadium	7440-62-2	ug/L	NC	14	1.3	JB	1	NC	14	8.6	B	1	NC	14	**25.7**	B	1
METAL	Zinc[1]	7440-66-6	ug/L	123.06	108.48	28.1	J		137.21	120.95	**232**	J		108.02	95.22	**2090**	J	
METAL	Cyanide	57-12-5	ug/L	22	5.2		U	10	22	5.2	**220**		10	22	5.2	**858**		10

Note:
Surface water screening values from NYSDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from Furnance Brook
Shaded — Detected concentration exceeds acute screening concentration
BOLD — Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC — No Criteria

Table 5-4
Magna Metals Site
Surface Water Screening Assessment
Metals Results

Furnace Brook

Chemical Group	Analyte	Cas No.	Units	Sample Name:	SW8					SW9					SW10					SW11				
				Sample Date:	5/12/1997					5/12/1997					5/12/1997					5/12/1997				
					Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L		NC	100	84.8	B		NC	100	**8960**			NC	100	**118**	B		NC	100	41.9	B	
METAL	Antimony	7440-36-0	ug/L		NC	NC		U	3	NC	NC		U	3	NC	NC		U	3	NC	NC		U	3
METAL	Arsenic	7440-38-2	ug/L		340	150		U	3	340	150	4.1	B	3	340	150		U	3	340	150		U	3
METAL	Barium	7440-39-3	ug/L		NC	NC	69.7	B		NC	NC	631			NC	NC	68.5	B		NC	NC	52.4	B	
METAL	Cadmium[1]	7440-43-9	ug/L		4.99	4.5		U	1	17.51	10.78	1.1	B	1	4.92	4.46		U	1	3.8	3.73		U	1
METAL	Calcium	7440-70-2	ug/L		NC	NC	18700			NC	NC	40600			NC	NC	18100			NC	NC	16300		
METAL	Chromium[1]	7440-47-3	ug/L		351.17	79.21		U	1	873.54	197.03	69.7		1	347.76	78.44	1.1	B	1	288.33	65.03		U	1
METAL	Cobalt	7440-48-4	ug/L		NC	5		U	1	NC	5	**31.4**	B	1	NC	5		U	1	NC	5		U	1
METAL	Copper[1]	7440-50-8	ug/L		18.46	13.99	6.2	B		52.66	36.21	**95.4**			18.25	13.86	5.3	B		14.71	11.39	2.8	B	
METAL	Iron	7439-89-6	ug/L		NC	300	272			NC	300	**24000**			NC	300	**346**			NC	300	94.2		
METAL	Lead[1]	7439-92-1	ug/L		124.97	4.87		U	2	404.86	15.78	**43.6**		2	123.37	4.81		U	2	96.25	3.75		U	2
METAL	Magnesium	7439-95-4	ug/L		NC	NC	19300			NC	NC	68600			NC	NC	19300			NC	NC	14200		
METAL	Manganese	7439-96-5	ug/L		NC	NC	109			NC	NC	1760			NC	NC	110			NC	NC	57.4		
METAL	Mercury	7439-97-6	ug/L		1.4	0.77		U	0.2	1.4	0.77		U	0.2	1.4	0.77		U	0.2	1.4	0.77		U	0.2
METAL	Nickel[1]	7440-02-0	ug/L		402.77	62.74	11.9	B	1	1032.45	160.83	**204**	B	1	398.72	62.11	6.2	B	1	328.56	51.18	5.5	B	1
METAL	Potassium	7440-09-7	ug/L		NC	NC	1900	B		NC	NC	5980	B		NC	NC	1820	B		NC	NC	1510	B	
METAL	Selenium	7782-49-2	ug/L		NC	4.6	**6.7**		3	NC	4.6	3	B	3	NC	4.6		U	3	NC	4.6		U	3
METAL	Sodium	7440-23-5	ug/L		NC	NC	27900		1	NC	NC	30300		1	NC	NC	26400		1	NC	NC	23600		1
METAL	Vanadium	7440-62-2	ug/L		NC	14		U	1	NC	14	**29.6**	B	1	NC	14		U	1	NC	14		U	1
METAL	Zinc[1]	7440-66-6	ug/L		127.48	112.37	20.8			327.25	288.47	146			126.19	111.24	27.3			103.96	91.64	18.3	B	
METAL	Cyanide	57-12-5	ug/L		22	5.2		U	10	22	5.2	**18.7**		10	22	5.2		U	10	22	5.2		U	10

Note:
Surface water screening values from NYSDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from Furnance Brook
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC No Criteria

Table 5-5
Magna Metals Site
Sediment Screening Assessment
VOC Results

Furnace Brook

		Sample Name:		SD -12 (Background)					SD-1					SD-1-DUP				
		Sample Date:		5/14/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
VOC	Chloromethane	74-87-3	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		UJ	67
VOC	Vinyl Chloride	75-01-4	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		UJ	67
VOC	Acetone	67-64-1	ug/gOC	NC	NC		UJ	12	NC	NC		UJ	74	NC	NC		UJ	320
VOC	Carbon Disulfide	75-15-0	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		U	67
VOC	2-Butanone	78-93-3	ug/gOC	NC	NC		U	12	NC	NC	0.55			NC	NC	0.46		
VOC	Trichloroethene	79-01-6	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		UJ	67
VOC	4-Methyl-2-Pentanone	108-10-1	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		UJ	67
VOC	2-Hexanone	591-78-6	ug/gOC	NC	NC		UJ	12	NC	NC		UJ	16	NC	NC		UJ	67
VOC	Tetrachlorothene	127-18-4	ug/gOC	NC	NC		U	12	NC	NC		U	16	NC	NC		UJ	67
VOC	Toluene	108-88-3	ug/gOC	235	49		U	12	235	49		U	16	235	49		UJ	67
	Total Organic Carbon					2590					38100					>160000	J	

Note:

	Detected concentration exceeds the detected background concentration
NC	No Criteria

Table 5-5
Magna Metals Site
Sediment Screening Assessment
VOC Results

Furnace Brook

		Sample Name:		SD-2					SD-3					SD-4				
		Sample Date:		5/12/1997					5/12/1997					5/14/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
VOC	Chloromethane	74-87-3	ug/gOC	NC	NC		UJ	34	NC	NC		R		NC	NC		UJ	40
VOC	Vinyl Chloride	75-01-4	ug/gOC	NC	NC		UJ	34	NC	NC		R		NC	NC		UJ	40
VOC	Acetone	67-64-1	ug/gOC	NC	NC		UJ	80	NC	NC		R		NC	NC	2.13	JB	
VOC	Carbon Disulfide	75-15-0	ug/gOC	NC	NC		UJ	34	NC	NC		R		NC	NC	0.075	J	
VOC	2-Butanone	78-93-3	ug/gOC	NC	NC	0.12	J		NC	NC		R		NC	NC	0.59	J	
VOC	Trichloroethene	79-01-6	ug/gOC	NC	NC		UJ	34	NC	NC		R		NC	NC		UJ	40
VOC	4-Methyl-2-Pentanone	108-10-1	ug/gOC	NC	NC	0.13	J		NC	NC		R		NC	NC		UJ	40
VOC	2-Hexanone	591-78-6	ug/gOC	NC	NC	0.19	J		NC	NC		R		NC	NC		UJ	40
VOC	Tetrachlorothene	127-18-4	ug/gOC	NC	NC		UJ	34	NC	NC		R		NC	NC		UJ	40
VOC	Toluene	108-88-3	ug/gOC	235	49		UJ	34	235	49		R		235	49		UJ	40
	Total Organic Carbon					93200					169000	J				>160000	J	

Table 5-5
Magna Metals Site
Sediment Screening Assessment
VOC Results

Furnace Brook

		Sample Name:		SD-5					SD-6					SD-7				
		Sample Date:		5/12/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
VOC	Chloromethane	74-87-3	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC	0.083	J	
VOC	Vinyl Chloride	75-01-4	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC		UJ	26
VOC	Acetone	67-64-1	ug/gOC	NC	NC	8.67	JB		NC	NC		UJ	88	NC	NC		UJ	96
VOC	Carbon Disulfide	75-15-0	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC		UJ	26
VOC	2-Butanone	78-93-3	ug/gOC	NC	NC	2.93	J		NC	NC	0.2	J		NC	NC	0.46	J	
VOC	Trichloroethene	79-01-6	ug/gOC	NC	NC	0.23	J		NC	NC		UJ	33	NC	NC		UJ	26
VOC	4-Methyl-2-Pentanone	108-10-1	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC		UJ	26
VOC	2-Hexanone	591-78-6	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC		UJ	26
VOC	Tetrachlorothene	127-18-4	ug/gOC	NC	NC		UJ	33	NC	NC		UJ	33	NC	NC		UJ	26
VOC	Toluene	108-88-3	ug/gOC	235	49		UJ	33	235	49		UJ	33	235	49	0.14	J	
	Total Organic Carbon					88800	J				110000	J				84800	J	

Table 5-5
Magna Metals Site
Sediment Screening Assessment
VOC Results

Furnace Brook

		Sample Name:		SD-8					SD-9					SD-10					SD-11				
		Sample Date:		5/12/1997					5/12/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
VOC	Chloromethane	74-87-3	ug/gOC	NC	NC		UJ	21	NC	NC		UJ	53	NC	NC		U	12	NC	NC		U	12
VOC	Vinyl Chloride	75-01-4	ug/gOC	NC	NC		UJ	21	NC	NC	0.16			NC	NC		U	12	NC	NC		U	12
VOC	Acetone	67-64-1	ug/gOC	NC	NC	4.63	JB		NC	NC	3.31	JB		NC	NC		UJ	14	NC	NC		UJ	12
VOC	Carbon Disulfide	75-15-0	ug/gOC	NC	NC		UJ	21	NC	NC		UJ	53	NC	NC		U	12	NC	NC		U	12
VOC	2-Butanone	78-93-3	ug/gOC	NC	NC	1.11	J		NC	NC	1	J		NC	NC		U	12	NC	NC		U	12
VOC	Trichloroethene	79-01-6	ug/gOC	NC	NC		UJ	21	NC	NC	0.14	J		NC	NC		U	12	NC	NC		U	12
VOC	4-Methyl-2-Pentanone	108-10-1	ug/gOC	NC	NC		UJ	21	NC	NC		UJ	53	NC	NC	1.99	J		NC	NC		U	12
VOC	2-Hexanone	591-78-6	ug/gOC	NC	NC		UJ	21	NC	NC		UJ	53	NC	NC	3.98	J		NC	NC		UJ	12
VOC	Tetrachlorothene	127-18-4	ug/gOC	NC	NC		UJ	21	NC	NC		UJ	53	NC	NC	1.59	J		NC	NC		U	12
VOC	Toluene	108-88-3	ug/gOC	235	49		UJ	21	235	49		UJ	53	235	49		U	12	235	49		U	12
	Total Organic Carbon			32400					160000 J					2510					8300				

Table 5-6
Magna Metals Site
Sediment Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SD-12 (background)					SD-1					SD-1-DUP				
		Sample Date:		5/13/97					5/12/97					5/12/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	Hexachloroethane	67-72-1	ug/gOC	NC	NC		U	400	NC	NC		U	530	NC	NC		UJ	2100
SVOC	Naphthalene	91-20-3	ug/gOC	258	30		U	400	258	30	1.10	J		258	30		UJ	2100
SVOC	4-Chloro-3-methylphenol	59-50-7	ug/gOC	NC	0.6		U	400	NC	0.6		U	530	NC	0.6		UJ	2100
SVOC	2-Methylnaphthalene	91-57-6	ug/gOC	340	34		U	400	340	34	1.00	J		340	34		UJ	2100
SVOC	Dimethylphthalate	131-11-3	ug/gOC	NC	NC		U	400	NC	NC		U	530	NC	NC		UJ	2100
SVOC	Acenaphthylene	208-96-8	ug/gOC	NC	NC		U	400	NC	NC	4.72	J		NC	NC		UJ	2100
SVOC	Acenaphthene	83-32-9	ug/gOC	NC	140		U	400	NC	140	3.67	J		NC	140		UJ	2100
SVOC	2,4-Dinitrophenol	51-28-5	ug/gOC	NC	0.5		U	1000	NC	0.5		UJ	1300	NC	0.5		UJ	5200
SVOC	Dibenzofuran	132-64-9	ug/gOC	NC	NC		U	400	NC	NC	5.77	J		NC	NC		UJ	2100
SVOC	2,4-Dinitrotoluene	121-14-2	ug/gOC	NC	NC		U	400	NC	NC		U	530	NC	NC		UJ	2100
SVOC	Fluorene	86-73-7	ug/gOC	73	8		U	400	73	8	**14.17**			73	8		UJ	2100
SVOC	Phenanthrene	85-01-8	ug/gOC	NC	120		U	400	NC	120	70.87			NC	120		UJ	2100
SVOC	Anthracene	120-12-7	ug/gOC	986	107		U	400	986	107	18.37			986	107		UJ	2100
SVOC	Carbazole	86-74-8	ug/gOC	NC	NC		U	400	NC	NC	8.92	J		NC	NC		UJ	2100
SVOC	Di-n-butylphthalate	84-74-2	ug/gOC	NC	NC		U	400	NC	NC		U	530	NC	NC	1.06	J	
SVOC	Fluoranthene	206-44-0	ug/gOC	NC	1020		U	400	NC	1020	62.99			NC	1020	1.69	J	
SVOC	Pyrene	129-00-0	ug/gOC	8775	961		U	400	8775	961	60.37			8775	961	1.38	J	
SVOC	Butylbenzylphthalate	85-68-7	ug/gOC	NC	NC		U	400	NC	NC		U	530	NC	NC		UJ	2100
SVOC	Benzo(a)anthracene	56-55-3	ug/gOC	94	12		U	400	94	12	**31.50**			94	12		UJ	2100
SVOC	Chrysene	218-01-9	ug/gOC	NC	NC		U	400	NC	NC	34.12			NC	NC		UJ	2100
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/gOC	NC	199.5		U	400	NC	199.5		U	530	NC	199.5	1.88	J	
SVOC	Benzo(b)fluoranthene	205-99-2	ug/gOC	NC	NC		UJ	400	NC	NC	22.05			NC	NC		UJ	2100
SVOC	Benzo(k)fluoranthene	207-08-9	ug/gOC	NC	NC		U	400	NC	NC	24.93			NC	NC		UJ	2100
SVOC	Benzo(a)pyrene	50-32-8	ug/gOC	NC	NC		U	400	NC	NC	26.25			NC	NC	1.44	J	
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	ug/gOC	NC	NC		U	400	NC	NC	2.89	J		NC	NC		UJ	2100
SVOC	Benzo(g,h,i)perylene	191-24-2	ug/gOC	NC	NC		U	400	NC	NC	1.44	J		NC	NC		UJ	2100

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

Shaded	Detected concentration exceeds acute screening concentration
BOLD	Detected concentration exceeds chronic screening concentration
	Detected concentration exceeds the detected background concentration
NC	No Criteria

Table 5-6
Magna Metals Site
Sediment Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SD-2					SD-3					SD-4				
		Sample Date:		5/12/97					5/12/97					5/14/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	Hexachloroethane	67-72-1	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Naphthalene	91-20-3	ug/gOC	258	30		U	470	258	30		UJ	1000	258	30		UJ	1800
SVOC	4-Chloro-3-methylphenol	59-50-7	ug/gOC	NC	0.6		U	470	NC	0.6	**0.947**	J		NC	0.6		UJ	1800
SVOC	2-Methylnaphthalene	91-57-6	ug/gOC	340	34		U	470	340	34		UJ	1000	340	34		UJ	1800
SVOC	Dimethylphthalate	131-11-3	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Acenaphthylene	208-96-8	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Acenaphthene	83-32-9	ug/gOC	NC	140		U	470	NC	140	0.521	J		NC	140		UJ	1800
SVOC	2,4-Dinitrophenol	51-28-5	ug/gOC	NC	0.5		UJ	1200	NC	0.5		UJ	2600	NC	0.5		UJ	4600
SVOC	Dibenzofuran	132-64-9	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	2,4-Dinitrotoluene	121-14-2	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Fluorene	86-73-7	ug/gOC	73	8		U	470	73	8		UJ	1000	73	8		UJ	1800
SVOC	Phenanthrene	85-01-8	ug/gOC	NC	120		U	470	NC	120		UJ	1000	NC	120		UJ	1800
SVOC	Anthracene	120-12-7	ug/gOC	986	107		U	470	986	107		UJ	1000	986	107		UJ	1800
SVOC	Carbazole	86-74-8	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Di-n-butylphthalate	84-74-2	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC	0.53	J	
SVOC	Fluoranthene	206-44-0	ug/gOC	NC	1020		U	470	NC	1020		UJ	59	NC	1020	1.75	J	
SVOC	Pyrene	129-00-0	ug/gOC	8775	961		U	470	8775	961	1.065	J		8775	961	1.38	J	
SVOC	Butylbenzylphthalate	85-68-7	ug/gOC	NC	NC		U	470	NC	NC	5.917	J		NC	NC		UJ	1800
SVOC	Benzo(a)anthracene	56-55-3	ug/gOC	94	12		U	470	94	12		UJ	1000	94	12		UJ	1800
SVOC	Chrysene	218-01-9	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/gOC	NC	199.5		U	470	NC	199.5		UJ	1000	NC	199.5	1.31	J	
SVOC	Benzo(b)fluoranthene	205-99-2	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC	0.94	J	
SVOC	Benzo(k)fluoranthene	207-08-9	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC	0.94	J	
SVOC	Benzo(a)pyrene	50-32-8	ug/gOC	NC	NC	0.62	J		NC	NC		UJ	1000	NC	NC	0.75	J	
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800
SVOC	Benzo(g,h,i)perylene	191-24-2	ug/gOC	NC	NC		U	470	NC	NC		UJ	1000	NC	NC		UJ	1800

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

Shaded	Detected concentration exceeds acute screening concentration
BOLD	Detected concentration exceeds chronic screening concentration
	Detected concentration exceeds the detected background concentration
NC	No Criteria

Table 5-6
Magna Metals Site
Sediment Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SD-5					SD-6					SD-7				
		Sample Date:		5/14/97					5/14/97					5/14/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	Hexachloroethane	67-72-1	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Naphthalene	91-20-3	ug/gOC	258	30		UJ	1300	258	30		UJ	1100	258	30		UJ	1000
SVOC	4-Chloro-3-methylphenol	59-50-7	ug/gOC	NC	0.6		UJ	1300	NC	0.6		UJ	1100	NC	0.6		UJ	1000
SVOC	2-Methylnaphthalene	91-57-6	ug/gOC	340	34		UJ	1300	340	34		UJ	1100	340	34		UJ	1000
SVOC	Dimethylphthalate	131-11-3	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Acenaphthylene	208-96-8	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Acenaphthene	83-32-9	ug/gOC	NC	140		UJ	1300	NC	140		UJ	1100	NC	140		UJ	1000
SVOC	2,4-Dinitrophenol	51-28-5	ug/gOC	NC	0.5		UJ	3200	NC	0.5		UJ	2900	NC	0.5		UJ	2600
SVOC	Dibenzofuran	132-64-9	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	2,4-Dinitrotoluene	121-14-2	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Fluorene	86-73-7	ug/gOC	73	8		UJ	1300	73	8		UJ	1100	73	8		UJ	1000
SVOC	Phenanthrene	85-01-8	ug/gOC	NC	120	3.04	J		NC	120	0.91	J		NC	120	4.13	J	
SVOC	Anthracene	120-12-7	ug/gOC	986	107	0.39	J		986	107		UJ	1100	986	107	0.53	J	
SVOC	Carbazole	86-74-8	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Di-n-butylphthalate	84-74-2	ug/gOC	NC	NC	1.04	J		NC	NC	0.88	J		NC	NC		UJ	1000
SVOC	Fluoranthene	206-44-0	ug/gOC	NC	1020	5.52	J		NC	1020	2.09	J		NC	1020	7.67	J	
SVOC	Pyrene	129-00-0	ug/gOC	8775	961	4.39	J		8775	961	1.82	J		8775	961	8.37	J	
SVOC	Butylbenzylphthalate	85-68-7	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC		UJ	1000
SVOC	Benzo(a)anthracene	56-55-3	ug/gOC	94	12	2.03	J		94	12	0.86	J		94	12	3.54	J	
SVOC	Chrysene	218-01-9	ug/gOC	NC	NC	3.38	J		NC	NC	1.36	J		NC	NC	4.83	J	
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/gOC	NC	199.5	2.82	J		NC	199.5	1.27	J		NC	199.5		UJ	1100
SVOC	Benzo(b)fluoranthene	205-99-2	ug/gOC	NC	NC	2.93	J		NC	NC	1.18	J		NC	NC	4.25	J	
SVOC	Benzo(k)fluoranthene	207-08-9	ug/gOC	NC	NC	2.36	J		NC	NC	1.09	J		NC	NC	3.77	J	
SVOC	Benzo(a)pyrene	50-32-8	ug/gOC	NC	NC	2.03	J		NC	NC		UJ	1100	NC	NC	3.54	J	
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC	3.42	J	
SVOC	Benzo(g,h,i)perylene	191-24-2	ug/gOC	NC	NC		UJ	1300	NC	NC		UJ	1100	NC	NC	2.95	J	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

Shaded	Detected concentration exceeds acute screening concentration
BOLD	Detected concentration exceeds chronic screening concentration
	Detected concentration exceeds the detected background concentration
NC	No Criteria

Table 5-6
Magna Metals Site
Sediment Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SD-8					SD-9					SD-10					SD-11				
		Sample Date:		5/12/97					5/12/97					5/12/97					5/12/97				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
SVOC	Hexachloroethane	67-72-1	ug/gOC	NC	NC		UJ	690	NC	NC		UJ	1600	NC	NC	382.47			NC	NC		U	380
SVOC	Naphthalene	91-20-3	ug/gOC	258	30		UJ	690	258	30		UJ	1600	258	30		U	410	258	30		U	380
SVOC	4-Chloro-3-methylphenol	59-50-7	ug/gOC	NC	0.6		UJ	690	NC	0.6		UJ	1600	NC	0.6		U	410	NC	0.6		U	380
SVOC	2-Methylnaphthalene	91-57-6	ug/gOC	340	34		UJ	690	340	34		UJ	1600	340	34		U	410	340	34		U	380
SVOC	Dimethylphthalate	131-11-3	ug/gOC	NC	NC		UJ	690	NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Acenaphthylene	208-96-8	ug/gOC	NC	NC	0.59	J		NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Acenaphthene	83-32-9	ug/gOC	NC	140	1.64	J		NC	140		UJ	1600	NC	140		U	410	NC	140		U	380
SVOC	2,4-Dinitrophenol	51-28-5	ug/gOC	NC	0.5		UJ	1700	NC	0.5		UJ	4200	NC	0.5		UJ	1000	NC	0.5		UJ	950
SVOC	Dibenzofuran	132-64-9	ug/gOC	NC	NC	0.90	J		NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	2,4-Dinitrotoluene	121-14-2	ug/gOC	NC	NC		UJ	690	NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Fluorene	86-73-7	ug/gOC	73	8	**2.28**	J		73	8		UJ	1600	73	8		U	410	73	8		U	380
SVOC	Phenanthrene	85-01-8	ug/gOC	NC	120	29.32	J		NC	120	1.56	J		NC	120	34.66	J		NC	120	4.217	J	
SVOC	Anthracene	120-12-7	ug/gOC	986	107	4.01	J		986	107	0.23	J		986	107	6.77	J		986	107	0.723	J	
SVOC	Carbazole	86-74-8	ug/gOC	NC	NC	3.70	J		NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Di-n-butylphthalate	84-74-2	ug/gOC	NC	NC		UJ	690	NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Fluoranthene	206-44-0	ug/gOC	NC	1020	43.21	J		NC	1020	3.69	J		NC	1020	55.78	J		NC	1020	8.554	J	
SVOC	Pyrene	129-00-0	ug/gOC	8775	961	46.30	J		8775	961	4.00	J		8775	961	55.78	J		8775	961	8.675	J	
SVOC	Butylbenzylphthalate	85-68-7	ug/gOC	NC	NC		UJ	690	NC	NC		UJ	1600	NC	NC		U	410	NC	NC		U	380
SVOC	Benzo(a)anthracene	56-55-3	ug/gOC	94	12	21.91	J		94	12	1.63	J		94	12	**24.70**	J		94	12	3.735	J	
SVOC	Chrysene	218-01-9	ug/gOC	NC	NC	30.86	J		NC	NC	2.31	J		NC	NC	32.27	J		NC	NC	5.542	J	
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	ug/gOC	NC	199.5		UJ	690	NC	199.5		UJ	1600	NC	199.5		U	410	NC	199.5		U	380
SVOC	Benzo(b)fluoranthene	205-99-2	ug/gOC	NC	NC	25.31	J		NC	NC	2.00	J		NC	NC	23.90	J		NC	NC	3.855	J	
SVOC	Benzo(k)fluoranthene	207-08-9	ug/gOC	NC	NC	24.07	J		NC	NC	1.88	J		NC	NC	25.90	J		NC	NC	4.578	J	
SVOC	Benzo(a)pyrene	50-32-8	ug/gOC	NC	NC	25.00	J		NC	NC	2.00	J		NC	NC	23.90	J		NC	NC	3.976	J	
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	ug/gOC	NC	NC	2.69	J		NC	NC	0.94	J		NC	NC	16.33	J		NC	NC	2.41	J	
SVOC	Benzo(g,h,i)perylene	191-24-2	ug/gOC	NC	NC	1.57	J		NC	NC	0.75	J		NC	NC	13.55	J		NC	NC	2.169	J	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC No Criteria

Table 5-7
Magna Metals Site
Sediment Screening Assessment
Pesticide and PCBs Results

Furnace Brook

		Sample Name:		SD-1-DUP					SD-4					SD-10				
		Sample Date:		5/12/1997					5/14/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit	Acute	Chronic	Rslt	Val qual	Det Limit
PEST	alpha-Chlordane	5103-71-9	ug/gOC	1.4	0.03	UJ		11	1.4	0.03	UJ		6.8	1.4	0.03	**1.39**	JP	
PEST	gamma-Chlordane	5103-74-2	ug/gOC	1.4	0.03	UJ		11	1.4	0.03	UJ		6.8	1.4	0.03	**1.35**		

Note
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
BOLD Detected concentration exceeds chronic screening concentration

Table 5-8
Magna Metals Site
Sediment Screening Assessment Metals Results

Furnace Brook

		Sample Name:		SD-12 (Background)					SD-1					SD-1-DUP				
		Sample Date:		5/14/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	mg/kg	--	--	2920			--	--	11700	J		--	--	10100	J	
METAL	Antimony	7440-36-0	mg/kg	25	2		UJ	0.68	25	2	1.1	UJ	1.1	25	2		UJ	3.1
METAL	Arsenic	7440-38-2	mg/kg	33	6		U	0.68	33	6	3.2	JB		33	6	**10.6**	J	
METAL	Barium	7440-39-3	mg/kg	--	--	33.8	B		--	--	132	J		--	--	289	J	
METAL	Beryllium		mg/kg	--	--		U	0.23	--	--	0.37	UJ	0.37	--	--		UJ	1
METAL	Cadmium	7440-43-9	mg/kg	9	0.6		U	0.23	9	0.6	**1**	JB		9	0.6	**1.3**	JB	
METAL	Calcium		mg/kg	--	--	882	B		--	--	7560	J		--	--	11500	J	
METAL	Chromium	7440-47-3	mg/kg	110	26		R		110	26	**78.1**	J		110	26		R	
METAL	Cobalt	7440-48-4	mg/kg	--	--	4.6	B		--	--	35.6	J		--	--	31.9	JB	
METAL	Copper	7440-50-8	mg/kg	110	16	4.4	B		110	16	**374**	J		110	16	**493**	J	
METAL	Iron	7439-89-6	mg/kg	40000	20000	7320			40000	20000	**34200**	J		40000	20000	**21100**	J	
METAL	Lead	7439-92-1	mg/kg	110	31	3			110	31	16.6	J		110	31	29.2	J	
METAL	Magnesium	7439-95-4	mg/kg	--	--	2130			--	--	23400	J		--	--	10700	J	
METAL	Manganese	7439-96-5	mg/kg	1100	460	87			1100	460		R		1100	460	154	J	
METAL	Nickel	7440-02-0	mg/kg	50	16	**17.3**			50	16	**166**	J		50	16	**284**	J	
METAL	Potassium		mg/kg	--	--	207	B		--	--	1240	JB		--	--	906	JB	
METAL	Selenium	7782-49-2	mg/kg	--	--		U	0.68	--	--	3.2	J		--	--	14.6	J	
METAL	Silver		mg/kg	2.2	1	0.26	B		2.2	1	0.37	UJ	0.37	2.2	1	**1.4**	JB	
METAL	Sodium		mg/kg	--	--	59.8	B		--	--	228	JB		--	--	384	JB	
METAL	Vanadium		mg/kg	--	--	5.8	B		--	--	23.5	J		--	--	44.1	JB	
METAL	Zinc	7440-66-6	mg/kg	270	120	29.3	J		270	120	**142**	J		270	120	**180**	J	
METAL	Cyanide		mg/kg	--	--		U	0.59	--	--	0.99	UJ	0.99	--	--	45.3	J	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

* - Background Samples for the samples taken from Furnance Brook
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC No Criteria

Table 5-8
Magna Metals Site
Sediment Screening Assessment Metals Results

Furnace Brook

		Sample Name:		SD-2					SD-3					SD-4				
		Sample Date:		5/12/1997					5/12/1997					5/14/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	mg/kg	--	--	9900			--	--	7770	J		--	--	10600	J	
METAL	Antimony	7440-36-0	mg/kg	25	2		U	1	25	2		UJ	1.6	25	2		UJ	2.6
METAL	Arsenic	7440-38-2	mg/kg	33	6	3	B		33	6	4.4	JB		33	6	**9.1**	J	
METAL	Barium	7440-39-3	mg/kg	--	--	135			--	--	261	J		--	--	256	J	
METAL	Beryllium		mg/kg	--	--		U	0.35	--	--		UJ	0.53	--	--		UJ	0.86
METAL	Cadmium	7440-43-9	mg/kg	9	0.6	**0.78**	B		9	0.6	**1.1**	JB		9	0.6	**1**	JB	
METAL	Calcium		mg/kg	--	--	4600			--	--	4490	J		--	--	9530	J	
METAL	Chromium	7440-47-3	mg/kg	110	26	**43**			110	26	**106**	J		110	26		R	
METAL	Cobalt	7440-48-4	mg/kg	--	--	14.2	B		--	--	37.3	J		--	--	24.6	JB	
METAL	Copper	7440-50-8	mg/kg	110	16	**162**			110	16	**398**	J		110	16	**603**	J	
METAL	Iron	7439-89-6	mg/kg	40000	20000	2160			40000	20000	**27000**	J		40000	20000	19500	J	
METAL	Lead	7439-92-1	mg/kg	110	31	19.4			110	31	15.4	J		110	31	29.3	J	
METAL	Magnesium	7439-95-4	mg/kg	--	--	6160			--	--	21800	J		--	--	8670	J	
METAL	Manganese	7439-96-5	mg/kg	1100	460		R		1100	460		R		1100	460	167	J	
METAL	Nickel	7440-02-0	mg/kg	50	16	**180**			50	16	**212**	J		50	16	**234**	J	
METAL	Potassium		mg/kg	--	--	976	B		--	--	668	JB		--	--	894	JB	
METAL	Selenium	7782-49-2	mg/kg	--	--	8.4			--	--	4.8	J		--	--	14	J	
METAL	Silver		mg/kg	2.2	1		U	0.35	2.2	1	0.58	JB		2.2	1	**1.3**	JB	
METAL	Sodium		mg/kg	--	--	193	B		--	--	324	JB		--	--	343	JB	
METAL	Vanadium		mg/kg	--	--	25.4			--	--	26.9	J		--	--	39.8	JB	
METAL	Zinc	7440-66-6	mg/kg	270	120	**155**			270	120	**133**	J		270	120	**209**	J	
METAL	Cyanide		mg/kg	--	--		U	0.98	--	--	3.33	J		--	--		UJ	2.66

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

* - Background Samples for the samples taken from Furnance Brook

Shaded	Detected concentration exceeds acute screening concentration
BOLD	Detected concentration exceeds chronic screening concentration
	Detected concentration exceeds the detected background concentration
NC	No Criteria

Table 5-8
Magna Metals Site
Sediment Screening Assessment Metals Results

Furnace Brook

		Sample Name:		SD-5					SD-6					SD-7				
		Sample Date:		5/14/1997					5/14/1997					5/14/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	mg/kg	--	--	19800	J		--	--	17800	J		--	--	12700	J	
METAL	Antimony	7440-36-0	mg/kg	25	2		UJ	1.5	25	2		UJ	1.7	25	2		UJ	1.2
METAL	Arsenic	7440-38-2	mg/kg	33	6	**7**	J		33	6	**19.3**	J		33	6	**16.9**	J	
METAL	Barium	7440-39-3	mg/kg	--	--	364	J		--	--	460	J		--	--	142	J	
METAL	Beryllium		mg/kg	--	--	0.62	JB		--	--	0.6	JB		--	--		UJ	0.4
METAL	Cadmium	7440-43-9	mg/kg	9	0.6	**1.1**	JB		9	0.6	**1.4**	JB		9	0.6	**1**	JB	
METAL	Calcium		mg/kg	--	--	7760	J		--	--	13000	J		--	--	4020	J	
METAL	Chromium	7440-47-3	mg/kg	110	26		R		110	26		R		110	26		R	
METAL	Cobalt	7440-48-4	mg/kg	--	--	22.2	JB		--	--	24.7	JB		--	--	20.4	J	
METAL	Copper	7440-50-8	mg/kg	110	16	**690**	J		110	16	**2330**	J		110	16	**2080**	J	
METAL	Iron	7439-89-6	mg/kg	40000	20000	**28000**	J		40000	20000	**20200**	J		40000	20000	**23600**	J	
METAL	Lead	7439-92-1	mg/kg	110	31	**46.2**	J		110	31	**48.2**	J		110	31	**62.9**	J	
METAL	Magnesium	7439-95-4	mg/kg	--	--	7000	J		--	--	7830	J		--	--	7120	J	
METAL	Manganese	7439-96-5	mg/kg	1100	460	321	J		1100	460	**841**	J		1100	460	220	J	
METAL	Nickel	7440-02-0	mg/kg	50	16	**231**	J		50	16	**835**	J		50	16	**494**	J	
METAL	Potassium		mg/kg	--	--	1400	JB		--	--	906	JB		--	--	831	JB	
METAL	Selenium	7782-49-2	mg/kg	--	--	19.2	J		--	--	68.2	J		--	--	46	J	
METAL	Silver		mg/kg	2.2	1	0.66	JB		2.2	1	0.72	JB		2.2	1	0.66	JB	
METAL	Sodium		mg/kg	--	--	546	JB		--	--	586	JB		--	--	311	JB	
METAL	Vanadium		mg/kg	--	--	41.6	J		--	--	36.2	J		--	--	30.6	J	
METAL	Zinc	7440-66-6	mg/kg	270	120	**441**	J		270	120	**938**	J		270	120	**1890**	J	
METAL	Cyanide		mg/kg	--	--		UJ	1.54	--	--	52.4	J		--	--	519	J	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

* - Background Samples for the samples taken from Furnance Brook
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC No Criteria

Table 5-8
Magna Metals Site
Sediment Screening Assessment Metals Results

Furnace Brook

		Sample Name:		SD-8					SD-9					SD-10					SD-11				
		Sample Date:		5/12/1997					5/12/1997					5/12/1997					5/12/1997				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	mg/kg	--	--	9370			--	--	14900	J		--	--	3490			--	--	4970		
METAL	Antimony	7440-36-0	mg/kg	25	2		U	0.76	25	2		UJ	2.4	25	2		U	0.53	25	2		U	0.71
METAL	Arsenic	7440-38-2	mg/kg	33	6	4.7			33	6	5.8	BJ		33	6	1.1	B		33	6	1.2	B	
METAL	Barium	7440-39-3	mg/kg	--	--	91.6			--	--	604	J		--	--	32.6	B		--	--	52		
METAL	Beryllium		mg/kg	--	--	0.28	B		--	--		UJ	0.82	--	--		U	0.18	--	--		U	0.24
METAL	Cadmium	7440-43-9	mg/kg	9	0.6	**0.63**	B		9	0.6	**1.8**	BJ		9	0.6	0.31	B		9	0.6	0.37	B	
METAL	Calcium		mg/kg	--	--	2750			--	--	11200	J		--	--	3840			--	--	2590		
METAL	Chromium	7440-47-3	mg/kg	110	26	**34**			110	26	**144**	J		110	26	11.4			110	26	13.1		
METAL	Cobalt	7440-48-4	mg/kg	--	--	13			--	--	41.7	J		--	--	4.9	B		--	--	7.9	B	
METAL	Copper	7440-50-8	mg/kg	110	16	**46.2**			110	16	**129**	J		110	16	12.3			110	16	**17.2**		
METAL	Iron	7439-89-6	mg/kg	40000	20000	17900			40000	20000	**38600**	J		40000	20000	9820			40000	20000	12800		
METAL	Lead	7439-92-1	mg/kg	110	31	7.9			110	31	**63.2**	J		110	31	3.9			110	31	5		
METAL	Magnesium	7439-95-4	mg/kg	--	--	7080			--	--	9420	J		--	--	4060			--	--	3950		
METAL	Manganese	7439-96-5	mg/kg	1100	460		R		1100	460		R		1100	460		R		1100	460		R	
METAL	Nickel	7440-02-0	mg/kg	50	16	**45.6**			50	16	**264**	J		50	16	**26.9**			50	16	**36**		
METAL	Potassium		mg/kg	--	--	1880	J		--	--	1040	BJ		--	--	413	B		--	--	805	B	
METAL	Selenium	7782-49-2	mg/kg	--	--	2.7			--	--	9.6	J		--	--	0.61	B		--	--		U	0.71
METAL	Silver		mg/kg	2.2	1		U	0.25	2.2	1		UJ	0.82	2.2	1		U	0.18	2.2	1		U	0.24
METAL	Sodium		mg/kg	--	--	208	B		--	--	454	BJ		--	--	92.7	B		--	--	104	B	
METAL	Vanadium		mg/kg	--	--	32.8			--	--	49.5	J		--	--	8.1	B		--	--	14.1		
METAL	Zinc	7440-66-6	mg/kg	270	120	67.7			270	120	**226**	J		270	120	36.8			270	120	47.2		
METAL	Cyanide		mg/kg	--	--	1.43			--	--		UJ	2.37	--	--		U	0.54	--	--		U	0.57

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.

* - Background Samples for the samples taken from Furnance Brook
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC No Criteria

Table 5-9
Magna Metals Site
Surface Soil Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SS-04 (Background)				SS-05 (Background)				SS-01			
		Sample Date:		4/11/97				4/11/97				4/11/97			
		Samplel Depth:		00"-12"				00"-12"				00"-12"			
Chemical Group	Analyte	Cas No.	Units	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual
SVOC	2-Methylphenol	95-48-7	mg/kg	NC	NC		U	NC	NC	39	J	NC	NC		U
SVOC	Phenanthrene	85-01-8	mg/kg	NC	NC	21	J	NC	NC	55	J	NC	NC	28	J
SVOC	Anthracene	120-12-7	mg/kg	NC	NC		U	NC	NC		U	NC	NC		U
SVOC	Di-n-butylphthalate	84-74-2	mg/kg	200	NC		U	200	NC		U	200	NC	530	JB
SVOC	Fluoranthene	206-44-0	mg/kg	NC	NC	27	J	NC	NC	97	J	NC	NC	49	J
SVOC	Pyrene	129-00-0	mg/kg	NC	NC	66	J	NC	NC	100	J	NC	NC	86	J
SVOC	Butylbenzylphthalate	85-68-7	mg/kg	NC	NC		U	NC	NC		U	NC	NC	370	J
SVOC	Benzo(a)anthracene	56-55-3	mg/kg	NC	NC	13	J	NC	NC	39	J	NC	NC		U
SVOC	Chrysene	218-01-9	mg/kg	NC	NC	19	J	NC	NC	62	J	NC	NC		U
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	NC	NC		U	NC	NC		U	NC	NC	4900	B
SVOC	Benzo(b)fluoranthene	205-99-2	mg/kg	NC	NC		U	NC	NC	49	J	NC	NC		U
SVOC	Benzo(k)fluoranthene	207-08-9	mg/kg	NC	NC		U	NC	NC	48	J	NC	NC		U
SVOC	Benzo(a)pyrene	50-32-8	mg/kg	NC	NC		U	NC	NC	29	J	NC	NC	97	J
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	NC	NC		U	NC	NC	41	J	NC	NC	81	J
SVOC	Benzo(g,h,i)perylene	191-24-2	mg/kg	NC	NC		U	NC	NC		U	NC	NC		U
SVOC	Semi-Volatile TICs			NC	NC	15990	JN	NC	NC	14090	JN	NC	NC	11260	JN

Shaded	Detected concentration exceeds benchmark screening concentration
	Detected concentration exceeds the highest detected background concentration
NC	No Criteria

Table 5-9
Magna Metals Site
Surface Soil Screening Assessment
SVOC Results

Furnace Brook

		Sample Name:		SS-01 (DUP)				SS-02				SS-03			
		Sample Date:		4/11/97							4/11/97				4/11/97
		Samplel Depth:		00"-12"					00"-12"				00"-12"		
Chemical Group	Analyte	Cas No.	Units	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual
SVOC	2-Methylphenol	95-48-7	mg/kg	NC	NC		U	NC	NC		U	NC	NC		U
SVOC	Phenanthrene	85-01-8	mg/kg	NC	NC	26	J	NC	NC	11	J	NC	NC	45	J
SVOC	Anthracene	120-12-7	mg/kg	NC	NC		U	NC	NC		U	NC	NC	8	J
SVOC	Di-n-butylphthalate	84-74-2	mg/kg	200	NC	610	JB	200	NC		U	200	NC		U
SVOC	Fluoranthene	206-44-0	mg/kg	NC	NC	45	J	NC	NC	19	J	NC	NC	57	J
SVOC	Pyrene	129-00-0	mg/kg	NC	NC	43	J	NC	NC	22	J	NC	NC	55	J
SVOC	Butylbenzylphthalate	85-68-7	mg/kg	NC	NC	360	J	NC	NC		U	NC	NC		U
SVOC	Benzo(a)anthracene	56-55-3	mg/kg	NC	NC		U	NC	NC		U	NC	NC	23	J
SVOC	Chrysene	218-01-9	mg/kg	NC	NC		U	NC	NC		U	NC	NC	28	J
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	NC	NC	4300	B	NC	NC	780	B	NC	NC		U
SVOC	Benzo(b)fluoranthene	205-99-2	mg/kg	NC	NC		U	NC	NC		U	NC	NC	21	J
SVOC	Benzo(k)fluoranthene	207-08-9	mg/kg	NC	NC		U	NC	NC		U	NC	NC	26	J
SVOC	Benzo(a)pyrene	50-32-8	mg/kg	NC	NC		U	NC	NC		U	NC	NC	20	J
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	NC	NC		U	NC	NC		U	NC	NC	22	J
SVOC	Benzo(g,h,i)perylene	191-24-2	mg/kg	NC	NC		U	NC	NC		U	NC	NC	46	J
SVOC	Semi-Volatile TICs			NC	NC	9860	JN	NC	NC	8550	JN	NC	NC	28330	JN

Table 5-10
Magna Metals Site
Surface Soil Assessment
Pesticide and PCB Results

		Sample Name: Sample		SS-04 (Background)				SS-05 (Background)				SS-01			
		Date:		4/11/97				4/11/97				4/11/97			
		Samplel Depth:		00"-12"				00"-12"				00"-12"			
Chemical Group	Analyte	Cas No.	Units	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual
PEST	4,4'-DDE	72-55-9	mg/kg	NC	NC	8		NC	NC		U	NC	NC		U
PEST	4,4'-DDD	72-54-8	mg/kg	NC	NC		U	NC	NC		U	NC	NC	28	J
PEST	4,4'-DDT	50-29-3	mg/kg	NC	NC	8.9		NC	NC	4.3		NC	NC		U
PCB	Aroclor-1254	11097-69-1	mg/kg	40	NC		U	40	NC		U	200	NC	530	JB
PCB	Aroclor-1260	11096-82-5	mg/kg	40	NC		U	NC	NC		U	NC	NC	49	J

Shaded	Detected concentration exceeds benchmark screening concentration
	Detected concentration exceeds the highest detected background concentration
NC	No Criteria

Table 5-10
Magna Metals Site
Surface Soil Assessment
Pesticide and PCB Results

		Sample Name: Sample		SS-01 (DUP)				SS-02				SS-03			
		Date:		4/11/97						4/11/97					4/11/97
		Samplel Depth:		00"-12"					00"-12"				00"-12"		
Chemical Group	Analyte	Cas No.	Units	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual
PEST	4,4'-DDE	72-55-9	mg/kg	NC	NC	10		NC	NC	6.5		NC	NC	5.3	
PEST	4,4'-DDD	72-54-8	mg/kg	NC	NC		U	NC	NC	7.1	JPN	NC	NC		U
PEST	4,4'-DDT	50-29-3	mg/kg	NC	NC	5	JP	NC	NC	6.2	JPN	NC	NC	6.2	
PCB	Aroclor-1254	11097-69-1	mg/kg	40	NC	62	J	40	NC	46	JP	40	NC		U
PCB	Aroclor-1260	11096-82-5	mg/kg	NC	NC	38	J	NC	NC	46	JP	NC	NC		U

Shaded — Detected concentration exceeds benchmark screening concentration
Detected concentration exceeds the highest detected background concentration
NC — No Criteria

Table 5-11
Magna Metals Site
Surface Soil Assessment
Metals Results

Chemical Group	Analyte	Cas No.	Units	Sample Name: / Sample Date: / Samplel Depth:	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual	Benchmark Screening Data	Regional Background Data	Rslt	Val qual
					SS-04 (Background) 4/11/97 00"-12"				SS-05 (Background) 4/11/97 00"-12"				SS-01 4/11/97 00"-12"			
METALS	Aluminum	7429-90-5	mg/kg		50	4500-100000	19100		50	4500-100000	12600		50	4500-100000	8660	
METALS	Arsenic	7440-38-2	mg/kg		10	1.0-93 (7)	3.1		10	1.0-93 (7)	2.9		10	1.0-93 (7)	2.4	
METALS	Barium	7440-39-3	mg/kg		500	70-300 (560)	83.2		500	70-300 (560)	70		500	70-300 (560)	46	
METALS	Beryllium	7440-41-7	mg/kg		10	1-5 (1.6)	0.59	B	10	1-5 (1.6)	0.54	B	10	1-5 (1.6)	0.35	B
METALS	Calcium	7440-70-2	mg/kg		NC	NC	847	B	NC	NC	808	B	NC	NC	1480	
METALS	Chromium	7440-47-3	mg/kg		1	7-1500 (50)	21.1		1	7-1500 (50)	14.1		1	7-1500 (50)	19	
METALS	Cobalt	7440-48-4	mg/kg		20	3-50 (10.5)	8.5	B	20	3-50 (10.5)	7.6	B	20	3-50 (10.5)	6.8	B
METALS	Copper	7440-50-8	mg/kg		100	NC	14.8		100	NC	12.8		100	NC	177	J
METALS	Iron	7439-89-6	mg/kg		NC	NC	19100		NC	NC	14800		NC	NC	13700	
METALS	Lead	7439-92-1	mg/kg		50	NC	12.2		50	NC	18.1		50	NC	10.1	
METALS	Magnesium	7439-95-4	mg/kg		NC	NC	3270		NC	NC	2380		NC	NC	2830	
METALS	Manganese	7439-96-5	mg/kg		500	20-3000 (490)	161		500	20-3000 (490)	241		500	20-3000 (490)	225	
METALS	Nickel	7440-02-0	mg/kg		30	5-150 (18.5)	18.8		30	5-150 (18.5)	16.2		30	5-150 (18.5)	15	
METALS	Potassium	7440-097	mg/kg		NC	NC	475	B	NC	NC	385	B	NC	NC	703	B
METALS	Selenium	7782-49-2	mg/kg		1	0.1-4 (0.31)	1.2	J	1	0.1-4 (0.31)	1.6	J	1	0.1-4 (0.31)	1.3	J
METALS	Sodium	7440-23-5	mg/kg		NC	NC	96.4	B	NC	NC	72.3	B	NC	NC	78.9	B
METALS	Vanadium	7440-62-2	mg/kg		2	0.7-98	38.8		2	0.7-98	24.1		2	0.7-98		U
METALS	Zinc	7440-66-6	mg/kg		50	13-300 (73.5)	41.1	J	50	13-300 (73.5)	34.2	J	50	13-300 (73.5)	124	

Shaded — Detected concentration exceeds acute screening concentration
Detected concentration exceeds the highest detected background concentration
NC — No Criteria

Table 5-11
Magna Metals Site
Surface Soil Assessment
Metals Results

Chemical Group	Analyte	Cas No.	Units	Sample Name: / Sample Date: / Samplel Depth:	Benchmark Screening Data	SS-01 (DUP) 4/11/97 00"-12" Regional Background Data	Rslt	Val qual	Benchmark Screening Data	SS-02 4/11/97 00"-12" Regional Background Data	Rslt	Val qual	Benchmark Screening Data	SS-03 4/11/97 00"-12" Regional Background Data	Rslt	Val qual
METALS	Aluminum	7429-90-5	mg/kg		50	4500-100000	8830		50	4500-100000	7510		50	4500-100000	8440	
METALS	Arsenic	7440-38-2	mg/kg		10	1.0-93 (7)	2.5		10	1.0-93 (7)	2.2		10	1.0-93 (7)	1.6	B
METALS	Barium	7440-39-3	mg/kg		500	70-300 (560)	52		500	70-300 (560)	46.7		500	70-300 (560)	42.6	B
METALS	Beryllium	7440-41-7	mg/kg		10	1-5 (1.6)	0.34	B	10	1-5 (1.6)	0.3	B	10	1-5 (1.6)	0.32	B
METALS	Calcium	7440-70-2	mg/kg		NC	NC	1430		NC	NC	1280		NC	NC	1540	
METALS	Chromium	7440-47-3	mg/kg		1	7-1500 (50)	15.8		1	7-1500 (50)	11.6		1	7-1500 (50)	10.5	
METALS	Cobalt	7440-48-4	mg/kg		20	3-50 (10.5)	7.3	B	20	3-50 (10.5)	5.2	B	20	3-50 (10.5)	5.5	B
METALS	Copper	7440-50-8	mg/kg		100	NC	51.7	J	100	NC	39		100	NC	18	
METALS	Iron	7439-89-6	mg/kg		NC	NC	12600		NC	NC	10900		NC	NC	11500	
METALS	Lead	7439-92-1	mg/kg		50	NC	10.8		50	NC	9.5		50	NC	8	
METALS	Magnesium	7439-95-4	mg/kg		NC	NC	2880		NC	NC	2130		NC	NC	2300	
METALS	Manganese	7439-96-5	mg/kg		500	20-3000 (490)	214		500	20-3000 (490)	168		500	20-3000 (490)	189	
METALS	Nickel	7440-02-0	mg/kg		30	5-150 (18.5)	13.9		30	5-150 (18.5)	11.4		30	5-150 (18.5)	10.2	
METALS	Potassium	7440-097	mg/kg		NC	NC	768	B	NC	NC	526	B	NC	NC	587	B
METALS	Selenium	7782-49-2	mg/kg		1	0.1-4 (0.31)	1.1	J	1	0.1-4 (0.31)	1	J	1	0.1-4 (0.31)	1.3	J
METALS	Sodium	7440-23-5	mg/kg		NC	NC	81.9	B	NC	NC	74.4	B	NC	NC	93.1	B
METALS	Vanadium	7440-62-2	mg/kg		2	0.7-98	18.8		2	0.7-98	16		2	0.7-98	17	
METALS	Zinc	7440-66-6	mg/kg		50	13-300 (73.5)	94.9	J	50	13-300 (73.5)	68.7	J	50	13-300 (73.5)	41.5	J

Shaded — Detected concentration exceeds acute screening concentration

☐ — Detected concentration exceeds the highest detected background concentration

NC — No Criteria

Table 5-12
Magna Metals Site
Water Quality Parameters

Surface Water and Surface Water Toxicity Sampling

Date	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004
Time	1018	1057	0946	0935	0921	0902	1324	1335	0842	1003
Sample Station	SW-13	SW-14	SW-15	SW-16	SW-17	SW-18	SW-19	SW-20	SW-21	SW-22
Physical Parameters										
pH (su)	7.72	7.72	7.70	7.62	7.63	7.02	8.03	8.24	6.24	7.45
Conductivity (ms/cm)	0.609	1.3	1.54	0.778	0.721	0.798	0.752	0.977	0.89	0.184
Turbidity (NTU)	-7.8	-4.3	10.4	-0.9	-9.0	76.9	-10.0	-8.4	80	14.1
Dissolved O_2 (mg/L)	10.31	10.33	11.20	11.22	10.87	8.33	9.28	10.61	8.50	8.21
Temperature (^oC)	10.88	9.99	7.53	7.21	6.81	7.26	15.28	15.15	6.19	10.54
Measured Depth (in)	-0.2	-0.1	-0.3	-0.3	-0.3	-0.4	-0.1	-0.1	-0.4	-0.2
Salinity (%)	0.03	0.05	0.06	0.03	0.03	0.03	0.03	0.04	0.04	0.01
TDS (g/L)	0.44	0.7	0.8	0.50	0.47	0.51	0.48	0.63	0.55	0.11
ORP (mV)	128	152	91	30	99	55	70	129	90	137

Sediment, Benthic and Sediment Toxicity Sampling

Date	3/30/2004	3/30/2004	3/30/2004	3/30/2004	3/31/2004	3/31/2004	3/31/2004	3/31/2004	4/3/2004	4/3/2004	4/3/2004	4/3/2004	4/3/2004	4/3/2004
Time	1035	0905	1604	1505	1208	1140	0945	0752	1040	1120	1150	1140	1250	1422
Sample Station	SD-13	SD-14	SD-15	SD-16	SD-17	SD-18	SD-19	SD-20	SD-21	SD-22	SD-23	SD-24	SD-25	SD-26
Physical Parameters														
pH (su)	7.33	5.68	7.83	7.68	7.56	7.23	6.84	6.25	6.49	6.71	7.8	7.55	8.03	8.18
Conductivity (ms/cm)	0.897	0.92	1.05	1.72	0.983	0.922	7.43	1.03	0.455	0.447	0.451	0.447	0.473	0.458
Turbidity (NTU)	-10.0	9.9	6.8	-10.0	0.3	0.6	9.3	0.0	27.9	20.0	18.0	18.4	145	30.3
Dissolved O_2 (mg/L)	11.46	9.78	9.71	10.43	10.05	0.0	13.85	18.40	9.21	13.35	13.63	13.4	12.73	11.99
Temperature (^oC)	8.04	7.28	8.48	8.66	27.21	28.61	28.18	28.86	7.21	7.5	7.87	7.91	8.81	9.53
Measured Depth (in)	0.1	-0.4	-0.1	-0.5	-1.0	-0.8	-0.6	-0.7	0.7	1.2	0.1	0.3	0.0	-0.1
Salinity (%)	0.04	0.04	0.06	0.07	0.04	0.04	0.03	0.05	0.02	0.02	0.02	0.02	0.02	0.02
TDS (g/L)	0.58	0.59	0.8	1.1	0.63	0.60	0.49	0.7	30	0.31	0.29	0.29	0.30	0.3
ORP (mV)	180	120	170	83	108	100	168	235	-9	-114	74	41	83	84

Note:
Data collected on 3/29/04, 3/30/04 and 3/31/04 had an error 2 reading

Table 5-13
Mage Metals Site
Benthic Substrate Characteristics

SAMPLE STATION	SEDIMENT DESCRIPTION	AREA DESCRIPTIONS
SD-13	Sediment is dark brown to black silt with a trace of sand. A layer of black fine to coarse organic matter present on top.	Sampling area is in a well defined streambed with leaf clutter, fallen trees and braches. The stream is approximately 7-9' wide and 9-12" deep. Moderate flow is evident.
SD-14	Sediment is dark brown to black silt with a lot of fine to coarse organic matter on top, slight odor.	Sampling location is in a stream approximately 1' deep and 15-20' wide. Floating pollen, plant matter, leaf debris and branches present in the water. The flow is stagnant.
SD-15	Sediment is dark brown to black silt with a trace of sand. Black fine to coarse debris (I.e. leaves, braches approximately 6" long) observed.	Sample location is located in the unnamed tributary approximately 4-6" deep and 3-4' wide. Poorly defined stream with a slight flow and a lot of leaf debris. Phragmites present in the area along with naturally downed trees approximately 2 1/2' wide.
SD-16	Sediment is dark brown to black silt with a trace of sand. A layer of black fine to coarse organic matter and root mat present on top.	Sample location is located in the unnamed tributary approximately 2-3" deep and 3' wide at the maximum. The area is surrounded by branches, with a lot of leaf debris present.
SD-17	Sediment is light brown sand with angular gravel and minimal organic matter present.	Sampling area is a stream with a well defined stream bed approximately 6-10" deep and 1-1 1/2 ' wide. Minimal leaf clutter and organic matter present. The stream water flow is slow.
SD-18	Sediment is dark brown to black silt with a lot of fine to coarse organic matter on top.	Sampling location is a pooled area in the wetland surrounded by a ladder and other anthropogenic debris. The water is shallow with an organic sheen.
SD-19	Sediment is black fine silt, with a layer of root mat and fine to coarse black organic material on top. Has a hint of sulfur odor present. Large branches, logs and tree stumps present in grabs.	Sampling location is in a stream approximately 2' deep with leaf clutter, green pollen and flotsam present on the surface. The water is stagnant.
SD-20	Sediment is black fine silt, with a layer of root mat and fine to coarse black organic material on top. Has a hint of sulfur odor present. Large branches, logs and tree stumps present in grabs.	Sediment sampling areas is 1-3' deep and 20-25' wide. A sulfur odor is detected, leaf debris and some flotsam present on the surface.
SD-21	Sediment is black fine silt with trace of fine brown wood chips, little organic matter on top, with a slight odor	Sampling area is located on the northeastern portion of the pond.
SD-22	Sediment is brownish black silt with no organic materials present. Took two grabs, first grab had no sediment, the grab was compromised by a tree stump.	Sampling area is located in the middle of the pond with a depth of 4.75' below water surface.
SD-23	Sediment is black silt with a trace of dark brown sediment. Coarse organic matter present (branches, leaves) with no odor.	Sampling location was situated where the pond and stream channel meet at the southeastern most point of the pond approximately 1.5' below the water surface.
SD-24	Sediment is dark brown, black fine silt with little coarse organic material and a strong sulfuric organic odor	Sampling station was located on the north western portion of the pond at a depth of 2.75' from the surface of the water.

Table 5-13
Mage Metals Site
Benthic Substrate Characteristics

SAMPLE STATION	SEDIMENT DESCRIPTION	AREA DESCRIPTIONS
SD-25	Sediment is black silt with some sand and coarse organic material on top. No odor present and there is a slight, slow water flow present.	Sample area is a basin approximately 10-15' wide, 1' deep at the maximum and 30-35' at the longest point. The basin had and in and out-let for the water to pass and is surrounded by boulders, trees and upland vegetation. The basin is filled with boulders and debris (leaves, trees, metal pipe).
SD-26	Sediment is medium brown and black silt with sand. Traces of gray silt is also present. Coarse organic material on top (leaves).	Sampling areas is a well defined stream with rapidly flowing water characteristic of a "babbling brook". Rocks, cobbles and sediment make up the stream bed. Layer of leaves in the areas on the upland floor with scattered skunk cabbage. Corroding drum in the area.

Table 5-14
Magna Metals Site
Surface Water Screening Assessment

Furnace Brook

Chemical Group	Analyte	Cas No.	Units	Sample Name:	MM-SW13-032904 (Background)					MM-SW14-032904					MM-SW19-032904					MM-SW20-032904				
				Sample Date:	3/29/2004					3/29/2004					3/29/2004					3/29/2004				
					Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L		NC	100	**366**		180	NC	100	**690**		180	NC	100	**728**	N	180	NC	100	**358**	N	180
METAL	Antimony	7440-36-0	ug/L		NC	NC		U	6.6	NC	NC		U	6.6	NC	NC		U	6.6	NC	NC		U	6.6
METAL	Arsenic	7440-38-2	ug/L		340	150		U	4.8	340	150		U	4.8	340	150		U	4.8	340	150		U	4.8
METAL	Barium	7440-39-3	ug/L		NC	NC	53.5	J	11	NC	NC	79	J	11	NC	NC	119	J	11	NC	NC	74.6	J	11
METAL	Beryllium	7440-41-7	ug/L		NC	NC		U	1.1	NC	NC		U	1.1	NC	NC		U	1.1	NC	NC		U	1.1
METAL	Cadmium[1]	7440-43-9	ug/L		6.75	5.55		U	0.99	7.24	5.83		U	0.99	8.08	6.29		U	0.99	7.56	6.01		U	0.99
METAL	Chromium[1]	7440-47-3	ug/L		437.12	95.59		U	1.2	460.2	130.8	1.3	J	1.2	498.1	112.35	2.6	J	1.2	474.9	107.12		U	1.2
METAL	Cobalt	7440-48-4	ug/L		NC	5		U	2.4	NC	5		U	2.4	NC	5		U	2.4	NC	5		U	2.4
METAL	Copper[1]	7440-50-8	ug/L		23.74	17.58		U	0.74	25.19	18.55	**57.6**		0.74	27.59	20.15	**22.6**	JN	0.74	26.12	19.17		UN	0.74
METAL	Iron	7439-89-6	ug/L		NC	300	**327**	N	29	NC	300	**1670**	N	29	NC	300	**2180**	N	29	NC	300	**363**	N	29
METAL	Lead[1]	7439-92-1	ug/L		166.59	6.49		U	1.8	178.16	6.94		U	1.8	197.49	7.70		U	1.8	185.62	7.23		U	1.8
METAL	Magnesium	7439-95-4	ug/L		NC	NC	20200	N	254	NC	NC	21400	N	254	NC	NC	27000		254	NC	NC	25800		254
METAL	Manganese	7439-96-5	ug/L		NC	NC	73.8		0.2	NC	NC	234		0.2	NC	NC	499	N	0.2	NC	NC	93.9	N	0.2
METAL	Nickel[1]	7440-02-0	ug/L		504.99	78.66		U	5.5	532.5	82.96	24.8	J	5.5	577.9	90.03	22.4	J	5.5	550.2	85.7	7	J	5.5
METAL	Selenium	7782-49-2	ug/L		NC	4.6		U	5.2	NC	4.6		U	5.2	NC	4.6		U	5.2	NC	4.6		U	5.2
METAL	Silver[1]	7440-22-4	ug/L		0.0877	NC		U	3.4	0.098	NC		U	3.4	0.115	NC		U	3.4	0.104	NC		U	3.4
METAL	Thallium	7440-28-0	ug/L		NC	8		U	5.8	NC	8		U	5.8	NC	8		U	5.8	NC	8		U	5.8
METAL	Vanadium	7440-62-2	ug/L		NC	14		U	1.9	NC	14		U	1.9	NC	14	2	J	1.9	NC	14		U	1.9
METAL	Zinc[1]	7440-66-6	ug/L		159.88	140.94		UN	8.1	168.6	148.64	23.7	N	8.1	183.02	161.33	57.3	N	8.1	174.2	153.56	9.3	JN	8.1

Note:
Surface water screening values from NYDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from Furnance Brook
Shaded — Detected concentration exceeds acute screening concentration
BOLD — Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC — No Criteria

Table 5-15
Magna Metals Site
Surface Water Screening Assessment

Unnamed Tributary of Furnace Brook

		Sample Name:		MM-SW17-032904					MM-SW15-032904					MM-SW16-032904				
		Sample Date:		3/29/2004					3/29/2004					3/29/2004				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	**282**		180	NC	100	**328**		180	NC	100	**316**		180
METAL	Antimony	7440-36-0	ug/L	NC	NC		U	6.6	NC	NC		U	6.6	NC	NC		U	6.6
METAL	Arsenic	7440-38-2	ug/L	340	150		U	4.8	340	150		U	4.8	340	150		U	4.8
METAL	Barium	7440-39-3	ug/L	NC	NC	82.2	J	11	NC	NC	105	J	11	NC	NC	99.7	J	11
METAL	Beryllium	7440-41-7	ug/L	NC	NC		U	1.1	NC	NC		U	1.1	NC	NC		U	1.1
METAL	Cadmium[1]	7440-43-9	ug/L	6.49	5.4		U	0.99	8.46	6.49		U	0.99	7.86	6.18		U	0.99
METAL	Chromium[1]	7440-47-3	ug/L	424.84	95.82	2.2	J	1.2	514.976	116.15		U	1.2	488.49	110.18		U	1.2
METAL	Cobalt	7440-48-4	ug/L	NC	5		U	2.4	NC	5		U	2.4	NC	5		U	2.4
METAL	Copper[1]	7440-50-8	ug/L	22.98	17.07		U	0.74	28.67	20.86		U	0.74	26.98	19.75		U	0.74
METAL	Iron	7439-89-6	ug/L	NC	300	107	N	29	NC	300	212	N	29	NC	300	205	N	29
METAL	Lead[1]	7439-92-1	ug/L	160.50	6.25		U	1.8	206.21	8.04		U	1.8	192.55	7.50		U	1.8
METAL	Magnesium	7439-95-4	ug/L	NC	NC	23500	N	254	NC	NC	30100	N	254	NC	NC	28200	N	254
METAL	Manganese	7439-96-5	ug/L	NC	NC	35.2		0.2	NC	NC	118		0.2	NC	NC	112		0.2
METAL	Nickel[1]	7440-02-0	ug/L	490.76	76.38	12.5	J	5.5	598.15	93.18	20.9	J	5.5	556.404	88.23	19.9	J	5.5
METAL	Selenium	7782-49-2	ug/L	NC	4.6		U	5.2	NC	4.6		U	5.2	NC	4.6		U	5.2
METAL	Silver[1]	7440-22-4	ug/L	0.0826	NC		U	3.4	0.12	NC		U	3.4	0.11	NC		U	3.4
METAL	Thallium	7440-28-0	ug/L	NC	8		U	5.8	NC	8		U	5.8	NC	8		U	5.8
METAL	Vanadium	7440-62-2	ug/L	NC	14		U	1.9	NC	14		U	1.9	NC	14		U	1.9
METAL	Zinc[1]	7440-66-6	ug/L	155.237	136.842	13	JN	8.1	189.43	166.98	11.5	JN	8.1	179.362	158.108	14.4	JN	8.1

Note:
Surface water screening values from NYDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
* - Background Samples for the samples taken from the unnamed tributary of Furnance Brook
Shaded — Detected concentration exceeds acute screening concentration
BOLD — Detected concentration exceeds chronic screening concentration
Detected concentration exceeds the detected background concentration
NC — No Criteria

Table 5-16
Magna Metals Site
Surface Water Screening Assessment

Wetland South of the Unnamed Tributary of Furnace Brook

		Sample Name:		MM-SW18-032904					MM-SW18D-032904					MM-SW21-032904				
		Sample Date:		3/29/2004					3/29/2004					3/29/2004				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	**342**		180	NC	100	**383**	N	180	NC	100	**725**	N	180
METAL	Antimony	7440-36-0	ug/L	NC	NC		U	6.6	NC	NC		U	6.6	NC	NC		U	6.6
METAL	Arsenic	7440-38-2	ug/L	340	150		U	4.8	340	150		U	4.8	340	150		U	4.8
METAL	Barium	7440-39-3	ug/L	NC	NC	132	J	11	NC	NC	141	J	11	NC	NC	185	J	11
METAL	Beryllium	7440-41-7	ug/L	NC	NC		U	1.1	NC	NC		U	1.1	NC	NC		U	1.1
METAL	Cadmium[1]	7440-43-9	ug/L	13.51	9		U	0.99	13.89	9.18		U	0.99	12.54	8.55		U	0.99
METAL	Chromium[1]	7440-47-3	ug/L	723.51	163.19		U	1.2	738.72	166.62		U	1.2	685.58	154.63	3.4	J	1.2
METAL	Cobalt	7440-48-4	ug/L	NC	5		U	2.4	NC	5		U	2.4	NC	5	2.8	J	2.4
METAL	Copper[1]	7440-50-8	ug/L	42.39	29.75		U	0.74	43.42	30.4		UN	0.74	39.85	28.12	5.5	JN	0.74
METAL	Iron	7439-89-6	ug/L	NC	300	**583**	N	29	NC	300	**903**	N	29	NC	300	**4790**	N	29
METAL	Lead[1]	7439-92-1	ug/L	319.08	12.43		U	1.8	327.64	12.77		U	1.8	297.94	11.61	3.5	J	1.8
METAL	Magnesium	7439-95-4	ug/L	NC	NC	55200	N	254	NC	NC	56500		254	NC	NC	49700		254
METAL	Manganese	7439-96-5	ug/L	NC	NC	134		0.2	NC	NC	157	N	0.2	NC	NC	319	N	0.2
METAL	Nickel[1]	7440-02-0	ug/L	849.82	132.38	16	J	5.5	868.3	135.26	19.4	J	5.5	803.85	125.22	29.9	J	5.5
METAL	Selenium	7782-49-2	ug/L	NC	4.6		U	5.2	NC	4.6		U	5.2	NC	4.6		U	5.2
METAL	Silver[1]	7440-22-4	ug/L	0.25	NC		U	3.4	0.26	NC		U	3.4	0.23	NC		U	3.4
METAL	Thallium	7440-28-0	ug/L	NC	8		U	5.8	NC	8		U	5.8	NC	8	6.9	J	5.8
METAL	Vanadium	7440-62-2	ug/L	NC	14		U	1.9	NC	14		U	1.9	NC	14	2	J	1.9
METAL	Zinc[1]	7440-66-6	ug/L	269.28	237.37	10.6	JN	8.1	275.14	242.54	16.8	JN	8.1	254.69	224.51	27.4	N	8.1

Note:
Surface water screening values from NYDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
NC No Criteria

Table 5-17
Magna Metals Site
Surface Water Screening Assessment

Wetland North of the Unnamed Tributary of Furnace Brook

			Sample Name:	MM-SW22-032904				
			Sample Date:	3/29/2004				
Chemical Group	Analyte	Cas No.	Units	Acute	Chronic	Rslt	Val qual	Det limit
METAL	Aluminum	7429-90-5	ug/L	NC	100	**381**	N	180
METAL	Antimony	7440-36-0	ug/L	NC	NC		U	6.6
METAL	Arsenic	7440-38-2	ug/L	340	150	6.9	J	4.8
METAL	Barium	7440-39-3	ug/L	NC	NC	33.4	J	11
METAL	Beryllium	7440-41-7	ug/L	NC	NC		U	1.1
METAL	Cadmium[1]	7440-43-9	ug/L	1.75	2.17		U	0.99
METAL	Chromium[1]	7440-47-3	ug/L	164.17	37.03	26.7		1.2
METAL	Cobalt	7440-48-4	ug/L	NC	5	**5.1**	J	2.4
METAL	Copper[1]	7440-50-8	ug/L	7.7	6.33	**772**	N	0.74
METAL	Iron	7439-89-6	ug/L	NC	300	**2020**	N	29
METAL	Lead[1]	7439-92-1	ug/L	45.18	1.76		U	1.8
METAL	Magnesium	7439-95-4	ug/L	NC	NC	5680		254
METAL	Manganese	7439-96-5	ug/L	NC	NC	244	N	0.2
METAL	Nickel[1]	7440-02-0	ug/L	183.63	28.6	161		5.5
METAL	Selenium	7782-49-2	ug/L	NC	4.6	**8.7**	J	5.2
METAL	Silver[1]	7440-22-4	ug/L	0.01	NC		U	3.4
METAL	Thallium	7440-28-0	ug/L	NC	8		U	5.8
METAL	Vanadium	7440-62-2	ug/L	NC	14		U	1.9
METAL	Zinc[1]	7440-66-6	ug/L	58.05	51.17	**343**	N	8.1

Note:
Surface water screening values from NYDEC Ambient water quality standards guidance, unless otherwise noted.
1 - Calculated hardness derived screening criteria
Shaded Detected concentration exceeds acute screening concentration
BOLD Detected concentration exceeds chronic screening concentration
NC No Criteria

Table 5-18
Magna Metals Site
Sediment Screening Assessment

Furnace Brook

Chemical Group	Analyte	Cas No.	Units	Sediment Screening Benchmarks Acute	Chronic	MM-SD13-033004* 3/30/2004 Rslt	Val qual	Det lim	MM-SD14-033004 3/30/2004 Rslt	Val qual	Det lim	MM-SD19A-033104 3/31/2004 Rslt	Val qual	Det lim	MM-SD20-033104 3/31/2004 Rslt	Val qual	Det lim
SVOC	Acenaphthe	83-32-9	µg/g OC	NC	140		U	0.675		U	0.716667		U	0.539326		U	0.81
SVOC	Acenaphthy	208-96-8	µg/g OC	NC	NC		U	0.9		U	0.966667		U	0.730337		U	1.1
SVOC	Anthracene	120-12-7	µg/g OC	986	107		U	0.725		U	0.766667		U	0.58427		U	0.87
SVOC	Benzo(a)ar	56-55-3	µg/g OC	94	12		U	0.45		U	0.483333		U	0.370787		U	0.55
SVOC	Benzo(a)py	50-32-8	µg/g OC	94	12		U	0.525		U	0.566667		U	0.426966		U	0.63
SVOC	Benzo(b)flu	205-99-2	µg/g OC	94	12		U	1.625		U	1.666667		U	1.348315		U	1.9
SVOC	Benzo(g,h,i	191-24-2	µg/g OC	94	12		U	1.325		U	1.416667		U	1.067416		U	1.6
SVOC	Benzo(k)flu	207-08-9	µg/g OC	94	12		U	1.05		U	1.1		U	0.831461		U	1.2
SVOC	Chrysene	218-01-9	µg/g OC	NC	NC		U	0.975		U	1.033333		U	0.775281		U	1.2
SVOC	Dibenz(a,h)	53-70-3	µg/g OC	NC	NC		U	0.9		U	0.95		U	0.719101		U	1.1
SVOC	Fluoranthe	206-44-0	µg/g OC	NC	1020		U	0.425		U	0.45	2.81	J	0.337079		U	0.51
SVOC	Fluorene	86-73-7	µg/g OC	73	8		U	0.875		U	0.916667		U	0.696629		U	1
SVOC	Indeno(1,2,	193-39-5	µg/g OC	NC	NC		U	0.725		U	0.783333		U	0.595506		U	0.88
SVOC	Naphthaler	91-20-3	µg/g OC	258	30		U	0.675		U	0.7		U	0.52809		U	0.79
SVOC	Phenanthre	85-01-8	µg/g OC	NC	120		U	0.675		U	0.733333		U	0.550562		U	0.82
SVOC	Pyrene	129-00-0	µg/g OC	8775	961		U	0.55		U	0.583333	2.47	J	0.438202		U	0.65
TOC	Total Orgar	TOC	mg/Kg	NC	NC	40000		170	60000		250	89000		290	100000		480
METAL	Aluminum	7429-90-5	mg/Kg	NC	NC	9920		2.4	13800		3.6	11500		4.1	11500		6.8
METAL	Antimony	7440-36-0	mg/Kg	25	2		UN	2.1		UN	3.2		UN	3.7		UN	6.1
METAL	Arsenic	7440-38-2	mg/Kg	33	6	2.3	J	0.89	**8.3**		1.4	**12.2**		1.6	4.1	J	2.6
METAL	Barium	7440-39-3	mg/Kg	NC	NC	229		0.08	334		0.13	418		0.14	283		0.24
METAL	Beryllium	7440-41-7	mg/Kg	NC	NC	0.86	J	0.01	1.2	J	0.02	1.3	J	0.03	1.6	J	0.04
METAL	Cadmium	7440-43-9	mg/Kg	9	0.6		U	0.17		U	0.26		U	0.3		U	0.5
METAL	Calcium	7440-70-2	mg/Kg			4940		1.3	13400		2	16400		2.3	10700		3.8
METAL	Chromium	7440-47-3	mg/Kg	110	2.6	**31.1**	N	0.35	**49.1**	N	0.55	**133**	N	0.62	**62.7**	N	1
METAL	Cobalt[1]	7440-48-4	mg/Kg	NC	50	14.4	J	0.3	22.5	J	0.45	**58.8**		0.52	21.3	J	0.85
METAL	Copper	7440-50-8	mg/Kg	110	16	**24.4**		0.43	**672**		0.66	**281**		0.75	**241**		1.2
METAL	Iron	7439-89-6	mg/Kg	40000	20000	11500		6.6	13600		10.1	17400		11.6	18200		19
METAL	Lead	7439-92-1	mg/Kg	110	31	23.6		0.38	**39.5**		0.59	**91.5**		0.68	**38.9**		1.1
METAL	Magnesium	7439-95-4	mg/Kg	NC	NC	4400		0.06	6310		0.09	11000		0.11	7400		0.17
METAL	Manganese	7439-96-5	mg/Kg	1100	460	391		3	598		4.6	302		5.3	482		8.6
METAL	Mercury	7439-97-6	mg/Kg	1.3	0.15	0.09		0.02	0.12		0.03	0.14		0.04	**0.15**		0.06
METAL	Nickel	7440-02-0	mg/Kg	50	16	**63.5**		0.56	**300**		0.87	**365**		0.99	**200**		1.6
METAL	Potassium	7440-09-7	mg/Kg			444	J	12.3	726	J	18.9	440	J	21.6	747	J	35.4
METAL	Selenium	7782-49-2	mg/Kg	NC	NC	2.1	J	1.2	12		1.8	10.1		2.1	10.8	J	3.4
METAL	Silver	7440-22-4	mg/Kg	2.2	1		U	0.39		U	0.6		U	0.69		U	1.1
METAL	Sodium	7440-23-5	mg/Kg			281	J	139	770	J	214	620	J	245	401	J	400
METAL	Thallium	7440-28-0	mg/Kg	NC	NC		U	1.2		U	1.9		U	2.2		U	3.6
METAL	Vanadium	7440-62-2	mg/Kg	NC	NC	22.3		0.38	31.2		0.59	61		0.67	28.5	J	1.1
METAL	Zinc	7440-66-6	mg/Kg	270	120	106		0.21	**146**		0.32	**176**		0.37	**258**		0.6
SEM/AVS	SEM/AVS I	SEM/AVS		NC	NC		<1			>1			>1			<1	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
* Reference sample for samples taken at specified water body
a - Screening Values for Benz(a)anthracene used in the absence of specified criterion
1 - TEC Value from Persaud et al. (1993)

Shaded	Detected concentration exceeds acute screening concentration	U	Undetected
BOLD	Detected concentration exceeds chronic screening concentration	J	Estimated
	Detected concentration exceeds the detected background concentration	N	Spiked recovery not within control limits
NC	No Criteria	E	Estimated due to interference

SEM/AVS >1 - Metals were measured to be bioavailable

Table 5-19
Magna Metals Site
Sediment Screening Assessment

Unnamed Tributary

Chemical Group	Analyte	Cas No.	Units	Sediment Screening Benchmarks Acute	Chronic	MM-SD17-033104* 3/31/2004 Rslt	Val qual	Det lim	MM-SD15-033004 3/30/2004 Rslt	Val qual	Det lim	MM-SD16-033004 3/30/2004 Rslt	Val qual	Det lim
SVOC	Acenaphth	83-32-9	µg/g OC	NC	140		U	1.606557		U	0.725		U	0.888889
SVOC	Acenaphth	208-96-8	µg/g OC	NC	NC		U	2.131148		U	0.975		U	1.222222
SVOC	Anthracen	120-12-7	µg/g OC	986	107	31.15	J	1.803279		U	0.775		U	0.944444
SVOC	Benzo(a)ar	56-55-3	µg/g OC	94	12	**73.77**		1.098361	12	J	0.5	8.33	J	0.611111
SVOC	Benzo(a)py	50-32-8	µg/g OC	94	12	**73.77**		1.245902	16	J	0.55	10.56	J	0.722222
SVOC	Benzo(b)flu	205-99-2	µg/g OC	94	12	**111.48**		3.934426	24.5	J	1.725	14.44	J	2.166667
SVOC	Benzo(g,h,	191-24-2	µg/g OC	94	12	**26.23**	J	3.114754	6.75	J	1.425		U	1.777778
SVOC	Benzo(k)flu	207-08-9	µg/g OC	94	12	**81.97**		2.459016	16.75	J	1.125	12.22	J	1.388889
SVOC	Chrysene	218-01-9	µg/g OC	NC	NC	80.33		2.295082	16.75	J	1.025	10.56	J	1.277778
SVOC	Dibenz(a,h	53-70-3	µg/g OC	NC	NC		U	2.131148		U	0.95		U	1.166667
SVOC	Fluoranthe	206-44-0	µg/g OC	NC	1020	196.72		1.016393	35		0.45	22.78	J	0.555556
SVOC	Fluorene	86-73-7	µg/g OC	73	8	**11.15**	J	2.131148		U	0.925		U	1.166667
SVOC	Indeno(1,2	193-39-5	µg/g OC	NC	NC		U	1.803279		U	0.8		U	1
SVOC	Naphthaler	91-20-3	µg/g OC	258	30		U	1.57377		U	0.7		U	0.888889
SVOC	Phenanthre	85-01-8	µg/g OC	NC	120	**144.26**		1.622951	15	J	0.725	10.56	J	0.888889
SVOC	Pyrene	129-00-0	µg/g OC	8775	961	213.11		1.295082	30	J	0.575	22.78	J	0.722222
TOC	Total Orga	TOC	mg/Kg	NC	NC	6100		60	40000		180	18000		99
METAL	Aluminum	7429-90-5	mg/Kg	NC	NC	4080		0.84	10100		2.5	9080		1.4
METAL	Antimony	7440-36-0	mg/Kg	25	2		UN	0.75		UN	2.3		UN	1.3
METAL	Arsenic	7440-38-2	mg/Kg	33	6	1.5		0.32	**8.3**		0.95	3.7		0.53
METAL	Barium	7440-39-3	mg/Kg	NC	NC	47.5		0.03	266		0.09	154		0.05
METAL	Beryllium	7440-41-7	mg/Kg	NC	NC	0.28	J	0.01	0.82	J	0.02	0.55	J	0.01
METAL	Cadmium	7440-43-9	mg/Kg	9	0.6		U	0.06		U	0.18		U	0.1
METAL	Calcium	7440-70-2	mg/Kg			16200		0.47	7130		1.4	7190		0.78
METAL	Chromium	7440-47-3	mg/Kg	110	2.6	**16.4**	N	0.13	**158**	N	0.38	**43.4**	N	0.21
METAL	Cobalt[1]	7440-48-4	mg/Kg	NC	50	5.4	J	0.11	16.5	J	0.32	12.8		0.18
METAL	Copper	7440-50-8	mg/Kg	110	16	9.9		0.15	**1040**		0.46	**107**		0.26
METAL	Iron	7439-89-6	mg/Kg	40000	20000	6590		2.4	10900		7.1	12400		4
METAL	Lead	7439-92-1	mg/Kg	110	31	6.7		0.14	**32.2**		0.41	22.9		0.23
METAL	Magnesiun	7439-95-4	mg/Kg	NC	NC	11900		0.02	5280		0.06	6880		0.04
METAL	Manganes	7439-96-5	mg/Kg	1100	460	337		1.1	958		3.2	313		1.8
METAL	Mercury	7439-97-6	mg/Kg	1.3	0.15	0.01	J	0.01	**0.15**		0.02	0.06		0.01
METAL	Nickel	7440-02-0	mg/Kg	50	16	**35.6**		0.2	**332**		0.61	**143**		0.34
METAL	Potassium	7440-09-7	mg/Kg			560	J	4.4	585	J	13.2	833	J	7.4
METAL	Selenium	7782-49-2	mg/Kg	NC	NC		U	0.42	18.2		1.3	2	J	0.7
METAL	Silver	7440-22-4	mg/Kg	2.2	1		U	0.14		U	0.42		U	0.24
METAL	Sodium	7440-23-5	mg/Kg			127	J	49.8	766	J	149	348	J	83.3
METAL	Thallium	7440-28-0	mg/Kg	NC	NC		U	0.44		U	1.3		U	0.74
METAL	Vanadium	7440-62-2	mg/Kg	NC	NC	9.3		0.14	20.6		0.41	22.2		0.23
METAL	Zinc	7440-66-6	mg/Kg	270	120	37.3		0.08	**528**		0.22	**139**		0.13
SEM/AVS	SEM/AVS	SEM/AVS		NC	NC		>1			>1			>1	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
* Reference sample for samples taken at specified water body
a - Screening Values for Benz(a)anthracene used in the absence of specified criterion
1 - TEC Value from Persaud et al. (1993)

Shaded	Detected concentration exceeds acute screening concentration	U	Undetected
BOLD	Detected concentration exceeds chronic screening concentration	J	Estimated
	Detected concentration exceeds the detected background concentration	N	Spiked recovery not within control limits
NC	No Criteria	E	Estimated due to interference

SEM/AVS >1 - Metals were measured to be bioavailable

Table 5-20
Magna Metals Site
Sediment Screening Assessment

South Wetland

Chemical Group	Analyte	Cas No.	Units	Sediment Screening Benchmarks Acute	Chronic	MM-SD18-033104 3/31/2004 Rslt	Val qual	Det lim	MM-SD18D-033104 3/31/2004 Rslt	Val qual	Det lim
SVOC	Acenaphth	83-32-9	µg/g OC	NC	140		U	0.447368		U	0.633333
SVOC	Acenaphth	208-96-8	µg/g OC	NC	NC		U	0.605263		U	0.866667
SVOC	Anthracene	120-12-7	µg/g OC	986	107		U	0.486842		U	0.683333
SVOC	Benzo(a)ar	56-55-3	µg/g OC	94	12	2.11	J	0.302632		U	0.433333
SVOC	Benzo(a)py	50-32-8	µg/g OC	94	12	2.89	J	0.355263		U	0.5
SVOC	Benzo(b)flu	205-99-2	µg/g OC	94	12	3.42	J	1.092105		U	1.533333
SVOC	Benzo(g,h,i	191-24-2	µg/g OC	94	12		U	0.894737		U	1.25
SVOC	Benzo(k)flu	207-08-9	µg/g OC	94	12	2.89	J	0.697368		U	0.983333
SVOC	Chrysene	218-01-9	µg/g OC	NC	NC	2.37	J	0.644737		U	0.916667
SVOC	Dibenz(a,h	53-70-3	µg/g OC	NC	NC		U	0.605263		U	0.85
SVOC	Fluoranthe	206-44-0	µg/g OC	NC	1020	5.39	J	0.289474	3	J	0.4
SVOC	Fluorene	86-73-7	µg/g OC	73	8		U	0.578947		U	0.816667
SVOC	Indeno(1,2,	193-39-5	µg/g OC	NC	NC		U	0.5		U	0.7
SVOC	Naphthaler	91-20-3	µg/g OC	258	30		U	0.447368		U	0.633333
SVOC	Phenanthre	85-01-8	µg/g OC	NC	120	2.24	J	0.460526		U	0.65
SVOC	Pyrene	129-00-0	µg/g OC	8775	961	5	J	0.368421		U	0.516667
TOC	Total Orga	TOC	mg/Kg	NC	NC	76000		210	60000		230
METAL	Aluminum	7429-90-5	mg/Kg	NC	NC	12700		2.9	12900		3.3
METAL	Antimony	7440-36-0	mg/Kg	25	2		UN	2.6		UN	2.9
METAL	Arsenic	7440-38-2	mg/Kg	33	6	12		1.1	**7.7**		1.2
METAL	Barium	7440-39-3	mg/Kg	NC	NC	409		0.1	506		0.12
METAL	Beryllium	7440-41-7	mg/Kg	NC	NC	0.98	J	0.02	1.1	J	0.02
METAL	Cadmium	7440-43-9	mg/Kg	9	0.6		U	0.21		U	0.24
METAL	Calcium	7440-70-2	mg/Kg			13300		1.6	14600		1.8
METAL	Chromium	7440-47-3	mg/Kg	110	2.6	**166**	N	0.44	**159**	N	0.5
METAL	Cobalt[1]	7440-48-4	mg/Kg	NC	50	36.1		0.37	35.7		0.41
METAL	Copper	7440-50-8	mg/Kg	110	16	**327**		0.53	**230**		0.6
METAL	Iron	7439-89-6	mg/Kg	40000	20000	14400		8.2	19600		9.2
METAL	Lead	7439-92-1	mg/Kg	110	31	**88.7**		0.48	**76.4**		0.54
METAL	Magnesium	7439-95-4	mg/Kg	NC	NC	9190		0.07	10300		0.08
METAL	Manganese	7439-96-5	mg/Kg	1100	460	241		3.7	456		4.2
METAL	Mercury	7439-97-6	mg/Kg	1.3	0.15	**0.17**		0.03	**0.16**		0.03
METAL	Nickel	7440-02-0	mg/Kg	50	16	**460**		0.7	**364**		0.79
METAL	Potassium	7440-09-7	mg/Kg			584	J	15.3	618	J	17.2
METAL	Selenium	7782-49-2	mg/Kg	NC	NC	9.9		1.5	8.8		1.6
METAL	Silver	7440-22-4	mg/Kg	2.2	1		U	0.49		U	0.55
METAL	Sodium	7440-23-5	mg/Kg			276	J	173	638	J	195
METAL	Thallium	7440-28-0	mg/Kg	NC	NC		U	1.5	3.4	J	1.7
METAL	Vanadium	7440-62-2	mg/Kg	NC	NC	43.4		0.47	42.2		0.53
METAL	Zinc	7440-66-6	mg/Kg	270	120	**290**		0.26	**259**		0.29
SEM/AVS	SEM/AVS I	SEM/AVS		NC	NC		<1			>1	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
* Reference sample for samples taken at specified water body
a - Screening Values for Benz(a)anthracene used in the absence of specified criterion
1 - TEC Value from Persaud et al. (1993)

Shaded	Detected concentration exceeds acute screening concentration	U	Undetected
BOLD	Detected concentration exceeds chronic screening concentration	J	Estimated
	Detected concentration exceeds the detected background concentrati	N	Spiked recovery not within Control limits
NC	No Criteria		
SEM/AVS	>1 - Metals were measured to be bioavailable	E	Estimated due to interference

Table 5-21
Magna Metals Site
Sediment Screening Assessment

Unnamed Pond

Chemical Group	Analyte	Cas No.	Units	Sample Name: / Sample Date: Sediment Screening Benchmarks Acute	Chronic	MM-SD21-040304 4/3/2004 Rslt	Val qual	Det lim	MM-SD22-040304 4/3/2004 Rslt	Val qual	Det lim	MM-SD23-040304 4/3/2004 Rslt	Val qual	Det lim	MM-SD24-040304 4/3/2004 Rslt	Val qual	Det lim
SVOC	Acenaphth	83-32-9	µg/g OC	NC	140		U	1.632653		U	6.666667		U	6.1		U	0.571429
SVOC	Acenaphth	208-96-8	µg/g OC	NC	NC		U	2.244898		U	9.166667		U	8.2		U	0.785714
SVOC	Anthracene	120-12-7	µg/g OC	986	107		U	1.755102		U	7.25		U	6.6		U	0.621429
SVOC	Benzo(a)ar	56-55-3	µg/g OC	94	12		U	1.122449		U	4.583333	36	J	4.2		U	0.392857
SVOC	Benzo(a)py	50-32-8	µg/g OC	94	12		U	1.265306		U	5.25	41	J	4.7		U	0.45
SVOC	Benzo(b)flu	205-99-2	µg/g OC	94	12		U	3.877551		U	15.83333	68	J	15		U	1.357143
SVOC	Benzo(g,h,	191-24-2	µg/g OC	94	12		U	3.265306		U	13.33333		U	12		U	1.142857
SVOC	Benzo(k)flu	207-08-9	µg/g OC	94	12		U	2.44898		U	10		U	9.4		U	0.857143
SVOC	Chrysene	218-01-9	µg/g OC	NC	NC		U	2.244898		U	10	51	J	8.7		U	0.857143
SVOC	Dibenz(a,h	53-70-3	µg/g OC	NC	NC		U	2.244898		U	9.166667		U	8.1		U	0.785714
SVOC	Fluoranthe	206-44-0	µg/g OC	NC	1020		U	1.020408		U	4.25	100	J	3.8		U	0.364286
SVOC	Fluorene	86-73-7	µg/g OC	73	8		U	2.040816		U	8.333333		U	7.8		U	0.714286
SVOC	Indeno(1,2	193-39-5	µg/g OC	NC	NC		U	1.77551		U	7.333333		U	6.6		U	0.628571
SVOC	Naphthaler	91-20-3	µg/g OC	258	30		U	1.612245		U	6.583333		U	6		U	0.564286
SVOC	Phenanthre	85-01-8	µg/g OC	NC	120		U	1.653061		U	6.75	45	J	6.1		U	0.585714
SVOC	Pyrene	129-00-0	µg/g OC	8775	961		U	1.306122		U	5.416667	79	J	4.9		U	0.464286
TOC	Total Orga	TOC	mg/Kg	NC	NC	49000		510	12000		490	10000		380	140000		510
METAL	Aluminum	7429-90-5	mg/Kg	NC	NC	15800		7.2	18000		7.1	12000		5.4	14400		7.2
METAL	Antimony	7440-36-0	mg/Kg	25	2		U	6.5		U	6.3		U	4.9		U	6.4
METAL	Arsenic	7440-38-2	mg/Kg	33	6		U	2.7		U	2.7		U	2		U	2.7
METAL	Barium	7440-39-3	mg/Kg	NC	NC	374	N	0.25	391	N	0.25	278	N	0.19	331	N	0.25
METAL	Beryllium	7440-41-7	mg/Kg	NC	NC	0.99	J	0.05	1.1	J	0.04	0.74	J	0.03	1	J	0.05
METAL	Cadmium	7440-43-9	mg/Kg	9	0.6		U	0.53		U	0.52		U	0.4		U	0.52
METAL	Calcium	7440-70-2	mg/Kg			13600		4	10600		3.9	11600		3	10400		4
METAL	Chromium	7440-47-3	mg/Kg	110	2.6	**60.5**		1.1	**78.3**		1.1	**73.7**		0.82	**76.3**		1.1
METAL	Cobalt[1]	7440-48-4	mg/Kg	NC	50	34.7	J	0.91	39.8	J	0.89	32.4	J	0.68	39.7	J	0.9
METAL	Copper	7440-50-8	mg/Kg	110	16	**403**	N	1.3	**415**	N	1.3	**194**	N	0.98	**216**	N	1.3
METAL	Iron	7439-89-6	mg/Kg	40000	20000	**30100**		20.3	**35300**		19.8	**26600**		15.2	**34700**		20.1
METAL	Lead	7439-92-1	mg/Kg	110	31	**112**		1.2	**53.9**		1.2	**48.7**		0.89	**42.2**		1.2
METAL	Magnesiun	7439-95-4	mg/Kg	NC	NC	8620		0.18	10600		0.18	12400		0.14	10800		0.18
METAL	Manganes	7439-96-5	mg/Kg	1100	460	735		9.2	693		9	525		6.9	338		9.1
METAL	Mercury	7439-97-6	mg/Kg	1.3	0.15	**0.22**		0.06	**0.25**		0.06	0.14		0.05	**0.2**		0.07
METAL	Nickel	7440-02-0	mg/Kg	50	16	**180**		1.7	**170**		1.7	**155**		1.3	**161**		1.7
METAL	Potassium	7440-09-7	mg/Kg			1460	JE	37.8	1970	JE	37	1440	JE	28.4	1500	JE	37.4
METAL	Selenium	7782-49-2	mg/Kg	NC	NC	12.4		3.6	7.7	J	3.5	6.7	J	2.7	4.7	J	3.6
METAL	Silver	7440-22-4	mg/Kg	2.2	1		UN	1.2		UN	1.2		UN	0.91		UN	1.2
METAL	Sodium	7440-23-5	mg/Kg				U	427	471	J	418	490	J	320		U	423
METAL	Thallium	7440-28-0	mg/Kg	NC	NC		U	3.8		U	3.7		U	2.8		U	3.8
METAL	Vanadium	7440-62-2	mg/Kg	NC	NC	38	JNE	1.2	44.7	JNE	1.1	31	JNE	0.88	42	JNE	1.2
METAL	Zinc	7440-66-6	mg/Kg	270	120	**191**		0.64	**195**		0.63	**270**		0.48	**170**		0.64
SEM/AVS	SEM/AVS	SEM/AVS		NC	NC		>1			<1			<1			<1	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
* Reference sample for samples taken at specified water body
a - Screening Values for Benz(a)anthracene used in the absence of specified criterion
1 - TEC Value from Persaud et al. (1993)

Shaded	Detected concentration exceeds acute screening concentration	U	Undetected
BOLD	Detected concentration exceeds chronic screening concentration	J	Estimated
	Detected concentration exceeds the detected background concentration	N	Spiked recovery not within control limits
NC	No Criteria	E	Estimated due to interference

SEM/AVS >1 - Metals were measured to be bioavailable

Table 5-22
Magna Metals Site
Sediment Screening Assessment

Furnace Brook Below Unnamed Pond

Chemical Group	Analyte	Cas No.	Units	Sample Name: / Sample Date: Sediment Screening Benchmarks Acute	Chronic	MM-SD25-040304 4/3/2004 Rslt	Val qual	Det lim	MM-SD26-040304 4/3/2004 Rslt	Val qual	Det lim
SVOC	Acenaphth	83-32-9	µg/g OC	NC	140		U	0.12		U	0.13
SVOC	Acenaphth	208-96-8	µg/g OC	NC	NC		U	0.16		U	0.18
SVOC	Anthracene	120-12-7	µg/g OC	986	107		U	0.13		U	0.14
SVOC	Benzo(a)ar	56-55-3	µg/g OC	94	12		U	0.083	1	J	0.089
SVOC	Benzo(a)py	50-32-8	µg/g OC	94	12		U	0.095	1.2	J	0.1
SVOC	Benzo(b)flu	205-99-2	µg/g OC	94	12	0.76	J	0.29	1.8	J	0.31
SVOC	Benzo(g,h,i	191-24-2	µg/g OC	94	12		U	0.24		U	0.26
SVOC	Benzo(k)flu	207-08-9	µg/g OC	94	12		U	0.19	0.85	J	0.2
SVOC	Chrysene	218-01-9	µg/g OC	NC	NC	0.71	J	0.17	1.5	J	0.19
SVOC	Dibenz(a,h	53-70-3	µg/g OC	NC	NC		U	0.16		U	0.17
SVOC	Fluoranthe	206-44-0	µg/g OC	NC	1020	1.6	J	0.077	2.8	J	0.082
SVOC	Fluorene	86-73-7	µg/g OC	73	8		U	0.16		U	0.17
SVOC	Indeno(1,2,	193-39-5	µg/g OC	NC	NC		U	0.13		U	0.14
SVOC	Naphthaler	91-20-3	µg/g OC	258	30		U	0.12		U	0.13
SVOC	Phenanthre	85-01-8	µg/g OC	NC	120	0.8	J	0.12	1.3	J	0.13
SVOC	Pyrene	129-00-0	µg/g OC	8775	961	1.2	J	0.098	2.2	J	0.11
TOC	Total Orga	TOC	mg/Kg	NC	NC	100000		75	100000		79
METAL	Aluminum	7429-90-5	mg/Kg	NC	NC	3310		1.1	6310		1.1
METAL	Antimony	7440-36-0	mg/Kg	25	2		U	0.94		U	1
METAL	Arsenic	7440-38-2	mg/Kg	33	6		U	0.4	1.4	J	0.43
METAL	Barium	7440-39-3	mg/Kg	NC	NC	65.3	N	0.04	209	N	0.04
METAL	Beryllium	7440-41-7	mg/Kg	NC	NC	0.17	J	0.01	0.28	J	0.01
METAL	Cadmium	7440-43-9	mg/Kg	9	0.6		U	0.08		U	0.08
METAL	Calcium	7440-70-2	mg/Kg			2170		0.59	2580		0.63
METAL	Chromium	7440-47-3	mg/Kg	110	2.6	**81.2**		0.16	**75.4**		0.17
METAL	Cobalt[1]	7440-48-4	mg/Kg	NC	50	26.7		0.13	21.5		0.14
METAL	Copper	7440-50-8	mg/Kg	110	16	**137**	N	0.19	**130**	N	0.21
METAL	Iron	7439-89-6	mg/Kg	40000	20000	17500		3	16300		3.2
METAL	Lead	7439-92-1	mg/Kg	110	31	10.1		0.17	18.5		0.19
METAL	Magnesium	7439-95-4	mg/Kg	NC	NC	18600		0.03	12400		0.03
METAL	Manganese	7439-96-5	mg/Kg	1100	460	301		1.3	549		1.4
METAL	Mercury	7439-97-6	mg/Kg	1.3	0.15	0.02		0.01	0.04		0.01
METAL	Nickel	7440-02-0	mg/Kg	50	16	**149**		0.25	**121**		0.27
METAL	Potassium	7440-09-7	mg/Kg			324	JE	5.5	471	JE	5.9
METAL	Selenium	7782-49-2	mg/Kg	NC	NC		U	0.53		U	0.56
METAL	Silver	7440-22-4	mg/Kg	2.2	1	0.19	JN	0.18		UN	0.19
METAL	Sodium	7440-23-5	mg/Kg			119	J	62.4		U	67.1
METAL	Thallium	7440-28-0	mg/Kg	NC	NC		U	0.55		U	0.6
METAL	Vanadium	7440-62-2	mg/Kg	NC	NC	14.5	NE	0.17	21.8	NE	0.18
METAL	Zinc	7440-66-6	mg/Kg	270	120	82.8		0.09	68.8		0.1
SEM/AVS	SEM/AVS I	SEM/AVS		NC	NC		>1			>1	

Note:
Sediment screening values from NYDEC Technical Guidance of Screening Contaminated Sediment (1999) used unless otherwise noted.
* Reference sample for samples taken at specified water body
a - Screening Values for Benz(a)anthracene used in the absence of specified criterion
1 - TEC Value from Persaud et al. (1993)

Shaded	Detected concentration exceeds acute screening concentration	U	Undetected
BOLD	Detected concentration exceeds chronic screening concentration	J	Estimated
	Detected concentration exceeds the detected background concentrati	N	Spiked recovery not within Control limits
NC	No Criteria		
SEM/AVS	>1 - Metals were measured to be bioavailable	E	Estimated due to interference

Table 5-23
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD13**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM1)	B (MM2)	C (MM3)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	7	6	2	15	217	3.3%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm			3	3	43	0.7%
Limnodrilus hoffmeisteri	tube worm	53			53	768	11.7%
Limnodrilus sp.	tube worm	95	87	53	235	3406	51.8%
Coleoptera							
Dytiscidae							
Agabus sp.	diving beetle	1			1	14	0.2%
Diptera							
Ceratopogonidae							
Culicoides sp.	biting midge	5	3	16	24	348	5.3%
Mallochohelea sp.	biting midge		4		4	58	0.9%
Palpomyia gr.	biting midge		2	2	4	58	0.9%
Probezzia sp.	biting midge	2		7	9	130	2.0%
Sphaeromias sp.	biting midge	6	6	9	21	304	4.6%
Chironomidae							
Diamesa sp.	midge	2			2	29	0.4%
Hydrobaenus sp.	midge	13	25		38	551	8.4%
Orthocladiinae	midge	2			2	29	0.4%
Orthocladius frigidus	midge	3			3	43	0.7%
Orthocladius sp.	midge		1	9	10	145	2.2%
Rheocricotopus unidentatus	midge	6			6	87	1.3%
Stempellinella sp.	midge	1			1	14	0.2%
Stictochironomus sp.	midge			1	1	14	0.2%
Tabanidae							
Chrysops sp.	deer fly	1		1	2	29	0.4%
Tipulidae							
Pilaria sp.	crane fly	10	1	5	16	232	3.5%
Ormosia sp.	crane fly	1	3		4	58	0.9%
Total Taxa		16	10	11	**21**		100.0%
Total Specimens		208	138	108	454		
Total Density (no./m^2)		9043	6000	4696		**6580**	

Table 5-24
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD14**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM4)	B (MM5)	C (MM6)	Total	Density (no./m^2)	Pct.
Tubificida							
Tubificidae							
Limnodrilus sp.	tube worm		1	1	2	29	1.8%
Basommatophora							
Ancylidae							
Ferissia rivularis	limpet snail		1		1	14	0.9%
Amphipoda							
Talitridae							
Hyalella azteca	sideswimmer	1	4	1	6	87	5.4%
Ephemeroptera							
Baetidae	mayfly		2		2	29	1.8%
Caenidae							
Caenis sp.	mayfly	1		1	2	29	1.8%
Isonychiidae							
Isonychia sp.	mayfly			2	2	29	1.8%
Odonata							
Libellulidae							
Plathemis sp.	dragonfly		1		1	14	0.9%
Diptera							
Ceratopogonidae							
Culicoides sp.	biting midge	2			2	29	1.8%
Mallochohelea sp.	biting midge	2	1		3	43	2.7%
Palpomyia gr.	biting midge	2	1		3	43	2.7%
Chironomidae							
Chironomus sp.	midge		1	3	4	58	3.6%
Clinotanypus sp.	midge	8	1	3	12	174	10.8%
Cryptochironomus fulvus gr.	midge		1		1	14	0.9%
Dicrotendipes sp.	midge			7	7	101	6.3%
Einfeldia sp.	midge	1			1	14	0.9%
Orthocladiinae	midge	1			1	14	0.9%
Paratanytarsus sp.	midge	1	5	7	13	188	11.7%
Procladius sp.	midge		8	30	38	551	34.2%
Tanypodinae	midge			4	4	58	3.6%
Tanytarsus sp.	midge	1		5	6	87	5.4%
Total Taxa		10	12	11	**20**		100.0%
Total Specimens		20	27	64	111		
Total Density (no./m^2)		870	1174	2783		**1609**	

Table 5-25
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD19**
Sample Date: March 31, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM16)	B (MM17)	C (MM18)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	1	2		3	43	1.4%
Tubificida							
Tubificidae							
Limnodrilus sp.	tube worm	2			2	29	1.0%
Naididae	naidid worm		1		1	14	0.5%
Isopoda							
Asellidae							
Caecidotea sp.	sow bug	1			1	14	0.5%
Ephemeroptera							
Caenidae							
Caenis sp.	mayfly	3			3	43	1.4%
Diptera							
Ceratopogonidae							
Palpomyia gr.	biting midge		1		1	14	0.5%
Chironomidae							
Chironomus sp.	midge	66	61	4	131	1899	62.4%
Dicrotendipes sp.	midge	11			11	159	5.2%
Hydrobaenus sp.	midge		4		4	58	1.9%
Kiefferulus sp.	midge	1			1	14	0.5%
Omisus sp.	midge	7			7	101	3.3%
Paratanytarsus sp.	midge			1	1	14	0.5%
Polypedilum tritum	midge			3	3	43	1.4%
Procladius sp.	midge	4			4	58	1.9%
Tanypus sp.	midge	7	7		14	203	6.7%
Tanytarsus sp.	midge	9	9	1	19	275	9.0%
Thienemannimyia gr.	midge		2	1	3	43	1.4%
Zavreliella sp.	midge	1			1	14	0.5%
Total Taxa		12	8	5	**18**		100.0%
Total Specimens		113	87	10	210		
Total Density (no./m^2)		4913	3783	435		**3043**	

Table 5-26
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD20**
Sample Date: March 31, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM19)	B (MM20)	C (MM21)	Total	Density (no./m^2)	Pct.
Basommatophora							
Physidae							
Physa sp.	pouch snail		1		1	14	1.4%
Ephemeroptera							
Caenidae							
Caenis sp.	mayfly	4		1	5	72	6.9%
Odonata							
Libellulidae							
Leucorrhinia sp.	dragonfly		1		1	14	1.4%
Diptera							
Ceratopogonidae							
Palpomyia gr.	biting midge	1			1	14	1.4%
Sphaeromias sp.	biting midge		2	1	3	43	4.2%
Chironomidae							
Chironomus sp.	midge	4		1	5	72	6.9%
Cladopelma sp.	midge	2			2	29	2.8%
Dicrotendipes sp.	midge	8	1		9	130	12.5%
Endochironomus sp.	midge			1	1	14	1.4%
Einfeldia sp.	midge	3	5		8	116	11.1%
Glyptotendipes sp.	midge			1	1	14	1.4%
Kiefferulus sp.	midge			1	1	14	1.4%
Polypedilum halterale gr.	midge	3		1	4	58	5.6%
Procladius sp.	midge	4	3		7	101	9.7%
Tanypodinae	midge			2	2	29	2.8%
Tanypus sp.	midge	2	3	1	6	87	8.3%
Tanytarsus sp.	midge	2	2	1	5	72	6.9%
Thienemannimyia gr.	midge	1	3	1	5	72	6.9%
Zavrelimyia sp.	midge	4	1		5	72	6.9%
Total Taxa		12	10	11	**19**		100.0%
Total Specimens		38	22	12	72		
Total Density (no./m^2)		1652	957	522		**1043**	

Table 5-27
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD17**
Sample Date: March 31 , 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM13)	B (MM14)	C (MM15)	Total	Density (no./m^2)	Pct.
Tubificida							
Enchytraeidae	tube worm		1		1	14	0.3%
Tubificidae							
Limnodrilus sp.	tube worm	1	1	2	4	58	1.1%
Coleoptera							
Dytiscidae							
Agabus sp.	diving beetle		1		1	14	0.3%
Diptera							
Chironomidae							
Hydrobaenus sp.	midge	92	55	151	298	4319	84.9%
Orthocladiinae	midge			1	1	14	0.3%
Orthocladius sp.	midge	11	6	13	30	435	8.5%
Rheocricotopus unidentatis	midge	4	2	2	8	116	2.3%
Tanytarsus sp.	midge	2			2	29	0.6%
Thienemannimyia gr.	midge			1	1	14	0.3%
Zavrelimyia sp.	midge	1		2	3	43	0.9%
Empididae							
Clinocera sp.	dance fly			1	1	14	0.3%
Tipulidae							
Pedicia sp.	crane fly			1	1	14	0.3%
Total Taxa		6	6	9	**12**		100.0%
Total Specimens		111	66	174	351		
Total Density (no./m^2)		4826	2870	7565		**5087**	

Table 5-28
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD16**
Sample Date: March 30 , 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM10)	B (MM11)	C (MM12)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	1	3		4	58	1.5%
Hoplonemertea							
Tetrastemmatidae							
Prostoma graescense	proboscus worm			1	1	14	0.4%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm		4	4	8	116	3.0%
Limnodrilus sp.	tube worm	23	19	37	79	1145	29.6%
Limnodrilus hoffmeisteri	tube worm		5	8	13	188	4.9%
Limnodrilus udekemianus	tube worm	11	10		21	304	7.9%
Veneroida							
Sphaeriidae							
Pisidium sp.	pill clam		1	1	2	29	0.7%
Arhynchobdellida							
Erpobdellidae							
Mooreobdella sp.	leech			1	1	14	0.4%
Coleoptera							
Dytiscidae							
Hydroporus sp.	diving beetle		1		1	14	0.4%
Diptera							
Ceratopogonidae							
Ceratopogon sp.	biting midge	1			1	14	0.4%
Culicoides sp.	biting midge	1		1	2	29	0.7%
Palpomyia gr.	biting midge	1			1	14	0.4%
Sphaeromias sp.	biting midge			1	1	14	0.4%
Chironomidae							
Chaetocladius sp.	midge	1			1	14	0.4%
Cryptochironomus fulvus gr.	midge			1	1	14	0.4%
Diplocladius sp.	midge	1			1	14	0.4%
Heterotrissocladius marcidus	midge		3		3	43	1.1%
Hydrobaenus sp.	midge	9	10	27	46	667	17.2%
Orthocladius sp.	midge		7	2	9	130	3.4%
Parametriocnemus sp.	midge	19	3	1	23	333	8.6%
Rheocricotopus sp.	midge	1		3	4	58	1.5%
Rheocricotopus unidentatis	midge	2	5	2	9	130	3.4%
Tanytarsus sp.	midge	3	4	2	9	130	3.4%
Thienemannimyia gr.	midge	2	4		6	87	2.2%
Tvetenia bavarica	midge	1			1	14	0.4%
Zavrelimyia sp.	midge	2	4	1	7	101	2.6%
Tabanidae							
Chrysops sp.	deer fly	1	1		2	29	0.7%
Tipulidae							
Ormosia sp.	crane fly	1			1	14	0.4%
Pilaria sp.	crane fly	3	6		9	130	3.4%
Total Taxa		19	17	16	**29**		100.0%
Total Specimens		84	90	93	267		
Total Density (no./m^2)		3652	3913	4043		**3870**	

Table 5-29
Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech EC.

Station: **MM-SW / SD15**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM7)	B (MM8)	C (MM9)	Total	Density (no./m^2)	Pct.
Nematoda	round worm			1	1	14	0.3%
Hoplonemertea							
Tetrastemmatidae							
Prostoma graescense	proboscus worm			1	1	14	0.3%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm			3	3	43	0.9%
Limnodrilus sp.	tube worm	11	2	2	15	217	4.7%
Limnodrilus hoffmeisteri	tube worm	6			6	87	1.9%
Veneroida							
Sphaeriidae							
Pisidium sp.	pill clam	1			1	14	0.3%
Amphipoda							
Talitridae							
Hyalella azteca	sideswimmer	1			1	14	0.3%
Coleoptera							
Dytiscidae							
Hydroporus sp.	diving beetle	3		1	4	58	1.3%
Scirtidae							
Cyphon sp.	marsh beetle	1			1	14	0.3%
Diptera							
Cecidomyiidae	gall gnat		1		1	14	0.3%
Ceratopogonidae							
Culicoides sp.	biting midge	2	1	4	7	101	2.2%
Mallochohelea sp.	biting midge	1		1	2	29	0.6%
Palpomyia gr.	biting midge	5	1	1	7	101	2.2%
Chironomidae							
Ablabesmyia sp.	midge	7			7	101	2.2%
Chaetocladius sp.	midge	1			1	14	0.3%
Cyrptochironomus fulvus gr.	midge		3	8	11	159	3.4%
Heterotrissocladius marcidus	midge			26	26	377	8.2%
Hydrobaenus sp.	midge	3		17	20	290	6.3%
Orthocladius sp.	midge	42	18	9	69	1000	21.6%
Psectrocladius sp.	midge	16			16	232	5.0%
Rheocricotopus sp.	midge		5		5	72	1.6%
Rheocricotopus unidentatis	midge	2	5	2	9	130	2.8%
Tanytarsus sp.	midge	1	1	1	3	43	0.9%
Thienemannimyia gr.	midge	48	13	36	97	1406	30.4%
Tipulidae							
Ormosia sp.	crane fly	1			1	14	0.3%
Pedicia sp.	crane fly			1	1	14	0.3%
Pilaria sp.	crane fly			2	2	29	0.6%
Pseudolimnophila sp.	crane fly		1		1	14	0.3%
Total Taxa		18	11	17	**28**		100.0%
Total Specimens		152	51	116	319		
Total Density (no./m^2)		6609	2217	5043		**4623**	

Table 5-30
Magna Metals Site
Biometrics for Benthics

Biological Impairment Criteria	Furnace Brook BS13(Reference)	Furnace Brook Downstream from Site		
		BS14	BS19	BS20
Taxa Richness (N)	21	20	18	19
Relative Density (No/M^2)	6580	1609	3043	1043
Dominant Taxa	*Limnodrilus*	*Procladius*	*Chironomus*	*Dicrotendipes*
Percent Dominant Taxa	51.8%	34.2%	62.4%	12.5%

*Site specific reference benthic communities present in Furnace Brook

Biological Impairment Criteria	Unnamed Tributary BS17(Reference)	Unnamed Tributary	
		BS16	BS15
Taxa Richness (N)	12	29	28
Relative Density (No/M2)	5087	3870	4623
Dominant Taxa	*Hydrobaenus*	*Limnodrilus*	*Thienemannimyia*
Percent Dominant Taxa	84.9%	29.6%	30.4%

*Site specific criteria reference benthic communities present in Unnamed Tributary

Table 5-31
Magna Metals Site
Ceriodaphnia dubia Surface Water Toxicity Test Results

Station	Location	*Ceriodaphnia dubia* Survival (Mean %)	*Ceriodaphnia dubia* Reproduction (Mean # Progeny Produced)
Control	N/A	100%	30.0
MM-SW-14	Furnace Brook	100%	30.7
MM-SW-19	Furnace Brook	100%	22.7*
MM-SW-15	Unnamed Tributary	100%	38.3
MM-SW-17[a]	Unnamed Tributary - Background	100%	32.2
MM-SW-21	Wetland South of the Unnamed Tributary	100%	33.6
MM-SW-22	Wetland North of the Unnamed Tributary	0%*	0*

Note:

[a] Background sample for samples taken from the Unnamed Tributary

* Statistically different from Laboratory Control (α=0.05)

N/A - Not Applicable

Table 5-32
Magna Metals Site
Chironomus tentans and *Hyalella azteca* Sediment Toxicity Test Results

		Chironomus tentans		*Hyalella azteca*	
Station	**Location**	Mean Survival (%)	Mean Weight (mg)	Mean Survival (%)	Mean Weight (mg)
Control	N/A	88.75%	1.0717	90.00%	0.0745
MM-SD-13[a]	Furnace Brook - Background	91.25%	1.0425	66.25%*	0.0371*
MM-SD-14	Furnace Brook	91.25%	0.7056*	67.50%	0.0489
MM-SD-19A	Furnace Brook	93.75%	0.6782*	87.50%	0.0918
MM-SD-15	Unnamed Tributary	91.25%	0.8619*	61.25%	0.0326*
MM-SD-17[b]	Unnamed Tributary - Background	90.00%	1.1075	65%*	0.0628*
MM-SD-21	Unnamed Pond	85.00%	0.9965	70.00%	0.0380
MM-SD-23	Unnamed Pond	81.25%	1.1643	67.50%	0.0737

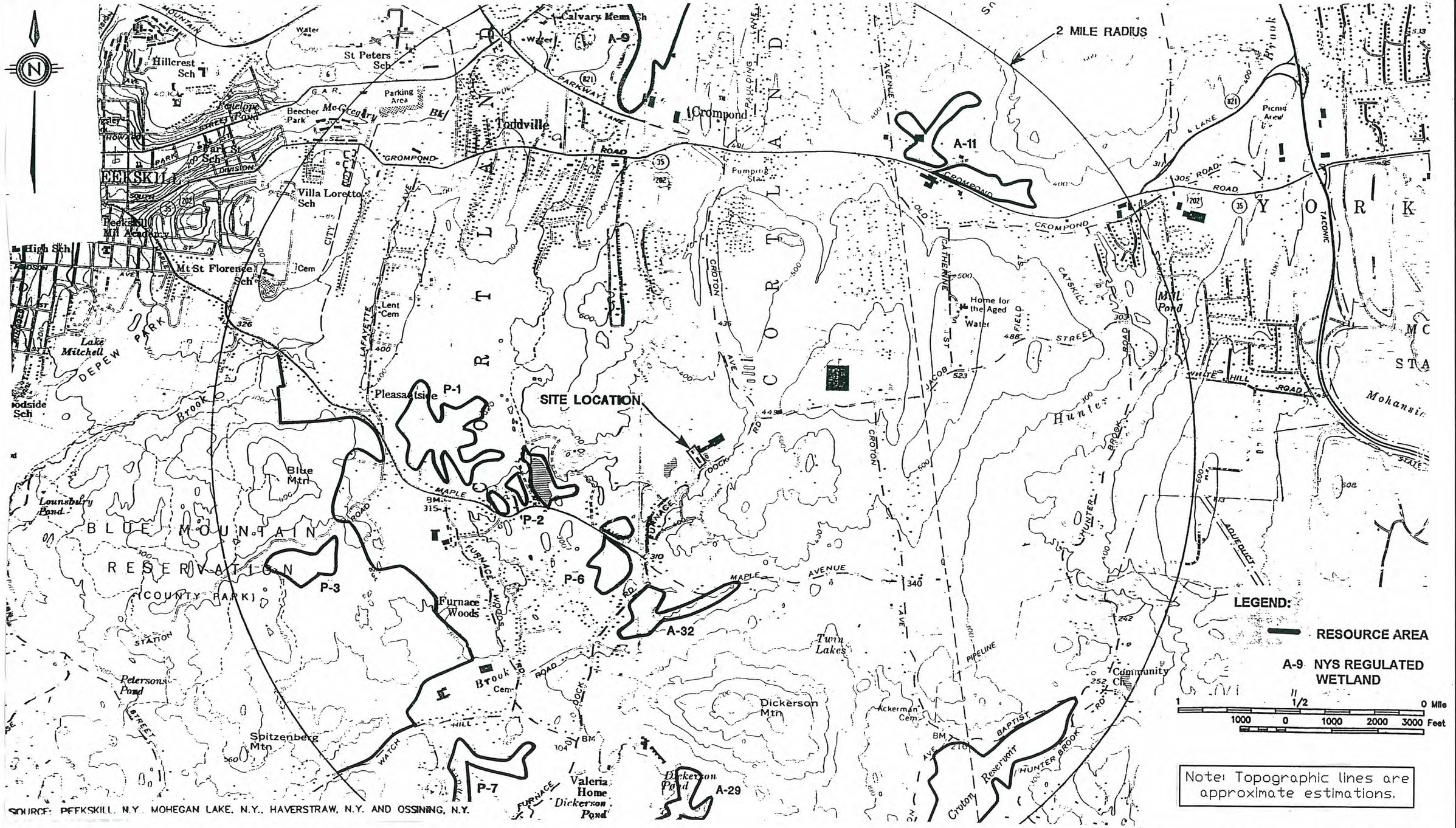
Note:

[a] Background sample for samples taken from the Furnace Brook

[b] Background sample for samples taken from the Unnamed Tributary

* Statistically different from Laboratory Control (α=0.05)

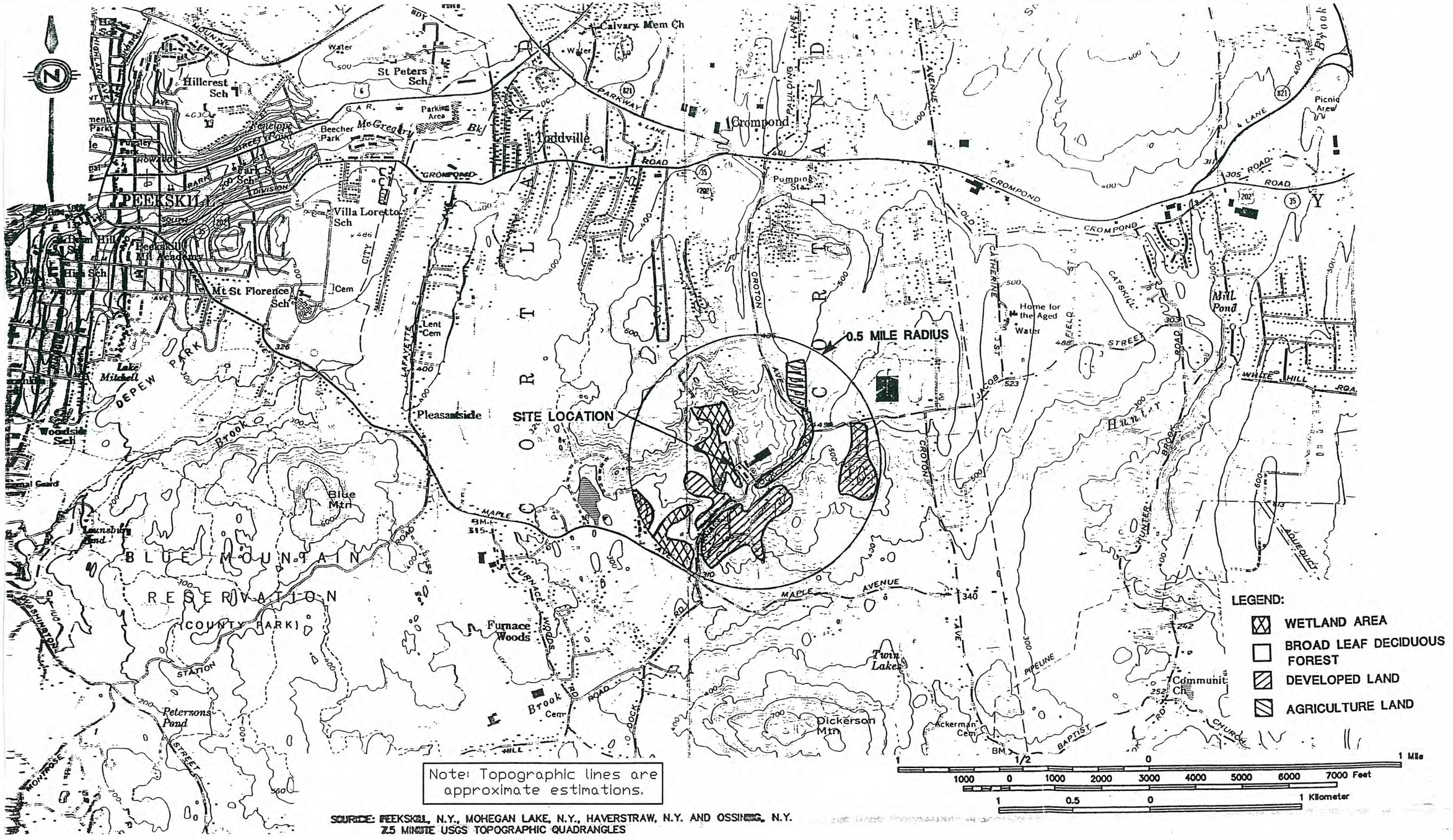
N/A - Not Applicable



TETRA TECH EC, INC.

TITLE:
Documented Fish and Wildlife Resources – 1998 RI Summary
Magna Metals
Cortlandt, New York

DWN.: LMB	DATE: 08/22/07	PROJECT NO.: 106-1172
CHKD:	REV.: 0	FIGURE NO.: 5-1
DES.:	APPD:	



Note: Topographic lines are approximate estimations.

SOURCE: PEEKSKILL, N.Y., MOHEGAN LAKE, N.Y., HAVERSTRAW, N.Y. AND OSSINING, N.Y. 7.5 MINUTE USGS TOPOGRAPHIC QUADRANGLES

TETRA TECH EC, INC.

TITLE:
Cover Type Map – 1998 RI Summary
Magna Metals
Cortlandt, New York

DWN.: LMB	DATE: 08/22/07	PROJECT NO.: 106-1172
CHKD:	REV.: 0	FIGURE NO.: 5-2
DES.:	APPD:	

LEGEND

- SS-01 ▲ PHASE I SURFACE SOIL LOCATION
- SW/SD-01 ● PHASE I SURFACE WATER AND SEDIMENT LOCATION
- SB-01 ● PHASE I SOIL BORING LOCATION
- LP-02 ▽ LEACH PIT LOCATION
- MW-01 ◈ MONITORING WELL LOCATION
- SW-15 ⊕ SUPPLEMENTAL RI SURFACE WATER SAMPLE OR ELEVATION LOCATION
- SD-15 ◆ SUPPLEMENTAL RI SEDIMENT SAMPLE LOCATION
- SS-08 ■ SUPPLEMENTAL RI SURFACE SOIL SAMPLE LOCATION
- RA ● SUPPLEMENTAL RI SOIL BORING LOCATION
- 320 CONTOUR LINE (20 FT INTERVAL)
- CROSS-SECTION A – A'
- GEOPHYSICAL SURVEY
- APPROXIMATE REFUSE AREA
- APPROXIMATE WETLAND AREA

NOTES:
1. PHASE I SAMPLE LOCATIONS AND SUPPLEMENTAL RI SOIL BORINGS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

3. LOCATIONS OF LEACH PITS AND SUPPLEMENTAL RI SURFACE WATER SAMPLES, SEDIMENT SAMPLES, AND SURFACE SOIL SAMPLES ARE BASED ON GPS COORDINATES.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

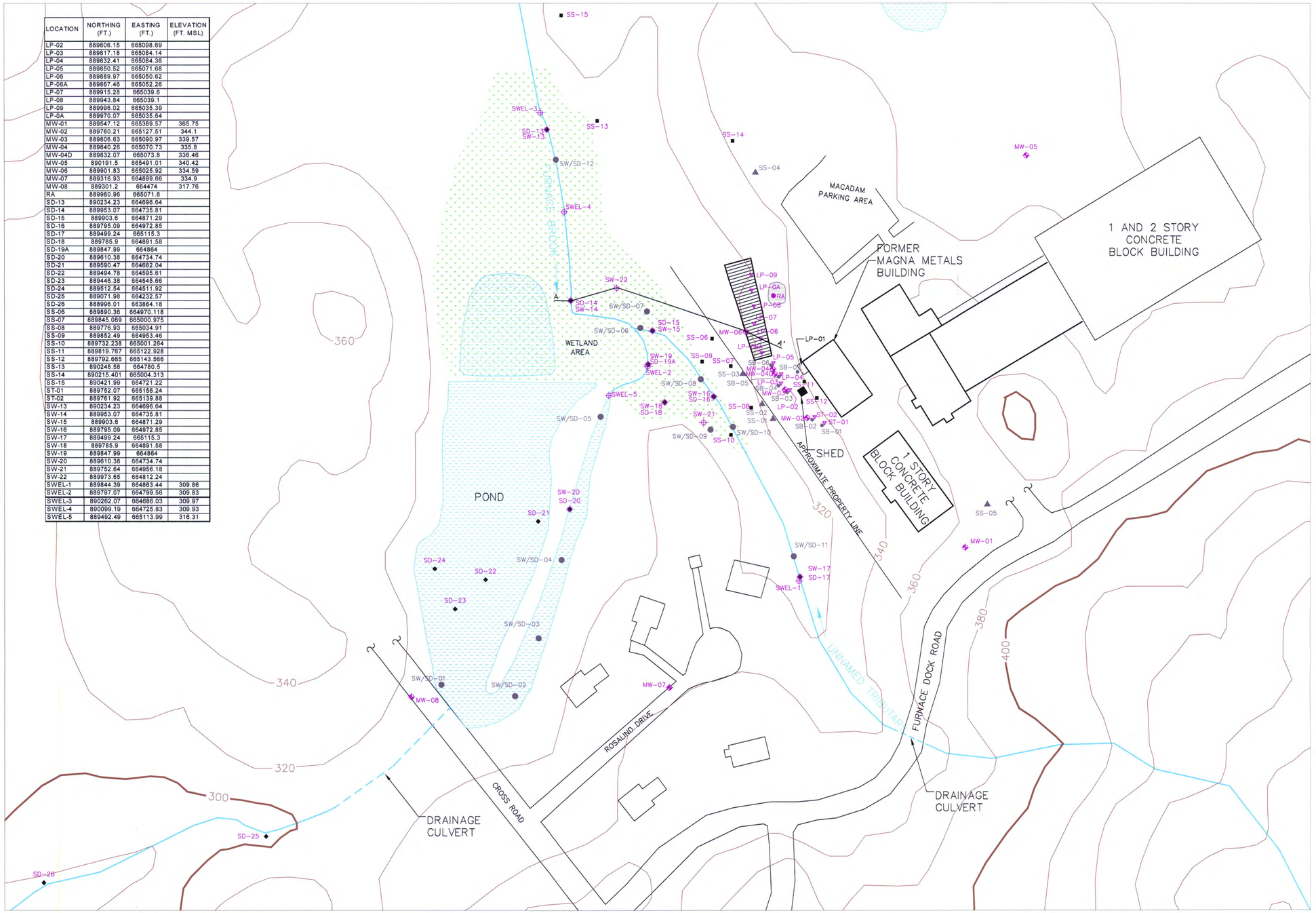
4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE ESTIMATIONS.

N

0 40 80
FEET

LOCATION	NORTHING (FT.)	EASTING (FT.)	ELEVATION (FT. MSL)
LP-02	889806.15	665098.69	
LP-03	889817.18	665084.14	
LP-04	889832.41	665084.36	
LP-05	889850.52	665071.68	
LP-06	889889.97	665050.62	
LP-06A	889867.46	665052.26	
LP-07	889915.28	665039.6	
LP-08	889943.84	665039.1	
LP-09	889996.02	665035.39	
LP-0A	889970.07	665035.64	
MW-01	889547.12	665389.57	365.75
MW-02	889760.21	665127.51	344.1
MW-03	889806.63	665090.97	339.57
MW-04	889840.26	665070.73	335.8
MW-04D	889832.07	665073.8	336.46
MW-05	890191.5	665491.01	340.42
MW-06	889901.83	665025.92	334.59
MW-07	889316.93	664899.66	334.9
MW-08	889301.2	664474	317.76
RA	889960.96	665071.6	
SD-13	890234.23	664696.64	
SD-14	889953.07	664735.81	
SD-15	889903.6	664871.29	
SD-16	889795.09	664972.85	
SD-17	889499.24	665115.3	
SD-18	889785.9	664891.58	
SD-19A	889847.99	664864	
SD-20	889610.38	664734.74	
SD-21	889590.47	664682.04	
SD-22	889494.78	664595.61	
SD-23	889446.38	664545.66	
SD-24	889512.54	664511.92	
SD-25	889071.98	664232.57	
SD-26	888996.01	663864.18	
SS-06	889890.36	664970.118	
SS-07	889845.089	665000.975	
SS-08	889776.93	665034.91	
SS-09	889852.49	664953.46	
SS-10	889732.238	665001.264	
SS-11	889819.767	665122.928	
SS-12	889792.665	665143.566	
SS-13	890248.58	664780.5	
SS-14	890215.401	665004.313	
SS-15	890421.99	664721.22	
ST-01	889752.07	665156.24	
ST-02	889761.92	665139.88	
SW-13	890234.23	664696.64	
SW-14	889953.07	664735.81	
SW-15	889903.6	664871.29	
SW-16	889795.09	664972.85	
SW-17	889499.24	665115.3	
SW-18	889785.9	664891.58	
SW-19	889847.99	664864	
SW-20	889610.38	664734.74	
SW-21	889752.64	664958.18	
SW-22	889973.65	664812.24	
SWEL-1	889844.39	664863.44	309.86
SWEL-2	889797.07	664799.56	309.83
SWEL-3	890262.07	664686.03	309.97
SWEL-4	890099.19	664725.83	309.93
SWEL-5	889492.49	665113.99	316.31



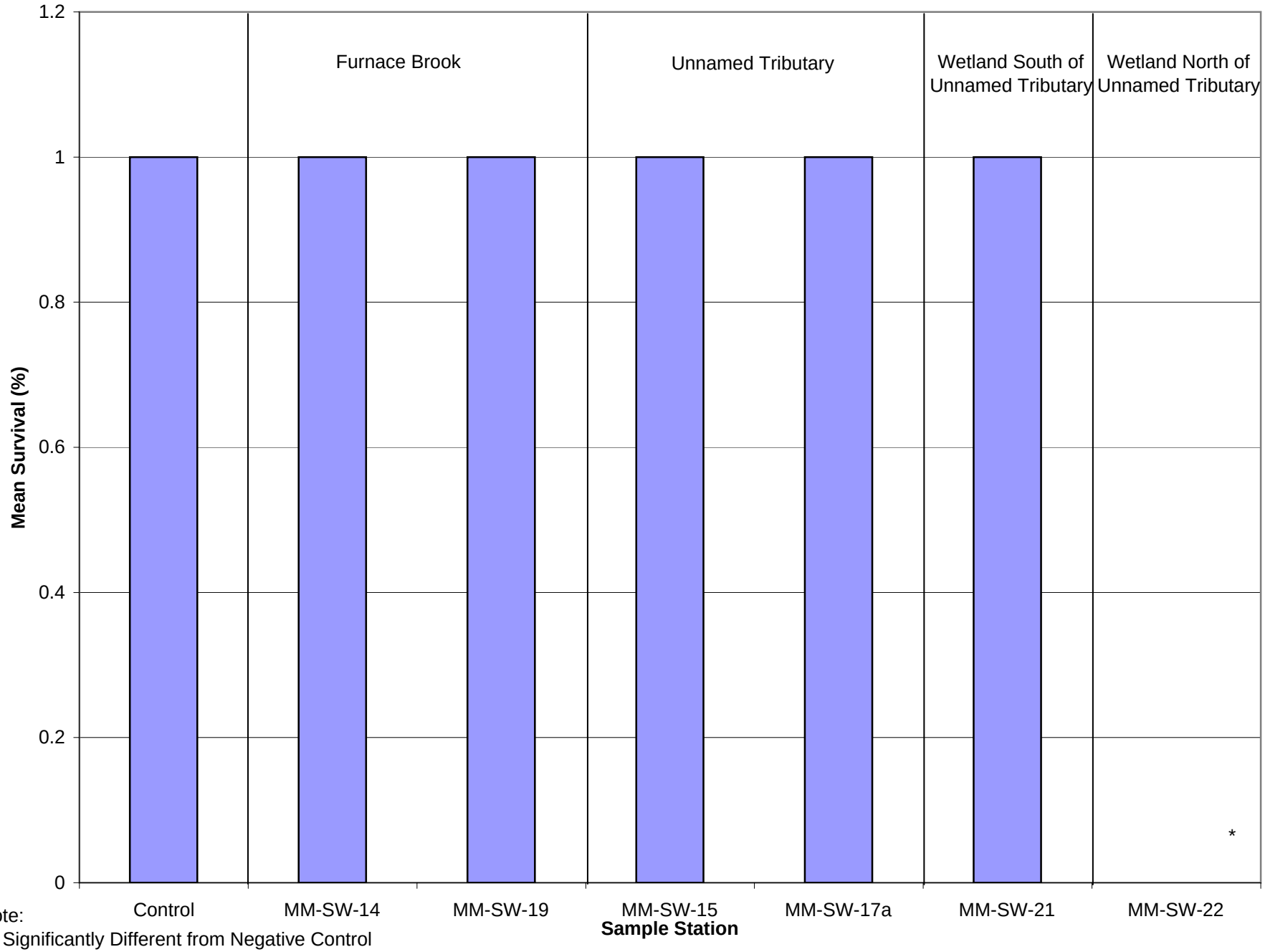
TETRA TECH EC, INC.

TITLE:
Sample Station Location Map – 2004 Supplemental RI
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
CTS	CTS	106-1172
CHKD:	APPD:	FIGURE NO.:
		5-3
DATE:	REV.:	
08/21/07	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\DRAFT FINAL RI\FIGURE 5-3 082407.DWG

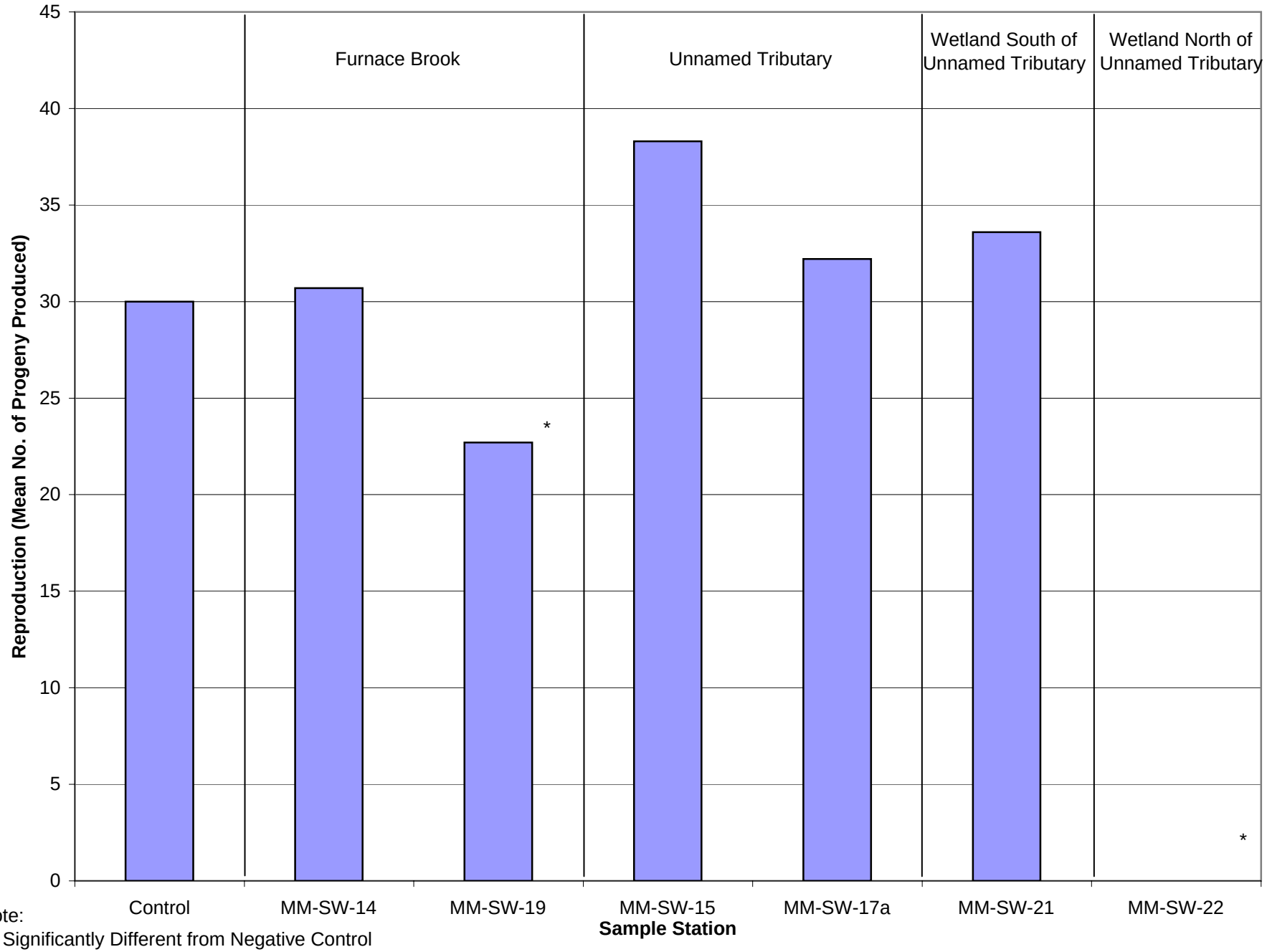
Figure 5-4
Magna Metals Site
Ceriodaphnia dubia Chronic Surface Water Toxicity Test Mean Survival



Note:
* - Significantly Different from Negative Control
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-4.xls.[Ceriodaphnia %]

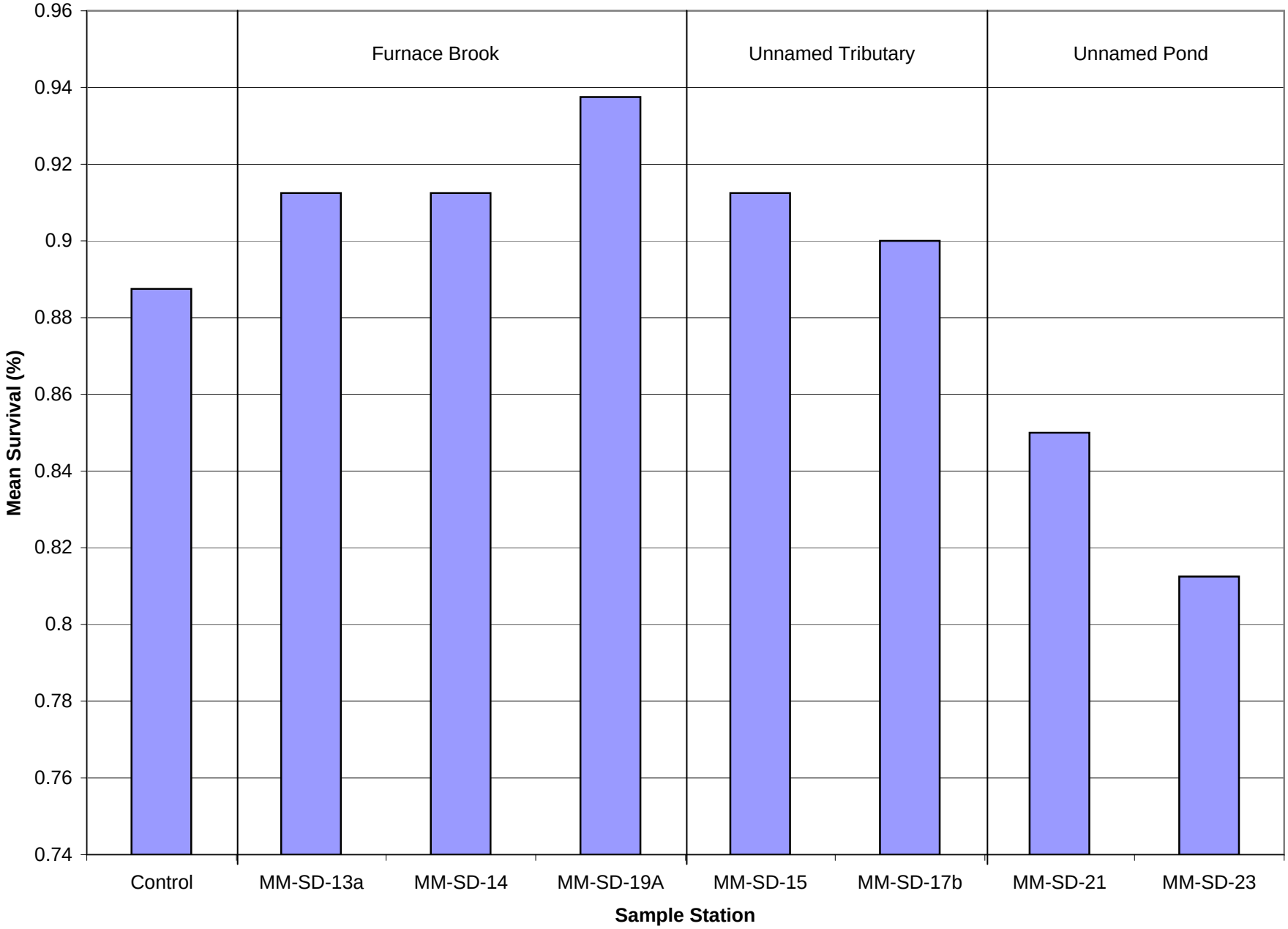
Figure 5-5
Magna Metals Site
Ceriodaphnia dubia Chronic Surface Water Toxicity Test Mean Reproduction Survival



Note:
* - Significantly Different from Negative Control
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-5.xls.[Ceriodaphnia.birth]

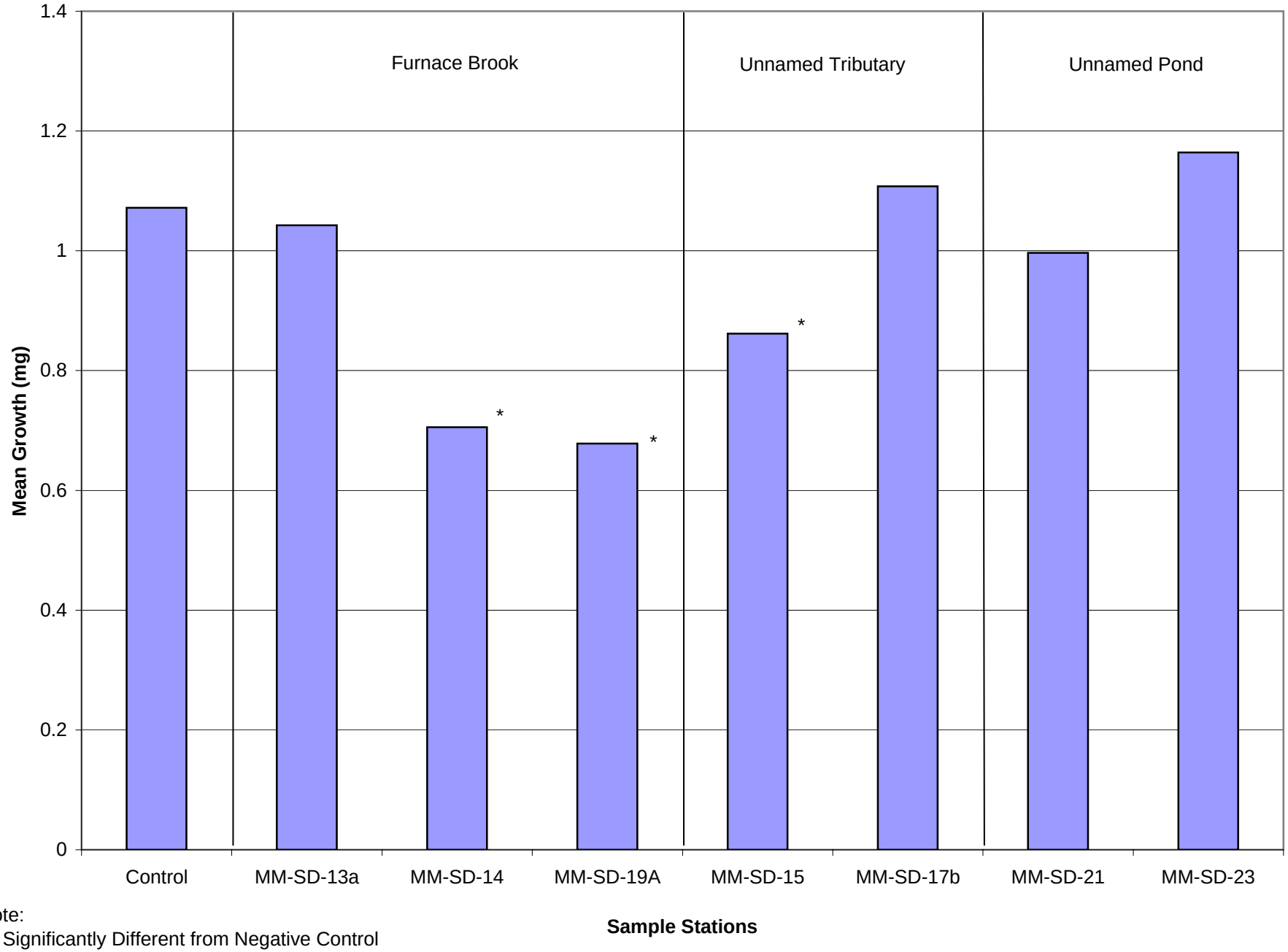
Figre 5-6
Magna Metals Site
Chironomus tentans 10-Day Whole Sediment Toxicity Test Mean Survival



Note:
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-6.xls.[Chironomid %]

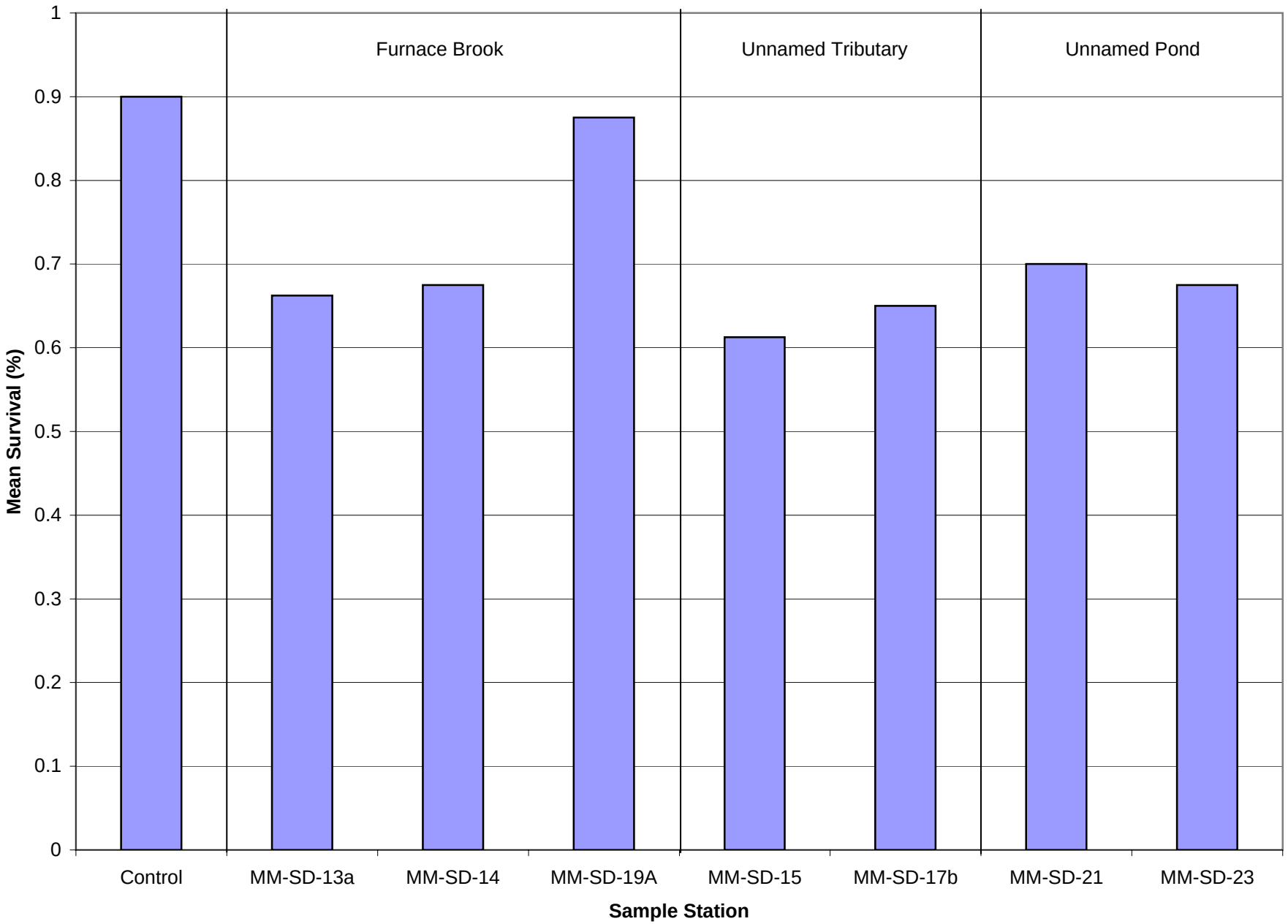
Figure 5-7
Magna Metals Site
Chironomus tentans 10-Day Whole Sediment Toxicity Test Mean Growth



Note:
* - Significantly Different from Negative Control
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-7.xls.[Chironomid Wgt]

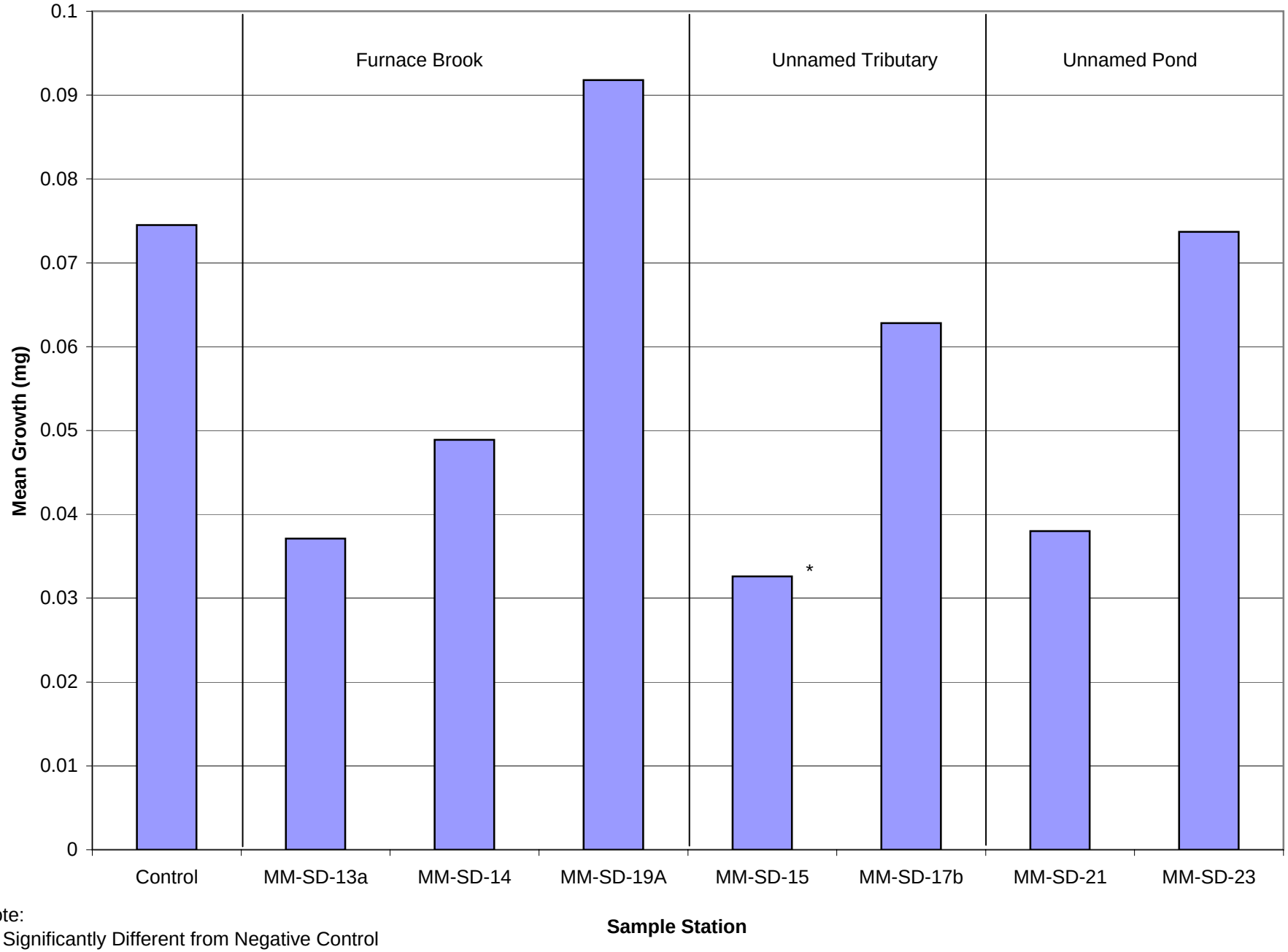
Figure 5-8
Magna Metals Site
Hyalella azteca 10-Day Whole Sediment Toxicity Test Mean Survival



Note:
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-8.xls [Hyalella %]

Figure 5-9
Magna Metals Site
Hyalella azteca 10-Day Whole Sediment Toxicity Test Mean Growth



Note:
* - Significantly Different from Negative Control
a - Background sample for samples taken from Furnace Brook
b - Background sample for samples taken from the Unnamed Tributary

Figure 5-9.xls [Hyalella wgt]

6.0 SUMMARY AND CONCLUSIONS

6.1 1998 RI/FS Summary

The chemical data collected indicated that the majority of media sampled, i.e., groundwater, surface water, surface soil, sediment, and subsurface soil were affected by organic and inorganic contaminants of concern.

Chlorinated VOCs (e.g., trichloroethene, cis-1,2-dichloroethene, vinyl chloride) were detected at concentrations less than 5 ug/L in the septic tank/leach pit water. VOCs were not present in the sludge from the tank/pit samples. This indicated a decrease from the WCHD and NYSDEC investigation events, as this class of VOCs had been present up to 15,000 ug/L in the tank/pit waters and 2,600 ug/kg in the sludge. A decrease of up to 7.2 times and 108 times in concentration of the chlorinated VOCs in surface water and sediments, respectively, was also noted. VOC occurrences were noted up to 18 ug/L (surface water) and 25 ug/kg (sediment). The groundwater beneath the former Magna Metals property contained concentrations of trichloroethene (maximum of 4,700 ug/L) and tetrachloroethene (maximum of 90 ug/L).

PAH constituents were detected in septic tank/leach pit sludge; containing 8 PAHs, at concentrations up to 1,500 ug/kg. In addition, concentrations greater than applicable criteria occurred in 7 of the 11 sediment samples (64 percent) and 1 of the 5 surface soil samples (20 percent). A majority of the maximum sediment concentrations (16 of 18) for this class of compounds occurred at location SD-1 (the drainage culvert). Runoff from nearby Cross Road Avenue may be a contributing factor to the culvert concentrations. Concentrations of PAHs less than 4 ug/L and 160 ug/kg, respectively, were detected in the surface water and subsurface soils.

Metals and cyanide were detected in the water and sludge samples from the tanks/pits. Exceedance concentrations for the inorganics were detected in the tributary (SW-6/SD-6) and wetlands (SW-7/SD-6 and SW-9/SD-9) samples. In addition, the surface soils, subsurface soils and groundwater samples collected downgradient from the tanks/pits contained inorganic exceedance concentrations.

Regarding groundwater, since on-site overburden monitoring wells had exceedances off-site overburden groundwater, on-site bedrock groundwater, and off-site bedrock groundwater, required additional investigation. Additional groundwater investigation was recommended based on exceedances of NYSDEC Water Quality Standards (Class GA) in two of the three downgradient overburden monitoring wells MW-03 and MW-04.

The Ecological Assessment, which incorporated surface soil, sediment, and surface water data, noted the following.

Down-gradient concentrations of the metals aluminum, copper, iron, mercury, zinc, and cyanide exceeded the NYSDEC Water Quality Standards, and selenium exceeded USEPA chronic and acute criteria in the surface water samples. Down-gradient levels of copper, nickel, chromium, and zinc surpassed the NYSDEC severe effect level for sediments. In the down-gradient surface soil samples, aluminum, chromium, copper, selenium, vanadium, and zinc were detected at concentrations that were greater than the screening benchmark concentrations. Concentrations of

aluminum, chromium, selenium, and vanadium were also higher than the screening benchmark concentrations in the background surface soil samples. In addition, levels of PCBs aroclor-1254 and aroclor-1260, and the semi-volatile organic compound di-n-butylphthalate exceeded the screening benchmark concentrations in the down-gradient surface soil samples.

Based upon these results, it was determined that removal of soils in the leach pit source area would eliminate the potential for exposure. These potential exposures were:

- Surface drainage from the site is directed into adjoining wetlands and streams deemed as sensitive environments (including a NYSDEC regulated wetland) supporting ecological receptors. Given that the principal fate and transport mechanism for site-related contaminants is the surface water pathway, the potential for exposure of ecological receptors to site-related contaminants was viable.

- Elevated concentrations of aluminum, chromium, copper, selenium, vanadium, and zinc were associated with on-site surface soils. While present at elevated concentrations, the developed nature of the site (warehouse/office building/parking lot) limits the surface soil exposure pathway for most ecological receptors. However, contaminated soils may function as a potential source for exposing ecological receptors downstream via erosion and runoff into adjoining streams and wetlands.

- Site-related contaminants including aluminum, copper, iron, mercury, zinc, and cyanide were present in surface water at elevated concentrations above background and corresponding acute and chronic AWQC in the adjoining streams and wetlands.

- Site-related contaminants including copper, nickel, chromium, and zinc were present in the sediments at concentrations above background and corresponding low and severe sediment quality criteria in the adjoining streams and wetlands.

A Step IIC Toxic Effects Analysis was recommended, which would focus on the aquatic communities, surface water and sediments of the tributaries and adjoining wetlands to determine if the potential exposure to site-related contaminants were impacting aquatic communities.

6.2 2004 Supplemental RI Summary

The 2004 Supplemental RI noted the following:

<u>Leach Pits/Tanks</u>

- Thirteen leach pits/septic pits had been discovered at the Magna Metals Site. The total number found was greater than anticipated based on NYSDEC and WCHD archival information.

- There appeared to have been two phases of leach pit construction at the site. The first and older set of leach pits is constructed of concrete cinder blocks with apparently a soil or gravel bottom. Leach pits of this construction are ST-02, LP-02, LP-03, LP-04, LP-05, and LP-06A.

- The second and newer set of leach pits is constructed of prefabricated concrete cylinders with perforated sides and apparently soil or gravel bottoms. Leach pits of this construction are LP-06, LP-07, LP-08, LP-0A, and LP-09. It appears that the pipe exiting from LP-06A was abandoned and additional fill material added to the site prior to the construction of the newer set of pits. The newer set of leach pits ties into the older set of pits at leach pit LP-05.

- Sludge or sludge cakes are still present in 12 of the 13 pits at the site. The pits still containing sludge or sludge cake are ST-02, LP-02, LP-03, LP-04, LP-05, LP-06, LP-06A, LP-07, LP-08, LP-0A, and LP-09.

- Based on observations and investigations in the field, fluids flowed from ST-01 to ST-02 to LP-02 to LP-03 to LP-04 to LP-05 to LP-06A. After abandonment of the pipe leading from LP-06A, flow proceeded from LP-05 to LP-06, to LP-07, to LP-08, to LP-0A to LP-09. LP-09 appears to be the end of the leach pit line, as no pipe exits this pit.

Stream and Wetlands

- Based on inorganic analytical results (particularly copper) for the surface water sample collected at location SW-22, groundwater samples collected from monitoring wells MW-04 and MW-04D, and surface soil samples collected downgradient of the leach pit area and the former Magna Metals building (SS-06, SS-07, SS-08, SS-09, SS-10, SS-11, and SS-12) the wetlands east of Furnace Brook and the unnamed tributary are impacted.

- The Step IIC Toxic Effects Analysis confirmed impacts to pelagic and benthic aquatic life were observed in indigenous and laboratory based analyses. The primary environmental media of concern are surface waters and sediments of Furnace Brook, its unnamed tributary, and the palustrine wetlands associated with the site.

In general, concentrations and distributions of contaminant compounds and analytes detected during the 2004 Supplemental RI were consistent with contaminant concentrations and distributions detected and presented in the 1998 RI/FS. The 2004 Supplemental RI analytical results indicate that all media sampled are affected by either organic or inorganic contaminants of concern at concentrations above criteria. In particular, TCE, PAHs, and Metals.

6.3 2006 Data Findings

The 2006 additional investigation included the collection of groundwater samples from existing wells MW-02, MW-03, MW-04, MW-06; installation of two new wells next to the former Magna Metals building, MW-09 and MW-10; and an additional new well, MW-11, approximately 200 feet north of the former Magna Metals building and adjacent to Leach Pit LP-09. Soil vapor samples were also collected from three exterior locations along the western side of the office/warehouse building, five exterior locations within the area containing the leach pits, and one interior sub-slab sample from the building south of the Magna Metals building and the office/warehouse building.

The sampling results indicated that groundwater collected from the two new monitoring wells, MW-9 and MW-10, did not contain contaminants above NYSDEC water quality standards. One hundred and ninety ppb of TCE was detected in well MW-11, located near Leach Pit-09. MW-11 sample groundwater results were consistent with previous data that is, groundwater adjacent to the leach pits is impacted.

Soil gas results indicated a response to a TCE concentration of 59 micrograms per cubic meter in one soil vapor sample (SV-03) that was collected next to the office/warehouse building. The soil gas sample results documented that VOCs were detected at concentrations ranging from 1 to 1,900 micrograms per cubic meter (ug/m^3).

6.4 2007 AKRF Soil Vapor and Indoor Air Investigation Findings

The following results were presented as part of the July 2007 Soil Vapor Investigation Report, AKRF and are presented herein as an overview. No indoor air samples contained TCE above the air guidance value of 5 ug/m^3 in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance. Although there was no evidence of exposure to workers at the site based upon the indoor air sampling results, the elevated concentrations of TCE, and to a lesser extent 1.2-DCE and toluene, were detected in the sub-slab soil gas (SV-11 and SV-12) beneath the Polymedco office area. (AKRF, July 2007). For additional detail, please refer to the July 2007 AKRF report.

6.5 RI Completion

Over the course of the RI, several key issues became apparent. These included the following:

(i) locating the source of groundwater contamination.

Sample data from the 1998, 2004 and 2006 reports consistently showed that the source of the groundwater contamination was the former leach pits. Data from the borings and wells installed closest to the former Magna Metals building did not suggest that an additional or larger groundwater plume source is present. Due to the weakened structural nature of the former Magna Metals building, ISCP's consultant was unable to obtain sample data directly below the floor. Therefore, as part of the FS, the alternative addressing leach pit/soil removal will include building demolition and post-demolition confirmation sampling of subsurface conditions. The alternative will include an estimate of quantities and costs for potential removal of soils below the building floor. The FS alternatives will develop soil excavation quantities based on the known depth to bedrock (which is relatively shallow, approximately 10 x 15 feet) and known aerial extent of contamination which has been already documented within the 1998, 2004, and 2006 reports.

(ii) defining the extent of the groundwater plume.

Over the course of three field investigation events which included monitoring well installation, it became evident that the groundwater plume is defined to a narrow aerial extent extending from the former Magna Metals building area to the steep slope where overburden is terminated. The plume extends along the leach pit system, as expected, as these structures apparently discharged directly, or through a series of pipes into the overburden. No evidence of off-site overburden or

off-site bedrock groundwater contamination was found. The aerial limit of the groundwater plume appeared to be limited to the site property.

(iii) ensuring all underground structures have been located.

After extensive investigation efforts involving two ground cover clearing events, two geophysical studies, a soil boring program, and mechanical/hand dig excavation effort, 13 leach pits/tanks were located in what appeared to be two historic phases of leach pit construction at the site. Interconnections between the pits were hand excavated and significant understanding of their historic operation was derived from the investigation efforts. The actual number of pits were significantly more than identified in historic NYSDEC and WCHD archival materials. As part of the FS alternative, all soils will be removed surrounding the pit area. A figure detailing the soil removal "box" will be presented in the FS based on the leach pit configuration, as previously shown on Figure 2-2 and the known depth to bedrock. The soil removal look will include the leach pit area, and soils on the slope surface as data indicated that the surface soils adjacent to the leach pit and down the slope had exceedances. The alternative will also include following all piping emanating from the pit, even beyond the "box" to fully ensure that soil remediation will be effective. As discussed in (i), the FS alternatives will also include soils beneath the former Magna Metals building floor.

(iv) fully delineating the nature and extent of soil contamination.

Subsurface soils and surface soils have been delineated. As discussed in (i) and (iii) contaminated soils will be included in the FS alternatives for removal. The horizontal extent of subsurface and surface soil contamination is essentially aligned with the leach pit configuration. The bedrock, which is relatively shallow, will be used in the FS alternative, as the bottom for soil excavation depths. The FS alternatives will include post-excavation confirmatory sampling.

(v) collecting additional sediment data points for ecological conformation of PRGs.

The data demonstrated that impacts to plagic and benthic acquatic life were observed. Both surface water and sediment are primary environmental media of concern. Although the ecological studies did derive site-specific preliminary remedial goals, the FS will also include an alternative that will result in pre-release conditions and an alternative to remediate to the Lowest Effort Level (LEL) concentrations for metals at all impacted areas.

The Remedial Investigation is now determined complete. Sufficient data exists to update the FS portion of the 1998 RI/FS. A new Feasibility Study will be prepared and submitted in the Fall of 2007. The Feasibility Study will contain evaluation of various remedial options and considerations as well as estimated costs. In addition, the FS options for remedial action will denote aerial extent of soil and sediment removal on isopleth maps to better define the FS alternative removal box.

In order to address the soil vapor investigation findings, an indoor air and subslab vapor feasibility study will be prepared to address subslab vapor mitigation and to prevent potential future vapor intrusion at the site.

7.0 REFERENCES

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FINAL REMEDIAL INVESTIGATION REPORT

FOR THE

FORMER MAGNA METALS SITE

(NYSDEC Site No. 360003)
TOWN OF CORTLANDT
WESTCHESTER COUNTY, NEW YORK

August 2007

PREPARED BY:

Tetra Tech EC, Inc.
1000 The American Road
Morris Plains, New Jersey 07950

INCORPORATING:

REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT
November 1998

DRAFT SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
June 2004

DATA FINDINGS FROM THE ADDITIONAL DATA COLLECTION LETTER REPORT
June 2006

VOLUME 2 OF 2

FINAL REMEDIAL INVESTIGATION REPORT

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June 2006

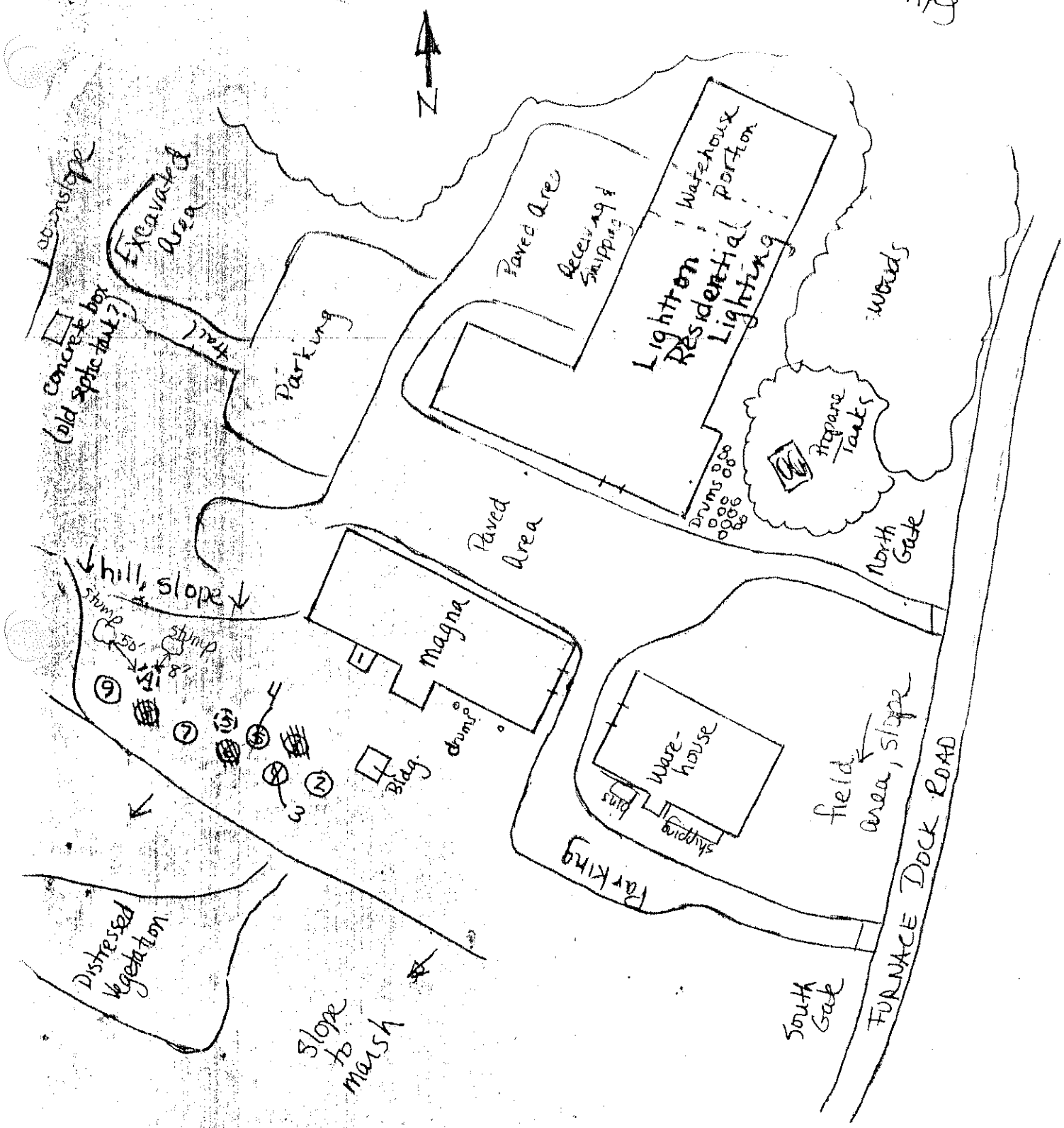
VOLUME 2 OF 2

APPENDIX A

NYSDEC HISTORICAL DOCUMENTATION

LIGHTRON / [illegible] / MAGNA

Site Sketch
8/19/87



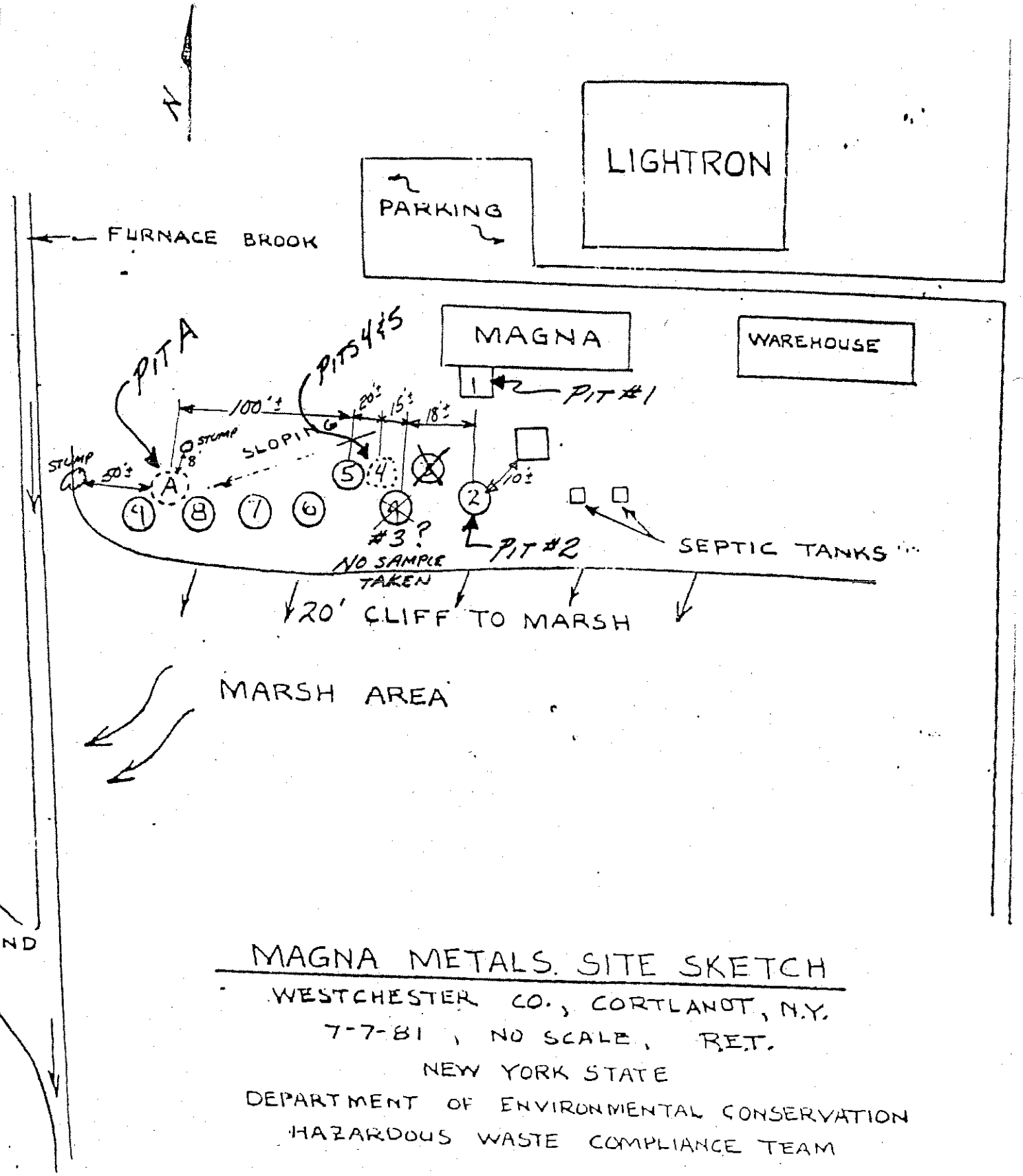
NOTE:
(5) revised location
pit not found
(4) 3 new number

Distances

(A) to (5)	100'
(5) to (4)	20'
(4) to (3)	15'
(3) to (2)	18'
(2) to bldg	10'

APPENDIX A

EXHIBIT A - APPROXIMATE LOCATION FROM WHICH SAMPLES WERE TAKEN ON 8/19/82



MAGNA METALS. SITE SKETCH

WESTCHESTER CO., CORTLANDT, N.Y.

7-7-81, NO SCALE, R.E.T.

NEW YORK STATE

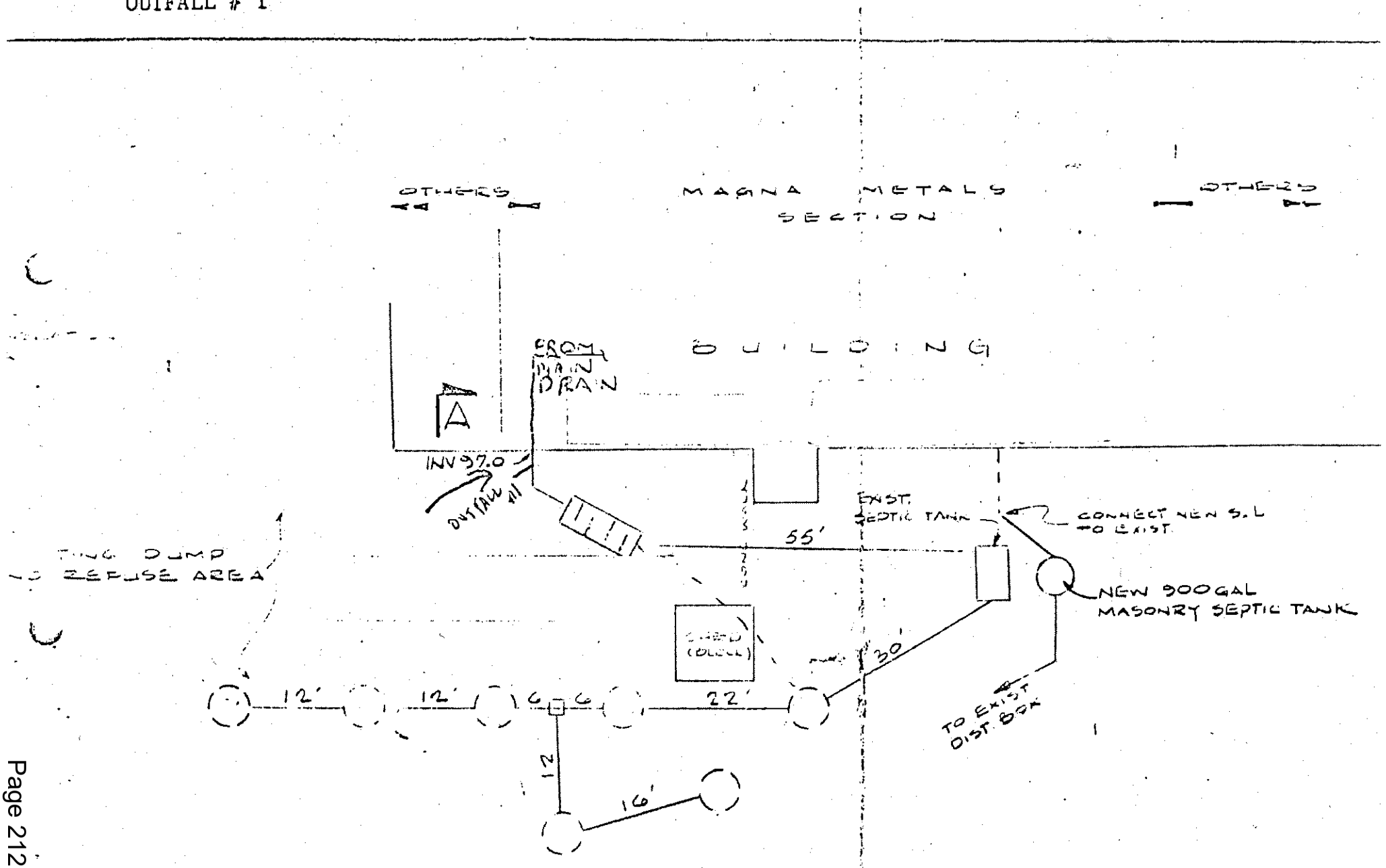
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE COMPLIANCE TEAM

SUBSURFACE DISCHARGE

OUTFALL # 1

FLOOR PL.



APPENDIX B

PHOTOGRAPH LOG OF LEACH PIT EXCAVATION FINDINGS



Photo 1: Geophysical Survey area (looking north) with Hager Richter targets flagged.



Photo 2: Leach pit LP-06 discovered via hand excavation methods during 2003/2004 RI/FS field activities.



Photo 3: Leach pit LP-07 discovered via hand excavation methods during 2003/2004 RI/FS field activities.



Photo 4: Leach pit LP-08 discovered via hand excavation methods during 2003/2004 RI/FS field activities.



Photo 5: Perforated PVC piping connecting leach pits LP-08 and LP-0A.



Photo 6: Leach pit LP-06A discovered using mini-excavator during 2003/2004 RI/FS field activities.



Photo 7: Coffee can blocking effluent pipe of leach pit LP-06A.



Photo 8: Desiccated sludge cake in leach pit LP-06.



Photo 9: Metal lamp debris uncovered during hand excavation activities.

APPENDIX C

GEOPHYSICAL REPORTS

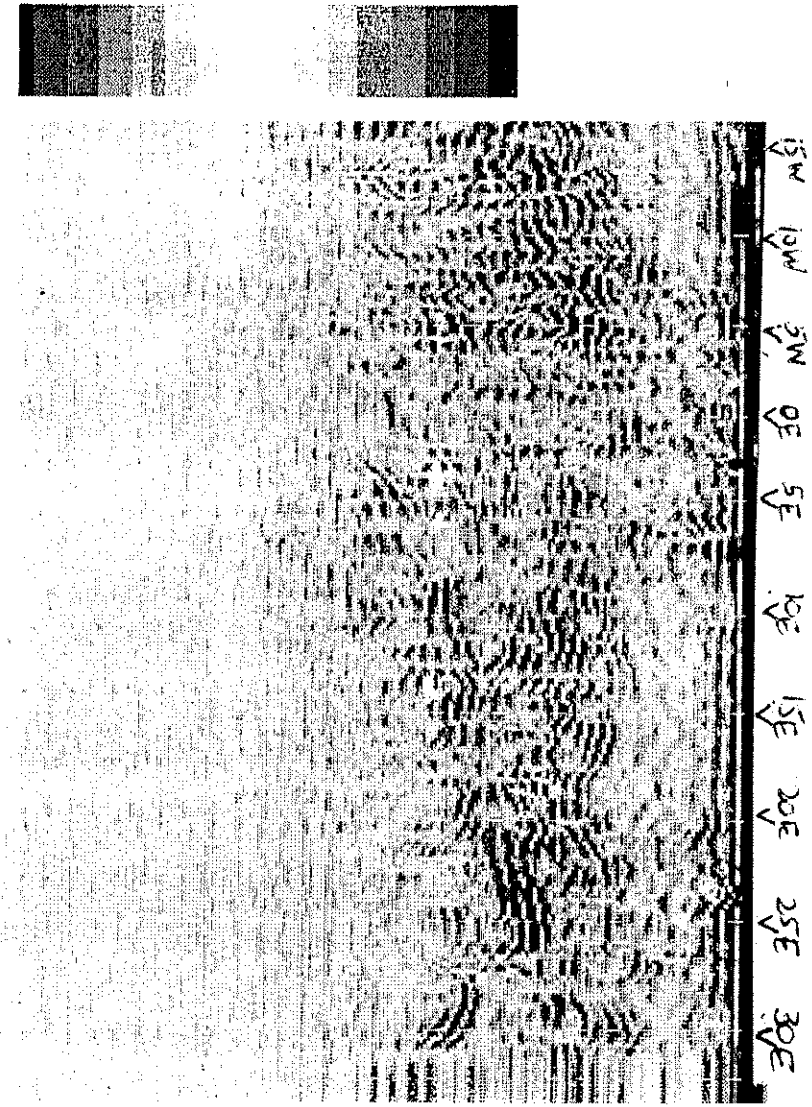
GPR DATA FINDINGS

A strong hyperbolic reflection was consistently observed in data along scans depicted in Files 28, 29, 31, 32, and 43 which may be attributed to subsurface pipe, or pipes, estimated to trend in a north-south direction, a distance of between 15 to 20 feet west of the former Magna Metals building (Figure 1). A characteristic signature of a subsurface tank was determined by collecting a number of scans (i.e., Files 10, 11, and 12) over a known location of a subsurface tank and comparing this signature to subsequent data collected. The raw GPR data collected over the site and within this appendix correspond to scan lines depicted in Appendix A, Figure 1. Also included in this map is a geophysical interpretation of the site in which suspected locations of subsurface tanks and potential appurtenant piping are displayed. An area of potential conductive material is displayed that was evidenced by an increase rate of EM attenuation. A shallow reflective zone is also displayed in the figure as evidenced along Files 13 and 14 at a depth of about three feet below ground surface. These findings were later used to guide the leach pit sampling program.

LE .11/21/96 13:39:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

osition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

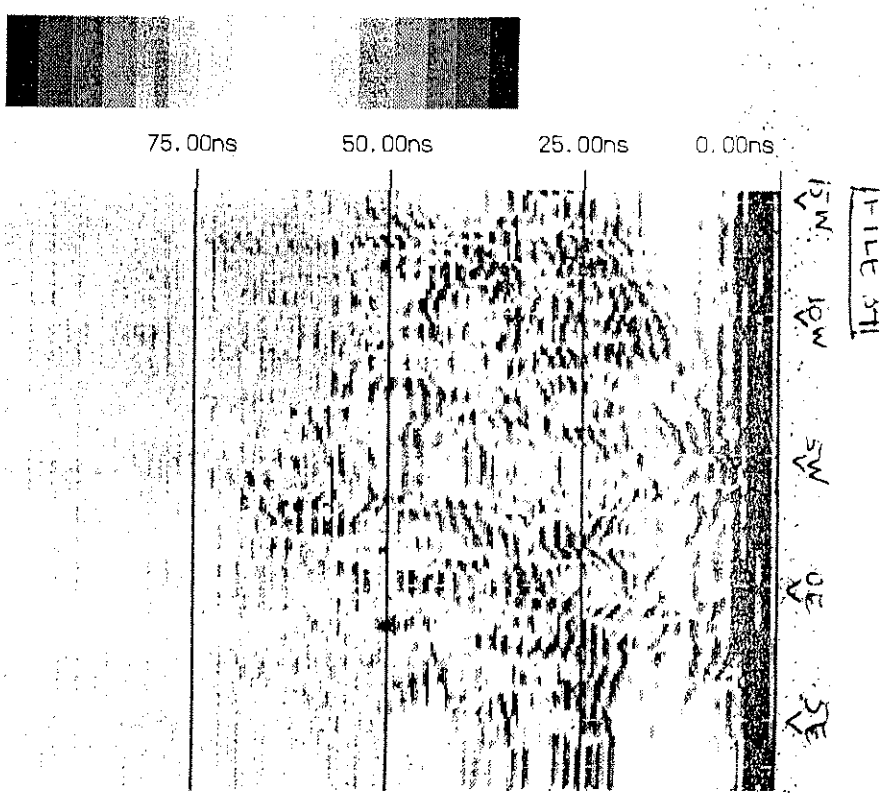


FILE 32

FILE34(11/21/96 13:45:52) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1

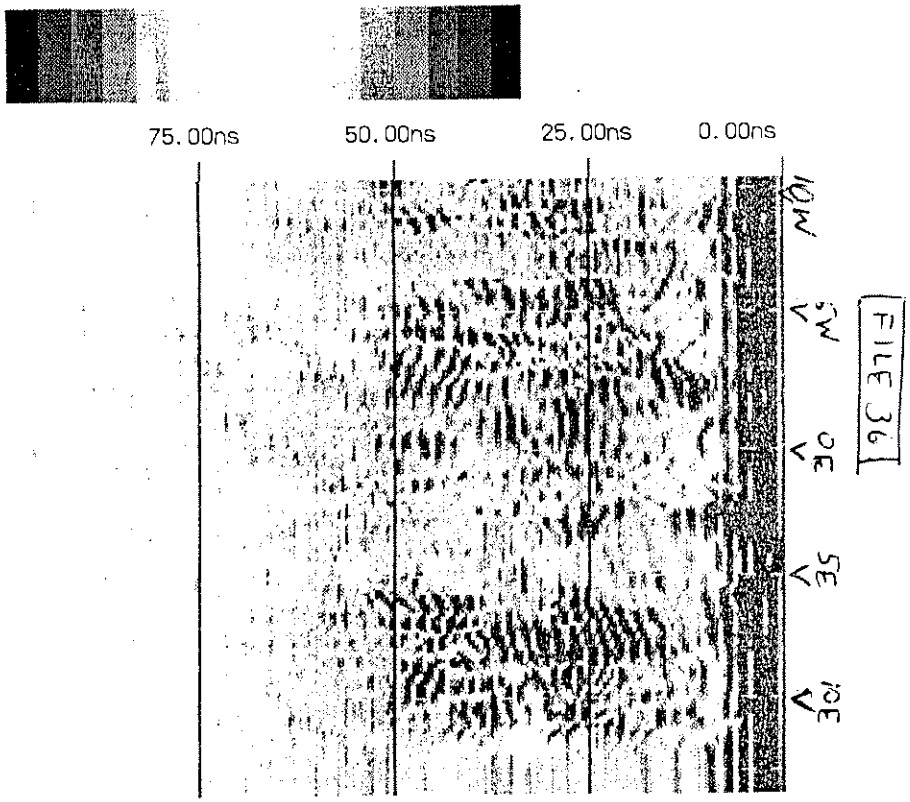


FILE 34

FILE36(11/21/96 13:50:52) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

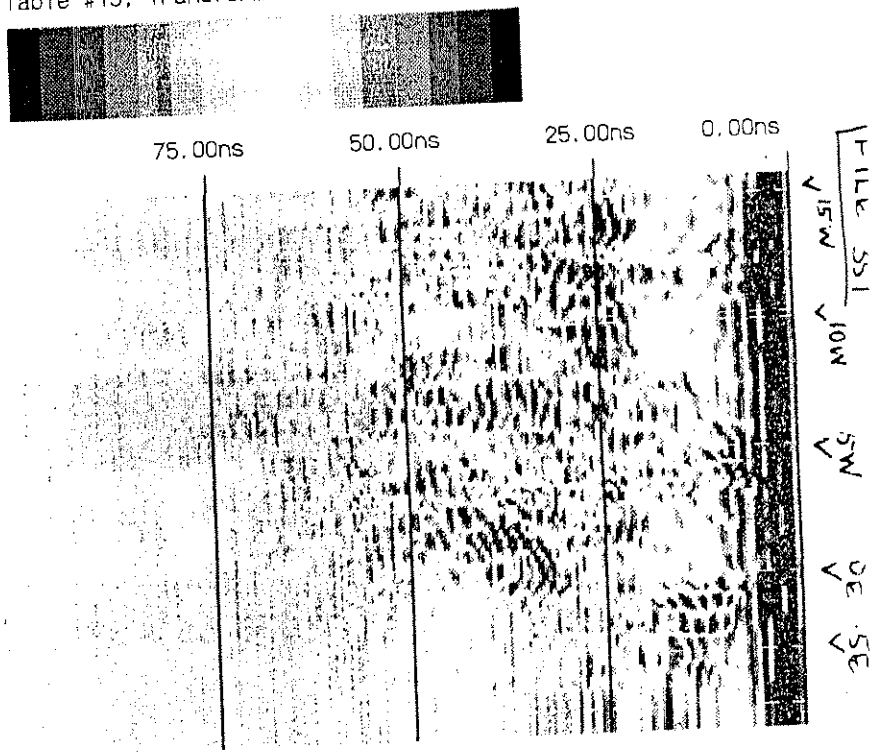
Table #15; Transform #1



FILE35(11/21/96 13:47:50) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

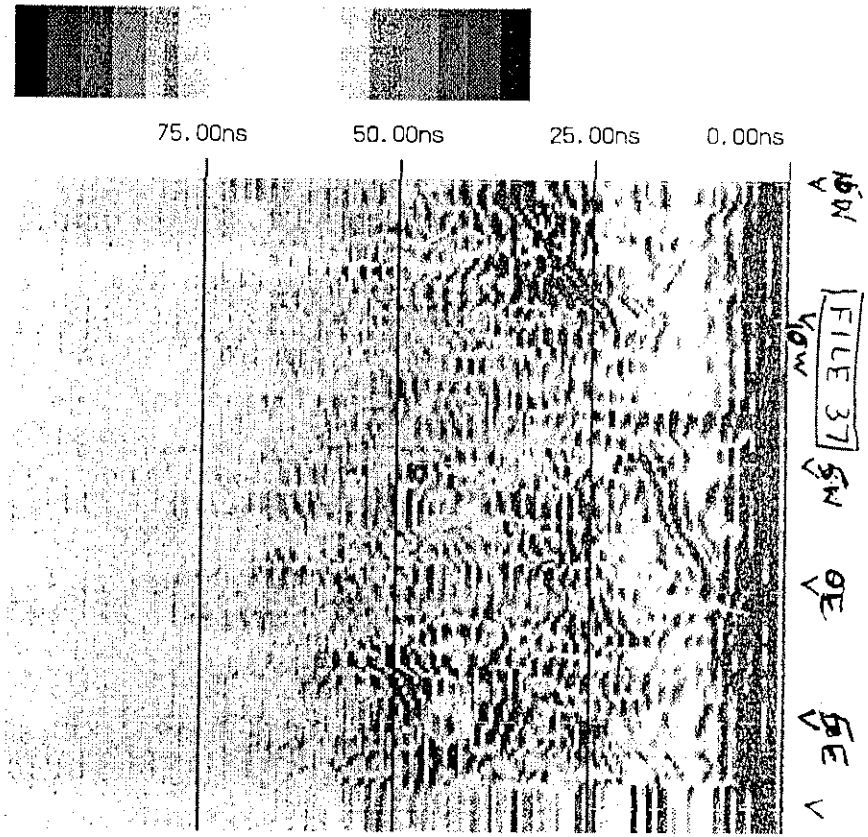
Table #15; Transform #1



FILE37(11/21/96 13:52:58) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

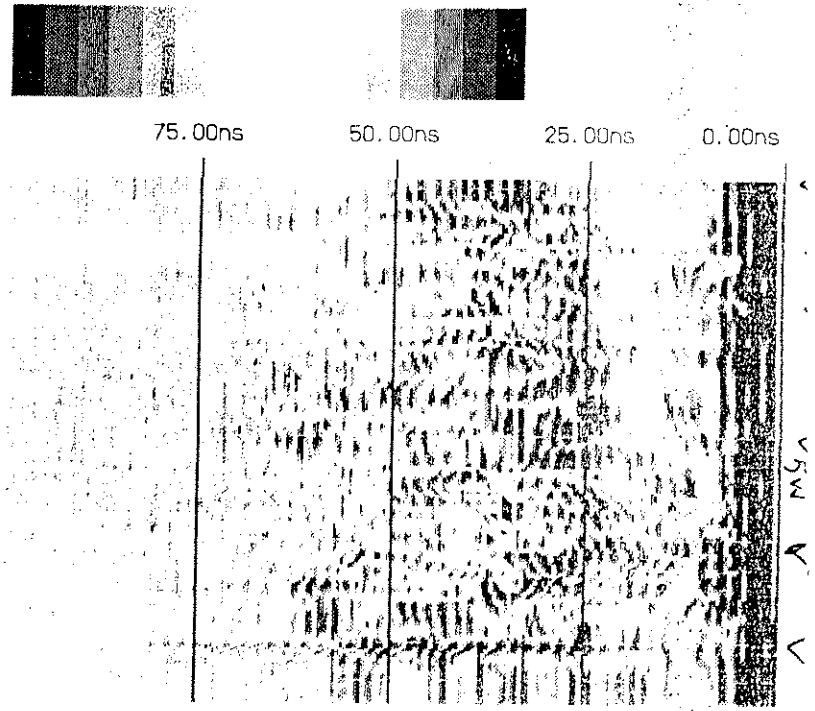
Table #15; Transform #1



FILE38(11/21/96 13:55:08) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1

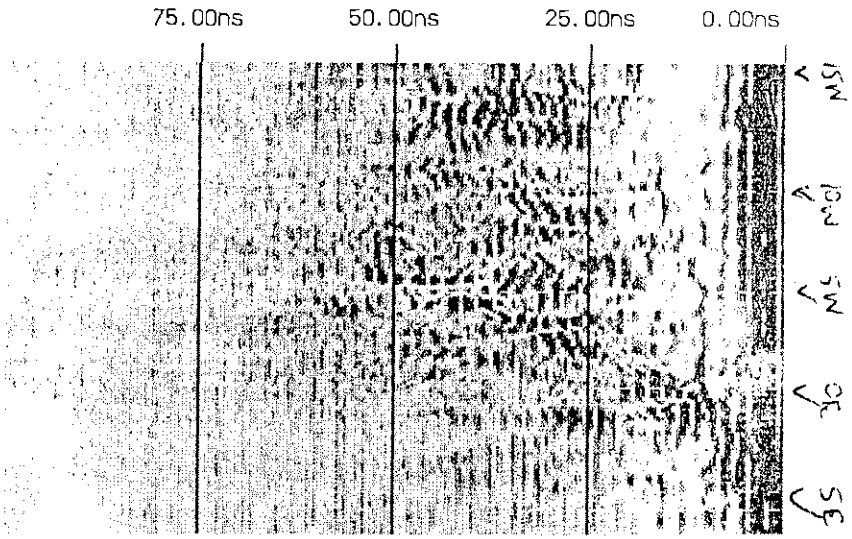


FILE39(11/21/96 13:56:22) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1





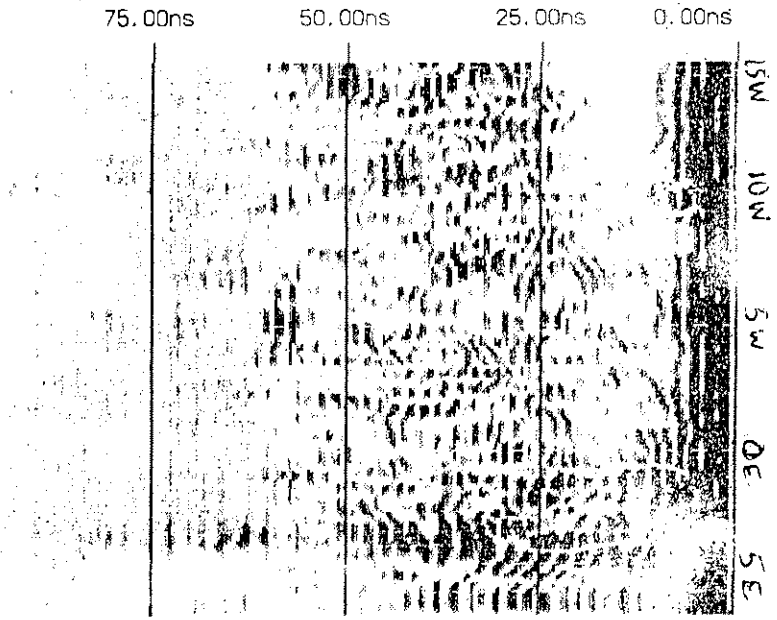
FILE 39

FILE 40(11/21/96 13:57:52) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1





FILE 40

FILE43

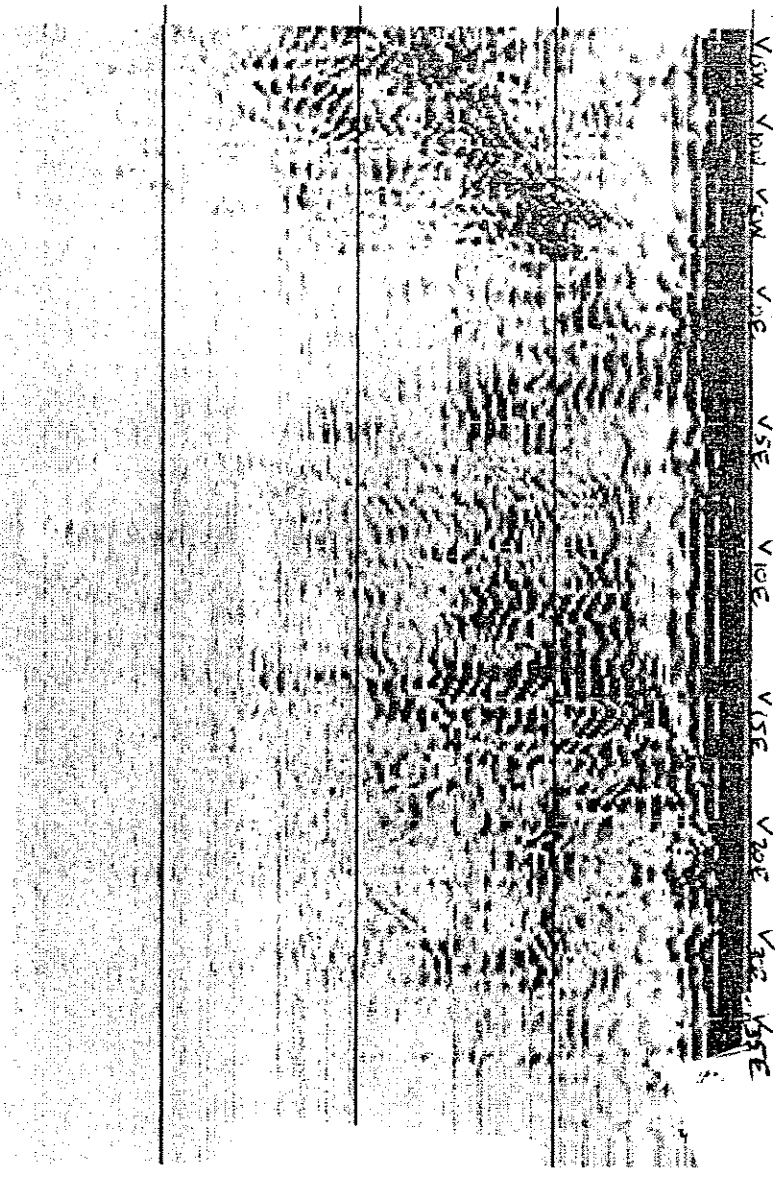
43(11/21/96 14:[illegible] 1024
Scan/Sec 16.0 Bits: 8
ectric: 1.00

tion: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15: Transform #1



75.00ns 50.00ns 25.00ns 0.00ns



FILE41

/96 14:00:12)

Scan/Sec 16.0 Bits: 8

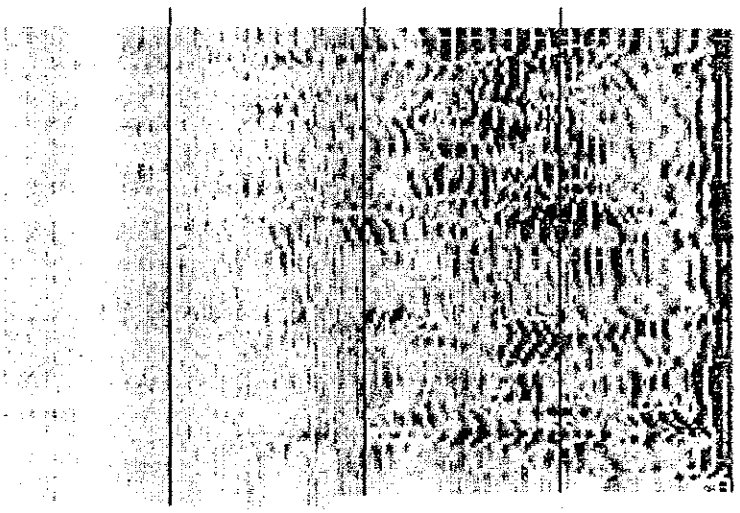
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ole #15: Transform #1



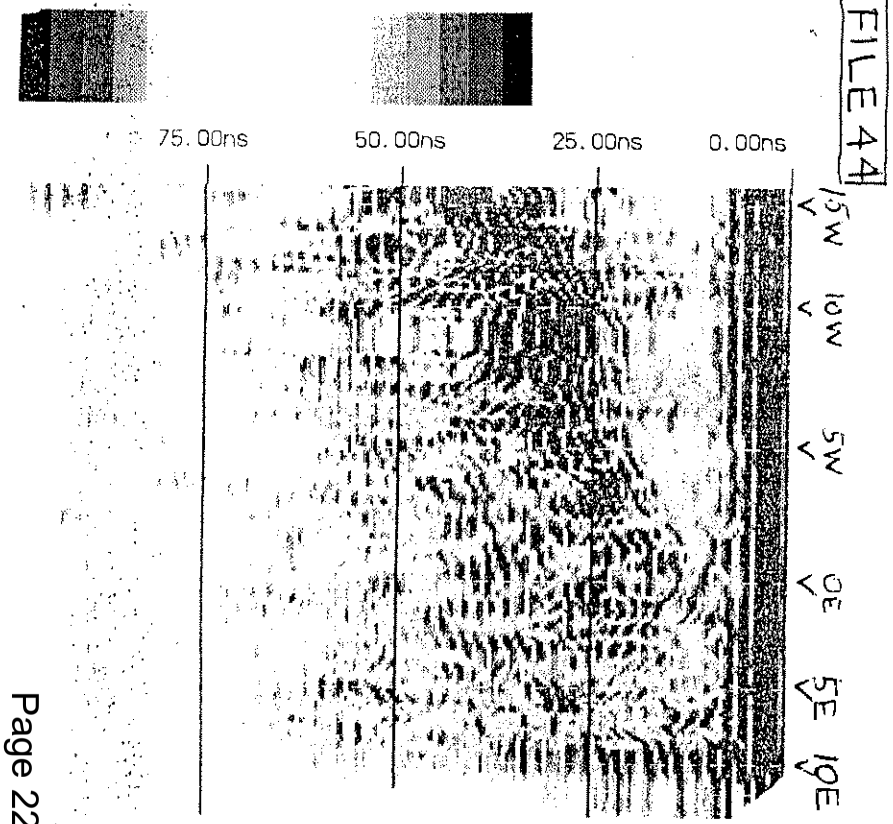
75.00ns 50.00ns 25.00ns 0.00r



FILE44(11/21/96 14:07:22) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1

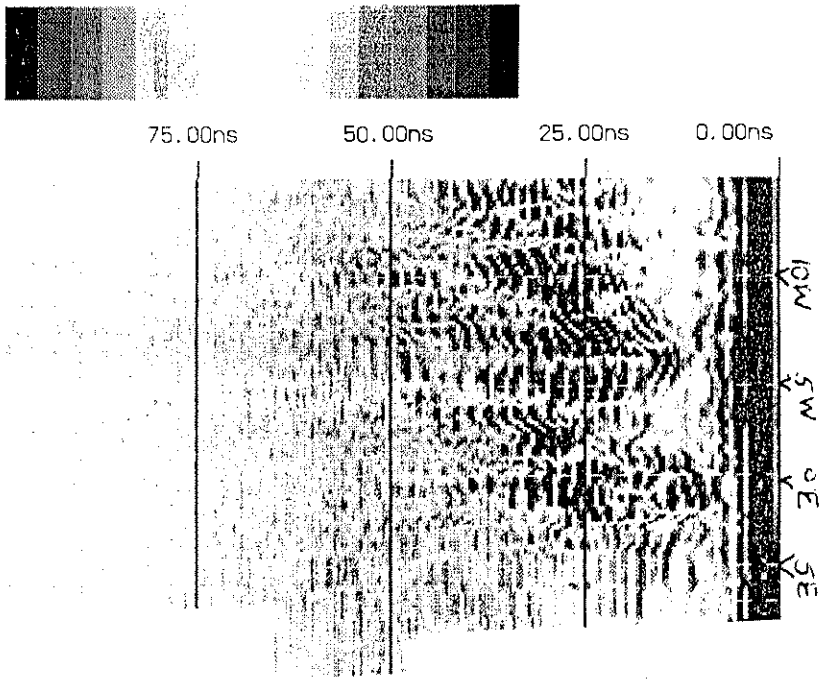


FILE 44

FILE42) 14:01:24) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

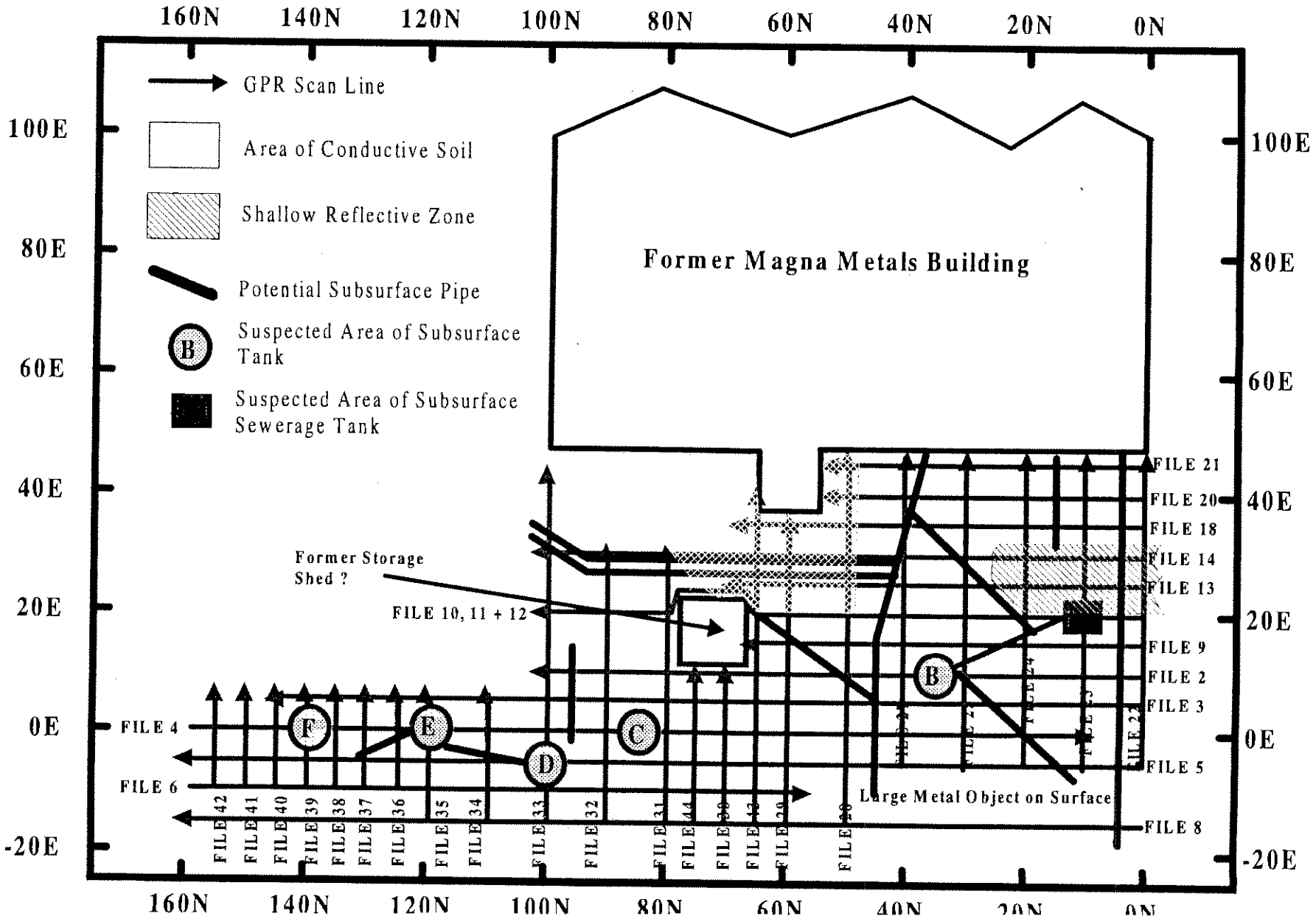
Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
V(IIR HP N=2 F=67)
H(IIR STK TC=4)

Table #15; Transform #1



FILE 42

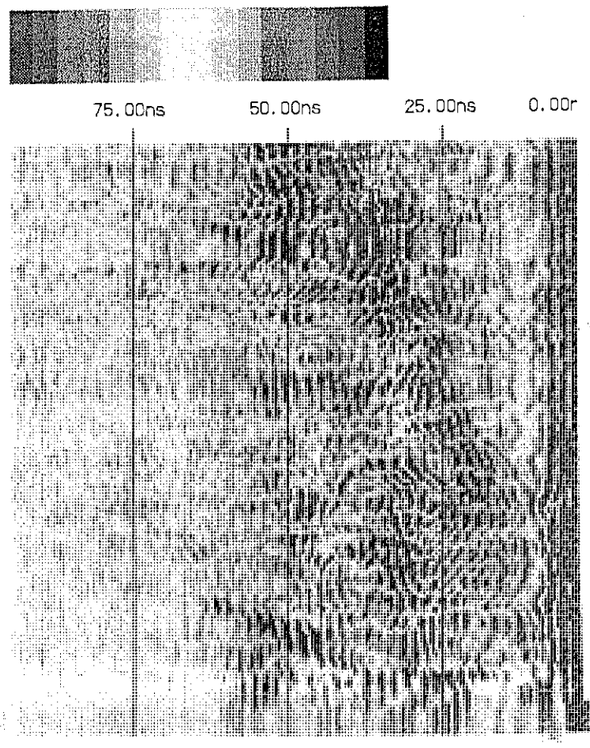
Figure 1: Map of Magna Metals Site Displaying GPR Scan Lines Conducted and and Subsurface Targets of Interest Detected.



E30(11/21/96 13:34:22) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15; Transform #1

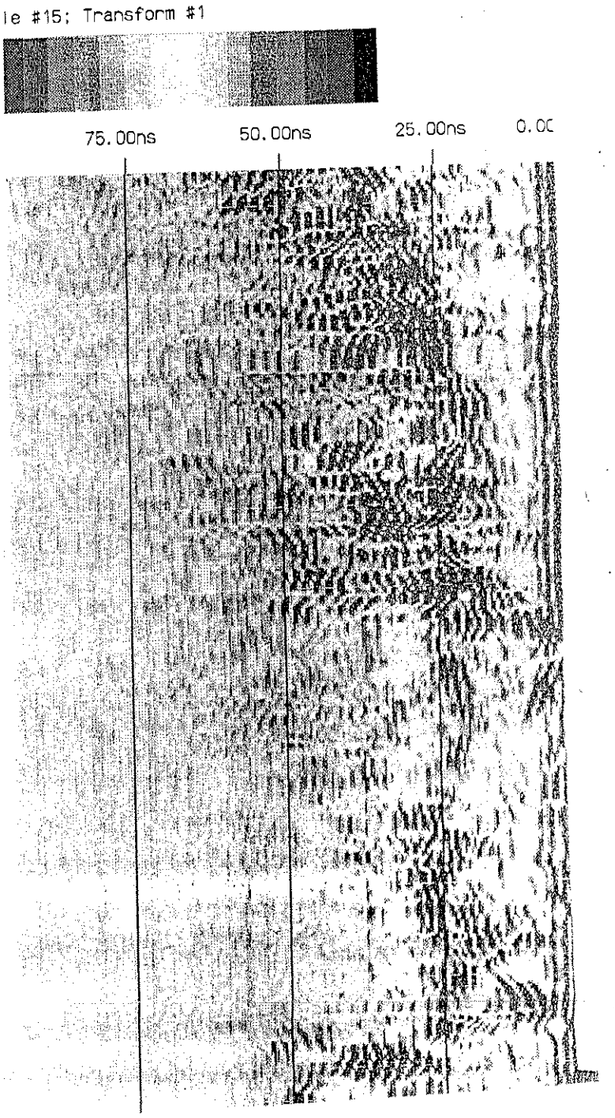


FILE 30

E31(11/21/96 13:36:12) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15; Transform #1

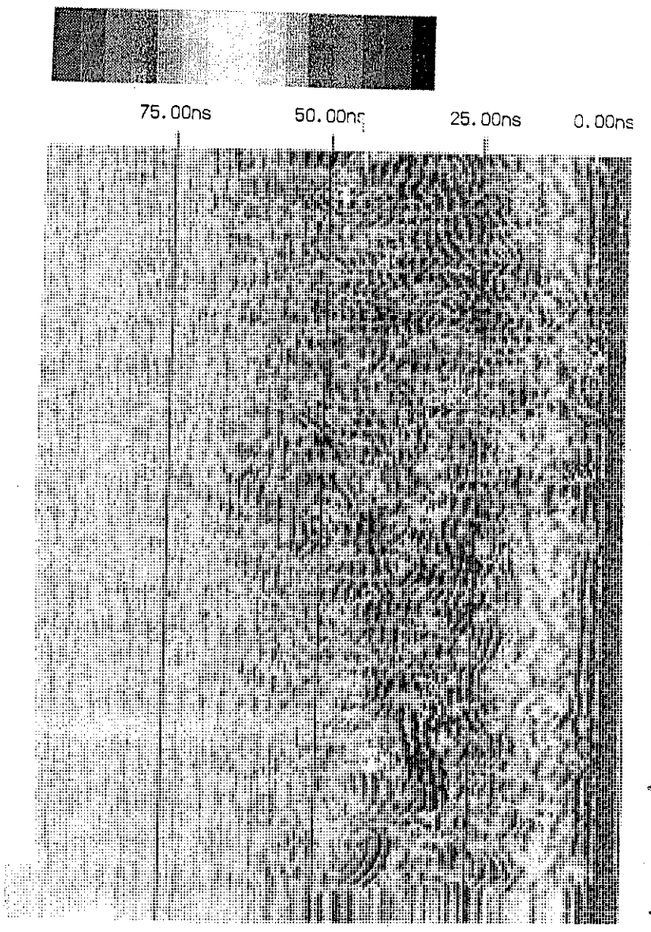


FILE 31

FILE32(11/21/96 13:39:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

ole #15; Transform #1

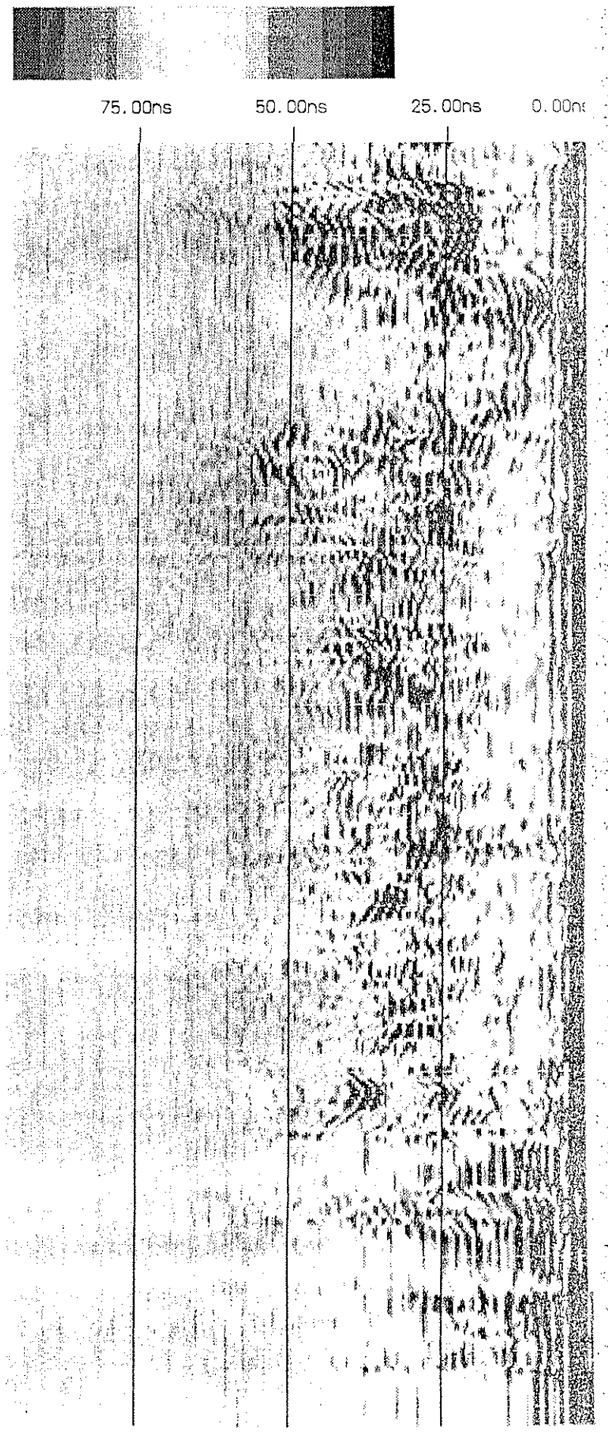


FILE 32

FILE33(11/21/96 13:42:12) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ole #15; Transform #1



FILE 33

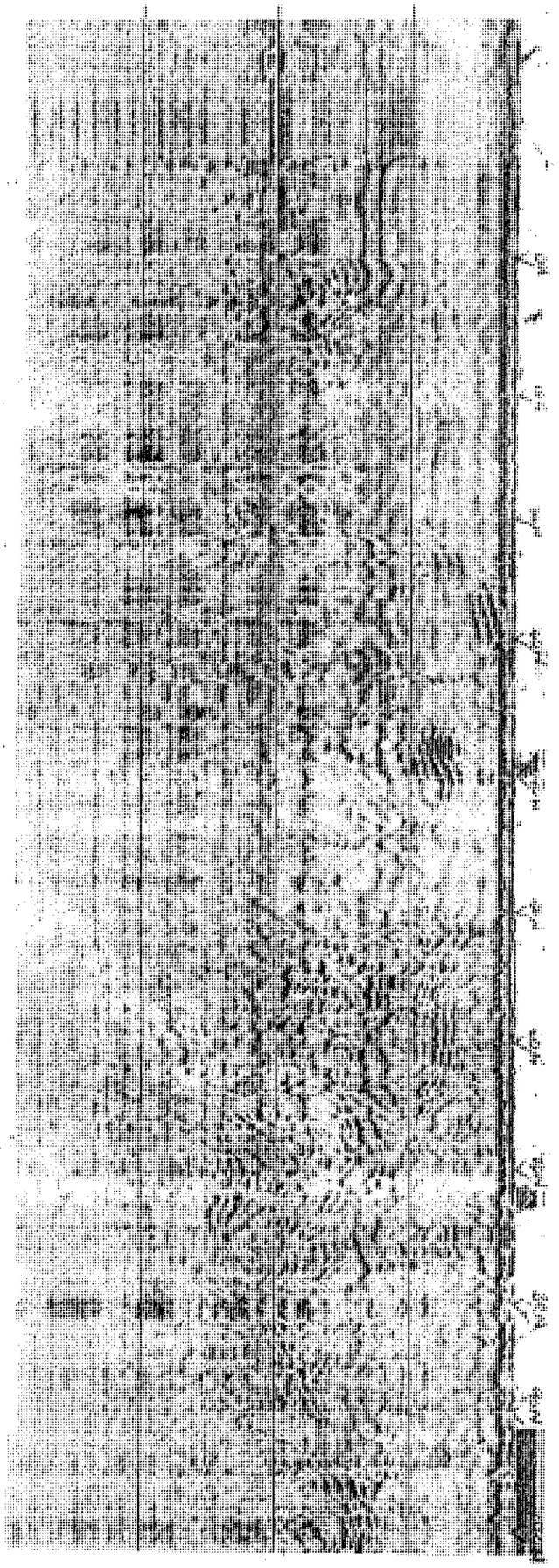
FILE2(11/21/96 11:40:54) Samp/Scan
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 16 33 49 52 54
(IIR LP N=1 F=1000)
IIR HP N=2 F=10)
IIR STK TC=4)

Table #15; Transform #1



75.00ns 50.00ns 25.00ns 0.00ns



FILE 2

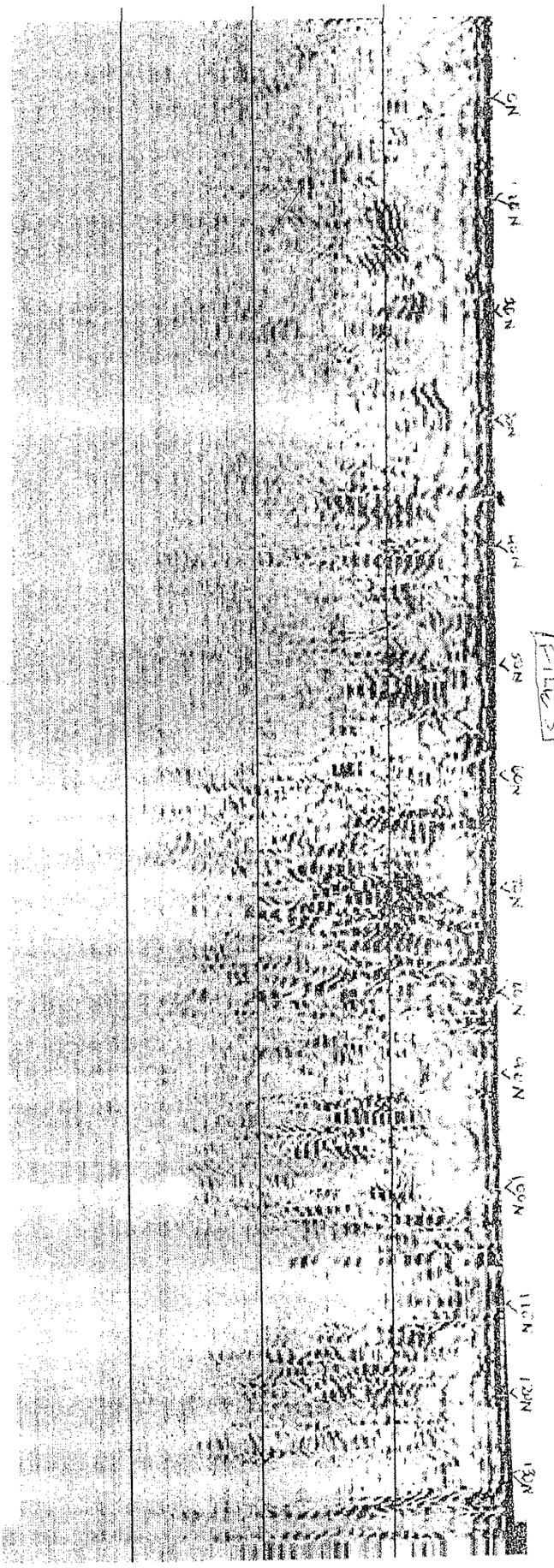
FILE3(11/21/96 12:23:48) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
(IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

Table #15; Transform #1



75.00ns 50.00ns 25.00ns 0.00

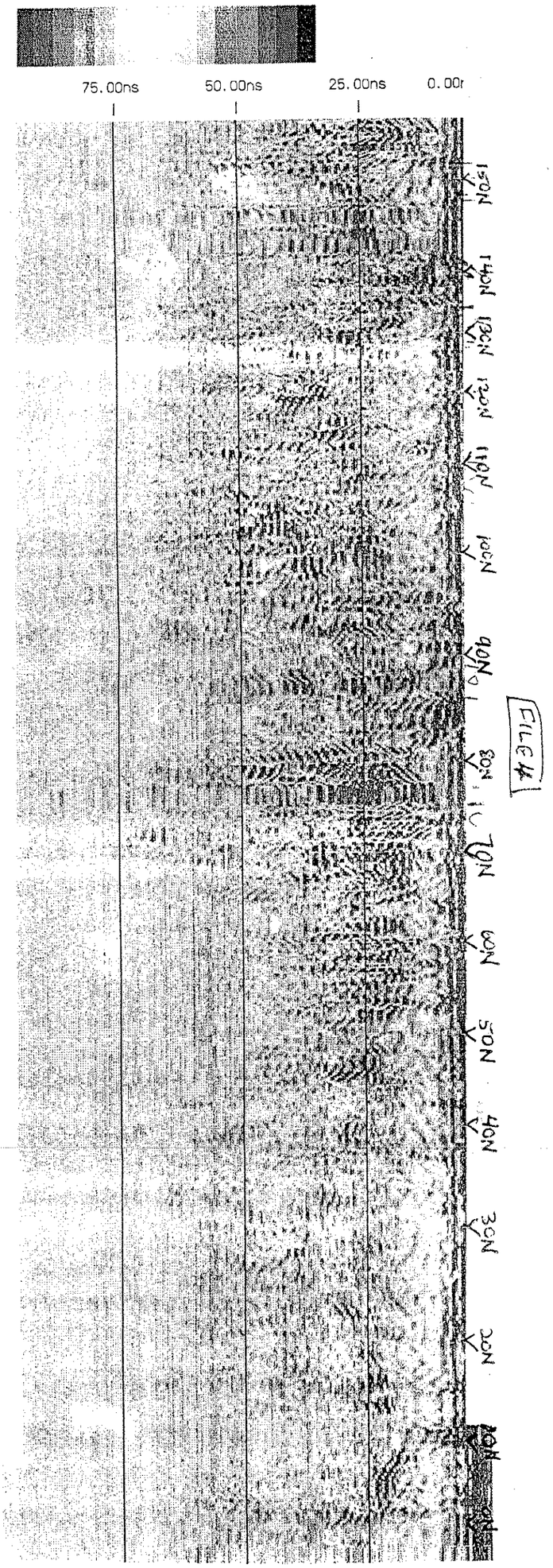


FILE 3

FILE 4 (11/21/96) Samples/scan: 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15; Transform #1

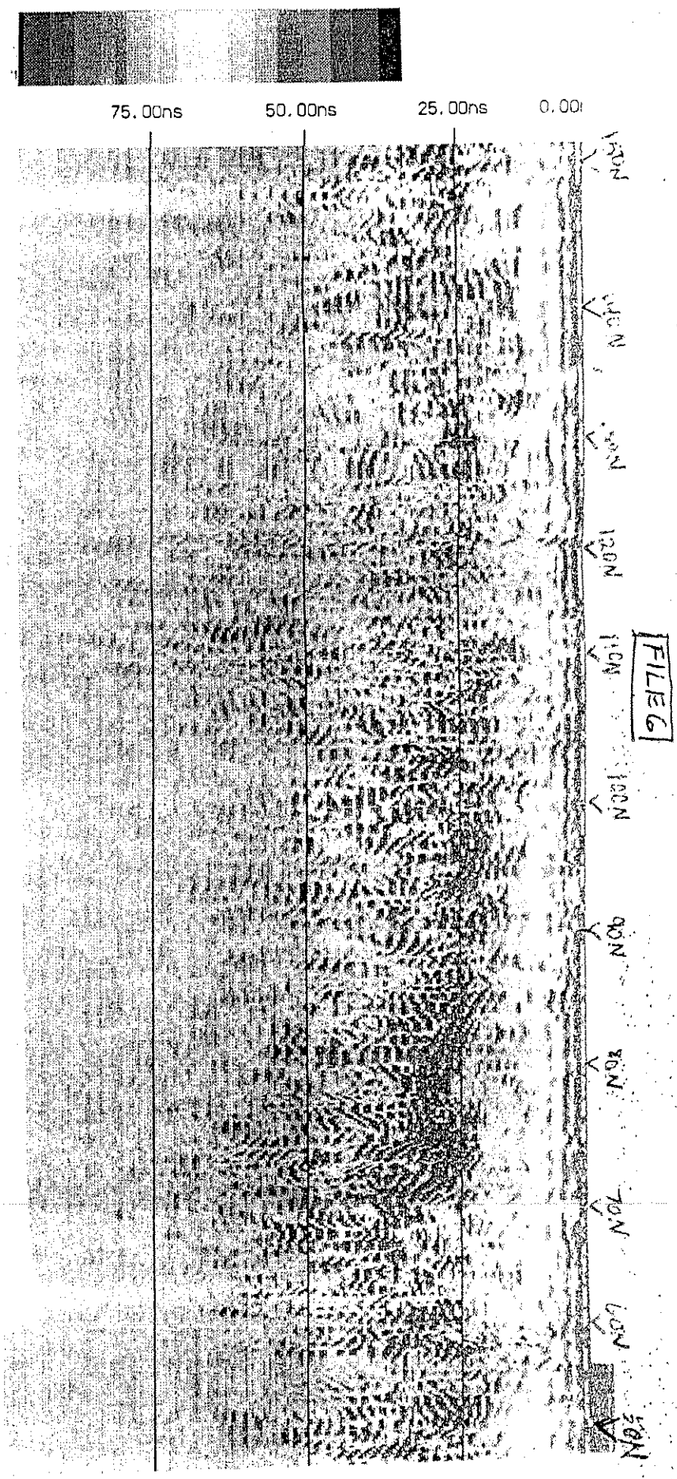


FILE 4

FILE6(11/21/96 12:...
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1



FILE 6

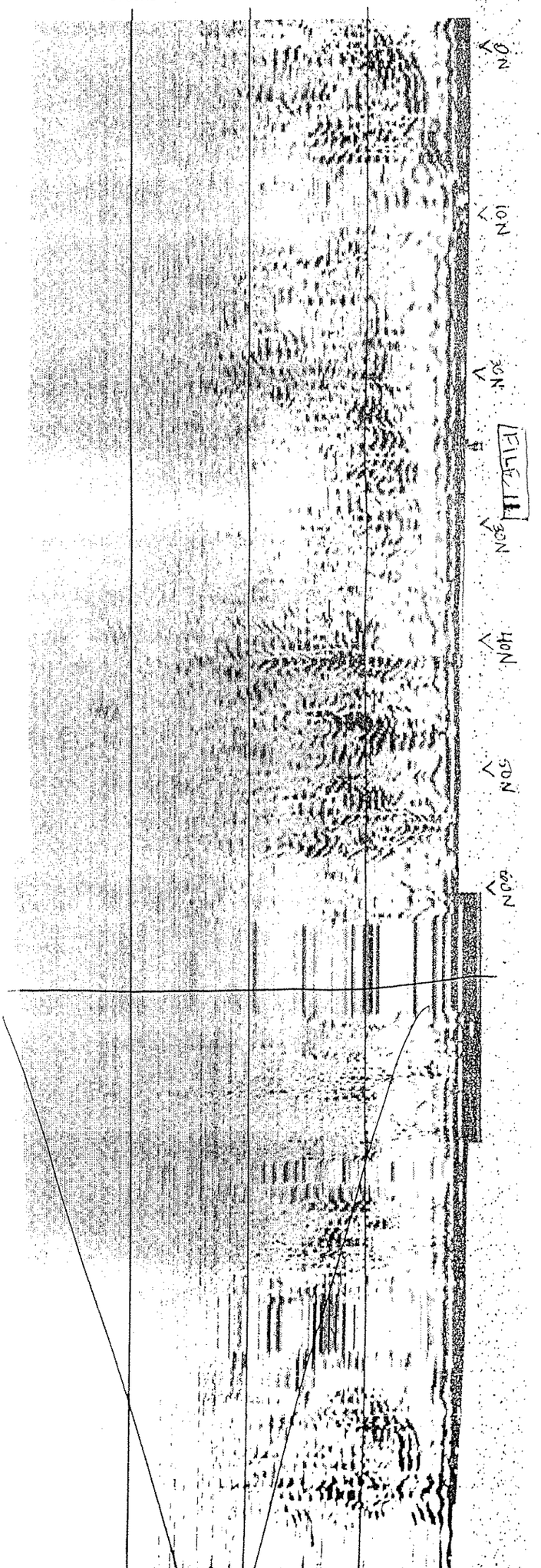
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ole #15; Transform #1



75.00ns 50.00ns 25.00ns 0.00ns



FILE 11

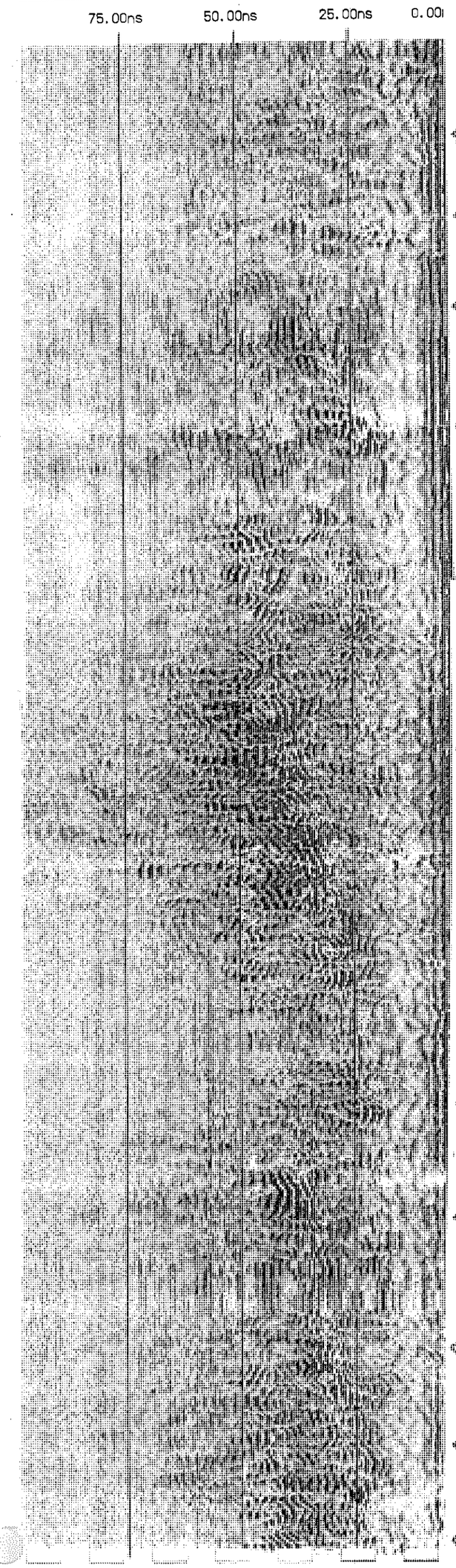
FILE 5

FILE 8 (11/21/96) Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
(IIR LP N=1 F=1078)
(IIR HP N=2 F=67)
(IIR STK TC=4)

Table #15; Transform #1



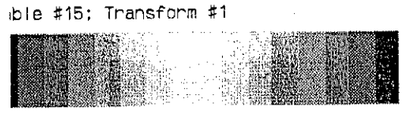


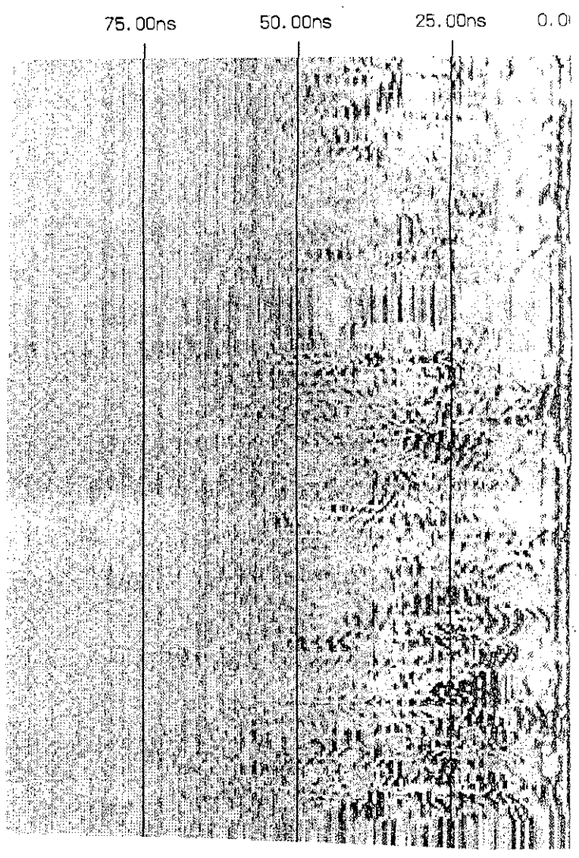
FILE8

FILE9(11/21/96 12:46:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
(IIR LP N=1 F=1078)
(IIR HP N=2 F=67)
(IIR STK TC=4)

Table #15; Transform #1



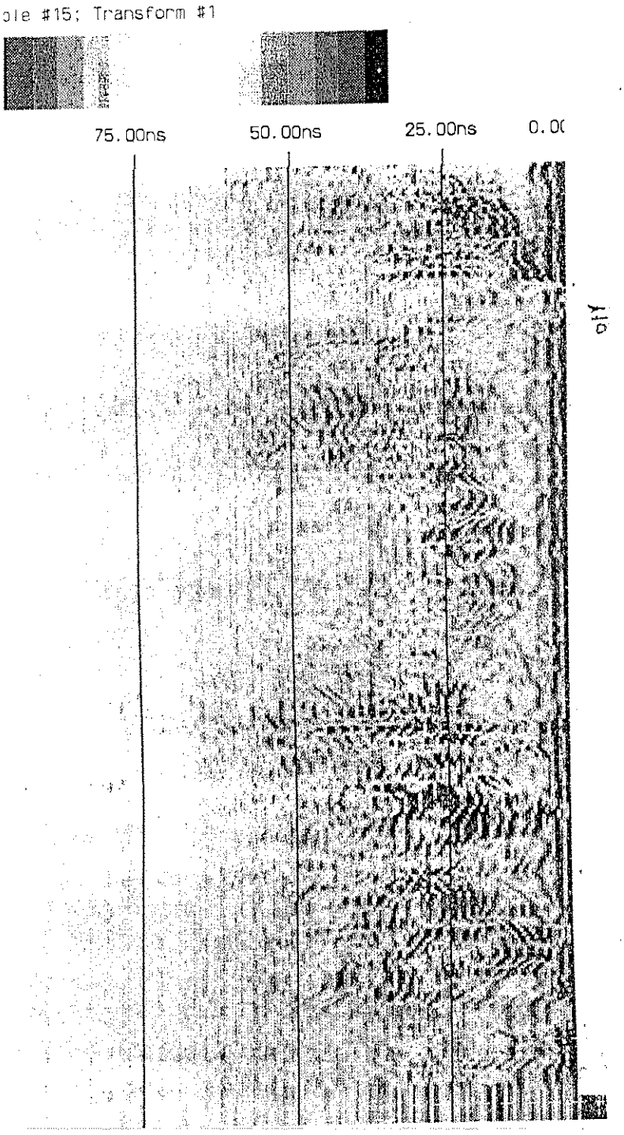


FILE9

_E10(11/21/98 12:49:14) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

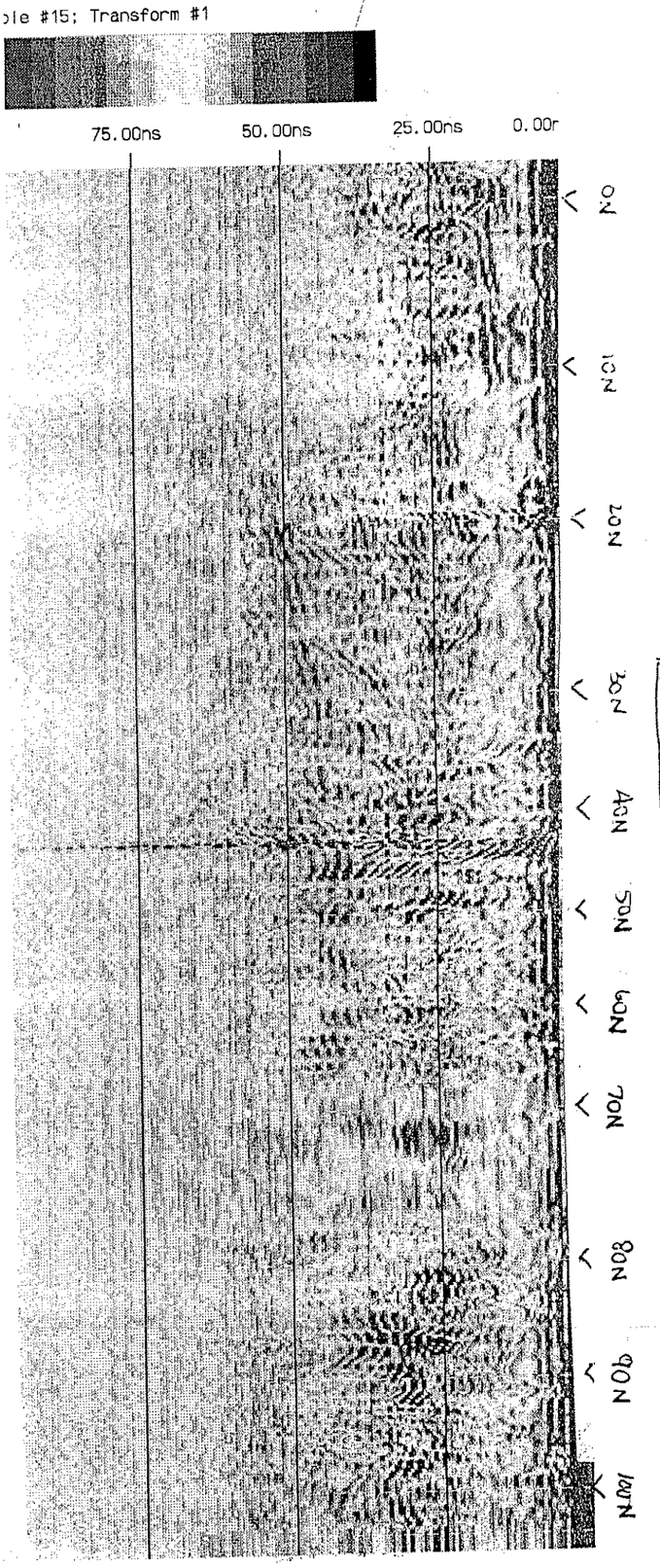


FILE 10

Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1



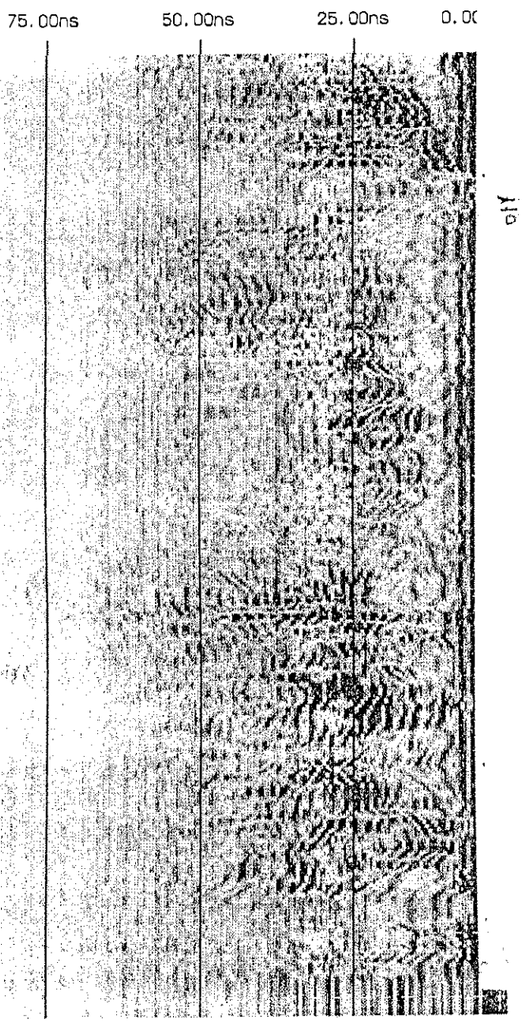
FILE 12

_E10(11/21/96 12:49:14) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1



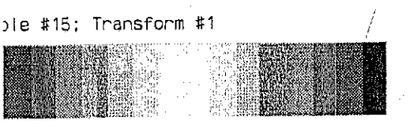


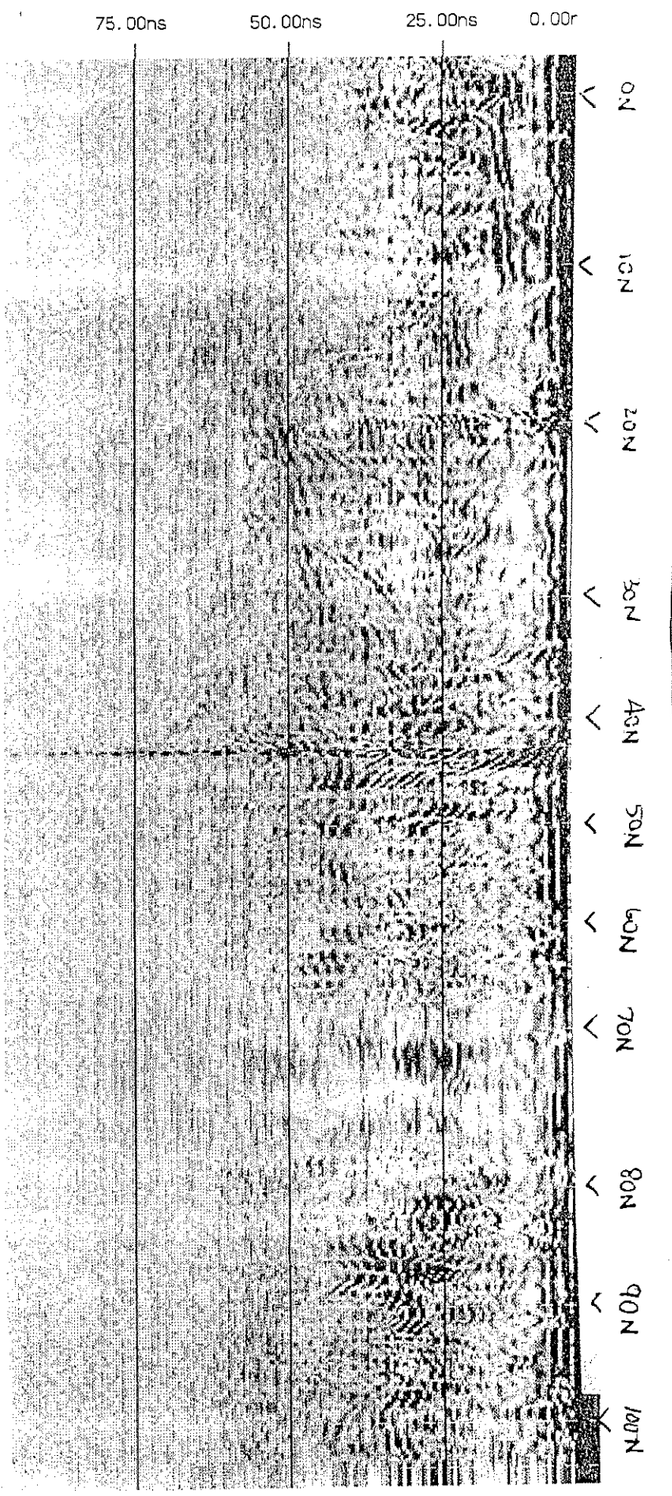
FILE 10

Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1





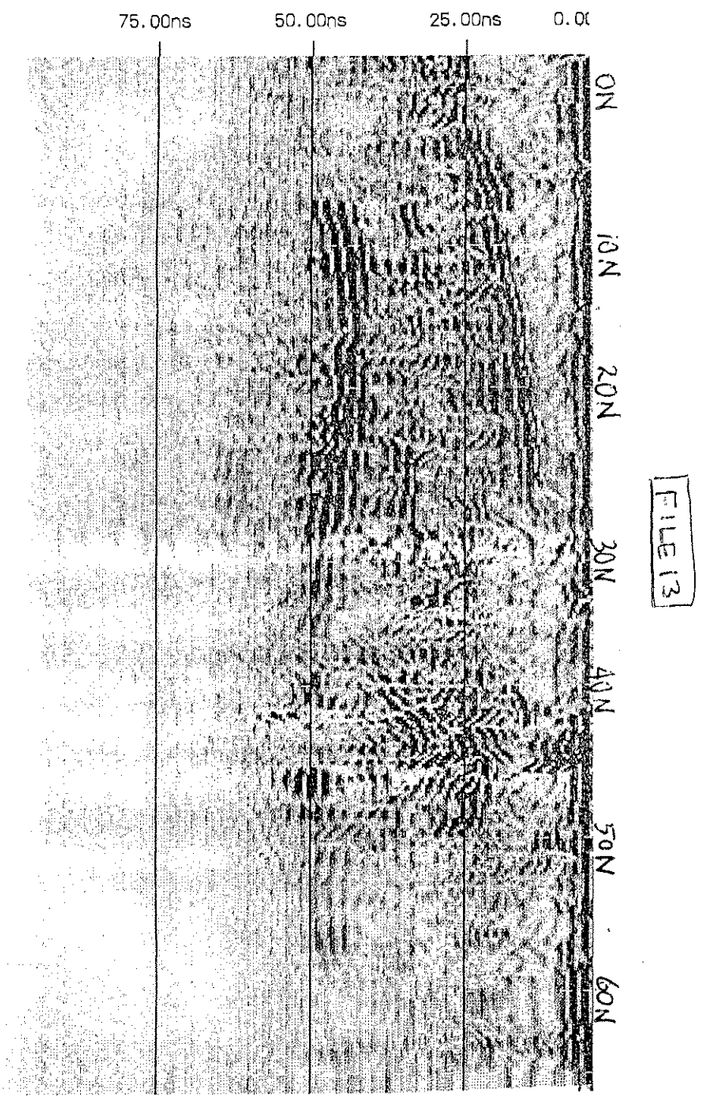
FILE 12

FILE13(11/21/96 13:00:34) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1





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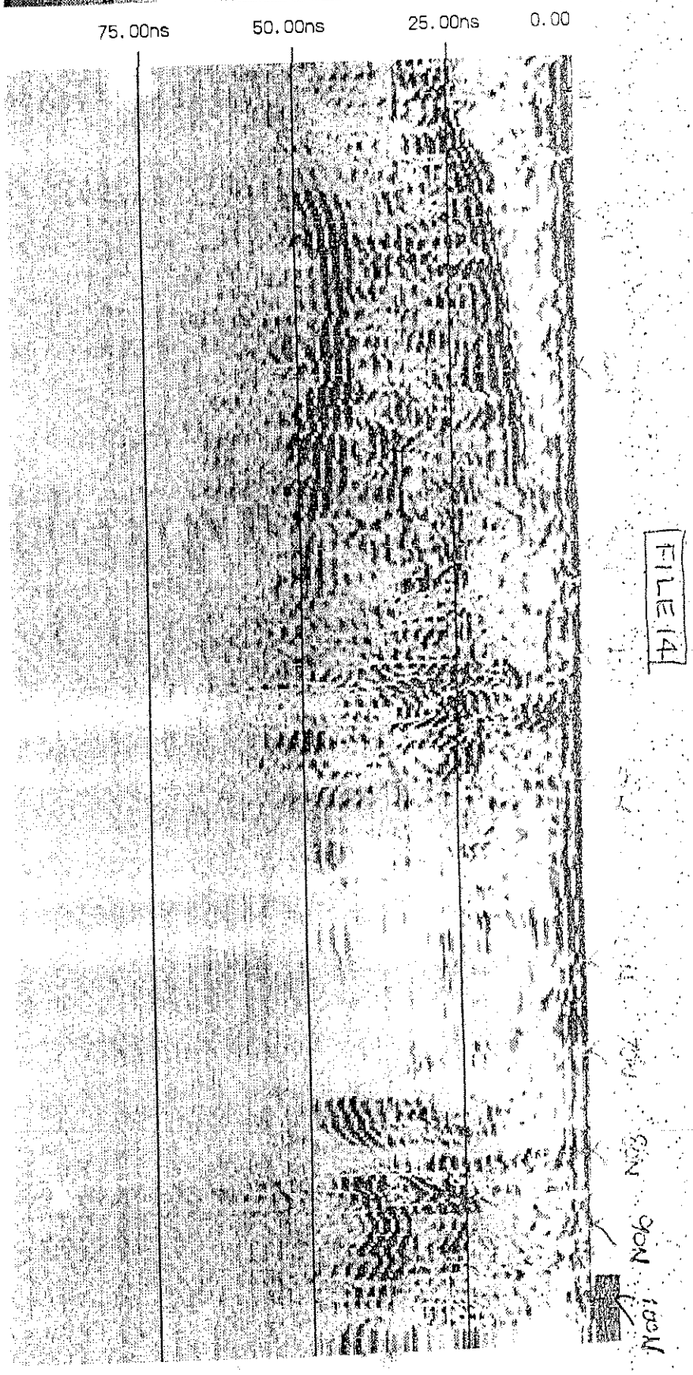

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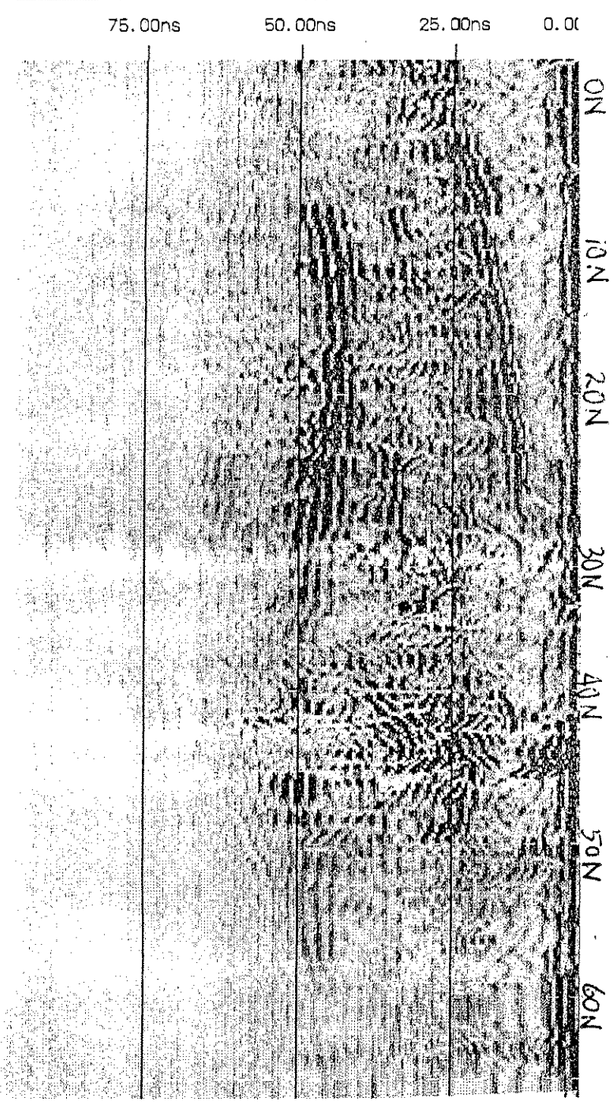

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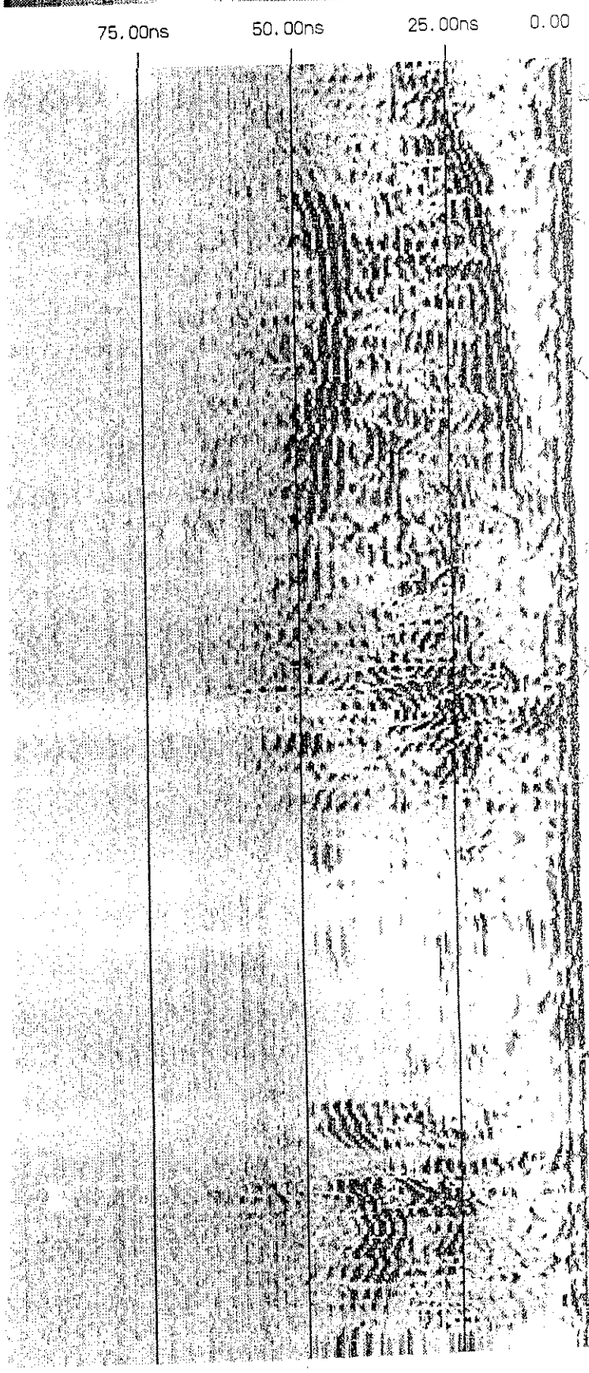

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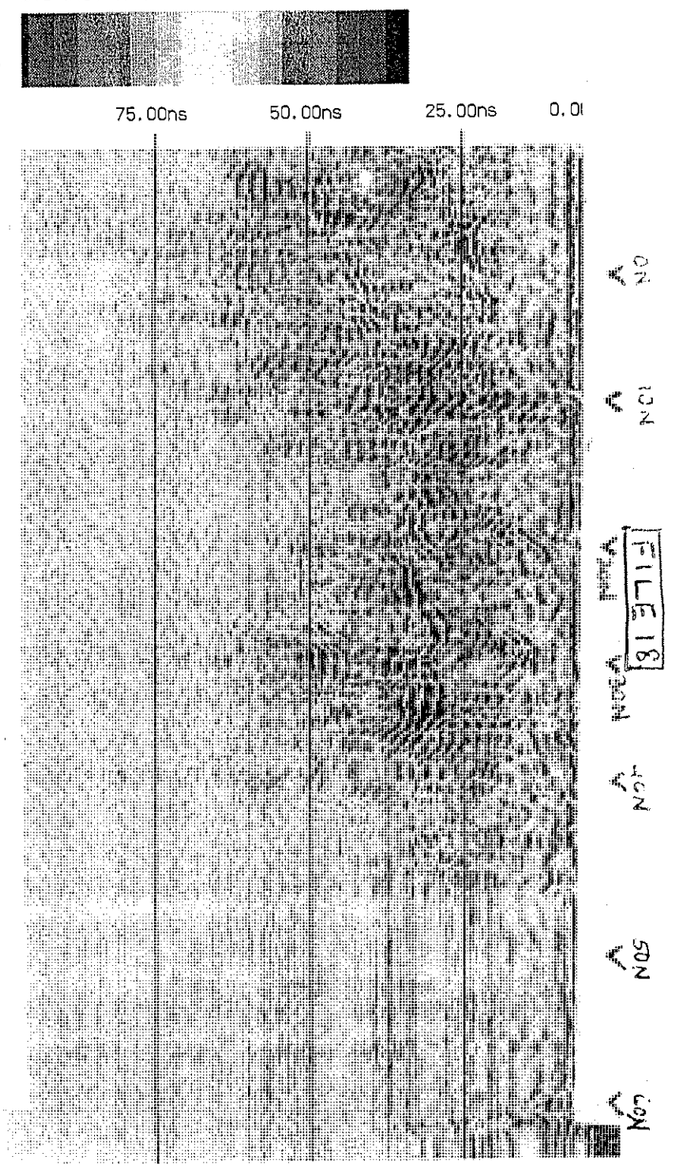

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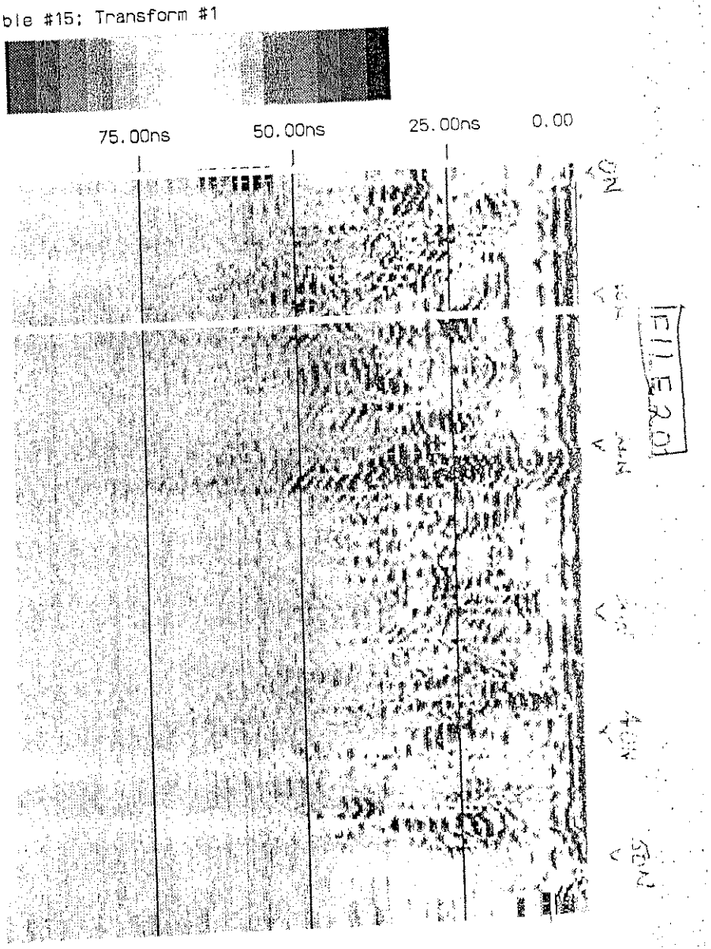

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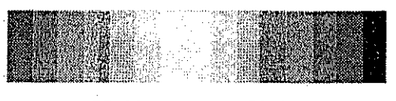

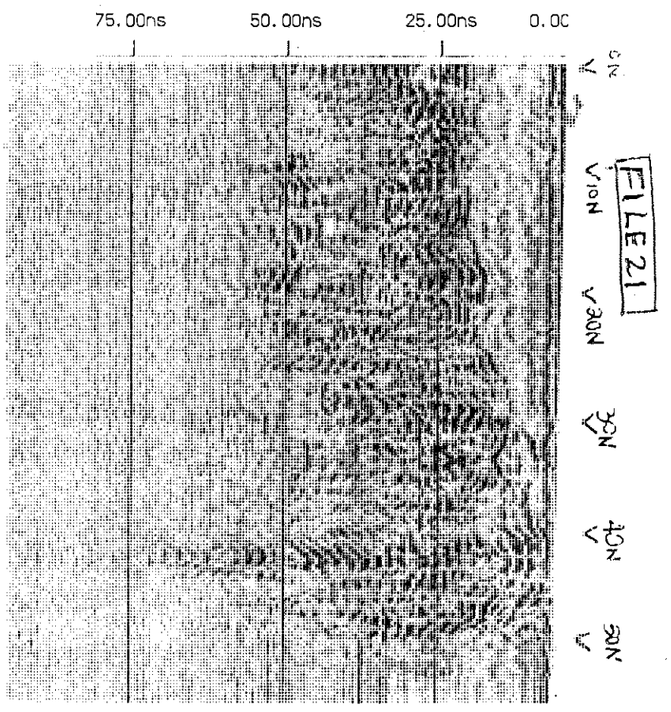

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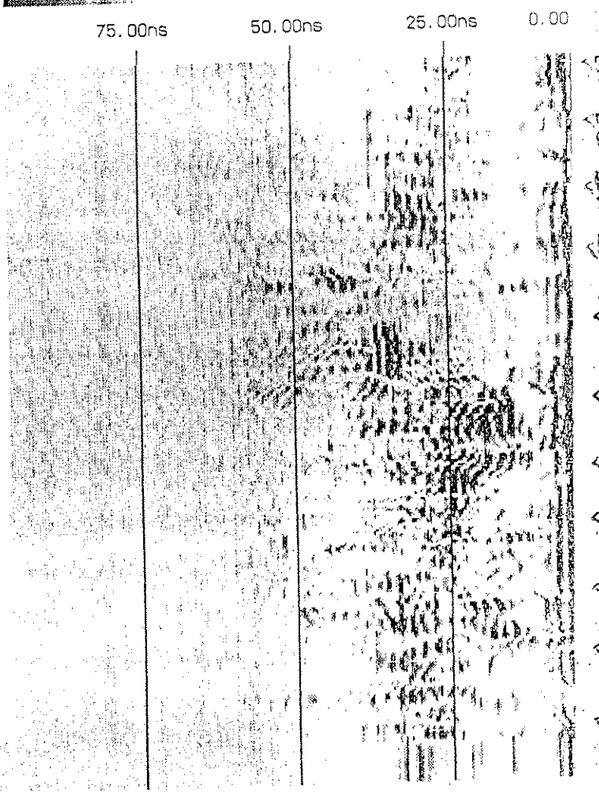

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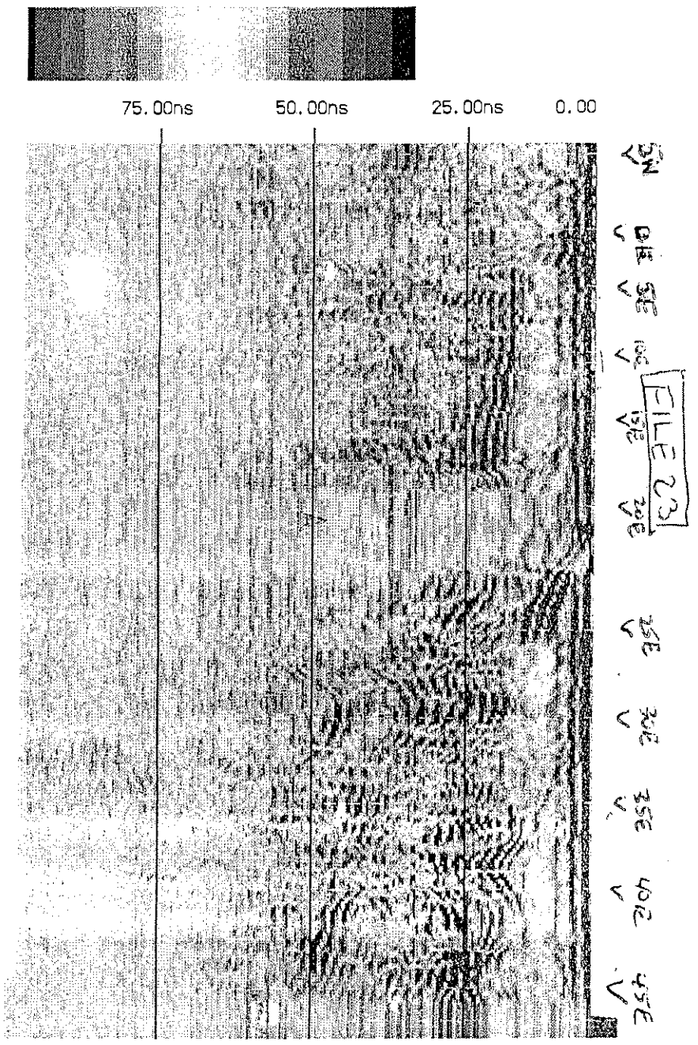

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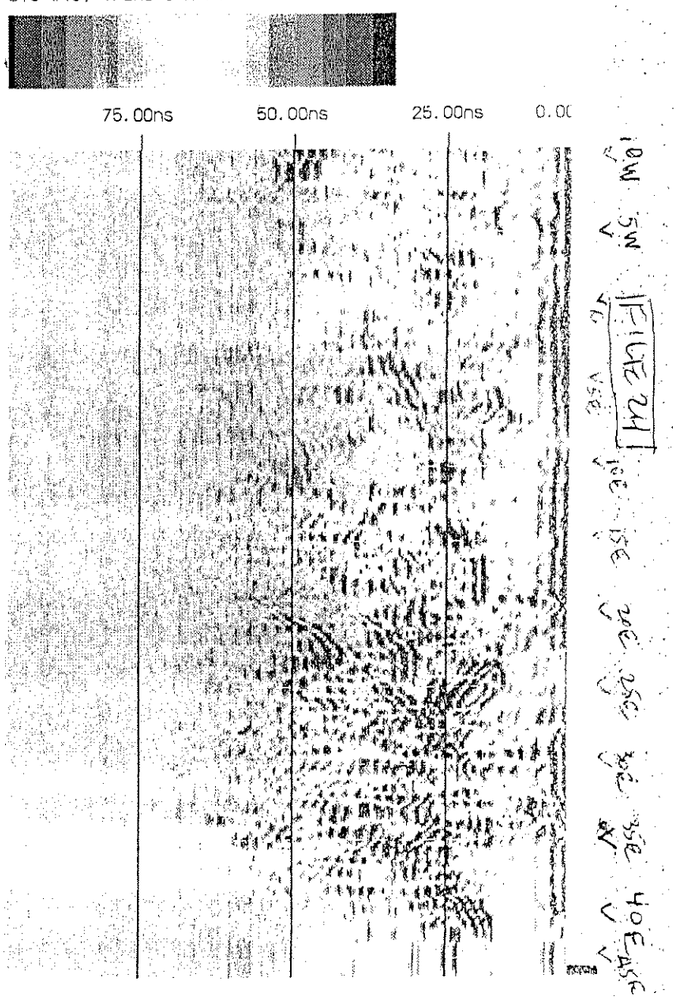

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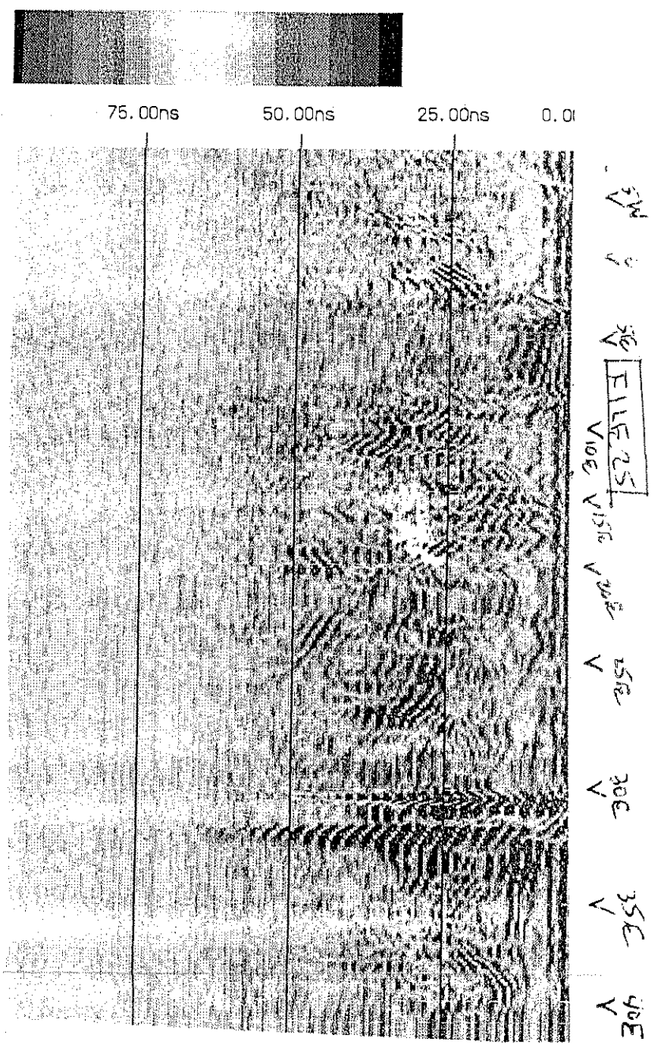

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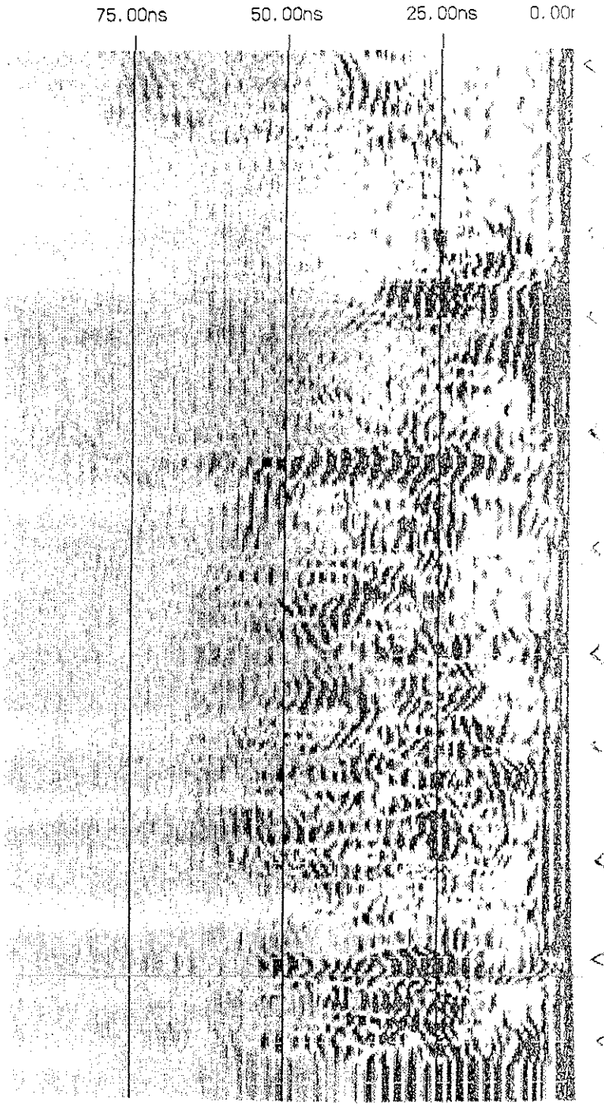

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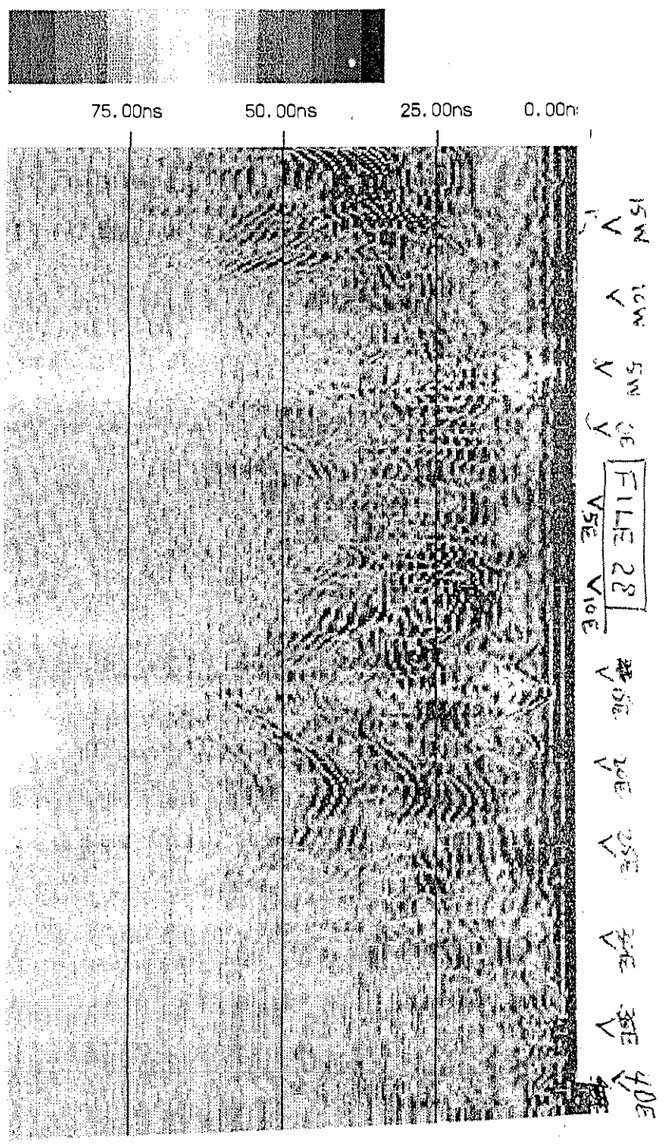

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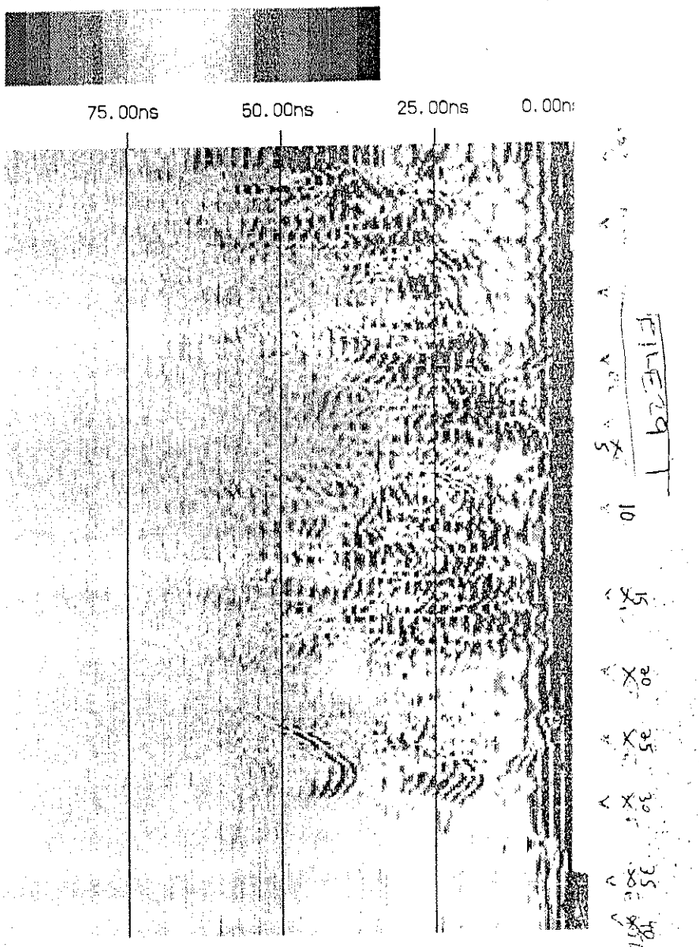

The data were collected and digitally stored with a Geophysical Survey Systems Incorporated (GSSI) Subsurface Interface Radar (SIR) System II control unit, coupled with a GSSI Model 5103 transducer. The GSSI Model 5103 transducer, with a center frequency of 400 MHz, is ideally suited for moderately shallow geophysical investigations and is routinely used for the detection and location of subsurface tanks, pits, utilities and voids.

The technique of GPR provides an effective non-invasive method of detecting and mapping small-scale variations in the very high frequency (VHF) electromagnetic (EM) properties of subsurface materials, which are often associated with geologic boundaries and/or man-made artifacts. Variation in these properties may also be related to changes in other physical properties of the subsurface, such as bulk density and water content. GPR systems commonly generate short pulses of VHF (10 to 1,000 MHz) EM energy at the earth's surface which is transmitted into the ground at velocities proportional to the VHF EM properties of the ground through which it propagates. Variations in the VHF EM properties of subsurface materials cause some of the transmitted EM energy to be reflected, or backscattered. GPR systems measure the relative amplitude of this backscattered energy, as well as the time interval between pulse generation and detection to a very high degree of accuracy.

The overall effectiveness of GPR is a function of site geology. The effective depth of EM propagation with GPR is controlled primarily by the electrical conductivity of the ground, as well as the frequency of the transmitted energy. In general, the technique of GPR works best in soils of low electrical conductivity, such as clay-free coarse sands above the water table. The higher the electrical conductivity of the subsurface materials, the greater the amount of transmitted energy that is converted into thermal energy. Since GPR systems are not capable of detecting the thermal energy, the effective depth of EM penetration is reduced. Attenuation of the transmitted EM energy with depth in geologic materials of low electrical conductivity is approximated by:

$$\text{EM Attenuation} = (\text{dB/m} = 1.69\text{x}10^{3} / (\text{K})^{1/2}$$

Where K is the dielectric permittivity of the subsurface materials surveyed, or relative ability of these materials to store charge.

The technique of GPR is likely to provide useful information to depths of about 100 feet with transducer-dependent resolution of less than 10 cm in clay-free coarse sands above the water table. Clay, due to its high electrical conductivity and high EM attenuation, severely limits the depth of GPR penetration. Another limiting factor in the overall effectiveness of GPR is the effect of scattering of the transmitted energy due to geologic materials and the consequent increase in attenuation of the transmitted energy.

GPR is sensitive to variation in the dielectric permittivity of subsurface materials. The velocity of EM propagation through subsurface materials of low electrical conductivity is approximated by:

$$V_{BM} = C/(\text{K})^{1/2}$$

Where $C = 3\text{x}10^{8}$ meters / second (1 foot / nanosecond), the velocity of EM propagation in air.

The velocity of EM propagation through subsurface materials may be estimated based upon a knowledge of local geologic conditions and an estimate of the dielectric permittivity of these materials. This velocity may also be directly measured, or calculated based upon the GPR data collected, by:

- collecting GPR data over a representative number of targets buried at known depth within the survey area; or

- measuring the aspect ratio of strong hyperbolic reflectors observed in the GPR data collected.

The estimated velocity of EM propagation for subsurface materials existing at the site was determined based upon the aspect ratio of a strong hyperbolic reflection. Analyses of these hyperbolae indicate the approximate velocity of EM propagation through subsurface materials existing at the site to be about 0.22 feet per nanosecond. This velocity was used to convert recorded time intervals between pulse transmission and detection into depths to subsurface features of interest.

Raw GPR data collected over the site are presented in Appendix A. These data are displayed with the time scale of the recording depicted on the vertical scale, in nanoseconds. The distance along the scan line is displayed as fiducials in the data along the top of each file. These data indicate that, based upon the velocity of EM propagation estimated for subsurface materials at the site, adequate resolution of subsurface features of interest may be expected to an average limiting depth of about ten feet below ground surface.

The digitally recorded GPR data were then post-processed using the GSSI RADAN for Windows™ GPR processing package. Raw data recorded along each scan were:

- stacked using an average of 4 traces per stack in the horizontal, or distance along the scan direction;

- normalized for distance along scan;
- vertically filtered with triangular finite impulse response filters using respective cutoff frequencies of 100 and 500 MHz; and

- vertically transformed from EM travel time to depth below ground surface using the velocity of EM propagation estimated for subsurface materials at the site.

The processed digital files were then analyzed for characteristic signatures that may be associated with potential subsurface tanks and appurtenant piping. A characteristic signature of a subsurface tank was determined by collecting a number of scans over the known location of a subsurface tank and comparing this signature to subsequent data collected.

Complete reports of geophysical findings are attached to this Appendix.

HAGER-RICHTER
GEOSCIENCE, INC.

GEOPHYSICAL SURVEY
MAGNA METALS SITE
CORTLANDT, NEW YORK

Prepared for:

Tetra Tech FW, Inc.
1000 The American Road
Morris Plains, New Jersey 07950

Prepared by:

Hager-Richter Geoscience, Inc.
417 Berkeley Avenue
Orange, New Jersey 07050

File 03J07
August, 2003

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GEOSCIENCE, INC.

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FAX (973) 676-4599

August 18, 2003
File 03J07

Mr. Donald Campbell
Tetra Tech FW, Inc.
1000 The American Road
Morris Plains, New Jersey 07950

RE: Geophysical Survey
Magna Metals Site
Cortlandt, New York

Dear Mr. Campbell:

In this letter, we report the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc. (H-R) at the Magna Metals Site located at 510 Furnace Dock Road in Cortlandt, New York for Tetra Tech FW, Inc. (TtFW) on August 4th and 11th, 2003. The scope of the project and the area of interest were specified by TtFW. The geophysical survey is part of an environmental investigation of the site.

Introduction

The Site is a former metal plating/polishing facility, and is now being used by commercial enterprise. The site is located in a residential section of Cortlandt, and its general location is shown in Figure 1. Some historical leach pits related to the metal plating facility were discovered in the western end of the site during brush clearing of the site by TtFW. TtFW possesses historical drawings indicating that other leach/septic components may be present in the subsurface related to the metals site. TtFW was interested in determining whether such targets could be detected and located with a geophysical survey in an approximately 30 ft by 165 ft area specified in the field by TtFW. Figure 2 is a modified site plan provided by TtFW showing the approximate location of the geophysical survey area.

Objective

The objective of the survey was to search the accessible portions of the specified area of interest for possible septic/leach structures, and if such were detected, to locate each. Additionally, TtFW had requested utility boring clearances at five specified locations, and the results of such were marked in the field only and are not reported herein.

The Survey

Alex Martinez, Rob Garfield, and James Coffman, P.G., of Hager-Richter conducted the field operations on August 4th and 11th, 2003. The project was coordinated with Ms. Kelly Millet of TtFW, who was present in the field to specify the survey area limits. Rain on August 4th postponed the conclusion of the GPR survey until the morning of August 11th.

The survey area was clear, flat and soil covered at the time of the survey. The geophysical survey was conducted using two geophysical methods: electromagnetic terrain conductivity (EM) and ground penetrating radar (GPR). The EM data were collected at approximately 2-foot intervals along lines spaced 2.5 feet apart across the accessible portion of the area of interest. The EM survey detects and outlines areas containing anomalously conductive ground and buried metal. However, the EM method cannot provide information on the types of objects causing the EM anomaly. In order to aid in the identification (size and shape) of the objects, a GPR survey was conducted across the accessible portion of the area of interest. GPR data were acquired along parallel lines spaced no greater than 2.5 ft apart in one trend.

Equipment

EM. The EM survey was conducted using a Geonics EM31 terrain conductivity meter. The 12-foot long boom of the EM31 terrain conductivity meter was oriented parallel to the traverse lines. Data were acquired in the vertical dipole mode (nominal depth of exploration of 18 feet) and recorded on a digital data logger for both the quadrature phase component (apparent conductivity) and in-phase component.

GPR. The GPR survey was conducted using a Sensors and Software Inc. Noggin Smart Cart digital GPR system equipped with a survey wheel to trigger recording of data at equal horizontal distances. The GPR system was used with a 250 MHZ antenna and an approximately 12 ft depth window.

Limitations of the Methods

HAGER-RICHTER GEOSCIENCE, INC. MAKES NO GUARANTEE THAT ALL TARGETS WERE DETECTED IN THIS SURVEY. HAGER-RICHTER

GEOSCIENCE, INC. IS NOT RESPONSIBLE FOR DETECTING TARGETS THAT NORMALLY CANNOT BE DETECTED BY THE METHODS EMPLOYED OR THAT CANNOT BE DETECTED BECAUSE OF SITE CONDITIONS.

EM. The data recorded for EM surveys are affected by ferrous and non-ferrous metal objects. In particular, metal objects above ground, such as rails, fences, drums and vehicles, can so influence the EM fields that the effects of buried metal objects, if any, at the same location are "masked." Thus, where EM anomalies can be attributed to surface metal objects, the presence or absence of buried metal objects cannot be determined from the data alone. Where the metal objects are relatively small, the instrument must be located within a few feet of the objects in order to detect them.

The depth of investigation of the EM instrument is a function of the inter-coil spacing and the orientation of the dipole. The nominal depth of exploration is generally estimated as 3/4 times the inter-coil spacing for the horizontal dipole mode, and 1.5 times the inter-coil spacing for the vertical dipole mode. The intercoil spacing for the EM instrument used for this survey is 12 feet and the data were collected in the vertical dipole mode. Thus, for this survey, the depth of investigation is approximately 18 feet below the ground surface.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the EM method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?), and the methods used cannot identify the buried metal object.

GPR. There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey: (1) surface conditions, (2) electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with snow piles, high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below concrete pavement, especially inside buildings, and a target may not be detectable. The GPR method also commonly does not provide useful data under canopies found at some facilities.

The electrical conductivity of the ground determines the attenuation of the GPR signals, and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small then the reflection may be too weak to recognize, possibly due to deeply corroded metal in the target, the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target.

Results

General. The geophysical survey conducted at the Magna Metals Site in Cortlandt, New York consisted of an EM and GPR survey in an area specified by TtFW. The EM data are presented as color contour plots of the apparent conductivity and in-phase components in Figures 3 and 4, respectively. Figure 5 shows the locations of the GPR survey and the integrated interpretation of the geophysical data.

EM. Terrain conductivity data are useful for detecting the presence of anomalously conductive ground, which might be caused by: 1) the presence of objects with properties unlike those of the natural materials on site, such as utilities, large concrete structures or buried metal or by 2) soil or rock changes (i.e., transitions from sand to clay or soil to rock). The in-phase component data, on the other hand, are *only* used to interpret the presence of metal objects.

Most of the apparent conductivity values appear to have a range from 2 to about -6 mmho/m. The anomalous apparent conductivity areas (both positive and negative)are shown as a red-hatched pattern on Figure 5, and represent areas which contain predominantly non-metal subsurface features (i.e. possibly buried pavement, structures (non-metal)or soil changes). Identification of the anomalies cannot be made with the EM method alone.

The in-phase component of the EM method outlines anomalies related to buried metal. Metal objects, whether buried or above ground, produce anomalously high or low apparent conductivity and in-phase component values in EM surveys. In-phase values range from 3 to about -8 ppt. One large pronounced in-phase anomaly is shown as a blue cross-hatched zone on figure 5, and is located west of Leach Pit A on Figure 5. This area likely contains metal, due to the elevated EM response in both recorded components. A few smaller anomalies are also located on Figure 5, and may represent areas of scattered buried metal.

GPR. GPR data were acquired across the accessible portion of the area of interest to aid in identifying the sources of the EM anomalies. The locations of the GPR traverses and the interpretation of the data are shown on Figure 5. GPR signal penetration was about 8 feet, assuming a handbook velocity for the GPR signal traveling through a soil media. *This estimate is only approximate, and true signal penetration is not known.*

Six relatively large buried objects were detected throughout the area included in the GPR survey, and their locations are shown as a circle on Figure 5. These features produce reflections typical for flat-topped structures, and their size makes them consistent with reflections expected for possible leach/septic pits. All such possible structures occur in the top five feet. Two flat reflectors and many unidentified buried objects (small size) were detected, and may represent debris, which has been found in the soil at the site, boulders or smaller leach/septic components. Whether any of the detected objects are leach/septic related can only be determined by excavation.

Conclusions

Based on the results of the geophysical survey conducted by Hager-Richter Geoscience, Inc. at the Magna Metals Site in Cortlandt, New York for TtFW on August 4th and 11th, 2003, we conclude:

- Six relatively large flat-topped buried objects were detected, and their size and shape are consistent with possible leach/septic related pits.
- Smaller flat reflectors, and unidentified buried objects were detected, and may represent debris, boulders or smaller leach/septic components.
- General areas of buried metal and apparent conductivity anomalies are outlined in conjunction with the above mentioned anomalies.

Limitations

This letter report was prepared for the exclusive use of TtFW (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience. Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface

conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory' testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with TtFW on this project. We look forward to working with you again in the future.

Sincerely yours,
HAGER-RICHTER GEOSCIENCE, INC.

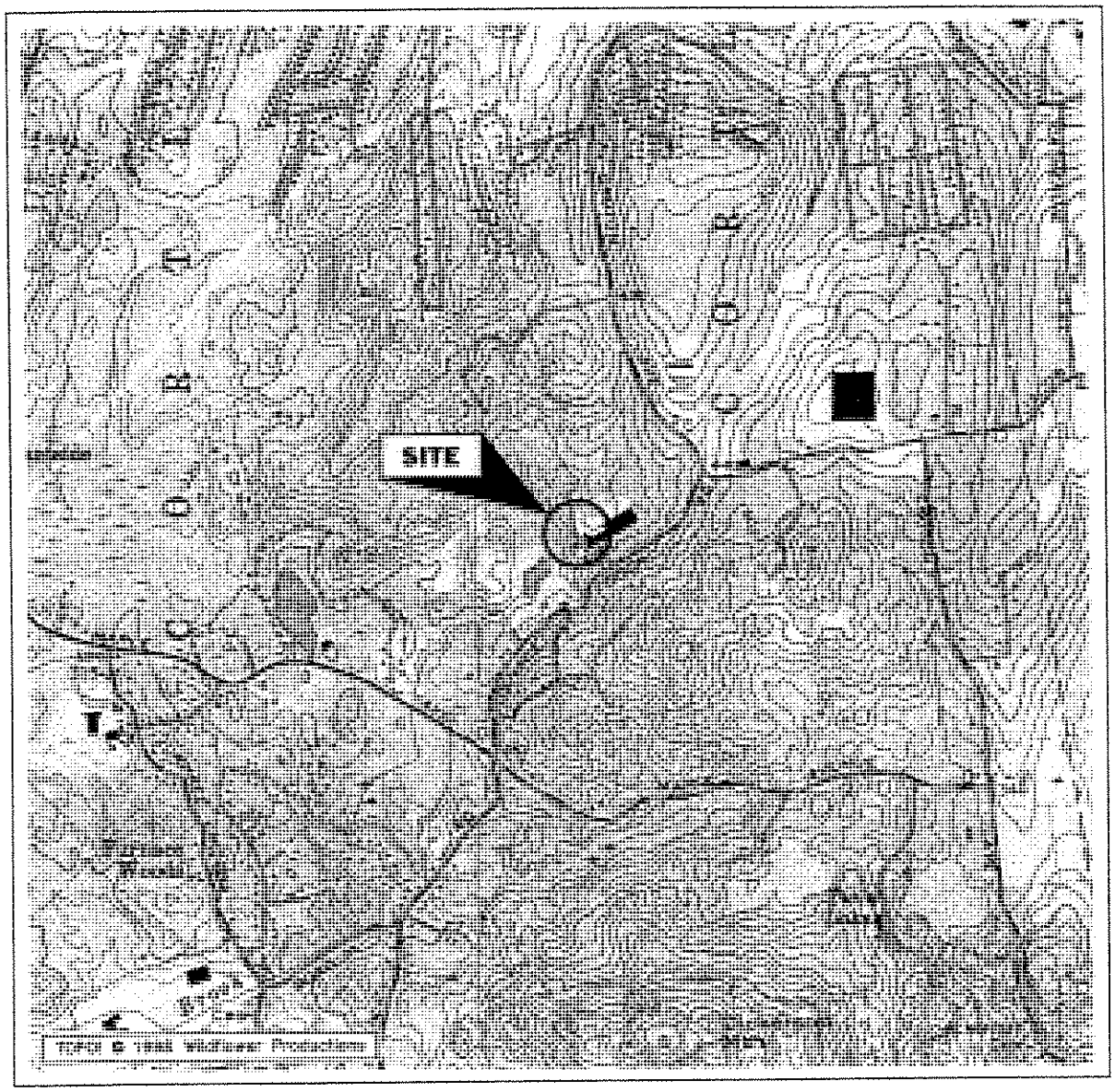
James Coffman

James Coffman, P.G.
Project Manager

Dorothy Richter

Dorothy Richter, P.G.
President

Attachments: Figure 1-5





LOCATION

SCALE (feet)

0 2000 4000

Figure 1
General Site Location
Magna Metals Site
Cortlandt, New York

File 03J07 | August, 2003

HAGER–RICHTER GEOSCIENCE, INC.
Orange, New Jersey

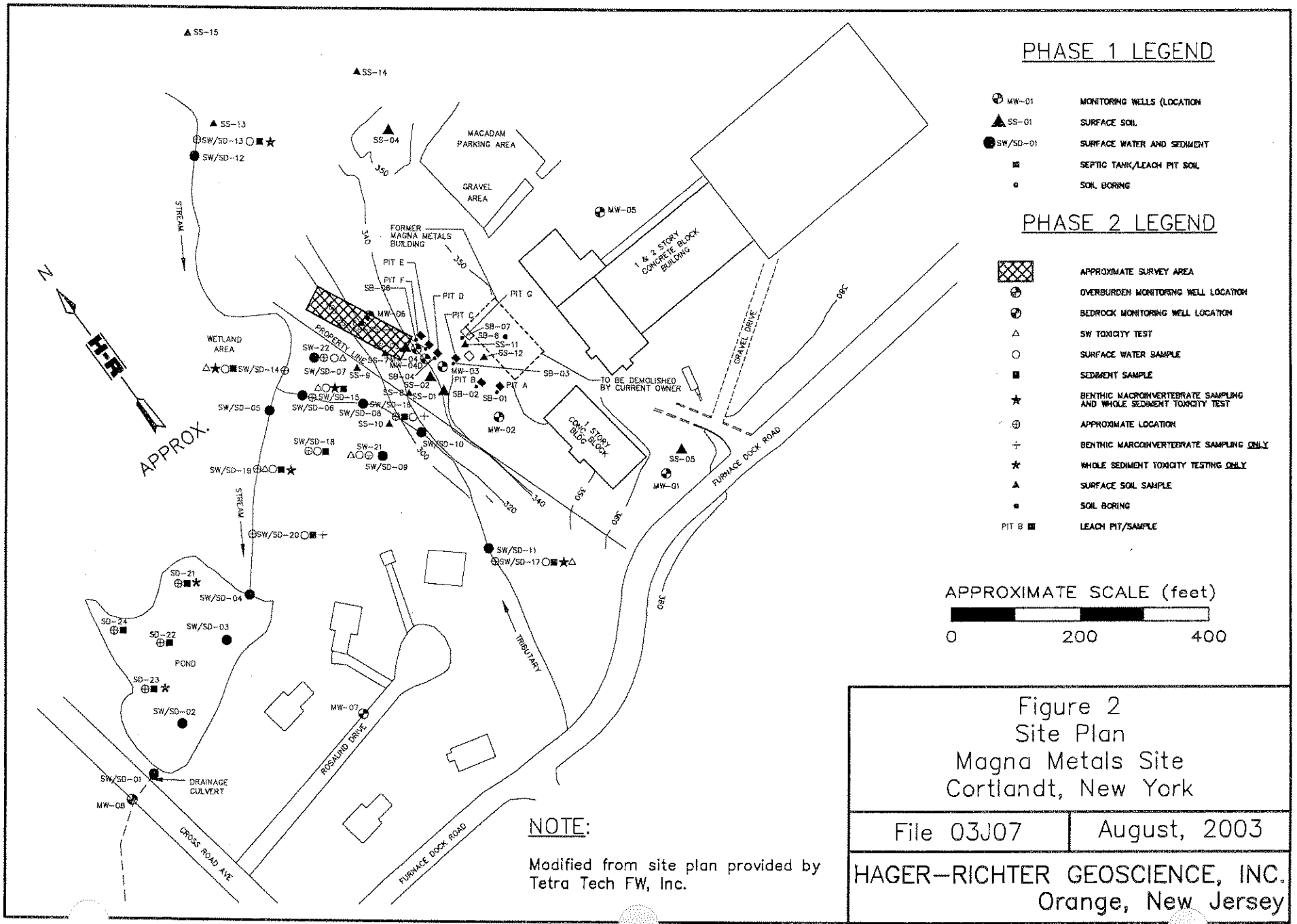
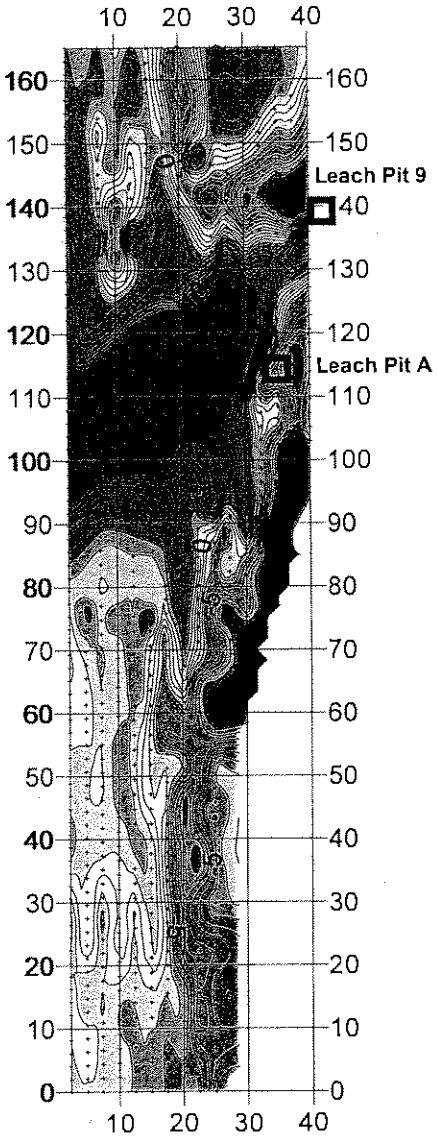
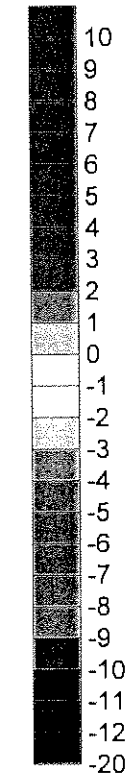


Figure 2
Site Plan
Magna Metals Site
Cortlandt, New York

File 03J07 | August, 2003

HAGER-RICHTER GEOSCIENCE, INC.
Orange, New Jersey







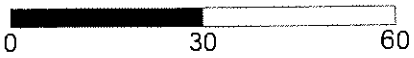
LEGEND

- Data Station
- Monitoring Well
- Leach Pit

NOTES

1. Site sketch generated from field notes.
2. Data were recorded with EM31 in vertical dipole mode with boom parallel to traverse line.
3. Survey area position is located relative to local grid features.
4. Contour interval = 1 mmho/m

SCALE (feet)



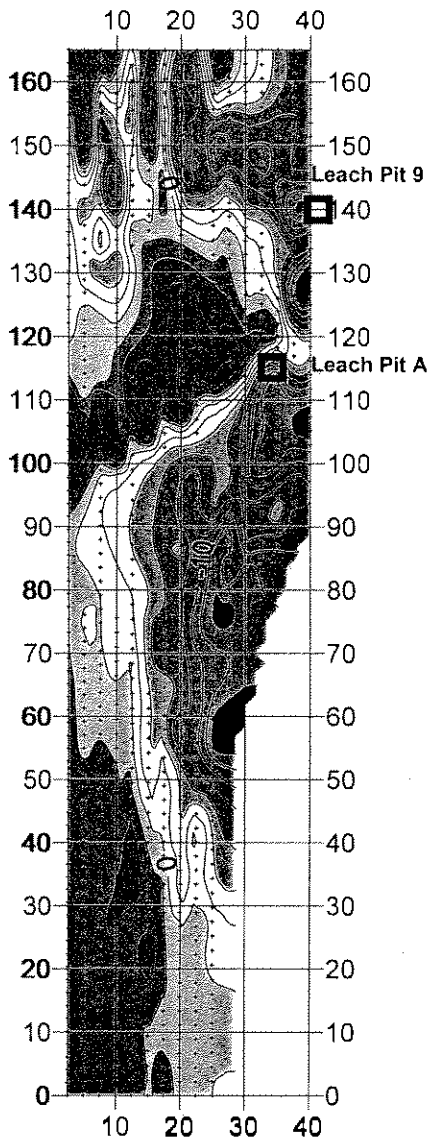
MW4

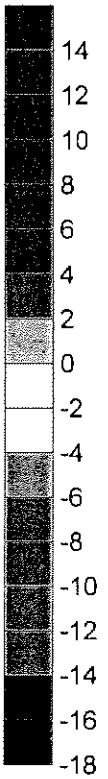
MW3

Figure 3
Apparent Conductivity
Magna Metals Site
Cortlandt, New York

File 03J07	August, 2003

HAGER-RICHTER GEOSCIENCE, INC.
Orange, New Jersey







LEGEND

+ Data Station

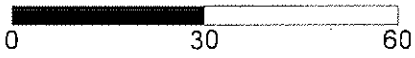
⊕ Monitoring Well

Leach Pit

NOTES

1. Site sketch generated from field notes.
2. Data were recorded with EM31 in vertical dipole mode with boom parallel to traverse line.
3. Survey area position is located relative to local grid features.
4. Contour Interval = 2 ppt.

SCALE (feet)



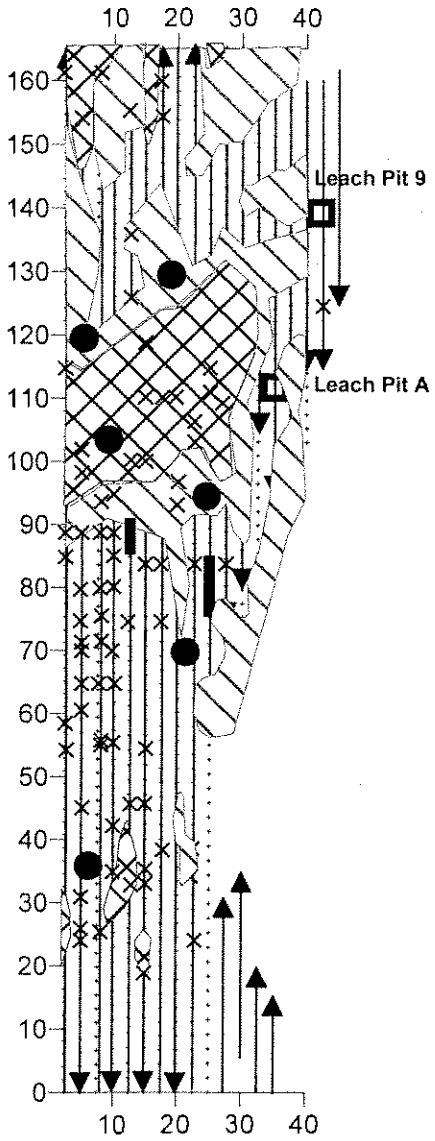
⊕ MW4

⊕ MW3

Figure 4
In-Phase Component
Magna Metals Site
Cortlandt, New York

File 03J07 | August, 2003

HAGER-RICHTER GEOSCIENCE, INC.
Orange, New Jersey



MW4

MW3

MN

H-R

LEGEND

- Data Station
- Large Object (possible leach/septic structure)
- Flat Reflector
- Area of Buried Metal
- Apparent Conductivity Anomaly
- Monitoring Well
- Leach Pit
- GPR Traverse Line
- Unidentified Buried Object (UBO)

NOTES

1. Site sketch generated from field notes.
2. Survey area position is located relative to local grid features.

SCALE (feet)

0 30 60

Figure 5
Integrated Interpretation
Magna Metals Site
Cortlandt, New York

File 03J07	August, 2003

HAGER-RICHTER GEOSCIENCE, INC.
Orange, New Jersey

APPENDIX D

BORING LOGS, WELL DEVELOPMENT DATA, WELL PURGE SHEETS AND WELL CONSTRUCTION DIAGRAMS

	Project Name: Magna Metals	Site Id: MW-04D
	Location: Cortlandt, NY	X Coordinate: 665073.80
	Logged By: A. Barroqueiro	Y Coordinate: 889832.07
	Contractor: B&B Drilling	Elevation: 336.46'
Drilling Method: Hollow Stem Auger/Rock Core		Blank Casing: type: PVC sch 40 dia: 2.00in fm: -3.2' to: 21.00'
Remarks:		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 21.00' to: 31.00'
		Annular Fill: type: Bent-Cement Grout fm: 0.00' to: 16.00'; type: Bentonite Chips fm: 16.00' to: 20.00'; type: No. 1 Sand Pack fm: 20.00' to: 31.00'
Date Started: 08/22/03		Date Completed: 09/02/03

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Material Description	Notes
	08/22/2003	65	3, 15	SP	Brown Fine to Medium sand, Trace root material.	
			12, 5	SP/SM	Brown fine Sand, trace silt, loose (FILL)	
	08/22/2003	10	7, 5, 5, 3	SP	Brown, Fine Sand, Trace Gravel	Cobble lodged in spoon leading to no recovery
	08/22/2003	33	6, 6, 16, 29	SP	Light Brown, Brown Fine Sand, Trace Fine to Coarse Gravel	
	08/22/2003	80	31, 36, 35, 10 0/5	SM	Light Brown, Fine Sand with Silt, Trace Gravel, moist	very tight
	08/22/2003	70	17, 34, 42, 50	ML	Light Brown, Silt, Trace Very Fine Sand, Trace Coarse Sand, Trace Fine to Coarse Gravel, moist	very tight
10	08/22/2003	85	27, 40, 50, 47	ML	Light Brown, Silt, Trace Fine Sand, Trace Coarse Sand, Trace Fine to Coarse Gravel, moist (3" quartz fragment layer at bottom of spoon)	very tight
	08/22/2003	75	24, 26, 29, 31	SP	Brown, Fine Sand, Trace coarse Sand, Trace Gravel, Trace Silt, Trace Quartz fragments, moist	tight
	08/22/2003	54	15, 23, 32, 10 0/3	SP	Brown, Fine to Coarse Sand, Trace Silt, Trace Gravel, Trace Quartz fragments, wet	tight
	08/22/2003	0	50/0, 49, 26, 48	SW	Refusal - Rock - Gabbro/Granite fragments	no recovery - bedrock starts at approximately 16 feet below grade
20						
	08/25/2003	71			Dark Grey, Granite, hard, fresh, slightly oxidized specs on top of rock core	Bedrock Core - RQD = 72%
	09/02/2003	74			Dark Grey, Hornblende, hard, fresh, some oxidation at 25.5'-26.0'	Bedrock Core - RQD = 76%

Well Construction

Project Name: Magna Metals	Site Id: MW-04D

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Graphic Log	Material Description	Well Construction	Notes
30	09/02/2003	100				Dark Grey, Hornblende, hard, fresh, some oxidation at 26.0'-27.0'		Bedrock core - RQD = 100%
	09/02/2003	90				Dark Grey, Hornblende, hard, fresh		Bedrock core - RQD = 91%
	09/02/2003	90				Dark Grey, Hornblende, hard, fresh		Bedrock Core - RQD = 90%
40								
50								

	Project Name: Magna Metals	Site Id: MW-05
	Location: Cortlandt, NY	X Coordinate: 665491.01
	Logged By: A. Barroqueiro	Y Coordinate: 890191.50
	Contractor: B&B Drilling	Elevation: 340.42'
Drilling Method: Hollow Stem Auger		Blank Casing: type: PVC sch 40 dia: 2.00in fm: -3.0' to: 4.00'
Remarks:		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 4.00' to: 14.00'
		Annular Fill: type: Bent-Cement Grout fm: 0.00' to: 2.00' type: Bentonite Chips fm: 2.00' to: 3.00' type: No. 1 Sand Pock fm: 3.00' to: 14.00'
Date Started: 08/26/03		Date Completed: 08/26/03

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Graphic Log	Material Description	Well Construction	Notes
	08/26/2003	43	5 11 14	SP/SM		Dark Brown, Fine to Medium Sand, Trace Silt, Trace Gravel, Trace Root Material (FILL)		Spoon hit boulder at 1.5' bgs
	08/26/2003	55	0 7 7	SM		Grey, fine silty Sand, Trace Gravel - Quartz fragments detected		
	08/26/2003	50	6 15 1	SM		Grey, fine Silty Sand, trace clay, moist		
	08/26/2003	30	1 1 1 1 2	SM ML		Grey, fine Silty Sand, trace clay, moist Grey, Clayey Silt, trace fine Sand, trace fine to coarse gravel, loose, moist		
	08/26/2003	34	2 1 2	SC		Grey, fine clayey sand, trace silt, troce hornblende rock fragments, loose, wet		
10	08/26/2003	17	28 23 26 23	SW		Grey, Fine to Coarse Sand, trace clay, trace silt, wet, loose		
	08/26/2003	83	31 25 27 20	SW		Grey, Fine to coarse Sand, with Fine to Coarse Gravel, wet, loose		
			26 20 10 0/4					Auger refusal at 14 feet below grade
20								

	Project Name: Magna Metals	Site Id: MW-06
	Location: Cortlandt, NY	X Coordinate: 665025.92
	Logged By: A. Barroqueiro	Y Coordinate: 889901.83
	Contractor: B&B Drilling	Elevation: 334.59'
Drilling Method: Hollow Stem Auger		Blank Casing: type: PVC sch 40 dia: 2.00in fm: -2.4' to: 8.00'
Remarks:		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 8.00' to: 18.00'
		Annular Fill: type: Bent-Cement Grout fm: 0.00' to: 6.00'; type: Bentonite Chips fm: 6.00' to: 7.00'; type: No. 1 Sand Pack fm: 7.00' to: 18.00'
Date Started: 08/27/03		Date Completed: 08/28/03

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Graphic Log	Material Description	Notes
	08/27/2003	55	6 11 15 18	SM		Brown, Fine to Medium Sand, trace Silt, Trace Gravel (FILL)	loose
	08/27/2003	55	15 13 9 8	SM		Grey, Fine Silty Sand (FILL)	medium
	08/27/2003	25	20 24 13 16	SM		Grey, Fine Silty Sand, Trace Gravel, Moist (FILL)	medium
	08/28/2003	55	8 18	SP		Brown, Fine to Medium Sand, trace Gravel, moist (FILL)	
			7 10	SM		Grey, Fine Silty Sand, Trace Gravel, Trace Glass Fragments, Moist (FILL)	
	08/28/2003	45	12 22	SM		Grey, Fine Silty Sand, Trace Gravel, Trace Glass Fragments, Moist (FILL)	
			39 35	SW		Brown, Fine Silty Sand, Trace Clay, moist	
10	08/28/2003	0	49 48 50/1	SP		Brown, Fine to coarse Sand, Trace Fine to Coarse Gravel, hornblende fragments Grey, Hornblende Fragments	
	08/28/2003	75	15 18 13 20	SP		Light Brown, Fine to Medium Sand, trace Silt, Trace Quartz Fragments, moist, Trace Coarse Sand	medium
	08/28/2003	88	24 18 36 34	SP		Light Brown, Fine to Medium Sand, trace Silt, Trace Quartz Fragments, moist, Trace Coarse Sand	medium
	08/28/2003	0	25 21 18 23			No recovery	Hornblende fragment lodged in spoon leading to no recovery
	08/28/2003	0	50/0	SM		Hornblende Fragments	Bedrock Refusal at approximately 18 feet below grade
20							

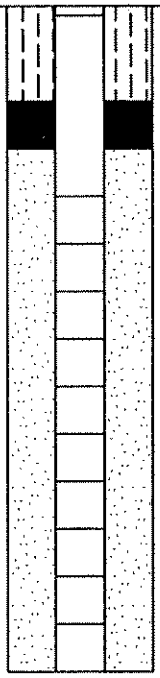
Well Construction

	Project Name: Magna Metals	Site Id: MW-07
	Location: Cortlandt, NY	X Coordinate: 664899.66
	Logged By: A. Barroqueiro	Y Coordinate: 889316.93
	Contractor: B&B Drilling	Elevation: 334.90'
Drilling Method: Hollow Stem Auger/Rock Core		Blank Casing: type: PVC sch 40 dia: 2.00in fm: 0.2' to: 3.00'
Remarks:		Screens: type: Slotted size: 0.010indio: 2.00in fm: 3.00' to: 18.00'
		Annular Fill: type: Bent-Cement Grout fm: 0.00' to: 1.00' type: Bentonite Chips fm: 1.00' to: 2.00' type: No. 1 Sand Pack fm: 2.00' to: 18.00'
Date Started: 08/27/03		Date Completed: 09/03/03

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Graphic Log	Material Description	Well Construction	Notes
				GP		Asphalt with Gravel Sub-base (FILL)		
	08/27/2003	0	50/2			Bedrock at approximotely 2 feet below grade		Drilled through bedrock 2'-7' below grade - no recovery
	09/03/2003	47				Dark Grey,Hornblende, hard, fresh - 9-10 feet hornblende frogments		Bedrock Core - RQD = 47% - Fractured zone at approximately 9'-10' below grade
10	09/03/2003	0				Dark Grey, Hornblende frogments		Bedrock Core - no whole core pieces recovered - RQD = 0%
	09/03/2003	100				Dark Grey, Hornblende, hard, fresh		Bedrock Core - RQD 100% - Frogmented zone from 9'-15' bgs
20								

	Project Name: Magna Metals	Site Id: MW-08
	Location: Cortlandt, NY	X Coordinate: 664474.00
	Logged By: A. Barroqueiro	Y Coordinate: 889301.20
	Contractor: B&B Drilling	Elevation: 317.76'
Drilling Method: Hollow Stem Auger		Blank Casing: type: PVC sch 40 dia: 2.00in fm: 0.2' to: 4.00'
Remarks:		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 4.00' to: 14.00'
		Annular Fill: type: Bent-Cement Grout fm: 0.00' to: 2.00'; type: Bentonite Chips fm: 2.00' to: 3.00'; type: No. 1 Sand Pack fm: 3.00' to: 14.00'
Date Started: 08/27/03		Date Completed: 08/27/03

Depth (ft)	Date	Recovery Percent	Blow Count	USCS Code	Material Description	Notes
	08/27/2003	63	9	SP	Grey, Fine Sand with Gravel (FILL)	
			11	SM	Brown, Fine Silty Sand with Gravel(FILL)	loose
			11			
	08/27/2003	63	8	SM	Brown, Fine Silty Sand, trace Gravel, moist	
			7			
			6			
			4			
	08/27/2003	67	7	SW	Grey, Fine to Medium Sand, trace gravel, wet	
			5			loose
			3			
			4	SC	Dark Grey, Fine Clayey Sand, trace silt, trace coarse sand, trace gravel, moist	loose
	08/27/2003	79	3	SM	Dark Grey, Very Fine Silty Sand, trace Clay, trace Gravel, wet	loose
			4			
			7			
			6			
			12			
	08/27/2003	75	11	SW	Grey, Fine to Coarse Sand, trace Silt, trace Clay, wet	
			31	GW	Grey, Fine to Coarse Gravel, trace Hornblende fragments, trace fine to coarse Sand, wet	loose
10			50			loose
			52			
	08/27/2003	71	25	GW	Grey, Fine to Coarse Gravel, trace Hornblende fragments, trace fine to coarse Sand, wet	loose
			24			
			11	SM	Grey, Fine Silty Sand, trace Gravel, trace Clay, wet	loose
			31	SW		loose
	08/27/2003	50	34	SP	Dark Grey, Fine to Coarse Sand, Trace Gravel, Trace Hornblende and Quartz fragments, wet	Bedrock encountered at approximately 14 feet below grade
			10 0/2		Grey, Hornblende fragments	
20						

Well Construction: 

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **MW-1**

PROJECT NO: 1172 DATE STARTED: 11/19/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/19/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: approximately 14 feet bgs.

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		2			Grass, Roots, fine GRAVEL, trace				
	1	2	1.5		Sand, trace Clay, and Silt; moist.	1017	11/19/97	NAB	
		3			Brown fine SAND, and Silt, trace Clay;				
	2	9			moist.				
		34			Orange-brown fine SAND, and Silt, trace				
	3	9	1.5		Clay; moist.	1022	11/19/97	NAB	
		37							
	4	13			Brown medium to fine SAND; moist.				
		21			Brown fine SAND, trace Silt, trace				
	5	38	1.5		medium to fine subrounded Gravel; dry.	1030	11/19/97	NAB	
		30							
	6	25							
		28			Brown medium to fine SAND, trace Silt,				
MMS-MW1-01	7	33	1.5		trace fine subangular to subrounded	1035	11/19/97	NAB	
		38			Gravel; dry.				
	8	29							
		27			Brown fine SAND, trace Silt, Granitic				
	9	30	1.5		fragments (9.0 to 9.3 ft. bgs); dry.	1047	11/19/97	NAB	
		38							
	10	40							
		65			Brown fine SAND, trace Silt, and medium				
	11	100/4"	0.67		Gravel; very tight, very dense; dry.	1055	11/19/97	NAB	
		--							
	12	--							
		27			Brown medium to fine SAND, trace Silt,				
MMS-MW1-02	13	28	1.8		some medium to fine subangular Gravel;	1110	11/19/97	NAB	
		30			dry.				
	14	33							
		33			Brown fine SAND, trace Silt; wet.				
	15	100/1"	0.5			1120	11/19/97	NAB	
					End of Boring @ 14.5 feet bgs.				
	16								
	17								
	18								
	19								
	20								

NOTES:

PAGE 1 OF 1

FOSTER WHEELER ENVIRONMENTAL CORPORATION

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **MW-2**

PROJECT NO: 1172 DATE STARTED: 11/18/07

LOCATION: Cortlandt, New York DATE COMPLETED: 11/18/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		3			Brown fine SAND, and Silt, some				
	1	5			medium to fine subrounded Gravel;	1315	11/18/97	NAB	
		4			moist.				
	2	5							
		4							
	3	4				1320	11/18/97	NAB	
		3							
	4	3							
		3			Brown to Orange-brown fine SAND, and				
	5	3			Silt, trace fine subrounded Gravel;	1335	11/18/97	NAB	
		3			slightly moist.				
	6	3							
		3			Light Brown to Tan fine SAND, dry.				
MMS-MW2-01	7	5				1350	11/18/97	NAB	
MMD-MW2-01		7							
	8	12							
		10							
	9	12				1415	11/18/97	NAB	
		17							
	10	19							
		12							
	11	15			Brown medium ot fine SAND with mica	1420	11/18/97	NAB	
		18			flakes, some fine subrounded Gravel; dry.				
	12	23							
		17							
MMS-MW2-02	13	25				1435	11/18/97	NAB	
		28							
	14	40							
		145/6"			Granite fragment.				
	15	--				1450	11/18/97	NAB	
		--							
	16	--							
		55			Brown medium to fine SAND, and Silt,				
	17	135			and medium to fine subangular to sub-	1515	11/18/97	NAB	
		--			rounded Gravel; dry.				
	18	--							
		100/6"			Brown medium to fine SAND, trace Silt,				
	19	--			some mica flakes, and subangular to	1535	11/18/97	NAB	
		--			subrounded Gravel; dry.				
	20	--							

NOTES:

PAGE 1 OF 1

FOSTER WHEELER ENVIRONMENTAL CORPORATION

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **MW-2**

PROJECT NO: 1172 DATE STARTED: 11/18/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/18/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	20								
	21	100/4"	0.25		Medium to fine subrounded GRAVEL, and Brown medium to fine Sand, and Silt; dry, abundant mica flakes.	1600	11/18/97	NAB	Auger refusal @ 22 feet bgs.
	22								
					End of boring @ 22 feet bgs.				
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30								
	31								
	32								
	33								
	34								
	35								
	36								
	37								
	38								
	39								
	40								

NOTES: NAB = not above background.

PAGE 2 OF

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PROJECT: **Magna Metals** BORING NUMBER: **MW-3**

PROJECT NO: 1172 DATE STARTED: 11/17/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/17/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		4			Brown fine SAND, and Silt; dry.				
	1	10	1.3			1105	11/17/97	NAB	
		12							
	2	18							
		8			Brown medium to fine SAND, trace				
	3	9	1.3		Silt, trace fine subrounded Gravel; dry.	1110	11/17/97	NAB	
		10							
	4	10							
		3			Brown fine SAND, trace fine				
	5	2	1.0		subrounded Gravel; dry.	1120	11/17/97	NAB	
		3							
	6	4							
		5			Light Brown to Tan fine SAND, trace				
MMS-MW3-01	7	9	1.5		fine subrounded Gravel; dry.	1125	11/17/97	NAB	
		27							
	8	35							
		21			Light Brown to Tan fine SAND, some				
	9	32	2.0		medium to fine subangular Gravel; dry.	1135	11/17/97	NAB	
		40			Dark Brown medium to fine SAND; dry.				
	10	48			SAME as 8.0 to 9.0 ft. bgs interval.				
		75			Light Brown to Tan fine SAND, trace				
	11	100/.4	0.83		subangular to subrounded Gravel; dry.	1140	11/17/97	NAB	
		--							
	12	--							
		15			Light Brown to Tan fine SAND, trace				
	13	19	1.25		subrounded Grevel; dry.	1200	11/17/97	NAB	
		20							
	14	24			Medium subangular GRAVEL; dry.				
		37			Light Brown to Tan fine SAND, and				
	15	100/3"	0.25		medium to fine subangular Gravel; dry.	1214	11/17/97	NAB	
					End of boring @ 14.8 feet bgs				
	16								
	17							NAB	
	18								
	19							NAB	
	20								

NOTES:

PAGE 1 OF 1

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **MW-4**
PROJECT NO: 1172 DATE STARTED: 11/18/97
LOCATION: Cortlandt, New York DATE COMPLETED: 11/18/97
GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA
DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:
DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		3			Brown fine SAND, and Silt, trace fine				
	1	4	1.0		subrounded Gravel; dry.	0905	11/18/97	NAB	
		6							
	2	6							
		6							
	3	6	0			0910	11/18/97	NAB	
		7							
	4	7							
		6			Brown fine SAND, trace Silt, some fine				
	5	7	0.25		Gravel; dry.	0920	11/18/97	NAB	
		8							
	6	8							
		8			Light Brown to Tan fine SAND, trace				
MMS-MW4-01	7	7	1.5		fine subrounded Gravel; dry.	0930	11/18/97	NAB	
		11							
	8	13							
		21							
	9	35	1.3			0940	11/18/97	NAB	
		48							
	10	50			Medium GRAVEL.				
		25			Brown fine SAND, trace Silt, trace fine				
	11	35	1.0		subangular Gravel; dry.	0945	11/18/97	NAB	
		75							
	12	105							
		68			Brown fine SAND, and medium sub-				
MMS-MW4-02	13	83	1.08		angular to subrounded Gravel; dry.	1015	11/18/97	NAB	
		90							
	14	95							
		45			Brown, Black, and White mottled				
MMS-MW4-03	15	74	1.42		medium to fine SAND, some Silt, trace	1033	11/18/97	NAB	
		83			medium to fine subangular Gravel; dry,				
	16	70			very dense, tight.				
		110/6"							
	17	--	0.58			1040	11/18/97	NAB	
		--							
	18	--							
		100/1"	0.08		Bedrock.	1115	11/18/97	NAB	
	19				End of boring @ 17.8 feet bgs				
	20								

NOTES:

PAGE 1 OF 1

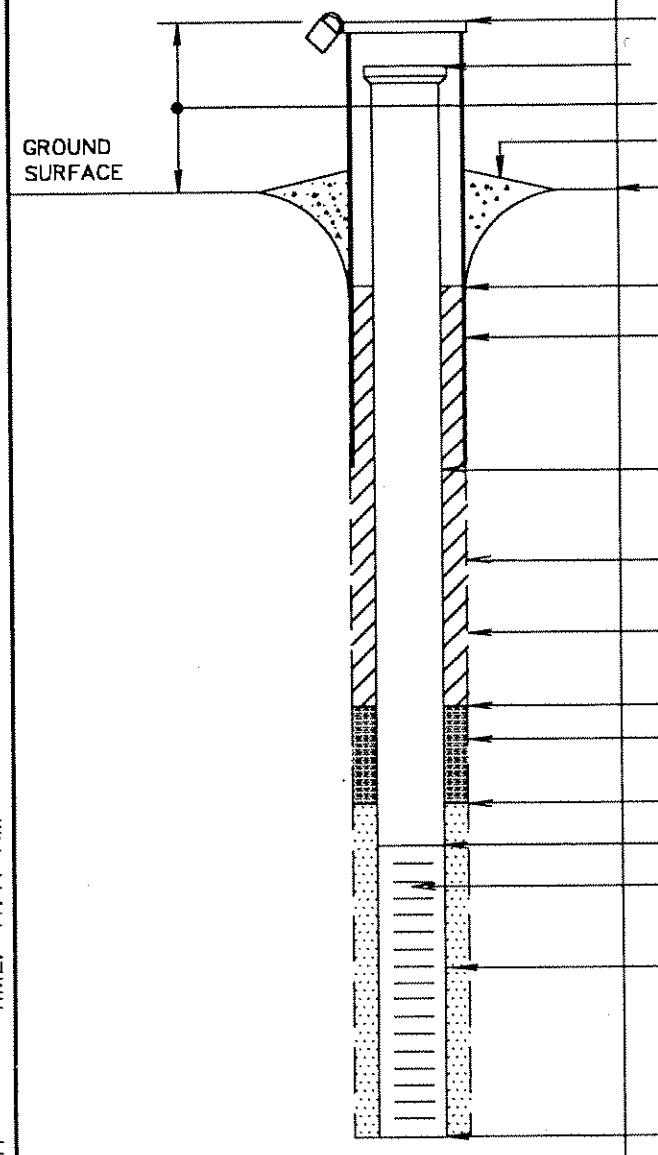
FOSTER WHEELER ENVIRONMENTAL CORPORATION

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-1

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-18-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____

DEPTH TO BACKFILL: 0.4' 0
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL

RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC

BOREHOLE DIAMETER: 8 1/4"

TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY

DEPTH TOP OF SEAL: 2.5' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS

DEPTH TOP OF SAND PACK: 3.5' bgs
DEPTH TOP OF SCREEN: 4.5' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1

DEPTH BORING AND BOTTOM OF SCREEN: 14.5' bgs

NOT TO SCALE

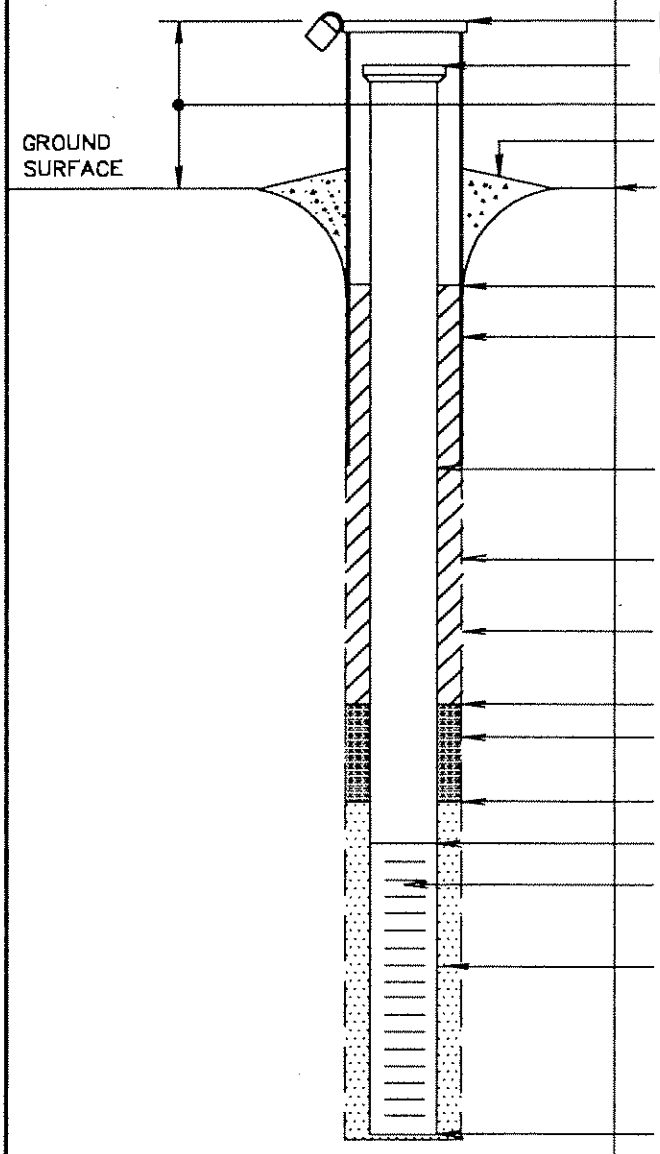
CAD FILE NAME: 1MM41098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:11 AM

UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-2

PROJECT MAGNA METALS	DRILLER ADVANCED DRILLING INC.
PROJECT NO. 1172	DRILLING METHOD HOLLOW STEM AUGER (HSA)
ELEVATION ____ DATE 11-18-97	DEVELOPMENT METHOD ____
FIELD GEOLOGIST M. MAZZA	



ELEVATION OF TOP OF SURFACE CASING: ____

ELEVATION OF TOP OF RISER PIPE: ____

STICK-UP TOP OF SURFACE CASING: ____

TYPE OF SURFACE SEAL: CONCRETE

GROUND SURFACE ELEVATION: ____

DEPTH TO BACKFILL: 0.4'

I.D. OF SURFACE CASING: 8 INCH

TYPE OF SURFACE CASING: STEEL

RISER PIPE I.D. 2 INCH

TYPE OF RISER PIPE: SCHEDULE 40 PVC

BOREHOLE DIAMETER: 8 1/4"

TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY

DEPTH TOP OF SEAL: 8' bgs

TYPE OF SEAL: HYDRATED BENTONITE PELLETS

DEPTH TOP OF SAND PACK: 10' bgs

DEPTH TOP OF SCREEN: 12' bgs

TYPE OF SCREEN: SCHEDULE 40 PVC

SLOT SIZE X LENGTH: .010 INCH x 10 FT.

TYPE OF SAND PACK: MORIE #1

DEPTH BORING AND BOTTOM OF SCREEN: 22' bgs

NOT TO SCALE

CAD FILE NAME: 2MM4098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:12 AM

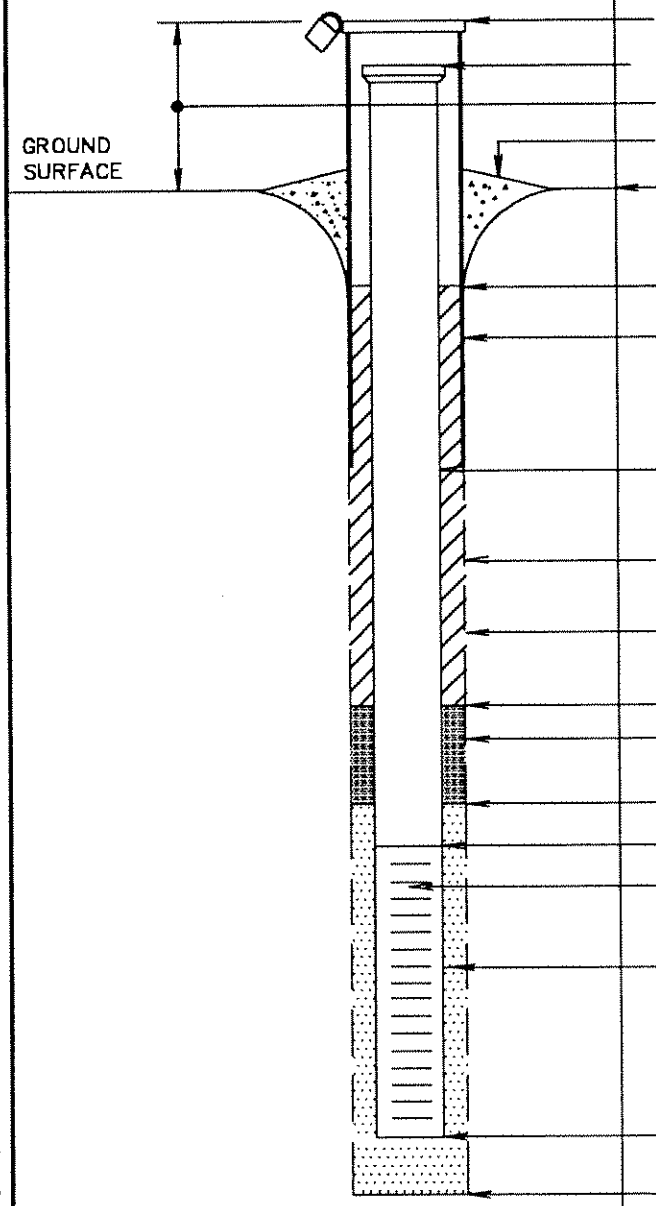
UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-3

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-16-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____

DEPTH TO BACKFILL: 0.4'
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL

RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC

BOREHOLE DIAMETER: 8 1/4"

TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY

DEPTH TOP OF SEAL: 2.5' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS

DEPTH TOP OF SAND PACK: 3.5' bgs
DEPTH TOP OF SCREEN: 4.5' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1

DEPTH BORING AND BOTTOM OF SCREEN: 14.5' bgs
DEPTH OF BORING: 14.8 bgs

NOT TO SCALE

CAD FILE NAME: 3MM4109B.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:115 AM

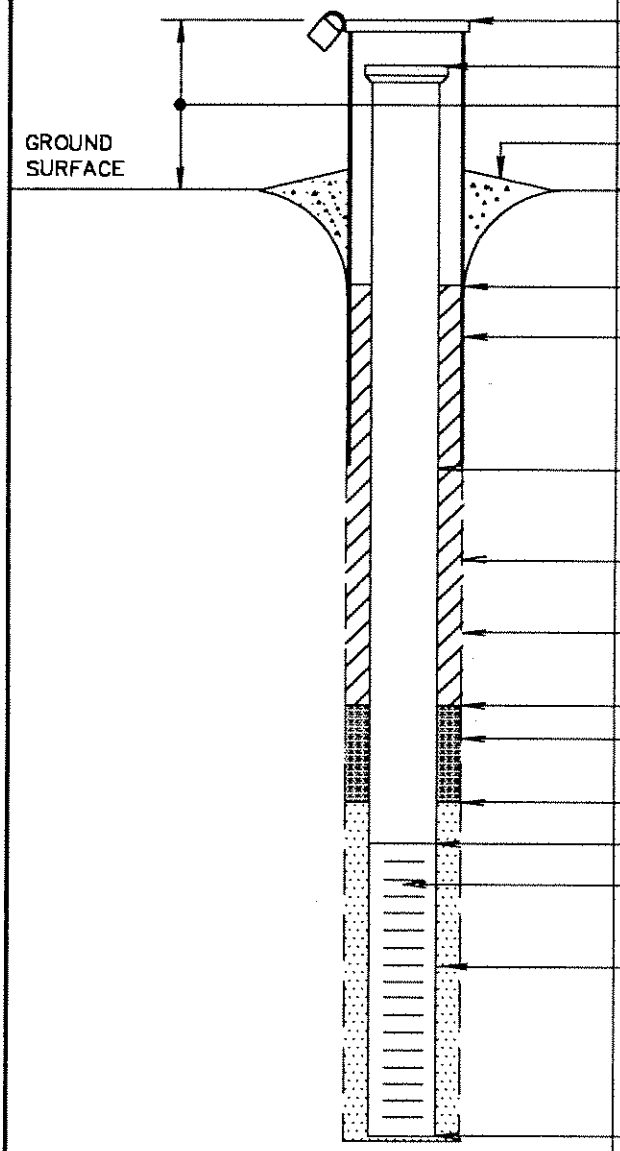
UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-4

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-17-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____
DEPTH TO BACKFILL: 0.4'
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC
BOREHOLE DIAMETER: 8 1/4"
TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY
DEPTH TOP OF SEAL: 3.5' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS
DEPTH TOP OF SAND PACK: 5.5' bgs
DEPTH TOP OF SCREEN: 7.8' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1
DEPTH BORING AND BOTTOM OF SCREEN: 17.8' bgs

NOT TO SCALE

CAD FILE NAME: 4MM4098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:16 AM

UNMW1.DWG

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.0002
LOCATION: 2 Feet west of Pit A
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" Split spoon driven by 140lb hammer dropped 30 inches. Tripod Rig.

BORING NUMBER: SB-01
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	5-9		0.5 Topsoil			
	1			Brown f SAND, little Silt, trace f Gravel. FILL	1100	12-10-96	OVA: NAB
	1.5	13-11					
	2						
	2.5	9-7					
	3				1110	12-10-96	OVA: NAB
	3.5	8-7					
	4						
MMS-SB01-01	4.5	3-5					4.0-5.5, OVA: NAB
	5				1120	12-10-96	
	5.5	17-22		5.5			5.5-6.0, OVA
	6			Brown Cmf SAND with gold and green grains, angular FILL			
	6.5	41-49			1130	12-10-96	OVA: NAB
	7						
	7.5	32-30					
	8						
	8.5			END OF BORING			
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit A: 4 Feet Deep. Target Sampling Depth 4 Feet to 6 Feet.

PAGE 1 OF 1

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 Feet West of Pit B
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallacky/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-02
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	5-6	12	0.5 Topsoil	1200	12-10-96	OVA: NAB
	1			Brown mf SAND, trace Silt, trace f Gravel FILL			
	1.5	9-18					
	2						
	2.5	9-8	2	Pushed Stone	1205	12-10-96	
	3						
	3.5	6-6					
	4						
	4.5	9-10	0	No Recovery	1210	12-10-96	
	5						
	5.5	11-10					
	6						
	6.5	9-13	0		1215	12-10-96	
	7						
	7.5	13-16					
	8						
MMS-SB02-01	8.5	30-48	19	Brown f SAND, little Clay moist FILL	1225	12-10-96	OVA: NAB
	9						
	9.5	49-51					
	10						
	10.5			END OF BORING			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit B: 8 feet deep. Target Sampling Depth 8 feet to 10 feet deep.

PAGE 1 OF 1

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0080.0002
LOCATION: 2 feet west of Pit C
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallack / Advanced Drilling
DRILLING/SAMPLING METHOD: 2" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-03
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0			0.2 Topsoil			
	0.5	3-6	17	Brown-grey f SAND, trace silt, trace clay	1330	12-10-96	OVA: NAB
	1						
	1.5	8-10					
	2						
	2.5	9-6	9	FILL	1340	12-10-96	2.0' to 3.5' OVA: NAB
	3						
	3.5	9-11		3.5 Black and white organic rich SILT FILL			3.5'-4.0' OVA: 3ppm
	4						
	4.5	10-8	14	Light red Brown grading to Ash Grey f SAND, little Silt, Dry, well sorted, well drained FILL	1350	12-10-96	OVA: NAB
	5						
	5.5	12-16					
	6						
	6.5	12-19	24		1355	12-10-96	OVA: NAB
	7						
	7.5	23-39					
	8						
MMS-SB03-01	8.5	27-50	14		1400	12-10-96	OVA: 3ppm
	9	9/6"					
	9.5						
	10			END OF BORING			
	10.5			REFUSAL AT 9.5 FEET			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit C: 8.5 feet deep. Target sampling depth was 8.5 to 10.5 feet, however sample was taken from 8.0' to 9.5 feet due to refusal of boring.

PAGE 1 OF 1

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 feet west of Pit D
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallack / Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split-Spoon and 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-04
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	6-9	22	0.2' Top Soil			
	1			Brown f SAND, little Silt,	1440	12-10-96	OVA: NAB
	1.5	32-18		little Clay, dry FILL			
	2			trace cm gravel, mediumdense			
	2.5	12-23	17				
	3			grading to	1445	12-10-96	OVA: 0.5 ppm
	3.5	14-12					
	4						
	4.5	13-12	16				
	5				1450	12-10-96	OVA: NAB
	5.5	19-16					
	6			Lt. Grey f SAND, little Silt,			
	6.5	23-18	6	well Sorted, loose, dry	1455	12-10-96	OVA: 1.5 ppm
MMS-SB04-01	7			FILL			
	7.5	23-46	12				
	8	100/6			1520	12-10-96	OVA: NAB
	8.5						
	9			END OF BORING			
	9.5			REFUSAL AT 8.5 FEET			
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: organic vapor analyzer
NAB: Not Above Background
Pit D: 7 feet Deep.
Target Sampling depth was 7 to 9 feet, but sample was taken from 6.5' to 8.5' because of refusal

PAGE 1 OF 1

LOG OF BORING

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 feet west of Pit E.
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split spoons driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-05
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	2-4	9	0.4 Topsoil			
	1			Brown mf SAND, little silt, trace clay trace f. Gravel medium dense FILL	0900	12-11-96	OVA: NAB
	1.5	4-6					
	2						
	2.5	3-6	11	grading to	0905	12-11-96	OVA: NAB
	3						
	3.5	16-23					
	4						
	4.5	23-31	15	Light Grey f SAND, little Silt, dry, medium dense FILL	0915	12-11-96	OVA: NAB
MMS-SB05-01	5						
	5.5	36-49					
	6						
	6.5	100/6	2		0920	12-11-96	OVA: 1PPm
	7			END OF BORING			
	7.5			REFUSAL AT 6.5 FEET			
	8						
	8.5						
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above background.
Pit E: 6 feet deep.
Target Sampling depth was 6 feet to 8 feet, however sample taken at 4.5 feet to 6.5 feet due to refusal.

PAGE 1 OF 1

EBASCO ENVIRONMENTAL DIVISION

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172-0001-0000-0002
LOCATION: 2 Feet West of Pit F
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 3" Split Spoon Advanced by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-06
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5			0.5 Topsoil			
	1	3-4					
	1.5	6-6	17	Brown mf SAND, little Silt, trace Clay, medium dense dry FILL	1010	12-11-96	OVA: NAB
	2						
	2.5						
	3	4-4					
	3.5	15-16	11		1020	12-11-96	OVA: NAB
	4						
	4.5	14-18					
	5						Pushed Stone
	5.5	15-16	0		1030	12-11-96	
	6						
	6.5	19-23					
	7						
	7.5	23-25	7	Grey-brown mf SAND, little Silt, trace Clay, little C Gravel, medium dense, moist FILL	1050	12-11-96	OVA: NAB
	8						
MMS-SB06-01	8.5	48-61					
	9		5		1110	12-11-96	OVA: 1 ppm
	9.5	100/6"					
	10			END OF BORING			
	10.5			REFUSAL AT 9.5 FEET			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Back
Pit F: 7.5 feet deep. Target Sampling Depth: 7.5 to 8.5 feet.

PAGE 1 OF 1

LOG OF BORING

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 feet west of Pit G
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack
DRILLING/SAMPLING METHOD: 3" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig.

BORING NUMBER: SB-07
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	3-4	14	Brown mf SAND, little Silt. Organic Rich Roots., loose, dry FILL	1235	12-11-96	OVA: NAB
	1						
	1.5	7-8					
	2						
	2.5	19-19	6		1245	12-11-96	OVA: NAB
	3						
	3.5	12					
	4			4.0			
MMS-SB07-01 MMD-SB07-01	4.5	14-10	17	Black to Brown mf SAND, little Silt Black bituminous sand sized particles FILL	1300	12-11-96	OVA: 1ppm
	5						
	5.5	1044		5.0			
	6			5.5 Lt. Grey f SAND, little Silt, dry, loose FILL			
	6.5			END OF BORING 5.5 FEET			
	7						
	7.5						
	8						
	8.5						
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit G: 3.5 Feet Deep. Target Sampling Depth: 3.5' to 5.5'.

PAGE 1 OF 1

FIGURE 3-2

LOG OF BORING

PROJECT: Magna Metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: D. Campbell, M Petaccia
DRILLER: —
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SS-01
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet) (in 0)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
MMS-01-01 and MMD-SS 01-01	1	6	6"/6"	Dk brown f. to m. SAND some Silt, little Gravel abundant organics (roots) slightly cohesive, moist	0947	4/11/97	NAB	Semi-VOA, Pest/PCB, metals, Cyanide
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9		6"/6"				NAB	VOA
	10							
	11							
	12							
	13			Boring terminated 1 ft				
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							

NOTES:
HNu - Baker 2ppm
6"-12" sampled twice 2nd time, adjacent borehole

PAGE 1 OF

EBASCO ENVIRONMENTAL DIVISION

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **SS02**

PROJECT NO: 1172 DATE STARTED: 11/17/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/17/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: 2" split spoon

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECO-VERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		17			Brown fine SAND, trace Silt, trace fine				
MMS-SS02-02	1	35	0.96		subangular Gravel; dry.	1515	11/17/97	NAB	
		40							
	2	20							
					End of boring @ 2.0 feet bgs				
	3							NAB	
	4								
	5							NAB	
	6								
	7							NAB	
	8								
	9							NAB	
	10								
	11							NAB	
	12								
	13							NAB	
	14								
	15							NAB	
	16								
	17							NAB	
	18								
	19							NAB	
	20								

NOTES:

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: D. Campbell, M. Potaccia
DRILLER: –
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SS02
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: N/A
ELEVATION:

SAMPLE ID	DEPTH ~~(feet)~~ in 0	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
MMS-02-01	1			0-2" Black organic-rich SILT				Semi-VOA, metals, Pest/PCB, Cyanide
	2							
	3			2"-6" Brown C. to F. SAND, little silt, Trace gravel, abundant roots	1027	4/11/97	NAB	
	4							
	5							
	6							
	7							
	8							
	9					4/11/97	NAB	VOA
	10							
	11							
	12							
	13			Boring terminated @ 1 ft				
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							

NOTES: 1st attempt - refusal
~~[illegible]~~
~~[illegible]~~

PAGE 1 OF

EBASCO ENVIRONMENTAL DIVISION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: M. Petraccia, O. Campbell
DRILLER:
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SS03
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: NE.
ELEVATION:

SAMPLE ID	DEPTH (feet) In 0	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
MMS-SS03-01 Comp MS, MSD	1–6	N/A		Brown Organic SILT trace vegetation dry.		4/11/97	N/AS	Semi-VOA, Pest/PCB metals, cyanide
	7–12			Brown f. to m. SAND some Silt, trace gravel abundant roots, loose		4/11/97		VOAs
	13			Boring Terminated @ 1 Ft				
	14–30							

NOTES:

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EBASCO ENVIRONMENTAL DIVISION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna Metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: M. Petraccia, D. Campbell
DRILLER: —
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: mms-SS04
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: N.E.
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
mms-SS04-01 ↓	0–6			DK Brown organic SILT, ~~roots~~, (Topsoil) moist		4/11/97		Semi-VOA Pest/PCB Metals Cyanide ↓ ↓
	7–12			~~Med~~ Brown ~~SILTY~~ ~~SAND~~, roots, trace mica, SILT, little f ~~SAN~~ sand, organic material (roots) little f Gravel		4/11/97		VOAs
	13–30			Boring terminated @ 1 ft trace mica ~~and other material~~ ~~[illegible]~~ moist				

NOTES:

PAGE 1 OF

EBASCO ENVIRONMENTAL DIVISION

WELL DEVELOPMENT DATA SHEET

Well I.D. MW-04D
Date 09/04/03

Project Magna Metals
Samplers John Imhoff

Initial Depth to Water (ft below TIC) 17.1
Screened Interval (ft below TIC): 20-30
Depth of Pump Intake (ft below TIC): -

Purge Method

Airlift

Field Parameters

TIME	VOL (Gal)	pH (SU)	COND. (ms/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	SAL. (%)	APPEARANCE
12:40	~0	8.14	1.60	-	13.10	14.9	0.07	-
12:50	~50	5.34	1.43	371	13.02	14.0	0.06	-
12:55	~75	6.96	1.24	140	13.46	13.5	0.05	No odor or sheen observed
13:00	~80	7.57	1.29	33	14.10	12.8	0.05	-
13:05	~90	7.61	1.29	20	13.86	12.7	0.05	-
13:10	~100	7.62	1.29	22	13.90	12.7	0.05	
End of Development								

Total Volume: ~100 gallons

Notes/Observations: 12:40 - pump rate ~ 5 gal/min
12:55 - pump rate ~ 2 gal/min

- : No observations recorded

WELL DEVELOPMENT DATA SHEET

Well I.D. MW-05
Date 09/04/03

Project Magna Metals
Samplers John Imhoff

Initial Depth to Water (ft below TIC) 9.1
Screened Interval (ft below TIC): 3-14
Depth of Pump Intake (ft below TIC): -

Purge Method

Single wale pump, 2" Submersible Pump

Field Parameters

TIME	VOL (Gal)	pH (SU)	COND. (ms/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	SAL (%)	APPEARANCE
11:30	~0	6.52	4.9	803	11.2	18.3	0.020	-
11:40	~5	6.70	0.694	999	11.41	17.7	0.020	-
11:50	~10	6.92	0.668	10	11.34	17.5	0.020	-
12:00	~15	6.89	0.691	10	11.28	17.5	0.020	-
12:10	~20	6.88	0.698	10	11.28	17.4	0.020	-
End of Development								

Total Volume: ~20 gallons

Notes/Observations:

- : No observations recorded

WELL DEVELOPMENT DATA SHEET

Well I.D. MW-07
Date 09/04/03

Project Magna Metals
Samplers John Imhoff

Initial Depth to Water (ft below TIC) 9.25
Screened Interval (ft below TIC): 3-14
Depth of Pump Intake (ft below TIC): -

Purge Method

Single wale pump, 2" Submersible Pump

Field Parameters

TIME	VOL (Gal)	pH (SU)	COND. (ms/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	SAL (%)	APPEARANCE
15:30	~0	9.14	0.388	235	11.17	18.7	0.01	-
15:35	~4	8.91	0.495	84	11.32	18.4	0.02	-
15:40	~8	8.72	0.514	128	11.29	18.5	0.02	-
15:45	~15	8.46	0.552	39	11.54	18.6	0.02	-
15:50	~18	8.33	0.574	29	11.83	18.4	0.02	No odor or sheen observed, colorless
15:55	~22	8.24	0.590	23	11.95	18.6	0.02	-
16:00	~25	8.20	0.601	33	12.05	18.6	0.02	Very slightly turbid, colorless, no odor observed
16:05	~30	8.15	0.615	16	12.25	18.2	0.02	-
16:10	~40	8.10	0.621	20	12.12	18.3	0.02	-
16:15	~40	8.11	0.632	15	12.36	18.3	0.02	-
16:20	~45	8.10	0.630	13	12.39	18.1	0.02	
End of Development								

Total Volume: ~45 gallons

Notes/Observations:

- : No observations recorded

WELL DEVELOPMENT DATA SHEET

Well I.D. MW-08
Date 09/04/03

Project Magna Metals
Samplers John Imhoff

Initial Depth to Water (ft below TIC) 7.3
Screened Interval (ft below TIC): 3-14
Depth of Pump Intake (ft below TIC): -

Purge Method

Single wale pump, 2" Submersible Pump

Field Parameters

TIME	VOL (Gal)	pH (SU)	COND. (ms/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	SAL (%)	APPEARANCE
14:15	~0	8.13	2.01	760	11.17	18.5	0.04	-
14:20	~5	8.04	0.792	555	11.57	17.5	0.03	-
14:25	~10	7.96	0.764	463	11.72	17.1	0.03	-
14:30	~15	7.94	0.758	188	11.74	17.1	0.03	-
14:35	~20	7.95	0.758	118	11.69	17.1	0.03	-
14:40	~25	7.95	0.749	125	11.78	16.9	0.03	-
14:45	~30	7.95	0.747	66	11.55	17.2	0.03	-
14:50	~35	7.94	0.743	50	11.66	17.0	0.03	-
14:55	~40	7.95	0.743	82	11.66	17.0	0.03	-
15:00	~45	7.93	0.740	53	11.66	17.0	0.03	Water is slightly turbid, colorless, odorless
End of Development								

Total Volume: ~45 gallons

Notes/Observations:

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-01
Date 10/06/03

Project Magna Metals
Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 13.75
Screened Interval (ft below ground surface): 4 -14
Depth of Pump Intake (ft below TIC): 16

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

	FLOW RATE	DTW	pH	SPEC. COND.	TURB.	DO	TEMP.	ORP	PID	
TIME	(ml/m)	(ft TIC)	(SU)	(mS/cm)	(NTU)	(mg/l)	(°C)	(mV)	0.0	APPEARANCE
14:05	200	14.10	6.28	0.313	731	6.35	13.76	121	0.0	-
14:08	200	14.16	5.99	0.293	605	6.31	13.85	128	0.0	-
14:11	200	14.23	5.98	0.296	638	6.53	14.65	134	0.0	-
14:14	200	14.28	6.08	0.294	432	6.53	15.91	131	0.0	-
14:17	200	14.40	6.16	0.286	251	6.29	19.18	129	0.0	-
14:20	200	14.51	6.19	0.285	161	6.21	19.40	131	0.0	-
14:23	200	14.53	6.2	0.286	155	6.00	19.29	135	0.0	-
14:26	200	15.16	6.15	0.312	783	5.23	16.00	147	0.0	-
End of Purge										

Total Volume Purged: ~2.5 gallons

Notes/Observations: Dry at 14:30, allow to recharge before sampling.
Samples collected at 15:00.

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-02
Date 10/08/03

Project Magna Metals
Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 20.69
Screened Interval (ft below ground surface): 12 -22
Depth of Pump Intake (ft below TIC): 22.5

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

TIME	FLOW RATE (ml/m)	DTW (ft TIC)	pH (SU)	SPEC. COND. (mS/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	ORP (mV)	PID (ppm)	APPEARANCE
08:50	150	20.75	5.78	2.75	999	2.60	13.19	180	0.8	-
08:53	150	20.76	5.78	2.75	691	2.45	14.90	146	0.9	-
08:56	150	20.75	5.83	2.77	535	2.50	15.19	139	1.3	-
08:59	150	20.75	5.85	2.75	434	2.41	15.97	132	1.3	-
09:02	150	20.75	5.88	2.70	267	2.41	16.77	131	1.5	-
09:05	150	20.75	5.89	2.67	683	2.38	18.74	130	1.8	-
09:08	200	20.76	5.90	2.66	999	2.27	20.66	133	2.0	-
09:17	200	20.91	5.82	2.70	380	2.34	14.03	163	2.4	-
09:20	300	20.87	5.78	2.68	304	2.28	14.75	164	3.0	-
09:23	200	20.85	5.81	2.69	145	2.25	15.36	164	2.9	-
09:26	200	20.83	5.86	2.68	91.2	2.21	16.37	161	2.8	-
09:29	200	20.83	5.89	2.67	67.7	2.21	17.23	159	3.2	-
09:32	200	20.82	5.91	2.68	48.4	2.22	17.51	160	4.2	-
End of Purge										

Total Volume Purged: ~4 gallons

Notes/Observations: Pump clogged at 09:10; stop and unclog pump.
Restart pump at 09:15.
Samples collected at 09:35.

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-04D
Date 10/08/03

Project Magna Metals
Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 20.66
Screened Interval (ft below ground surface): 20 -30
Depth of Pump Intake (ft below TIC): 26.5

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

	FLOW RATE	DTW	pH	SPEC. COND.	TURB.	DO	TEMP.	ORP	PID	
TIME	(ml/m)	(ft TIC)	(SU)	(mS/cm)	(NTU)	(mg/l)	(°C)	(mV)	(ppm)	APPEARANCE
10:04	425	21.71	6.60	1.98	67.9	1.81	12.29	-13	9.0	-
10:07	425	21.71	6.51	2.00	62.7	1.21	12.71	-22	10.7	-
10:10	425	21.71	6.54	2.00	67.9	0.96	13.11	-32	11.0	-
10:13	425	21.72	6.59	2.00	66.7	0.85	13.63	-39	14.4	-
10:16	425	21.72	6.62	2.00	60.2	0.65	13.85	-46	13.4	-
10:19	425	21.71	6.64	2.00	55.5	0.66	14.03	-46	13.4	-
10:22	425	21.71	6.64	2.01	47.4	0.63	14.26	-46	16.0	-
End of Purge										

Total Volume Purged: ~4 gallons

Notes/Observations: Samples and duplicate (MM-GWMW-05D) collected at 10:25.

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-05 Project Magna Metals
Date 10/06/03 Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 11.98
Screened Interval (ft below ground surface): 4 - 14
Depth of Pump Intake (ft below TIC): 16

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

TIME	FLOW RATE (ml/m)	DTW (ft TIC)	pH (SU)	SPEC. COND. (S/cm)	TURB. (NTU)	DO (mg/l)	TEMP. (°C)	ORP (mV)	PID 0.0	APPEARANCE
12:40	200	12.31	6.50	1.06	999	1.25	16.95	-90	0.0	-
12:43	200	12.25	6.54	1.04	999	0.73	17.19	-97	-	-
12:46	200	12.25	6.55	1.04	999	0.57	18.83	-100	0.0	-
12:49	200	12.26	6.56	1.03	999	0.55	19.62	-103	0.0	-
12:52	200	12.28	6.58	1.02	681	0.54	20.11	-108	0.0	-
12:55	200	12.28	6.59	1.02	399	0.52	20.38	-109	0.0	-
12:58	200	12.29	6.59	1.01	289	0.50	20.66	-111	0.0	-
13:01	200	12.29	6.60	1.01	255	0.51	20.57	-111	0.0	-
13:04	200	12.30	6.60	1.01	206	0.51	20.53	-112	0.0	-
13:07	200	12.30	6.60	1.01	182	0.50	20.50	-112	0.0	-
13:10	200	12.30	6.60	1.00	132	0.49	20.72	-113	0.0	-
13:13	200	12.30	6.61	1.00	112	0.47	20.81	-114	0.0	-
13:16	200	12.30	6.61	1.00	100	0.48	20.67	-114	0.0	-
13:19	200	12.30	6.61	1.00	94.9	0.48	20.65	-114	0.0	-
13:22	200	12.30	6.62	0.99	63.9	0.49	20.81	-116	0.0	-
13:25	200	12.30	6.62	0.99	56.4	0.48	20.81	-116	0.0	-
13:28	200	12.30	6.63	0.98	50.5	0.46	20.88	-117	0.0	-
13:31	200	12.30	6.63	0.98	55.8	0.46	20.90	-117	0.0	-
13:34	200	12.30	6.63	0.98	46.3	0.51	20.85	-118	0.0	-
End of Purge										

Total Volume Purged: ~5 gallons

Notes/Observations: Samples collected at 13:35.

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-07 Project Magna Metals
Date 10/07/03 Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 8.98
Screened Interval (ft below ground surface): 8.5 -18.5
Depth of Pump Intake (ft below TIC): 14

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

	FLOW RATE	DTW	pH	SPEC. COND.	TURB.	DO	TEMP.	ORP	PID	
TIME	(ml/m)	(ft TIC)	(SU)	(mS/cm)	(NTU)	(mg/l)	(°C)	(mV)	0.0	APPEARANCE
10:50	200	9.02	7.57	1.29	34.0	1.27	16.77	7	0.0	-
10:53	200	9.02	7.54	1.26	34.7	0.64	18.20	-6	0.0	-
10:56	225	9.02	7.51	1.28	5.5	0.55	19.07	-12	0.0	-
10:59	225	9.02	7.46	1.29	3.2	0.61	19.23	-8	0.0	-
11:02	225	9.02	7.43	1.30	3.0	0.62	19.29	-5	0.0	-
11:05	225	9.03	7.40	1.29	0.4	0.70	19.41	-1	-	-
11:08	225	9.03	7.39	1.29	0.7	0.72	19.43	2	0.0	-
11:11	225	9.03	7.38	1.29	0.7	0.74	19.45	4	0.0	-
11:14	225	9.03	7.37	1.28	0.3	0.79	19.45	6	0.0	-
11:17	225	9.03	7.37	1.28	0.4	0.79	19.56	8	0.0	-
11:20	225	9.03	7.36	1.28	0.6	0.77	19.51	9	0.0	-
End of Purge										

Total Volume Purged: ~3 gallons

Notes/Observations: Samples and MS/MSD collected at 11:22.

- : No observations recorded

LOW FLOW PURGE DATA SHEET

Well I.D. MW-08 Project Magna Metals
Date 10/07/03 Samplers K. Millet, A Barroqueiro

Initial Depth to Water (ft below TIC) 6.12
Screened Interval (ft below ground surface): 6 - 12
Depth of Pump Intake (ft below TIC): 10

Purge Method

Grundfos Rediflo 2, 2" Submersible Pump

Field Parameters

	FLOW RATE	DTW	pH	SPEC. COND.	TURB.	DO	TEMP.	ORP	PID	
TIME	(ml/m)	(ft TIC)	(SU)	(mS/cm)	(NTU)	(mg/l)	(°C)	(mV)	0.0	APPEARANCE
08:30	225	6.18	7.31	0.688	999	1.81	15.77	156	0.0	-
08:33	225	6.20	7.43	0.670	317	0.70	17.00	137	0.0	-
08:36	225	6.20	7.49	0.658	133	0.48	18.30	108	0.0	-
08:39	225	6.20	7.51	0.658	104	0.45	18.35	92	0.0	-
08:42	225	6.21	7.52	0.658	77.4	0.42	18.57	76	0.0	-
08:45	225	6.21	7.52	0.657	54.3	0.40	18.64	66	0.0	-
08:48	225	6.22	7.53	0.656	44.4	0.40	18.49	58	0.0	-
08:51	225	6.22	7.53	0.653	31.1	0.38	18.57	51	0.0	-
08:54	225	6.22	7.53	0.653	25.0	0.36	18.56	45	0.0	-
08:57	225	6.22	7.54	0.652	22.5	0.35	18.62	41	0.0	-
End of Purge										

Total Volume Purged: ~3.5 gallons

Notes/Observations: Samples collected at 09:00.

-: No observations recorded

MW-02

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals | ENVIRONMENTAL | Sheet 1 of 1
DATE: 2/24/06 | CONSULTING FIRM: Tetra Tech EC
WEATHER: Sunny High of 40°F | FIELD PERSONNEL: Kelly Millet & Shannon Hill
MONITORING WELL NO.: MW-02 | WELL PERMIT NUMBER:
PID/FID READINGS (ppm): AMBIENT AIR: 0.0 ppm | PUMP INTAKE DEPTH: 22 ft from top of casing (TOC)
OPEN WELL (Initial): 0.2 ppm | WATER ELEVATION WITH PUMP IN PLACE (Initial): 13.15 ft from TOC
PUMP START TIME: 9:44

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
9:44	X		4.90	NA	8.37	NA	249	NA	12.54	NA	42.7	NA	8.99	NA	NA	13.15
8:49	X		5.89	0.99	2.41	101.69	218	-31	7.24	61.72	8.4	19.67	9.73		500	13.21
8:54	X		6.03	0.14	2.40	99.59	201	-17	7.64	98.71	-2.0	23.81	10.14	1gal	500	13.22
8:59	X		6.07	0.04	2.40	100	194	-7	7.71	100.92	-5.9		10.86	1.75gal		13.21
9:04	X		6.09	0.02	2.43	101.25	188	-6	7.59	97.15	-9.0		10.97	3gal		13.24
9:09	X		6.10	0.01	2.44	100.41	184	-4	7.42	79.07	-9.9		11.03	4.5gal	"	
9:10		X	Sample Taken													

COMMENTS: MW-GWMW02-022406 collected at 9:10 total purged 4.5 gallons

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-03

Bailing
~~LOW FLOW RATE~~

PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals
DATE: 2/24/06
WEATHER: Mod-Cl Sunny 40°F
MONITORING WELL NO.: MW-03
WELL PERMIT NUMBER:
ENVIRONMENTAL CONSULTING FIRM: Tetra Tech EC
FIELD PERSONNEL: Kelly Millet & Shannon Hill
Sheet 1 of 1

PID/FID READINGS (ppm): AMBIENT AIR: 0.0
OPEN WELL (initial): 0.4
PUMP INTAKE DEPTH: _____ ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (initial): 16.51 ft from TOC
PUMP START TIME: _____

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity % **	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen % ****	Turbidity (NTU) Reading	Turbidity % ****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
Initial 11:30	X		6.12	NA	1.73	NA	218	NA	6.55	NA	199	NA	9.20	NA	NA	16.51
11:40	X		5.76		1.58		230		7.00		~~99~~ 334		9.32			Dry
			Well Dry at 11:40, ~~40~~ 45 min 0.75 gallons bailed, will return to well prior to sampling											3/4 gallon		15.53
14:10		X	Sample MW-GW/MW03-022406 collected													
14:10	—		5.65		1.69		213		7.55		133		9.44			15.53

COMMENTS: Well Purged by Bailer due to low water volume insufficient for low flow sampling, sample # MW-GW/MW03-022406 taken at 14:10
Water Visually Turbid w/ light brown silt

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-04

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals
DATE: 2/24/06
WEATHER: Sunny High of 40°F
MONITORING WELL NO.: MW-04
WELL PERMIT NUMBER:
ENVIRONMENTAL CONSULTING FIRM: Tetra Tech EC
FIELD PERSONNEL: Kelly Millet & Shannon Hill
Sheet 1 of 1

PID/FID READINGS (ppm): AMBIENT AIR: 0.0
OPEN WELL (initial): 10.6
PUMP INTAKE DEPTH: 16 ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (initial): 12.31 ft from TOC
PUMP START TIME: 9:47

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
9:47	X		6.08	NA	0.505	NA	163	NA	2.53	NA	16.8	NA	8.43	NA	NA	12.31
9:50	X		6.08	-0.4	0.491	98.4	179	+16	0.00	—	2.4	15.4%	8.50	Vinyl	200	13.02
9:56	X		6.18	0.1	0.490	96.59	163	+16	0.00	—	-8.5	-326.3%	10.19		260	13.04
10:00	X		6.16	-0.02	0.495	101.0%	155	-8	0.00	—	-10	117.6%	10.18		300	13.03
10:04	X		6.13	0.03	0.496	100	137	-18	0.00	—	-7	70%	10.28	1gal	"	12.99
10:09	X		6.12	-0.01	0.501	101.2%	142	5	0.00	—	-25	35.7%	11.41		"	13.19
10:12	X		6.13	0.01	0.497	99.2	147	5	0.00	—	3.5	-140	10.75		"	13.04
10:16	X		6.08	-0.05	0.493	99.2	137	10	0.00	—	6.9	197	11.16		"	13.02
10:18		X	Sample collected											2 gallons		

COMMENTS: 10:18 Sample MW-GW/MW04-022406 also collect Sample # MW-GW/MW94-022406 for Dup.

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

2 gallons total purged

MW-06

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals | ENVIRONMENTAL | Sheet 1 of 1
DATE: 2/23/16 | CONSULTING FIRM: Tetra Tech EC
WEATHER: Overcast ~40°F | FIELD PERSONNEL: Kelly Millet & Shannon Hill
MONITORING WELL NO.: MW-06 | WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 | OPEN WELL (Initial): 0.1
PUMP INTAKE DEPTH: 19.5 ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (Initial): 15.91 ft from TOC
PUMP START TIME: 13:48

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
13:48	X		6.50	NA	0.309	NA	117	NA	7.80	NA	65.3	NA	9.60	NA	NA	15.56
13:55	X		6.65	-0.45	0.305	98.71	117	0	3.14	40.26	30.1	99.16	11.22		300	15.82
14:00	X		5.98	-0.07	0.303	99.34	93117	0	2.76	87.89	23.5	-73.21	12.52	½gal	250	15.90
14:05	X		5.97	-0.01	0.305	100.66	118	1	2.24	81.15	10.4	-44.26	13.42	1.25gal	"	15.97
14:10	X		5.94	-0.03	0.310	101.64	119	1	1.83	81.80	8.5	-81.73	13.39	1.5gal	200	15.98
14:14	X		5.95	0.01	.311	100.32	115	-4	1.84	100.55	7.3	-85.88	13.78	1.75gal		15.98
14:18	X		5.94	0.01	.306	98.39	106	-9	1.61	87.5	12.5	171.23	13.36		150	16.27
14:22	X		5.92	-0.02	.297	97.39	103	3	1.44	89.44	8.3	-66.4	14.87	2gal		15.99
14:26	X		5.93	0.01	0.303	101.68	102	1	1.47	102.08	15.2	183.13	14.60			16.03
14:30	X		5.96	0.03	.295	97.36	104	2	1.44	97.96	411	2703.95	14.54			16.50
14:38	X		5.87	-0.09	0.302	102.37	99	-5	.57	39.58	307	74.70	11.65	3gal		16.45
14:44	X		5.98	0.11	0.303	100.33	106	7	0.06	—	219	71.34	12.33			16.80
14:48	X		5.94	-0.04	0.297	98	108	2	0.00	—	405	184.93	13.39	4.5gal		16.53
14:54	X		5.96	0.02	0.290	97.6	103	-5	0.00	—	271	66.9	17.80	4.75gal		16.41
15:00	X		5.94	-0.02	0.299		96	-7	0.00	—	294		17.61			16.18
15:05		X	Sample collected											5gal		

COMMENTS: All parameters stable except Turbidity contact office per DC collect sample MW-GW-MW-06-022316

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-09

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals
DATE: [redacted] 2/24/06
WEATHER: Sunny 40's
MONITORING WELL NO.: MW-09
ENVIRONMENTAL CONSULTING FIRM: Tetra Tech EC
FIELD PERSONNEL: Kelly Millet & Shannon Hill
Sheet 1 of 1
WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: 0.0
OPEN WELL (Initial): 1.0
PUMP INTAKE DEPTH: 17.5 ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (Initial): [illegible] ft from TOC
PUMP START TIME: 13:03
14.89

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
13:03	X		5.87	NA	3.27	NA	218	NA	9.30	NA	563	NA	8.80	NA	NA	14.89
13:08	X		5.75	-0.12	2.27	100	203	-15	7.71	83.66	999	177.44	9.37		250	15.84
13:13	X		5.76	0.01	2.30	101.32	191	-12	6.87	89.12	294	29.42	10.11	1gal	"	15.90
13:18	X		5.77	0.01	2.28	99	180	-11	6.74	98.1	37.1	13.01	11.86	1.5gal		16.99
13:24	X		5.77	—	2.28	100	175	-15	7.58	112.46	38.3	103.23	11.63		175	15.95
13:28	X		5.78	0.01	2.27	99.56	ND	5	7.55	99.6	23.8	84.10	12.18	2gal	"	15.92
13:32	X		5.80	0.02	2.30	101.32	167	-3	7.71	103.18	13.4	56.3	11.60	2.5gal	11	15.94
13:36	X		5.80	—	2.28		169	0	7.89		9.7		11.74			15.90
13:40			Sample Time													

COMMENTS: mm-GWMW09-022406 taken @ 13:40, collect triple volume for MS/MSD
Gallons purge = ~2.5

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-10

Bailing

~~LOW FLOW RATE~~

PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals — ENVIRONMENTAL — Sheet 1 of 1

DATE: 2/24/06 — CONSULTING FIRM: Tetra Tech EC

WEATHER: Sunny 11gr of 40°F — FIELD PERSONNEL: Kelly Millet & Shannon Hill

MONITORING WELL NO.: MW-10 — WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 — PUMP INTAKE DEPTH: N/A ft from top of casing (TOC)

OPEN WELL (initial): 0.3 — WATER ELEVATION WITH PUMP IN PLACE (initial): _____ ft from TOC

PUMP START TIME: N/A — TDW 15.91

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
Initial			5.73	NA	2.39	NA	248	NA	7.07	NA	136	NA	10.07	NA	NA	14.24
11:56			5.57		2.45		279		8.28		999		10.09			Dry
11:57			well dry Aprx 1 gallon bailed slow well to recharge													
			prior to collection Sample													
sample 14:35	—		5.79		2.52		258		7.84		442		9.75			

COMMENTS: Sample # MM-GW-MW10-022406 taken at 14:25 (taken with bailer)

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-11

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE:	Magna Metals	ENVIRONMENTAL	Sheet 1 of 1
DATE:	2/23/06	CONSULTING FIRM:	Tetra Tech EC
WEATHER:	Overcast 40°F (High)	FIELD PERSONNEL:	Kelly Millet & Shannon Hill
MONITORING WELL NO.:	MW-11	WELL PERMIT NUMBER:	

PID/FID READINGS (ppm): AMBIENT AIR: ~~1.2~~ 0.0 PUMP INTAKE DEPTH: ~~[illegible]~~ 15.0 ft ft from top of casing (TOC)

OPEN WELL (initial): 1.2 WATER ELEVATION WITH PUMP IN PLACE (initial): 13.33 ft from TOC

PUMP START TIME: ~~[illegible]~~ 11:10

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
—	X		—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	NA	—
11:10	X		5.55	NA	1.99	NA	189	NA	6.90	NA	228	NA	9.04			13.33
11:15	X		5.72	0.17	2.02	~~0.03~~ 98.5	172	-17	7.86	86.5	69.9	412%	8.91		200	14.16
11:20	X		5.79	0.07	2.04	100.99	147	-25	8.84	98	42.5	2740	8.36	1gal		13.99
11:25	X		5.81	0.02	1.97	96.56	136	-11	4.32	48.86	23.8		11.82			13.98
11:30	Pump		Stopped		11:32 re started											~~14.54~~
11:35	X		5.84	0.03	1.96	99.4	123	-13	6.85	158.5	172	409.60	11.47	2.5gal	450	14.54
11:40	X		5.86	0.02	1.95	99.4	127	4	6.55	95.6	61.9	35.99	11.84	3gal	450	14.54
11:45	X		5.82	-0.04	2.00	102.56	119	-8	7.66	116.95	20	32.31	10.62	3 1/4gal		14.20
11:50	X		5.80	0.02	1.86	93	112	-7	8.79	114.62	31.5	157.5	14.43			14.52
11:54	X		5.81	0.01	1.95	104.8	122	10	9.20	104.78	15.0	47.62	11.73	4gal		14.55
~~11:58~~ 12:00	X		5.83	0.02	1.95	100	116	-6	7.02	76.3	29.1	194	11.74	4 1/2gal	350	14.55
12:04	X		5.85	0.02	1.95	100	108	8	6.81	97	17.4	59.79	12.16	4 3/4gal	"	14.38
12:08	X		5.85	0	1.95	"	95	-13	7.32	107	40	229.89	12.6		"	14.38
12:12	X		5.86	0.01	1.93	98.97	79	-16	6.56	89.86	106	265	18.95	5gal	"	14.32
12:16	X		5.88	0.02	1.95	101.04	103	24	6.16	93.9	56.3	54.66	14.94		500	14.71
12:20	X		5.97	0.09	1.94	99.48	113	10	6.77	109.9	144	255.77	11.07			
12:23	Well dry - allow well to recharge															
12:35		X	Sam													14.42

COMMENTS: Collect sample MM-gWMW11-0223~~[illegible]~~06

well recharge 16

H2O got sediment turbid and flow increase

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

APPENDIX E

SLUG TEST DATA

SITE HYDROLOGY

Instantaneous displacement test or slug test data are presented in Figures E-2 through E-5. Data recorded from slug tests conducted in the unconfined aquifer consisting of the fill material were analyzed via the Bouwer and Rice (1976) method, a modified version of Hvorslev (1951) and Bouwer (1989) which applies to wells with water-table or unconfined conditions (Bouwer, 1989).

In order to calculate the hydraulic conductivity by the Bouwer and Rice method, the displacement (Y) or elevation of the water column in the riser from the static water level is plotted on a logarithmic scale against time, which is plotted on an linear scale. The other parameters are illustrated as follows:

Instantaneous displacement tests or slug tests were conducted at the four Magna Metals Site monitoring wells on May 11 and 12, 1998 following completion of the groundwater sampling. These tests were conducted in order to provide a general indication of relative hydraulic conductivity in the shallow unconsolidated aquifer. Slug tests influence aquifer fluids within a small radius of the well or piezometer tested. Slug tests are conducted by the injection or the removal of a measured quantity of water and observing the resultant response of the water table over time. The criterion for the performance of either the slug injection or the slug withdrawal test is dependent on the pre-test water level in the observation well relative to the well screen intake.

Each slug test was conducted by dropping a sealed PVC cylinder (i.e., slug) into the well and measuring the resultant water level displacement. First, the static water level was measured with a hand-held instrument from the top of the casing prior to the test. The slug was then dropped into the well and completely submerged within a few seconds. Water levels were measured by hand-held instrument at regular intervals after displacement by the slug. Measurements were continued until approximately 90 percent recovery had occurred. After recovery from the first test was achieved, the slug was removed within a few seconds and recovering water levels were again monitored with a hand-held instrument.

Effective radius Re, or radius of influence, is calculated based on an analogy to electrical current.

$$\ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/r_w)} + \frac{A+(B)\ln(D-H/r_w)}{(L/r_w)} \right]^{-1}$$

For H < D cases A and B are derived graphically. A and B are dimensionless parameters that are a function of L/r_w (Bower and Rice, 1976).

$$\text{or } \ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/rw)} + \frac{C}{L/r_w} \right]^{-1}$$

C (a dimensionless parameter that is a function of L/r_w) is derived graphically (Figure E-6)

The hydraulic conductivity, K, is as follows:

$$K = \frac{r_c^2 \ln}{2Lt}\left(\ln \frac{Y_o}{Y_t}\right)$$

where: r_c = the radius of the riser casing (feet)
r_w = the radius of the well and gravel pack combined (feet)
L = the screen length (feet)
H = saturated thickness above the bottom of the well (feet)
D = saturated thickness above the bottom of the aquifer (feet)
Y_o = maximum displacement (feet)
Y_t = displacement at time t (feet)
t = time since displacement (minutes)

These parameters are illustrated on Figure E-5.

A gravel pack correction is calculated for the r value (casing radius) if the water level rises or falls within the screened interval instead of the casing above the screen (Bouwer, 1989). The corrected radius = $[(l\text{-}p)\ r_c^2 + pr_w^2]^{1/2}$, where p is porosity typically estimated at 0.30. This correction was applied to the MW-3 calculation.

The parameters and resultant hydraulic conductivities are summarized in Table E-5.

Results of the slug tests indicate a range in hydraulic conductivity values from 5.3×10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2×10^{-3} cm/sec (6.2 ft/day) at MW-3 in the center of the three monitoring wells in the lower portion of the leach pit area. These values are representative of a range (Freeze and Cherry, 1979) from predominant sand with silt to predominant silt with sand. Values at MW-2 and MW-4, located near MW-3, were somewhat less at 1.0×10^{-4} cm/sec (0.29 ft/day) and 3.6×10^{-4} cm/sec (1.0 ft/day), respectively. MW-3 was the only monitoring well requiring correction of r_c because it was the only well with the water level within the screen rather than the riser casing and therefore, the corrected r_c value may be elevated.

It appears that the calculated hydraulic conductivity values for these monitoring wells are not consistent with the sand and silty sand encountered during drilling and well installation which typically have a range of hydraulic conductivity between 10^{-2} cm/sec and 10^{-3} cm/sec. The lower range of conductivity values is likely attributable to the limited aquifer thickness and aerial extent. The potential limited quantity of water was noted following installation of the monitoring wells where sampling had to be postponed until Spring 1998 since immediately following installation, these wells appeared dry. Sampling in 2003 also indicated low well yields.

TABLE E-1
MW-1 INSTANTANEOUS DISPLACEMENT TEST
May 11-12, 1998

Falling Head Test

Time (5/11/98)	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1454	0	5.02	0
1455	0	Slug in	
1456	1	4.18	0.84
1457	2	4.39	0.63
1458	3	4.47	0.55
1459	4	4.54	0.48
1500	5	4.59	0.43
1501	6	4.63	0.39
1502	7	4.66	0.36
1503	8	4.68	0.34
1504	9	4.70	0.32
1505	10	4.71	0.31
1508	13	4.72	0.30
1510	15	4.74	0.28
1520	25	4.74	0.28

Rising Head Test

0718	0	4.44	0
0720	0	Slug out	
0720.2	0.2	5.49	1.05
0721	1	5.19	0.73
0722	2	4.96	0.52
0723	3	4.87	0.43
0724	4	4.81	0.37
0725	5	4.76	0.32
0726	6	4.72	0.28
0729	9	4.64	0.20
0730	10	4.62	0.18
0732	12	4.60	0.16
0735	15	4.57	0.13
0742	22	4.55	0.11
0800	40	4.53	0.09
1046	146	4.52	0.08

TABLE E-2
MW-2 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1319	0		
1320	0	Slug in	
1320.2	0.2	11.24	0.30
1321	1	11.51	0.03
1322	2	11.52	0.02
1323	3	11.52	0.02
1332	12	11.52	0.02

Rising Head Test

1333	0	Slug out	
1333.2	0.2	11.80	0.28
1333.6	0.6	11.60	0.08
1334	1	11.57	0.05
1334.5	1.5	11.55	0.03
1335	2	11.55	0.03
1336	3	11.54	0.02
1337	4	11.54	0.02
1338	5	11.54	0.02

TABLE E-3
MW-3 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1154	0	11.56	0
1157	0	Slug in	
1157.2	0.2	11.38	0.18
1158	1	11.46	0.10
1159	2	11.50	0.06
1200	3	11.53	0.03
1201	4	11.54	0.02
1202	5	11.54	0.02
1256	59	11.52	0.04

Rising Head Test

1257	0	Slug out	
1257.2	0.2	11.76	0.24
1258	1	11.69	0.17
1259	2	11.62	0.10
1300	3	11.60	0.08
1301	4	11.58	0.06
1302	5	11.58	0.06
1312	15	11.54	0.02
1331	34	11.54	0.02

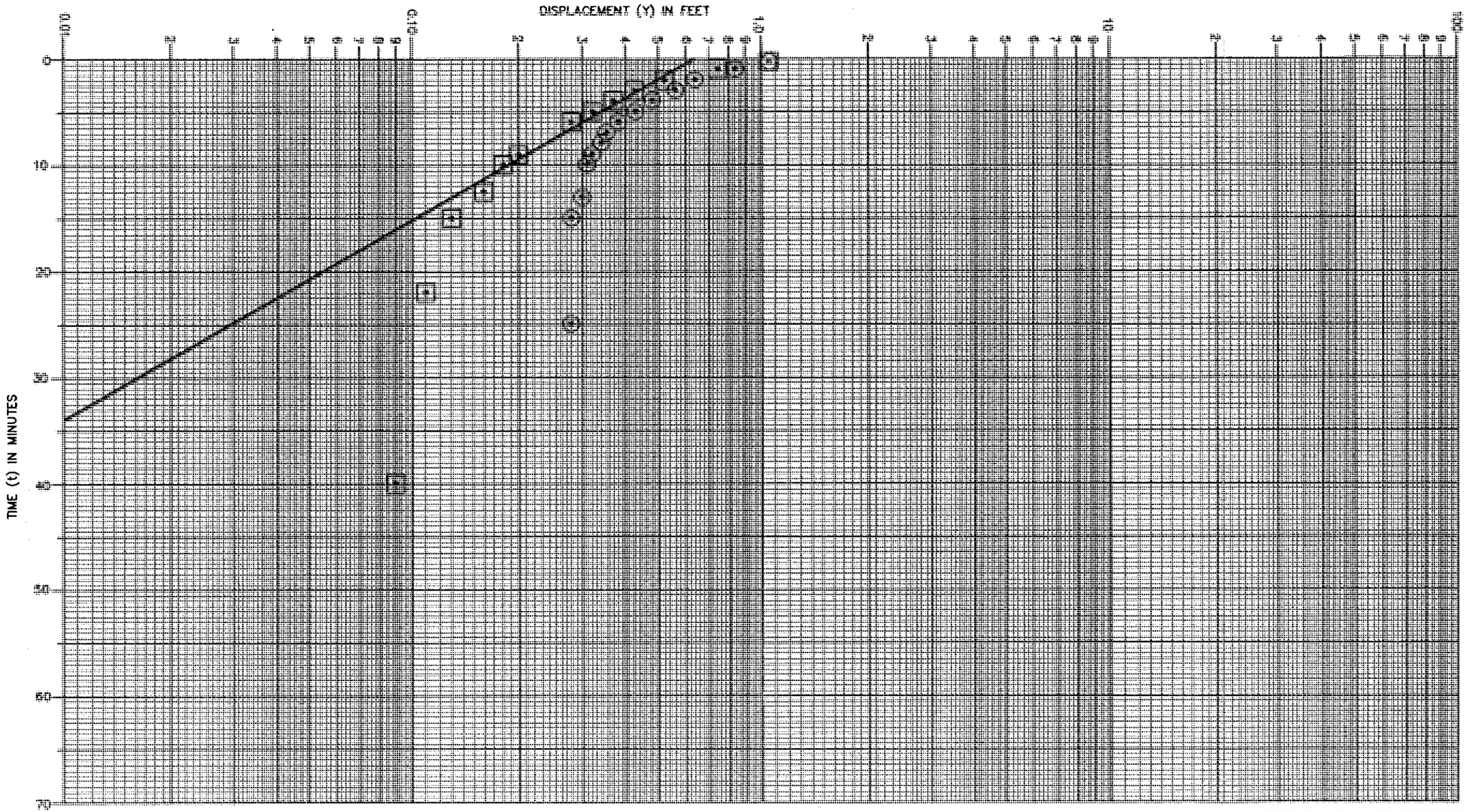
TABLE E 3-4
MW-4 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1304		10.112	0
1305	Slug in	0	0
1305.3	0.3	9.83	0.29
1306	1	9.92	0.20
1307	2	9.95	0.17
1308	3	9.97	0.15
1309	4	9.98	0.14
1310	5	9.98	0.14
1311	6	9.99	0.13
1314	9	9.99	0.13
1317	12	10.00	0.12
1318	0	Slug out	0.35
1318.2	0.2	10.35	0.35
1319	1	10.20	0.20
1320	2	10.16	0.16
1321	3	10.12	0.12
1322	4	10.10	0.10
1323	5	10.09	0.09
1329	11	10.00	0.03

TABLE E-5
SLUG TEST RESULTS
BOUWER AND RICE PARAMETERS AND RESULTANT HYDRAULIC CONDUCTIVITIES

Monitoring Well	r_c (ft)	corrected r_c (ft)	r_w (ft)	L (ft)	H (ft)	D (ft)	ft/day	Hydraulic Conductivity cm/sec
MW-1	0.083	0.083	0.34	10	11.17	11.17	0.16	5.3×10^{-5}
MW-2	0.083	0.083	0.34	10	12.38	12.38	0.29	1.0×10^{-4}
MW-3	0.083	0.20	0.34	5.16	5.16	5.16	6.2	2.2×10^{-3}
MW-4	0.083	0.083	0.34	10	10.15	10.15	1.0	3.6×10^{-4}



LEGEND:

⊙ FALLING HEAD TEST

⊡ RISING HEAD TEST

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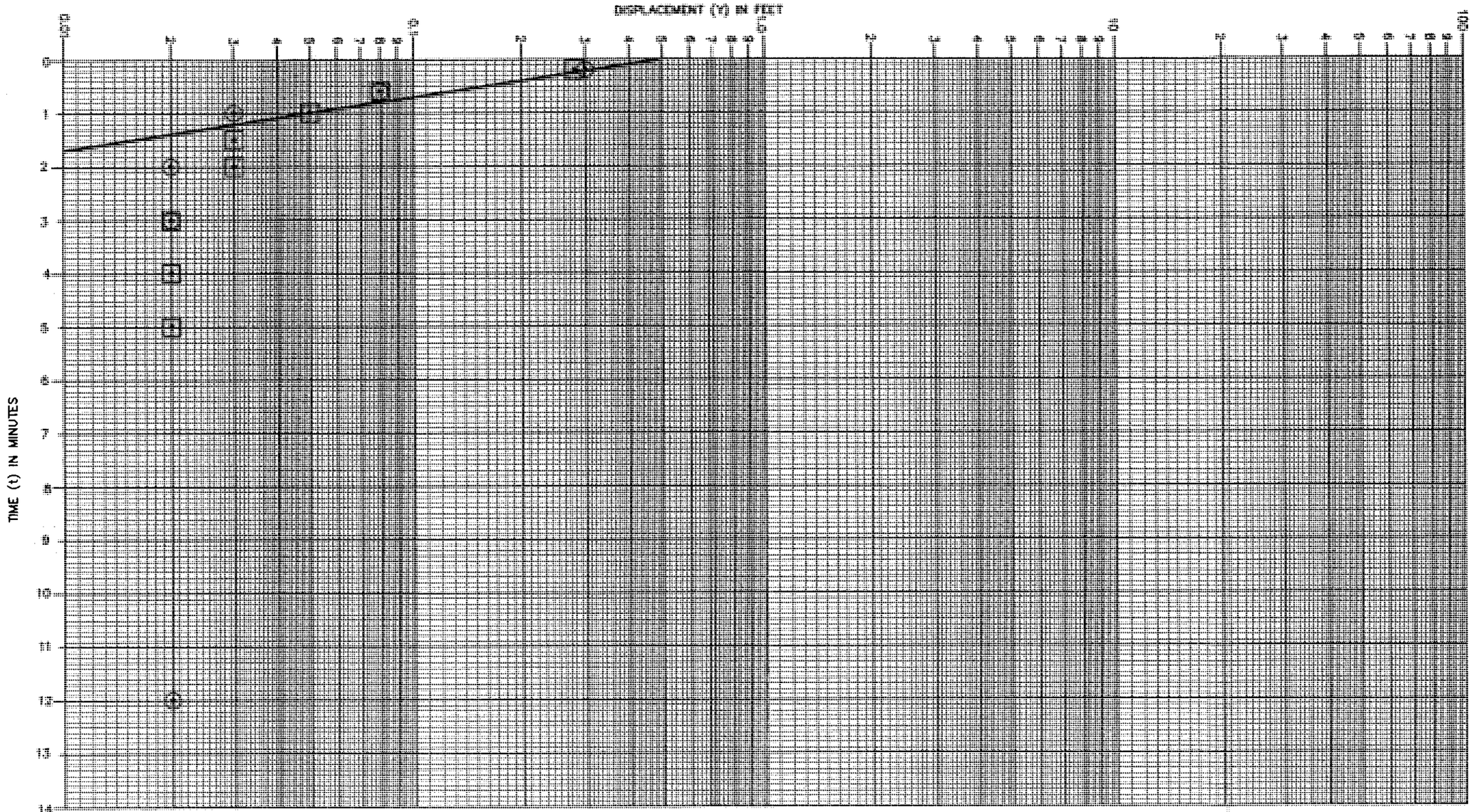
MAGNA METALS SITE
CORTLANDT, N.Y.

FIGURE E-1
MW-1 INSTANTANEOUS DISPLACEMENT AQUIFER TEST
May 11, 1998

TETRATECH EC, INC.

CAD FILE NAME: MM6298A.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:00 AM



LEGEND:

- FALLING HEAD TEST
- RISING HEAD TEST

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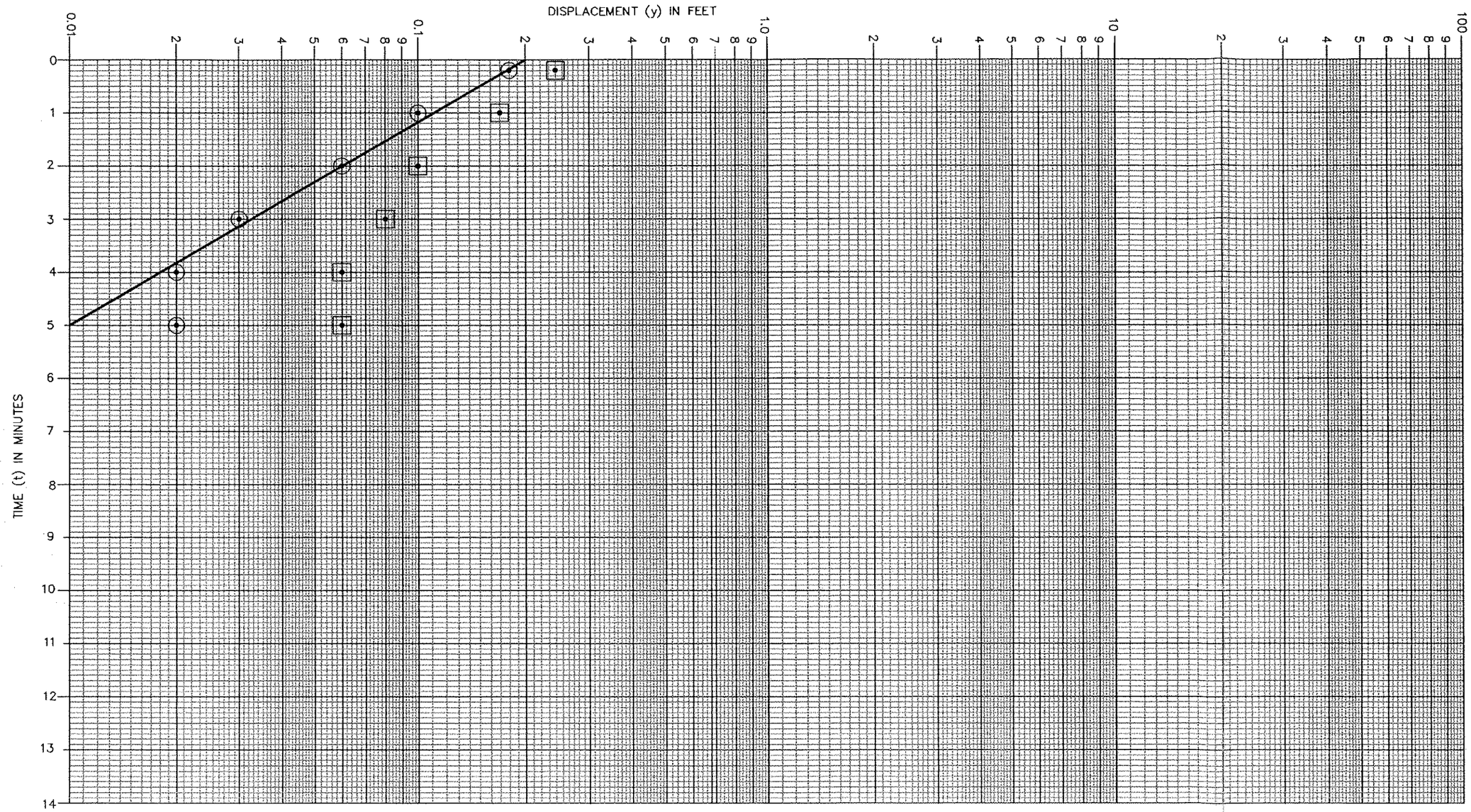
MAGNA METALS SITE CORTLANDT, N.Y.
FIGURE E-2 MW-2 INSTANTANEOUS DISPLACEMENT AQUIFER TEST
TETRA TECH EC, INC.

CAD FILE NAME: MM6298.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:12 AM



LEGEND:

⊙ FALLING HEAD TEST

⊡ RISING HEAD TEST

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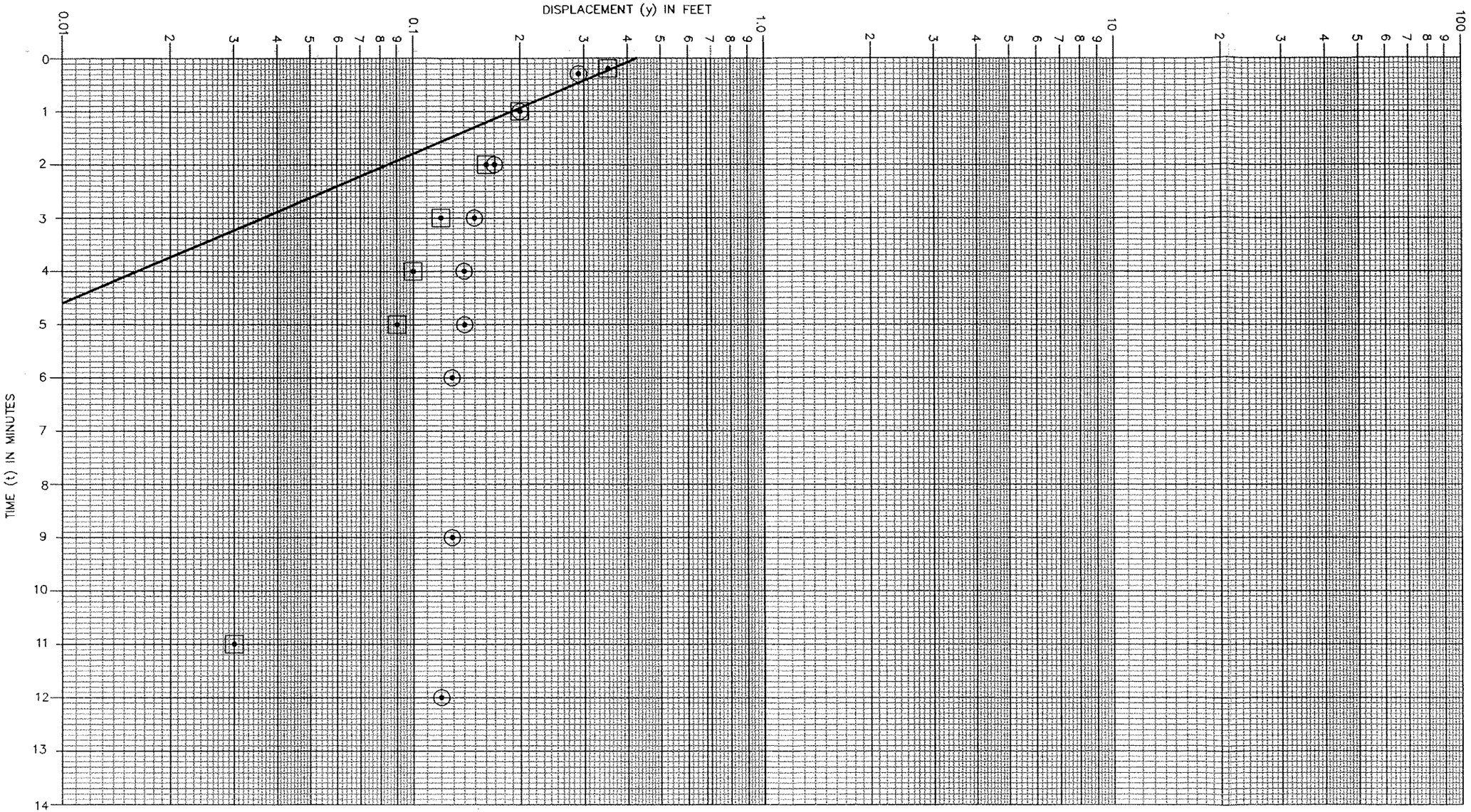
MAGNA METALS SITE
CORTLANDT, N.Y.

FIGURE E-3
MW-3 INSTANTANEOUS DISPLACEMENT
AQUIFER TEST

TETRA TECH EC, INC.

CAD FILE NAME: MM62988.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:05 AM



LEGEND:

- ⊙ FALLING HEAD TEST
- ⊡ RISING HEAD TEST

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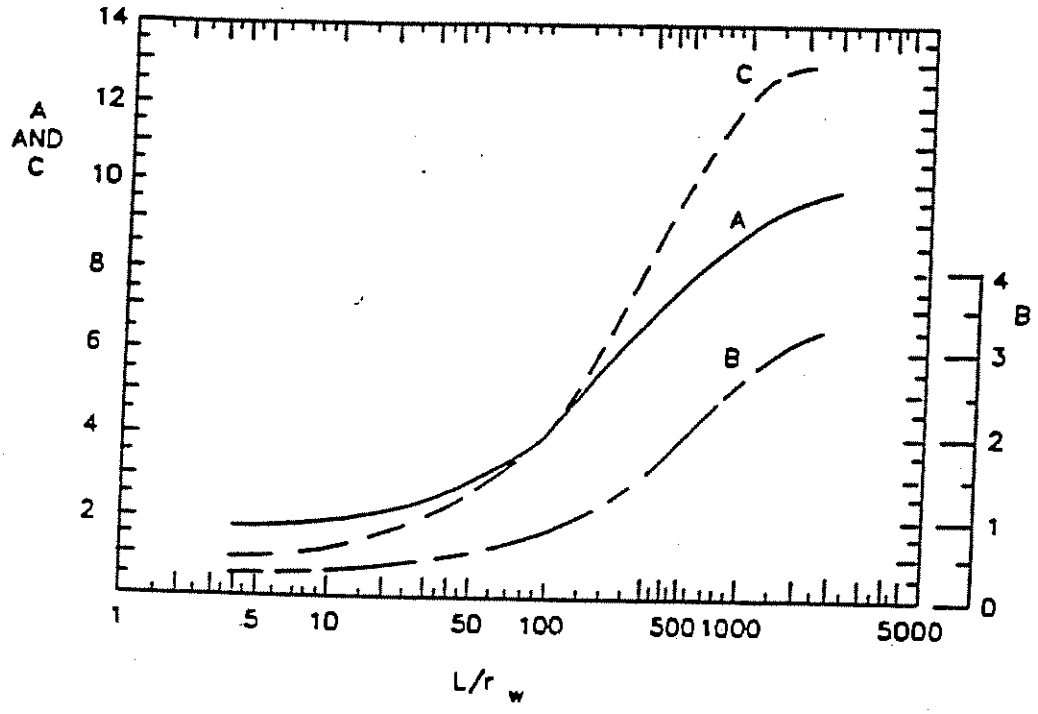
MAGNA METALS SITE
CORTLANDT, N.Y.

FIGURE E-4
MW-4 INSTANTANEOUS DISPLACEMENT
AQUIFER TEST

TETRA TECH EC, INC.

CAD FILE NAME: MM6298CDWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:10 AM

TYPE CURVES USED IN BOUWER AND RICE CALCULATION



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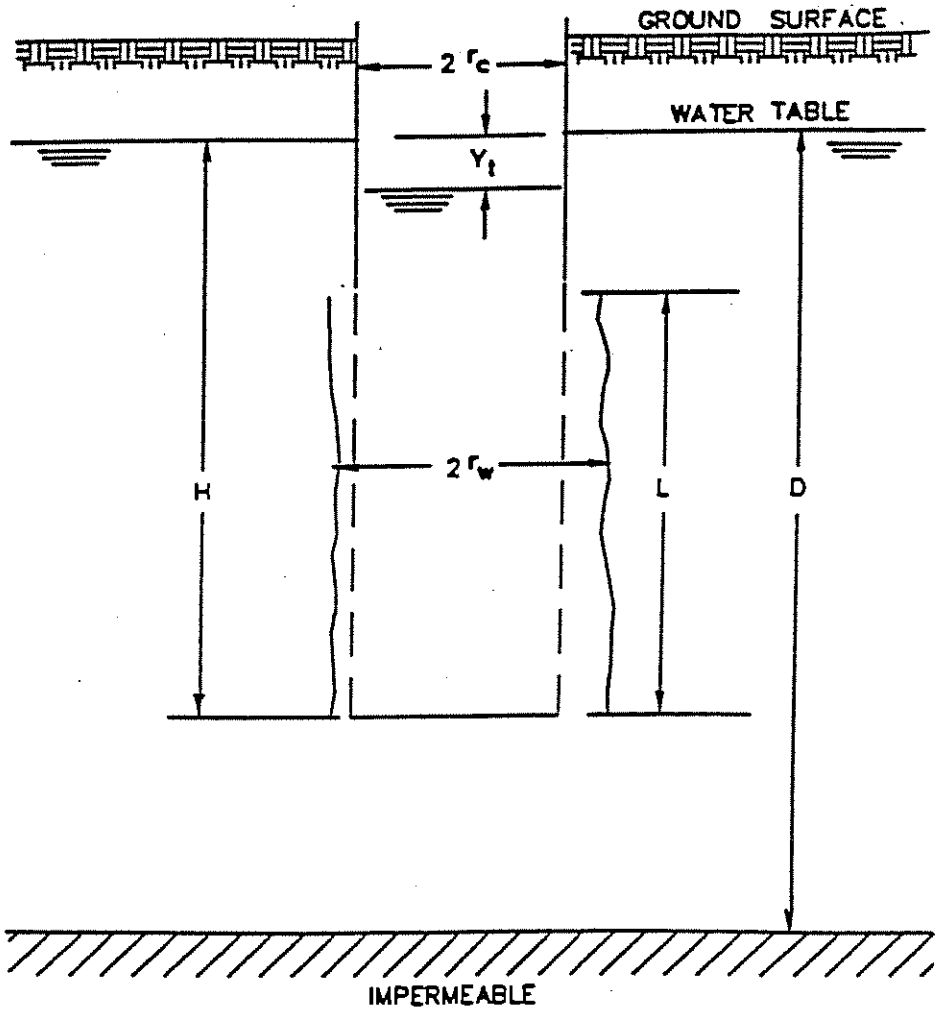
ISC PROPERTIES
MAGNA METALS SITE CORTLANDT, N.Y.
FIGURE E-5
TETRA TECH EC, INC.

WELL PARAMETERS USED PARTICULARLY WITH BOUWER AND RICE METHOD



LEGEND

r_c = 0.083 FT
r_w = 0.25 FT
L = 10 FT
H = 9 FT
D = 22 FT

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CORTLANDT, N.Y.

FIGURE E-6

TETRA TECH EC, INC.

APPENDIX F

1998 RI/FS DATA TABULATION

TABLE F-1
ABBREVIATIONS AND QUALIFIERS UTILIZED IN RESULT TABLES

Abbreviation	Definition
AQ	Aqueous Sample.
FB	Field Blank.
LP	Leach Pit Location.
mg/kg	milligrams per kilogram.
mg/L	milligrams per liter.
MW	Monitoring Well Location.
ppb	parts per billion (ug/kg or ug/L).
ppm	parts per million (mg/kg or mg/L).
SB	Soil Boring Location.
SD	Sediment Location.
SL	Sludge Sample.
SP	Septic Tank Location.
SS	Surface Soil Location.
SW	Surface Water Location.
TAL	Target Analyte List.
TB	Trip Blank.
TCL	Target Compound List.
TICs	Tentatively Identified Compounds.
TOC	Total Organic Carbon.
ug/kg	micrograms per kilogram.
ug/L	micrograms per liter.
	Compound concentration is above the criteria and/or guidance value provided on the table (see Section 4.0 for selection rationale). To be used for comparison and reference purposes only.

Qualifier	Definition
U	Compound not detected at given detection limits.
--	No Tentatively Identified Compounds (TICs) identified in sample.
J	Compound value is estimated.
R	Compound value is rejected and deemed unusable.
B (organics)	Compound was also present in an associated blank sample.
B (inorganics)	Analyte value is less than the required method detection limit but greater than the instrument detection limit.
E	Compound concentration exceeds the calibration range.
D	Compound value reported is from a dilution analysis.
P	Compound had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
N	Presumptive evidence exists for the presence of compound.
NC	No criteria available.
ND (criteria)	Not to be detected above the detection limit for the analytical method.
NA	Not analyzed/not available.

TABLE F-2
TCL Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72184003	72184004
Date Sampled	05/14/97	05/14/97	05/14/97
Chloromethane	40 UJ	1 U	1 U
Bromomethane	40 UJ	1 U	1 U
Vinyl Chloride	40 UJ	1 U	2.2
Chloroethane	40 UJ	1 U	1 U
Methylene Chloride	40 UJ	2 U	2 U
Acetone	110 UJ	R	R
Carbon Disulfide	40 UJ	1 U	1 U
1,1-Dichloroethene	40 UJ	1 U	1 U
1,1-Dichloroethane	40 UJ	1 U	1 U
cis-1,2-Dichloroethene	NA	1 U	4.8
trans-1,2-Dichloroethene	NA	1 U	1 U
1,2-Dichloroethene (total)	40 UJ	NA	NA
Chloroform	40 UJ	1 U	1 U
1,2-Dichloroethane	40 UJ	1 U	1 U
2-Butanone	37 J	R	R
Bromochloromethane	NA	1 U	1 U
1,1,1-Trichloroethane	40 UJ	1 U	1 U
Carbon Tetrachloride	40 UJ	1 U	1 U
Bromodichloromethane	40 UJ	1 U	1 U
1,2-Dichloropropane	40 UJ	1 U	1 U
cis-1,3-Dichloropropene	40 UJ	1 U	1 U
Trichloroethene	40 UJ	1 U	0.92 J
Dibromochloromethane	40 UJ	1 U	1 U
1,1,2-Trichloroethane	40 UJ	1 U	1 U
Benzene	40 UJ	1 U	1 U
trans-1,3-Dichloropropene	40 UJ	1 U	1 U
Bromoform	40 UJ	1 U	1 U
4-Methyl-2-Pentanone	40 UJ	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb

TABLE F-2
TCL Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72184003	72184004
Date Sampled	05/14/97	05/14/97	05/14/97
2-Hexanone	40 UJ	R	R
Tetrachloroethene	40 UJ	1 U	1 U
1,1,2,2-Tetrachloroethane	40 UJ	1 U	1 U
Toluene	14 J	1 U	1 U
Chlorobenzene	40 UJ	1 U	1 U
Ethylbenzene	40 UJ	1 U	1 U
Styrene	40 UJ	1 U	1 U
Xylene (total)	30 J	1 U	1 U
!,3-Dichlorobenzene	NA	1 U	1 U
1,4-Dichlorobenzene	NA	0.76 J	1 U
1,2-Dichlorobenzene	NA	1 U	1 U
1,2-Dibromo-3-chloropropane	NA	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE F-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Phenol	1300 UJ	5 U	5 U
bis(2-Chloroethyl) ether	1300 UJ	5 U	5 U
2-Chlorophenol	1300 UJ	5 U	5 U
1,3-Dichlorobenzene	1300 UJ	5 U	5 U
1,4-Dichlorobenzene	4200 J	5 U	5 U
1,2-Dichlorobenzene	1300 UJ	5 U	5 U
2-Methylphenol	1300 UJ	5 U	5 U
2,2'-oxybis(1-Chloropropane)	1300 UJ	5 U	5 U
4-Methylphenol	1300 UJ	5 U	5 U
N-Nitroso-di-n-propylamine	1300 UJ	5 U	5 U
Hexachloroethane	1300 UJ	5 U	5 U
Nitrobenzene	1300 UJ	5 U	5 U
Isophorone	1300 UJ	5 U	5 U
2-Nitrophenol	1300 UJ	5 U	5 U
bis (2-Chloroethoxy) methane	1300 UJ	5 U	5 U
2,4-Dimethylphenol	1300 UJ	5 U	5 U
1,2,4-Trichlorobenzene	1300 UJ	5 U	5 U
Naphthalene	1300 UJ	5 U	5 U
4-Chloroaniline	1300 UJ	5 U	5 U
Hexachlorobutadiene	1300 UJ	5 U	5 U
4-Chloro-3-methylphenol	1300 UJ	5 U	5 U
2-Methylnaphthalene	1500 J	5 U	5 U
Hexachlorocyclopentadiene	1300 UJ	5 U	5 U
2,4,6-Trichlorophenol	1300 UJ	5 U	5 U
2,4,5-Trichlorophenol	3200 UJ	20 U	21 U
2-Chloronaphthalene	1300 UJ	5 U	5 U
2-Nitroaniline	3200 UJ	20 U	21 U

See appendix introduction for abbreviations and data qualifiers.
Sludge lts are presented in ug/kg (ppb); water results are presented in ug/L (ppb

TABLE F-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Dimethylphthalate	1300 UJ	5 U	5 U
Acenaphthylene	1300 UJ	5 U	5 U
2,6-Dinitrotoluene	1300 UJ	5 U	5 U
3-Nitroaniline	3200 UJ	20 U	21 U
Acenaphthene	1300 UJ	5 U	5 U
2,4-Dinitrophenol	3200 UJ	20 U	21 U
4-Nitrophenol	3200 UJ	20 U	21 U
Dibenzofuran	1300 UJ	5 U	5 U
2,4-Dinitrotoluene	1300 UJ	5 U	5 U
Diethylphthalate	1300 UJ	5 U	5 U
4-Chlorophenyl-phenylether	1300 UJ	5 U	5 U
Fluorene	1300 UJ	5 U	5 U
4-Nitroaniline	3200 UJ	20 U	21 U
4,6-Dinitro-2-methylphenol	3200 UJ	20 U	21 U
N-Nitrosodiphenylamine	1300 UJ	5 U	5 U
4-Bromophenyl-phenylether	1300 UJ	5 U	5 U
Hexachlorobenzene	1300 UJ	5 U	5 U
Pentachlorophenol	3200 UJ	20 U	21 U
Phenanthrene	1300 UJ	5 U	5 U
Anthracene	1300 UJ	5 U	5 U
Carbazole	1300 UJ	5 U	5 U
Di-n-butylphthalate	1300 UJ	5 U	5 U
Fluoranthene	1200 J	5 U	5 U
Pyrene	300 J	5 U	5 U
Butylbenzylphthalate	1300 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	1300 UJ	5 U	5 U
Benzo(a)anthracene	230 J	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE F-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Chrysene	280 J	5 U	5 U
bis(2-Ethylhexyl)phthalate	12000 JD	2 J	2 J
Di-n-octylphthalate	330 J	5 UJ	5 UJ
Benzo(b)fluoranthene	330 J	5 U	5 U
Benzo(k)fluoranthene	240 J	5 U	5 U
Benzo(a)pyrene	200 J	5 U	5 U
Indeno(1,2,3-cd)pyrene	1300 UJ	5 U	5 U
Dibenz(a,h)anthracene	1300 UJ	5 U	5 U
Benzo(g,h,i)perylene	1300 UJ	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE F-4
TCL Pesticide/PCB Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72085001	72085003
Date Sampled	05/14/97	05/14/97	05/14/97
alpha-BHC	6.8 UJ	0.01 U	0.01 U
beta-BHC	6.8 UJ	0.01 U	0.01 U
delta-BHC	6.8 UJ	0.01 U	0.01 U
gamma-BHC (Lindane)	6.8 UJ	0.01 U	0.01 U
Heptachlor	6.8 UJ	0.01 U	0.01 U
Aldrin	6.8 UJ	0.01 U	0.01 U
Heptachlor epoxide	6.8 UJ	0.01 U	0.01 U
Endosulfan I	6.8 UJ	0.01 U	0.01 U
Dieldrin	13 UJ	0.02 U	0.02 U
4,4'-DDE	11 JP	0.02 U	0.02 U
Endrin	13 UJ	0.02 U	0.02 U
Endosulfan II	13 UJ	0.02 U	0.02 U
4,4'-DDD	13 UJ	0.02 U	0.02 U
Endosulfan sulfate	13 UJ	0.02 U	0.02 U
4,4'-DDT	13 UJ	0.02 U	0.02 U
Methoxychlor	68 UJ	0.11 U	0.11 U
Endrin ketone	13 UJ	0.02 U	0.02 U
Endrin aldehyde	13 UJ	0.02 U	0.02 U
alpha-Chlordane	6.8 UJ	0.01 U	0.01 U
gamma-Chlordane	6.8 UJ	0.01 U	0.01 U
Toxaphene	680 UJ	1.1 U	1.1 U
Aroclor-1016	130 UJ	0.22 U	0.23 U
Aroclor-1221	270 UJ	0.44 U	0.45 U
Aroclor-1232	130 UJ	0.22 U	0.23 U
Aroclor-1242	130 UJ	0.22 U	0.23 U
Aroclor-1248	150 JP	0.22 U	0.23 U
Aroclor-1254	130 UJ	0.22 U	0.23 U
Aroclor-1260	72 JP	0.22 U	0.23 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE F-5
TAL Metals and Cyanide - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Aluminum	16100 J	80.8 B	162 B
Antimony	5.9 JB	3.1 B	3 U
Arsenic	402 J	3.4 B	88.8
Barium	174 J	20.4 B	23.8 B
Beryllium	0.7 UJ	1 U	1 U
Cadmium	6.4 J	1 U	1 U
Calcium	9760 J	22000	9500
Chromium	R	2 B	1 U
Cobalt	34 JB	1.8 B	1 U
Copper	1160 J	167	154
Iron	30400 J	582 J	256 J
Lead	228 J	R	R
Magnesium	5940 J	2560 B	536 B
Manganese	815 J	72.5	28.2
Mercury	0.49 J	0.2 U	0.2 U
Nickel	10400 J	788	45.9
Potassium	1120 JB	2900 JB	704 JB
Selenium	200 J	14.3	3.2 B
Silver	0.97 JB	1 UJ	1 UJ
Sodium	717 JB	4500 B	5750
Thallium	2.1 UJ	3 UJ	3 UJ
Vanadium	32.9 JB	1.1 B	1.4 B
Zinc	9660 J	230 J	286 J
Cyanide	2420 J	39.3	12.7

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in mg/kg (ppm); water results are presented in ug/L (p

TABLE F-6
Total Organic Carbon - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge
Laboratory ID	1144014
Date Sampled	05/14/97
Total Organic Carbon	52000 J

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in mg/kg (ppm); water results are presented in ug/L (ppb).

TABLE F-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 72184005 05/22/97	SW-1 DUP 72184009 05/22/97	SW-2 72184006 05/22/97	SW-3 72184007 05/22/97	SW-4 72184008 05/22/97	SW-5 721840010 05/22/97	SW-6 721840011 05/22/97
Chloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	NC	1 U	1 U	1 U	1 U	0.7 J	1 U	1 U
Chloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	NC	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	NC	R	R	R	R	R	R	R
Carbon Disulfide	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	NC	3.5	4.2	3.2	3.3	4.5	2.1	5.1
trans1,2-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	NC	1 U	1 U	1 U	1 U	1 U	1 U	0.79 J
1,2-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	NC	R	R	R	R	R	R	R
Bromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	11	5.5	2.7	2.4	2.3	2.6	2.2	0.97 J
Dibromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone	NC	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	NC	R	R	R	R	R	R	R
Tetrachloroethene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-7
TCL Volatile Organic Compounds - Surface Water
Magua Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 72184005 05/22/97	SW-1 DUP 72184009 05/22/97	SW-2 72184006 05/22/97	SW-3 72184007 05/22/97	SW-4 72184008 05/22/97	SW-5 721840010 05/22/97	SW-6 721840011 05/22/97
1,1,2,2-Tetrachloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 72184012 05/22/97	SW-8 72184013 05/22/97	SW-9 72184014 05/22/97	SW-10 72184015 05/22/97	SW-11 72184018 05/22/97	SW-12 72184019 05/22/97
Chloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	NC	1 U	1 U	2.5	0.91 J	1 U	1 U
Chloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	NC	2.3	2 U	2 U	2 U	2 U	2 U
Acetone	NC	R	R	R	R	R	R
Carbon Disulfide	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	NC	1 U	7.4	18	9	1 U	1 U
trans1,2-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	NC	1 U	0.77 J	1 U	0.89 J	1.6	1 U
1,2-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	NC	R	R	R	R	R	R
Bromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	11	1 U	1.4	0.73 J	1	1 U	1 U
Dibromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	6	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NC	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone	NC	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	NC	R	R	R	R	R	R
Tetrachloroethene	1	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 72184012 05/22/97	SW-8 72184013 05/22/97	SW-9 72184014 05/22/97	SW-10 72184015 05/22/97	SW-11 72184018 05/22/97	SW-12 72184019 05/22/97
1,1,2,2-Tetrachloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Phenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Chloroethyl) ether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Chlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Methylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Methylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachloroethane	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Nitrobenzene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Isophorone	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Nitrophenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dimethylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dichlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	50	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Naphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Chloroaniline	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorobutadiene	10	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Methylnaphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	4.5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	1	25 U	20 U	25 U	22 U	21 U	21 U	21 U
2-Chloronaphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Dimethylphthalate	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Acenaphthylene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,6-Dinitrotoluene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
3-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Acenaphthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dinitrophenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
4-Nitrophenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Dibenzofuran	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dinitrotoluene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Diethylphthalate	NC	0.3 J	5 U	6 U	0.2 J	5 U	5 U	5 U
4-Chlorophenyl-phenylether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Fluorene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U
4,6-Dinitro-2-methylphenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
N-Nitrosodiphenylamine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorobenzene	NC	6 U	0.2 J	6 U	0.3 J	5 U	5 U	0.3 J
Pentachlorophenol	1	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Phenanthrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Di-n-butylphthalate	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Pyrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Butylbenzylphthalate	NC	6 UJ	5 UJ	6 UJ	6 UJ	5 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(a)anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Chrysene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	NC	6 UJ	2 J	6 UJ	6 UJ	5 UJ	0.6 J	0.7 J
Di-n-octylphthalate	NC	6 UJ	5 UJ	6 UJ	6 UJ	5 UJ	5 UJ	5 UJ
Benzo(b)fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(k)fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(a)pyrene	0.0012	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Dibenz(a,h)anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surfac er results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compouuds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
Phenol	5	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Chloroethyl) ether	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Chlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2-Methylphenol	5	6 U	6 U	6 U	6 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Methylphenol	5	0.2 J	6 U	6 U	6 U	5 U	5 U
N-Nitroso-di-n-propylamine	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachloroethane	NC	6 U	6 U	6 U	6 U	5 U	5 U
Nitrobenzene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Isophorone	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Nitrophenol	5	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dimethylphenol	5	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Chloroethoxy)methane	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dichlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
1,2,4-Trichlorobenzene	50	6 U	6 U	6 U	6 U	5 U	5 U
Naphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Chloroaniline	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorobutadiene	10	6 U	6 U	6 U	6 U	5 U	5 U
4-Chloro-3-methylphenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2-Methylnaphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorocyclopentadiene	4.5	6 U	6 U	6 U	6 U	5 U	5 U
2,4,6-Trichlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2,4,5-Trichlorophenol	1	22 U	22 U	22 U	25 U	20 U	20 U
2-Chloronaphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U
Dimethylphthalate	NC	6 U	6 U	6 U	6 U	5 U	5 U
Acenaphthylene	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,6-Dinitrotoluene	NC	6 U	6 U	6 U	6 U	5 U	5 U
3-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
Acenaphthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dinitrophenol	5	22 U	22 U	22 U	25 U	20 U	20 U
4-Nitrophenol	5	22 U	22 U	22 U	25 U	20 U	20 U
Dibenzofuran	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dinitrotoluene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Diethylphthalate	NC	6 U	0.2 J	6 U	6 U	5 U	5 U
4-Chlorophenyl-phenylether	NC	6 U	6 U	6 U	6 U	5 U	5 U
Fluorene	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U
4,6-Dinitro-2-methylphenol	5	22 U	22 U	22 U	25 U	20 U	20 U
N-Nitrosodiphenylamine	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Bromophenyl-phenylether	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorobenzene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Pentachlorophenol	1	22 U	22 U	22 U	25 U	20 U	20 U
Phenanthrene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Di-n-butylphthalate	NC	6 U	6 U	6 U	6 U	5 U	5 U
Fluoranthene	NC	6 U	6 U	0.3 J	6 U	5 U	5 U
Pyrene	NC	6 U	6 U	0.3 J	6 U	5 U	5 U
Butylbenzylphthalate	NC	6 UJ	6 UJ	6 UJ	6 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(a)anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Chrysene	NC	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	NC	1 J	6 UJ	6 UJ	6 UJ	5 UJ	3 J
Di-n-octylphthalate	NC	6 UJ	6 UJ	6 UJ	6 UJ	5 UJ	5 UJ
Benzo(b)fluoranthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(k)fluoranthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(a)pyrene	0.0012	6 U	6 U	6 U	6 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	NC	6 U	6 U	6 U	6 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surfac er results are presented in ug/L (ppb).

TABLE F-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
Dibenz(a,h)anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(g,h,i)perylene	NC	6 U	6 U	6 U	6 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-9
TCL Pesticide/PCB Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 DUP 72093011 05/12/97	SW-4 72093001 05/14/97	SW-10 72054001 05/12/97
alpha-BHC	2	0.01 U	0.01 U	0.01 U
beta-BHC	2	0.01 U	0.01 U	0.01 U
delta-BHC	2	0.01 U	0.01 U	0.01 U
gamma-BHC (Lindane)	2	0.01 U	0.01 U	0.01 U
Heptachlor	0.001	0.01 U	0.01 U	0.01 U
Aldrin	0.001	0.01 U	0.01 U	0.01 U
Heptachlor epoxide	0.001	0.01 U	0.01 U	0.01 U
Endosulfan I	0.22	0.01 U	0.01 U	0.01 U
Dieldrin	0.001	0.02 U	0.02 U	0.02 U
4,4'-DDE	0.001	0.02 U	0.02 U	0.02 U
Endrin	0.002	0.02 U	0.02 U	0.02 U
Endosulfan II	0.22	0.02 U	0.02 U	0.02 U
4,4'-DDD	0.001	0.02 U	0.02 U	0.02 U
Endosulfan sulfate	NC	0.02 U	0.02 U	0.02 U
4,4'-DDT	0.001	0.02 U	0.02 U	0.02 U
Methoxychlor	NC	0.11 U	0.1 U	0.11 U
Endrin ketone	NC	0.02 U	0.02 U	0.02 U
Endrin aldehyde	NC	0.02 U	0.02 U	0.02 U
alpha-Chlordane	0.002	0.01 U	0.01 U	0.01 U
gamma-Chlordane	0.002	0.01 U	0.01 U	0.01 U
Toxaphene	1.6	1.1 U	1 U	1.1 U
Aroclor-1016	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1221	6.00E-07	0.43 U	0.4 U	0.44 U
Aroclor-1232	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1242	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1248	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1254	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1260	6.00E-07	0.21 U	0.2 U	0.22 U

See appendix introduction for abbreviations and data qualifiers.
Surfac er results are presented in ug/L (ppb).

TABLE F-10
TAL Metals and Cyanide - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 9711121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Aluminum	NC	54.2 B	135 B	126 B	454	103 B	178 B	2660
Antimony	NC	3 U	3 U	3 U	3 U	3.5 B	3.1 B	3.5 B
Arsenic	360	3 U	3 U	3 U	3 U	3 U	3 U	4 B
Barium	NC	27.2 B	56 B	25.4 B	33.7 B	37.7 B	68 B	154 B
Beryllium	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	6.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Calcium	NC	22200	23500	20700	21500	22600	23400	21800
Chromium	2490	1 U	1 U	1.4 B	3.5 B	1 U	1.5 B	39.6
Cobalt	110	1 U	1 U	1 U	1 U	1 U	1.4 B	6.7 B
Copper	26.8	4.9 B	6.5 B	8 B	14 B	4.3 B	14.1 B	491
Iron	300	658	1060 J	908	1510	856 J	1110 J	7240 J
Lead	144	2 U	R	2.2 JB	2 JB	2 U	R	14.2
Magnesium	NC	18900	18800	17300	17900	18200	15200	20200
Manganese	NC	209	422	188	182	336	888	625
Mercury	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2577	2.3 B	10.6 B	4.6 B	4 B	8.9 B	15.7 B	136
Potassium	NC	2230 B	2300 JB	2080 B	2160 B	2360 JB	2060 JB	1990 JB
Selenium	NC	3 U	3.4 B	3 U	4.5 B	3 U	3 U	10.2
Silver	8.6	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Sodium	NC	20300	20400	18600	19200	19600	18800	27000
Thallium	20	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium	190	1 U	1 U	1 U	1.6 B	1 U	1.3 JB	8.6 B
Zinc	463	10.7 B	21.8 J	16.7 B	37	17.8 B	28.1 J	232 J
Cyanide	22	10 U	39.6 J	10 U	10 U	10 UJ	10 U	220

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE F-10
TAL Metals and Cyanide - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/12/97
Aluminum	NC	13100	84.8 B	8960	118 B	41.9 B	64.8 B
Antimony	NC	4.9 B	3 U	3 U	3 U	3 U	3.6 B
Arsenic	360	18.3	3 U	4.1 B	3 U	3 U	3 U
Barium	NC	250	69.7 B	631	68.5 B	52.4 B	33.4 B
Beryllium	NC	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	6.4	1.7 B	1 U	1.1 B	1 U	1 U	1 U
Calcium	NC	18800	18700	40600	18100	16300	23000
Chromium	2490	253	1 U	69.7	1.1 B	1 U	1 U
Cobalt	110	32.8 B	1 U	31.4 B	1 U	1 U	1 U
Copper	26.8	3960	6.2 B	95.4	5.3 B	2.8 B	2.7 B
Iron	300	34100 J	272	24000	346	94.2 B	363 J
Lead	144	88	2 U	43.6	2 U	2 U	R
Magnesium	NC	13800	19300	68600	19300	14200	13800
Manganese	NC	1010	109	1760	110	57.4	60.3
Mercury	0.2	0.22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2577	558	11.9 B	204	6.2 B	5.5 B	3.5 B
Potassium	NC	2790 JB	1900 B	5980 J	1820 B	1510 B	1970 JB
Selenium	NC	40.1	6.7	3 B	3 U	3 U	3 U
Silver	8.6	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Sodium	NC	21700	27900	30300	26400	23600	17600
Thallium	20	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium	190	25.7 B	1 U	29.6 B	1 U	1 U	1 U
Zinc	463	2090 J	20.8	146	27.3	18.3 B	27.3 J
Cyanide	22	858	10 U	18.7	10 U	10 U	10 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

T-SW.XLS

TABLE F-11
Hardness - Surface Water
Magna Metals Site
Page 1 of 2

Sample ID	SW-1	SW-1 DUP	SW-2	SW-3	SW-4	SW-5	SW-6
Laboratory ID	72054-12	72093-11	72054-9	72054-13	72093-1	72093-3	72093-5
Date Sampled	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97
Hardness	134.17	139.3	131.2	131.87	141.54	131.11	130.55

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in mg/L (ppm).

TABLE F-11
Hardness - Surface Water
Magna Metals Site
Page 2 of 2

Sample ID	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12
Laboratory ID	72093-7	72054-14	72054-15	72054-1	72054-7	72093-9
Date Sampled	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/12/97
Hardness	103.39	135.1	479	131.54	101.98	127.56

See appendix introduction for abbreviations and data qualifiers.
Surfac er results are presented in mg/L (ppm).

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 72054019 05/12/97	SD-1 DUP 72093012 05/12/97	SD-2 72054010 05/12/97	SD-3 72054020 05/12/97	SD-4 72093002 05/14/97
Chloromethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Bromomethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Vinyl Chloride	0.07 HH	5.98	16 U	67 UJ	34 UJ	R	40 UJ
Chloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Methylene Chloride	NC	NC	18 UJ	67 UJ	34 UJ	R	40 UJ
Acetone	NC	NC	74 UJ	320 UJ	80 UJ	R	340 JB
CarbonDisulfide	NC	NC	16 U	67 UJ	34 UJ	R	12 J
1,1-Dichloroethene	0.02 HH	1.71	16 U	67 UJ	34 UJ	R	40 UJ
1,1-Dichloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloroethene (total)	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Chloroform	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloroethane	0.7 HH	59.75	16 U	67 UJ	34 UJ	R	40 UJ
2-Butanone	NC	NC	21	74	11 J	R	95 J
1,1,1-Trichloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Carbon Tetrachloride	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
Bromodichloromethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloropropane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
cis-1,3-Dichloropropene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Trichloroethene	2 HH	170.72	16 U	67 UJ	34 UJ	R	40 UJ
Dibromochloromethane	NC	NC	16 UJ	67 UJ	34 UJ	R	40 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
Benzene	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
trans-1,3-Dichloropropene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Bromoform	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
4-Methyl-2-Pentanone	NC	NC	16 U	67 UJ	12 J	R	40 UJ
2-Hexanone	NC	NC	16 UJ	67 UJ	18 J	R	40 UJ
Tetrachloroethene	0.8 HH	68.29	16 U	67 UJ	34 UJ	R	40 UJ
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	16 U	67 UJ	34 UJ	R	40 UJ
Toluene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 72054019 05/12/97	SD-1 DUP 72093012 05/12/97	SD-2 72054010 05/12/97	SD-3 72054020 05/12/97	SD-4 72093002 05/14/97
Chlorobenzene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Ethylbenzene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Styrene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Xylene (total)	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Crite rmalized using average TOC concentration in sediments.

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 72093004 05/14/97	SD-6 72093006 05/14/97	SD-7 72093008 05/14/97	SD-8 72054017 05/12/97	SD-9 72054018 05/12/97
Chloromethane	NC	NC	33 UJ	33 UJ	7 J	21 UJ	53 UJ
Bromomethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Vinyl Chloride	0.07 HH	5.98	33 UJ	33 UJ	26 UJ	21 UJ	25 J
Chloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Methylene Chloride	NC	NC	37 UJ	33 UJ	25 UJ	26 UJ	100 UJ
Acetone	NC	NC	770 JB	88 UJ	96 UJ	150 JB	530 JB
CarbonDisulfide	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1-Dichloroethene	0.02 HH	1.71	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1-Dichloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloroethene (total)	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Chloroform	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloroethane	0.7 HH	59.75	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
2-Butanone	NC	NC	260 J	22 J	39 J	36 J	160 J
1,1,1-Trichloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Carbon Tetrachloride	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Bromodichloromethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloropropane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
cis-1,3-Dichloropropene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Trichloroethene	2 HH	170.72	20 J	33 UJ	26 UJ	21 UJ	22 J
Dibromochloromethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Benzene	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
trans-1,3-Dichloropropene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Bromoform	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
4-Methyl-2-Pentanone	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
2-Hexanone	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Tetrachloroethene	0.8 HH	68.29	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Toluene	NC	NC	33 UJ	33 UJ	12 J	21 UJ	53 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 72093004 05/14/97	SD-6 72093006 05/14/97	SD-7 72093008 05/14/97	SD-8 72054017 05/12/97	SD-9 72054018 05/12/97
Chlorobenzene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Ethylbenzene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Styrene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Xylene (total)	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Crite rmalized using average TOC concentration in sediments.

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 72054004 05/12/97	SD-11 72054008 05/12/97	SD-12 72093010 05/14/97
Chloromethane	NC	NC	12 U	12 U	12 U
Bromomethane	NC	NC	12 U	12 U	12 U
Vinyl Chloride	0.07 HH	5.98	12 U	12 U	12 U
Chloroethane	NC	NC	12 U	12 U	12 U
Methylene Chloride	NC	NC	12 UJ	12 UJ	12 UJ
Acetone	NC	NC	14 UJ	12 UJ	12 UJ
CarbonDisulfide	NC	NC	12 U	12 U	12 U
1,1-Dichloroethene	0.02 HH	1.71	12 U	12 U	12 U
1,1-Dichloroethane	NC	NC	12 U	12 U	12 U
1,2-Dichloroethene (total)	NC	NC	12 U	12 U	12 U
Chloroform	NC	NC	12 U	12 U	12 U
1,2-Dichloroethane	0.7 HH	59.75	12 U	12 U	12 U
2-Butanone	NC	NC	12 U	12 U	12 U
1,1,1-Trichloroethane	NC	NC	12 U	12 U	12 U
Carbon Tetrachloride	0.6 HH	51.22	12 U	12 U	12 U
Bromodichloromethane	NC	NC	12 U	12 U	12 U
1,2-Dichloropropane	NC	NC	12 U	12 U	12 U
cis-1,3-Dichloropropene	NC	NC	12 U	12 U	12 U
Trichloroethene	2 HH	170.72	12 U	12 U	12 U
Dibromochloromethane	NC	NC	12 UJ	12 UJ	12 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	12 U	12 U	12 U
Benzene	0.6 HH	51.22	12 U	12 U	12 U
trans-1,3-Dichloropropene	NC	NC	12 U	12 U	12 U
Bromoform	NC	NC	12 U	12 U	12 U
4-Methyl-2-Pentanone	NC	NC	5 J	12 U	12 U
2-Hexanone	NC	NC	10 J	12 UJ	12 UJ
Tetrachloroethene	0.8 HH	68.29	4 J	12 U	12 U
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	12 U	12 U	12 U
Toluene	NC	NC	12 U	12 U	12 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 72054004 05/12/97	SD-11 72054008 05/12/97	SD-12 72093010 05/14/97
Chlorobenzene	NC	NC	12 U	12 U	12 U
Ethylbenzene	NC	NC	12 U	12 U	12 U
Styrene	NC	NC	12 U	12 U	12 U
Xylene (total)	NC	NC	12 U	12 U	12 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Crite rmalized using average TOC concentration in sediments.

A-SD.XLS

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
Phenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
bis(2-Chloroethyl) ether	0.03 HH	2.56	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Chlorophenol	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,3-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,4-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,2-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Methylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,2'-oxybis(1-Chloropropane)	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Methylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
N-Nitroso-di-n-propylamine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachloroethane	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Nitrobenzene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Isophorone	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Nitrophenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dimethylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
bis (2-Chloroethoxy) methane		0.00	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dichlorophenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,2,4-Trichlorobenzene	91 CT	7767.94	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Naphthalene	NC	NC	42 J	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chloroaniline	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorobutadiene	0.3 HH	25.61	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chloro-3-methylphenol	0.6 CTY	51.22	530 U	2100 UJ	470 U	160 J	1800 UJ
2-Methylnaphthalene	NC	NC	38 J	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorocyclopentadiene	4.4 CT	375.59	530 UJ	2100 UJ	470 UJ	1000 UJ	1800 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4,5-Trichlorophenol	0.6 CT	51.22	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
2-Chloronaphthalene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
Dimethylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
Acenaphthylene	NC	NC	180 J	2100 UJ	470 U	1000 UJ	1800 UJ
2,6-Dinitrotoluene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
3-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
Acenaphthene	140 CT	11950.68	140 J	2100 UJ	470 U	88 J	1800 UJ
2,4-Dinitrophenol	0.5 CT	42.68	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
4-Nitrophenol	0.5 CT	42.68	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
Dibenzofuran	NC	NC	220 J	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dinitrotoluene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Diethylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chlorophenyl-phenylether	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Fluorene	NC	NC	540	2100 UJ	470 U	1000 UJ	1800 UJ
4-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
4,6-Dinitro-2-methylphenol	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
N-Nitrosodiphenylamine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Bromophenyl-phenylether	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorobenzene	0.15 HH	12.80	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Pentachlorophenol	0.6 CT	51.22	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
Phenanthrene	120 CT	10243.44	2700	2100 UJ	470 U	1000 UJ	1800 UJ
Anthracene	NC	NC	700	2100 UJ	470 U	1000 UJ	1800 UJ
Carbazole	NC	NC	340 J	2100 UJ	470 U	1000 UJ	1800 UJ
Di-n-butylphthalate	NC	NC	530 U	170 J	470 U	1000 UJ	85 J
Fluoranthene	1,020 CT	87069.24	2400	270 J	470 U	59 UJ	280 J
Pyrene	NC	NC	2300	220 J	470 U	180 J	220 J
Butylbenzylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 J	1800 UJ
3,3'-Dichlorobenzidine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Benzo(a)anthracene	1.3 HH	110.97	1200	2100 UJ	470 U	1000 UJ	1800 UJ
Chrysene	1.3 HH	110.97	1300	2100 UJ	470 U	1000 UJ	1800 UJ
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	530 U	300 J	470 U	1000 UJ	210 J
Di-n-octylphthalate	NC	NC	530 UJ	2100 UJ	470 UJ	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Crite rmalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
Benzo(b)fluoranthene	1.3 HH	110.97	840	2100 UJ	470 U	1000 UJ	150 J
Benzo(k)fluoranthene	1.3 HH	110.97	950	2100 UJ	470 U	1000 UJ	150 J
Benzo(a)pyrene	1.3 HH	110.97	1000	230 J	58 J	1000 UJ	120 J
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	110 J	2100 UJ	470 U	1000 UJ	1800 UJ
Dibenz(a,h)anthracene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Benzo(g,h,i)perylene	NC	NC	55 J	2100 UJ	470 U	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
Phenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
bis(2-Chloroethyl) etber	0.03 HH	2.56	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Chlorophenol	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,3-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,4-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,2-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Methylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,2'-oxybis(1-Chloropropane)	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Methylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
N-Nitroso-di-n-propylamine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachloroethane	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Nitrobenzene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Isophorone	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Nitrophenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4-Dimethylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
bis (2-Chloroethoxy) methane		0.00	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4-Dichlorophenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,2,4-Trichlorobenzene	91 CT	7767.94	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Naphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chloroaniline	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorobutadiene	0.3 HH	25.61	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chloro-3-methylphenol	0.6 CTY	51.22	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Methylnaphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorocyclopentadiene	4.4 CT	375.59	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4,5-Trichlorophenol	0.6 CT	51.22	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
2-Chloronaphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Dimethylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
Acenaphthylene	NC	NC	1300 UJ	1100 UJ	1000 UJ	19 J	1600 UJ
2,6-Dinitrotoluene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
3-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Acenaphthene	140 CT	11950.68	1300 UJ	1100 UJ	1000 UJ	53 J	1600 UJ
2,4-Dinitrophenol	0.5 CT	42.68	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
4-Nitrophenol	0.5 CT	42.68	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Dibenzofuran	NC	NC	1300 UJ	1100 UJ	1000 UJ	29 J	1600 UJ
2,4-Dinitrotoluene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Diethylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chlorophenyl-phenylether	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Fluorene	NC	NC	1300 UJ	1100 UJ	1000 UJ	74 J	1600 UJ
4-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
4,6-Dinitro-2-methylphenol	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
N-Nitrosodiphenylamine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Bromophenyl-phenylether	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorobenzene	0.15 HH	12.80	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Pentachlorophenol	0.6 CT	51.22	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Phenanthrene	120 CT	10243.44	270 J	100 J	350 J	950 J	250 J
Anthracene	NC	NC	35 J	1100 UJ	45 J	130 J	37 J
Carbazole	NC	NC	1300 UJ	1100 UJ	1000 UJ	120 J	1600 UJ
Di-n-butylphthalate	NC	NC	92 J	97 J	1000 UJ	690 UJ	1600 UJ
Fluoranthene	1,020 CT	87069.24	490 J	230 J	650 J	1400 J	590 J
Pyrene	NC	NC	390 J	200 J	710 J	1500 J	640 J
Butylbenzylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
3,3'-Dichlorobenzidine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Benzo(a)anthracene	1.3 HH	110.97	180 J	95 J	300 J	710 J	260 J
Chrysene	1.3 HH	110.97	300 J	150 J	410 J	1000 J	370 J
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	250 J	140 J	1100 UJ	690 UJ	1600 UJ
Di-n-octylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
Benzo(b)fluoranthene	1.3 HH	110.97	260 J	130 J	360 J	820 J	320 J
Benzo(k)fluoranthene	1.3 HH	110.97	210 J	120 J	320 J	780 J	300 J
Benzo(a)pyrene	1.3 HH	110.97	180 J	1100 UJ	300 J	810 J	320 J
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	1300 UJ	1100 UJ	290 J	87 J	150 J
Dibenz(a,h)anthracene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Benzo(g,h,i)perylene	NC	NC	1300 UJ	1100 UJ	250 J	51 J	120 J

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criter rmalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Phenol	0.5 CT	42.68	410 U	380 U	400 U
bis(2-Chloroethyl) ether	0.03 HH	2.56	410 U	380 U	400 U
2-Chlorophenol	NC	NC	410 U	380 U	400 U
1,3-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
1,4-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
1,2-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
2-Methylphenol	0.5 CT	42.68	410 U	380 U	400 U
2,2'-oxybis(1-Chloropropane)	NC	NC	410 U	380 U	400 U
4-Methylphenol	0.5 CT	42.68	410 U	380 U	400 U
N-Nitroso-di-n-propylamine	NC	NC	410 U	380 U	400 U
Hexachloroethane	NC	NC	960	380 U	400 U
Nitrobenzene	NC	NC	410 U	380 U	400 U
Isophorone	NC	NC	410 U	380 U	400 U
2-Nitrophenol	0.5 CT	42.68	410 U	380 U	400 U
2,4-Dimethylphenol	0.5 CT	42.68	410 U	380 U	400 U
bis (2-Chloroethoxy) methane		0.00	410 U	380 U	400 U
2,4-Dichlorophenol	0.5 CT	42.68	410 U	380 U	400 U
1,2,4-Trichlorobenzene	91 CT	7767.94	410 U	380 U	400 U
Naphthalene	NC	NC	410 U	380 U	400 U
4-Chloroaniline	NC	NC	410 U	380 U	400 U
Hexachlorobutadiene	0.3 HH	25.61	410 U	380 U	400 U
4-Chloro-3-methylphenol	0.6 CTY	51.22	410 U	380 U	400 U
2-Methylnaphthalene	NC	NC	410 U	380 U	400 U
Hexachlorocyclopentadiene	4.4 CT	375.59	410 UJ	380 UJ	400 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	410 U	380 U	400 U
2,4,5-Trichlorophenol	0.6 CT	51.22	1000 U	950 U	1000 U
2-Chloronaphthalene	NC	NC	410 U	380 U	400 U
2-Nitroaniline	NC	NC	1000 U	950 U	1000 U
Dimethylphthalate	NC	NC	410 U	380 U	400 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Acenaphthylene	NC	NC	410 U	380 U	400 U
2,6-Dinitrotoluene	NC	NC	410 U	380 U	400 U
3-Nitroaniline	NC	NC	1000 U	950 U	1000 U
Acenaphthene	140 CT	11950.68	410 U	380 U	400 U
2,4-Dinitrophenol	0.5 CT	42.68	1000 UJ	950 UJ	1000 U
4-Nitrophenol	0.5 CT	42.68	1000 UJ	950 UJ	1000 UJ
Dibenzofuran	NC	NC	410 U	380 U	400 U
2,4-Dinitrotoluene	NC	NC	410 U	380 U	400 U
Diethylphthalate	NC	NC	410 U	380 U	400 U
4-Chlorophenyl-phenylether	NC	NC	410 U	380 U	400 U
Fluorene	NC	NC	410 U	380 U	400 U
4-Nitroaniline	NC	NC	1000 U	950 U	1000 U
4,6-Dinitro-2-methylphenol	NC	NC	1000 U	950 U	1000 U
N-Nitrosodiphenylamine	NC	NC	410 U	380 U	400 U
4-Bromophenyl-phenylether	NC	NC	410 U	380 U	400 U
Hexachlorobenzene	0.15 HH	12.80	410 U	380 U	400 U
Pentachlorophenol	0.6 CT	51.22	1000 UJ	950 UJ	1000 U
Phenanthrene	120 CT	10243.44	87 J	35 J	400 U
Anthracene	NC	NC	17 J	6 J	400 U
Carbazole	NC	NC	410 U	380 U	400 U
Di-n-butylphthalate	NC	NC	410 U	380 U	400 U
Fluoranthene	1,020 CT	87069.24	140 J	71 J	400 U
Pyrene	NC	NC	140 J	72 J	400 U
Butylbenzylphthalate	NC	NC	410 U	380 U	400 U
3,3'-Dichlorobenzidine	NC	NC	410 U	380 U	400 U
Benzo(a)anthracene	1.3 HH	110.97	62 J	31 J	400 U
Chrysene	1.3 HH	110.97	81 J	46 J	400 U
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	410 U	380 U	400 U
Di-n-octylphthalate	NC	NC	410 UJ	380 UJ	400 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criter rmalized using average TOC concentration in sediments.

TABLE F-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID **Laboratory ID** **Date Sampled**	**NYSDEC Sediment Criteria ug/gOC**	**Normalized Sediment Criteria* ug/kg**	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Benzo(b)fluoranthene	1.3 HH	110.97	60 J	32 J	400 UJ
Benzo(k)fluoranthene	1.3 HH	110.97	65 J	38 J	400 U
Benzo(a)pyrene	1.3 HH	110.97	60 J	33 J	400 U
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	41 J	20 J	400 U
Dibenz(a,h)anthracene	NC	NC	410 U	380 U	400 U
Benzo(g,h,i)perylene	NC	NC	34 J	18 J	400 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE F-14
TCL Pesticide/PCB Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Citeria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 DUP 72093012 05/12/97	SD-4 72093002 05/14/97	SD-10 72054004 05/12/97
alpha-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
beta-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
delta-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
gamma-BHC (Lindane)	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
Heptachlor	0.0008 HH	0.07	11 UJ	6.8 UJ	2.1 U
Aldrin	0.1 HH	8.54	11 UJ	6.8 UJ	2.1 U
Heptachlor epoxide	0.0008 HH	0.07	11 UJ	6.8 UJ	2.1 U
Endosulfan I	NC	NC	11 UJ	6.8 UJ	2.1 U
Dieldrin	0.1 HH	8.54	22 UJ	13 UJ	4 U
4,4'-DDE	0.01 HH	0.85	22 UJ	13 UJ	4 U
Endrin	0.8 HH, WB	68.29	22 UJ	13 UJ	4 U
Endosulfan II	NC	NC	22 UJ	13 UJ	4 U
4,4'-DDD	0.01 HH	0.85	22 UJ	13 UJ	4 U
Endosulfan sulfate	NC	NC	22 UJ	13 UJ	4 U
4,4'-DDT	0.01 HH	0.85	22 UJ	13 UJ	4 U
Methoxychlor	0.6 CT	51.22	110 UJ	68 UJ	21 U
Endrin ketone	0.8 WB	68.29	22 UJ	13 UJ	4 U
Endrin aldehyde	0.8 WB	68.29	22 UJ	13 UJ	4 U
alpha-Chlordane	0.001 HH	0.09	11 UJ	6.8 UJ	3.5 JP
gamma-Chlordane	0.001 HH	0.09	11 UJ	6.8 UJ	3.4
Toxaphene	0.01 CT	0.85	1100 UJ	680 UJ	210 U
Aroclor-1016	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1221	0.0008 HH	0.07	450 UJ	270 UJ	82 U
Aroclor-1232	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1242	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1248	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1254	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1260	0.0008 HH	0.07	220 UJ	130 UJ	40 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
* Criteria normalized using average TOC concentration in sediments.

TABLE F-15
TAL Metals and Cyanide - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121a-15 05/12/97	SD-4 971144A-02 05/14/97
Aluminum	NC	NC	11700 J	10100 J	9900	7770 J	10600 J
Antimony	2	25	1.1 UJ	3.1 UJ	1 U	1.6 UJ	2.6 UJ
Arsenic	6	33	3.2 JB	10.6 J	3 B	4.4 JB	9.1 J
Barium	NC	NC	132 J	289 J	135	261 J	256 J
Beryllium	NC	NC	0.37 UJ	1 UJ	0.35 U	0.53 UJ	0.86 UJ
Cadmium	0.6	9	1 JB	1.3 JB	0.78 B	1.1 JB	1 JB
Calcium	NC	NC	7560 J	11500 J	4600	4490 J	9530 J
Chromium	26	110	78.1 J	R	43	106 J	R
Cobalt	NC	NC	35.6 J	31.9 JB	14.2 B	37.3 J	24.6 JB
Copper	16	110	374 J	493 J	162	398 J	603 J
Iron	20,000 (2%)	40,000 (4%)	34200 J	21100 J	2160	27000 J	19500 J
Lead	31	110	16.6 J	29.2 J	19.4	15.4 J	29.3 J
Magnesium	NC	NC	23400 J	10700 J	6160	21800 J	8670 J
Manganese	460	1100	R	154 J	R	R	167 J
Mercury	0.15	1.3	0.18 UJ	0.58 UJ	0.14 U	0.23 UJ	0.32 UJ
Nickel	16	50	166 J	284 J	180	212 J	234 J
Potassium	NC	NC	1240 JB	906 JB	976 B	668 JB	894 JB
Selenium	NC	NC	3.2 J	14.6 J	8.4	4.8 J	14 J
Silver	1	2.2	0.37 UJ	1.4 JB	0.35 U	0.58 JB	1.3 JB
Sodium	NC	NC	228 JB	384 JB	193 B	324 JB	343 JB
Thallium	NC	NC	1.1 UJ	3.1 UJ	1 UJ	1.6 UJ	2.6 UJ
Vanadium	NC	NC	23.5 J	44.1 JB	25.4	26.9 J	39.8 JB
Zinc	120	270	142 J	180 J	155	133 J	209 J
Cyanide	NC	NC	0.99 UJ	45.3 J	0.98 U	3.33 J	2.66 UJ

See appendix introduction for abbreviations and data qualifiers.
Sedim sults are presented in mg/kg (ppm).

TABLE F-15
TAL Metals and Cyanide - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/12/97	SD-9 971121A-13 05/12/97
Aluminum	NC	NC	19800 J	17800 J	12700 J	9370	14900 J
Antimony	2	25	1.5 UJ	1.7 UJ	1.2 UJ	0.76 U	2.4 UJ
Arsenic	6	33	7 J	19.3 J	16.9 J	4.7	5.8 BJ
Barium	NC	NC	364 J	460 J	142 J	91.6	604 J
Beryllium	NC	NC	0.62 JB	0.6 JB	0.4 UJ	0.28 B	0.82 UJ
Cadmium	0.6	9	1.1 JB	1.4 JB	1 JB	0.63 B	1.8 BJ
Calcium	NC	NC	7760 J	13000 J	4020 J	2750	11200 J
Chromium	26	110	R	R	R	34	144 J
Cobalt	NC	NC	22.2 JB	24.7 JB	20.4 J	13	41.7 J
Copper	16	110	690 J	2330 J	2080 J	46.2	129 J
Iron	20,000 (2%)	40,000 (4%)	28000 J	20200 J	23600 J	17900	38600 J
Lead	31	110	46.2 J	48.2 J	62.9 J	7.9	63.2 J
Magnesium	NC	NC	7000 J	7830 J	7120 J	7080	9420 J
Manganese	460	1100	321 J	841 J	220 J	R	R
Mercury	0.15	1.3	0.28 UJ	0.3 UJ	0.24 UJ	0.15 U	0.3 UJ
Nickel	16	50	231 J	835 J	494 J	45.6	264 J
Potassium	NC	NC	1400 JB	906 JB	831 JB	1880 J	1040 BJ
Selenium	NC	NC	19.2 J	68.2 J	46 J	2.7	9.6 J
Silver	1	2.2	0.66 JB	0.72 JB	0.66 JB	0.25 U	0.82 UJ
Sodium	NC	NC	546 JB	586 JB	311 JB	208 B	454 BJ
Thallium	NC	NC	1.5 UJ	1.7 UJ	1.2 UJ	0.76 UJ	2.4 UJ
Vanadium	NC	NC	41.6 J	36.2 J	30.6 J	32.8	49.5 J
Zinc	120	270	441 J	938 J	1890 J	67.7	226 J
Cyanide	NC	NC	1.54 UJ	52.4 J	519 J	1.43	2.37 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

TABLE F-15
TAL Metals and Cyanide - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Aluminum	NC	NC	3490	4970	2920
Antimony	2	25	0.53 U	0.71 U	0.68 UJ
Arsenic	6	33	1.1 B	1.2 B	0.68 U
Barium	NC	NC	32.6 B	52	33.8 B
Beryllium	NC	NC	0.18 U	0.24 U	0.23 U
Cadmium	0.6	9	0.31 B	0.37 B	0.23 U
Calcium	NC	NC	3840	2590	882 B
Chromium	26	110	11.4	13.1	R
Cobalt	NC	NC	4.9 B	7.9 B	4.6 B
Copper	16	110	12.3	17.2	4.4 B
Iron	20,000 (2%)	40,000 (4%)	9820	12800	7320
Lead	31	110	3.9	5	3
Magnesium	NC	NC	4060	3950	2130
Manganese	460	1100	R	R	87
Mercury	0.15	1.3	0.11 U	0.12 U	0.082 U
Nickel	16	50	26.9	36	17.3
Potassium	NC	NC	413 B	805 B	207 B
Selenium	NC	NC	0.61 B	0.71 U	0.68 U
Silver	1	2.2	0.18 U	0.24 U	0.26 B
Sodium	NC	NC	92.7 B	104 B	59.8 B
Thallium	NC	NC	R	0.71 UJ	0.68 U
Vanadium	NC	NC	8.1 B	14.1	5.8 B
Zinc	120	270	36.8	47.2	29.3 J
Cyanide	NC	NC	0.54 U	0.57 U	0.59 U

See appendix introduction for abbreviations and data qualifiers.
Sedim esults are presented in mg/kg (ppm).

TABLE F-16
Total Organic Carbon - Sediment
Magna Metals Site

Sample ID	SD-1	SD-1 DUP	SD-2	SD-3	SD-4	SD-5	SD-6
Laboratory ID	1121014	1144012	1121006	1121015	1144002	1144004	1144006
Date Sampled	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97
Total Organic Carbon	38100	> 160000 J	93200	169000 J	>160000 J	88800 J	110000 J

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

TABLE F-16
Total Organic Carbon - Sediment
Magna Metals Site
Page 2 of 2

Sample ID	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12
Laboratory ID	1144008	1121012	1121013	1121002	1121004	1144010
Date Sampled	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97
Total Organic Carbon	84800 J	32400	160000 J	2510	8300	2590

See appendix introduction for abbreviations and data qualifiers.
Sedim esults are presented in mg/kg (ppm).

TABLE F-17
TCL Volatile Organic Compounds - Surface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	71589001	71589002	71589003	71589004	71589008	71589009
Depth	Clean-up	6"-12"	06"-12"	06"-12"	06"-12"	06"-12"	06"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Chloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Bromomethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Vinyl Chloride	200	12 U	12 U	11 U	12 U	12 U	11 U
Chloroethane	1,900	12 U	12 U	11 U	12 U	12 U	11 U
Methylene Chloride	100	12 U	12 U	11 U	12 U	12 U	11 U
Acetone	200	12 UJ	12 UJ	11 UJ	12 UJ	12 UJ	11 UJ
Carbon Disulfide	2,700	12 U	12 U	11 U	12 U	12 U	11 U
1,1-Dichloroethene	400	12 U	12 U	11 U	12 U	12 U	11 U
1,1-Dichloroethane	200	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloroethene (total)	300	12 U	12 U	11 U	12 U	12 U	11 U
Chloroform	300	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloroethane	100	12 U	12 U	11 U	12 U	12 U	11 U
2-Butanone	300	12 U	12 U	11 U	12 U	12 U	11 U
1,1,1-Trichloroethane	800	12 U	12 U	11 U	12 U	12 U	11 U
Carbon Tetrachloride	600	12 U	12 U	11 U	12 U	12 U	11 U
Bromodichloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloropropane	NA	12 U	12 U	11 U	12 U	12 U	11 U
cis-1,3-Dichloropropene	300	12 U	12 U	11 U	12 U	12 U	11 U
Trichloroethene	700	12 U	12 U	11 U	12 U	12 U	11 U
Dibromochloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
1,1,2-Trichloroethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Benzene	60	12 U	12 U	11 U	12 U	12 U	11 U
trans-1,3-Dichloropropene	300	12 U	12 U	11 U	12 U	12 U	11 U
Bromoform	NA	12 U	12 U	11 U	12 U	12 U	11 U
4-Methyl-2-Pentanone	1,000	12 U	12 U	11 U	12 U	12 U	11 U
2-Hexanone	NA	12 U	12 U	11 U	12 U	12 U	11 U
Tetrachloroethene	1,400	12 U	12 U	11 U	12 U	12 U	11 U
1,1,2,2-Tetrachloroethane	600	12 U	12 U	11 U	12 U	12 U	11 U
Toluene	1,500	12 U	12 U	11 U	12 U	12 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

MM-VA-SS.XLS

TABLE F-17
TCL Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 2 of 2

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	71589001	71589002	71589003	71589004	71589008	71589009
Depth	Clean-up	6"-12"	06"-12"	06"-12"	06"-12"	06"-12"	06"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Chlorobenzene	1,700	12 U	12 U	11 U	12 U	12 U	11 U
Ethylbenzene	5,500	12 U	12 U	11 U	12 U	12 U	11 U
Styrene	NA	12 U	12 U	11 U	12 U	12 U	11 U
Xylene (total)	1,200	12 U	12 U	11 U	12 U	12 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil re[illegible] are presented in ug/kg (ppb).

TABLE F-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	970835A-01	970835A-02	970835A-03	970835A-04	970835A-06	970835A-07
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Phenol	30	770 U	770 U	390 U	390 U	420 U	390 U
bis(2-Chloroethyl) ether	NA	770 U	770 U	390 U	390 U	420 U	390 U
2-Chlorophenol	800	770 U	770 U	390 U	390 U	420 U	390 U
1,3-Dichlorobenzene	1,600	770 U	770 U	390 U	390 U	420 U	390 U
1,4-Dichlorobenzene	8,500	770 U	770 U	390 U	390 U	420 U	390 U
1,2-Dichlorobenzene	7,900	770 U	770 U	390 U	390 U	420 U	390 U
2-Methylphenol	100	770 U	770 U	390 U	390 U	420 U	39 J
2,2'-oxybis(1-Chloropropane)	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Methylphenol	900	770 U	770 U	390 U	390 U	420 U	390 U
N-Nitroso-di-n-propylamine	NA	770 U	770 U	390 U	390 U	420 U	390 U
Hexachloroethane	NA	770 U	770 U	390 U	390 U	420 U	390 U
Nitrobenzene	200	770 U	770 U	390 U	390 U	420 U	390 U
Isophorone	4,400	770 U	770 U	390 U	390 U	420 U	390 U
2-Nitrophenol	330	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dimethylphenol	400	770 U	770 U	390 U	390 U	420 U	390 U
bis(2-chloroethoxy)methane	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dichlorophenol	400	770 U	770 U	390 U	390 U	420 U	390 U
1,2,4-Trichlorobenzene	NA	770 U	770 U	390 U	390 U	420 U	390 U
Naphthalene	13,000	770 U	770 U	390 U	390 U	420 U	390 U
4-Chloroaniline	220	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorobutadiene	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Chloro-3-methylphenol	240	770 U	770 U	390 U	390 U	420 U	390 U
2-Methylnaphthalene	36,400	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorocyclopentadiene	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4,6-Trichlorophenol	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4,5-Trichlorophenol	100	1900 U	1900 U	980 U	990 U	1000 U	990 U
2-Chloronaphthalene	NA	770 U	770 U	390 U	390 U	420 U	390 U
2-Nitroaniline	430	1900 U	1900 U	980 U	990 U	1000 U	990 U
Dimethylphthalate	2,000	770 U	770 U	390 U	390 U	420 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 2 of 3

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	970835A-01	970835A-02	970835A-03	970835A-04	970835A-06	970835A-07
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Acenaphthylene	41,000	770 U	770 U	390 U	390 U	420 U	390 U
2,6-Dinitrotoluene	1,000	770 U	770 U	390 U	390 U	420 U	390 U
3-Nitroaniline	500	1900 U	1900 U	980 U	990 U	1000 U	990 U
Acenaphthene	50,000	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dinitrophenol	200	1900 UJ	1900 UJ	980 U	990 U	1000 U	990 U
4-Nitrophenol	100	1900 U	1900 U	980 U	990 U	1000 U	990 U
Dibenzofuran	6,200	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dinitrotoluene	NA	770 U	770 U	390 U	390 U	420 U	390 U
Diethylphthalate	7,100	770 U	770 U	390 U	390 U	420 U	390 U
4-Chlorophenyl-phenylether	NA	770 U	770 U	390 U	390 U	420 U	390 U
Fluorene	50,000	770 U	770 U	390 U	390 U	420 U	390 U
4-Nitroaniline	NA	1900 U	1900 U	980 U	990 U	1000 U	990 U
4,6-Dinitro-2-methylphenol	NA	1900 U	1900 U	980 U	990 U	1000 U	990 U
N-Nitrosodiphenylamine	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Bromophenyl-phenylether	NA	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorobenzene	410	770 U	770 U	390 U	390 U	420 U	390 U
Pentachlorophenol	1,000	1900 U	1900 U	980 U	990 U	1000 U	990 U
Phenanthrene	50,000	28 J	26 J	11 J	45 J	21 J	55 J
Anthracene	50,000	770 U	770 U	390 U	8 J	420 U	390 U
Carbazole	NA	770 U	770 U	390 U	390 U	420 U	390 U
Di-n-butylphthalate	8,100	530 JB	610 JB	390 U	390 U	420 U	390 U
Fluoranthene	50,000	49 J	45 J	19 J	57 J	27 J	97 J
Pyrene	50,000	86 J	43 J	22 J	55 J	66 J	100 J
Butylbenzylphthalate	50,000	370 J	360 J	390 U	390 U	420 U	390 U
3,3'-Dichlorobenzidine	NA	770 U	770 U	390 U	390 U	420 U	390 U
Benzo(a)anthracene	224	770 U	770 U	390 U	23 J	13 J	39 J
Chrysene	400	770 U	770 U	390 U	28 J	19 J	62 J
bis(2-Ethylhexyl)phthalate	50,000	4900 B	4300 B	780 B	390 U	420 U	390 U
Di-n-octylphthalate	50,000	770 U	770 U	390 U	390 U	420 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil re are presented in ug/kg (ppb).

TABLE F-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	SS-01 970835A-01 00"-12" 04/11/97	SS-01DUP 970835A-02 00"-12" 04/11/97	SS-02 970835A-03 00"-12" 04/11/97	SS-03 970835A-04 00"-12" 04/11/97	SS-04 Background 970835A-06 00"-12" 04/11/97	SS-05 Background 970835A-07 00"-12" 04/11/97
Benzo(b)fluoranthene	1,100	770 U	770 U	390 U	21 J	420 U	49 J
Benzo(k)fluoranthene	1,100	770 U	770 U	390 U	26 J	420 U	48 J
Benzo(a)pyrene	61	97 J	770 U	390 U	20 J	420 U	29 J
Indeno(1,2,3-cd)pyrene	3,200	81 J	770 U	390 U	22 J	420 U	41 J
Dibenz(a,h)anthracene	14	770 U	770 U	390 U	390 U	420 U	390 U
Benzo(g,h,i)perylene	50,000	770 U	770 U	390 U	46 J	420 U	390 U
Semi-Volatile TICs	NA	11260 JN	9860 JN	8550 JN	28330 JN	15990 JN	14090 JN

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-19
TCL Pesticide/PCB Compounds - Surface Soils
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	SS-01 71589001 00"-12" 04/11/97	SS-01DUP 71589002 00"-12" 04/10/97	SS-02 71589003 00"-12" 04/10/97	SS-03 71589004 00"-12" 04/10/97	SS-04 Background 71589008 00"-12" 04/10/97	SS-05 Background 71589009 00"-12" 04/11/97
alpha-BHC	110	2 U	2 U	2 U	2 U	2.1 U	2 U
beta-BHC	200	2 U	2 U	2 U	2 U	2.1 U	2 U
delta-BHC	300	2 U	2 U	2 U	2 U	2.1 U	2 U
gamma-BHC (Lindane)	60	2 U	2 U	2 U	2 U	2.1 U	2 U
Heptachlor	100	2 U	2 U	2 U	2 U	2.1 U	2 U
Aldrin	41	2 U	2 U	2 U	2 U	2.1 U	2 U
Heptachlor epoxide	20	2 U	2 U	2 U	2 U	2.1 U	2 U
Endosulfan I	900	2 U	2 U	2 U	2 U	2.1 U	2 U
Dieldrin	44	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDE	2,100	7.4 JP	10	6.5	5.3	8	3.8 U
Endrin	100	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
Endosulfan II	900	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDD	2,900	3.8 U	3.8 U	7.1 JPN	3.9 U	4 U	3.8 U
Endosulfan sulfate	1,000	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDT	2,100	6.6 JPN	5 JP	6.2 JPN	6.2	8.9	4.3
Methoxychlor	NA	20 U	20 U	20 U	20 U	21 U	20 U
Endrin ketone	NA	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
Endrin aldehyde	NA	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
alpha-Chlordane	NA	2 U	2 U	2 U	2 U	2.1 U	2 U
gamma-Chlordane	540	2 U	2 U	2 U	2 U	2.1 U	2 U
Toxaphene	NA	200 U	200 U	200 U	200 U	210 U	200 U
Aroclor-1016	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1221	1,000	78 U	78 U	79 U	79 U	82 U	77 U
Aroclor-1232	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1242	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1248	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1254	1,000	56 J	62 J	46 JP	39 U	40 U	38 U
Aroclor-1260	1,000	46 J	38 J	46 JP	39 U	40 U	38 U

See appendix introduction for abbreviations and data qualifiers.
Soil re[illegible] are presented in ug/kg (ppb).

TABLE F-20
TAL Metals and Cyanide - Surface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	SS-01 970835A-01 00"-12" 04/11/97	SS-01DUP 970835A-02 00"-12" 04/11/97	SS-02 970835A-03 00"-12" 04/11/97	SS-03 970835A-04 00"-12" 04/11/97	SS-04 Background 970835A-06 00"-12" 04/11/97	SS-05 Background 970835A-07 00"-12" 04/11/97
Aluminum	SB	19,100	8660	8830	7510	8440	19100	12600
Antimony	SB	NA	0.52 UJ	0.57 UJ	0.6 UJ	0.64 UJ	0.64 UJ	0.6 UJ
Arsenic	7.5 or SB	7.5	2.4	2.5	2.2	1.6 B	3.1	2.9
Barium	300 or SB	300	46	52	46.7	42.6 B	83.2	70
Beryllium	0.16 or SB	0.59	0.35 B	0.34 B	0.3 B	0.32 B	0.59 B	0.54 B
Cadmium	1 or SB	1	0.18 UJ	0.19 UJ	0.2 UJ	0.21 UJ	0.21 UJ	0.2 UJ
Calcium	SB	847	1480	1430	1280	1540	847 B	808 B
Chromium	10 or SB	21.1	19	15.8	11.6	10.5	21.1	14.1
Cobalt	30 or SB	30	6.8 B	7.3 B	5.2 B	5.5 B	8.5 B	7.6 B
Copper	25 or SB	25	177 J	51.7 J	39	18	14.8	12.8
Iron	2,000 or SB	19,100	13700	12600	10900	11500	19100	14800
Lead	SB	18.1	10.1	10.8	9.5	8	12.2	18.1
Magnesium	SB	3,270	2830	2880	2130	2300	3270	2380
Manganese	SB	241	225	214	168	189	161	241
Mercury	0.1	0.1	0.099 U	0.11 U	0.11 U	0.11 U	0.1 U	0.11 U
Nickel	13 or SB	18.8	15	13.9	11.4	10.2	18.8	16.2
Potassium	SB	475	703 B	768 B	526 B	587 B	475 B	385 B
Selenium	2 or SB	2	1.3 J	1.1 J	1 J	1.3 J	1.2 J	1.6 J
Silver	SB	NA	0.18 U	0.19 U	0.2 U	0.21 U	0.21 U	0.2 U
Sodium	SB	96.4	78.9 B	81.9 B	74.4 B	93.1 B	96.4 B	72.3 B
Thallium	SB	NA	0.52 U	0.57 U	0.6 U	0.64 U	0.64 U	0.6 U
Vanadium	150 or SB	150	20.8 U	18.8	16	17	38.8	24.1
Zinc	20 or SB	41.1	124	94.9 J	68.7 J	41.5 J	41.1 J	34.2 J
Cyanide	NA	NA	0.54 UJ	0.56 UJ	0.58 UJ	0.57 UJ	0.55 UJ	0.55 UJ

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

TABLE F-21
Total Organic Carbon - Surface Soils
Magna Metals Site

Sample ID	SS-02
Laboratory ID	2897002
Depth	00"-12"
Date Sampled	11/17/97
Total Organic Carbon	8760

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in mg/kg (ppm).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	65807003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	07'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Chloromethane	NA	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
Bromomethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
Vinyl Chloride	200	12 U	11 U	11 U	11 U	11 U	11 U
Chloroethane	1,900	12 U	11 U	11 U	11 U	11 U	11 U
Methylene Chloride	100	7 J	8 J	6 J	7 J	11 U	8 U
Acetone	200	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	5 UJ
Carbon Disulfide	2,700	12 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethene	400	12 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethane	200	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethene (total)	300	12 U	11 U	11 U	11 U	11 U	11 U
Chloroform	300	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethane	100	12 U	11 U	11 U	11 U	11 U	11 U
2-Butanone	300	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
1,1,1-Trichloroethane	800	12 U	11 U	11 U	11 U	11 U	11 U
Carbon Tetrachloride	600	12 U	11 U	11 U	11 U	11 U	11 U
Bromodichloromethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloropropane	NA	12 U	11 U	11 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	300	12 U	11 U	11 U	11 U	11 U	11 U
Trichloroethene	700	12 U	11 U	11 U	11 U	11 U	11 U
Dibromochloromethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
1,1,2-Trichloroethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
Benzene	60	12 U	11 U	11 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	300	12 U	11 U	11 U	11 U	11 U	11 U
Bromoform	NA	12 U	11 U	11 U	11 U	11 U	11 U
4-Methyl-2-Pentanone	1,000	12 U	11 U	11 U	11 U	11 U	11 U
2-Hexanone	NA	12 U	11 U	11 U	11 U	11 U	11 U
Tetrachloroethene	1,400	12 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	600	12 U	11 U	11 U	11 U	11 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	65807003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	07'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Toluene	1,500	12 U	11 U	11 U	11 U	11 U	11 U
Chlorobenzene	1,700	12 U	11 U	11 U	11 U	11 U	11 U
Ethylbenzene	5,500	12 U	11 U	11 U	11 U	11 U	11 U
Styrene	NA	12 U	11 U	11 U	11 U	11 U	11 U
Xylene (total)	1,200	12 U	11 U	11 U	11 U	11 U	11 U
Volatile TICs	NA	31 JN	29 JN	42 JN	200 JN	21 JN	30 JN

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in ug/kg (ppb).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	65807009	65807010	75528009	75528010	75528006	75528007
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Chloromethane	NA	11 UJ	11 UJ	10 U	10 U	10 U	10 U
Bromomethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
Vinyl Chloride	200	11 U	11 U	10 U	10 U	10 U	10 U
Chloroethane	1,900	11 U	11 U	10 U	10 U	10 U	10 U
Methylene Chloride	100	11 U	11 U	10 U	5 JB	10 U	4 JB
Acetone	200	11 UJ	11 UJ	5 JB	6 JB	5 JB	7 JB
Carbon Disulfide	2,700	11 U	11 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	400	11 U	11 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	200	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	300	11 U	11 U	10 U	10 U	10 U	10 U
Chloroform	300	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	100	11 U	11 U	10 U	10 U	10 U	10 U
2-Butanone	300	11 UJ	11 UJ	10 U	10 U	10 U	4 J
1,1,1-Trichloroethane	800	11 U	11 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	600	11 U	11 U	10 U	10 U	10 U	10 U
Bromodichloromethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	NA	11 U	11 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	300	11 U	11 U	10 U	10 U	10 U	10 U
Trichloroethene	700	35	29	10 U	10 U	10 U	10 U
Dibromochloromethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
Benzene	60	11 U	11 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	300	11 U	11 U	10 U	10 U	10 U	10 U
Bromoform	NA	11 U	11 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	1,000	11 U	11 U	10 U	10 U	10 U	4 J
2-Hexanone	NA	11 U	11 U	10 U	10 U	10 U	5 J
Tetrachloroethene	1,400	11 U	11 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	600	11 U	11 U	10 U	10 U	10 U	3 J

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	65807009	65807010	75528009	75528010	75528006	75528007
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Toluene	1,500	11 U	11 U	10 U	10 U	10 U	10 U
Chlorobenzene	1,700	11 U	11 U	10 U	10 U	10 U	10 U
Ethylbenzene	5,500	11 U	11 U	10 U	10 U	10 U	10 U
Styrene	NA	11 U	11 U	10 U	10 U	10 U	10 U
Xylene (total)	1,200	11 U	11 U	10 U	10 U	10 U	10 U
Volatile TICs	NA	56 JN	50 JN	--	--	--	--

See appendix introduction for abbreviations and data qualifiers.
Soil re[illegible] are presented in ug/kg (ppb).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	75528008	75528001	75528003	75528004
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Chloromethane	NA	10 U	10 U	10 U	10 U
Bromomethane	NA	10 U	10 U	10 U	10 U
Vinyl Chloride	200	10 U	10 U	10 U	10 U
Chloroethane	1,900	10 U	10 U	10 U	10 U
Methylene Chloride	100	4 JB	4 JB	4 JB	4 JB
Acetone	200	5 JB	6 JB	5 JB	7 JB
Carbon Disulfide	2,700	10 U	10 U	10 U	10 U
1,1-Dichloroethene	400	10 U	10 U	10 U	10 U
1,1-Dichloroethane	200	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	300	10 U	10 U	10 U	10 U
Chloroform	300	10 U	10 U	10 U	10 U
1,2-Dichloroethane	100	10 U	10 U	10 U	10 U
2-Butanone	300	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	800	10 U	10 U	10 U	10 U
Carbon Tetrachloride	600	10 U	10 U	10 U	10 U
Bromodichloromethane	NA	10 U	10 U	10 U	10 U
1,2-Dichloropropane	NA	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	300	10 U	10 U	10 U	10 U
Trichloroethene	700	10 U	10 U	4 J	10 U
Dibromochloromethane	NA	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	NA	10 U	10 U	10 U	10 U
Benzene	60	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	300	10 U	10 U	10 U	10 U
Bromoform	NA	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	1,000	10 U	10 U	10 U	10 U
2-Hexanone	NA	10 U	10 U	10 U	10 U
Tetrachloroethene	1,400	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	600	10 U	10 U	10 U	10 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	75528008	75528001	75528003	75528004
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Toluene	1,500	10 U	10 U	10 U	10 U
Chlorobenzene	1,700	10 U	10 U	10 U	10 U
Ethylbenzene	5,500	10 U	10 U	10 U	10 U
Styrene	NA	10 U	10 U	10 U	10 U
Xylene (total)	1,200	10 U	10 U	10 U	10 U
Volatile TICs	NA	--	--	--	--

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	SB-1 962803A-01 04'-06' 12/10/96	SB-2 962803A-02 08'-09.5' 12/10/96	SB-3 962803A-03 08'-09.5' 12/10/96	SB-4 962803A-04 06.5'-08.5' 12/10/96	SB-5 962803A-05 04.5'-06.5' 12/11/96	SB-6 962803A-06 07'-10' 12/11/96
Phenol	30	380 U	370 U	370 U	370 U	360 U	390 U
bis(2-Chloroethyl) ether	NA	380 U	370 U	370 U	370 U	360 U	390 U
2-Chlorophenol	800	380 U	370 U	370 U	370 U	360 U	390 U
1,3-Dichlorobenzene	1,600	380 U	370 U	370 U	370 U	360 U	390 U
1,4-Dichlorobenzene	8,500	380 U	370 U	370 U	370 U	360 U	390 U
1,2-Dichlorobenzene	7,900	380 U	370 U	370 U	370 U	360 U	390 U
2-Methylphenol	100	380 U	370 U	370 U	370 U	360 U	390 U
2,2'-oxybis(1-Chloropropane)	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Methylphenol	900	380 U	370 U	370 U	370 U	360 U	390 U
N-Nitroso-di-n-propylamine	NA	380 U	370 U	370 U	370 U	360 U	390 U
Hexachloroethane	NA	380 U	370 U	370 U	370 U	360 U	390 U
Nitrobenzene	200	380 U	370 U	370 U	370 U	360 U	390 U
Isophorone	4,400	380 U	370 U	370 U	370 U	360 U	390 U
2-Nitrophenol	330	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dimethylphenol	400	380 U	370 U	370 U	370 U	360 U	390 U
bis (2-Chloroethoxy) methane	NA	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dichlorophenol	400	380 U	370 U	370 U	370 U	360 U	390 U
1,2,4-Trichlorobenzene	NA	380 U	370 U	370 U	370 U	360 U	390 U
Naphthalene	13,000	380 U	370 U	370 U	370 U	360 U	390 U
4-Chloroaniline	220	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorobutadiene	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Chloro-3-methylphenol	240	380 U	370 U	370 U	370 U	360 U	390 U
2-Methylnaphthalene	36,400	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorocyclopentadiene	NA	380 UJ	370 UJ	370 UJ	370 UJ	360 UJ	390 UJ
2,4,6-Trichlorophenol	NA	380 U	370 U	370 U	370 U	360 U	390 U
2,4,5-Trichlorophenol	100	960 U	920 U	920 U	930 U	910 U	980 U
2-Chloronaphthalene	NA	380 U	370 U	370 U	370 U	360 U	390 U
2-Nitroaniline	430	960 U	920 U	920 U	930 U	910 U	980 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	SB-1 962803A-01 04'-06' 12/10/96	SB-2 962803A-02 08'-09.5' 12/10/96	SB-3 962803A-03 08'-09.5' 12/10/96	SB-4 962803A-04 06.5'-08.5' 12/10/96	SB-5 962803A-05 04.5'-06.5' 12/11/96	SB-6 962803A-06 07'-10' 12/11/96
Dimethylphthalate	2,000	380 U	370 U	370 U	370 U	360 U	390 U
Acenaphthylene	41,000	380 U	370 U	370 U	370 U	360 U	390 U
2,6-Dinitrotoluene	1,000	380 U	370 U	370 U	370 U	360 U	390 U
3-Nitroaniline	500	960 U	920 U	920 U	930 U	910 U	980 U
Acenaphthene	50,000	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dinitrophenol	200	960 U	920 U	920 U	930 U	910 U	980 U
4-Nitrophenol	100	960 U	920 U	920 U	930 U	910 U	980 U
Dibenzofuran	6,200	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dinitrotoluene	NA	380 U	370 U	370 U	370 U	360 U	390 U
Diethylphthalate	7,100	380 U	370 U	370 U	370 U	360 U	390 U
4-Chlorophenyl-phenylether	NA	380 U	370 U	370 U	370 U	360 U	390 U
Fluorene	50,000	380 U	370 U	370 U	370 U	360 U	390 U
4-Nitroaniline	NA	960 U	920 U	920 U	930 U	910 U	980 U
4,6-Dinitro-2-methylphenol	NA	960 U	920 U	920 U	930 U	910 U	980 U
N-Nitrosodiphenylamine	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Bromophenyl-phenylether	NA	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorobenzene	410	380 U	370 U	370 U	370 U	360 U	390 U
Pentachlorophenol	1,000	960 U	920 U	920 U	930 U	910 U	980 U
Phenanthrene	50,000	19 J	6 J	370 U	370 U	360 U	390 U
Anthracene	50,000	4 J	370 U	370 U	370 U	360 U	390 U
Carbazole	NA	380 U	370 U	370 U	370 U	360 U	390 U
Di-n-butylphthalate	8,100	380 U	370 U	370 U	660 B	360 U	390 U
Fluoranthene	50,000	17 J	9 J	370 U	370 U	8 J	390 U
Pyrene	50,000	16 J	8 J	370 U	370 U	8 J	390 U
Butylbenzylphthalate	50,000	380 U	370 U	13 J	43 J	360 U	390 U
3,3'-Dichlorobenzidine	NA	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(a)anthracene	224	380 U	370 U	370 U	370 U	360 U	390 U
Chrysene	400	380 U	370 U	370 U	370 U	360 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	962803A-01	962803A-02	962803A-03	962803A-04	962803A-05	962803A-06
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
bis(2-Ethylhexyl)phthalate	50,000	380 U	370 U	370 U	370 U	360 U	390 U
Di-n-octylphthalate	50,000	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(b)fluoranthene	1,100	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(k)fluoranthene	1,100	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(a)pyrene	61	380 U	370 U	370 U	370 U	360 U	390 U
Indeno(1,2,3-cd)pyrene	3,200	380 U	370 U	370 U	370 U	360 U	390 U
Dibenz(a,h)anthracene	14	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(g,h,i)perylene	50,000	380 U	370 U	370 U	370 U	360 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Phenol	30	370 U	380 U	370 U	360 U	350 U	360 U
bis(2-Chloroethyl) ether	NA	370 U	380 U	370 U	360 U	350 U	360 U
2-Chlorophenol	800	370 U	380 U	370 U	360 U	350 U	360 U
1,3-Dichlorobenzene	1,600	370 U	380 U	370 U	360 U	350 U	360 U
1,4-Dichlorobenzene	8,500	370 U	380 U	370 U	360 U	350 U	360 U
1,2-Dichlorobenzene	7,900	370 U	380 U	370 U	360 U	350 U	360 U
2-Methylphenol	100	370 U	380 U	370 U	360 U	350 U	360 U
2,2'-oxybis(1-Chloropropane)	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Methylphenol	900	370 U	380 U	370 U	360 U	350 U	360 U
N-Nitroso-di-n-propylamine	NA	370 U	380 U	370 U	360 U	350 U	360 U
Hexachloroethane	NA	370 U	380 U	370 U	360 U	350 U	360 U
Nitrobenzene	200	370 U	380 U	370 U	360 U	350 U	360 U
Isophorone	4,400	370 U	380 U	370 U	360 U	350 U	360 U
2-Nitrophenol	330	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dimethylphenol	400	370 U	380 U	370 U	360 U	350 U	360 U
bis (2-Chloroethoxy) methane	NA	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dichlorophenol	400	370 U	380 U	370 U	360 U	350 U	360 U
1,2,4-Trichlorobenzene	NA	370 U	380 U	370 U	360 U	350 U	360 U
Naphthalene	13,000	370 U	380 U	370 U	360 U	350 U	360 U
4-Chloroaniline	220	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorobutadiene	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Chloro-3-methylphenol	240	370 U	380 U	370 U	360 U	350 U	360 U
2-Methylnaphthalene	36,400	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorocyclopentadiene	NA	370 UJ	380 UJ	370 U	360 U	350 U	360 U
2,4,6-Trichlorophenol	NA	370 U	380 U	370 U	360 U	350 U	360 U
2,4,5-Trichlorophenol	100	920 U	940 U	920 U	910 U	890 U	900 U
2-Chloronaphthalene	NA	370 U	380 U	370 U	360 U	350 U	360 U
2-Nitroaniline	430	920 U	940 U	920 U	910 U	890 U	900 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Dimethylphthalate	2,000	370 U	380 U	370 U	360 U	350 U	360 U
Acenaphthylene	41,000	370 U	380 U	370 U	360 U	350 U	360 U
2,6-Dinitrotoluene	1,000	370 U	380 U	370 U	360 U	350 U	360 U
3-Nitroaniline	500	920 U	940 U	920 U	910 U	890 U	900 U
Acenaphthene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dinitrophenol	200	920 U	940 U	920 U	910 U	890 U	900 U
4-Nitrophenol	100	920 U	940 U	920 U	910 U	890 U	900 U
Dibenzofuran	6,200	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dinitrotoluene	NA	370 U	380 U	370 U	360 U	350 U	360 U
Diethylphthalate	7,100	370 U	380 U	370 U	360 U	13 JB	360 U
4-Chlorophenyl-phenylether	NA	370 U	380 U	370 U	360 U	350 U	360 U
Fluorene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
4-Nitroaniline	NA	920 U	940 U	920 U	910 U	890 U	900 U
4,6-Dinitro-2-methylphenol	NA	920 U	940 U	920 U	910 U	890 U	900 U
N-Nitrosodiphenylamine	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Bromophenyl-phenylether	NA	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorobenzene	410	370 U	380 U	370 U	360 U	350 U	360 U
Pentachlorophenol	1,000	920 U	940 U	920 U	910 U	890 U	900 U
Phenanthrene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Anthracene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Carbazole	NA	370 U	380 U	370 U	360 U	350 U	360 U
Di-n-butylphthalate	8,100	370 U	380 U	31 JB	22 JB	13 JB	42 JB
Fluoranthene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Pyrene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Butylbenzylphthalate	50,000	370 U	380 U	370 U	360 U	350 U	360 U
3,3'-Dichlorobenzidine	NA	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(a)anthracene	224	370 U	380 U	370 U	360 U	350 U	360 U
Chrysene	400	370 U	380 U	370 U	360 U	350 U	360 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
bis(2-Ethylhexyl)phthalate	50,000	370 U	380 U	370 U	43 JB	31 JB	38 JB
Di-n-octylphthalate	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(b)fluoranthene	1,100	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(k)fluoranthene	1,100	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(a)pyrene	61	370 U	380 U	370 U	360 U	350 U	360 U
Indeno(1,2,3-cd)pyrene	3,200	370 U	380 U	370 U	360 U	350 U	360 U
Dibenz(a,h)anthracene	14	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(g,h,i)perylene	50,000	370 U	380 U	370 U	360 U	350 U	360 U

See appendix introduction for abbreviations and data qualifiers.
Soil r are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	MW-02 972897A-07 12'-14' 11/18/97	MW-03 972897A-01 06'-08' 11/17/97	MW-04 972897A-03 06'-08' 11/18/97	MW-04 972897A-04 12'-14' 11/18/97
Phenol	30	350 U	350 U	370 U	350 U
bis(2-Chloroethyl) ether	NA	350 U	350 U	370 U	350 U
2-Chlorophenol	800	350 U	350 U	370 U	350 U
1,3-Dichlorobenzene	1,600	350 U	350 U	370 U	350 U
1,4-Dichlorobenzene	8,500	350 U	350 U	370 U	350 U
1,2-Dichlorobenzene	7,900	350 U	350 U	370 U	350 U
2-Methylphenol	100	350 U	350 U	370 U	350 U
2,2'-oxybis(1-Chloropropane)	NA	350 U	350 U	370 U	350 U
4-Methylphenol	900	350 U	350 U	370 U	350 U
N-Nitroso-di-n-propylamine	NA	350 U	350 U	370 U	350 U
Hexachloroethane	NA	350 U	350 U	370 U	350 U
Nitrobenzene	200	350 U	350 U	370 U	350 U
Isophorone	4,400	350 U	350 U	370 U	350 U
2-Nitrophenol	330	350 U	350 U	370 U	350 U
2,4-Dimethylphenol	400	350 U	350 U	370 U	350 U
bis (2-Chloroethoxy) methane	NA	350 U	350 U	370 U	350 U
2,4-Dichlorophenol	400	350 U	350 U	370 U	350 U
1,2,4-Trichlorobenzene	NA	350 U	350 U	370 U	350 U
Naphthalene	13,000	350 U	350 U	370 U	350 U
4-Chloroaniline	220	350 U	350 U	370 U	350 U
Hexachlorobutadiene	NA	350 U	350 U	370 U	350 U
4-Chloro-3-methylphenol	240	350 U	350 U	370 U	350 U
2-Methylnaphthalene	36,400	350 U	350 U	370 U	350 U
Hexachlorocyclopentadiene	NA	350 U	350 U	370 U	350 U
2,4,6-Trichlorophenol	NA	350 U	350 U	370 U	350 U
2,4,5-Trichlorophenol	100	890 U	880 U	920 U	870 U
2-Chloronaphthalene	NA	350 U	350 U	370 U	350 U
2-Nitroaniline	430	890 U	880 U	920 U	870 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	972897A-07	972897A-01	972897A-03	972897A-04
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Dimethylphthalate	2,000	350 U	350 U	370 U	350 U
Acenaphthylene	41,000	350 U	350 U	370 U	350 U
2,6-Dinitrotoluene	1,000	350 U	350 U	370 U	350 U
3-Nitroaniline	500	890 U	880 U	920 U	870 U
Acenaphthene	50,000	350 U	350 U	370 U	350 U
2,4-Dinitrophenol	200	890 U	880 U	920 U	870 U
4-Nitrophenol	100	890 U	880 U	920 U	870 U
Dibenzofuran	6,200	350 U	350 U	370 U	350 U
2,4-Dinitrotoluene	NA	350 U	350 U	370 U	350 U
Diethylphthalate	7,100	350 U	350 U	13 JB	350 U
4-Chlorophenyl-phenylether	NA	350 U	350 U	370 U	350 U
Fluorene	50,000	350 U	350 U	370 U	350 U
4-Nitroaniline	NA	890 U	880 U	920 U	870 U
4,6-Dinitro-2-methylphenol	NA	890 U	880 U	920 U	870 U
N-Nitrosodiphenylamine	NA	350 U	350 U	370 U	350 U
4-Bromophenyl-phenylether	NA	350 U	350 U	370 U	350 U
Hexachlorobenzene	410	350 U	350 U	370 U	350 U
Pentachlorophenol	1,000	890 U	880 U	920 U	870 U
Phenanthrene	50,000	350 U	350 U	370 U	350 U
Anthracene	50,000	350 U	350 U	370 U	350 U
Carbazole	NA	350 U	350 U	370 U	350 U
Di-n-butylphthalate	8,100	41 JB	12 JB	25 JB	14 JB
Fluoranthene	50,000	350 U	350 U	370 U	350 U
Pyrene	50,000	350 U	350 U	370 U	350 U
Butylbenzylphthalate	50,000	350 U	350 U	370 U	350 U
3,3'-Dichlorobenzidine	NA	350 U	350 U	370 U	350 U
Benzo(a)anthracene	224	350 U	350 U	370 U	350 U
Chrysene	400	350 U	350 U	370 U	350 U

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible]s are presented in ug/kg (ppb).

TABLE F-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	972897A-07	972897A-01	972897A-03	972897A-04
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
bis(2-Ethylhexyl)phthalate	50,000	56 JB	17 JB	100 JB	12 JB
Di-n-octylphthalate	50,000	350 U	350 U	370 U	13 J
Benzo(b)fluoranthene	1,100	350 U	350 U	370 U	350 U
Benzo(k)fluoranthene	1,100	350 U	350 U	370 U	350 U
Benzo(a)pyrene	61	350 U	350 U	18 J	350 U
Indeno(1,2,3-cd)pyrene	3,200	350 U	350 U	370 U	350 U
Dibenz(a,h)anthracene	14	350 U	350 U	370 U	350 U
Benzo(g,h,i)perylene	50,000	350 U	350 U	160 J	350 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-24
TCL Pesticide/PCB Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	6587003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
alpha-BHC	110	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ
beta-BHC	200	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
delta-BHC	300	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
gamma-BHC (Lindane)	60	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Heptachlor	100	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Aldrin	41	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Heptachlor epoxide	20	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Endosulfan I	900	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Dieldrin	44	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDE	2,100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endrin	100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endosulfan II	900	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDD	2,900	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endosulfan sulfate	1,000	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDT	2,100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Methoxychlor	NA	20 U	19 U	19 U	19 U	19 U	19 U
Endrin ketone	NA	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endrin aldehyde	NA	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
alpha-Chlordane	NA	2 U	1.9 U	1.9 U	2 JPN	1.9 U	1.9 U
gamma-Chlordane	540	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Toxaphene	NA	200 U	190 U	190 U	190 U	190 U	190 U
Aroclor-1016	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1221	10,000	80 U	74 U	74 U	74 U	74 U	76 U
Aroclor-1232	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1242	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1248	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1254	10,000	39 U	37 U	24 JP	160 JP	36 U	38 U
Aroclor-1260	10,000	39 U	37 U	37 U	37 U	36 U	38 U

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in ug/kg (ppb).

TABLE F-24
TCL Pesticide/PCB Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-04
Laboratory ID	Soil	65807009	65807010	75528004
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	12'-14'
Date Sampled	Objectives	12/11/96	12/11/96	11/18/97
alpha-BHC	110	1.9 UJ	1.9 UJ	0.05 JP
beta-BHC	200	1.9 U	1.9 U	0.86 U
delta-BHC	300	1.9 U	1.9 U	0.86 U
gamma-BHC (Lindane)	60	1.9 UJ	1.9 UJ	0.86 U
Heptachlor	100	1.9 U	1.9 U	0.19 JP
Aldrin	41	1.9 U	1.9 U	0.86 U
Heptachlor epoxide	20	1.9 U	1.9 U	0.86 U
Endosulfan I	900	1.9 U	1.9 U	0.32 JP
Dieldrin	44	3.8 U	3.8 U	0.28 JP
4,4'-DDE	2,100	3.8 U	3.8 U	1.7 U
Endrin	100	3.8 U	3.8 U	1.7 U
Endosulfan II	900	3.8 U	3.8 U	0.15 JP
4,4'-DDD	2,900	3.8 U	3.8 U	0.98 JP
Endosulfan sulfate	1,000	3.8 U	3.8 U	1.7 U
4,4'-DDT	2,100	3.8 U	3.8 U	0.92 JP
Methoxychlor	NA	19 U	19 U	8.6 U
Endrin ketone	NA	3.8 U	3.8 U	1.7 U
Endrin aldehyde	NA	3.8 U	3.8 U	1.7 U
alpha-Chlordane	NA	1.9 U	1.9 U	0.27 JP
gamma-Chlordane	540	1.9 U	1.9 U	0.86 U
Toxaphene	NA	190 U	190 U	86 U
Aroclor-1016	10,000	38 U	38 U	17 U
Aroclor-1221	10,000	76 U	76 U	34 U
Aroclor-1232	10,000	38 U	38 U	17 U
Aroclor-1242	10,000	38 U	38 U	17 U
Aroclor-1248	10,000	38 U	38 U	17 U
Aroclor-1254	10,000	280 JP	240 JP	17 U
Aroclor-1260	10,000	38 U	38 U	17 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE F-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	SB-1 962803A-01 04'-06' 12/10/96	SB-2 962803A-02 08'-09.5' 12/10/96	SB-3 962803A-03 08'-09.5' 12/10/96	SB-4 962803A-04 06.5'-08.5' 12/10/96	SB-5 962803A-05 04.5'-06.5' 12/11/96	SB-6 962803A-06 07'-10' 12/11/96
Aluminum	SB	5,040	14471	7099	5274.3	5213.5	4554.3	6426.2
Antimony	SB	ND	0.96 UJ	1.2 UJ	1.2 UJ	1 UJ	0.94 UJ	1.4 UJ
Arsenic	7.5 or SB	7.5	30.8 J	27.6 J	10 J	27.6 J	6	8.4
Barium	300 or SB	300	69.7	53	34.1 B	40.5	43.7	38 B
Beryllium	0.16 or SB	0.32	0.43 B	0.3 B	0.19 U	0.21 B	0.17 B	0.27 B
Cadmium	1 or SB	1	0.16 U	0.19 U	0.19 U	0.17 U	0.16 U	0.23 U
Calcium	SB	1,690	1195.5	1413.2	1660.3	1452	925	1263.3
Chromium	10 or SB	10	36.2	13.8	48.7	48	7.5	36.2
Cobalt	30 or SB	30	9 J	5.1 B	4 B	3.2 B	4 B	4.2 B
Copper	25 or SB	25	40.4	52.2	83.8	249	369	1309
Iron	2,000 or SB	10,000	19186	11697	8393	6463.3	6198.5	7892.7
Lead	SB	3.7	8	4.3	12.9	6.7	2.9	5.3
Magnesium	SB	2,100	3545.3	2201.2	1982.2	1648.8	1408.3	1952.1
Manganese	SB	250	177 J	282 J	140 J	183 J	226 J	156 J
Mercury	0.1	0.1	0.1 U	0.095 U	0.076 U	0.11 U	0.088 U	0.12
Nickel	13 or SB	15.2	46.9 J	108 J	62.5 J	84.2 J	38.9 J	93.5 J
Potassium	SB	864	678 B	869 B	655 B	527 B	398 B	543 B
Selenium	2 or SB	2	2.8 J	0.97 UJ	0.96 UJ	2.2 J	7.8	11.7
Silver	SB	ND	0.16 UJ	0.19 UJ	0.19 UJ	0.17 UJ	0.16 UJ	0.23 UJ
Sodium	SB	86.8	124 B	152 B	209 B	122 B	98.7 B	135 B
Thallium	SB	ND	1.8 J	1.5 UJ	1.5 UJ	1.4 UJ	1.3 UJ	1.8 UJ
Vanadium	150 or SB	150	32.7	12.6	10.2	8.3 B	8.2	10.6 B
Zinc	20 or SB	23.3	77.4	209	123	617	28.7	764
Cyanide	NA	NA	1.95	72	14.9	49.1	0.51 U	225

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in mg/kg (ppm).

TABLE F-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	SB-7 962803A-07 03.5'-05.5' 12/11/96	SB-7DUP 962803A-08 03.5'-05.5' 12/11/96	MW-01 Background 972897A-08 06'-08' 11/19/97	MW-01 Background 972897A-09 12'-14' 11/19/97	MW-02 972897A-05 06'-08' 11/18/97	MW-02DUP 972897A-06 06'-08' 11/18/97
Aluminum	SB	5,040	21295	18074	2260	5040	3190	3540
Antimony	SB	ND	1.2 UJ	1.1 UJ	1.8 U	1.8 U	1.7 U	1.7 U
Arsenic	7.5 or SB	7.5	3.8	3.5	0.66 U	1.6 B	1.1 B	0.87 B
Barium	300 or SB	300	721	484	74	81.9	19.7 B	20 B
Beryllium	0.16 or SB	0.32	0.24 B	0.23 B	0.24 B	0.32 B	0.29 B	0.3 B
Cadmium	1 or SB	1	0.19 U	0.18 U	0.22 U	0.22 U	0.22 U	0.22 U
Calcium	SB	1,690	5124.1	4792.8	1690	1560	664 B	771 B
Chromium	10 or SB	10	5.9	5.7	2.2 B	6.8	3.1	3.5
Cobalt	30 or SB	30	24.3 J	18 J	3.2 B	4.6 B	2.5 B	2.7 B
Copper	25 or SB	25	87.2	71.2	13.7	20.6	45.9	42.8
Iron	2,000 or SB	10,000	24435	18931	4350	10000	3880	5040
Lead	SB	3.7	4.3	5	2.2	3.7	2.8	2.9
Magnesium	SB	2,100	11389	8583.6	1030 B	2100	770 B	994 B
Manganese	SB	250	179 J	160 J	171	250	121	122
Mercury	0.1	0.1	0.1 U	0.079 U	0.11 U	0.11 U	0.25	0.17
Nickel	13 or SB	15.2	15.5 J	11.9 J	6.7 B	15.2	10.4	10.5
Potassium	SB	864	6993.6 J	4652.7 J	487 B	864 B	267 B	341 B
Selenium	2 or SB	2	0.97 U	0.93 U	0.89 U	0.9 B	1.6	0.99 B
Silver	SB	ND	0.19 UJ	0.18 UJ	0.22 U	0.22 U	0.22 U	0.22 U
Sodium	SB	86.8	481 B	485 B	50 B	86.8 B	53.9 B	52.8 B
Thallium	SB	ND	1.6 UJ	1.5 UJ	1.1 U	1.1 U	1.1 U	1.1 U
Vanadium	150 or SB	150	69	52.4	7.2 B	11.6	4.5 B	5 B
Zinc	20 or SB	23.3	302	282	11.2	23.3	10.3	13.2
Cyanide	NA	NA	6.6	5.12	0.55 U	0.56 U	0.54 U	0.55 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

TABLE F-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	MW-02 972897A-07 12'-14' 11/18/97	MW-03 972897A-01 06'-08' 11/17/97	MW-04 972897A-03 06'-08' 11/18/97	MW-04 972897A-04 12'-14' 11/18/97
Aluminum	SB	5,040	3500	3230	7500	8480
Antimony	SB	ND	1.7 U	1.7 U	1.8 U	1.7 U
Arsenic	7.5 or SB	7.5	18.5	9.5	2 B	20.4
Barium	300 or SB	300	54.4	22.6 B	39.3 B	434
Beryllium	0.16 or SB	0.32	0.21 U	0.25 B	0.36 B	0.4 B
Cadmium	1 or SB	1	0.21 U	0.21 U	0.22 U	0.21 U
Calcium	SB	1,690	1850	927 B	1310	5110
Chromium	10 or SB	10	61.1	4.3	9.4	13.3
Cobalt	30 or SB	30	20.8	2.3 B	5.6 B	10.1 B
Copper	25 or SB	25	114	695	23.2	19.4
Iron	2,000 or SB	10,000	10800	4960	11400	13400
Lead	SB	3.7	1.1	2.7	5.2	2
Magnesium	SB	2,100	5480	970 B	2150	5230
Manganese	SB	250	304	146	177	162
Mercury	0.1	0.1	0.2	0.11 U	0.11 U	0.1 U
Nickel	13 or SB	15.2	39	28.4	11.3	7.4 B
Potassium	SB	864	300 B	358 B	548 B	3190
Selenium	2 or SB	2	1.9	6.7	1.8	8.6
Silver	SB	ND	0.21 U	0.21 U	0.22 U	0.21 U
Sodium	SB	86.8	196 B	62.5 B	115 B	548 B
Thallium	SB	ND	1.1 U	1.1 U	1.1 U	1 U
Vanadium	150 or SB	150	18.4	5.2 B	16.6	37.3
Zinc	20 or SB	23.3	32.4	37.7	39.3	34.3
Cyanide	NA	NA	7.24	19.9	0.6	2.34

See appendix introduction for abbreviations and data qualifiers.
Soil r[illegible] are presented in mg/kg (ppm).

TABLE F-26
Total Organic Carbon - Subsurface Soils
Magna Metals Site

Sample ID	MW-01 Background	MW-02	MW-03	MW-04
Laboratory ID	972897A-09	972897A-07	972897A-01	972897A-04
Depth	12'-14'	12'-14'	06'-08'	12'-14'
Date Sampled	11/19/97	11/18/97	11/17/97	11/18/97
Total Organic Carbon	1050	1180	1360	806

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

TABLE F-27
TCL Volatile Organic Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 82228003 05/11/98	GW-02 82228004 05/11/98	GW-03 82228008 05/12/98	GW-04 82228009 05/12/98	GW-05 Duplicate of GW-04 82228010 05/12/98
Chloromethane	5	1 U	1 U	5 U	250 U	1 U
Bromomethane	5	1 U	1 U	5 U	250 U	1 U
Vinyl Chloride	2	1 U	1 U	5 U	250 U	1 U
Chloroethane	5	1 U	1 U	5 U	250 U	1 U
Methylene Chloride	5	2 U	2 U	10 U	500 U	2 U
Acetone	50	5 U	5 U	25 U	1200 U	5 U
Carbon Disulfide	NA	1 U	1 U	5 U	250 U	1 U
1,1-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
1,1-Dichloroethane	5	1 U	1 U	5 U	250 U	1 U
cis-1,2-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
trans-1,2-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
Chloroform	7	1 U	1 U	5 U	250 U	1 U
1,2-Dichloroethane	5	1 U	1 U	5 U	250 U	1 U
2-Butanone	50	5 U	5 U	25 U	1200 U	5 U
Bromochloromethane	5	1 U	1 U	5 U	250 U	1 U
1,1,1-Trichloroethane	5	1 U	1 U	5 U	250 U	1 U
Carbon Tetrachloride	5	1 U	1 U	5 U	250 U	1 U
Bromodichloromethane	50	1 U	1 U	5 U	250 U	1 U
1,2-Dichloropropane	5	1 U	1 U	5 U	250 U	1 U
cis-1,3-Dichloropropene	5	1 U	1 U	5 U	250 U	1 U
Trichloroethene	5	1 U	3.7	68	4700	2700 D
Dibromochloromethane	50	1 U	1 U	5 U	250 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	5 U	250 U	1 U
Benzene	0.7	1 U	1 U	5 U	250 U	1 U
trans-1,3-Dichloropropene	5	1 U	1 U	5 U	250 U	1 U
Bromoform	50	1 U	1 U	5 U	250 U	1 U
4-Methyl-2-Pentanone	NA	5 U	5 U	25 U	1200 U	5 U
2-Hexanone	50	5 U	5 U	25 U	1200 U	5 U
Tetrachloroethene	5	1 U	1 U	5 U	250 U	90 E

See appendix introduction for abbreviations and data qualifiers.
Groun er results are presented in ug/L (ppb).

TABLE F-27
TCL Volatile Organic Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 82228003 05/11/98	GW-02 82228004 05/11/98	GW-03 82228008 05/12/98	GW-04 82228009 05/12/98	GW-05 Duplicate of GW-04 82228010 05/12/98
1,1,2,2-Tetrachloroethane	5	1 U	1 U	5 U	250 U	1 U
1,2-Dibromoethane	NA	1 U	1 U	5 U	250 U	1 U
Toluene	5	1 U	1 U	5 U	250 U	1 U
Chlorobenzene	5	1 U	1 U	5 U	250 U	1 U
Ethylbenzene	5	1 U	1 U	5 U	250 U	1 U
Styrene	5	1 U	1 U	5 U	250 U	1 U
Xylene (total)	5	1 U	1 U	5 U	250 U	1 U
1,3-Dichlorobenzene	5	1 U	1 U	5 U	250 U	1 U
1,4-Dichlorobenzene	4.7	1 U	1 U	5 U	250 U	1 U
1,2-Dichlorobenzene	4.7	1 U	1 U	5 U	250 U	1 U
1,2-Dibromo-3-chloromethane	5	1 U	1 U	5 U	250 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE F-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Phenol	1	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethyl) ether	1	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	1	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	1	5 U	5 U	5 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	5	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	1	5 U	5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	NA	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	5	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	5	5 U	5 U	5 U	5 U	5 U
Isophorone	50	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	1	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	1	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	5	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	1	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U
Naphthalene	10	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	5	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	5	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	1	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	NA	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	1	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	1	20 U	20 U	20 U	20 U	20 U
2-Chloronaphthalene	10	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U
Dimethylphthalate	50	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	NA	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U

See appendix introduction for abbreviations and data qualifiers.
Grou[illegible]er results are presented in ug/L (ppb).

TABLE F-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Acenaphthene	20	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	1	20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	1	20 U	20 U	20 U	20 U	20 U
Dibenzofuran	NA	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	50	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	1	5 U	5 U	5 U	5 U	5 U
Fluorene	50	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U
4,6-Dinitro-2-methylphenol	1	20 U	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	50	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	1	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	0.35	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	1	20 U	20 U	20 U	20 U	20 U
Phenanthrene	50	5 U	5 U	5 U	5 U	5 U
Anthracene	50	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	50	5 U	5 U	5 U	5 U	5 U
Fluoranthene	50	5 U	5 U	5 U	5 U	5 U
Pyrene	50	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	50	5 U	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	0.002	5 U	5 U	5 U	5 U	5 U
Chrysene	0.002	5 U	5 U	5 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	50	5 U	5 U	5 U	5 U	0.9 JB
Di-n-octylphthalate	50	5 U	5 U	5 U	5 U	5 U
Benzo(b)fluoranthene	0.002	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	0.002	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	ND	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	0.002	5 U	5 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE F-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site
Page 3 of 3

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Dibenz(a,h)anthracene	NA	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	NA	5 U	5 U	5 U	5 U	5 U
Semi-Volatile TICs	NA	--	13 J	--	7 J	7 J

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE F-29
TCL Pesticide/PCB Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
alpha-BHC	ND	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
beta-BHC	ND	0.00078 JP	0.00022 JP	0.01 P	0.021 P	0.11 P
delta-BHC	ND	0.00088 JP	0.0013 JPB	0.01 U	0.02 U	0.01 U
gamma-BHC (Lindane)	ND	0.01 U	0.01 U	0.009 J	0.02 U	0.01 U
Heptachlor	ND	0.01 U	0.0029 J	0.01 U	0.02 U	0.01 U
Aldrin	ND	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
Heptachlor epoxide	ND	0.001 JP	0.018	0.035 P	0.014 JP	0.01 U
Endosulfan I	NA	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
Dieldrin	ND	0.00072 JP	0.02 U	0.0038 JP	0.04 U	0.021 U
4,4'-DDE	ND	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endrin	ND	0.021 U	0.0033 JP	0.019 JP	0.0045 JP	0.003 JP
Endosulfan II	NA	0.021 U	0.02 U	0.02 U	0.0044 JP	0.0026 JP
4,4'-DDD	ND	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endosulfan sulfate	NA	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
4,4'-DDT	ND	0.021 U	0.008 JP	0.026 P	0.0048 JP	0.0046 JP
Methoxychlor	35	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U
Endrin ketone	5	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endrin aldehyde	5	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
alpha-Chlordane	0.1	0.01 U	0.01 U	0.004 JP	0.02 U	0.01 U
gamma-Chlordane	0.1	0.01 U	0.01 U	0.01 U	0.0063 JP	0.0028 JP
Toxaphene	ND	1 U	1 U	1 U	2 U	1 U
Aroclor-1016	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1221	0.1	0.42 U	0.4 U	0.4 U	0.8 U	0.42 U
Aroclor-1232	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1242	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1248	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1254	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1260	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE F-30
TAL Metals and Cyanide - Groundwater
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-02-2 981084A-06 05/12/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Aluminum	NC	51.1 B	7400	965	1190	1910	1540
Antimony	3	4 U	4 U	4 U	5.1 B	4 U	4 U
Arsenic	25	2 U	64.3	54.5	15.7	20.4	19.4
Barium	1,000	89.5 B	204	65.8 B	61.8 B	66.1 B	56.5 B
Beryllium	3	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	10	1.4 B	1 U	1.1 B	1.5 B	1.5 B	1.1 B
Calcium	NC	10700	28100	21400	17100	19100	16500
Chromium	50	2.2 B	112	20	31.6	18.4	14.5
Cobalt	NC	1 U	20.2 B	4.5 B	1.4 B	6.6 B	5.8 B
Copper	200	1.7 B	148	27.6	37.8	9.8 B	8.3 B
Iron	300	122	18900	2270	1420	2090	1660
Lead	25	1.2 B	3.2	1.4 B	1.8 B	2.5 B	1.3 B
Magnesium	35,000	6980	18300	7780	2140 B	6390	5560
Manganese	300	5.9 B	439	71.1	56.6	1600	1380
Mercury	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	NC	6.1 B	169	113	262	10.4 B	7.9 B
Potassium	NC	1210 B	8250	6540	1640 B	3530 B	3030 B
Selenium	10	2.5 B	93.1	91.6	60.1	96.8	88.4
Silver	50	1 U	1 U	1 U	1 U	1 U	1 U
Sodium	20,000	27700	57600	54600	7950	39900	35400
Thallium	4	3 U	3 U	3 U	3 U	3 U	3 U
Vanadium	NC	1 U	37.3 B	5.8 B	2.8 B	4.6 B	3.3 B
Zinc	300	7.8 B	113	39.6	516	7.4 B	4 B
Cyanide	100	10 U	35	14	128	416	382

See appendix introduction for abbreviations and data qualifiers.
Groun er results are presented in ug/L (ppb).

T-GW.XLS

TABLE F-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	TRIPBLANK	FB-01	FB-02	FB-04	FB-051297	MW-FB
	Trip Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank
Laboratory ID	72184001	65807001	65807006	71589007	72184002	75528011
Date Sampled	--	12/10/96	12/11/96	04/11/97	05/12/97	11/19/97
Chloromethane	1 U	10 UJ	10 UJ	10 U	1 U	1 U
Bromomethane	1 U	10 U	10 U	10 U	1 U	1 U
Vinyl Chloride	1 U	10 U	10 U	10 U	1 U	1 U
Chloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Methylene Chloride	2 U	10 U	3 JB	10 U	2 U	2 U
Acetone	R	3 JB	6 JB	4 J	R	5 U
Carbon Disulfide	1 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	1 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	NA	NA	NA	1 U	1 U
1,2-Dichloroethene (total)	NA	10 U	10 U	10 U	NA	NA
trans-1,2-Dichloroethene	1 U	NA	NA	NA	1 U	1 U
Chloroform	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
2-Butanone	R	10 U	10 U	10 U	R	5 U
Bromochloromethane	1 U	NA	NA	NA	1 U	1 U
1,1,1-Trichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Carbon Tetrachloride	1 U	10 U	10 U	10 U	1 U	1 U
Bromodichloromethane	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloropropane	1 U	10 U	10 U	10 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	10 U	10 U	10 U	1 U	1 U
Trichloroethene	1 U	10 U	10 U	10 U	1 U	1 U
Dibromochloromethane	1 U	10 U	10 U	10 U	1 U	1 U
1,1,2-Trichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Benzene	1 U	10 U	10 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	10 U	10 U	10 U	1 U	1 U
Bromoform	1 U	10 U	10 U	10 U	1 U	1 U
4-Methyl-2-Pentanone	5 U	10 U	10 U	10 U	5 U	5 U
2-Hexanone	R	10 UJ	10 UJ	10 U	R	5 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE F-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID **Laboratory ID** **Date Sampled**	TRIPBLANK Trip Blank 72184001 --	FB-01 Field Blank 65807001 12/10/96	FB-02 Field Blank 65807006 12/11/96	FB-04 Field Blank 71589007 04/11/97	FB-051297 Field Blank 72184002 05/12/97	MW-FB Field Blank 75528011 11/19/97
Tetrachloroethene	1 U	10 U	10 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dibromoethane	1 U	NA	NA	NA	1 U	1 U
Toluene	1 U	10 U	10 U	10 U	1 U	1 U
Chlorobenzene	1 U	10 U	10 U	10 U	1 U	1 U
Ethylbenzene	1 U	10 U	10 U	10 U	1 U	1 U
Styrene	1 U	10 U	10 U	10 U	1 U	1 U
Xylene (total)	1 U	10 U	10 U	10 U	1 U	1 U
1,3-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,4-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,2-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	NA	NA	NA	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/Q ults are presented in ug/L (ppb).

TABLE F-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-051198	TB-051198	TB-051298
	Field Blank	Trip Blank	Trip Blank
Laboratory ID	980518A2	82228001	82228007
Date Sampled	05/11/98	05/11/98	05/12/98
Chloromethane	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U
Vinyl Chloride	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U
Methylene Chloride	2 U	2 U	2 U
Acetone	5 U	5 U	5 U
Carbon Disulfide	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U
1,2-Dichloroethene (total)	NA	NA	NA
trans-1,2-Dichloroethene	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U
2-Butanone	5 U	5 U	5 U
Bromochloromethane	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U
Carbon Tetrachloride	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U
Benzene	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U
4-Methyl-2-Pentanone	5 U	5 U	5 U
2-Hexanone	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE F-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-051198	TB-051198	TB-051298
	Field Blank	Trip Blank	Trip Blank
Laboratory ID	980518A2	82228001	82228007
Date Sampled	05/11/98	05/11/98	05/12/98
Tetrachloroethene	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U
Toluene	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U
Styrene	1 U	1 U	1 U
Xylene (total)	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/Q ults are presented in ug/L (ppb).

TABLE F-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Phenol	10 U	10 U	5 U
bis(2-Chloroethyl) ether	10 U	10 U	5 U
2-Chlorophenol	10 U	10 U	5 U
1,3-Dichlorobenzene	10 U	NA	NA
1,4-Dichlorobenzene	10 U	NA	NA
1,2-Dichlorobenzene	10 U	NA	NA
2-Methylphenol	10 U	10 U	5 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U	5 U
4-Methylphenol	10 U	10 U	5 U
N-Nitroso-di-n-propylamine	10 U	10 U	5 U
Hexachloroethane	10 U	10 U	5 U
Nitrobenzene	10 U	10 U	5 U
Isophorone	10 U	10 U	5 U
2-Nitrophenol	10 U	10 U	5 U
2,4-Dimethylphenol	10 U	10 U	5 U
bis(2-Chloroethoxy)methane	10 U	10 U	5 U
2,4-Dichlorophenol	10 U	10 U	5 U
1,2,4-Trichlorobenzene	10 U	10 U	5 U
Naphthalene	10 U	10 U	5 U
4-Chloroaniline	10 U	10 U	5 U
Hexachlorobutadiene	10 U	10 U	5 U
4-Chloro-3-methylphenol	10 U	10 U	5 U
2-Methylnaphthalene	10 U	10 U	5 U
Hexachlorocyclopentadiene	10 U	10 UJ	5 U
2,4,6-Trichlorophenol	10 U	10 U	5 U
2,4,5-Trichlorophenol	26 U	25 U	20 U
2-Chloronaphthalene	10 U	10 U	5 U
2-Nitroaniline	26 U	25 U	20 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE F-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Dimethylphthalate	10 U	10 U	5 U
Acenaphthylene	10 U	10 U	5 U
2,6-Dinitrotoluene	10 U	10 U	5 U
3-Nitroaniline	26 U	25 U	20 U
Acenaphthene	10 U	10 U	5 U
2,4-Dinitrophenol	26 U	25 U	20 U
4-Nitrophenol	26 U	25 UJ	20 U
Dibenzofuran	10 U	10 U	5 U
2,4-Dinitrotoluene	10 U	10 U	5 U
Diethylphthalate	0.4 JB	10 U	5 U
4-Chlorophenyl-phenylether	10 U	10 U	5 U
Fluorene	10 U	10 U	5 U
4-Nitroaniline	26 U	25 U	20 U
4,6-Dinitro-2-methylphenol	26 U	25 U	20 U
N-Nitrosodiphenylamine	10 U	10 U	5 U
4-Bromophenyl-phenylether	10 U	10 U	5 U
Hexachlorobenzene	10 U	10 U	5 U
Pentachlorophenol	26 U	25 U	20 U
Phenanthrene	10 U	10 U	5 U
Anthracene	10 U	10 U	5 U
Carbazole	10 U	10 U	NA
Di-n-butylphthalate	0.4 JB	10 U	5 U
Fluoranthene	10 U	10 U	5 U
Pyrene	10 U	10 U	5 U
Butylbenzylphthalate	10 U	10 U	5 U
3,3'-Dichlorobenzidine	10 U	10 U	5 U
Benzo(a)anthracene	10 U	10 U	5 U
Chrysene	10 U	10 U	5 U

See appendix introduction for abbreviations and data qualifiers.
QA/C ults are presented in ug/L (ppb).

TABLE F-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
bis(2-Ethylhexyl)phthalate	0.8 JB	10 U	0.8 JB
Di-n-octylphthalate	10 U	10 UJ	5 U
Benzo(b)fluoranthene	10 U	10 UJ	5 U
Benzo(k)fluoranthene	10 U	10 U	5 U
Benzo(a)pyrene	10 U	10 U	5 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	5 U
Dibenz(a,h)anthracene	10 U	10 U	5 U
Benzo(g,h,i)perylene	10 U	10 U	5 U
Semi-Volatile TICs	--	--	5 JN

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE F-33
TCL Pesticide/PCB Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04	FB-051297	FB-051198
	Field Blank	Field Blank	Field Blank
Laboratory ID	71589007	72054016	981084A-07
Date Sampled	04/10/97	05/12/97	05/11/98
alpha-BHC	0.05 U	0.05 U	0.01 U
beta-BHC	0.05 U	0.05 U	0.0016 JP
delta-BHC	0.05 U	0.05 U	0.00046 JP
gamma-BHC (Lindane)	0.05 U	0.05 U	0.01 U
Heptachlor	0.05 U	0.05 U	0.01 U
Aldrin	0.05 U	0.05 U	0.01 U
Heptachlor epoxide	0.05 U	0.05 U	0.01 U
Endosulfan I	0.05 U	0.05 U	0.01 U
Dieldrin	0.1 U	0.1 U	0.021 U
4,4'-DDE	0.1 U	0.1 U	0.021 U
Endrin	0.1 U	0.1 U	0.021 U
Endosulfan II	0.1 U	0.1 U	0.021 U
4,4'-DDD	0.1 U	0.1 U	0.021 U
Endosulfan sulfate	0.1 U	0.1 U	0.021 U
4,4'-DDT	0.1 U	0.1 U	0.00092 JP
Methoxychlor	0.5 U	0.5 U	0.1 U
Endrin ketone	0.1 U	0.1 U	0.021 U
Endrin aldehyde	0.1 U	0.1 U	0.021 U
alpha-Chlordane	0.05 U	0.05 U	0.01 U
gamma-Chlordane	0.05 U	0.05 U	0.01 U
Toxaphene	5 U	5 U	1 U
Aroclor-1016	1 U	1 U	0.21 U
Aroclor-1221	2 U	2 U	0.42 U
Aroclor-1232	1 U	1 U	0.21 U
Aroclor-1242	1 U	1 U	0.21 U
Aroclor-1248	1 U	1 U	0.21 U
Aroclor-1254	1 U	1 U	0.21 U
Aroclor-1260	1 U	1 U	0.021 U

See appendix introduction for abbreviations and data qualifiers.
QA/C sults are presented in ug/L (ppb).

TABLE F-34
TAL Metals and Cyanide - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04	FB-051297	FB-051198
	Field Blank	Field Blank	Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Aluminum	23.1 B	31.2 B	6.0 U
Antimony	3.7 B	3 U	4.0 U
Arsenic	3 U	3 U	2.0 U
Barium	4 U	4 U	1.0 U
Beryllium	1 U	1 U	1.0 U
Cadmium	1 U	1 U	1.0 B
Calcium	84.8 B	197 B	19.9 B
Chromium	1.8 B	1 U	1.3 B
Cobalt	1 U	1 U	1.0 U
Copper	1 U	1.3 B	1.0 U
Iron	48.2 B	56.4 B	18.3 B
Lead	2 U	2 U	1.2 B
Magnesium	5.9 B	43.9 B	12.0 U
Manganese	1 U	2.3 B	1.0 U
Mercury	0.2 U	0.2 U	0.2 U
Nickel	2.8 B	0.2 U	2.5 B
Potassium	27.7 B	29.4 B	15.4 B
Selenium	3 U	3 U	2.0 U
Silver	1 UJ	1 UJ	1.0 U
Sodium	405 B	95.1 B	79.2 B
Thallium	3 U	3 UJ	3.0 U
Vanadium	1 U	1 U	1.0 U
Zinc	3.6 JB	15.7 B	2.5 B
Cyanide	10 U	10 U	10.0 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

APPENDIX G

2004 SUMMARY SHEETS FOR SAMPLING RESULTS

CHEMTECH 284 Sheffield Street • Mountainside, NJ 07092 Phone: 908.789.8900 Fax: 908.789.8922

ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

A FULL SERVICE ENVIRONMENTAL LABORATORY

CHEMTECH PROJECT NO. R3601
ATTENTION: Donald Campbell

Hit Summary Report

SDG No.: R3601 Order ID: R3601

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Test: VOC-TCL

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-SS08-072903RE**							
R3601-07RE	MM-SS08-072903RE	SOIL	Acetone	11		6.8	4.7	ug/Kg
R3601-07RE	MM-SS08-072903RE	SOIL	Ethyl Benzene	1.6	J	6.8	1.4	ug/Kg
			Total VOC's:	12.60				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	12.60				
Client ID:	**MM-SS11-072903**							
R3601-05	MM-SS11-072903	SOIL	Acetone	12	B	6.1	4.3	ug/Kg
			Total VOC's:	12.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	12.00				
Client ID:	**MM-SS11-072903RE**							
R3601-05RE	MM-SS11-072903RE	SOIL	Methylene Chloride	5.8	J	6.1	1.6	ug/Kg
			Total VOC's:	5.80				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	5.80				
Client ID:	**MM-SS12-072903**							
R3601-06	MM-SS12-072903	SOIL	Acetone	9.9	B	5.7	4.0	ug/Kg
			Total VOC's:	9.90				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	9.90				
Client ID:	**MM-SS14-072903**							
R3601-01	MM-SS14-072903	SOIL	Acetone	40		6.9	4.9	ug/Kg
			Total VOC's:	40.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	40.00				
Client ID:	**MM-SS14-072903RE**							
R3601-01RE	MM-SS14-072903RE	SOIL	Acetone	26		6.9	4.9	ug/Kg
			Total VOC's:	26.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	26.00				
Client ID:	**MM-SS15-072903**							
R3601-03	MM-SS15-072903	SOIL	Acetone	29	B	6.8	4.7	ug/Kg
			Total VOC's:	29.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	29.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R3601 **Order ID:** R3601

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: VOC-TCL

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-SS15-072903RE**							
R3601-03RE	MM-SS15-072903RE	SOIL	Acetone	37	B	6.8	4.7	ug/Kg
			Total VOC's:	37.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	37.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Sheet
SW-846

SDG No.: R3601 Order ID: R3601

Client: Tetra Tech FW Inc.. Project ID:

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SS07-072903							
R3601-08	MM-SS07-072903	SOIL	Aluminum	9040		26.5	0.86	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Antimony	1.3	J	7.9	0.26	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Arsenic	62.7		1.3	0.34	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Barium	82.4		26.5	0.19	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Beryllium	0.30	J	0.66	0.01	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Cadmium	2.4		0.66	0.07	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Calcium	3470		662	3.0	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Chromium	952		1.3	0.09	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Cobalt	8.0		6.6	0.09	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Copper	370		3.3	0.20	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Iron	14800		13.2	2.1	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Lead	96.1		0.40	0.24	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Magnesium	6220		662	1.9	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Manganese	393		2.0	0.01	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Mercury	0.09		0.01	0.01	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Nickel	483		5.3	0.29	mg/Kg
R[illegible]-08	MM-SS07-072903	SOIL	Potassium	575	J	662	4.8	mg/Kg
R[illegible]-08	MM-SS07-072903	SOIL	Selenium	18.7		0.66	0.44	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Sodium	969		662	52.4	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Vanadium	18.0		6.6	0.13	mg/Kg
R3601-08	MM-SS07-072903	SOIL	Zinc	3830		26.5	0.79	mg/Kg
Client ID:	MM-SS08-072903							
R3601-07	MM-SS08-072903	SOIL	Aluminum	7940		26.4	0.86	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Antimony	1.2	J	7.9	0.26	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Arsenic	3.5		1.3	0.34	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Barium	75.3		26.4	0.18	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Beryllium	0.23	J	0.66	0.01	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Cadmium	0.20	J	0.66	0.07	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Calcium	1890		660	3.0	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Chromium	14.2		1.3	0.09	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Cobalt	6.3	J	6.6	0.09	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Copper	62.7		3.3	0.20	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Iron	11100		13.2	2.1	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Lead	37.6		0.40	0.24	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Magnesium	2200		660	1.8	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Manganese	134		2.0	0.01	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Mercury	0.52		0.01	0.01	mg/Kg
R[illegible]-07	MM-SS08-072903	SOIL	Nickel	27.3		5.3	0.29	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Potassium	402	J	660	4.7	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Selenium	0.82		0.66	0.44	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Vanadium	24.4		6.6	0.13	mg/Kg
R3601-07	MM-SS08-072903	SOIL	Zinc	76.9		2.6	0.08	mg/Kg

Hit Summary Sheet
SW-846

G No.: R3601 Order ID: R3601

Client: Tetra Tech FW Inc.. Project ID:

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SS11-072903							
R3601-05	MM-SS11-072903	SOIL	Aluminum	7760		24.4	0.79	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Arsenic	1.6		1.2	0.32	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Barium	48.2		24.4	0.17	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Beryllium	0.21	J	0.61	0.01	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Calcium	3310		609	2.8	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Chromium	10.8		1.2	0.09	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Cobalt	6.6		6.1	0.09	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Copper	30.2		3.0	0.18	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Iron	11000		12.2	1.9	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Lead	12.1		0.37	0.22	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Magnesium	2440		609	1.7	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Manganese	251		1.8	0.01	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Mercury	0.03		0.01	0.01	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Nickel	11.6		4.9	0.27	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Potassium	655		609	4.4	mg/Kg
R3601-05	MM-SS11-072903	SOIL	Sodium	92.8	J	609	48.2	mg/Kg
R[illegible]-05	MM-SS11-072903	SOIL	Vanadium	17.4		6.1	0.12	mg/Kg
R[illegible]-05	MM-SS11-072903	SOIL	Zinc	250		2.4	0.07	mg/Kg
Client ID:	MM-SS12-072903							
R3601-06	MM-SS12-072903	SOIL	Aluminum	7080		23.1	0.75	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Antimony	0.69	J	6.9	0.23	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Arsenic	1.7		1.2	0.30	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Barium	71.6		23.1	0.16	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Beryllium	0.21	J	0.58	0.01	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Cadmium	0.29	J	0.58	0.06	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Calcium	1640		577	2.7	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Chromium	10.6		1.2	0.08	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Cobalt	5.9		5.8	0.08	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Copper	136		2.9	0.17	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Iron	9830		11.5	1.8	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Lead	20.8		0.35	0.21	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Magnesium	2280		577	1.6	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Manganese	214		1.7	0.01	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Mercury	0.02		0.01	0.01	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Nickel	11.1		4.6	0.25	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Potassium	651		577	4.2	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Silver	1.6		1.2	0.43	mg/Kg
R[illegible]-06	MM-SS12-072903	SOIL	Sodium	122	J	577	45.7	mg/Kg
R[illegible]-06	MM-SS12-072903	SOIL	Vanadium	16.9		5.8	0.12	mg/Kg
R3601-06	MM-SS12-072903	SOIL	Zinc	160		2.3	0.07	mg/Kg

Hit Summary Sheet
SW-846

)G No.: R3601 Order ID: R3601

Client: Tetra Tech FW Inc.. Project ID:

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SS13-072903							
R3601-02	MM-SS13-072903	SOIL	Aluminum	8760		30.5	0.99	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Arsenic	2.6		1.5	0.40	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Barium	76.1		30.5	0.21	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Beryllium	0.59	J	0.76	0.01	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Cadmium	0.45	J	0.76	0.08	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Calcium	5060		762	3.5	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Chromium	19.5		1.5	0.11	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Cobalt	5.0	J	7.6	0.11	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Copper	22.8		3.8	0.23	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Iron	17900		15.2	2.4	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Lead	67.4		0.46	0.27	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Magnesium	1910		762	2.1	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Manganese	95.4		2.3	0.02	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Mercury	0.14		0.02	0.02	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Nickel	17.8		6.1	0.34	mg/Kg
R3601-02	MM-SS13-072903	SOIL	Potassium	387	J	762	5.5	mg/Kg
R[illegible]1-02	MM-SS13-072903	SOIL	Silver	6.2		1.5	0.56	mg/Kg
R[illegible]1-02	MM-SS13-072903	SOIL	Vanadium	27.6		7.6	0.15	[illegible]g
R3601-02	MM-SS13-072903	SOIL	Zinc	19.8		3.0	0.09	mg/Kg
Client ID:	MM-SS14-072903							
R3601-01	MM-SS14-072903	SOIL	Aluminum	10600		27.3	0.89	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Antimony	0.87	J	8.2	0.27	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Arsenic	4.3		1.4	0.36	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Barium	139		27.3	0.19	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Beryllium	0.26	J	0.68	0.01	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Cadmium	0.29	J	0.68	0.07	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Calcium	2630		683	3.1	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Chromium	15.4		1.4	0.10	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Cobalt	7.7		6.8	0.10	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Copper	21.2		3.4	0.20	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Iron	13700		13.7	2.2	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Lead	91.7		0.41	0.25	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Magnesium	2730		683	1.9	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Manganese	408		2.0	0.01	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Mercury	0.15		0.01	0.01	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Nickel	17.3		5.5	0.30	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Potassium	496	J	683	4.9	mg/Kg
[illegible]1-01	MM-SS14-072903	SOIL	Selenium	1.1		0.68	0.45	[illegible]Kg
R3601-01	MM-SS14-072903	SOIL	Silver	0.95	J	1.4	0.51	[illegible]g
R3601-01	MM-SS14-072903	SOIL	Vanadium	50.7		6.8	0.14	mg/Kg
R3601-01	MM-SS14-072903	SOIL	Zinc	50.7		2.7	0.08	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: R3601 **Order ID:** R3601

Client: Tetra Tech FW Inc.. **Project ID:**

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SS15-072903							
R3601-03	MM-SS15-072903	SOIL	Aluminum	11500		27.0	0.88	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Antimony	1.2	J	8.1	0.27	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Arsenic	3.7		1.3	0.35	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Barium	80.9		27.0	0.19	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Beryllium	0.29	J	0.67	0.01	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Cadmium	0.16	J	0.67	0.07	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Calcium	1690		675	3.1	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Chromium	70.5		1.3	0.09	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Cobalt	26.5		6.7	0.09	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Copper	22.4		3.4	0.20	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Iron	21100		13.5	2.2	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Lead	39.2		0.40	0.24	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Magnesium	7830		675	1.9	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Manganese	335		2.0	0.01	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Mercury	0.13		0.01	0.01	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Nickel	87.5		5.4	0.30	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Potassium	442	J	675	4.9	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Selenium	0.63	J	0.67	0.45	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Vanadium	43.6		6.7	0.13	mg/Kg
R3601-03	MM-SS15-072903	SOIL	Zinc	44.4		2.7	0.08	mg/Kg

CHEMTECH 284 Sheffield Street • Mountainside, NJ 07092 Phone: 908.789.8900 Fax: 908.789.8922

ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

CHEMTECH PROJECT NO. **R4008**
ATTENTION: **Donald Campbell**

Hit Summary Report

SDG No.: R4008 **Order ID:** R4008

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: VOC-TCL

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP02-08260310.010.75**							
R4008-05	MM-LP02-08260310.	SOIL	Methylene Chloride	18		5.4	1.4	ug/K
			Total VOC's:	18.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	18.00				
Client ID:	**MM-ST01-082603**							
R4008-01	MM-ST01-082603	SOIL	Methylene Chloride	33		13	3.3	ug/K
R4008-01	MM-ST01-082603	SOIL	cis-1,2-Dichloroethene	23		13	2.3	ug/K
R4008-01	MM-ST01-082603	SOIL	Benzene	8.5	J	13	2.6	ug/K
R4008-01	MM-ST01-082603	SOIL	Toluene	120		13	2.8	ug/K
R4008-01	MM-ST01-082603	SOIL	Ethyl Benzene	160		13	2.6	ug/K
			Total VOC's:	344.50				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	344.50				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4008 **Order ID:** R4008

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: VOC-TCL

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-ST01-082603DL**							
R4008-01DL	MM-ST01-082603DL	SOIL	m/p-Xylenes	1600	JD	3200	490	ug/Kg
R4008-01DL	MM-ST01-082603DL	SOIL	o-Xylene	730	JD	1600	230	ug/Kg

Total VOC's:	2330.00
Total TIC's:	0.00
Total VOC's and TIC's:	2330.00

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4008 **Order ID:** R4008

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP02-08260310.010.75**							
R4008-05	MM-LP02-08260310.	SOIL	bis(2-Ethylhexyl)phthalate	40	J	350	35	ug/Kg
			Total SVOC's:	40.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	40.00				
Client ID:	**MM-ST01-082603**							
R4008-01	MM-ST01-082603	SOIL	bis(2-Ethylhexyl)phthalate	190	J	840	84	ug/Kg
			Total SVOC's:	190.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	190.00				
Client ID:	**MM-ST02-0826031-1.25**							
R4008-03	MM-ST02-0826031-1	SOIL	Phenanthrene	140	J	390	39	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Fluoranthene	230	J	390	39	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Pyrene	260	J	390	39	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Benzo(a)anthracene	160	J	390	39	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Chrysene	120	J	390	62	ug/Kg
'008-03	MM-ST02-0826031-1	SOIL	bis(2-Ethylhexyl)phthalate	73	J	390	39	ug/Kg
008-03	MM-ST02-0826031-1	SOIL	Benzo(b)fluoranthene	130	J	390	39	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Benzo(a)pyrene	110	J	390	59	ug/Kg
R4008-03	MM-ST02-0826031-1	SOIL	Benzo(g,h,i)perylene	64	J	390	51	ug/Kg
			Total SVOC's:	1287.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	1287.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4008
Client: Tetra Tech FW Inc..
Test: PCB

Order ID: R4008
Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP02-08260310.010.75							
R4008-05	MM-LP02-08260310.	SOIL	AROCLOR 1260	7.1	J	18	2.1	ug/Kg
			Total PCB's:	7.10				

Hit Summary Sheet
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SDG No.: R4008 Order ID: R4008

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP02-08260310.010.75**							
R4008-05	MM-LP02-08260310.	SOIL	Aluminum	4450		21.5	0.70	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Antimony	0.57	J	6.4	0.21	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Arsenic	9.7		1.1	0.28	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Barium	29.5		21.5	0.15	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Beryllium	0.13	J	0.54	0.01	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Calcium	1380		537	2.5	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Chromium	34.1		1.1	0.08	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Cobalt	3.4	J	5.4	0.08	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Copper	203		2.7	0.16	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Iron	5880		10.7	1.7	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Lead	6.2		0.32	0.19	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Magnesium	1570		537	1.5	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Manganese	83.0		1.6	0.01	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Nickel	226		4.3	0.24	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Potassium	451	J	537	3.9	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Selenium	13.0		0.54	0.35	mg/K
4008-05	MM-LP02-08260310.	SOIL	Sodium	124	J	537	42.5	mg/K
008-05	MM-LP02-08260310.	SOIL	Vanadium	8.8		5.4	0.11	mg/K
R4008-05	MM-LP02-08260310.	SOIL	Zinc	235		2.1	0.06	mg/K
Client ID:	**MM-ST01-082603**							
R4008-01	MM-ST01-082603	SOIL	Aluminum	7100		51.3	1.7	mg/K
R4008-01	MM-ST01-082603	SOIL	Arsenic	330		2.6	0.67	mg/K
R4008-01	MM-ST01-082603	SOIL	Barium	94.3		51.3	0.36	mg/K
R4008-01	MM-ST01-082603	SOIL	Beryllium	0.25	J	1.3	0.01	mg/K
R4008-01	MM-ST01-082603	SOIL	Cadmium	4.2		1.3	0.13	mg/K
R4008-01	MM-ST01-082603	SOIL	Calcium	8360		1280	5.9	mg/K
R4008-01	MM-ST01-082603	SOIL	Chromium	354		2.6	0.18	mg/K
R4008-01	MM-ST01-082603	SOIL	Cobalt	12.8	J	12.8	0.18	mg/K
R4008-01	MM-ST01-082603	SOIL	Copper	368		6.4	0.38	mg/K
R4008-01	MM-ST01-082603	SOIL	Iron	13300		25.6	4.1	mg/K
R4008-01	MM-ST01-082603	SOIL	Lead	208		0.77	0.46	mg/K
R4008-01	MM-ST01-082603	SOIL	Magnesium	2960		1280	3.6	mg/K
R4008-01	MM-ST01-082603	SOIL	Manganese	271		3.8	0.03	mg/K
R4008-01	MM-ST01-082603	SOIL	Mercury	0.27		0.03	0.03	mg/K
R4008-01	MM-ST01-082603	SOIL	Nickel	6470		10.3	0.56	mg/K
R4008-01	MM-ST01-082603	SOIL	Potassium	512	J	1280	9.2	mg/K
R4008-01	MM-ST01-082603	SOIL	Selenium	225		1.3	0.85	mg/K
4008-01	MM-ST01-082603	SOIL	Sodium	5010		1280	102	mg/K
4008-01	MM-ST01-082603	SOIL	Vanadium	17.6		12.8	0.26	mg/K
R4008-01	MM-ST01-082603	SOIL	Zinc	12500		51.3	1.5	mg/K

Hit Summary Sheet
SW-846

SDG No.: R4008 Order ID: R4008

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-ST02-0826030-1							
R4008-02	MM-ST02-0826030-1	SOIL	Aluminum	6660		54.6	1.8	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Arsenic	767		2.7	0.71	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Barium	108		54.6	0.38	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Beryllium	0.24	J	1.4	0.01	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Cadmium	10.7		1.4	0.14	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Calcium	9810		1370	6.3	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Chromium	1690		2.7	0.19	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Cobalt	84.2		13.7	0.19	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Copper	8180		6.8	0.41	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Iron	19500		27.3	4.4	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Lead	325		0.82	0.49	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Magnesium	3290		1370	3.8	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Manganese	579		4.1	0.03	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Mercury	0.37		0.03	0.03	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Nickel	49400		109	6.0	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Potassium	596	J	1370	9.8	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Selenium	565		1.4	0.90	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Sodium	11900		1370	108	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Thallium	2.0	J	2.7	1.6	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Vanadium	11.0	J	13.7	0.27	mg/K
R4008-02	MM-ST02-0826030-1	SOIL	Zinc	29800		54.6	1.6	mg/K

Hit Summary Sheet
SW-846

SDG No.: R4008 Order ID: R4008

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-ST02-0826031-1.25							
R4008-03	MM-ST02-0826031-1	SOIL	Aluminum	12000		23.8	0.77	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Antimony	0.40	J	7.1	0.24	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Arsenic	82.7		1.2	0.31	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Barium	203		23.8	0.17	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Beryllium	0.34	J	0.59	0.01	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Cadmium	0.39	J	0.59	0.06	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Calcium	9160		594	2.7	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Chromium	240		1.2	0.08	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Cobalt	20.8		5.9	0.08	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Copper	593		3.0	0.18	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Iron	18400		11.9	1.9	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Lead	26.8		0.36	0.21	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Magnesium	9770		594	1.7	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Manganese	394		1.8	0.01	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Mercury	0.01		0.01	0.01	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Nickel	1830		4.8	0.26	mg/K
4008-03	MM-ST02-0826031-1	SOIL	Potassium	2050		594	4.3	mg/K
008-03	MM-ST02-0826031-1	SOIL	Selenium	27.8		0.59	0.39	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Sodium	906		594	47.0	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Vanadium	30.4		5.9	0.12	mg/K
R4008-03	MM-ST02-0826031-1	SOIL	Zinc	1830		2.4	0.07	mg/K

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ANALYTICAL RESULTS SUMMARY

PROJECT NAME: MAGNA METALS

TETRA TECH FW INC.
1000 THE AMERICAN ROAD
MORRIS PLAINS, NJ 07950
973-630-8413

CHEMTECH PROJECT # **R4142**
ATTENTION **Robert Olewinski**

ENVIRONMENTAL LABORATORY REFERENCE

Hit Summary Sheet
SW-846

SDG No.: R4142 Order ID: R4142

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP03-0905031.3-2.0							
R4142-01	MM-LP03-0905031.3	SOIL	Aluminum	14700		26.6	1.9	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Antimony	1.9	J	8.0	0.27	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Arsenic	103		1.3	0.28	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Barium	142		26.6	1.7	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Beryllium	0.43	J	0.67	0.17	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Cadmium	0.70		0.67	0.16	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Calcium	3000		666	2.2	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Chromium	276		1.3	0.25	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Cobalt	18.8		6.7	0.32	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Copper	987		3.3	0.35	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Iron	18500		13.3	1.5	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Lead	67.2		0.40	0.32	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Magnesium	5380		666	2.3	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Manganese	229		2.0	0.17	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Mercury	0.10		0.01	0.01	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Nickel	2380		5.3	1.0	mg/Kg
142-01	MM-LP03-0905031.3	SOIL	Potassium	1430		666	14.3	mg/Kg
142-01	MM-LP03-0905031.3	SOIL	Selenium	184		0.67	0.56	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Sodium	574	J	666	133	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Vanadium	36.8		6.7	0.31	mg/Kg
R4142-01	MM-LP03-0905031.3	SOIL	Zinc	4940		2.7	0.85	mg/Kg
Client ID:	MM-LP05-0905031.0-1.2							
R4142-02	MM-LP05-0905031.0	SOIL	Aluminum	4560		21.2	1.5	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Arsenic	19.4		1.1	0.22	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Barium	50.4		21.2	1.3	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Beryllium	0.20	J	0.53	0.14	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Calcium	3190		529	1.7	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Chromium	94.8		1.1	0.20	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Cobalt	5.7		5.3	0.25	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Copper	152		2.6	0.28	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Iron	20000		10.6	1.2	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Lead	10.5		0.32	0.25	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Magnesium	1770		529	1.8	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Manganese	206		1.6	0.14	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Mercury	0.02		0.01	0.01	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Nickel	340		4.2	0.80	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Potassium	589		529	11.3	mg/K
142-02	MM-LP05-0905031.0	SOIL	Selenium	29.8		0.53	0.44	mg/K
142-02	MM-LP05-0905031.0	SOIL	Sodium	111	J	529	106	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Vanadium	10.6		5.3	0.24	mg/K
R4142-02	MM-LP05-0905031.0	SOIL	Zinc	693		2.1	0.68	mg/K

Hit Summary Sheet
SW-846

SDG No.: R4142 Order ID: R4142

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP06-0905030.3-0.8							
R4142-03	MM-LP06-0905030.3	SOIL	Aluminum	7110		47.1	3.4	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Antimony	22.0		14.1	0.47	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Arsenic	376		2.4	0.49	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Barium	223		47.1	3.0	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Cadmium	1.3		1.2	0.28	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Calcium	2840		1180	3.8	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Chromium	187		2.4	0.45	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Cobalt	52.3		11.8	0.57	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Copper	34700		58.9	6.1	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Iron	22200		23.6	2.7	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Lead	858		0.71	0.57	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Magnesium	3560		1180	4.1	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Manganese	262		3.5	0.31	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Nickel	63700		9.4	1.8	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Potassium	1050	J	1180	25.2	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Selenium	178		1.2	0.99	mg/Kg
142-03	MM-LP06-0905030.3	SOIL	Silver	3.5		2.4	0.64	/Kg
4142-03	MM-LP06-0905030.3	SOIL	Sodium	1520		1180	235	Kg
R4142-03	MM-LP06-0905030.3	SOIL	Thallium	23.6		2.4	0.73	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Vanadium	18.1		11.8	0.54	mg/Kg
R4142-03	MM-LP06-0905030.3	SOIL	Zinc	15900		4.7	1.5	mg/Kg
Client ID:	MM-LP06-0905030-0.3							
R4142-04	MM-LP06-0905030-0	SOIL	Aluminum	10600		38.8	2.8	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Arsenic	10.3		1.9	0.41	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Barium	152		38.8	2.5	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Beryllium	0.68	J	0.97	0.25	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Calcium	16800		969	3.2	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Chromium	21.8		1.9	0.37	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Cobalt	5.8	J	9.7	0.47	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Copper	483		4.8	0.50	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Iron	18600		19.4	2.2	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Lead	268		0.58	0.47	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Magnesium	3450		969	3.3	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Manganese	715		2.9	0.25	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Mercury	0.17		0.02	0.02	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Nickel	781		7.8	1.5	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Potassium	1640		969	20.7	mg/Kg
142-04	MM-LP06-0905030-0	SOIL	Selenium	3.1		0.97	0.81	/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Silver	0.87	J	1.9	0.52	g/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Sodium	2750		969	194	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Vanadium	28.6		9.7	0.45	mg/Kg
R4142-04	MM-LP06-0905030-0	SOIL	Zinc	386		3.9	1.2	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: R4142 Order ID: R4142

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP07-0905030.1-0.5							
R4142-06	MM-LP07-0905030.1	SOIL	Aluminum	15300		21.6	1.5	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Arsenic	16.7		1.1	0.23	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Barium	116		21.6	1.4	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Beryllium	0.46	J	0.54	0.14	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Calcium	3300		541	1.8	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Chromium	20.8		1.1	0.21	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Cobalt	14.5		5.4	0.26	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Copper	185		2.7	0.28	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Iron	19500		10.8	1.2	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Lead	22.7		0.32	0.26	ug/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Magnesium	6700		541	1.9	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Manganese	280		1.6	0.14	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Mercury	0.01		0.01	0.01	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Nickel	2510		4.3	0.82	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Potassium	1260		541	11.6	mg/Kg
R4142-06	MM-LP07-0905030.1	SOIL	Selenium	4.7		0.54	0.45	mg/Kg
142-06	MM-LP07-0905030.1	SOIL	Sodium	289	J	541	108	mg/Kg
142-06	MM-LP07-0905030.1	SOIL	Vanadium	25.0		5.4	0.25	mg/K
R4142-06	MM-LP07-0905030.1	SOIL	Zinc	962		2.2	0.69	mg/K
Client ID:	MM-LP07-0905030-0.1							
R4142-05	MM-LP07-0905030-0	SOIL	Aluminum	3270		23.1	1.6	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Antimony	1.0	J	6.9	0.23	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Arsenic	79.1		1.2	0.24	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Barium	61.8		23.1	1.5	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Calcium	1990		577	1.9	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Chromium	28.3		1.2	0.22	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Cobalt	34.5		5.8	0.28	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Copper	9710		28.8	3.0	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Iron	8260		11.5	1.3	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Lead	197		0.35	0.28	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Magnesium	1890		577	2.0	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Manganese	135		1.7	0.15	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Mercury	0.09		0.01	0.01	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Nickel	45600		4.6	0.88	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Potassium	567	J	577	12.3	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Selenium	53.5		0.58	0.48	mg/K
4142-05	MM-LP07-0905030-0	SOIL	Silver	0.99	J	1.2	0.31	mg/K
142-05	MM-LP07-0905030-0	SOIL	Sodium	544	J	577	115	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Thallium	16.9		1.2	0.36	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Vanadium	6.9		5.8	0.27	mg/K
R4142-05	MM-LP07-0905030-0	SOIL	Zinc	7020		2.3	0.74	mg/K

Hit Summary Sheet
SW-846

SDG No.: R4142 **Order ID:** R4142

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP08-0905030.3-0.6**							
R4142-10	MM-LP08-0905030.3	SOIL	Aluminum	3760		21.7	1.6	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Arsenic	3.8		1.1	0.23	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Barium	20.1	J	21.7	1.4	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Beryllium	0.18	J	0.54	0.14	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Calcium	1200		542	1.8	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Chromium	5.6		1.1	0.21	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Cobalt	5.3	J	5.4	0.26	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Copper	35.3		2.7	0.28	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Iron	6020		10.8	1.2	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Lead	2.9		0.33	0.26	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Magnesium	1680		542	1.9	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Manganese	97.8		1.6	0.14	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Nickel	99.3		4.3	0.82	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Potassium	447	J	542	11.6	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Selenium	0.98		0.54	0.46	mg/Kg
R4142-10	MM-LP08-0905030.3	SOIL	Vanadium	7.6		5.4	0.25	mg/Kg
142-10	MM-LP08-0905030.3	SOIL	Zinc	220		2.2	0.69	mg/Kg
Client ID:	**MM-LP08-0905030-0.3**							
R4142-08	MM-LP08-0905030-0	SOIL	Aluminum	5110		22.2	1.6	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Arsenic	8.6		1.1	0.23	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Barium	26.7		22.2	1.4	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Beryllium	0.20	J	0.55	0.14	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Calcium	1460		555	1.8	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Chromium	9.8		1.1	0.21	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Cobalt	6.1		5.5	0.27	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Copper	210		2.8	0.29	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Iron	7990		11.1	1.3	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Lead	15.3		0.33	0.27	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Magnesium	2110		555	1.9	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Manganese	97.0		1.7	0.14	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Nickel	468		4.4	0.84	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Potassium	550	J	555	11.9	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Selenium	2.1		0.55	0.47	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Sodium	118	J	555	111	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Vanadium	9.8		5.5	0.26	mg/Kg
R4142-08	MM-LP08-0905030-0	SOIL	Zinc	440		2.2	0.71	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: R4142 Order ID: R4142

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP18-0905030-0.3							
R4142-07	MM-LP18-0905030-0	SOIL	Aluminum	4080		22.3	1.6	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Arsenic	7.6		1.1	0.23	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Barium	21.9	J	22.3	1.4	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Beryllium	0.17	J	0.56	0.14	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Calcium	1310		557	1.8	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Chromium	7.3		1.1	0.21	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Cobalt	5.3	J	5.6	0.27	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Copper	214		2.8	0.29	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Iron	6680		11.1	1.3	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Lead	19.1		0.33	0.27	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Magnesium	1650		557	1.9	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Manganese	89.4		1.7	0.14	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Nickel	399		4.5	0.85	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Potassium	442	J	557	11.9	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Selenium	1.5		0.56	0.47	mg/Kg
R4142-07	MM-LP18-0905030-0	SOIL	Vanadium	7.1		5.6	0.26	mg/Kg
142-07	MM-LP18-0905030-0	SOIL	Zinc	402		2.2	0.71	mg/Kg

Hit Summary Report

SDG No.: R4142 **Order ID:** R4142

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP03-0905031.3-2.0**							
R4142-01	MM-LP03-0905031.3	SOIL	Phenanthrene	110	J	440	44	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	Di-n-butylphthalate	160	J	440	53	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	Fluoranthene	120	J	440	44	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	Pyrene	100	J	440	44	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	Benzo(a)anthracene	57	J	440	44	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	bis(2-Ethylhexyl)phthalate	520		440	44	ug/K
			Total SVOC's:	1067.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	1067.00				
Client ID:	**MM-LP05-0905031.0-1.2**							
R4142-02	MM-LP05-0905031.0	SOIL	bis(2-Ethylhexyl)phthalate	62	J	350	35	ug/K
			Total SVOC's:	62.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	62.00				
Client ID:	**MM-LP06-0905030-0.3**							
4142-04	MM-LP06-0905030-0	SOIL	Di-n-butylphthalate	130	J	630	74	ug/K
R4142-04	MM-LP06-0905030-0	SOIL	Pyrene	98	J	630	63	ug/K
R4142-04	MM-LP06-0905030-0	SOIL	Benzo(a)anthracene	180	J	630	63	ug/K
R4142-04	MM-LP06-0905030-0	SOIL	Chrysene	220	J	630	100	ug/K
R4142-04	MM-LP06-0905030-0	SOIL	bis(2-Ethylhexyl)phthalate	2200		630	63	ug/K
R4142-04	MM-LP06-0905030-0	SOIL	Benzo(b)fluoranthene	210	J	630	63	ug/K
			Total SVOC's:	3038.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	3038.00				
Client ID:	**MM-LP07-0905030.1-0.5**							
R4142-06	MM-LP07-0905030.1	SOIL	Diethylphthalate	48	J	360	36	ug/K
R4142-06	MM-LP07-0905030.1	SOIL	Fluoranthene	81	J	360	36	ug/K
R4142-06	MM-LP07-0905030.1	SOIL	Pyrene	70	J	360	36	ug/K
R4142-06	MM-LP07-0905030.1	SOIL	Benzo(a)anthracene	44	J	360	36	ug/K
R4142-06	MM-LP07-0905030.1	SOIL	bis(2-Ethylhexyl)phthalate	280	J	360	36	ug/K
R4142-06	MM-LP07-0905030.1	SOIL	Benzo(b)fluoranthene	44	J	360	36	ug/K
			Total SVOC's:	567.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	567.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4142 **Order ID:** R4142

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP07-0905030-0.1**							
R4142-05	MM-LP07-0905030-0	SOIL	Phenanthrene	82	J	380	38	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Di-n-butylphthalate	140	J	380	45	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Fluoranthene	300	J	380	38	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Pyrene	370	J	380	38	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Benzo(a)anthracene	470		380	38	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Chrysene	620		380	60	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Benzo(b)fluoranthene	730		380	38	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Benzo(k)fluoranthene	430		380	98	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Benzo(a)pyrene	360	J	380	57	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Indeno(1,2,3-cd)pyrene	190	J	380	60	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Dibenz(a,h)anthracene	89	J	380	57	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	Benzo(g,h,i)perylene	220	J	380	49	ug/K
			Total SVOC's:	4001.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	4001.00				
Client ID:	**MM-LP07-0905030-0.1DL**							
R4142-05DL	MM-LP07-0905030-0	SOIL	Fluoranthene	380	JD	1900	190	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Pyrene	460	JD	1900	190	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Benzo(a)anthracene	490	JD	1900	190	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Chrysene	640	JD	1900	300	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	bis(2-Ethylhexyl)phthalate	13000	D	1900	190	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Benzo(b)fluoranthene	950	JD	1900	190	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Benzo(k)fluoranthene	580	JD	1900	490	ug/K
R4142-05DL	MM-LP07-0905030-0	SOIL	Benzo(a)pyrene	380	JD	1900	280	ug/K
			Total SVOC's:	16880.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	16880.00				
Client ID:	**MM-LP08-0905030.3-0.6**							
R4142-10	MM-LP08-0905030.3	SOIL	Diethylphthalate	46	J	360	36	ug/K
R4142-10	MM-LP08-0905030.3	SOIL	Di-n-butylphthalate	43	J	360	42	ug/K
			Total SVOC's:	89.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	89.00				
Client ID:	**MM-LP08-0905030-0.3**							
R4142-08	MM-LP08-0905030-0	SOIL	bis(2-Ethylhexyl)phthalate	210	J	360	36	ug/K
			Total SVOC's:	210.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	210.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter

Hit Summary Report

SDG No.: R4142 **Order ID:** R4142

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LPI8-0905030-0.3							
R4142-07	MM-LP18-0905030-0	SOIL	Diethylphthalate	51	J	370	37	ug/K
R4142-07	MM-LP18-0905030-0	SOIL	Di-n-butylphthalate	87	J	370	43	ug/K
R4142-07	MM-LP18-0905030-0	SOIL	bis(2-Ethylhexyl)phthalate	94	J	370	37	ug/K

Total SVOC's:	232.00
Total TIC's:	0.00
Total SVOC's and TIC's:	232.00

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4142 Order ID: R4142

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Test: VOC-TCL

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP03-0905031.3-2.0							
R4142-01	MM-LP03-0905031.3	SOIL	Methylene Chloride	8.1	B	6.8	1.8	ug/K
R4142-01	MM-LP03-0905031.3	SOIL	Trichloroethene	13		6.8	1.4	ug/K
			Total VOC's:	21.10				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	21.10				
Client ID:	MM-LP05-0905031.0-1.2							
R4142-02	MM-LP05-0905031.0	SOIL	Methylene Chloride	4.0	JB	5.3	1.4	ug/K
			Total VOC's:	4.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	4.00				
Client ID:	MM-LP06-0905030.3-0.8							
R4142-03	MM-LP06-0905030.3	SOIL	Methylene Chloride	22	B	12	3.2	ug/K
			Total VOC's:	22.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	22.00				
ent ID:	MM-LP07-0905030-0.1							
R4142-05	MM-LP07-0905030-0	SOIL	Toluene	5.8		5.7	1.3	ug/K
R4142-05	MM-LP07-0905030-0	SOIL	m/p-Xylenes	26		11	3.2	ug/K
			Total VOC's:	31.80				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	31.80				
Client ID:	MM-LP07-0905030-0.1RE							
R4142-05RE	MM-LP07-0905030-0	SOIL	Methylene Chloride	13	B	5.7	1.5	ug/K
R4142-05RE	MM-LP07-0905030-0	SOIL	Toluene	3.1	J	5.7	1.3	ug/K
R4142-05RE	MM-LP07-0905030-0	SOIL	m/p-Xylenes	24		11	3.2	ug/K
			Total VOC's:	40.10				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	40.10				
Client ID:	MM-LP08-0905030.3-0.6							
R4142-10	MM-LP08-0905030.3	SOIL	Trichloroethene	12		5.4	1.1	ug/K
R4142-10	MM-LP08-0905030.3	SOIL	Toluene	6.6		5.4	1.2	ug/K
R4142-10	MM-LP08-0905030.3	SOIL	m/p-Xylenes	5.5	J	11	3.0	ug/K
			Total VOC's:	24.10				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	24.10				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Chemtech

Hit Summary Report

SDG No.: R4142
Client: Tetra Tech FW Inc..
Test: PCB

Order ID: R4142
Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP03-0905031.3-2.0							
R4142-01	MM-LP03-0905031.3	SOIL	AROCLOR 1260	75		23	2.7	ug/Kg
			Total PCB's:	75.00				

CHEMTECH 284 Sheffield Street • Mountainside, NJ 07092 Phone: 908.789.8900 Fax: 908.789.8922

ANALYTICAL RESULTS SUMMARY

PROJECT NAME: MAGNA METALS

TETRA TECH FW INC.
1000 THE AMERICAN ROAD
MORRIS PLAINS, NJ 07950
973-630-8413

CHEMTECH PROJECT # R4548
ATTENTION Donald Compbell

A FULL SERVICE ENVIRONMENTAL LABORATORY

Summary Sheet
SW-846

SDG No.: R4548 Order ID: R4548

Client: Tetra Tech FW Inc.. Project ID: FOST03

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Uni
Client ID:	MM-RA-2.5-3.0-100703							
R4548-08	MM-RA-2.5-3.0-100	SOIL	Methylene Chloride	6.3	B	6.2	1.6	ug
			Total VOC's:	6.30				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	6.30				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Sheet
SW-846

G No.: R4548 Order ID: R4548

nt: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-GWMW01-100603							
R4548-03	MM-GWMW01-1006	WATER	Aluminum	909		200	18.4	ug/L
R4548-03	MM-GWMW01-1006	WATER	Barium	156	J	200	9.9	ug/L
R4548-03	MM-GWMW01-1006	WATER	Beryllium	0.12	J	5.0	0.10	ug/L
R4548-03	MM-GWMW01-1006	WATER	Calcium	20400		5000	36.2	ug/L
R4548-03	MM-GWMW01-1006	WATER	Chromium	17.8		10.0	1.4	ug/L
R4548-03	MM-GWMW01-1006	WATER	Cobalt	1.1	J	50.0	0.70	ug/L
R4548-03	MM-GWMW01-1006	WATER	Copper	8.4	J	25.0	3.6	ug/L
R4548-03	MM-GWMW01-1006	WATER	Iron	1540		100	22.2	ug/L
R4548-03	MM-GWMW01-1006	WATER	Lead	3.1		3.0	3.0	ug/L
R4548-03	MM-GWMW01-1006	WATER	Magnesium	14800		5000	7.0	ug/L
R4548-03	MM-GWMW01-1006	WATER	Manganese	45.3		15.0	0.20	ug/L
R4548-03	MM-GWMW01-1006	WATER	Nickel	18.2	J	40.0	2.0	ug/L
R4548-03	MM-GWMW01-1006	WATER	Potassium	2230	J	5000	27.3	ug/L
R4548-03	MM-GWMW01-1006	WATER	Sodium	12700		5000	217	ug/L
R4548-03	MM-GWMW01-1006	WATER	Vanadium	2.5	J	50.0	1.4	ug/L
R4548-03	MM-GWMW01-1006	WATER	Zinc	89.2		20.0	1.8	ug/L
C ID:	MM-GWMW05-100603							
R -02	MM-GWMW05-1006	WATER	Aluminum	6070		200	18.4	ug/L
R4548-02	MM-GWMW05-1006	WATER	Arsenic	7.7	J	10.0	4.0	ug/L
R4548-02	MM-GWMW05-1006	WATER	Barium	170	J	200	9.9	ug/L
R4548-02	MM-GWMW05-1006	WATER	Beryllium	0.36	J	5.0	0.10	ug/L
R4548-02	MM-GWMW05-1006	WATER	Calcium	43900		5000	36.2	ug/L
R4548-02	MM-GWMW05-1006	WATER	Chromium	44.8		10.0	1.4	ug/L
R4548-02	MM-GWMW05-1006	WATER	Cobalt	10.1	J	50.0	0.70	ug/L
R4548-02	MM-GWMW05-1006	WATER	Copper	15.8	J	25.0	3.6	ug/L
R4548-02	MM-GWMW05-1006	WATER	Iron	33800		100	22.2	ug/L
R4548-02	MM-GWMW05-1006	WATER	Lead	13.2		3.0	3.0	ug/L
R4548-02	MM-GWMW05-1006	WATER	Magnesium	14600		5000	7.0	ug/L
R4548-02	MM-GWMW05-1006	WATER	Manganese	5660		15.0	0.20	ug/L
R4548-02	MM-GWMW05-1006	WATER	Nickel	29.5	J	40.0	2.0	ug/L
R4548-02	MM-GWMW05-1006	WATER	Potassium	4740	J	5000	27.3	ug/L
R4548-02	MM-GWMW05-1006	WATER	Selenium	1.6	J	5.0	1.3	ug/L
R4548-02	MM-GWMW05-1006	WATER	Sodium	62900		5000	217	ug/L
R4548-02	MM-GWMW05-1006	WATER	Thallium	14.4		10.0	5.3	ug/L
R4548-02	MM-GWMW05-1006	WATER	Vanadium	15.9	J	50.0	1.4	ug/L
R4548-02	MM-GWMW05-1006	WATER	Zinc	34.0		20.0	1.8	ug/L

Hit Summary Report

SDG No.: R4548 **Order ID:** R4548

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Unit
Client ID:	MM-RA-2.5-3.0-100703							
R4548-08	MM-RA-2.5-3.0-100	SOIL	Phenanthrene	53	J	410	41	ug/
R4548-08	MM-RA-2.5-3.0-100	SOIL	Fluoranthene	55	J	410	41	ug/
R4548-08	MM-RA-2.5-3.0-100	SOIL	Pyrene	74	J	410	41	ug/
R4548-08	MM-RA-2.5-3.0-100	SOIL	bis(2-Ethylhexyl)phthalate	84	JB	410	41	ug/
			Total SVOC's:	266.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	266.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4548 **Order ID:** R4548

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Unit
Client ID:	MM-RA-2.5-3.0-100703							
R4548-08	MM-RA-2.5-3.0-100	SOIL	Phenanthrene	53	J	410	41	ug/l
R4548-08	MM-RA-2.5-3.0-100	SOIL	Fluoranthene	55	J	410	41	ug/l
R4548-08	MM-RA-2.5-3.0-100	SOIL	Pyrene	74	J	410	41	ug/l
R4548-08	MM-RA-2.5-3.0-100	SOIL	bis(2-Ethylhexyl)phthalate	84	JB	410	41	ug/l
			Total SVOC's:	266.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	266.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Sheet
SW-846

G No.: R4548 Order ID: R4548

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-GWMW07-100703							
R4548-05	MM-GWMW07-1007	WATER	Aluminum	52.0	J	200	18.4	ug/L
R4548-05	MM-GWMW07-1007	WATER	Barium	266		200	9.9	ug/L
R4548-05	MM-GWMW07-1007	WATER	Calcium	27100		5000	36.2	ug/L
R4548-05	MM-GWMW07-1007	WATER	Cobalt	1.1	J	50.0	0.70	ug/L
R4548-05	MM-GWMW07-1007	WATER	Iron	33.2	J	100	22.2	ug/L
R4548-05	MM-GWMW07-1007	WATER	Magnesium	74700		5000	7.0	ug/L
R4548-05	MM-GWMW07-1007	WATER	Manganese	63.4		15.0	0.20	ug/L
R4548-05	MM-GWMW07-1007	WATER	Nickel	8.2	J	40.0	2.0	ug/L
R4548-05	MM-GWMW07-1007	WATER	Potassium	6090		5000	27.3	ug/L
R4548-05	MM-GWMW07-1007	WATER	Sodium	57200		5000	217	ug/L
R4548-05	MM-GWMW07-1007	WATER	Zinc	24.0		20.0	1.8	ug/L
Client ID:	MM-GWMW08-100703							
R4548-04	MM-GWMW08-1007	WATER	Aluminum	975		200	18.4	ug/L
R4548-04	MM-GWMW08-1007	WATER	Barium	68.9	J	200	9.9	ug/L
R4548-04	MM-GWMW08-1007	WATER	Beryllium	0.10	J	5.0	0.10	ug/L
R4548-04	MM-GWMW08-1007	WATER	Calcium	23000		5000	36.2	ug/L
R[illegible]-04	MM-GWMW08-1007	WATER	Chromium	20.6		10.0	1.4	u[illegible]
R4548-04	MM-GWMW08-1007	WATER	Cobalt	8.7	J	50.0	0.70	u[illegible]
R4548-04	MM-GWMW08-1007	WATER	Copper	52.8		25.0	3.6	ug/L
R4548-04	MM-GWMW08-1007	WATER	Iron	3160		100	22.2	ug/L
R4548-04	MM-GWMW08-1007	WATER	Magnesium	66200		5000	7.0	ug/L
R4548-04	MM-GWMW08-1007	WATER	Manganese	174		15.0	0.20	ug/L
R4548-04	MM-GWMW08-1007	WATER	Mercury	0.26		0.20	0.20	ug/L
R4548-04	MM-GWMW08-1007	WATER	Nickel	89.9		40.0	2.0	ug/L
R4548-04	MM-GWMW08-1007	WATER	Potassium	3670	J	5000	27.3	ug/L
R4548-04	MM-GWMW08-1007	WATER	Selenium	3.5	J	5.0	1.3	ug/L
R4548-04	MM-GWMW08-1007	WATER	Sodium	36800		5000	217	ug/L
R4548-04	MM-GWMW08-1007	WATER	Vanadium	3.0	J	50.0	1.4	ug/L
R4548-04	MM-GWMW08-1007	WATER	Zinc	31.7		20.0	1.8	ug/L

Hit Summary Sheet
SW-846

G No.: R4548 Order ID: R4548

ent: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-RA-2.5-3.0-100703							
R4548-08	MM-RA-2.5-3.0-100	SOIL	Aluminum	15300		24.5	1.8	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Antimony	20.9		7.4	0.25	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Arsenic	6.5		1.2	0.26	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Barium	431		24.5	1.6	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Beryllium	0.26	J	0.61	0.16	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Cadmium	1.6		0.61	0.15	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Calcium	18200		613	2.0	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Chromium	35.0		1.2	0.23	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Cobalt	8.5		6.1	0.29	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Copper	2930		3.1	0.32	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Iron	30300		12.3	1.4	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Lead	354		0.37	0.29	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Magnesium	3890		613	2.1	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Manganese	562		1.8	0.16	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Mercury	0.06		0.01	0.01	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Nickel	32.1		4.9	0.93	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Potassium	1470		613	13.1	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Silver	9.0		1.2	0.33	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Sodium	2680		613	122	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Vanadium	25.0		6.1	0.28	mg/Kg
R4548-08	MM-RA-2.5-3.0-100	SOIL	Zinc	833		2.5	0.78	mg/Kg

Hit Summary Sheet
SW-846

J No.:	R4548	Order ID:	R4548
Client:	Tetra Tech FW Inc..	Project ID:	Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-GWMW01-100603							
R4548-10	MM-GWMW01-1006	WATER	Aluminum	56.8	J	200	18.4	ug/L
R4548-10	MM-GWMW01-1006	WATER	Barium	128	J	200	9.9	ug/L
R4548-10	MM-GWMW01-1006	WATER	Beryllium	0.11	J	5.0	0.10	ug/L
R4548-10	MM-GWMW01-1006	WATER	Calcium	20000		5000	36.2	ug/L
R4548-10	MM-GWMW01-1006	WATER	Chromium	2.4	J	10.0	1.4	ug/L
R4548-10	MM-GWMW01-1006	WATER	Cobalt	1.4	J	50.0	0.70	ug/L
R4548-10	MM-GWMW01-1006	WATER	Iron	55.0	J	100	22.2	ug/L
R4548-10	MM-GWMW01-1006	WATER	Magnesium	14000		5000	7.0	ug/L
R4548-10	MM-GWMW01-1006	WATER	Manganese	3.2	J	15.0	0.20	ug/L
R4548-10	MM-GWMW01-1006	WATER	Nickel	8.0	J	40.0	2.0	ug/L
R4548-10	MM-GWMW01-1006	WATER	Potassium	2180	J	5000	27.3	ug/L
R4548-10	MM-GWMW01-1006	WATER	Sodium	12900		5000	217	ug/L
R4548-10	MM-GWMW01-1006	WATER	Zinc	56.5		20.0	1.8	ug/L

CHEMTECH 284 Sheffield Street • Mountainside, NJ 07092 Phone: 908.789.8900 Fax: 908.789.8922

ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC.
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

CHEMTECH PROJECT NO. R4573
ATTENTION: Donald Campbell

A FULL SERVICE ENVIRONMENTAL LABORATORY

Hit Summary Sheet
SW-846

SDG No.: **R4573** Order ID: **R4573**

Client: **Tetra Tech FW Inc..** Project ID: **Magna Metals**

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-FB-100803**							
R4573-05	MM-FB-100803	WATER	Aluminum	20.5	J	200	18.4	ug/L
R4573-05	MM-FB-100803	WATER	Beryllium	0.11	J	5.0	0.10	ug/L
R4573-05	MM-FB-100803	WATER	Calcium	107	J	5000	36.2	ug/L
R4573-05	MM-FB-100803	WATER	Manganese	4.2	J	15.0	0.20	ug/L
R4573-05	MM-FB-100803	WATER	Zinc	9.2	J	20.0	1.8	ug/L
Client ID:	**MM-GWMW02-100803**							
R4573-02	MM-GWMW02-1008	WATER	Aluminum	278		200	18.4	ug/L
R4573-02	MM-GWMW02-1008	WATER	Barium	294		200	9.9	ug/L
R4573-02	MM-GWMW02-1008	WATER	Calcium	122000		5000	36.2	ug/L
R4573-02	MM-GWMW02-1008	WATER	Chromium	11.4		10.0	1.4	ug/L
R4573-02	MM-GWMW02-1008	WATER	Cobalt	5.9	J	50.0	0.70	ug/L
R4573-02	MM-GWMW02-1008	WATER	Copper	8.8	J	25.0	3.6	ug/L
R4573-02	MM-GWMW02-1008	WATER	Iron	346		100	22.2	ug/L
R4573-02	MM-GWMW02-1008	WATER	Magnesium	48900		5000	7.0	ug/L
R4573-02	MM-GWMW02-1008	WATER	Manganese	29.4		15.0	0.20	ug/L
R4573-02	MM-GWMW02-1008	WATER	Nickel	88.1		40.0	2.0	ug/L
73-02	MM-GWMW02-1008	WATER	Potassium	17100		5000	27.3	L
R4573-02	MM-GWMW02-1008	WATER	Selenium	30.8		5.0	1.3	L
R4573-02	MM-GWMW02-1008	WATER	Sodium	264000		5000	217	ug/L
R4573-02	MM-GWMW02-1008	WATER	Vanadium	1.8	J	50.0	1.4	ug/L
R4573-02	MM-GWMW02-1008	WATER	Zinc	150		20.0	1.8	ug/L

Hit Summary Sheet
SW-846

SDG No.: R4573 Order ID: R4573

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-GWMW04-100803**							
R4573-06	MM-GWMW04-1008	WATER	Aluminum	46900		200	18.4	ug/L
R4573-06	MM-GWMW04-1008	WATER	Arsenic	133		10.0	4.0	ug/L
R4573-06	MM-GWMW04-1008	WATER	Barium	1140		200	9.9	ug/L
R4573-06	MM-GWMW04-1008	WATER	Beryllium	5.6		5.0	0.10	ug/L
R4573-06	MM-GWMW04-1008	WATER	Calcium	72900		5000	36.2	ug/L
R4573-06	MM-GWMW04-1008	WATER	Chromium	139		10.0	1.4	ug/L
R4573-06	MM-GWMW04-1008	WATER	Cobalt	40.8	J	50.0	0.70	ug/L
R4573-06	MM-GWMW04-1008	WATER	Copper	240		25.0	3.6	ug/L
R4573-06	MM-GWMW04-1008	WATER	Iron	37200		100	22.2	ug/L
R4573-06	MM-GWMW04-1008	WATER	Lead	10.4		3.0	3.0	ug/L
R4573-06	MM-GWMW04-1008	WATER	Magnesium	38600		5000	7.0	ug/L
R4573-06	MM-GWMW04-1008	WATER	Manganese	6400		15.0	0.20	ug/L
R4573-06	MM-GWMW04-1008	WATER	Nickel	108		40.0	2.0	ug/L
R4573-06	MM-GWMW04-1008	WATER	Potassium	16900		5000	27.3	ug/L
R4573-06	MM-GWMW04-1008	WATER	Selenium	131		5.0	1.3	ug/L
R4573-06	MM-GWMW04-1008	WATER	Sodium	76900		5000	217	ug/L
R4573-06	MM-GWMW04-1008	WATER	Thallium	10.5		10.0	5.3	ug/L
R4573-06	MM-GWMW04-1008	WATER	Vanadium	72.2		50.0	1.4	ug/L
R4573-06	MM-GWMW04-1008	WATER	Zinc	78.1		20.0	1.8	ug/L
Client ID:	**MM-GWMW04D-100803**							
R4573-03	MM-GWMW04D-10	WATER	Aluminum	82.4	J	200	18.4	ug/L
R4573-03	MM-GWMW04D-10	WATER	Arsenic	6.9	J	10.0	4.0	ug/L
R4573-03	MM-GWMW04D-10	WATER	Barium	395		200	9.9	ug/L
R4573-03	MM-GWMW04D-10	WATER	Calcium	127000		5000	36.2	ug/L
R4573-03	MM-GWMW04D-10	WATER	Chromium	2.5	J	10.0	1.4	ug/L
R4573-03	MM-GWMW04D-10	WATER	Cobalt	5.5	J	50.0	0.70	ug/L
R4573-03	MM-GWMW04D-10	WATER	Iron	3810		100	22.2	ug/L
R4573-03	MM-GWMW04D-10	WATER	Magnesium	44300		5000	7.0	ug/L
R4573-03	MM-GWMW04D-10	WATER	Manganese	9500		15.0	0.20	ug/L
R4573-03	MM-GWMW04D-10	WATER	Nickel	15.8	J	40.0	2.0	ug/L
R4573-03	MM-GWMW04D-10	WATER	Potassium	11400		5000	27.3	ug/L
R4573-03	MM-GWMW04D-10	WATER	Selenium	30.4		5.0	1.3	ug/L
R4573-03	MM-GWMW04D-10	WATER	Sodium	126000		5000	217	ug/L
R4573-03	MM-GWMW04D-10	WATER	Thallium	8.6	J	10.0	5.3	ug/L

Hit Summary Sheet
SW-846

SDG No.: R4573 Order ID: R4573

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-GWMW05D-100803							
R4573-04	MM-GWMW05D-10	WATER	Aluminum	84.5	J	200	18.4	ug/L
R4573-04	MM-GWMW05D-10	WATER	Arsenic	4.8	J	10.0	4.0	ug/L
R4573-04	MM-GWMW05D-10	WATER	Barium	350		200	9.9	ug/L
R4573-04	MM-GWMW05D-10	WATER	Beryllium	0.13	J	5.0	0.10	ug/L
R4573-04	MM-GWMW05D-10	WATER	Calcium	113000		5000	36.2	ug/L
R4573-04	MM-GWMW05D-10	WATER	Chromium	2.0	J	10.0	1.4	ug/L
R4573-04	MM-GWMW05D-10	WATER	Cobalt	4.6	J	50.0	0.70	ug/L
R4573-04	MM-GWMW05D-10	WATER	Iron	3510		100	22.2	ug/L
R4573-04	MM-GWMW05D-10	WATER	Magnesium	39400		5000	7.0	ug/L
R4573-04	MM-GWMW05D-10	WATER	Manganese	8510		15.0	0.20	ug/L
R4573-04	MM-GWMW05D-10	WATER	Nickel	13.8	J	40.0	2.0	ug/L
R4573-04	MM-GWMW05D-10	WATER	Potassium	10000		5000	27.3	ug/L
R4573-04	MM-GWMW05D-10	WATER	Selenium	23.9		5.0	1.3	ug/L
R4573-04	MM-GWMW05D-10	WATER	Sodium	111000		5000	217	ug/L
R4573-04	MM-GWMW05D-10	WATER	Thallium	8.3	J	10.0	5.3	ug/L
R4573-04	MM-GWMW05D-10	WATER	Zinc	4.3	J	20.0	1.8	ug/L

Hit Summary Sheet
SW-846

SDG No.: R4573 Order ID: R4573

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-GWMW04-100803							
R4573-07	MM-GWMW04-1008	WATER	Aluminum	18000		200	18.4	ug/L
R4573-07	MM-GWMW04-1008	WATER	Arsenic	46.8		10.0	4.0	ug/L
R4573-07	MM-GWMW04-1008	WATER	Barium	545		200	9.9	ug/L
R4573-07	MM-GWMW04-1008	WATER	Beryllium	2.2	J	5.0	0.10	ug/L
R4573-07	MM-GWMW04-1008	WATER	Calcium	64000		5000	36.2	ug/L
R4573-07	MM-GWMW04-1008	WATER	Chromium	47.8		10.0	1.4	ug/L
R4573-07	MM-GWMW04-1008	WATER	Cobalt	20.2	J	50.0	0.70	ug/L
R4573-07	MM-GWMW04-1008	WATER	Copper	94.5		25.0	3.6	ug/L
R4573-07	MM-GWMW04-1008	WATER	Iron	14300		100	22.2	ug/L
R4573-07	MM-GWMW04-1008	WATER	Lead	4.6		3.0	3.0	ug/L
R4573-07	MM-GWMW04-1008	WATER	Magnesium	27300		5000	7.0	ug/L
R4573-07	MM-GWMW04-1008	WATER	Manganese	5810		15.0	0.20	ug/L
R4573-07	MM-GWMW04-1008	WATER	Nickel	47.6		40.0	2.0	ug/L
R4573-07	MM-GWMW04-1008	WATER	Potassium	11200		5000	27.3	ug/L
R4573-07	MM-GWMW04-1008	WATER	Selenium	71.1		5.0	1.3	ug/L
R4573-07	MM-GWMW04-1008	WATER	Sodium	77800		5000	217	ug/L
R4573-07	MM-GWMW04-1008	WATER	Vanadium	27.0	J	50.0	1.4	ug/L
R4573-07	MM-GWMW04-1008	WATER	Zinc	28.0		20.0	1.8	ug/L

Summary Sheet
SW-846

SDG No.: R4573 **Order ID:** R4573

Client: Tetra Tech FW Inc.. **Project ID:** FOST03

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Unit
Client ID:	**MM-GWMW02-100803**							
R4573-02	MM-GWMW02-1008	WATER	Trichloroethene	9.4		5.0	0.72	ug/
			Total VOC's:	9.40				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	9.40				
Client ID:	**MM-GWMW04-100803**							
R4573-06	MM-GWMW04-1008	WATER	cis-1,2-Dichloroethene	7.7		5.0	0.62	ug/
R4573-06	MM-GWMW04-1008	WATER	Trichloroethene	910	E	5.0	0.72	ug/
R4573-06	MM-GWMW04-1008	WATER	Tetrachloroethene	13		5.0	0.70	ug/
			Total VOC's:	930.70				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	930.70				
Client ID:	**MM-GWMW04-100803DL**							
R4573-06DL	MM-GWMW04-1008	WATER	Trichloroethene	910	D	50	7.2	ug/
			Total VOC's:	910.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	910.00				
Client ID:	**MM-GWMW04D-100803**							
R4573-03	MM-GWMW04D-10	WATER	cis-1,2-Dichloroethene	4.9	J	5.0	0.62	ug/
R4573-03	MM-GWMW04D-10	WATER	Trichloroethene	810	E	5.0	0.72	ug/
R4573-03	MM-GWMW04D-10	WATER	Tetrachloroethene	13		5.0	0.70	ug/
			Total VOC's:	827.90				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	827.90				
Client ID:	**MM-GWMW04D-100803DL**							
R4573-03DL	MM-GWMW04D-10	WATER	Trichloroethene	870	D	50	7.2	ug/
			Total VOC's:	870.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	870.00				
Client ID:	**MM-GWMW05D-100803**							
R4573-04	MM-GWMW05D-10	WATER	cis-1,2-Dichloroethene	5.5		5.0	0.62	ug/
R4573-04	MM-GWMW05D-10	WATER	Trichloroethene	830	E	5.0	0.72	ug/
R4573-04	MM-GWMW05D-10	WATER	Tetrachloroethene	14		5.0	0.70	ug/
			Total VOC's:	849.50				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	849.50				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Summary Sheet
SW-846

SDG No.: R4573 **Order ID:** R4573

Client: Tetra Tech FW Inc.. **Project ID:** FOST03

Sample ID / Client ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Unit
Client ID:	MM-GWMW05D-100803DL							
R4573-04DL	MM-GWMW05D-10	WATER	Trichloroethene	870	D	50	7.2	ug/l
			Total VOC's:	870.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	870.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

CHEMTECH 284 Sheffield Street • Mountainside, NJ 07092 Phone: 908.789.8900 Fax: 908.789.8922

ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

A FULL SERVICE ENVIRONMENTAL LABORATORY

CHEMTECH PROJECT NO. R4604
ATTENTION: Donald Campbell

Summary Sheet
SW-846

SDG No.: R4604 **Order ID:** R4604

Client: Tetra Tech FW Inc.. **Project ID:** FOST03

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP06A-101003**							
R4604-01	MM-LP06A-101003	SOIL	Acetone	9.9	J	31	4.4	ug/k
R4604-01	MM-LP06A-101003	SOIL	Trichloroethene	1.7	J	6.2	1.2	ug/k
			Total VOC's:	11.60				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	11.60				
Client ID:	**MM-LP06A-1010032-2.5**							
R4604-02	MM-LP06A-1010032	SOIL	Trichloroethene	18		9.8	2.0	ug/k
			Total VOC's:	18.00				
			Total TIC's:	0.00				
			Total VOC's and TIC's:	18.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: R4604 **Order ID:** R4604

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-TCL BNA

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-LP06A-101003**							
R4604-01	MM-LP06A-101003	SOIL	Phenanthrene	38	J	330	33	ug/K
R4604-01	MM-LP06A-101003	SOIL	Di-n-butylphthalate	75	J	330	39	ug/K
R4604-01	MM-LP06A-101003	SOIL	Fluoranthene	72	J	330	33	ug/K
R4604-01	MM-LP06A-101003	SOIL	Pyrene	64	J	330	33	ug/K
R4604-01	MM-LP06A-101003	SOIL	Benzo(a)anthracene	41	J	330	33	ug/K
R4604-01	MM-LP06A-101003	SOIL	bis(2-Ethylhexyl)phthalate	310	JB	330	33	ug/K
R4604-01	MM-LP06A-101003	SOIL	Benzo(b)fluoranthene	50	J	330	33	ug/K
			Total SVOC's:	650.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	650.00				
Client ID:	**MM-LP06A-1010032-2.5**							
R4604-02	MM-LP06A-1010032	SOIL	bis(2-Ethylhexyl)phthalate	790	B	330	33	ug/K
			Total SVOC's:	790.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	790.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Sheet
SW-846

)G No.: R4604 Order ID: R4604

Client: Camp Dresser & McKee Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-LP06A-101003							
R4604-01	MM-LP06A-101003	SOIL	Aluminum	10500		25.1	1.8	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Arsenic	29.3		1.3	0.26	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Barium	67.3		25.1	1.6	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Beryllium	0.37	J	0.63	0.16	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Calcium	3950		627	2.0	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Chromium	440		1.3	0.24	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Cobalt	16.3		6.3	0.30	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Copper	3580		3.1	0.33	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Iron	14100		12.5	1.4	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Lead	39.5		0.38	0.30	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Magnesium	3370		627	2.2	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Manganese	330		1.9	0.16	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Mercury	0.15		0.01	0.01	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Nickel	2940		5.0	0.95	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Potassium	607	J	627	13.4	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Selenium	80.1		0.63	0.53	mg/Kg
)4-01	MM-LP06A-101003	SOIL	Silver	0.88	J	1.3	0.34	mg/Kg
4-01	MM-LP06A-101003	SOIL	Sodium	303	J	627	125	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Vanadium	21.4		6.3	0.29	mg/Kg
R4604-01	MM-LP06A-101003	SOIL	Zinc	2100		2.5	0.80	mg/Kg
Client ID:	MM-LP06A-1010032-2.5							
R4604-02	MM-LP06A-1010032	SOIL	Aluminum	8730		39.3	2.8	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Arsenic	609		2.0	0.41	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Barium	111		39.3	2.5	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Cadmium	7.2		0.98	0.24	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Calcium	3550		982	3.2	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Chromium	5050		2.0	0.37	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Cobalt	34.0		9.8	0.47	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Copper	15000		24.6	2.6	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Iron	18700		19.6	2.2	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Lead	279		0.59	0.47	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Magnesinm	2870		982	3.4	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Manganese	344		2.9	0.26	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Mercury	0.50		0.02	0.02	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Nickel	23200		39.3	7.5	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Potassium	402	J	982	21.0	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Selenium	733		0.98	0.83	mg/Kg
)4-02	MM-LP06A-1010032	SOIL	Silver	1.3	J	2.0	0.53	mg/Kg
4-02	MM-LP06A-1010032	SOIL	Sodium	964	J	982	196	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Thallium	8.1		2.0	0.61	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Vanadium	17.0		9.8	0.45	mg/Kg
R4604-02	MM-LP06A-1010032	SOIL	Zinc	8570		3.9	1.3	mg/Kg

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ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

CHEMTECH PROJECT NO. S1950
ATTENTION: Donald Campbell

Hit Summary Sheet
SW-846

SDG No.: S1950 Order ID: S1950

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SW13-032904							
S1950-01	MM-SW13-032904	WATER	Aluminum	366		200	180	ug/L
S1950-01	MM-SW13-032904	WATER	Barium	53.5	J	200	11.0	ug/L
S1950-01	MM-SW13-032904	WATER	Calcium	32700		5000	1740	ug/L
S1950-01	MM-SW13-032904	WATER	Iron	327		100	29.0	ug/L
S1950-01	MM-SW13-032904	WATER	Magnesium	20200		5000	254	ug/L
S1950-01	MM-SW13-032904	WATER	Manganese	73.8		15.0	0.20	ug/L
S1950-01	MM-SW13-032904	WATER	Potassium	2940	J	5000	51.0	ug/L
S1950-01	MM-SW13-032904	WATER	Sodium	43000		5000	189	ug/L
Client ID:	MM-SW14-032904							
S1950-02	MM-SW14-032904	WATER	Aluminum	690		200	180	ug/L
S1950-02	MM-SW14-032904	WATER	Barium	79.0	J	200	11.0	ug/L
S1950-02	MM-SW14-032904	WATER	Calcium	35000		5000	1740	ug/L
S1950-02	MM-SW14-032904	WATER	Chromium	1.3	J	10.0	1.2	ug/L
S1950-02	MM-SW14-032904	WATER	Copper	57.6		25.0	0.74	ug/L
S1950-02	MM-SW14-032904	WATER	Iron	1670		100	29.0	ug/L
S1950-02	MM-SW14-032904	WATER	Magnesium	21400		5000	254	ug/L
S1950-02	MM-SW14-032904	WATER	Manganese	234		15.0	0.20	ug/L
S1950-02	MM-SW14-032904	WATER	Nickel	24.8	J	40.0	5.5	ug/L
S1950-02	MM-SW14-032904	WATER	Potassium	3130	J	5000	51.0	ug/L
S1950-02	MM-SW14-032904	WATER	Sodium	38300		5000	189	ug/L
S1950-02	MM-SW14-032904	WATER	Zinc	23.7		20.0	8.1	ug/L
Client ID:	MM-SW15-032904							
S1950-03	MM-SW15-032904	WATER	Aluminum	328		200	180	ug/L
S1950-03	MM-SW15-032904	WATER	Barium	105	J	200	11.0	ug/L
S1950-03	MM-SW15-032904	WATER	Calcium	31000		5000	1740	ug/L
S1950-03	MM-SW15-032904	WATER	Iron	212		100	29.0	ug/L
S1950-03	MM-SW15-032904	WATER	Magnesium	30100		5000	254	ug/L
S1950-03	MM-SW15-032904	WATER	Manganese	118		15.0	0.20	ug/L
S1950-03	MM-SW15-032904	WATER	Nickel	20.9	J	40.0	5.5	ug/L
S1950-03	MM-SW15-032904	WATER	Potassium	2990	J	5000	51.0	ug/L
S1950-03	MM-SW15-032904	WATER	Sodium	67000		5000	189	ug/L
S1950-03	MM-SW15-032904	WATER	Zinc	11.5	J	20.0	8.1	ug/L

Hit Summary Sheet
SW-846

SDG No.: S1950 Order ID: S1950

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SW16-032904							
S1950-04	MM-SW16-032904	WATER	Aluminum	316		200	180	ug/L
S1950-04	MM-SW16-032904	WATER	Barium	99.7	J	200	11.0	ug/L
S1950-04	MM-SW16-032904	WATER	Calcium	29100		5000	1740	ug/L
S1950-04	MM-SW16-032904	WATER	Iron	205		100	29.0	ug/L
S1950-04	MM-SW16-032904	WATER	Magnesium	28200		5000	254	ug/L
S1950-04	MM-SW16-032904	WATER	Manganese	112		15.0	0.20	ug/L
S1950-04	MM-SW16-032904	WATER	Nickel	19.9	J	40.0	5.5	ug/L
S1950-04	MM-SW16-032904	WATER	Potassium	2700	J	5000	51.0	ug/L
S1950-04	MM-SW16-032904	WATER	Sodium	62100		5000	189	ug/L
S1950-04	MM-SW16-032904	WATER	Zinc	14.4	J	20.0	8.1	ug/L
Client ID:	MM-SW17-032904							
S1950-05	MM-SW17-032904	WATER	Aluminum	282		200	180	ug/L
S1950-05	MM-SW17-032904	WATER	Barium	82.2	J	200	11.0	ug/L
S1950-05	MM-SW17-032904	WATER	Calcium	25000		5000	1740	ug/L
S1950-05	MM-SW17-032904	WATER	Chromium	2.2	J	10.0	1.2	ug/L
S1950-05	MM-SW17-032904	WATER	Iron	107		100	29.0	ug/L
S1950-05	MM-SW17-032904	WATER	Magnesium	23500		5000	254	ug/L
S1950-05	MM-SW17-032904	WATER	Manganese	35.2		15.0	0.20	ug/L
S1950-05	MM-SW17-032904	WATER	Nickel	12.5	J	40.0	5.5	ug/L
S1950-05	MM-SW17-032904	WATER	Potassium	2360	J	5000	51.0	ug/L
S1950-05	MM-SW17-032904	WATER	Sodium	61500		5000	189	ug/L
S1950-05	MM-SW17-032904	WATER	Zinc	13.0	J	20.0	8.1	ug/L
Client ID:	MM-SW18-032904							
S1950-06	MM-SW18-032904	WATER	Aluminum	342		200	180	ug/L
S1950-06	MM-SW18-032904	WATER	Barium	132	J	200	11.0	ug/L
S1950-06	MM-SW18-032904	WATER	Calcium	31100		5000	1740	ug/L
S1950-06	MM-SW18-032904	WATER	Iron	583		100	29.0	ug/L
S1950-06	MM-SW18-032904	WATER	Magnesium	55200		5000	254	ug/L
S1950-06	MM-SW18-032904	WATER	Manganese	134		15.0	0.20	ug/L
S1950-06	MM-SW18-032904	WATER	Nickel	16.0	J	40.0	5.5	ug/L
S1950-06	MM-SW18-032904	WATER	Potassium	5140		5000	51.0	ug/L
S1950-06	MM-SW18-032904	WATER	Sodium	38900		5000	189	ug/L
S1950-06	MM-SW18-032904	WATER	Zinc	10.6	J	20.0	8.1	ug/L

Hit Summary Sheet
SW-846

SDG No.: S1950
Client: Tetra Tech FW Inc..
Order ID: S1950
Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-SW18D-032904**							
S1950-13	MM-SW18D-032904	WATER	Aluminum	383		200	180	ug/L
S1950-13	MM-SW18D-032904	WATER	Barium	141	J	200	11.0	ug/L
S1950-13	MM-SW18D-032904	WATER	Calcium	32100		5000	1740	ug/L
S1950-13	MM-SW18D-032904	WATER	Iron	903		100	29.0	ug/L
S1950-13	MM-SW18D-032904	WATER	Magnesium	56500		5000	254	ug/L
S1950-13	MM-SW18D-032904	WATER	Manganese	157		15.0	0.20	ug/L
S1950-13	MM-SW18D-032904	WATER	Nickel	19.4	J	40.0	5.5	ug/L
S1950-13	MM-SW18D-032904	WATER	Potassium	5400		5000	51.0	ug/L
S1950-13	MM-SW18D-032904	WATER	Sodium	40500		5000	189	ug/L
S1950-13	MM-SW18D-032904	WATER	Zinc	16.8	J	20.0	8.1	ug/L
Client ID:	**MM-SW19-032904**							
S1950-07	MM-SW19-032904	WATER	Aluminum	728		200	180	ug/L
S1950-07	MM-SW19-032904	WATER	Barium	119	J	200	11.0	ug/L
S1950-07	MM-SW19-032904	WATER	Calcium	32900		5000	1740	ug/L
S1950-07	MM-SW19-032904	WATER	Chromium	2.6	J	10.0	1.2	ug/L
S1950-07	MM-SW19-032904	WATER	Copper	22.6	J	25.0	0.74	ug/L
S1950-07	MM-SW19-032904	WATER	Iron	2180		100	29.0	ug/L
S1950-07	MM-SW19-032904	WATER	Magnesium	27000		5000	254	ug/L
S1950-07	MM-SW19-032904	WATER	Manganese	499		15.0	0.20	ug/L
S1950-07	MM-SW19-032904	WATER	Nickel	22.4	J	40.0	5.5	ug/L
S1950-07	MM-SW19-032904	WATER	Potassium	3910	J	5000	51.0	ug/L
S1950-07	MM-SW19-032904	WATER	Sodium	48400		5000	189	ug/L
S1950-07	MM-SW19-032904	WATER	Vanadium	2.0	J	50.0	1.9	ug/L
S1950-07	MM-SW19-032904	WATER	Zinc	57.3		20.0	8.1	ug/L
Client ID:	**MM-SW20-032904**							
S1950-08	MM-SW20-032904	WATER	Aluminum	358		200	180	ug/L
S1950-08	MM-SW20-032904	WATER	Barium	74.6	J	200	11.0	ug/L
S1950-08	MM-SW20-032904	WATER	Calcium	30500		5000	1740	ug/L
S1950-08	MM-SW20-032904	WATER	Iron	363		100	29.0	ug/L
S1950-08	MM-SW20-032904	WATER	Magnesium	25800		5000	254	ug/L
S1950-08	MM-SW20-032904	WATER	Manganese	93.9		15.0	0.20	ug/L
S1950-08	MM-SW20-032904	WATER	Nickel	7.0	J	40.0	5.5	ug/L
S1950-08	MM-SW20-032904	WATER	Potassium	3140	J	5000	51.0	ug/L
S1950-08	MM-SW20-032904	WATER	Sodium	48500		5000	189	ug/L
S1950-08	MM-SW20-032904	WATER	Zinc	9.3	J	20.0	8.1	ug/L

Hit Summary Sheet
SW-846

SDG No.: S1950 Order ID: S1950

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SW21-032904							
S1950-09	MM-SW21-032904	WATER	Aluminum	725		200	180	ug/L
S1950-09	MM-SW21-032904	WATER	Barium	185	J	200	11.0	ug/L
S1950-09	MM-SW21-032904	WATER	Calcium	32400		5000	1740	ug/L
S1950-09	MM-SW21-032904	WATER	Chromium	3.4	J	10.0	1.2	ug/L
S1950-09	MM-SW21-032904	WATER	Cobalt	2.8	J	50.0	2.4	ug/L
S1950-09	MM-SW21-032904	WATER	Copper	5.5	J	25.0	0.74	ug/L
S1950-09	MM-SW21-032904	WATER	Iron	4790		100	29.0	ug/L
S1950-09	MM-SW21-032904	WATER	Lead	3.5	J	5.0	1.8	ug/L
S1950-09	MM-SW21-032904	WATER	Magnesium	49700		5000	254	ug/L
S1950-09	MM-SW21-032904	WATER	Manganese	319		15.0	0.20	ug/L
S1950-09	MM-SW21-032904	WATER	Nickel	29.9	J	40.0	5.5	ug/L
S1950-09	MM-SW21-032904	WATER	Potassium	5000	J	5000	51.0	ug/L
S1950-09	MM-SW21-032904	WATER	Sodium	36100		5000	189	ug/L
S1950-09	MM-SW21-032904	WATER	Thallium	6.9	J	10.0	5.8	ug/L
S1950-09	MM-SW21-032904	WATER	Vanadium	2.0	J	50.0	1.9	ug/L
S1950-09	MM-SW21-032904	WATER	Zinc	27.4		20.0	8.1	ug/L
ent ID:	MM-SW22-032904							
50-10	MM-SW22-032904	WATER	Aluminum	381		200	180	
S1950-10	MM-SW22-032904	WATER	Arsenic	6.9	J	10.0	4.8	ug/L
S1950-10	MM-SW22-032904	WATER	Barium	33.4	J	200	11.0	ug/L
S1950-10	MM-SW22-032904	WATER	Calcium	10600		5000	1740	ug/L
S1950-10	MM-SW22-032904	WATER	Chromium	26.7		10.0	1.2	ug/L
S1950-10	MM-SW22-032904	WATER	Cobalt	5.1	J	50.0	2.4	ug/L
S1950-10	MM-SW22-032904	WATER	Copper	772		25.0	0.74	ug/L
S1950-10	MM-SW22-032904	WATER	Iron	2020		100	29.0	ug/L
S1950-10	MM-SW22-032904	WATER	Magnesium	5680		5000	254	ug/L
S1950-10	MM-SW22-032904	WATER	Manganese	244		15.0	0.20	ug/L
S1950-10	MM-SW22-032904	WATER	Nickel	161		40.0	5.5	ug/L
S1950-10	MM-SW22-032904	WATER	Potassium	828	J	5000	51.0	ug/L
S1950-10	MM-SW22-032904	WATER	Selenium	8.7	J	10.0	5.2	ug/L
S1950-10	MM-SW22-032904	WATER	Sodium	12100		5000	189	ug/L
S1950-10	MM-SW22-032904	WATER	Zinc	343		20.0	8.1	ug/L

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ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

CHEMTECH PROJECT NO. S2003
ATTENTION: Donald Campbell

Hit Summary Report

SDG No.: S2003-01 Order ID: S2003

lient: Tetra Tech FW Inc.. Project ID: Magna Metals

Test: SVOC-PAH

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SD15-033004							
S2003-03	MM-SD15-033004	SOIL	Phenanthrene	590	J	1300	29	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Fluoranthene	1400		1300	18	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Pyrene	1300		1300	23	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Benzo(a)anthracene	470	J	1300	20	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Chrysene	650	J	1300	41	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Benzo(b)fluoranthene	1200	J	1300	69	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Benzo(k)fluoranthene	600	J	1300	45	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Benzo(a)pyrene	660	J	1300	22	ug/Kg
S2003-03	MM-SD15-033004	SOIL	Benzo(g,h,i)perylene	220	J	1300	57	ug/Kg
			Total SVOC's:	7090.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	7090.00				
Client ID:	MM-SD15-033004RE							
S2003-03RE	MM-SD15-033004R	SOIL	Phenanthrene	600	J	1300	29	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Fluoranthene	1400		1300	18	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Pyrene	1200	J	1300	23	ug/Kg
3-03RE	MM-SD15-033004R	SOIL	Benzo(a)anthracene	480	J	1300	20	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Chrysene	670	J	1300	41	u
S2003-03RE	MM-SD15-033004R	SOIL	Benzo(b)fluoranthene	980	J	1300	69	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Benzo(k)fluoranthene	670	J	1300	45	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Benzo(a)pyrene	640	J	1300	22	ug/Kg
S2003-03RE	MM-SD15-033004R	SOIL	Benzo(g,h,i)perylene	270	J	1300	57	ug/Kg
			Total SVOC's:	6910.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	6910.00				
Client ID:	MM-SD16-033004							
S2003-04	MM-SD16-033004	SOIL	Phenanthrene	190	J	730	16	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Fluoranthene	410	J	730	10	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Pyrene	380	J	730	13	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Benzo(a)anthracene	140	J	730	11	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Chrysene	190	J	730	23	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Benzo(b)fluoranthene	260	J	730	39	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Benzo(k)fluoranthene	190	J	730	25	ug/Kg
S2003-04	MM-SD16-033004	SOIL	Benzo(a)pyrene	190	J	730	13	ug/Kg
			Total SVOC's:	1950.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	1950.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: S2003-01 Order ID: S2003

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Test: SVOC-PAH

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SD16-033004RE							
S2003-04RE	MM-SD16-033004R	SOIL	Phenanthrene	190	J	730	16	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Fluoranthene	410	J	730	10	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Pyrene	410	J	730	13	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Benzo(a)anthracene	150	J	730	11	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Chrysene	190	J	730	23	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Benzo(b)fluoranthene	260	J	730	39	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Benzo(k)fluoranthene	220	J	730	25	ug/Kg
S2003-04RE	MM-SD16-033004R	SOIL	Benzo(a)pyrene	190	J	730	13	ug/Kg
			Total SVOC's:	2020.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	2020.00				
Client ID:	MM-SD17-033104							
S2003-05	MM-SD17-033104	SOIL	Fluorene	70	J	440	13	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Phenanthrene	900		440	9.9	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Anthracene	200	J	440	11	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Fluoranthene	1300		440	6.2	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Pyrene	1000		440	7.9	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Benzo(a)anthracene	470		440	6.7	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Chrysene	490		440	14	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Benzo(b)fluoranthene	670		440	24	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Benzo(k)fluoranthene	380	J	440	15	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Benzo(a)pyrene	430	J	440	7.6	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Indeno(1,2,3-cd)pyrene	48	J	440	11	ug/Kg
S2003-05	MM-SD17-033104	SOIL	Benzo(g,h,i)perylene	150	J	440	19	ug/Kg
			Total SVOC's:	6108.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	6108.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Report

SDG No.: S2003-01 Order ID: S2003

ient: Tetra Tech FW Inc.. Project ID: Magna Metals

Test: SVOC-PAH

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-SD17-033104RE**							
S2003-05RE	MM-SD17-033104R	SOIL	Fluorene	68	J	440	13	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Phenanthrene	880		440	9.9	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Anthracene	190	J	440	11	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Fluoranthene	1200		440	6.2	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Pyrene	1300		440	7.9	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Benzo(a)anthracene	450		440	6.7	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Chrysene	490		440	14	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Benzo(b)fluoranthene	680		440	24	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Benzo(k)fluoranthene	500		440	15	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Benzo(a)pyrene	450		440	7.6	ug/Kg
S2003-05RE	MM-SD17-033104R	SOIL	Benzo(g,h,i)perylene	160	J	440	19	ug/Kg
			Total SVOC's:	6368.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	6368.00				
Client ID:	**MM-SD18-033104**							
S2003-06	MM-SD18-033104	SOIL	Phenanthrene	170	J	1500	35	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Fluoranthene	410	J	1500	22	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Pyrene	380	J	1500	28	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Benzo(a)anthracene	160	J	1500	23	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Chrysene	180	J	1500	49	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Benzo(b)fluoranthene	260	J	1500	83	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Benzo(k)fluoranthene	220	J	1500	53	ug/Kg
S2003-06	MM-SD18-033104	SOIL	Benzo(a)pyrene	220	J	1500	27	ug/Kg
			Total SVOC's:	2000.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	2000.00				
Client ID:	**MM-SD18D-033104**							
S2003-11	MM-SD18D-033104	SOIL	Fluoranthene	180	J	1700	24	ug/Kg
			Total SVOC's:	180.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	180.00				
Client ID:	**MM-SD19A-033104**							
S2003-12	MM-SD19A-033104	SOIL	Fluoranthene	250	J	2200	30	ug/Kg
S2003-12	MM-SD19A-033104	SOIL	Pyrene	220	J	2200	39	ug/Kg
			Total SVOC's:	470.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	470.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

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ANALYTICAL RESULTS SUMMARY

PROJECT NAME: Magna Metals

TETRA TECH FW INC..
1000 AMERICAN ROAD
MORRIS PLAINS, NJ 07950
9736308000

CHEMTECH PROJECT NO. **S2041**
ATTENTION: **Donald Campbell**

Hit Summary Report

SDG No.: S2041 **Order ID:** S2041

Client: Tetra Tech FW Inc.. **Project ID:** Magna Metals

Test: SVOC-PAH

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	**MM-SD23-040304**							
S2041-03	MM-SD23-040304	SOIL	Phenanthrene	450	J	2700	61	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Fluoranthene	1000	J	2700	38	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Pyrene	790	J	2700	49	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Benzo(a)anthracene	360	J	2700	42	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Chrysene	510	J	2700	87	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Benzo(b)fluoranthene	680	J	2700	150	ug/Kg
S2041-03	MM-SD23-040304	SOIL	Benzo(a)pyrene	410	J	2700	47	ug/Kg
			Total SVOC's:	4200.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	4200.00				
Client ID:	**MM-SD25-040304**							
S2041-05	MM-SD25-040304	SOIL	Phenanthrene	80	J	550	12	ug/Kg
S2041-05	MM-SD25-040304	SOIL	Fluoranthene	160	J	550	7.7	ug/Kg
S2041-05	MM-SD25-040304	SOIL	Pyrene	120	J	550	9.8	ug/Kg
S2041-05	MM-SD25-040304	SOIL	Chrysene	71	J	550	17	ug/Kg
S2041-05	MM-SD25-040304	SOIL	Benzo(b)fluoranthene	76	J	550	29	ug/Kg
			Total SVOC's:	507.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	507.00				
Client ID:	**MM-SD26-040304**							
S2041-06	MM-SD26-040304	SOIL	Phenanthrene	130	J	590	13	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Fluoranthene	280	J	590	8.2	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Pyrene	220	J	590	11	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Benzo(a)anthracene	100	J	590	8.9	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Chrysene	150	J	590	19	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Benzo(b)fluoranthene	180	J	590	31	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Benzo(k)fluoranthene	85	J	590	20	ug/Kg
S2041-06	MM-SD26-040304	SOIL	Benzo(a)pyrene	120	J	590	10	ug/Kg
			Total SVOC's:	1265.00				
			Total TIC's:	0.00				
			Total SVOC's and TIC's:	1265.00				

Note: The asterisk "*" flag next to a parameter signifies a TIC parameter.

Hit Summary Sheet
SW-846

SDG No.: S2041 Order ID: S2041

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SD21-040304							
S2041-01	MM-SD21-040304	SOIL	Aluminum	15800		230	7.2	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Barium	374		230	0.25	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Beryllium	0.99	J	5.7	0.05	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Calcium	13600		5750	4.0	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Chromium	60.5		11.5	1.1	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Cobalt	34.7	J	57.5	0.91	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Copper	403		28.7	1.3	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Iron	30100		115	20.3	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Lead	112		5.7	1.2	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Magnesium	8620		5750	0.18	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Manganese	735		17.2	9.2	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Mercury	0.22		0.11	0.06	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Nickel	180		46.0	1.7	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Potassium	1460	J	5750	37.8	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Selenium	12.4		11.5	3.6	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Vanadium	38.0	J	57.5	1.2	mg/Kg
S2041-01	MM-SD21-040304	SOIL	Zinc	191		23.0	0.64	mg/Kg
t ID:	MM-SD22-040304							
S2041-02	MM-SD22-040304	SOIL	Aluminum	18000		225	7.1	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Barium	391		225	0.25	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Beryllium	1.1	J	5.6	0.04	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Calcium	10600		5620	3.9	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Chromium	78.3		11.2	1.1	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Cobalt	39.8	J	56.2	0.89	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Copper	415		28.1	1.3	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Iron	35300		112	19.8	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Lead	53.9		5.6	1.2	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Magnesium	10600		5620	0.18	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Manganese	693		16.9	9.0	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Mercury	0.25		0.11	0.06	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Nickel	170		44.9	1.7	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Potassium	1970	J	5620	37.0	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Selenium	7.7	J	11.2	3.5	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Sodium	471	J	5620	418	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Vanadium	44.7	J	56.2	1.1	mg/Kg
S2041-02	MM-SD22-040304	SOIL	Zinc	195		22.5	0.63	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: S2041 | Order ID: S2041

Client: Tetra Tech FW Inc.. | Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SD23-040304							
S2041-03	MM-SD23-040304	SOIL	Aluminum	12000		172	5.4	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Barium	278		172	0.19	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Beryllium	0.74	J	4.3	0.03	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Calcium	11600		4310	3.0	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Chromium	73.7		8.6	0.82	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Cobalt	32.4	J	43.1	0.68	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Copper	194		21.6	0.98	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Iron	26600		86.2	15.2	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Lead	48.7		4.3	0.89	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Magnesium	12400		4310	0.14	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Manganese	525		12.9	6.9	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Mercury	0.14		0.09	0.05	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Nickel	155		34.5	1.3	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Potassium	1440	J	4310	28.4	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Selenium	6.7	J	8.6	2.7	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Sodium	490	J	4310	320	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Vanadium	31.0	J	43.1	0.88	mg/Kg
S2041-03	MM-SD23-040304	SOIL	Zinc	270		17.2	0.48	mg/Kg
Client ID:	MM-SD24-040304							
S2041-04	MM-SD24-040304	SOIL	Aluminum	14400		228	7.2	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Barium	331		228	0.25	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Beryllium	1.0	J	5.7	0.05	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Calcium	10400		5690	4.0	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Chromium	76.3		11.4	1.1	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Cobalt	39.7	J	56.9	0.90	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Copper	216		28.5	1.3	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Iron	34700		114	20.1	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Lead	42.2		5.7	1.2	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Magnesium	10800		5690	0.18	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Manganese	338		17.1	9.1	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Mercury	0.20		0.11	0.07	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Nickel	161		45.5	1.7	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Potassium	1500	J	5690	37.4	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Selenium	4.7	J	11.4	3.6	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Vanadium	42.0	J	56.9	1.2	mg/Kg
S2041-04	MM-SD24-040304	SOIL	Zinc	170		22.8	0.64	mg/Kg

Hit Summary Sheet
SW-846

SDG No.: S2041 Order ID: S2041

Client: Tetra Tech FW Inc.. Project ID: Magna Metals

Sample ID	Client ID	Matrix	Parameter	Concentration	C	RDL	MDL	Units
Client ID:	MM-SD25-040304							
S2041-05	MM-SD25-040304	SOIL	Aluminum	3310		33.6	1.1	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Barium	65.3		33.6	0.04	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Beryllium	0.17	J	0.84	0.01	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Calcium	2170		839	0.59	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Chromium	81.2		1.7	0.16	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Cobalt	26.7		8.4	0.13	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Copper	137		4.2	0.19	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Iron	17500		16.8	3.0	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Lead	10.1		0.84	0.17	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Magnesium	18600		839	0.03	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Manganese	301		2.5	1.3	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Mercury	0.02		0.02	0.01	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Nickel	149		6.7	0.25	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Potassium	324	J	839	5.5	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Silver	0.19	J	1.7	0.18	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Sodium	119	J	839	62.4	mg/Kg
S2041-05	MM-SD25-040304	SOIL	Vanadium	14.5		8.4	0.17	mg/Kg
[illegible]1-05	MM-SD25-040304	SOIL	Zinc	82.8		3.4	0.09	mg/Kg
Client ID:	MM-SD26-040304							
S2041-06	MM-SD26-040304	SOIL	Aluminum	6310		36.1	1.1	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Arsenic	1.4	J	1.8	0.43	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Barium	209		36.1	0.04	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Beryllium	0.28	J	0.90	0.01	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Calcium	2580		903	0.63	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Chromium	75.4		1.8	0.17	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Cobalt	21.5		9.0	0.14	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Copper	130		4.5	0.21	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Iron	16300		18.1	3.2	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Lead	18.5		0.90	0.19	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Magnesium	12400		903	0.03	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Manganese	549		2.7	1.4	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Mercury	0.04		0.02	0.01	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Nickel	121		7.2	0.27	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Potassium	471	J	903	5.9	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Vanadium	21.8		9.0	0.18	mg/Kg
S2041-06	MM-SD26-040304	SOIL	Zinc	68.8		3.6	0.10	mg/Kg

APPENDIX H

2006 ADDITIONAL DATA FINDINGS REPORT DATA SUMMARY SHEETS

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/23/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW11-022306	SDG No.:	X1726
Lab Sample ID:	X1726-01	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004109.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	1.3	J	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	190		5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	2.2	~~J~~ J	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

fea 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/23/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW11-022306	SDG No.:	X1726
Lab Sample ID:	X1726-01	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004109.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	48.64	97 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	49.51	99 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.28	101 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	49.77	100 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	680652	5.02			
540-36-3	1,4-Difluorobenzene	1148922	5.64			
3114-55-4	Chlorobenzene-d5	970599	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	447813	11.84			

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/23/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW06-022306	SDG No.:	X1726
Lab Sample ID:	X1726-02	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004110.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	8.1		5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	180 ~~230~~	~~E~~ D	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	2.6	~~J~~ J	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

BEa 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	**Date Collected:**	2/23/2006
Project:	Magna Metals	**Date Received:**	2/24/2006
Client Sample ID:	MM-GWMW06-022306	**SDG No.:**	X1726
Lab Sample ID:	X1726-02	**Matrix:**	WATER
Analytical Method:	8260	**% Moisture:**	100
Sample Wt/Vol:	5.0 Units: mL	**Soil Extract Vol:**	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004110.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	48.4	97 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	52.69	105 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	51.59	103 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	52.23	104 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	669630	5.02			
540-36-3	1,4-Difluorobenzene	1106870	5.64			
3114-55-4	Chlorobenzene-d5	954224	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	455007	11.84			

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

PEa 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/23/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW06-022306DL	SDG No.:	X1726
Lab Sample ID:	X1726-02DL	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004153.D	5	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	1.7	UD	25	1.7	ug/L
75-01-4	Vinyl chloride	1.6	UD	25	1.6	ug/L
74-83-9	Bromomethane	2.1	UD	25	2.1	ug/L
75-00-3	Chloroethane	4.1	~~UD~~ U5D	25	4.1	ug/L
75-35-4	1,1-Dichloroethene	2.1	UD	25	2.1	ug/L
67-64-1	Acetone	78	JD	120	11	ug/L
75-15-0	Carbon disulfide	2.0	~~UD~~ U5D	25	2.0	ug/L
75-09-2	Methylene Chloride	2.1	UD	25	2.1	ug/L
156-60-5	trans-1,2-Dichloroethene	2.0	UD	25	2.0	ug/L
75-34-3	1,1-Dichloroethane	1.9	UD	25	1.9	ug/L
78-93-3	2-Butanone	5.7	~~UD~~ R	120	5.7	ug/L
56-23-5	Carbon Tetrachloride	5.7	UD	25	5.7	ug/L
156-59-2	cis-1,2-Dichloroethene	1.5	UD	25	1.5	ug/L
67-66-3	Chloroform	1.7	UD	25	1.7	ug/L
71-55-6	1,1,1-Trichloroethane	1.6	UD	25	1.6	ug/L
71-43-2	Benzene	1.9	UD	25	1.9	ug/L
107-06-2	1,2-Dichloroethane	1.7	UD	25	1.7	ug/L
79-01-6	Trichloroethene	180	D	25	2.3	ug/L
78-87-5	1,2-Dichloropropane	2.0	UD	25	2.0	ug/L
75-27-4	Bromodichloromethane	1.7	UD	25	1.7	ug/L
108-10-1	4-Methyl-2-Pentanone	8.1	UD	120	8.1	ug/L
108-88-3	Toluene	1.8	UD	25	1.8	ug/L
10061-02-6	t-1,3-Dichloropropene	1.6	UD	25	1.6	ug/L
10061-01-5	cis-1,3-Dichloropropene	1.8	UD	25	1.8	ug/L
79-00-5	1,1,2-Trichloroethane	2.0	UD	25	2.0	ug/L
591-78-6	2-Hexanone	8.4	UD	120	8.4	ug/L
124-48-1	Dibromochloromethane	1.3	UD	25	1.3	ug/L
127-18-4	Tetrachloroethene	2.4	UD	25	2.4	ug/L
108-90-7	Chlorobenzene	2.3	UD	25	2.3	ug/L
100-41-4	Ethyl Benzene	2.3	UD	25	2.3	ug/L
126777-61-2	m/p-Xylenes	5.9	UD	25	5.9	ug/L
95-47-6	o-Xylene	2.3	UD	25	2.3	ug/L

do not use

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

BEW 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	**Date Collected:**	2/23/2006
Project:	Magna Metals	**Date Received:**	2/24/2006
Client Sample ID:	MM-GWMW06-022306DL	**SDG No.:**	X1726
Lab Sample ID:	X1726-02DL	**Matrix:**	WATER
Analytical Method:	8260	**% Moisture:**	100
Sample Wt/Vol:	5.0 Units: mL	**Soil Extract Vol:**	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004153.D	5	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	2.0	UD	25	2.0	ug/L
75-25-2	Bromoform	1.6	UD	25	1.6	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	1.5	UD	25	1.5	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	49.85	100 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.29	103 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.06	100 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	51.18	102 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	628280	5.02			
540-36-3	1,4-Difluorobenzene	1076629	5.64			
3114-55-4	Chlorobenzene-d5	926179	9.37			
3855-82-1	1,4-Dichlorobenzene-d4	406010	11.84			

do not use

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/21/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-TRIPBLANK	SDG No.:	X1726
Lab Sample ID:	X1726-03	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004108.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	0.46	U	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	0.48	~~U~~ UJ	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range
J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/21/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-TRIPBLANK	SDG No.:	X1726
Lab Sample ID:	X1726-03	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004108.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	47.13	94 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.62	103 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.18	100 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	49.7	99 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	686165	5.02			
540-36-3	1,4-Difluorobenzene	1159435	5.64			
3114-55-4	Chlorobenzene-d5	960595	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	447733	11.84			

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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

EE2 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW02-022406	SDG No.:	X1726
Lab Sample ID:	X1726-04	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004111.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	X UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	X R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	4.9	J	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	0.48	X UJ	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

8/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW02-022406	SDG No.:	X1726
Lab Sample ID:	X1726-04	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004111.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	49.74	99 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.77	104 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	49.93	100 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	50.92	102 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	661923	5.02			
540-36-3	1,4-Difluorobenzene	1140395	5.64			
3114-55-4	Chlorobenzene-d5	962559	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	451481	11.84			

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

PEA 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW04-022406	SDG No.:	X1726
Lab Sample ID:	X1726-05	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004112.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	2.2	J	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	270 ~~320~~	~~E~~ D	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	7.5	J	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/29/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW04-022406	SDG No.:	X1726
Lab Sample ID:	X1726-05	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004112.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	48.6	97 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.79	104 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	51.26	103 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	51.37	103 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	667811	5.02			
540-36-3	1,4-Difluorobenzene	1125341	5.64			
3114-55-4	Chlorobenzene-d5	967938	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	453466	11.84			

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW04-022406DL	SDG No.:	X1726
Lab Sample ID:	X1726-05DL	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004154.D	10	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	3.4	UD	50	3.4	ug/L
75-01-4	Vinyl chloride	3.3	UD	50	3.3	ug/L
74-83-9	Bromomethane	4.1	UD	50	4.1	ug/L
75-00-3	Chloroethane	8.3	UJD ~~UD~~	50	8.3	ug/L
75-35-4	1,1-Dichloroethene	4.2	UD	50	4.2	ug/L
67-64-1	Acetone	160	JD	250	23	ug/L
75-15-0	Carbon disulfide	4.0	UJD ~~UD~~	50	4.0	ug/L
75-09-2	Methylene Chloride	4.3	UD	50	4.3	ug/L
156-60-5	trans-1,2-Dichloroethene	4.0	UD	50	4.0	ug/L
75-34-3	1,1-Dichloroethane	3.8	UD	50	3.8	ug/L
78-93-3	2-Butanone	11	~~UD~~ R	250	11	ug/L
56-23-5	Carbon Tetrachloride	11	UD	50	11	ug/L
156-59-2	cis-1,2-Dichloroethene	2.9	UD	50	2.9	ug/L
67-66-3	Chloroform	3.3	UD	50	3.3	ug/L
71-55-6	1,1,1-Trichloroethane	3.2	UD	50	3.2	ug/L
71-43-2	Benzene	3.9	UD	50	3.9	ug/L
107-06-2	1,2-Dichloroethane	3.4	UD	50	3.4	ug/L
79-01-6	Trichloroethene	270	D	50	4.6	ug/L
78-87-5	1,2-Dichloropropane	4.0	UD	50	4.0	ug/L
75-27-4	Bromodichloromethane	3.3	UD	50	3.3	ug/L
108-10-1	4-Methyl-2-Pentanone	16	UD	250	16	ug/L
108-88-3	Toluene	3.6	UD	50	3.6	ug/L
10061-02-6	t-1,3-Dichloropropene	3.2	UD	50	3.2	ug/L
10061-01-5	cis-1,3-Dichloropropene	3.6	UD	50	3.6	ug/L
79-00-5	1,1,2-Trichloroethane	4.1	UD	50	4.1	ug/L
591-78-6	2-Hexanone	17	UD	250	17	ug/L
124-48-1	Dibromochloromethane	2.6	UD	50	2.6	ug/L
127-18-4	Tetrachloroethene	25	JD	50	4.8	ug/L
108-90-7	Chlorobenzene	4.7	UD	50	4.7	ug/L
100-41-4	Ethyl Benzene	4.5	UD	50	4.5	ug/L
126777-61-2	m/p-Xylenes	12	UD	50	12	ug/L
95-47-6	o-Xylene	4.6	UD	50	4.6	ug/L

U = Not Detected
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E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

SE 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW04-022406DL	SDG No.:	X1726
Lab Sample ID:	X1726-05DL	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004154.D	10	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	4.1	UD	50	4.1	ug/L
75-25-2	Bromoform	3.2	UD	50	3.2	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	3.0	UD	50	3.0	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	50.54	101 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.7	103 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.96	102 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	52.1	104 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	627246	5.02			
540-36-3	1,4-Difluorobenzene	1073851	5.63			
3114-55-4	Chlorobenzene-d5	927712	9.37			
3855-82-1	1,4-Dichlorobenzene-d4	417493	11.84			

do not use

U = Not Detected
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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW94-022406	SDG No.:	X1726
Lab Sample ID:	X1726-06	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004113.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	2.2	J	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	260 ~~340~~	E D	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	8.2	J	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
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E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

PCA 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW94-022406	SDG No.:	X1726
Lab Sample ID:	X1726-06	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004113.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	48.72	97 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.61	103 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	51.44	103 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	52.72	105 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	667397	5.02			
540-36-3	1,4-Difluorobenzene	1123034	5.64			
3114-55-4	Chlorobenzene-d5	971882	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	451922	11.84			

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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

06/24/07 68

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc.	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW94-022406DL	SDG No.:	X1726
Lab Sample ID:	X1726-06DL	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004155.D	10	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	3.4	UD	50	3.4	ug/L
75-01-4	Vinyl chloride	3.3	UD	50	3.3	ug/L
74-83-9	Bromomethane	4.1	UD	50	4.1	ug/L
75-00-3	Chloroethane	8.3	UJD ~~UD~~	50	8.3	ug/L
75-35-4	1,1-Dichloroethene	4.2	UD	50	4.2	ug/L
67-64-1	Acetone	150	JD	250	23	ug/L
75-15-0	Carbon disulfide	4.0	UJD ~~UD~~	50	4.0	ug/L
75-09-2	Methylene Chloride	4.3	UD	50	4.3	ug/L
156-60-5	trans-1,2-Dichloroethene	4.0	UD	50	4.0	ug/L
75-34-3	1,1-Dichloroethane	3.8	UD	50	3.8	ug/L
78-93-3	2-Butanone	11	~~UD~~ R	250	11	ug/L
56-23-5	Carbon Tetrachloride	11	UD	50	11	ug/L
156-59-2	cis-1,2-Dichloroethene	2.9	UD	50	2.9	ug/L
67-66-3	Chloroform	3.3	UD	50	3.3	ug/L
71-55-6	1,1,1-Trichloroethane	3.2	UD	50	3.2	ug/L
71-43-2	Benzene	3.9	UD	50	3.9	ug/L
107-06-2	1,2-Dichloroethane	3.4	UD	50	3.4	ug/L
79-01-6	Trichloroethene	260	D	50	4.6	ug/L
78-87-5	1,2-Dichloropropane	4.0	UD	50	4.0	ug/L
75-27-4	Bromodichloromethane	3.3	UD	50	3.3	ug/L
108-10-1	4-Methyl-2-Pentanone	16	UD	250	16	ug/L
108-88-3	Toluene	3.6	UD	50	3.6	ug/L
10061-02-6	t-1,3-Dichloropropene	3.2	UD	50	3.2	ug/L
10061-01-5	cis-1,3-Dichloropropene	3.6	UD	50	3.6	ug/L
79-00-5	1,1,2-Trichloroethane	4.1	UD	50	4.1	ug/L
591-78-6	2-Hexanone	17	UD	250	17	ug/L
124-48-1	Dibromochloromethane	2.6	UD	50	2.6	ug/L
127-18-4	Tetrachloroethene	25	JD	50	4.8	ug/L
108-90-7	Chlorobenzene	4.7	UD	50	4.7	ug/L
100-41-4	Ethyl Benzene	4.5	UD	50	4.5	ug/L
126777-61-2	m/p-Xylenes	12	UD	50	12	ug/L
95-47-6	o-Xylene	4.6	UD	50	4.6	ug/L

U = Not Detected
RL = Reporting Limit
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E = Value Exceeds Calibration Range

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N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	**Date Collected:**	2/24/2006
Project:	Magna Metals	**Date Received:**	2/24/2006
Client Sample ID:	MM-GWMW94-022406DL	**SDG No.:**	X1726
Lab Sample ID:	X1726-06DL	**Matrix:**	WATER
Analytical Method:	8260	**% Moisture:**	100
Sample Wt/Vol:	5.0 Units: mL	**Soil Extract Vol:**	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004155.D	10	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	4.1	UD	50	4.1	ug/L
75-25-2	Bromoform	3.2	UD	50	3.2	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	3.0	UD	50	3.0	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	49.82	100 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.22	102 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.43	101 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	51.74	103 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	622193	5.01			
540-36-3	1,4-Difluorobenzene	1084456	5.64			
3114-55-4	Chlorobenzene-d5	920440	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	411817	11.84			

Do not Use

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N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc.	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW09-022406	SDG No.:	X1726
Lab Sample ID:	X1726-07	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004114.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	0.46	U	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	0.48	~~U~~ UJ	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
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E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

8/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW09-022406	SDG No.:	X1726
Lab Sample ID:	X1726-07	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004114.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	49.22	98 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.87	104 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	51.37	103 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	51.49	103 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	644302	5.02			
540-36-3	1,4-Difluorobenzene	1103198	5.64			
3114-55-4	Chlorobenzene-d5	945311	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	439190	11.84			

U = Not Detected
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E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

REa 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-FB-022406	SDG No.:	X1726
Lab Sample ID:	X1726-18	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004095.D	1	2/28/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	U	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	0.46	U	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	0.48	U	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-FB-022406	SDG No.:	X1726
Lab Sample ID:	X1726-10	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004095.D	1	2/28/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	46.5	93 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	49.93	100 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.32	101 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	49.36	99 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	665437	5.02			
540-36-3	1,4-Difluorobenzene	1115546	5.64			
3114-55-4	Chlorobenzene-d5	928798	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	422149	11.84			

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MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc.,	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW03-022406	SDG No.:	X1726
Lab Sample ID:	X1726-11	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004115.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~J~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~J~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	17		5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	2.6	~~J~~ J	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
RL = Reporting Limit
MDL = Method Detection Limit
E = Value Exceeds Calibration Range

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

AEA 08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc..	**Date Collected:**	2/24/2006
Project:	Magna Metals	**Date Received:**	2/24/2006
Client Sample ID:	MM-GWMW03-022406	**SDG No.:**	X1726
Lab Sample ID:	X1726-11	**Matrix:**	WATER
Analytical Method:	8260	**% Moisture:**	100
Sample Wt/Vol:	5.0 Units: mL	**Soil Extract Vol:**	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004115.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	50.29	101 %	72 - 119	SPK: 50	
1868-53-7	Dibromofluoromethane	50.87	102 %	85 - 115	SPK: 50	
2037-26-5	Toluene-d8	49.78	100 %	81 - 120	SPK: 50	
460-00-4	4-Bromofluorobenzene	50.5	101 %	76 - 119	SPK: 50	
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	651614	5.02			
540-36-3	1,4-Difluorobenzene	1133746	5.64			
3114-55-4	Chlorobenzene-d5	954563	9.38			
3855-82-1	1,4-Dichlorobenzene-d4	436614	11.84			

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N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc.,	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW10-022406	SDG No.:	X1726
Lab Sample ID:	X1726-12	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004116.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
TARGETS						
74-87-3	Chloromethane	0.34	U	5.0	0.34	ug/L
75-01-4	Vinyl chloride	0.33	U	5.0	0.33	ug/L
74-83-9	Bromomethane	0.41	U	5.0	0.41	ug/L
75-00-3	Chloroethane	0.83	U	5.0	0.83	ug/L
75-35-4	1,1-Dichloroethene	0.42	U	5.0	0.42	ug/L
67-64-1	Acetone	2.3	U	25	2.3	ug/L
75-15-0	Carbon disulfide	0.40	~~U~~ UJ	5.0	0.40	ug/L
75-09-2	Methylene Chloride	0.43	U	5.0	0.43	ug/L
156-60-5	trans-1,2-Dichloroethene	0.40	U	5.0	0.40	ug/L
75-34-3	1,1-Dichloroethane	0.38	U	5.0	0.38	ug/L
78-93-3	2-Butanone	1.1	~~U~~ R	25	1.1	ug/L
56-23-5	Carbon Tetrachloride	1.1	U	5.0	1.1	ug/L
156-59-2	cis-1,2-Dichloroethene	0.29	U	5.0	0.29	ug/L
67-66-3	Chloroform	0.33	U	5.0	0.33	ug/L
71-55-6	1,1,1-Trichloroethane	0.32	U	5.0	0.32	ug/L
71-43-2	Benzene	0.39	U	5.0	0.39	ug/L
107-06-2	1,2-Dichloroethane	0.34	U	5.0	0.34	ug/L
79-01-6	Trichloroethene	4.5	J	5.0	0.46	ug/L
78-87-5	1,2-Dichloropropane	0.40	U	5.0	0.40	ug/L
75-27-4	Bromodichloromethane	0.33	U	5.0	0.33	ug/L
108-10-1	4-Methyl-2-Pentanone	1.6	U	25	1.6	ug/L
108-88-3	Toluene	0.36	U	5.0	0.36	ug/L
10061-02-6	t-1,3-Dichloropropene	0.32	U	5.0	0.32	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.36	U	5.0	0.36	ug/L
79-00-5	1,1,2-Trichloroethane	0.41	U	5.0	0.41	ug/L
591-78-6	2-Hexanone	1.7	U	25	1.7	ug/L
124-48-1	Dibromochloromethane	0.26	U	5.0	0.26	ug/L
127-18-4	Tetrachloroethene	0.48	~~U~~ UJ	5.0	0.48	ug/L
108-90-7	Chlorobenzene	0.47	U	5.0	0.47	ug/L
100-41-4	Ethyl Benzene	0.45	U	5.0	0.45	ug/L
126777-61-2	m/p-Xylenes	1.2	U	5.0	1.2	ug/L
95-47-6	o-Xylene	0.46	U	5.0	0.46	ug/L

U = Not Detected
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E = Value Exceeds Calibration Range

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B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

08/24/07

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908-789-8900 Fax: 908-789-8922

Report of Analysis

Client:	Tetra Tech FW Inc.,	Date Collected:	2/24/2006
Project:	Magna Metals	Date Received:	2/24/2006
Client Sample ID:	MM-GWMW10-022406	SDG No.:	X1726
Lab Sample ID:	X1726-12	Matrix:	WATER
Analytical Method:	8260	% Moisture:	100
Sample Wt/Vol:	5.0 Units: mL	Soil Extract Vol:	uL
Soil Aliquot Vol:	uL		

File ID:	Dilution:	Date Analyzed	Analytical Batch ID
VH004116.D	1	3/1/2006	VH022706

CAS Number	Parameter	Conc.	Qualifier	RL	MDL	Units
100-42-5	Styrene	0.41	U	5.0	0.41	ug/L
75-25-2	Bromoform	0.32	U	5.0	0.32	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U	5.0	0.30	ug/L
SURROGATES						
17060-07-0	1,2-Dichloroethane-d4	48.05	96 %	72 - 119		SPK: 50
1868-53-7	Dibromofluoromethane	51.64	103 %	85 - 115		SPK: 50
2037-26-5	Toluene-d8	50.8	102 %	81 - 120		SPK: 50
460-00-4	4-Bromofluorobenzene	51.67	103 %	76 - 119		SPK: 50
INTERNAL STANDARDS						
363-72-4	Pentafluorobenzene	670365	5.03			
540-36-3	1,4-Difluorobenzene	1126101	5.65			
3114-55-4	Chlorobenzene-d5	964875	9.39			
3855-82-1	1,4-Dichlorobenzene-d4	453050	11.85			

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J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound

SGa 08/24/07

APPENDIX I

LABORATORY AND TOXICITY REPORTS FOR THE FISH AND WILDLIFE IMPACT ANALYSIS

ATTACHMENT I-1

Benthic Macroinvertebrate Laboratory Report

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD13**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM1)	B (MM2)	C (MM3)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	7	6	2	15	217	3.3%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm			3	3	43	0.7%
Limnodrilus hoffmeisteri	tube worm	53			53	768	11.7%
Limnodrilus sp.	tube worm	95	87	53	235	3406	51.8%
Coleoptera							
Dytiscidae							
Agabus sp.	diving beetle	1			1	14	0.2%
Diptera							
Ceratopogonidae							
Culicoides sp.	biting midge	5	3	16	24	348	5.3%
Mallochohelea sp.	biting midge		4		4	58	0.9%
Palpomyia gr.	biting midge		2	2	4	58	0.9%
Probezzia sp.	biting midge	2		7	9	130	2.0%
Sphaeromias sp.	biting midge	6	6	9	21	304	4.6%
Chironomidae							
Diamesa sp.	midge	2			2	29	0.4%
Hydrobaenus sp.	midge	13	25		38	551	8.4%
Orthocladiinae	midge	2			2	29	0.4%
Orthocladius frigidus	midge	3			3	43	0.7%
Orthocladius sp.	midge		1	9	10	145	2.2%
Rheocricotopus unidentatus	midge	6			6	87	1.3%
Stempellinella sp.	midge	1			1	14	0.2%
Stictochironomus sp.	midge			1	1	14	0.2%
Tabanidae							
Chrysops sp.	deer fly	1		1	2	29	0.4%
Tipulidae							
Pilaria sp.	crane fly	10	1	5	16	232	3.5%
Ormosia sp.	crane fly	1	3		4	58	0.9%
Total Taxa		16	10	11	**21**		100.0%
Total Specimens		208	138	108	454		
Total Density (no./m^2)		9043	6000	4696		**6580**	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD14**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM4)	B (MM5)	C (MM6)	Total	Density (no./m^2)	Pct.
Tubificida							
Tubificidae							
Limnodrilus sp.	tube worm		1	1	2	29	1.8%
Basommatophora							
Ancylidae							
Ferissia rivularis	limpet snail		1		1	14	0.9%
Amphipoda							
Talitridae							
Hyalella azteca	sideswimmer	1	4	1	6	87	5.4%
Ephemeroptera							
Baetidae	mayfly		2		2	29	1.8%
Caenidae							
Caenis sp.	mayfly	1		1	2	29	1.8%
Isonychiidae							
Isonychia sp.	mayfly			2	2	29	1.8%
Odonata							
Libellulidae							
Plathemis sp.	dragonfly		1		1	14	0.9%
Diptera							
Ceratopogonidae							
Culicoides sp.	biting midge	2			2	29	1.8%
Mallochohelea sp.	biting midge	2	1		3	43	2.7%
Palpomyia gr.	biting midge	2	1		3	43	2.7%
Chironomidae							
Chironomus sp.	midge		1	3	4	58	3.6%
Clinotanypus sp.	midge	8	1	3	12	174	10.8%
Cryptochironomus fulvus gr.	midge		1		1	14	0.9%
Dicrotendipes sp.	midge			7	7	101	6.3%
Einfeldia sp.	midge	1			1	14	0.9%
Orthocladiinae	midge	1			1	14	0.9%
Paratanytarsus sp.	midge	1	5	7	13	188	11.7%
Procladius sp.	midge		8	30	38	551	34.2%
Tanypodinae	midge			4	4	58	3.6%
Tanytarsus sp.	midge	1		5	6	87	5.4%
Total Taxa		10	12	11	**20**		100.0%
Total Specimens		20	27	64	111		
Total Density (no./m^2)		870	1174	2783		**1609**	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD15**
Sample Date: March 30, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM7)	B (MM8)	C (MM9)	Total	Density (no./m^2)	Pct.
Nematoda	round worm			1	1	14	0.3%
Hoplonemertea							
Tetrastemmatidae							
Prostoma graescense	proboscus worm			1	1	14	0.3%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm			3	3	43	0.9%
Limnodrilus sp.	tube worm	11	2	2	15	217	4.7%
Limnodrilus hoffmeisteri	tube worm	6			6	87	1.9%
Veneroida							
Sphaeriidae							
Pisidium sp.	pill clam	1			1	14	0.3%
Amphipoda							
Talitridae							
Hyalella azteca	sideswimmer	1			1	14	0.3%
Coleoptera							
Dytiscidae							
Hydroporus sp.	diving beetle	3		1	4	58	1.3%
Scirtidae							
Cyphon sp.	marsh beetle	1			1	14	0.3%
Diptera							
Cecidomyiidae	gall gnat		1		1	14	0.3%
Ceratopogonidae							
Culicoides sp.	biting midge	2	1	4	7	101	2.2%
Mallochohelea sp.	biting midge	1		1	2	29	0.6%
Palpomyia gr.	biting midge	5	1	1	7	101	2.2%
Chironomidae							
Ablabesmyia sp.	midge	7			7	101	2.2%
Chaetocladius sp.	midge	1			1	14	0.3%
Cyrptochironomus fulvus gr.	midge		3	8	11	159	3.4%
Heterotrissocladius marcidus	midge			26	26	377	8.2%
Hydrobaenus sp.	midge	3		17	20	290	6.3%
Orthocladius sp.	midge	42	18	9	69	1000	21.6%
Psectrocladius sp.	midge	16			16	232	5.0%
Rheocricotopus sp.	midge		5		5	72	1.6%
Rheocricotopus unidentatis	midge	2	5	2	9	130	2.8%
Tanytarsus sp.	midge	1	1	1	3	43	0.9%
Thienemannimyia gr.	midge	48	13	36	97	1406	30.4%
Tipulidae							
Ormosia sp.	crane fly	1			1	14	0.3%
Pedicia sp.	crane fly			1	1	14	0.3%
Pilaria sp.	crane fly			2	2	29	0.6%
Pseudolimnophila sp.	crane fly		1		1	14	0.3%
Total Taxa		18	11	17	**28**		100.0%
Total Specimens		152	51	116	319		
Total Density (no./m^2)		6609	2217	5043		4623	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD16**
Sample Date: March 30 , 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM10)	B (MM11)	C (MM12)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	1	3		4	58	1.5%
Hoplonemertea							
Tetrastemmatidae							
Prostoma graescense	proboscus worm			1	1	14	0.4%
Tubificida							
Tubificidae							
Ilyodrilus templetoni	tube worm		4	4	8	116	3.0%
Limnodrilus sp.	tube worm	23	19	37	79	1145	29.6%
Limnodrilus hoffmeisteri	tube worm		5	8	13	188	4.9%
Limnodrilus udekemianus	tube worm	11	10		21	304	7.9%
Veneroida							
Sphaeriidae							
Pisidium sp.	pill clam		1	1	2	29	0.7%
Arhynchobdellida							
Erpobdellidae							
Mooreobdella sp.	leech			1	1	14	0.4%
Coleoptera							
Dytiscidae							
Hydroporus sp.	diving beetle		1		1	14	0.4%
Diptera							
Ceratopogonidae							
Ceratopogon sp.	biting midge	1			1	14	0.4%
Culicoides sp.	biting midge	1		1	2	29	0.7%
Palpomyia gr.	biting midge	1			1	14	0.4%
Sphaeromias sp.	biting midge			1	1	14	0.4%
Chironomidae							
Chaetocladius sp.	midge	1			1	14	0.4%
Cryptochironomus fulvus gr.	midge			1	1	14	0.4%
Diplocladius sp.	midge	1			1	14	0.4%
Heterotrissocladius marcidus	midge		3		3	43	1.1%
Hydrobaenus sp.	midge	9	10	27	46	667	17.2%
Orthocladius sp.	midge		7	2	9	130	3.4%
Parametriocnemus sp.	midge	19	3	1	23	333	8.6%
Rheocricotopus sp.	midge	1		3	4	58	1.5%
Rheocricotopus unidentatis	midge	2	5	2	9	130	3.4%
Tanytarsus sp.	midge	3	4	2	9	130	3.4%
Thienemannimyia gr.	midge	2	4		6	87	2.2%
Tvetenia bavarica	midge	1			1	14	0.4%
Zavrelimyia sp.	midge	2	4	1	7	101	2.6%
Tabanidae							
Chrysops sp.	deer fly	1	1		2	29	0.7%
Tipulidae							
Ormosia sp.	crane fly	1			1	14	0.4%
Pilaria sp.	crane fly	3	6		9	130	3.4%
Total Taxa		19	17	16	**29**		100.0%
Total Specimens		84	90	93	267		
Total Density (no./m^2)		3652	3913	4043		**3870**	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD17**
Sample Date: March 31 , 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM13)	B (MM14)	C (MM15)	Total	Density (no./m^2)	Pct.
Tubificida							
Enchytraeidae	tube worm		1		1	14	0.3%
Tubificidae							
Limnodrilus sp.	tube worm	1	1	2	4	58	1.1%
Coleoptera							
Dytiscidae							
Agabus sp.	diving beetle		1		1	14	0.3%
Diptera							
Chironomidae							
Hydrobaenus sp.	midge	92	55	151	298	4319	84.9%
Orthocladiinae	midge			1	1	14	0.3%
Orthocladius sp.	midge	11	6	13	30	435	8.5%
Rheocricotopus unidentatis	midge	4	2	2	8	116	2.3%
Tanytarsus sp.	midge	2			2	29	0.6%
Thienemannimyia gr.	midge			1	1	14	0.3%
Zavrelimyia sp.	midge	1		2	3	43	0.9%
Empididae							
Clinocera sp.	dance fly			1	1	14	0.3%
Tipulidae							
Pedicia sp.	crane fly			1	1	14	0.3%
Total Taxa		6	6	9	**12**		100.0%
Total Specimens		111	66	174	351		
Total Density (no./m^2)		4826	2870	7565		5087	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD19**
Sample Date: March 31, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM16)	B (MM17)	C (MM18)	Total	Density (no./m^2)	Pct.
Nematoda	round worm	1	2		3	43	1.4%
Tubificida							
Tubificidae							
Limnodrilus sp.	tube worm	2			2	29	1.0%
Naididae	naidid worm		1		1	14	0.5%
Isopoda							
Asellidae							
Caecidotea sp.	sow bug	1			1	14	0.5%
Ephemeroptera							
Caenidae							
Caenis sp.	mayfly	3			3	43	1.4%
Diptera							
Ceratopogonidae							
Palpomyia gr.	biting midge		1		1	14	0.5%
Chironomidae							
Chironomus sp.	midge	66	61	4	131	1899	62.4%
Dicrotendipes sp.	midge	11			11	159	5.2%
Hydrobaenus sp.	midge		4		4	58	1.9%
Kiefferulus sp.	midge	1			1	14	0.5%
Omisus sp.	midge	7			7	101	3.3%
Paratanytarsus sp.	midge			1	1	14	0.5%
Polypedilum tritum	midge			3	3	43	1.4%
Procladius sp.	midge	4			4	58	1.9%
Tanypus sp.	midge	7	7		14	203	6.7%
Tanytarsus sp.	midge	9	9	1	19	275	9.0%
Thienemannimyia gr.	midge		2	1	3	43	1.4%
Zavreliella sp.	midge	1			1	14	0.5%
Total Taxa		12	8	5	18		100.0%
Total Specimens		113	87	10	210		
Total Density (no./m^2)		4913	3783	435		3043	

Benthic Macroinvertebrates Collected from the Magna Metals Site by Tetra Tech FW.

Station: **MM-SW / SD20**
Sample Date: March 31, 2004
Gear: Petite Ponar Grab (0.023 m^2)

Taxon	Common Name	Replicate / (Lab Sample No.) A (MM19)	B (MM20)	C (MM21)	Total	Density (no./m^2)	Pct.
Basommatophora							
Physidae							
Physa sp.	pouch snail		1		1	14	1.4%
Ephemeroptera							
Caenidae							
Caenis sp.	mayfly	4		1	5	72	6.9%
Odonata							
Libellulidae							
Leucorrhinia sp.	dragonfly		1		1	14	1.4%
Diptera							
Ceratopogonidae							
Palpomyia gr.	biting midge	1			1	14	1.4%
Sphaeromias sp.	biting midge		2	1	3	43	4.2%
Chironomidae							
Chironomus sp.	midge	4		1	5	72	6.9%
Cladopelma sp.	midge	2			2	29	2.8%
Dicrotendipes sp.	midge	8	1		9	130	12.5%
Endochironomus sp.	midge			1	1	14	1.4%
Einfeldia sp.	midge	3	5		8	116	11.1%
Glyptotendipes sp.	midge			1	1	14	1.4%
Kiefferulus sp.	midge			1	1	14	1.4%
Polypedilum halterale gr.	midge	3		1	4	58	5.6%
Procladius sp.	midge	4	3		7	101	9.7%
Tanypodinae	midge			2	2	29	2.8%
Tanypus sp.	midge	2	3	1	6	87	8.3%
Tanytarsus sp.	midge	2	2	1	5	72	6.9%
Thienemannimyia gr.	midge	1	3	1	5	72	6.9%
Zavrelimyia sp.	midge	4	1		5	72	6.9%
Total Taxa		12	10	11	**19**		100.0%
Total Specimens		38	22	12	72		
Total Density (no./m^2)		1652	957	522		**1043**	

NORMANDEAU ASSOCIATES, INC.
INVERTEBRATE GROUP ANALYTICAL REQUEST FORM

CLIENT INFORMATION

Client Number —

Client Name Tetra Tech FW

Client Contact Mr. John Schaffer / Don Campbell

Client Address 1000 The American Rd
Morris Plains, NJ

Telephone Number (973) 630-8530

JOB INFORMATION

Client Number —

Job Number 19826.000

Job Name Magna Metals Benthos

Project Manager G. Christian Authorization [illegible]

Required Completion Date 28 ~~30~~ day No. of Samples 21

Sample Relinquished by Tetra Tech (Fed Ex) Date 4-1-04

Special Handling/Other Information

Client Job # 1172.0003.0000.00000

Internal use only
to

SAMPLE INFORMATION

Sample Type (circle one)

A. Qualitative Bug B. Quantitative Bug C. IP Z. Other _____

Sample Gear (circle one)

~~A. Kick Net~~ or B. Kick Screen C. Ponar D. Eckma E. Suber

F. PIBS G. Hester/Dendy Z. Other _____

Mesh Size (circle one)

A. 202 B. 350 C. 595 D. 850 E. 1000 Z. Other 0.500

Preservative (circle one)

A. Isopropanol B. Formalin C. Lugois Z. Other _____

Preservative Disposition Return to sample matrix and store for 28-days

(March 2002)

INVERTEBRATE GROUP ANALYTICAL FORM (Continued)

SORTING INFORMATION

Sort Task 265 Sorting Budget 2.0 Seive Size 0.500

Sort QC Lab (2621) Abundant Taxa Subsampling Allowed: (YES) NO

IDENTIFICATION INFORMATION

ID Task: 444 ID Budget: 3.0

Identification Level (circle one):
(A. Lowest Practical)
B. Order
C. Family
D. Ohio EPA
E. Species
Z. Others _____

Identification QC: 2 of 21

Quantification Level (circle one):
~~A. Number/Sample~~
(B. Number/Area) Power
(C. Relative Abundance) KK6167
D. Presesnce/Abundance
Z. Other _____

Reporting Requirement (circle one):
A. Bench/Coding Sheet
(B. Summary Table(s))
(C. Short Report)
D. Formal Report
(Z. Other) QC/Tracking forms

Additional Information Pertinent to this Request: Submit Bench Sheets/Processing Forms with Data Tables. Cross reference sample #'s with Lab #'s. Note any problems with analysis.

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Magna Metals
Coll. Date: 3-30-04
Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☐ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 2:00 - 6:00

Job #/Task/Labor Code: 19826.00 / 00 / 444
Sample ID: MM-SD 13A
ID Time Budget: 3.0
Presort ID Time: 3.0 Date: 4/27/04 By: [illegible]
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.0 Date: " By: [illegible]
QC Info: ☐ Sort QC and/or ☒ ID QC
ID QC Time: 1.5 Date: 5-6-04 By: ADE

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
√1	ADE	—	Nematoda (L)	7 ~~5~~	5+2		—
2							
√3	ADE	Coleoptr.	Agabus sp. (L)	1	1		Dytiscidae
4							
√5	ADE	Diptera	Pilaria sp (L)	10	3, 7		Tipulidae
√6	ADE	"	Chrysops sp. (L)	1	1		Tabanidae
7		"					
√8	ADE, GMC	"	Probezzia sp (L)	2 ~~1~~	1+1		Ceratopogonidae
9		~~"~~	~~Mallochohelia~~	~~1~~	~~1~~		"
√10	ADE	"	Sphaeromias sp (L)	6	6		"
√11	ADE	"	Culicoides sp (L)	5 ~~6~~	6-1		"
√12	ADE	"	Ormosia sp (L)	1	1		Tipulidae
13							
14	ADE	"	Limnodrilus sp. (T)	95	95		Tubificidae
√15	ADE	"	L. hoffmeisteri (A)	53	53		"
16							
√17	ADE	"	Hydrobaenus sp. (L)	13 ~~15~~	15-2	Chironomidae	6th ant. seg hard to see.
18							
19							
√20	ADE	"	Rheocricotopus unidentatus (L)	6	6	"	strong beard; single median tooth (Epler
21							
22							
√23	ADE	"	Diamesa sp (L)	2	2	"	hard to see features
24							
√25	ADE	"	Orthocladius frigidus (L)	3	3	"	Seta submentum abs
26							outer margin of
√27	ADE	"	Orthocladiinae (L)	2	2	"	mandible w/ rugose
28							area
29							
√30	ADE	"	Stempellinella sp (L)	1	1	"	see fig 26.103, p65
31							in Merritt/Cummins
32							
33							
34							
35							

Comments:

Page: 1 of 1

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimate Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☞)
1	Tub.	w/o cc (Lim)	148	(14m)	L. hoffmeistri ###	5/14·148 =	53 ✓	#1
2					Lim. sp ### ////	9/14·148 =	95 ✓	#1
3	Ortho	mottled brown	6	(3m)		1		
4	"	green	19	(9m)	Hydrobaenus sp ### ///	8/10·19 =	13 ✓	#4
5	"	typ	1	(m)	Diamesa sp	1/10·19 =	2 ✓	#4
6	Tanytar	log lat	1	(m)	Rheocrisotopus unidentatus	3/3·6 =	6 ✓	#3
7					Stempellinella	1/1·1 =	1 ✓	#6
8		Σ =	27					
9					Orthocladius frigidus	1/10·19 =	2 ✓	#4
10					Ortho. frigidus	1/1·1 =	1 ✓	#5
11								
12					~~Rheo unidentatus~~	Σ =	27	
13								
14					Orthocladiinae	1/10·19	2	
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 16
Subsampled Taxa: –
QA/QC Taxa: –
Sample Total Taxa: 16

Presorted Specimens: 207
Estimated Subsampled Specimens: –
Actual (or Subsampled) QA/QC Specimens: –
Sample Total Specimens: 207
Estimated QA/QC Specimens: – 208 (='s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: ADE
QA/QC Req.: 90%

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = 16-2/16 = 87.5 %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = 208-1/208 = 99.5 %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction:_____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magma Metals
Location: Cortland NY
Coll. Date: 3-30-04
Job #/Task/Labor Code: 19726.000 / on 1444
Sample ID: MM-SW / SD136

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 3-3:45 / 3:45-4:00 chiro + 9-10:30 10:30-11:00 12:30-3:00 + 10:00-10:15

ID Time Budget: _____
Presort ID Time: .75 Date: 4-27-04 By: MDS
Split ID Time: _____ Date: _____ By: _____
Chiro ID Time: 3.0 Date: 5-6-04 By: MDS
Worms QC Info: ☐ Sort QC and/or ☒ ID QC
ID QC Time: AC Date: 5/7/04 By: [illegible]

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1	[illegible]	Diptera	Pilaria sp. (L)	1	1		Tipulidae
✓2	GMC	"	Culicoides sp. (L)	3	1+2		Ceratopogonidae
✓3	GMC	"	Sphaeromias sp. (L)	6	6		"
✓4	GMC	"	Mallochohelea sp. (L)	4	4		"
✓5	GMC	"	Palpomyia gp. (L)	2	1+1		"
✓6	JSD	"	Ormosia sp. (L)	3	1+2		Tipulidae
✓7	GMC		Hudrobaenus sp. (L)	25	25		Chironomidae
✓8	GMC		Orthocladius sp. (L)	1	1		"
9							
✓10	[illegible]	Nematoda	(A)	6	6		
11							
12	PMC	Tubificida	Limnodrilus sp. (J)	87	87		Tubificidae
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☜)
1	Orthocladius	small, white	1	1	Hydrobaenus sp. HIT	5/5-25	25	2
2	"	larger, green	25	5	Orthocladius sp.	1	1	1
3	~~Chironomini~~		+	*				
4				7→6				
5								
6					Limnodrilus sp. HIT	9/9-87	87	8
7								
8	Oligochaeta	no hairs	87	9				
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 10
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 10

Presorted Specimens: 138
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 138
Estimated QA/QC Specimens: _____ (=s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = 10-0 / 10 = 100.0 %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = 138-0 / 138 = 100.0 %

QA/QC (Processing)

QA/QC Based Upon (circle): (Whole Sample) Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = Presorted Taxa + Subsampled Taxa / Sample Total Taxa = _____ = _____ %

Count QC = Presorted Specimens + Est. Subsampled Specimens / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Mann Metals
Location: Cortland NY
Coll. Date: 3-30-04

Job #/Task/Labor Code: 19826.000 001444
Sample ID: MM-SW / SD12C

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: Ham. 1:30 / worm-chiro 1:30-3:00 + 10-10:30 2:00-2:30

ID Time Budget: —
Presort ID Time: 2.5 Date: 4-27-04 By: ADE
Split ID Time: — Date: — By: —
+Chiro. ID Time: 1.0 Date: 4/27-04 By: ADE
Worm QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1		Diptera	Pilaria sp. (L)	5	3+1+1		Tipulidae
✓2		"	Chrysops sp. (L)	1	1		Tabanidae
✓3	GMC	"	Sphaeromias sp. (L)	9	9		Ceratopogonidae
✓4	JSD	"	Probezzia sp. (L)	7	7		"
✓5	JSD	"	Culicoides sp. (L)	16	16		"
✓6		"	Palpomyia grp. (L)	2	2		"
✓7	GMC	"	Stictochironomus sp. (L)	1	1		Chironomidae
✓8	GMC	"	Orthocladius sp. (L)	9	9		"
9							
10							
✓11		Nematoda	(T)	2	2		
12		Tubificida	Limnodrilus sp. (T)	53	53		Tubificidae
13		"	Ilyodrilus templetoni (T)	3	3		"
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Chironomini		1	1	Stictochironomus sp.	1	1	1
2	Orthocladiinae	small	2	1	Chaetocladius sp.	3/3.9	9	36
3	"	large	7	2				
4				4→4				
5								
6								
7	Oligochaetes	hairs	3	2	Limnodrilus sp.	4/4.53	53	8
8		no hairs	53	4	Ilyodrilus templetoni	2/2.3	3	7
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 11
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 11

Presorted Specimens: 108
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 108
Estimated QA/QC Specimens: _____ (=s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 3-30-04

Job #/Task/Labor Code: 7826.000 / 00 / 444
Sample ID: MM-SW/SO14A

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☑ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 11:30-11:45 / 11:05-12 + 3:00-3:30 x 8:00-8:45 chiro

ID Time Budget: 3.0
Presort ID Time: .25 Date: 4-28-04 By: ADS
Split ID Time: _____ Date: _____ By: _____
Chiro. ID Time: 1.5 Date: 5-3-04 By: ADS
QC Info: ☑ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1	✓	Ephemeroptera	Caenis sp. (N)	1	1		Caenidae
2							
3	✓	Amphipoda	Hyalella sp. (T)	1	1		Talitridae
4							
5	✓	Diptera	Polypedilum aep. (L)	2	2		Ceratopogonidae
6	✓	"	Culicoides sp. (L)	2	2		"
7	✓	"	Mallochohelea sp. (L)	2	2		"
8	✓ GMC	"	Clinotanypus sp. (L)	8	8		Chironomidae
9	✓ GMC	"	Einfeldia sp. (L)	1	1		"
10	✓ GMC	"	Orthocladiinae (L)	1	1		mount too mangled
11	✓ GMC	"	Paratanytarsus sp. (L)	1	1		"
12	GMC	"	Tanytarsus sp. (L)	1	1		"
13			0				
14					QC coef = 0		
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (=)
1	Tanytarsini		2+6	2	Para-tanytarsus	1	1	6
2					Clinotanypus sp. #	2/2·8	8	1
3	Chironomini		1	1	Einfeldia sp.	1	1	3
4					Tanytarsus sp.	1	1	7
5	Orthocladiinae		1	1				
6	Tanytarsini	Long ant	1	1	Orthocladinae	1	1	5
7	"	shorter	1	1				
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 10
Subsampled Taxa: -
QA/QC Taxa: 0
Sample Total Taxa: 10

Presorted Specimens: 20
Estimated Subsampled Specimens: -
Actual (or Subsampled) QA/QC Specimens: 0
Sample Total Specimens: 20
Estimated QA/QC Specimens: _____ (#'s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: MJG
QA/QC Req.: 5%

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = 0 %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = 0 %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW | Job #/Task/Labor Code: 19826.000 / 00 / 444
Location: Magna Metals | Sample ID: MM-SW/3014B
Coll. Date: 3-30-04 | ID Time Budget: 3.0
Prelim. Sorter: MSB | Split Sorter: _____ | Presort ID Time: 1.0 | Date: 5/5/04 | By: [illegible]
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____ | Split ID Time: — | Date: — | By: —
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.) | Chiro. ID Time: 1.0 | Date: 5/5/04 | By: GEC
(_____ of _____ grids) | QC Info: ☐ Sort QC and/or ☐ ID QC
☐ Other: 11:00 - 11:30 | ID QC Time: _____ | Date: _____ | By: _____

	QC Check	Taxonomic Order	Taxon		Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1	✓	Basommatophora	Ferrissia rivularis	(A)	1	1		Ancylidae
2								
3	✓	Tubificida	Limnodrilus sp.	(J)	1	1		Tubificidae
4								
5	✓	Amphipoda	Hyalella azteca	(A)	4	4		Talitridae
6								
7	✓	Ephemp.	Baetidae	(N)	2	2		"mutilated"
8								
9	✓	Odonata	Plathemis sp	(N)	1	1		Libellulidae
10								
11	✓	Diptera	Mallochohelia sp.	(L)	1	1		Ceratopogonidae
12	✓	"	Palpomyia gr.	(L)	1	1		"
		"	Cryptochironomus fulvus gr.	(L)	1	1		Chironomidae
15	✓	"	Chironomus sp	(L)	1	1		"
16	✓	"	Clinotanypus sp	(L)	1	1		"
17	✓	"	Paratanytarsus sp	(L)	5	5		"
18	✓	"	Procladius sp.	(L)	8	8		"
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
35								

Comments: finish wt + midges/worms

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimate Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☜)
1	Tanypod	nr. Proclad	8	(1 mick.)	Proclad '	1/1 · 8 =	8	#1
2	"	nr. Clino.	1	(m)	Clinotanypus '	1/1 · 1 =	1 ✓	#2
3	Tanytar.	lrg-lat.	5	(3m)	Paratany '''	3/3 · 5 =	5	#3
4	Chir.	Dicro ?	1	(m)	Chironomus '	1/1 · 1 =	1 ✓	#4
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 12
Subsampled Taxa: –
QA/QC Taxa: –
Sample Total Taxa: 12

Presorted Specimens: 27
Estimated Subsampled Specimens: –
Actual (or Subsampled) QA/QC Specimens: –
Sample Total Specimens: 27
Estimated QA/QC Specimens: – (='s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

$$\text{Taxa QC} = \frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}} = \_\_\_\_ = \_\_\_\_ \%$$

$$\text{Count QC} = \frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}} = \_\_\_\_ = \_\_\_\_ \%$$

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

$$\text{Taxa QC} = \frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}} = \_\_\_\_ = \_\_\_\_ \%$$

$$\text{Count QC} = \frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}} = \_\_\_\_ = \_\_\_\_ \%$$

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 2-30-04

Job #/Task/Labor Code: 19826.000 00 1444
Sample ID: MM-SW/SD14C

ID Time Budget:
Presort ID Time: .25 Date: 4-27-04 By: ADE
Split ID Time: Date: By:
Chiro. ID Time: 2.5 Date: 5-3-04 By: ADE
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: Date: By:

Prelim. Sorter: MJG Split Sorter:
Subsample: ☒ None ☐ Abundant Taxa: Split:
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(of grids)
☐ Other: 12:00-12:15 / chiro 12:15-1:15 + 3:30-4:00 8:30-9:30

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1		Amphipoda	Hyalella sp. (J)	1	1		Talitridae
2							
✓3		Ephemeroptera	Caenis (N)	1	1		Caenidae
✓4	TSD	"	Isonychia (N)	2	2		Isonychiidae
5							
✓6	GMC	Diptera	Chironomus sp. (L)	3	3		Chironomidae
✓7	GMC	"	Dicrotendipes sp. (L)	7	7		"
✓8	GMC	"	Paratanytarsus sp. (L)	7	7		"
✓9		"	Procladius sp. (L)	30	30		"
✓10		"	Tanypodinae (L)	4	4		"
✓11		"	Tanytarsus sp. (L)	5	5		"
12		"	Clinotanypus sp. (L)	3	3		"
13							
✓14		Tubificida	Limnodrilus sp. (J)	1	1		Tubificidae
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments:

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split		Multiplier		Estimated Total
		x		=	
		x		=	
		x		=	
		x		=	

Taxon	Number Of Specimens In Split		Multiplier		Estimate Total
		x		=	
		x		=	
		x		=	
		x		=	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☞)
1	Tanytarsini		12	5	Tanytarsus sp. 1	2/5·12	5	1
2					Paratanytarsus sp. III	5/5·30	30	8
3					Dirrotendipes sp. II	2/3·10	7	9
4					Paratanytarsus sp. II	3/5·12	7	1
5	Tanypodinae	long head / hairy / large	4	1	Clinotanypus sp. 1	1/1·3	3	6
6		Long Head / not Fringed	3	1	Chironomus sp. 1	1/3·10	3	9
7		Short head / Small	19	3	Tanypodinae 1	1/1·4	4	5
8		Short head / large	11	2				
9	Chironomini		10	3				
10	Oligochaeta	no hairs	1	0	Limnodrilus sp.		1	10
11	→ ID from other samples							
12				16+15				
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 11
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 11

Presorted Specimens: 64
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 64
Estimated QA/QC Specimens: _____ (=’s Actual Subsampled QA/QC Spec. X Multiplie

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 3-30-04

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW/SD15A

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 4:00-4:30 / 4:30-5:30 + 9-10 8-8:30 + worms 10:45-11:30 12:30-1:30

ID Time Budget: 3.0
Presort ID Time: 0.5 Date: 4-27-04 By: ADE
Split ID Time: — Date: — By: —
Chiro. ID Time: 3.25 Date: 5-6-04 By: ADE
QC Info: ☐ Sort QC and/or ☒ ID QC
ID QC Time: 2.0 Date: 5/6/04 By: JSD

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1	JSD	Veneroida	Pisidium sp. (J)	1	1		Sphaeridae
2							
✓3	JSD	Amphipoda	Hyalella sp. (J)	1	1		Talitridae
4							
✓5	JSD	Coleoptera	Hydroporus sp. (L)	3	2+1		Dytiscidae (larva
6							
✓7	JSD	Diptera	Mallochohelea sp. (L)	1	1		Ceratopogonidae
✓8	JSD	"	Palpomyia gp. (L)	5	3+1+1		"
✓9	JSD	"	Culicoides sp. (L)	2	2		"
10							
11							
12							
13							
✓14	JSD	Diptera	Dicrotendipes sp. (L)	1	1		Tipulidae.
15							
✓16	GMC	Coleoptera	Cyphon sp. (L)	1	1		Scirtidae
17							
✓18	GMC	Diptera	Ablabesmyia sp. (L)	7	7		Chironomidae
✓19	1	"	Chaetocladius sp. (L)	1	1		"
✓20	1	"	Hydrobaenus sp. (L)	3	3		"
✓21	1	"	Orthocladius sp. (L)	42	42		"
✓22	1	"	Parectocladius sp. (L)	16	16		"
✓23	1	"	Rheocricotopus robacki (L)	2	2		"
✓24	1	"	Tanytarsus sp. (L)	1	1		"
✓25	↓	"	Thienemanniella gp. (L)	48	48		"
26							
✓27	GMC	Tubificida	Limnodrilus sp. (J)	11	11		Tubificidae
✓28	GMC	"	L. hoffmeisteri (A)	6	6		"
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☜)
1	Orthocladinae	dark head	1	1	Hydrobaenus sp. I	1/2·5	3	3
2		Sm. yellow	16	3	Psectrocladius sp. III	3/3·16	16	2
3		misc	5	2	Thienemanniella sp. III	7/8·55	48	5
4		lg. green	42	43	Orthocladius sp. III	3/3·42	42	4
5	Tanypodinae		55	8	Tanytarsus sp. I	1/1·1	1	7
6					Chaetocladius sp. I	1/1·1	1	1
7	Tanytarsini		1	1	Rheocricotopus inidentatis	1/2·5	2	3
8				19→19	Ablabesmyia sp. I	1/8·55	7	5
9								
10								
11					Limnodrilus sp. II	2/2·17	11	12
12	Diamesinae	no hair	17	3	L. hoffmeisteri I	1/3·17	6	12
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 18
Subsampled Taxa:
QA/QC Taxa:
Sample Total Taxa: 18

Presorted Specimens: 152
Estimated Subsampled Specimens:
Actual (or Subsampled) QA/QC Specimens:
Sample Total Specimens: 152
Estimated QA/QC Specimens: (=’s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: TSD
QA/QC Req.: 90%

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = 18-0/18 = 100 %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = 152-0/152 = 100 %

QA/QC (Processing)

QA/QC Based Upon (circle): ~~Whole Sample~~ Split Estimate (Split Fraction:_____)

QA/QC By:
QA/QC Req.:

Taxa QC = Presorted Taxa ÷ Subsampled Taxa / Sample Total Taxa = = %

Count QC = Presorted Specimens + Est. Subsampled Specimens / Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens) = = %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Portland NY
Coll. Date: 3-30-04

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW 1SD15G

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 10:30-12:00 / 12-12:30 chiro 1:30-2:00 11-11:30

ID Time Budget: 3.0
Presort ID Time: 1.5 Date: 4-28-04 By: ADE
Split ID Time: _____ Date: _____ By: _____
Chiro. ID Time: 1.5 Date: 5-6-04 By: ADE
4 worms
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓ 1		Diptera	Palpomyia grp. (L)	1	1		Ceratopogonidae
✓ 2		"	Culicoides sp. (L)	1	1		"
✓ 3		"	Pseudolimnophila sp. (L)	1	1		Tipulidae
✓ 4	GMC	"	Cecidomyiidae (L)	1	1		
5							
✓ 6	GMC	Diptera	Cricotopus tulvus grp. (L)	3	3		Chironomidae
✓ 7	↓	"	Orthocladius sp. (L)	18	18		"
✓ 8	↓	"	Rheocricotopus sp. (L)	5	5		"
✓ 9	↓	"	Rh. unidentatis (L)	5	5		"
✓ 10	↓	"	Tanytarsus sp. (L)	1	1		"
✓ 11	↓	"	Thienemannimyia (L)	13	13		"
12							
13	GMC	Tubificida	Limnodrilus sp. (J)	2	2		Tubificidae
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Tanytarsini	no frms	13	2	Orthocladius sp.	1/1·18	18	4
2	Tanytarsini	6.	1	1	Rheocricotopus sp.	1/2·10	5	3
3	Orthocladiinae	sm. squarehead	10	2	Thienemanniella sp. "	2/2·13	13	1
4	"	la. saccular	18	1	Cricotopus fulvus grp.	1/1·3	3	5
5	"	basic	3	1	Tanytarsus sp. "	1/1·1	1	2
6				8-7	Rh. tridentatus	1/2·10	5	3
7								
8								
9								
10								
11								
12								
13								
14	Oligochaeta	no hairs	2	2	Limnodrilus sp. "	2/2·2	2	
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 11
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 11

Presorted Specimens: 51
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 51
Estimated QA/QC Specimens: _____ (=s Actual Subsampled QA/QC Spec. X Multiplie

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = Presorted Taxa ÷ Subsampled Taxa / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 3-30-04

Job #/Task/Labor Code: 19826.000/00 / 44
Sample ID: MM-SW1SD15C

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 12:30-1:30 / chiro 1:30-2:15

ID Time Budget: 3.0
Presort ID Time: 1.0 Date: 4-28-04 By: ADS
Split ID Time: _____ Date: _____ By: _____
Chiro. ID Time: 2.0 Date: 5-6-04 By: ADS
+worms
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

2-3:00
11:30-45

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	÷ Split Number	Notes (Inc. Sort QC Number)
√ 1		Coleoptera	Hydroporus sp. (L)	1	1		Dytiscidae (larva
√ 2		Nematoda	U	1	1		
√ 3		Diptera	Culicoides sp. (L)	4	3 +1		Ceratopogonidae
√ 4		"	Mallochohelea sp. (L)	1	1		"
√ 5		"	Palpomyia gp. (L)	1	1		"
√ 6		"	Pilaria sp. (L)	2	1+1		Tipulidae
√ 7	JSD	"	Pedicia sp. (L)	1	1		"
8							
√ 9	GMC	Diptera	Cryptochironomus fulvus grp.	8	8	(L)	Chironomidae
√ 10	|	"	Heterotrissocladius marcidus	26	26	(L)	"
√ 11	|	"	Hydrobaenus sp.	17	17	(L)	"
12	|	"	Orthocladius sp.	9	9	(L)	"
13	|	"	Rheocricotopus uncidentatis	2	2	(L)	"
√ 14	|	"	Tanytarsus sp.	1	1	(L)	"
√ 15	↓	"	Thienemannimyia grp.	36	36	(L)	"
16							
√ 17	GMC	Tubificida	Limnodrilus sp.	2	2	(J)	Tubificidae
√ 18	|	"	Ilyodrilus templetoni	3	3	(J)	"
√ 19	↓	Nemertina	Prostoma graescense	1	1	(A)	Tetrastomatidae
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
2							
33							
34							
35							

Comments:

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Tanytarsini		1	1	Heterotrissocladius marcidus	3/5.43	26	6
2					Rhencricotopus unidentatis	2/2.2	2	7
3	Tanypodinae		36	5	Cryptochironomus fulvus grp.	1/5.43	8	6
4					Tanytarsus sp.	1/1.1	1	1
5	Orthocladiinae	sm white	17	3	Hydrobaenus sp.	3/3.17	17	5
6		lg. green	43	5	Thienemannimyia sp.	5/5.36	36	3
7		misc.	2	2	Orthocladius sp.	1/5.43	9	6
8				16				
9								
10								
11								
12								
13					Limnodrilus sp.	1/1.2	2	15
14	Oligochaeta	wt hairs	3	1	Prostoma graescense	1/1.1	1	1
15		no hairs	2	1	Hyodrilus templetoni	1/1.3	3	4
16								
17		white spotted	1	1				
18		[illegible] prostoma						
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 17
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 17

Presorted Specimens: 116
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 116
Estimated QA/QC Specimens: _____ (='s Actual Subsampled QA/QC Spec. X Multiplie

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}}$ = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}}$ = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Moapa Motels
Coll. Date: 30 Mar. 04

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW-SD 16 A

Prelim. Sorter: MTC Split Sorter: —
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 1:00 - 2:00

ID Time Budget: 3.0
Presort ID Time: 1.0 Date: 5/5/04 By: CMC
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.0 Date: 5/7/04 By: CMC
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon		Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1	✓	—	Nematoda	(A)	1	1		—
2	✓	Tubificida	Limnodrilus sp	(J)	13	13		Tubificidae
3	✓	"	L. udekemianus	(J)	11	11		"
4	✓	Diptera	Ceratopogonidae sp	(A) (L)	1	1		Ceratopogonidae
5	✓	"	Ceratopogon sp	(A) (L)	1	1		"
6	✓	"	Palpomyia gr	(A) (L)	1	1		"
7								
8	✓	"	Ormosia sp	(A) (L)	1	1		Tipulidae
9	✓	"	Pilaria sp	(A) (L)	3	3		"
10	✓	"	Chrysops sp	(A) (L)	1	1		Tabanidae
11								
12	✓	"	Tanytarsus sp	(L)	3	3		Chironomidae
13	✓	"	Thienemanniella sp	(L)	2	1+1		"
14	✓	"	Chaetocladius sp	(L)	1	1		"
15	✓	"	Hydrobaenus sp	(L)	9	9		"
16	✓	"	Diplocladius sp	(L)	1	1		"
17	✓	"	Paramerina cingulata sp	(L)	19	19		"
18	✓	"	Rheocricotopus sp	(L)	1	1		"
19	✓	"	R. uniden tatus	(L)	2	2		"
20	✓	"	Tvetenia bavarica	(L)	1	1		"
21								
22	✓	"	Zavrelimyia sp	(L)	2	2		"
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

Comments: _____

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estima Tota
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Re # (
1	Tub	w/o cc	34 ✓	(6a)	Limnodrilus sp	4/6·34	= 23 ✓	#1
2					L. udekemianus	2/6·34	= 11 ✓	#1
3	Tanypod	straight teeth	3 ✓	(3a)	Zavrelimyia	2/3·3	= 2 ✓	#3
4	Ortho	top	6	(6a)	Thienemanni. gr.	1/3·3	= 1 ✓	#3
5	Orth.	green	28 ✓	(10a)	Parametriocnemus	5/12·28	= 19 ✓	#5
6					Diplocladius	1/6·6	= 1 ✓	#4
7		Σ =	37		Hydrobaenus	4/12·28	= 9 ✓	#5
8					Rheo. vinidutatus	3/6·6	= 3 ✓	#4
9					Chaetocladius	1/6·6	= 1 ✓	#4
10					Tve. bavarica	1/6·6	= 1 ✓	#4
11					Rheocricotopus sp	1/6·6	= 1 ✓	#4
12								
13						Σ =	37	
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 19
Subsampled Taxa: —
QA/QC Taxa: —
Sample Total Taxa: 19

Presorted Specimens: 84
Estimated Subsampled Specimens: —
Actual (or Subsampled) QA/QC Specimens: —
Sample Total Specimens: 84
Estimated QA/QC Specimens: — (=’s Actual Subsample QA/QC Spec. X Multipl

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Magna Metals
Coll. Date: 30 Mar. 04
Prelim. Sorter: MKG Split Sorter: —
Subsample: ☑ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 2:00 - 3:00

Job #/Task/Labor Code: 19826.00 / 00 / 444
Sample ID: MM-SW/SD 16B
ID Time Budget: 3.0
Presort ID Time: 1.0 Date: 5/4/04 By: [illegible]
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.0 Date: 5/7/04 By: [illegible]
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1		—	Nematoda (A)	3	3		—
2							
✓3		Tubificida	Limnodrilus sp. ~~(L)~~ (J)	19	19		Tubificidae
✓4		"	L. hoffmeisteri (A)	5	5		"
✓5		"	L. udekemianus ~~(L)~~ (J)	10	10		"
✓6		"	Ilydrilus templetoni (J)	4	4		"
✓7		Veneroida	Pisidium sp. (J)	1	1		Sphaeriidae
8							
✓9		Coleoptera	Hydroporus sp (L)	1	1		Dytiscidae
10							
11							
12		Diptera	Chrysops sp (L)	1	1		Tabanidae
13		"	Pilaria sp. (L)	6	5+1		Tipulidae
14							
✓15		"	Tanytarsus sp (L)	4	4	(1 mick)	Chironomidae
✓16		"	Thienemannimyia gr	4	4	(L)	"
✓17		"	Heterotrissocladius marcidus	3	3	(L)	"
✓18		"	Hydrobaenus sp	10	10	(L)	"
✓19		"	Orthocladius sp.	7	7		"
✓20		"	Parametriocnemus sp.	3	3		"
✓21		"	Rheocricotopus unidentatus	5	5		"
✓22		"	Zavrelimyia sp.	4	4		"
23							
24							
25							
26							
27							
28							
29							
30							
31							
2							
3							
34							
35							

Comments:

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Tub	w/o cc	3d ✓	(7m)	L. udekemianus "	2/7·3d	= 10 ✓	#1
2	"	w/cc	4 ✓	(4m)	Lim. sp. ""	4/7·3d	= 19 ✓	#1
3					L. hoffmeisteri '	1/7·3d	= 5 ✓	#1
4	Tanytar	lg-lab	4 ✓	(1w ich)	Tanytar '	1/1·4	= 4 ✓	#4
5	Tanytar	non-sitter	4 ✓	(4m)	Zavrelimyia ""	4/4·4	= 4 ✓	#5
6	Ortho	dk-hd	3 ✓	(3m)	Orthocladius "	3/3·3	= 3 ✓	#6
7	"	Typ (green/lav.)	25 ✓	(10m)	Parorthocl. '	1/10·25	3 ✓	#7
8					Rheo. viridiv "	2/10·25	5 ✓	#7
9					Orthocl. sp '	1/10·25	3 ✓	#7
10					Hydrobaen. ""	4/10·25	10 ✓	#7
11					Heterotrissocl. marcidus '	1/10·25	3 ✓	#7
12								
13					I. tarsalis '	1/1·4	= 4 ✓	#7
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 17
Subsampled Taxa: —
QA/QC Taxa: —
Sample Total Taxa: 17

Presorted Specimens: 90
Estimated Subsampled Specimens: —
Actual (or Subsampled) QA/QC Specimens: —
Sample Total Specimens: 90
Estimated QA/QC Specimens: — (=’s Actual Subsample QA/QC Spec. X Multip

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

$$\text{Taxa QC} = \frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}} = \_\_\_\_ = \_\_\_\_$$

$$\text{Count QC} = \frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}} = \_\_\_\_ = \_\_\_\_$$

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

$$\text{Taxa QC} = \frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}} = \_\_\_\_ = \_\_\_\_$$

$$\text{Count QC} = \frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}} = \_\_\_\_ = \_\_\_\_$$

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech, FWS
Location: Mapa Metals
Coll. Date: 3-30-04

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW/SD-16C

ID Time Budget: 3.0

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☑ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 3:00 – 4:15

Presort ID Time: 1.25 Date: 5/4/04 By: [illegible]
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.0 Date: 5/7/04 By: [illegible]
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number =	Presort Number +	Split Number	Notes (Inc. Sort QC Number)
√1		Haplonemer.	Prostoma graescense (J)	1	1		Tetrastemmatidae
√2		Tubificida	Ilydrilus templetoni (J)	4	4		Tubificidae
√3		Tubificida	Limnodrilus sp. (J)	37	37		Tubificidae
√4		"	L. hoffmeisteri (A)	8	8		"
√5		Arynchobdelli	Moorobdella sp. (A)	1	1		Erpobdellidae
6							
√7		Veneroida	Pisidium sp (A)	1	1		Sphaeriidae
8							
9							
√10		Diptera	Culicoides sp (L)	1	1		Ceratopogonidae
√11		"	Sphaeromias sp (L)	1	1		"
12							
13		"	Cryptochironomus fulvus gr. (L)	1	1		Chironomidae
√14		"	Hydrobaenus sp. (L)	27	27		"
√15		"	Parametriocnemus sp. (L)	1	1		"
√16		"	Orthocladius sp. (L)	2	2		"
√17		"	Rheocricotopus sp. (L)	3	3		"
√18		"	R. unidentatus (L)	2	2		"
√19		"	Tanytarsus sp (L)	2	2		"
√20		"	Zavrelimyia sp (L)	1	1		"
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments:

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estima Tota
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Re # ("*
1	Tub	w/o cc	45 ✓	(8m)	Lim. sp	9/16·45 =	37 ✓	1
2	"	w/cc	3+1 ✓	(4m)	L. hoffi	4/16·45 =	8 ✓	1
3					I. kimb.	4/4·4 =	4 ✓	2
4	Orth.	green	27 ✓	(10m)	Hydrobaenus	10/10·27 =	27 ✓	4
5	"	gr. str-bel	2 ✓	(2m)	Parametrio	1/6·6 =	1 ✓	
6	"	brown	6	(6m)	Orthocladius	3/6·6 =	2 ✓	6
7	Tany for	lg - lat	2 ✓	(2m)	Rheo. unidentate	3/2·2 =	2 ✓	
8	Tanypod	lg	1 ✓	(1m)	Zavrel	1/1·1 =	1	8
9					Rheo. sp.	3/6·6 =	3 ✓	6
10					Tany Forcens	1/1·2 =	2 ✓	7
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 16
Subsampled Taxa: —
QA/QC Taxa: —
Sample Total Taxa: 16

Presorted Specimens: 93
Estimated Subsampled Specimens: —
Actual (or Subsampled) QA/QC Specimens: —
Sample Total Specimens: 93
Estimated QA/QC Specimens: — (=/= Actual Subsample QA/QC Spec. X Multipl

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens − (Estimated QA/QC Specimens − Actual QA/QC Specimens)) = _____ = _____

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Nama Metals
Location: Cortland NY
Coll. Date: 3-31-04
Job #/Task/Labor Code: 19826.000/01 Rev 1
Sample ID: Mm-SW1SD1-R

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☑ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: Chiro. 11-12:00 + 12-1:00

ID Time Budget: 3.0
Presort ID Time: — Date: — By: —
Split ID Time: — Date: — By: —
Chiro. ID Time: 2.0 Date: 5-6-04 By: AD
*worms QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓ 1	GMC	Diptera	Hydrobaenus sp. (L)	92	82 + 10 pupae		Chironomidae
✓ 2	1	"	Orthocladius sp. (L)	11	10 + 1 pupae		"
✓ 3	1	"	Rheocricotopus unidentatus	4	4	(L)	"
✓ 4	1	"	Tanytarsus sp. (L)	2	2		"
✓ 5	↓	"	Zavrelimyia sp. (L)	1	1		"
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
✓ 20		Tubificida	Limnodrilus sp. (J)	1	1		Tubificidae
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimat Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Ortho	green typ.	79	5	Hydrobaenus sp. ~~III~~ I	5/5·79+1/3·10	82	1.3
2	"	dark head	7	2	Orthocladius sp. III	2/2·7+1/3·10	10	2.3
3	"	misc. white	10	3	Rheocricotopus unidentatis I	1/3·10	4	3
4	Tanytarsini		2	2	Zavrelimyia sp. I	1/1·1	1	5
5	Ortho	other	1	1	Tanytarsus sp. II	2/2·2	2	4
6				13→13				
7								
8								
9								
10								
11								
12	Ortho Pupae		11					
13								
14	Oligochaeta	sm. white, no [illegible]	1	Ø	Limnodrilus sp.		1	
15	(10 from other samples)							
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 6
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 6

Presorted Specimens: 111
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 111
Estimated QA/QC Specimens: _____ (='s Actual Subsampled QA/QC Spec. X Multiplier

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}}$ = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}}$ = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magnametals
Location: Cortland NY
Coll. Date: 3-31-04

Job #/Task/Labor Code: 19826.000/00/444
Sample ID: [illegible]

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☑ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 12:10:15 / chiro 12:15-1
/ +worms 1-1:30

ID Time Budget: _____
Presort ID Time: .25 Date: 5-3-04 By: ADE
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.25 Date: 5-6-04 By: ADE
+worms QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
√ 1	GMC	Coleoptera	Agabus sp. (L)	1	1		Dytiscidae
2							
√ 3	GMC	Tubificida	Enchytraeidae (J)	1	1		
√ 4	GMC	"	Limnodrilus (J)	1	1		
5							
√ 6	GMC	Diptera	Hydrobaenus sp. (L)	55	52+3 pupae		Chironomidae
√ 7	GMC	"	Orthocladius sp. (L)	6	6		"
√ 8	GMC	"	Rheocricotopus unidentatus (L)	2	2		"
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Orthocl	Type	52	4	Hydrobaenus sp. II	4/4-52	52+3	1,4
2		blackhead	5	1	Rheocricotopus uniidentatus II	2/3-3	2	3
3		misc	3	3	Orthocladius sp. II	1/1-5+1/3-3	6	2
4		Dubar	3	0				
5								
6								
7								
8								
9								
10								
11								
12								
13								
14	Oligochaeta	Long thin	1	1	Enchytraeidae	1/1-1	1	
15		Short white	1	1	Limnodrilus sp.	1/1-1	1	4
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 6
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 6

Presorted Specimens: 66
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 66
Estimated QA/QC Specimens: _____ (=s Actual Subsampled QA/QC Spec. X Multipli

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = Presorted Taxa + Subsampled Taxa / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Magna Metals
Coll. Date: 3-31-04
Prelim. Sorter: MJG Split Sorter: —
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 4:15 - 5:00

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW / SD17C
ID Time Budget: _____
Presort ID Time: 1.25 Date: 4/22/04 By: JSD, G
Split ID Time: _____ Date: _____ By: _____
Chiro. ID Time: 1.5 Date: 5/7/04 By: [illegible]
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
√1		Tubificida	Limnodrilus sp (J)	2	2		Tubificidae
2							
√3	[illegible]	Diptera	Clinocera sp (L)	1	1		Empididae
√4	[illegible]	"	Pedicea sp (L)	1	1		Tipulidae sp
5							
6							
√7		"	Thienemannimyia gr. (L)	1	1		Chironomidae
√8		"	Zavrelimyia sp (L)	2	2		"
√9		"	Orthocladius sp (L)	13	13		"
√10		"	Orthocladiinae (L)	1	1		"
√11		"	Hydrobaenus sp (L)	151	151		"
12		"	Rheocricotopus unidentatus (L)	2	2		"
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: [illegible]

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimate Total
		X	=			X	=
		X	=			X	=
		X	=			X	=
		X	=			X	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☞)
1	Ortho	dk.-hd	9	(2m)	Orthocladius "	2/2·9 =	9 ✓	#1
2	"	brown	7	(4m)	Orthocladius "	2/4·7 =	4 ✓	#2
3	"	green	151	(10m)	Hydrobaenus ###	10/10·151 =	151 ✓	#3
4					Orthocladiinae # '	1/4·7 =	1 ✓	#2
5		Σ =	167		Rheo. unidentatus '	1/4·7 =	2 ✓	#2
6								
7						Σ =	167	
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 9
Subsampled Taxa: –
QA/QC Taxa: –
Sample Total Taxa: 9

Presorted Specimens: 174
Estimated Subsampled Specimens: –
Actual (or Subsampled) QA/QC Specimens: –
Sample Total Specimens: 174
Estimated QA/QC Specimens: – (='s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}}$ = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}}$ = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 3-31-04

Job #/Task/Labor Code: 19826.000/00 / 444
Sample ID: MM-SW15D19A

ID Time Budget:

Prelim. Sorter: MJG Split Sorter:
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 1:30-1:45 / chiro 1:45-2:30 + 10 min 1:30-1:45

Presort ID Time: 0.25 Date: 4-27-04 By: ADE
Split ID Time: _____ Date: _____ By: _____
Chiro. ID Time: 2.0 Date: 5-6-04 By: ADE
4 worm
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
√1		Isopoda	Caecidotea sp. (A)	1	1		Asellidae
2							
√3		Ephemeroptera	Caenis sp. (N)	3	3		Caenidae
4							
√5		Nematoda	(A)	1	1		
6							
7							
8							
√9	GMC	Diptera	Chironomus sp. (L)	66	66		Chironomidae
√10		"	Dicrotendipes sp. (L)	11	11		"
√11		"	Kiefferulus sp. (L)	1	1		"
12		"	Cmisus sp. (L)	7	7		"
13		"	Procladius sp. (L)	4	4		"
√14		"	Tanypus sp. (L)	7	7		"
√15		"	Tanytarsus sp. (L)	9	9		"
√16		"	Zavreliella sp. (L)	1	1		"
17							
√18	GMC	Tubificida	Limnodrilus sp. (J)	2	2		Tubificidae
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: terrestrial

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x	=			x	=
		x	=			x	=
		x	=			x	=
		x	=			x	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Unknown	Longish ant	1	1	Kiefferulus sp.	1/1.1	1	1
2					Tanytarsus sp.	2/5.7	7	4
3	Tanypodinae	hairy forer	4	1	Tan. tarsis sp.	2/2.9	9	7,8
4		no forer	7	2	Procladius sp.	1/1.4	4	3
5					Chironomus sp.	6/7.77	66	9
6	Chiro	misc	1	1	Dicrotendipes sp.	1/7.77	11	9
7	Tanytarsini	green	3	1	Zavreliella sp.	1/1.1	1	6
8		orange	6	1	Omisus sp.	1/1.7	7	10
9	Chironomini	many, notgill, w/ ventral tubercle	77	87				
10		Large	7	1				
11				116→15				
12	Oligochaeta	Long + skinny	2	1	Limnodrilus sp.	1/1.2	2	12
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 12
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 12

Presorted Specimens: 113
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 113
Estimated QA/QC Specimens: _____ (=’s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Magna Metals
Location: Cortland NY
Coll. Date: 3-31-04

Job #/Task/Labor Code: 9826.000/00/444
Sample ID: MM-SW/SD19E

ID Time Budget: 3.0
Presort ID Time: 0.5 Date: 4-27-04 By: ADE
Split ID Time: Date: By:
Chiro. ID Time: 2.25 Date: 5-6-04 By: ADE
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: Date: By:

Prelim. Sorter: MJG Split Sorter:
Subsample: ☒ None ☐ Abundant Taxa: Split:
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(of grids)
☐ Other: 2:30-3:00/ chiro 3:00-3:30 10-10:30 11-12:00 1:45-2:00

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1		Nematoda	(J)	2	2		
2							
✓3		Diptera	Palpomyia grp. (L)	1	1		Ceratopogonidae
4							
✓5	GMC	Diptera	Chironomus sp. (L)	61	61		Chironomidae
✓6		"	Hydrobaenus sp. (L)	4	4		"
✓7		"	Tanypus sp. (L)	7	7		"
✓8		"	Tanytarsus sp. (L)	9	9		"
✓9		"	Thienemannimyia grp. (L)	2	2		"
10							
✓11	GMC	Tubificida	Naididae (J)	1	1		
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments:

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimat Total
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Tanypodinae	hairy fringe	7	1	Chironomini sp. ### III	8/8.61	61	6, 7
2	"	no fringe	2	0	Tanytarsini sp. "	2½.9	9	5
3					Tanypus sp. "	½.7	7	1
4	Orthocladinae	(one pupa)	4	3.1	Hydrobaenus sp. "	¼.4	4	4
5	Tanytarsini		9	2	Thienemanniella gr.	—	2	2
6	Chironomini	Large	5	1				
7	"	Olive	56	7				
8				13-12				
9								
10								
11								
12	Oligochaeta	hairs	1	1	Naididae	½.1	1	12
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 9
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 9

Presorted Specimens: 87
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 87
Estimated QA/QC Specimens: _____ (=’s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Maana Metals
Location: Cortland NY
Coll. Date: 3-31-04

Job #/Task/Labor Code: 19826.000 / 00 / 444
Sample ID: MM-SW-SD19C

Prelim. Sorter: MJG Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 3:30-4:00 chiro ← 10:30-11 ✓ 1-2

ID Time Budget: 3.0
Presort ID Time: ~ Date: ~ By: ~
Split ID Time: ~ Date: ~ By: ~
Chiro. ID Time: 2.0 Date: 5-5-04 By: AOL
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
✓1	GMC	Diptera	Chironomus (L)	4	4		Chironomidae
✓2	1	"	Rheotanytarsus (L)	1	1		"
✓3	1	"	Polypedilum tritum (L)	3	3		"
✓4	1	"	Tanytarsus (L)	1	1		"
✓5	✓	"	Thienemanniella sp. (L)	1	1		"
6							
7							
8							
9							
10							
11							
12							
13							
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27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estima Tota
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (
1	Tanypodinae	no hair fringe	1	0	Tanytarsus sp.	½·2	1	3
2	"				Chironomus sp.	½·7	4	5
3	Tanytarsini		2	2	Paratanytarsus sp.	½·2	1	3
4	"				Polypedilum tritum	½·7	3	5
5	Chironomini		7	2	Thienemanniella gp.	1	1	1
6				5=4-2				
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 5
Subsampled Taxa: _____
QA/QC Taxa: _____
Sample Total Taxa: 5

Presorted Specimens: 10
Estimated Subsampled Specimens: _____
Actual (or Subsampled) QA/QC Specimens: _____
Sample Total Specimens: 10
Estimated QA/QC Specimens: _____ (=’s Actual Subsampled QA/QC Spec. X Multiplie

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Job #/Task/Labor Code: 19826,000 / 00 / 444
Location: Magna Metals
Sample ID: mm-SW-SD20A
Coll. Date: 3-31-04
ID Time Budget: 3.0
Prelim. Sorter: MJG Split Sorter: —
Presort ID Time: 1.5 Date: 4/24/04 By: JSD/G
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
Split ID Time: _____ Date: _____ By: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
Chiro. ID Time: 1.5 Date: 5/7/04 By: [illegible]
(_____ of _____ grids)
QC Info: ☑ Sort QC and/or ☐ ID QC
☐ Other: 10:00 - 11:00
ID QC Time: 0.25 Date: 5/5/04 By: GMC

	QC Check	Taxonomic Order	Taxon		Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1	GMC	Ephemeroptera	Caenis sp.	(N)	4	4		Caenidae
2	GMC	Diptera	Palpomyia gr.	(L)	1	1		Ceratopogonidae
3								
4		"	Chironomus sp.	(L)	4	4		Chironomidae
5		"	Dicrotendipes sp.	(L)	8	1+7		"
6		"	Cladopelma sp.	(L)	2	2		"
7		"	Tanytarsus sp.	(L)	2	1	+ 1 (QC)	"
8		"	Eukiefferiella sp.	(L)	3	3		"
9		"	Polypedilum halterale gr.	(L)	3	3		"
10		"	Procladius sp.	(L)	4	4		"
11		"	Tanypus sp.	(L)	2	2		"
12		"	Thienemanniella gr.	(L)	1	1		"
		"	Zavrelimyia sp.	(L)	4	4		"
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

Comments: finish midges/worms

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimated Total
		x =				x =	
		x =				x =	
		x =				x =	
		x =				x =	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☜)
1	Tanypod	nr Procladius	6	(3m)	Procladius "	3/3·6 =	4 ✓	#1
2	"	non-setose	1	(1m)	Tanypus '	1/3·6 =	2 ✓	#1
3	Chir	Dicro ? small	12	(7m)	Microtendipes ////	4/7·12 =	7 ✓	#3
4	Tanytar	lg - lat : long	3	(1m)	Cladopelma '	1/7·12 =	2 ✓	#3
5	"	sl - lat ? : sm.	4	(4m)	Zavrelimyia ///	3/3·4 =	4 ✓	#5
6	Chir	1 pr. tubules : dk chin	3	(2m)				
7					Poly Gattendorfia gr. "	3/7·12 =	3 ✓	#3
8								
9								
10					Eukiefferiella "	3/2·3 =	3 ✓	#6
11								
12					Thienemanniella gr '	1/1·1 =	1 ✓	#2
13								
14					Tany Frast	-	1 ✓	
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 12
Subsampled Taxa: –
QA/QC Taxa: 0
Sample Total Taxa: 12

Presorted Specimens: 37
Estimated Subsampled Specimens: –
Actual (or Subsampled) QA/QC Specimens: 1
Sample Total Specimens: 38
Estimated QA/QC Specimens: _____ (=’s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): (Whole Sample) Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = 12/12 = 100.0 %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = 37/38 = 97.4 %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Magna Motels
Coll. Date: 31 Mar. 04

Job #/Task/Labor Code: 19926.00 / 00 / 404
Sample ID: MM-SW/SD 20 R

Prelim. Sorter: MK Split Sorter: _____
Subsample: ☒ None ☐ Abundant Taxa: _____ Split: _____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(_____ of _____ grids)
☐ Other: 11:00 – 12:00

ID Time Budget: 3.0
Presort ID Time: 1.0 Date: 5/4/04 By: GMC
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.5 Date: 5/7/04 By: GMC
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: _____ Date: _____ By: _____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1	✓	Basommatophora	Physa sp. (A)	1	1		Physidae
2							
3	✓	Odonata	Leucorrhinia sp. (N)	1	1 (Early instar)		Libellulidae
4							
5	✓	Diptera	Sphaeromias sp. (L)	2	2		Ceratopogonidae
6							
7		"	Dicrotendipes sp (L)	1	1		Chironomidae
8		"	Eukiefferiella sp (L)	5	5		"
9		"	Tanypus sp. (L)	3	3		"
10		"	Tanytarsus sp (L)	2	2		"
11		"	Thienemanniella gr. (L)	3	3		"
12		"	Procladius sp (L)	3	3		"
13		"	Zavrelimyia sp (L)	1	1		"
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: _____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split		Multiplier		Estimated Total
		x		=	
		x		=	
		x		=	
		x		=	

Taxon	Number Of Specimens In Split		Multiplier		Estimate Total
		x		=	
		x		=	
		x		=	
		x		=	

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref #
1	Tanypod	non-biting	3	(1m)	Thienemanni. sp.	1/1 · 3	= 3 ✓	#1
2	"	proc. lvl?	5	(2m)	Procladius	—	= 3 ✓	#2
3	Chir.	Lge Hab: dk. cb	5	(0m)	Eukiefferiella	(some)	5 ✓	#3
4	Chir.	Brown	2	(2m)	Tanytarsini	—	2 ✓	#2
5	Tanytar.	lg-lat	3	(0m)	Tanytarsus	(some)	3 ✓	#5
6								
7					Zavrelimyia '	1/2 · 2	= 1 ✓	#4
8					Dicrotendipes '	1/2 · 2	= 1 ✓	#4
9					Kiefferulus '			
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 10
Subsampled Taxa: —
QA/QC Taxa: —
Sample Total Taxa: 10

Presorted Specimens: 22
Estimated Subsampled Specimens: —
Actual (or Subsampled) QA/QC Specimens: —
Sample Total Specimens: 22
Estimated QA/QC Specimens: — (=s Actual Subsampled QA/QC Spec. X Multiplier)

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Sample Total Taxa - Misidentified Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Sample Total Specimens - Difference from Original Counts) / Sample Total Specimens = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = (Presorted Taxa + Subsampled Taxa) / Sample Total Taxa = _____ = _____ %

Count QC = (Presorted Specimens + Est. Subsampled Specimens) / (Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)) = _____ = _____ %

INVERTEBRATE SECTION LABORATORY IDENTIFICATION BENCH SHEET

Client: Tetra Tech FW
Location: Magna Metals
Coll. Date: 3-31-04
Job #/Task/Labor Code: 19826.000 / 00 / 404
Sample ID: MM-SW150 20C
Prelim. Sorter: MG Split Sorter: ____
Subsample: ☑ None ☐ Abundant Taxa: ____ Split: ____
☐ RBP III: ☐ 100 ☐ 200 ☐ 300 (Spec. Subsamp.)
(____ of ____ grids)
☐ Other: 12:00 - 12:30
ID Time Budget: 3.0
Presort ID Time: 0.5 Date: 5/5/04 By: GLK
Split ID Time: — Date: — By: —
Chiro. ID Time: 1.5 Date: 5/7/04 By: GLK
QC Info: ☐ Sort QC and/or ☐ ID QC
ID QC Time: ____ Date: ____ By: ____

	QC Check	Taxonomic Order	Taxon	Total Number	= Presort Number	+ Split Number	Notes (Inc. Sort QC Number)
1							
2							
3							
4		Ephmptr.	Caenis sp (N)	1	1		Caenidae
5							
6							
7		Diptera	Sphaeromias sp (L)	1	1		Ceratopogonidae
8							
9		Diptera	Tanypodinae (L)	2	2		Chironomidae
10		"	Tanytarsus sp (L)	1	1		"
11		"	Chironomus sp (L)	1	1		"
12		"	Kiefferulus sp (L)	1	1		"
13		"	Endochironomus sp (L)	1	1		"
14		"	Glyptotendipes sp (L)	1	1		"
15		"	Poly. halterale gr (L)	1	1		"
16		"	Tanypus sp (L)	1	1		"
17		"	Thienemanniella gr (L)	1	1		"
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Comments: ____

SECONDARY SUBSAMPLING RESULTS

Taxon	Number Of Specimens In Split	Multiplier	Estimated Total	Taxon	Number Of Specimens In Split	Multiplier	Estimat Total
		X	=			X	=
		X	=			X	=
		X	=			X	=
		X	=			X	=

CHIRONOMIDAE AND WORM SAMPLING

Ref #	Group	Type	Total Number	Number Mounted	Taxon	Number On Mount	Total Number	Ref # (☞)
1	Tanypod	mottled: same	1	(m)	~~Fa~~ Thienemanni gr	–	1 –	#1
2	Chir	3 types	6	(6m)	Chironomus '	1/6 · 6 =	1 ✓	#2
3					Glyptotenu '	1/6 · 6 =	1 ✓	#2
4					P. halterale '	1/6 · 6 =	1 ✓	#2
5					Tanypus '	1/1 · 1 =	1 ✓	#
6					Endochironomus '	1/6 · 6 =	1 ✓	#2
7					Kiefferulus '	1/6 · 6 =	1 ✓	#2
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SAMPLE SUMMARY INFORMATION

Sample Totals

Presorted Taxa: 11
Subsampled Taxa: –
QA/QC Taxa: –
Sample Total Taxa: 11

Presorted Specimens: 12
Estimated Subsampled Specimens: –
Actual (or Subsampled) QA/QC Specimens: –
Sample Total Specimens: 12
Estimated QA/QC Specimens: – (='s Actual Subsampled QA/QC Spec. X Multiplie

QA/QC (Identifications)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Sample Total Taxa - Misidentified Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Sample Total Specimens - Difference from Original Counts}}{\text{Sample Total Specimens}}$ = _____ = _____ %

QA/QC (Processing)

QA/QC Based Upon (circle): Whole Sample Split Estimate (Split Fraction: _____)

QA/QC By: _____
QA/QC Req.: _____

Taxa QC = $\frac{\text{Presorted Taxa + Subsampled Taxa}}{\text{Sample Total Taxa}}$ = _____ = _____ %

Count QC = $\frac{\text{Presorted Specimens + Est. Subsampled Specimens}}{\text{Sample Total Specimens + (Estimated QA/QC Specimens - Actual QA/QC Specimens)}}$ = _____ = _____ %

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD13A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 9.5 Split Volume: _____

Sorting Date: 4-5-04 Split Sorting Date: _____

Sorting Technician: MM Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 4/27/04 ID Biologist [illegible]

Identification Time: 3.0 Data Time: 1.0

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	16	
Number of Specimens:	207	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: 1.5

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: ADE

QC Sort Tech: _____

NOTES: Idbuf = 87.5%
Count = 99.5%

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826-000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD13B

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 3.0 Split Volume: _____

Sorting Date: 4-6-04 Split Sorting Date: _____

Sorting Technician: MJC Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: .75 Data Time: .25

Chir. & Oligo. Time: 3.0

	Preliminary Sort	Missed
Number of Taxa:	10	
Number of Specimens:	138	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: 1.0

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: ADE

QC Sort Tech: _____

NOTES: Identity = 100.0%
Count = 100.0%

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

(March 2002) 2 of 2

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD 13C

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 2.0 Split Volume: _____

Sorting Date: 4-6-04 Split Sorting Date: _____

Sorting Technician: MJF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: 2.5 Data Time: 0.25

Chir. & Oligo. Time: 3.0

	Preliminary Sort	Missed
Number of Taxa:	11	
Number of Specimens:	108	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826-000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW-SD14A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES NO

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 1.5 Split Volume: _____

Sorting Date: 4-6-04 Split Sorting Date: _____

Sorting Technician: MJB Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 4-28 - 5-3-04 ID Biologist ADE

Identification Time: .25 Data Time: 0.25

Chir. & Oligo. Time: 1.5

	Preliminary Sort	Missed
Number of Taxa:	10	Ø
Number of Specimens:	20	Ø

QC Sort Date: 4-13-04 QC ID Time: Ø Taxa QC Time: _____

QC Sort Time: 15 QC ID Biologist: — Taxa QC Biologist: _____

QC Sort Tech: MJG

NOTES: Ø missed organisms in sort QC Taxa = 100.0%, Specimens = 100.0%

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: mm-sw/SD 14B

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.5 Split Volume: _____

Sorting Date: 4-6-04 Split Sorting Date: _____

Sorting Technician: MB Split Sorting Tech: _____

Additional/Other Sorting Information: _____

(March 2002) 1 of 2

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/5/04 ID Biologist [signature]

Identification Time: 1.0 Data Time: 1.0

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	12	
Number of Specimens:	27	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD14C

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.5 Split Volume: _____

Sorting Date: 4-6-04 Split Sorting Date: _____

Sorting Technician: MJF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/3/04 ID Biologist ADE

Identification Time: 0.25 Data Time: _____

Chir. & Oligo. Time: 2.50

	Preliminary Sort	Missed
Number of Taxa:	11	
Number of Specimens:	64	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD 15A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 2.0 Split Volume: _____

Sorting Date: 4-13-04 Split Sorting Date: _____

Sorting Technician: MJF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE / SD

Identification Time: 0.5 Data Time: 0.25

Chir. & Oligo. Time: 3.75

	Preliminary Sort	Missed
Number of Taxa:	18	-
Number of Specimens:	152	-

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: 2.0

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: SD

QC Sort Tech: _____

NOTES: Ident. = 100.0%
Count = 100.0%

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD 15B

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.5 Split Volume: _____

Sorting Date: 4-12-04 Split Sorting Date: _____

Sorting Technician: MTZ Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: 1.5 Data Time: 0.75

Chir. & Oligo. Time: 1.5

	Preliminary Sort	Missed
Number of Taxa:	11	
Number of Specimens:	51	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD15C

Location: Magna Marsh

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 2.0 Split Volume: _____

Sorting Date: 4-13-04 Split Sorting Date: _____

Sorting Technician: MSF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: 1.0 Data Time: 0.85

Chir. & Oligo. Time: 2.0

	Preliminary Sort	Missed
Number of Taxa:	17	
Number of Specimens:	116	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD #6A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-9-04 Split Sorting Date: _____

Sorting Technician: MJF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist [illegible]

Identification Time: 1.0 Data Time: 1.0

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	19	
Number of Specimens:	84	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

(March 2002)

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD163

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.5 Split Volume: _____

Sorting Date: 4-12-04 Split Sorting Date: _____

Sorting Technician: MJG Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist Blue

Identification Time: 1.0 Data Time: 1.0

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	17	
Number of Specimens:	90	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826-000 Lab Sample Number: _____

Date Collected: 3-30-04 Date Received: _____

Field ID/Number: MM-SW/SD16C

Location: Magna Metals.

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Debris

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 1.5 Split Volume: _____

Sorting Date: 4-12-04 Split Sorting Date: _____

Sorting Technician: MJO Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist CMC

Identification Time: 1.25 Data Time: 1.0

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	16	
Number of Specimens:	93	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD 17A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus, Sand

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-9-04 Split Sorting Date: _____

Sorting Technician: MJF Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-10-04 ID Biologist ADE

Identification Time: — Data Time: 0.25

Chir. & Oligo. Time: 2.0

	Preliminary Sort	Missed
Number of Taxa:	6	
Number of Specimens:	111	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXXX	XXXXXXXXXXXX	
Specimens					XXXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD12B

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus, sand

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 1.0 Split Volume: _____

Sorting Date: 4-9-04 Split Sorting Date: _____

Sorting Technician: MJT Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/6-04 ID Biologist AJE

Identification Time: 0.25 Data Time: 0.25

Chir. & Oligo. Time: 1.25

	Preliminary Sort	Missed
Number of Taxa:	6	
Number of Specimens:	66	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 18826.000 Lab Sample Number: _____

Date Collected: 2-3-04 Date Received: _____

Field ID/Number: MM-SW/SD/PC

Location: Magla Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus, sand

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-9-04 Split Sorting Date: _____

Sorting Technician: MBC Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist [illegible]

Identification Time: 1,25 Data Time: 1.0

Chir. & Oligo. Time: 1,5

	Preliminary Sort	Missed
Number of Taxa:	9	
Number of Specimens:	179	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

(March 2002) 2 of 2

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD19A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-8-04 Split Sorting Date: _____

Sorting Technician: MSO Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: 0.25 Data Time: 0.25

Chir. & Oligo. Time: 2.0

	Preliminary Sort	Missed
Number of Taxa:	12	
Number of Specimens:	113	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD 19B

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 40 Split Volume: _____

Sorting Date: 4-9-04 Split Sorting Date: _____

Sorting Technician: MV Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-6-04 ID Biologist ADE

Identification Time: 0.5 Data Time: 0.25

Chir. & Oligo. Time: 2.25

	Preliminary Sort	Missed
Number of Taxa:	8	
Number of Specimens:	87	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5-5-04 ID Biologist AOE

Identification Time: ~ Data Time: 0.5

Chir. & Oligo. Time: 1.0

	Preliminary Sort	Missed
Number of Taxa:	5	
Number of Specimens:	10	

QC Sort Date: _____ QC ID Time: .5 Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: GMC Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.
GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826-000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD19C

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):
Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 1.0 Split Volume: _____

Sorting Date: 4.9.04 Split Sorting Date: _____

Sorting Technician: MJS Split Sorting Tech: _____

Additional/Other Sorting Information: _____

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD20A

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-8-04 Split Sorting Date: _____

Sorting Technician: MJO Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist AD, CMC

Identification Time: 1.5 Data Time: 1.0

Chir. & Oligo. Time: 1.5

	Preliminary Sort	Missed
Number of Taxa:	12	0
Number of Specimens:	37	1

QC Sort Date: 5/13/04 QC ID Time: 0.5 Taxa QC Time: _____

QC Sort Time: .5 QC ID Biologist: CMC Taxa QC Biologist: _____

QC Sort Tech: MG

NOTES: Taxa = 100.0 %
Specimens = 97.4 %

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

(March 2002)

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826.000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD 20B

Location: Magna Marble

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

~~Sort~~ Time: 1.0 Split Volume: _____

Sorting Date: 4-8-04 Split Sorting Date: _____

Sorting Technician: MTC Split Sorting Tech: _____

Additional/Other Sorting Information: _____

(March 2002)

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist Alle

Identification Time: 1.0 Data Time: 1/0

Chir. & Oligo. Time: 1.5

	Preliminary Sort	Missed
Number of Taxa:	10	
Number of Specimens:	22	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

NORMANDEAU ASSOCIATES, INC.

GENERAL SAMPLE SORTING & IDENTIFICATION INFORMATION

Project Number: 19826-000 Lab Sample Number: _____

Date Collected: 3-31-04 Date Received: _____

Field ID/Number: MM-SW/SD20C

Location: Magna Metals

Physical Description of Substrate (i.e., particle sizes present, detritus, algae, broken glass, odor, etc):

Detritus

Subsampled: YES (NO)

Taxa Subsampled: _____ Splitting Time: _____

Sort Time: 1.0 Split Volume: _____

Sorting Date: 4-8-04 Split Sorting Date: _____

Sorting Technician: MJO Split Sorting Tech: _____

Additional/Other Sorting Information: _____

IDENTIFICATION INFORMATION (Sample NOT Split)

Identification Date: 5/7/04 ID Biologist Glo

Identification Time: 0.5 Data Time: 1.0

Chir. & Oligo. Time: 1.5

	Preliminary Sort	Missed
Number of Taxa:	11	
Number of Specimens:	12	

QC Sort Date: _____ QC ID Time: _____ Taxa QC Time: _____

QC Sort Time: _____ QC ID Biologist: _____ Taxa QC Biologist: _____

QC Sort Tech: _____

NOTES: _____

IDENTIFICATION INFORMATION (Sample Split)

Project Number: _____ ID Biologist #1: _____

ID Date: _____ ID Biologist #2: _____

Initial ID Time: _____ Data Time: _____

Split ID Time: _____ Taxa QC Time: _____

Chir. & Oligo Time: _____ Taxa QC Biologist: _____

	Pre Sort	Subsample	Actual Others	Estimated Others	Missed Taxa
Taxa			XXXXXXXXXXX	XXXXXXXXXXX	
Specimens					XXXXXXXXXXX

NOTES: _____

CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

Client: TETRA TECH FW
Address: 1000 THE AMERICAN RD
MORRIS PLAINS, NJ
Phone: 973.630.8530
Samplers: G. KIM + K. MILLET
Project No.: 1172.0003.0000.00000

Client Contact: JOHN SCHAFFER
973.630.8530

Sample Disposal	Return To Client	[ ]
	Disposal by Lab	[ ]

No. Container							Benthic Macro invertebrate		# of bottles
Container Size									

SAMPLE INFORMATION / **Toxicity Test Requested**

SAMPLE TEMP: IN SAMPLER	AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
✓		MM-SD13A-033004	SD Benthic	033004	1120							X		1
✓		MM-SD13B-033004	↓	↓	↓							↓		1
✓		MM-SD13C-033004	↓	↓	↓							↓		1
✓		MM-SD14A-033004	↓	↓	1000							↓		1
✓		MM-SD14B-033004	↓	↓	↓							↓		1
✓		MM-SD14C-033004	↓	↓	↓							↓		1
✓		MM-SD15A-033004	↓	↓	1640							↓		2
✓		MM-SD15B-033004	↓	↓	↓							↓		2
✓		MM-SD15C-033004	↓	↓	↓							↓		2

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
	[signature] (Normandeau)	0900	4/2/04				

Special Instructions:
*All benthics preserved w/ 70% isopropyl alcohol.
*samples 15A, B, C ← only samples of 2 bottles each = total 6 bottles
2 COOLERS

***Matrix Codes:**

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

COMPLETING THE CHAIN OF CUSTODY

1. The Client name and address as it should appear on the final report.
2. Telephone number of #1 above.
3. Job Number or Project Number.
4. Client Contact.
5. How you would like samples disposed. (All hazardous samples are returned to the client for disposal.)

6a. List the number of containers.

6b. List the Container Size

7. Toxicity test requested.
8. Record temperature of the sample while in the sampler.
9. The sample description that will appear on the Certificate of Analysis.
10. From the matrix codes provided on the form ("S" for soil, "WW" for waste water).
11. The date and time that each sample point is collected.
12. Hazards that are known, if any.
13. The sign-off blocks should be filled out as necessary in the field; when the sample is delivered to the lab, the Project Manager or Deisgner will receive the sample for Normandeau.
14. Provide any special instructions.

SAMPLE CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

1 Client: Acme Waste Company
Address: 1234 Waste Way, Clean, PA 19999

4 Client Contact: John Smith

2 Phone:
Samplers:
3 Project No.:

Sample Disposal — 5 Return To Client [ ] Disposal by Lab [x]

6a	No. Container		2							
6b	Container Size		1 gal.							

SAMPLE INFORMATION — 7 Toxicity Test Requested

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
8 1.5°C		9 24 hr comp. final effluent	10 WW	11 1/1-1/2/94	0800		2							

Potential Hazard Identification: 12

Non- Hazard [x] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
13 Peter Tourseite							

14 Special Instructions:

*Matrix Codes:

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

2 of 2

Client:
Address: SAME AS
Phone:
Samplers: PAGE 1
Project No.:

Client Contact:

Sample Disposal	Return To Client	[ ]
	Disposal by Lab	[ ]

No. Container												Benthic macro invert		#2 container
Container Size														

SAMPLE INFORMATION — **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
✓		MM-SD16A-033004	SE Benthics	033004	1520							X		1
✓		MM-SD16B-033004	↓	↓	↓							↓		↓
✓		MM-SD16C-033004	↓	↓	↓							↓		↓
✓		MM-SD17A-033104	↓	033104	1300							↓		↓
✓		MM-SD17B-033104	↓	↓	↓							↓		↓
✓		MM-SD17C-033104	↓	↓	↓							↓		↓
✓		MM-SD19A-033104	↓	↓	1050							↓		↓
✓		MM-SD19B-033104	↓	↓	↓							↓		↓
✓		MM-SD19C-033104	↓	↓	↓							↓		↓

JR 3-31-04

Potential Hazard Identification:

Non- Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:

Special Instructions:

2 COOLERS!

***Matrix Codes:**

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

COMPLETING THE CHAIN OF CUSTODY

1. The Client name and address as it should appear on the final report.
2. Telephone number of #1 above.
3. Job Number or Project Number.
4. Client Contact.
5. How you would like samples disposed. (All hazardous samples are returned to the client for disposal.)

6a. List the number of containers.

6b. List the Container Size

7. Toxicity test requested.
8. Record temperature of the sample while in the sampler.
9. The sample description that will appear on the Certificate of Analysis.
10. From the matrix codes provided on the form ("S" for soil, "WW" for waste water).
11. The date and time that each sample point is collected.
12. Hazards that are known, if any.
13. The sign-off blocks should be filled out as necessary in the field; when the sample is delivered to the lab, the Project Manager or Deisgner will receive the sample for Normandeau.
14. Provide any special instructions.

SAMPLE CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3480 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

1 Client: Acme Waste Company
Address: 1234 Waste Way, Clean, PA 19999

2 Phone:
Samplers:
3 Project No.:

4 Client Contact: John Smith

Sample Disposal — 5 Return To Client [ ] Disposal by Lab [x]

6a	No. Container		2								
6b	Container Size		1 gal.								

SAMPLE INFORMATION — 7 Toxicity Test Requested

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
8 1.5°C		9 24 hr. comp. [illegible]	10 WW	11 1/1/2/94	0800		2							

Potential Hazard Identification: 12

Non- Hazard [x] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
13 Peter Toutsaite							

14 Special Instructions:

*Matrix Codes:

S	- soil	GW	- ground water
SE	- sediment	ST	- stormwater
SL	- sludge	PW	- processed water
O	- oil	DW	- dilution water
WW	- waste water	RW	- receiving water
SW	- surface water	X	- other

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

CHAIN OF CUSTODY

Client: SAME AS
Address:
Phone: PAGE 1
Samplers:
Project No.:

Client Contact:

Sample	Return To Client	[ ]
Disposal	Disposal by Lab	[ ]

No. Container										long hold invert				#1 D Contained
Container Size														

SAMPLE INFORMATION						Toxicity Test Requested								
SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
		~~PAPA-BAY-ST-qw~~												
✓		MM-SD20A-033104	SE	033104	0945							X		①
✓		MM-SD20B-033104	Benthic	↓	↓							↓		↓
✓		MM-SD20C-033104	↓	↓	↓				3-31-04			↓		↓

Potential Hazard Identification:

Non- Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:

Special Instructions:

2 COOLERS

***Matrix Codes:**

S - soil		GW - ground water	
SE - sediment		ST - stormwater	
SL - sludge		PW - processed water	
O - oil		DW - dilution water	
WW - waste water		RW - receiving water	
SW - surface water		X - other	

RMC Use Only

Samples Were:

1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:

1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

COMPLETING THE CHAIN OF CUSTODY

1. The Client name and address as it should appear on the final report.
2. Telephone number of #1 above.
3. Job Number or Project Number.
4. Client Contact.
5. How you would like samples disposed. (All hazardous samples are returned to the client for disposal.)

6a. List the number of containers.

6b. List the Container Size

7. Toxicity test requested.
8. Record temperature of the sample while in the sampler.
9. The sample description that will appear on the Certificate of Analysis.
10. From the matrix codes provided on the form ("S" for soil, "WW" for waste water).
11. The date and time that each sample point is collected.
12. Hazards that are known, if any.
13. The sign-off blocks should be filled out as necessary in the field; when the sample is delivered to the lab, the Project Manager or Deisgner will receive the sample for Normandeau.
14. Provide any special instructions.

SAMPLE CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

1 Client: Acme Waste Company
Address: 123 Waste Way, Ocean, NJ 12099

4 Client Contact: John Smith

2 Phone:
Samplers:
3 Project No.:

Sample Disposal — Return To Client [ ] Disposal by Lab [X]

6	No. Container			2										
6	Container Size			1 : 80L										

SAMPLE INFORMATION — 7 Toxicity Test Requested

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Pipitact Efficacy	Other	Other	Other
8 1.9°C		9 24 hr. comp. final effluent	10 SW	11 MM-DD-YY	0800		2							

Potential Hazard Identification: 12

Non-Hazard [X] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
13 Peter Townsite							

14 Special Instructions:

*Matrix Codes:

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

RMC Use Only

Samples Were:
1. Shipped or hand delivered — Notes:
2. Chilled or ambient — Notes:
3. Received broken / leaking — Yes No
4. Received within holding times — Yes No
5. Discrepancies between sample labels and COC record? — Yes No

COC Tape Was:
1. Present on outer package — Yes No
2. Unbroken on outer package — Yes No
3. Present on sample — Yes No
4. Unbroken on sample — Yes No

White Copy - RMC Yellow Copy - Client

ATTACHMENT I-2

Ceriodaphnia dubia Toxicity Test Report

AQUATIC LABORATORY SERVICES, INC.

Aquatic and Terrestrial Toxicity Testing

30 April 2004

Mr. George Christian
Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, PA 19475

SUBJECT: Magna Metals Site
Surface Water Toxicity Evaluation
Aquatic Laboratory Services Study No.: 0574CDC

Dear Mr. Christian:

Enclosed please find one bound and one unbound copy of the results of the Surface Water Toxicity Evaluation conducted for the Magna Metals Site. The chronic toxicity testing was conducted 30 March through 5 April 2004 using the water flea *Ceriodaphnia dubia*.

The analysis revealed a significant difference in reproduction between the controls and site MM-SW-19 and MM-SW-22.

Please do not hesitate to contact me at 610.792.1828 or rzirkalsi@aolcom should you have any questions regarding this report.

Sincerely,

Roger G. Zirk,
Laboratory Manager

Enclosures

Cc: S. Brunk, ALSI

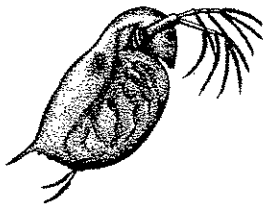
rgz-c:msword/letters/0574cdc.nai.rz1/4-04

3450 Schuylkill Road • Spring City, PA 19475 • phone 610-792-1828 • fax 610-792-1829

Results of a Chronic Toxicity Study on Surface Water Samples Collected from the

Magna Metals Site
Cortlandt, New York

Aquatic Laboratory Services Study No. 0574CdC



Prepared for:

Normandeau Associates, Inc.

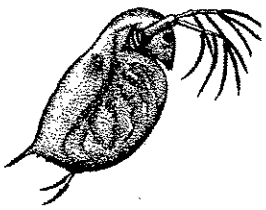
AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

April 2004

Results of a Chronic Toxicity Study on
Surface Water Samples
Collected from the

Magna Metals Site
Cortlandt, New York

Using the
Water flea *Ceriodaphnia dubia*



30 March through 5 April 2004

Prepared for:

Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, Pennsylvania 19475

Report Prepared By: _____ Date: 4-30-04
Roger G. Zink, Laboratory Manager

Aquatic Laboratory Services, Inc.
3540 Schuylkill Road
Spring City, Pennsylvania 19475
Phone: 610.792.1828
Fax: 610.792.1829
New Jersey Certification No. PA021

Aquatic Laboratory Services Study No. 0574CdC

April 2004

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INTRODUCTION

A toxicity evaluation was conducted 30 March through 5 April 2004 at Aquatic Laboratory Services, Spring City, Pennsylvania. Toxicity testing was conducted on samples of surface water collected from the Magna Metal site located in Cortlandt, New York. The objective of this testing was to determine chronic toxicity of the surface waters to the cladoceran *Ceriodaphnia dubia* (*C. dubia*

All tests were conducted according to procedures outlined *in Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*, Fifth Edition (EPA-821-R-02-012) and *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms*, Third Edition (EPA-821-R-02-013).

MATERIALS

TEST ORGANISM

Freshwater Cladoceran, *Ceriodaphnia dubia*

Cladoceran neonates, *C. dubia*, were obtained from Aquatic Laboratory Services in-house cultures. Cultures are maintained in 30-ml borosilicate culture vessels containing 15-ml of moderately hard reconstituted culture media. These animals are transferred to fresh reconstituted water every 48-hours or with every new brood of neonates produced. The *C. dubia* are fed a combination of a unicellular green alga (*Selenastrum capricornutum*) concentrate and yeast/CEROPHYLL/trout chow (YCT) suspension daily.

Only broods that were released within an 8-hour window were used to initiate the test. Neonates are taken from one female and distributed to the same replicate throughout test concentrations (e.g. one neonate from culture tube #1 into each replicate A, one neonate from culture tube #3 into each replicate B, etc.) This parental blocking allows the performance of each female to be tracked.

Since the neonates used in the test were released into moderately hard reconstituted water, they were fully acclimated to the dilution water. The neonates were released between 7:30 and 10:30 on 30 March 2004. The neonates were less than 24-hours old (within an eight-hour window) at test initiation.

DILUTION WATER

Moderately hard-reconstituted water (MHRW) is prepared in accordance to procedures outlined in EPA-821-R-02-013 and used as acclimation, dilution and control water for the toxicity tests. Water is forced through de-ionizing columns (U. S. Filter, Inc.) consisting of carbon, mixed resin-bed and membrane filters. Reagent grade chemicals are dissolved into solution in the following concentrations: 96.0 mg/L of $NaHCO_3$; 60.0 mg/L of $MgSO_4$, and 4.0 mg/L of KCl. The water is then aerated for 24-hours. After aerating for 24 hours, 60.0 mg/L of $CaSO_4 \cdot 2H_2O$ is dissolved into the solution and the water is aerated an additional 24-hours prior to use as acclimation, dilution or control water.

TEST MATERIAL

The material tested was collected from the Magna Metals site located in Cortlandt, New York by Tetra Tech-FW, Inc, personnel. The samples consisted of grabs collected at various locations within the Magna Metals site. The site samples were identified as MM-SW-14, MM-SW-15, MM-SW-17, MM-SW-19, MM-SW-21 and MM-SW-22.

One-gallon of sample was collected at each location on 29 March 2004 was used to initiate the tests on 30 March 2004 (Day 0) and for renewals on Days 1 through 5. The samples were shipped overnight via Federal Express to Aquatic Laboratory Services in Spring City, Pennsylvania. The samples arrived at Aquatic Laboratory Services on 30 March 2004.

Chain-of-Custody forms accompanied all samples. The temperature, dissolved oxygen, pH, conductivity, alkalinity and hardness was measured in each sample upon receipt and recorded. All samples were stored at 1.0 - 4.4°C when not in use. The maximum sample storage time at Aquatic Laboratory Services prior to first use in a test is 36-hours. Samples were warmed to test temperature prior to preparing test solutions for renewal. After warming the samples to test temperature, the dissolved oxygen, pH and conductivity were measured.

METHODS

CERIODAPHNIA DUBIA STATIC RENEWAL CHRONIC TEST METHOD

C. dubia neonates were continuously exposed under static renewal conditions to the test samples. *C. dubia* are exposed until 60% of the surviving control organisms produced three broods of neonates. The individual *C. dubia* were exposed in a 30-ml glass culture tube containing 15-ml of test sample. Each treatment and the controls (consisting of 100% EPA moderately hard-reconstituted water) included 10 replicate test tubes (10 animals per sample). Test chambers were placed in randomized positions within a temperature-controlled incubator maintained at 25 ± 1°C.

After test initiation, the adult *C. dubia* were transferred daily to freshly prepared test samples. *C. dubia* were fed 0.1-ml YCT suspension and 0.1-ml of *Selenastrum* concentrate after each renewal. Observations of the number of live or dead animals were made daily. Reproduction was monitored daily by counting the number of neonates produced by each individual female. The neonates were counted by placing the exposure chamber over a light table. To eliminate the possibility of a miscount, the neonates are counted after the adults are transferred to new test samples. The young were discarded after counting.

Temperature, dissolved oxygen and pH were measured at the beginning and end of each 24-hour exposure period in one replicate of each sample. Conductivity was measured daily in each sample. Alkalinity and hardness were measured in each new sample and the reconstituted water. The lighting regime was 16-hours light, 8-hours dark. The test was terminated when 60% of the surviving females had their third brood (at either the sixth or seventh day).

STATISTICAL ANALYSES

The statistical analysis of chronic toxicity tests with aquatic organisms follows a decision process illustrated in (EPA-821-R-02-013). All chronic test data are statistically analyzed to estimate the highest "safe" or "no observable effect concentration" (NOEC) and "lowest observable effect concentration" (LOEC) of the effluent for fathead minnow survival and growth, and *C. dubia* survival and reproduction. That is, the NOEC is the highest concentration of effluent that causes no observable adverse effects on the test organisms (i.e., the highest concentration of effluent in which the values for the observed responses are not statistically significantly different from the controls). The LOEC is the lowest concentration of effluent, which causes adverse effects on the test organisms (i.e., where the values for the observed responses are statistically significantly different from the controls). NOEC and LOEC values are used to calculate Chronic Toxicity Units (TU_c) and the Chronic Value.

In data analysis, the test data first undergo hypothesis testing to determine if the distribution of the results is normal using the Shapiro-Wilk's Test or Chi-Square Test. The variance is then tested for homogeneity using Bartlett's Test. The endpoint estimates, NOEC and LOEC are determined using an Analysis of Variance Test (ANOVA) followed by a multiple comparison method comparing each of the treatment means with the control. Dunnett's Test (one-sided), Bonferroni's t-Test, Steel's Many-One Rank Test, and Wilcoxon Rank Sum Test are several types of multiple comparison tests used. Statistical Analyses are performed using TidePool Scientific Software ToxCalc version 5.0.23D.

RESULTS

Table 1. Summary of Survival Data – *Ceriodaphnia dubia,* 3-Brood Survival and Reproduction Test, Magna Metals Site, 30 March through 5 April 2004

Sample No./ Sample Location	*Ceriodaphnia dubia* Survival By Replicate (1 organism per replicate at test initiation)										Mean Survival	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H	I	J		
Negative Control	1	1	1	1	1	1	1	1	1	1	100.0%	N/A
MM-SW-14	1	1	1	1	1	1	1	1	1	1	100.0%	NO
MM-SW-15	1	1	1	1	1	1	1	1	1	1	100.0%	NO
MM-SW-17	1	1	1	1	1	1	1	1	1	1	100.0%	NO
MM-SW-19	1	1	1	1	1	1	1	1	1	1	100.0%	NO
MM-SW-21	1	1	1	1	1	1	1	1	1	1	100.0%	NO
MM-SW-22	0	0	0	0	0	0	0	0	0	0	0.0%	YES

Table 2. Summary of Reproduction Data – *Ceriodaphnia dubia,* 3-Brood Survival and Reproduction Test, Magna Metals Site, 30 March through 5 April 2004

Sample No./ Sample Location	*Ceriodaphnia dubia* Reproduction By Replicate										Mean Number of Progeny Produced	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H	I	J		
Negative Control	22	34	33	24	30	24	30	33	36	34	30.0	N/A
MM-SW-14	30	26	24	24	32	23	38	34	38	38	30.7	NO
MM-SW-15	42	38	29	34	40	46	38	40	38	38	38.3	NO
MM-SW-17	32	25	24	34	30	40	26	40	36	35	32.2	NO
MM-SW-19	13	26	31	16	24	32	17	21	23	24	22.7	YES
MM-SW-21	26	30	40	36	25	39	34	26	35	45	33.6	NO
MM-SW-22	0	0	0	0	0	0	0	0	0	0	0.0	YES

Table 3a.
Project: Magna Metals Site
Sample ID: Surface Water
Test: *Ceriodaphnia dubia* 3-Brood Survival and Reproduction Test
Date: 30 March through 5 April 2004

Sample Site	P/Chem Parameter	Exposure Period Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Mean	Maximum	Minimum
Control	Initial Temp.	24.2	24.6	24.6	24.7	24.9	25.0	--	24.8	25.2	24.2
	Final Temp.	24.8	24.6	24.7	25.1	25.2	25.1	--			
	Initial D.O.	7.2	7.8	7.2	7.6	7.7	7.9	--	7.8	8.4	7.2
	Final D.O.	8.0	8.4	7.6	7.8	8.1	8.3	--			
	Initial pH	7.67	7.24	7.16	6.94	7.68	7.64	--	7.50	7.85	6.94
	Final pH	7.73	7.85	7.47	7.51	7.53	7.58	--			
	Conductivity	264	265	263	264	263	265	--	264	265	263
	Alkalinity	67	--	--	--	--	--	--	67	67	67
	Hardness	84	--	--	--	--	--	--	84	84	84
MM-SW-14	Initial Temp.	24.7	26.0	25.7	25.4	24.8	25.2	--	25.0	26.0	24.4
	Final Temp.	24.4	24.6	24.4	25.2	25.1	24.9	--			
	Initial D.O.	9.8	9.4	9.3	9.1	9.4	9.2	--	8.9	9.8	8.2
	Final D.O.	8.2	8.5	8.2	8.5	8.7	8.9	--			
	Initial pH	7.48	7.19	7.13	7.18	7.21	7.22	--	7.52	7.93	7.13
	Final pH	7.91	7.93	7.70	7.73	7.77	7.81	--			
	Conductivity	476	447	476	476	478	476	--	472	478	447
	Alkalinity	90	--	--	--	--	--	--	90	90	90
	Hardness	166	--	--	--	--	--	--	166	166	166
MM-SW-15	Initial Temp.	24.0	25.6	25.5	25.1	24.7	25.1	--	24.8	25.6	24.0
	Final Temp.	24.1	24.4	24.0	25.0	25.1	25.1	--			
	Initial D.O.	9.5	9.0	9.5	9.3	9.2	9.3	--	8.8	9.5	7.9
	Final D.O.	8.2	7.9	7.9	8.2	8.5	8.8	--			
	Initial pH	7.64	7.50	7.45	7.47	7.51	7.56	--	7.70	8.01	7.45
	Final pH	8.01	7.89	7.77	7.82	7.85	7.92	--			
	Conductivity	642	632	638	642	644	641	--	640	644	632
	Alkalinity	115	--	--	--	--	--	--	115	115	115
	Hardness	202	--	--	--	--	--	--	202	202	202

Table 3b.
Project: Magna Metals Site
Sample ID: Surface Water
Test: *Ceriodaphnia dubia* 3-Brood Survival and Reproduction Test
Date: 30 March through 5 April 2004

Sample Site	P/Chem Parameter	Exposure Period Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Mean	Maximum	Minimum
	Initial Temp.	25.7	26.0	24.9	24.4	24.9	25.0	--	24.9	26.0	24.0
	Final Temp.	24.0	24.4	24.0	25.1	25.3	25.0	--			
	Initial D.O.	9.1	9.1	9.3	9.5	9.4	9.3	--	8.9	9.5	8.0
	Final D.O.	8.3	8.0	8.0	9.2	8.5	8.7	--			
MM-SW-17	Initial pH	7.51	7.42	7.38	7.58	7.39	7.42	--	7.68	8.11	7.38
	Final pH	7.97	7.91	7.77	8.11	7.84	7.89	--			
	Conductivity	585	588	588	592	592	594	--	590	594	585
	Alkalinity	102	--	--	--	--	--	--	102	102	102
	Hardness	174	--	--	--	--	--	--	174	174	174
	Initial Temp.	24.2	26.0	24.0	24.4	24.8	25.1	--	24.8	26.0	24.0
	Final Temp.	24.6	24.7	24.4	25.1	25.2	24.9	--			
	Initial D.O.	9.9	9.4	9.9	9.5	9.6	9.8	--	9.4	9.9	8.8
	Final D.O.	8.9	9.3	8.8	9.2	9.4	9.6	--			
MM-SW-19	Initial pH	7.88	7.67	7.63	7.58	7.63	7.65	--	7.91	8.22	7.58
	Final pH	8.22	8.22	8.06	8.11	8.14	8.18	--			
	Conductivity	573	576	574	575	578	581	--	576	581	573
	Alkalinity	116	--	--	--	--	--	--	116	116	116
	Hardness	194	--	--	--	--	--	--	194	194	194
	Initial Temp.	24.0	24.4	24.0	24.5	24.9	25.2	--	24.7	25.2	24.0
	Final Temp.	24.5	24.7	24.5	25.0	25.2	25.1	--			
	Initial D.O.	8.3	9.4	9.1	9.4	9.2	9.4	--	8.7	9.4	7.8
	Final D.O.	8.0	8.4	7.8	8.2	8.5	8.7	--			
MM-SW-21	Initial pH	7.32	7.25	7.27	7.28	7.31	7.36	--	7.65	8.06	7.25
	Final pH	7.98	8.06	7.93	7.96	7.99	8.04	--			
	Conductivity	658	660	658	659	662	666	--	661	666	658
	Alkalinity	214	--	--	--	--	--	--	214	214	214
	Hardness	294	--	--	--	--	--	--	294	294	294

Table 3c.
Project: Magna Metals Site
Sample ID: Surface Water
Test: *Ceriodaphnia dubia* 3-Brood Survival and Reproduction Test
Date: 30 March through 5 April 2004

Sample Site	P/Chem Parameter	Exposure Period Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Mean	Maximum	Minimum
	Initial Temp.	24.5	24.9	25.0	24.8	25.0	24.8	--	24.8	25.1	24.4
	Final Temp.	24.4	25.1	24.8	24.9	24.8	25.1	--			
	Initial D.O.	7.0	8.0	7.4	7.8	7.4	7.6	--	7.8	8.6	7.0
	Final D.O.	7.7	7.9	7.9	8.2	8.4	8.6	--			
MM-SW-22	Initial pH	6.43	7.66	7.51	7.59	7.82	7.71	--	7.59	8.01	6.43
	Final pH	7.01	7.69	7.79	7.89	7.98	8.01	--			
	Conductivity	132	286	263	263	262	263	--	245	286	132
	Alkalinity	N/A	--	--	--	--	--	--	N/A	N/A	N/A
	Hardness	N/A	--	--	--	--	--	--	N/A	N/A	N/A

Alkalinity and hardness could not be measured for MM-SW-22 due to interferences.

APPENDIX A

ORIGINAL DATA – Water Flea, *Ceriodaphnia dubia*

			Prog		Prog		Prog		Prog		Prog		Prog		Prog		Prog		Progeny/Rep
Control	A	1	0	N	0	N	0	N	6	N	12	N	0	N	14	N			22
Control	B	1	0	N	0	N	0	N	6	N	10	N	0	N	18	N			34
Control	C	1	0	N	0	N	0	N	5	N	12	N	0	N	16	N			33
Control	D	1	0	N	0	N	0	N	4	N	8	N	0	N	12	N			24
Control	E	1	0	N	0	N	0	N	6	N	10	N	0	N	14	N			30
Control	F	1	0	N	0	N	0	N	4	N	8	N	0	N	12	N			24
Control	G	1	0	N	0	N	0	N	4	N	10	N	0	N	16	N			30
Control	H	1	0	N	0	N	0	N	5	N	12	N	0	N	16	N			33
Control	I	1	0	N	0	N	0	N	6	N	12	N	0	N	18	N			36
Control	J	1	0	N	0	N	0	N	6	N	12	N	0	N	16	N			34
MM-SW 14	A	1	0	N	0	N	0	N	4	N	10	N	0	N	16	N			30
MM-SW 14	B	1	0	N	0	N	0	N	4	N	8	N	0	N	14	N			26
MM-SW 14	C	1	0	N	0	N	0	N	4	N	8	N	0	N	12	N			24
MM-SW 14	D	1	0	N	0	N	0	N	4	N	8	N	0	N	12	N			24
MM-SW 14	E	1	0	N	0	N	0	N	5	N	12	N	0	N	15	N			32
MM-SW 14	F	1	0	N	0	N	0	N	4	N	8	N	0	N	11	N			23
MM-SW 14	G	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38
MM-SW 14	H	1	0	N	0	N	0	N	6	N	12	N	0	N	16	N			34
MM-SW 14	I	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38
MM-SW 14	J	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38
MM-SW 15	A	1	0	N	0	N	0	N	6	N	16	N	0	N	20	N			42
MM-SW 15	B	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38
MM-SW 15	C	1	0	N	0	N	0	N	4	N	10	N	0	N	15	N			29
MM-SW 15	D	1	0	N	0	N	0	N	6	N	12	N	0	N	16	N			34
MM-SW 15	E	1	0	N	0	N	0	N	6	N	14	N	0	N	20	N			40
MM-SW 15	F	1	0	N	0	N	0	N	8	N	16	N	0	N	22	N			46
MM-SW 15	G	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38
MM-SW 15	H	1	0	N	0	N	0	N	8	N	14	N	0	N	18	N			40
MM-SW 15	I	1	0	N	0	N	0	N	6	N	12	N	0	N	20	N			38
MM-SW 15	J	1	0	N	0	N	0	N	6	N	14	N	0	N	18	N			38

Behavioral Codes: N - Normal, D – Dead, M- Male, C – Crushed in transfer, DIS = Discolored, E = Erratic swimming, T = Torpor

Reviewed By: RJZ

Date: 4-7-04

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			Prog		Prog		Prog		Prog		Prog		Prog		Prog		Prog		Progeny/Rep
MM-SW 17	A	1	0	N	0	N	0	N	4	N	10	2	0	2	18	2			32
MM-SW 17	B	1	0	N	0	N	0	N	4	N	8	2	0	2	13	2			25
MM-SW 17	C	1	0	N	0	N	0	N	4	N	8	2	0	2	12	2			24
MM-SW 17	D	1	0	N	0	N	0	N	5	N	13	2	0	2	16	2			34
MM-SW 17	E	1	0	N	0	N	0	N	4	N	10	2	0	2	16	2			30
MM-SW 17	F	1	0	N	0	N	0	N	6	N	14	2	0	2	20	2			40
MM-SW 17	G	1	0	N	0	N	0	N	4	N	8	2	0	2	14	2			26
MM-SW 17	H	1	0	N	0	N	0	N	6	N	14	2	0	2	20	2			40
MM-SW 17	I	1	0	N	0	N	0	N	6	N	12	2	0	2	18	2			36
MM-SW 17	J	1	0	N	0	N	0	N	6	N	12	2	0	2	17	2			35
MM-SW 19	A	1	0	N	0	N	0	N	3	N	0	2	10	2	0	2			13
MM-SW 19	B	1	0	N	0	N	0	N	4	N	8	2	0	2	14	2			26
MM-SW 19	C	1	0	N	0	N	0	N	5	N	10	2	0	2	16	2			31
MM-SW 19	D	1	0	N	0	N	0	N	3	N	5	2	0	2	8	2			16
MM-SW 19	E	1	0	N	0	N	0	N	4	N	8	2	0	2	12	2			24
MM-SW 19	F	1	0	N	0	N	0	N	6	N	12	2	0	2	14	2			32
MM-SW 19	G	1	0	N	0	N	0	N	2	N	6	2	0	2	9	2			17
MM-SW 19	H	1	0	N	0	N	0	N	2	N	8	2	0	2	11	2			21
MM-SW 19	I	1	0	N	0	N	0	N	3	N	8	2	0	2	12	2			23
MM-SW 19	J	1	0	N	0	N	0	N	4	N	8	2	0	2	12	2			24
MM-SW 21	A	1	0	N	0	N	0	N	4	N	8	2	0	2	14	2			26
MM-SW 21	B	1	0	N	0	N	0	N	4	N	10	2	0	2	16	2			30
MM-SW 21	C	1	0	N	0	N	0	N	6	N	14	2	0	2	20	2			40
MM-SW 21	D	1	0	N	0	N	0	N	6	N	12	2	0	2	18	2			36
MM-SW 21	E	1	0	N	0	N	0	N	4	N	8	2	0	2	13	2			25
MM-SW 21	F	1	0	N	0	N	0	N	5	N	12	2	0	2	22	2			39
MM-SW 21	G	1	0	N	0	N	0	N	6	N	12	2	0	2	16	2			34
MM-SW 21	H	1	0	N	0	N	0	N	4	N	8	2	0	2	14	2			26
MM-SW 21	I	1	0	N	0	N	0	N	6	N	12	2	0	2	17	2			35
MM-SW 21	J	1	0	N	0	N	0	N	8	N	16	2	0	2	21	2			45

Behavioral Codes: N - Normal, D – Dead, M- Male, C – Crushed in transfer, DIS = Discolored, E = Erratic swimming, T = Torpor

Reviewed By: _____ Date: 4-7-04

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			Prog		Prog		Prog		Prog		Prog		Prog		Prog		Progeny/Rep
MM-SW 22	A	1	O	N	O	D											O
MM-SW 22	B	1	O	N	O	D											O
MM-SW 22	C	1	O	N	O	D											O
MM-SW 22	D	1	O	N	O	D											O
MM-SW 22	E	1	O	N	O	D											O
MM-SW 22	F	1	O	N	O	D											O
MM-SW 22	G	1	O	N	O	D											O
MM-SW 22	H	1	O	N	O	D											O
MM-SW 22	I	1	O	N	O	D											O
MM-SW 22	J	1	O	N	O	D											O

Behavioral Codes: N - Normal, D – Dead, M- Male, C – Crushed in transfer, DIS = Discolored, E = Erratic swimming, T = Torpor

Reviewed By: _____

Date: 4-7-04

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	Tech ID	RSH	RSH	RSH	RSH	RDS	RDS	
Control	Temp. Initial	24.2	24.6	24.6	24.7	24.9	25.0	
	Temp. Final	24.8	24.6	24.7	25.1	25.2	25.1	
	D. O. Initial	7.2	7.8	7.2	7.6	7.7	7.9	
	D. O. Final	8.0	8.4	7.6	7.8	8.1	8.3	
	pH Initial	7.67	7.24	7.16	6.94	7.68	7.64	
	pH Final	7.73	7.85	7.47	7.51	7.53	7.58	
	Conductivity	264	265	263	264	263	265	
MM-SW-14	Temp. Initial	24.7	26.0	25.7	25.4	24.8	25.2	
	Temp. Final	24.4	24.6	24.4	25.2	25.1	24.9	
	D. O. Initial	9.8	9.4	9.3	9.1	9.4	9.2	
	D. O. Final	8.2	8.5	8.2	8.5	8.7	8.9	
	pH Initial	7.48	7.19	7.13	7.18	7.21	7.22	
	pH Final	7.91	7.93	7.70	7.73	7.77	7.81	
	Conductivity	476	477	476	476	478	476	
MM-SW-15	Temp. Initial	24.0	25.6	25.5	25.1	24.7	25.1	
	Temp. Final	24.1	24.4	24.0	25.0	25.1	25.1	
	D. O. Initial	9.5	9.0	9.5	9.3	9.2	9.3	
	D. O. Final	8.2	7.9	7.9	8.2	8.5	8.8	
	pH Initial	7.68	7.50	7.45	7.47	7.51	7.56	
	pH Final	8.01	7.89	7.77	7.82	7.85	7.92	
	Conductivity	642	632	638	642	644	641	
MM-SW-17	Temp. Initial	25.7	26.0	24.9	25.4	24.9	25.0	
	Temp. Final	24.0	24.4	24.0	25.1	25.3	25.0	
	D. O. Initial	9.1	9.1	9.3	9.2	9.4	9.3	
	D. O. Final	8.3	8.0	8.0	8.3	8.5	8.7	
	pH Initial	7.51	7.42	7.38	7.37	7.39	7.42	
	pH Final	7.97	7.91	7.77	7.81	7.84	7.89	
	Conductivity	585	588	588	589	592	594	
MM-SW-19	Temp. Initial	24.2	26.0	24.0	24.4	24.8	25.1	
	Temp. Final	24.6	24.7	24.4	25.1	25.2	24.9	
	D. O. Initial	9.9	9.4	9.9	9.5	9.6	9.8	
	D. O. Final	8.9	9.3	8.8	9.2	9.4	9.6	
	pH Initial	7.88	7.67	7.63	7.58	7.63	7.65	
	pH Final	8.22	8.22	8.06	8.11	8.14	8.18	
	Conductivity	573	576	574	575	578	581	
MM-SW-21	Temp. Initial	24.0	24.4	24.0	24.5	24.9	25.2	
	Temp. Final	24.5	24.7	24.5	25.0	25.2	25.1	
	D. O. Initial	8.3	9.4	9.1	9.4	9.2	9.4	
	D. O. Final	8.0	8.4	7.8	8.2	8.5	8.7	
	pH Initial	7.32	7.25	7.27	7.28	7.31	7.36	
	pH Final	7.98	8.06	7.93	7.96	7.99	8.04	
	Conductivity	658	660	658	659	662	666	
MM-SW-22	Temp. Initial	24.5	26.0					
	Temp. Final	24.4						
	D. O. Initial	7.0	8.5					
	D. O. Final	7.7						
	pH Initial	6.43	6.36					
	pH Final	7.01						
	Conductivity	132	133					

Reviewed By: RJZ Jr

Date: 4-7-04

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APPENDIX B

STATISTICAL ANALYSES – Water Flea, *Ceriodaphnia dubia*

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	3/30/2004	Test ID:	574CdC	Sample ID:	Magna Metals
End Date:	4/5/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	OV-Overlying Water
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

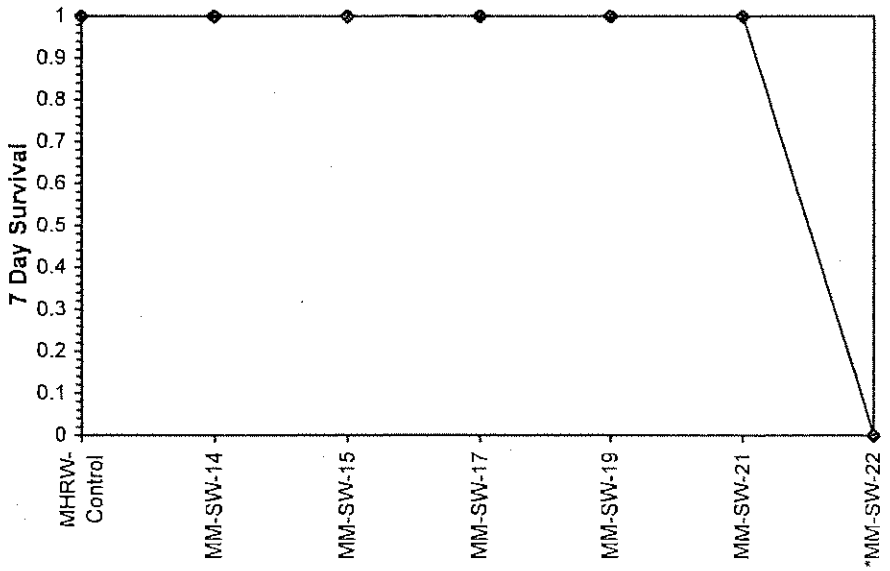
Conc-%	1	2	3	4	5	6	7	8	9	10
MHRW-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-14	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-15	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-17	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-19	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-21	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SW-22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
MHRW-Control	1.0000	1.0000	0	10	10	10		
MM-SW-14	1.0000	1.0000	0	10	10	10	1.0000	0.0500
MM-SW-15	1.0000	1.0000	0	10	10	10	1.0000	0.0500
MM-SW-17	1.0000	1.0000	0	10	10	10	1.0000	0.0500
MM-SW-19	1.0000	1.0000	0	10	10	10	1.0000	0.0500
MM-SW-21	1.0000	1.0000	0	10	10	10	1.0000	0.0500
*MM-SW-22	0.0000	0.0000	10	0	10	10	0.0000	0.0500

Hypothesis Test (1-tail, 0.05)

Fisher's Exact Test indicates significant differences

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	3/30/2004	Test ID:	574CdC	Sample ID:	Magna Metals
End Date:	4/5/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	OV-Overlying Water
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
MHRW-Control	22.000	34.000	33.000	24.000	30.000	24.000	30.000	33.000	36.000	34.000
MM-SW-14	30.000	26.000	24.000	24.000	32.000	23.000	38.000	34.000	38.000	38.000
MM-SW-15	42.000	38.000	29.000	34.000	40.000	46.000	38.000	40.000	38.000	38.000
MM-SW-17	32.000	25.000	24.000	34.000	30.000	40.000	26.000	40.000	36.000	35.000
MM-SW-19	13.000	26.000	31.000	16.000	24.000	32.000	17.000	21.000	23.000	24.000
MM-SW-21	26.000	30.000	40.000	36.000	25.000	39.000	34.000	26.000	35.000	45.000
MM-SW-22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

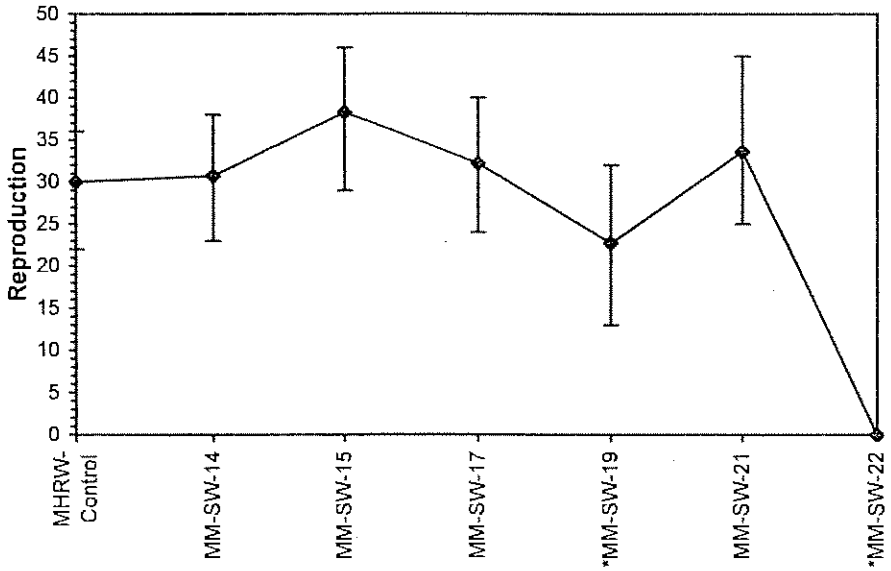
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MHRW-Control	30.000	1.0000	30.000	22.000	36.000	16.555	10		
MM-SW-14	30.700	1.0233	30.700	23.000	38.000	20.141	10	110.00	74.00
MM-SW-15	38.300	1.2767	38.300	29.000	46.000	11.809	10	146.00	74.00
MM-SW-17	32.200	1.0733	32.200	24.000	40.000	18.215	10	118.50	74.00
*MM-SW-19	22.700	0.7567	22.700	13.000	32.000	27.239	10	73.00	74.00
MM-SW-21	33.600	1.1200	33.600	25.000	45.000	20.098	10	124.50	74.00
*MM-SW-22	0.000	0.0000	0.000	0.000	0.000	0.000	10	55.00	74.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.37351	1.035	-0.071	-0.6353
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

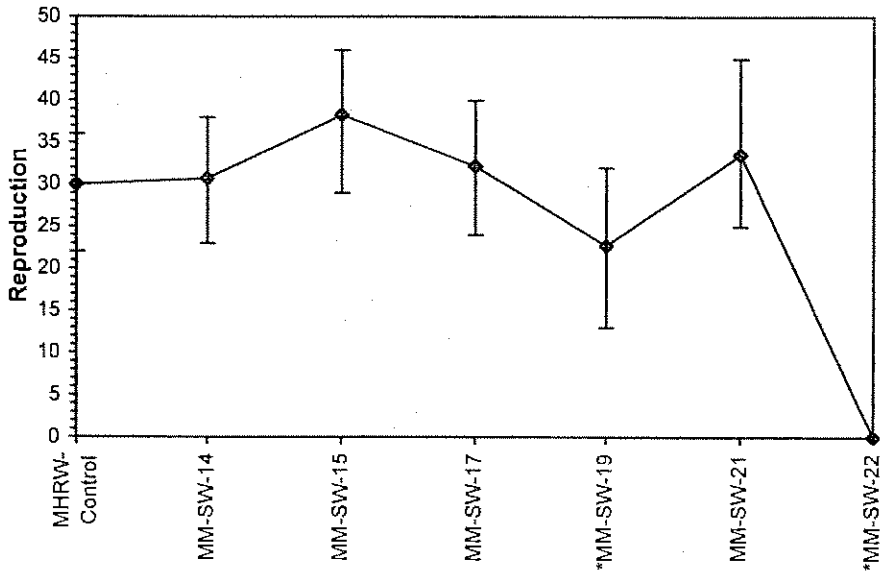
Start Date:	3/30/2004	Test ID:	574CdC	Sample ID:	Magna Metals
End Date:	4/5/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	OV-Overlying Water
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-%	1	2	3	4	5	6	7	8	9	10
MHRW-Control	22.000	34.000	33.000	24.000	30.000	24.000	30.000	33.000	36.000	34.000
MM-SW-14	30.000	26.000	24.000	24.000	32.000	23.000	38.000	34.000	38.000	38.000
MM-SW-15	42.000	38.000	29.000	34.000	40.000	46.000	38.000	40.000	38.000	38.000
MM-SW-17	32.000	25.000	24.000	34.000	30.000	40.000	26.000	40.000	36.000	35.000
MM-SW-19	13.000	26.000	31.000	16.000	24.000	32.000	17.000	21.000	23.000	24.000
MM-SW-21	26.000	30.000	40.000	36.000	25.000	39.000	34.000	26.000	35.000	45.000
MM-SW-22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MHRW-Control	30.000	1.0000	30.000	22.000	36.000	16.555	10		
MM-SW-14	30.700	1.0233	30.700	23.000	38.000	20.141	10	110.00	82.00
MM-SW-15	38.300	1.2767	38.300	29.000	46.000	11.809	10	146.00	82.00
MM-SW-17	32.200	1.0733	32.200	24.000	40.000	18.215	10	118.50	82.00
*MM-SW-19	22.700	0.7567	22.700	13.000	32.000	27.239	10	73.00	82.00
MM-SW-21	33.600	1.1200	33.600	25.000	45.000	20.098	10	124.50	82.00
*MM-SW-22	0.000	0.0000	0.000	0.000	0.000	0.000	10	55.00	82.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.37351	1.035	-0.071	-0.6353
Equality of variance cannot be confirmed				
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates significant differences				

Dose-Response Plot



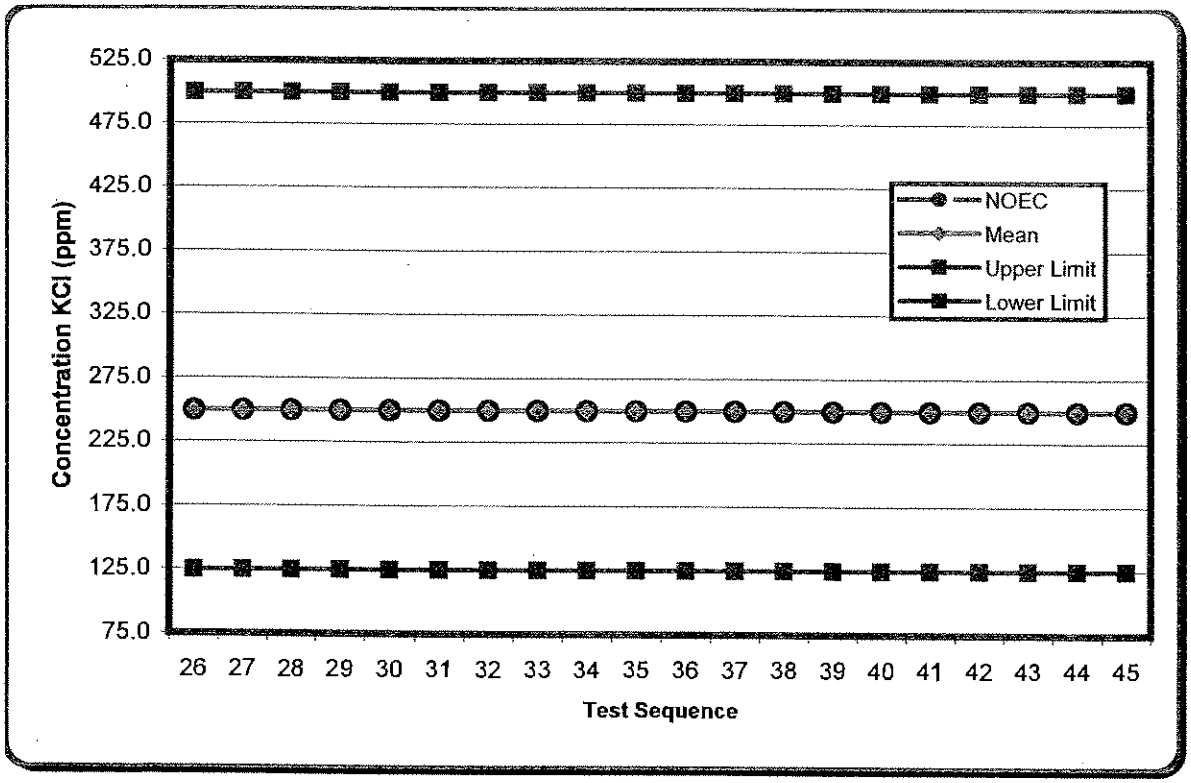
APPENDIX C

QA/QC – Chronic Control Chart

Aquatic Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing
***Ceriodaphnia dubia* 3-Brood Survival and Reproduction Test**
March-04

Date	Test Sequence	NOEC	Mean	Upper Limit	Lower Limit	Biological Effect
7/23/02	26	250.0	250.0	500.0	125.0	Survival
8/5/02	27	250.0	250.0	500.0	125.0	Survival
9/4/02	28	250.0	250.0	500.0	125.0	Survival
10/1/02	29	250.0	250.0	500.0	125.0	Survival
10/28/02	30	250.0	250.0	500.0	125.0	Repro.
12/20/02	31	250.0	250.0	500.0	125.0	Repro.
1/14/03	32	250.0	250.0	500.0	125.0	Repro.
2/11/03	33	250.0	250.0	500.0	125.0	Repro.
3/11/03	34	250.0	250.0	500.0	125.0	Repro.
4/8/03	35	250.0	250.0	500.0	125.0	Survival
5/13/03	36	250.0	250.0	500.0	125.0	Survival
6/10/03	37	250.0	250.0	500.0	125.0	Survival
8/12/03	38	250.0	250.0	500.0	125.0	Survival
9/23/03	39	250.0	250.0	500.0	125.0	Survival
10/28/03	40	250.0	250.0	500.0	125.0	Survival
11/18/03	41	250.0	250.0	500.0	125.0	Survival
12/2/03	42	250.0	250.0	500.0	125.0	Survival
1/6/04	43	250.0	250.0	500.0	125.0	Survival
2/10/04	44	250.0	250.0	500.0	125.0	Repro.
3/9/04	45	250.0	250.0	500.0	125.0	Survival

Toxicant: *Potassium chloride*



B-H Laboratories, Inc. – Biological Services Division *Ceriodaphnia dubia*

Biological Data: Standard Reference Toxicant Test Study No.: 0559CdC Test Week: 3/09/04

Tech ID	RSH	RSH	RSH	RSH	QDB	QDB	QDB	QDB
Date/Time	3-9/13²⁰	3-10/14²⁰	3-11/14²⁰	3-12/13⁴⁴	3-13/14¹⁰	3-14/13³⁰	3-15/13⁰⁰	3-16/13¹⁵
Day/Hour	0 / 1	1 / 24	2 / 48	3 / 72	4 / 96	5 / 120	6 / 144	7 / 168

Conc.	Rep	N_o	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	Total # of Progeny/Rep
Control	A	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	14	N	26
Control	B	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	12	N	24
Control	C	1	0	N	0	N	0	N	2	N	0	N	10	N	16	N	0	N	28
Control	D	1	0	N	0	N	0	N	5	N	0	N	10	N	16	N	0	N	31
Control	E	1	0	N	0	N	0	N	0	N	6	N	6	N	12	N	16	N	34
Control	F	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
Control	G	1	0	N	0	N	0	N	0	N	4	N	0	N	8	N	12	N	24
Control	H	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	16	N	34
Control	I	1	0	N	0	N	0	N	0	N	4	N	0	N	8	N	12	N	24
Control	J	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	12	N	24
62.5 ppm	A	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
62.5 ppm	B	1	0	N	0	N	0	N	2	N	0	N	8	N	12	N	0	N	22
62.5 ppm	C	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	12	N	24
62.5 ppm	D	1	0	N	0	N	0	N	0	N	6	N	14	N	0	N	16	N	36
62.5 ppm	E	1	0	N	0	N	0	N	0	N	4	N	0	N	8	N	10	N	22
62.5 ppm	F	1	0	N	0	N	0	N	3	N	0	N	8	N	12	N	0	N	23
62.5 ppm	G	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
62.5 ppm	H	1	0	N	0	N	0	N	0	N	6	N	0	N	12	N	20	N	38
62.5 ppm	I	1	0	N	0	N	0	N	0	N	6	N	0	N	14	N	18	N	38
62.5 ppm	J	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	12	N	24
125 ppm	A	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
125 ppm	B	1	0	N	0	N	0	N	0	N	4	N	10	N	0	N	16	N	30
125 ppm	C	1	0	N	0	N	0	N	0	N	6	N	14	N	0	N	20	N	40
125 ppm	D	1	0	N	0	N	0	N	0	N	6	N	0	N	12	N	22	N	40
125 ppm	E	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	12	N	24
125 ppm	F	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
125 ppm	G	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	16	N	34
125 ppm	H	1	0	N	0	N	0	N	0	N	4	N	0	N	8	N	12	N	24
125 ppm	I	1	0	N	0	N	0	N	0	N	4	N	10	N	0	N	12	N	26
125 ppm	J	1	0	N	0	N	0	N	0	N	6	N	0	N	10	N	0	N	16

Behavioral Codes: N - Normal, D – Dead, M- Male, C – Crushed in transfer, DIS = Discolored, E = Erratic swimming, T = Torpor

Reviewed By: _____ Date: 3-26-04

rgz-c:msword/datasheets/ceriodata.srt/1-02(rev#2)

B-H Laboratories, Inc. – Biological Services Division *Ceriodaphnia dubia*

Biological Data: Standard Reference Toxicant Test Study No.: 0559CdC Test Week: 3/09/04

Tech ID			RSH		RSH		RSH		RSH		RDB		RDB		RDB		RDB		
Date/Time			3-9/1320		3-10/1420		3-11/1420		3-12/1344		3-13/1410		3-14/1330		3-15/1300		3-16/1315		
Day/Hour			0 / 1		1 / 24		2 / 48		3 / 72		4 / 96		5 / 120		6 / 144		7 / 168		
Conc.	Rep	No	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	# Prog	Key	Total # of Progeny/Rep
250 ppm	A	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
250 ppm	B	1	0	N	RSH 10	N	0	N	0	N	6	N	12	N	0	N	20	N	38
250 ppm	C	1	0	N	0	N	0	N	4	N	0	N	8	N	12	N	0	N	24
250 ppm	D	1	0	N	0	N	0	N	0	N	6	N	14	N	0	N	18	N	38
250 ppm	E	1	0	N	0	N	0	N	0	N	4	N	8	N	0	N	14	N	26
250 ppm	F	1	0	N	0	N	0	N	4	N	0	N	10	N	16	N	0	N	30
250 ppm	G	1	0	N	0	N	0	N	0	N	6	N	12	N	0	N	18	N	36
250 ppm	H	1	0	N	0	N	0	N	4	N	0	N	8	N	12	N	0	N	24
250 ppm	I	1	0	N	0	N	0	N	0	N	6	N	14	N	0	N	19	N	37
250 ppm	J	1	0	N	0	N	0	N	0	N	6	N	0	N	14		20	N	40
500 ppm	A	1	0	N	0	N	0	N	0	N	0	N	7	D					7
500 ppm	B	1	0	N	0	N	0	N	0	N	6	N	14	D					20
500 ppm	C	1	0	N	0	N	0	N	0	N	4	N	8	N					~~12~~ 12
500 ppm	D	1	0	N	0	N	0	N	0	N	6	N	10	D					16
500 ppm	E	1	0	N	0	N	0	N	0	N	0	N	3	D					3
500 ppm	F	1	0	N	0	N	0	N	0	N	6	N	10	D					16
500 ppm	G	1	0	N	0	N	0	N	0	N	4	N	0	D					4
500 ppm	H	1	0	N	0	N	0	N	0	N	4	N	8	D					12
500 ppm	I	1	0	N	0	D													0
500 ppm	J	1	0	N	0	N	0	N	0	N	3	N	0	D					3
1000 ppm	A	1	0	N	0	D													0
1000 ppm	B	1	0	N	0	D													0
1000 ppm	C	1	0	N	0	D													0
1000 ppm	D	1	0	N	0	D													0
1000 ppm	E	1	0	N	0	D													0
1000 ppm	F	1	0	N	0	D													0
1000 ppm	G	1	0	N	0	D													0
1000 ppm	H	1	0	N	0	D													0
1000 ppm	I	1	0	N	0	D													0
1000 ppm	J	1	0	N	0	D													0

Behavioral Codes: N - Normal, D – Dead, M – Male, C – Crushed in transfer, DIS = Discolored, E = Erratic swimming, T = Torpor

Reviewed By: [signature] Date: 3-26-04

rgz-c:msword/datasheets/ceriodata.srt/1-02(rev#2)

B-H Laboratories, Inc.
Biological Services Division

Ceriodaphnia dubia
PHYSICAL/CHEMICAL PARAMETER DATA SHEET

P/Chem Data: Standard Reference Toxicant Test **Study No.: 0559CdC** **Test Week: 3/09/04**

Sample Concentration	P/Chem. Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
	Tech ID	RSH	RSH	RSH	RSH	DWB	RSH/DWB	DWB
Control	Temp. Initial	24.9	24.8	25.1	24.9	24.7	24.7	24.9
	Temp. Final	25.1	24.8	24.9	25.0	24.8	25.2	24.9
	D. O. Initial	8.0	7.8	7.9	8.0	7.7	7.8	7.7
	D. O. Final	8.9	8.7	8.9	9.1	9.3	9.5	9.3
	pH Initial	7.68	7.65	7.63	7.71	7.73	7.75	7.73
	pH Final	8.25	8.14	8.16	8.18	8.21	8.23	8.18
	Conductivity	294	291	295	~~255~~ ①	296	296	298
62.5 ppm	Temp. Initial	24.9	24.8	25.0	25.0	24.7	24.9	25.0
	Temp. Final	24.9	24.8	24.5	25.0	25.0	25.4	25.1
	D. O. Initial	8.1	7.6	7.9	7.7	7.7	7.8	7.5
	D. O. Final	8.7	8.6	8.7	9.2	9.2	9.5	9.2
	pH Initial	7.73	7.70	7.70	7.77	7.78	7.80	7.77
	pH Final	8.20	8.10	8.10	8.18	8.23	8.25	8.20
	Conductivity	397	396	422	~~363~~ ②	398	396	405
125 ppm	Temp. Initial	24.8	24.7	25.0	24.9	24.6	24.9	249
	Temp. Final	24.5	24.8	24.4	24.8	25.0	25.3	25.0
	D. O. Initial	8.3	7.9	8.0	8.0	7.7	7.8	7.9
	D. O. Final	8.7	8.4	8.7	9.2	9.3	9.6	9.5
	pH Initial	7.77	7.75	7.73	7.80	7.82	7.83	7.78
	pH Final	8.20	8.10	8.09	8.20	8.26	8.29	8.24
	Conductivity	494	457	500	452 ③	498	501	516
250 ppm	Temp. Initial	25.0	24.9	25.1	252.0	24.6	24.9	248
	Temp. Final	25.0	24.8	24.3	25.1	24.9	25.6	24.7
	D. O. Initial	8.0	7.8	8.0	7.9	7.7	7.8	7.8
	D. O. Final	8.6	8.5	8.7	9.3	9.4	9.8	9.6
	pH Initial	7.80	7.80	7.77	7.84	7.82	7.84	7.81
	pH Final	8.23	8.14	8.12	8.21	8.29	8.31	8.26
	Conductivity	731	709	743	~~656~~ ④	726	731	738
500 ppm	Temp. Initial	25.1	24.9	25.1	25.0	24.7	25.0	25.0
	Temp. Final	25.1	25.0	25.0	24.9	24.8	25.2	24.9
	D. O. Initial	8.2	7.9	7.8	7.9	7.5	7.9	7.8
	D. O. Final	8.9	8.9	9.1	9.4	9.6	9.8	9.6
	pH Initial	7.84	7.85	7.81	7.89	7.84	7.87	7.85
	pH Final	8.37	8.32	8.34	8.28	8.32	8.36	8.29
	Conductivity	1181	1157	1141	~~1067~~ ⑤	1146	1139	1144
1000 ppm	Temp. Initial	25.1						
	Temp. Final	25.2						
	D. O. Initial	8.1						
	D. O. Final	8.7						
	pH Initial	7.87						
	pH Final	8.34						
	Conductivity	2093						

RSH 3-12-04
① 294
② 423
③ 521
④ 788
⑤ 1229

Page 3 of 4

Reviewed By: _____ Date: 3-26-04

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Alkalinity (mg/L $CaCO_3$)

Tech ID	RSH		RSH		RJB		/		Tech ID: RJB		
Date/Day	3-9 / 0		3-11 / 2		3-13 / 4		/		Date: 3-26-04		
Titrate	0.02N HCl		0.02N HCl		0.02N HCl		0.02N HCl				
Concentration	Burette Reading	Alkalinity	Burette Reading	Alkalinity	Burette Reading	Alkalinity	Burette Reading	Alkalinity	n	Mean	s
Control Water	6.5	65	6.5	65	6.5	65			3	65	
1000 ppm	6.5	65	6.5	65	6.5	65			3	65	

Hardness (mg/L $CaCO_3$)

Tech ID	RSH		RSH		RJB		/		Tech ID: RJB		
Date/Day	3-9 / 0		3-11 / 2		3-13 / 4		/		Date: 3-26-04		
Titrate	EDTA		EDTA		EDTA		EDTA				
Concentration	Burette Reading	Hardness	Burette Reading	Hardness	Burette Reading	Hardness	Burette Reading	Hardness	n	Mean	s
Control Water	4.1	82	4.1	82	4.1	82			3	82	
1000 ppm	4.1	82	4.1	82	4.1	82			3	82	

Day	Date	Tech ID	Notes
Day 0 / 1-hrs	3-9-04	RSH	None
Day 1 / 24-hrs	3-10-04	RSH	None
Day 2 / 48-hrs	3-11-04	RSH	None
Day 3 / 72-hrs	3-12-04	RSH	None
Day 4 / 96-hrs	3-13	RJB	None
Day 5 / 120-hrs	3-14	RJB	None
Day 6 / 144-hrs	3-15	RJB	None
Day 7 / 168-hrs	3-16	RSH	None

Reviewed By: RJB

Date: 3-26-04

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

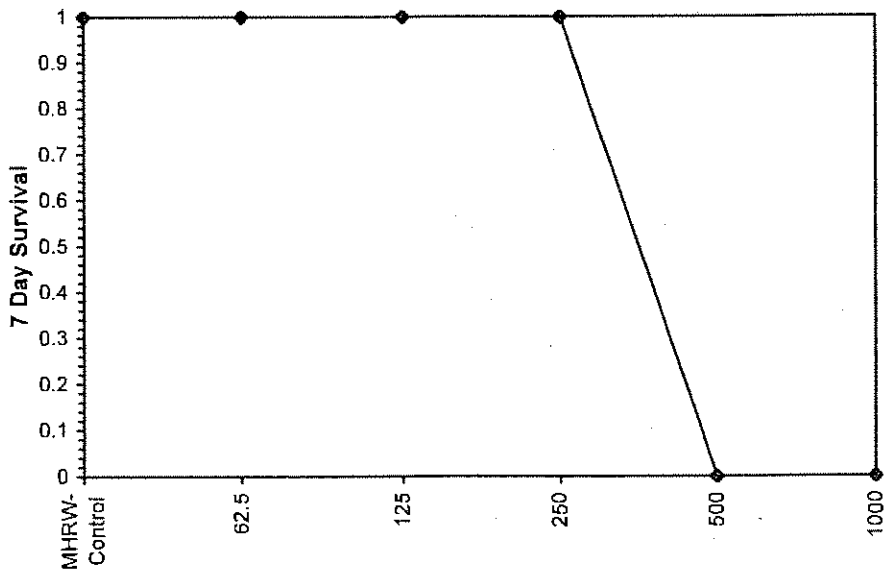
Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Sen	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
62.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
250	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-ppm	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical
MHRW-Control	1.0000	1.0000	0	10	10	10		
62.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500
125	1.0000	1.0000	0	10	10	10	1.0000	0.0500
250	1.0000	1.0000	0	10	10	10	1.0000	0.0500
500	0.0000	0.0000	10	0	10	10		
1000	0.0000	0.0000	10	0	10	10		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	250	500	353.553	

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by: [signature]

Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Ser	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

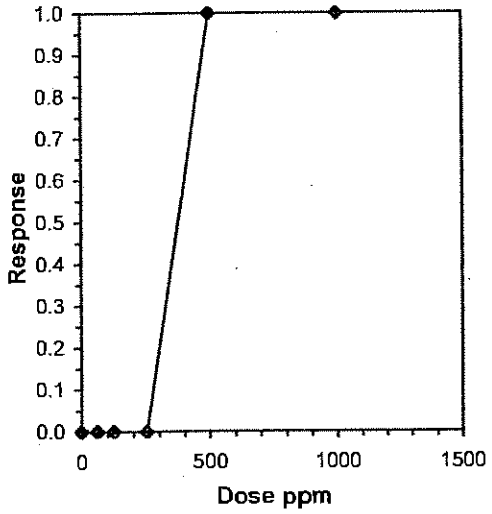
Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
62.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
250	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Isotonic	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
MHRW-Control	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	1.0000	1.0000
62.5	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	1.0000	1.0000
125	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	1.0000	1.0000
250	1.0000	1.0000	1.0472	1.0472	1.0472	0.000	10	1.0000	1.0000
500	0.0000	0.0000	0.5236	0.5236	0.5236	0.000	10	0.0000	0.0000
1000	0.0000	0.0000	0.5236	0.5236	0.5236	0.000	10	0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	1	0.919		
Equality of variance cannot be confirmed				

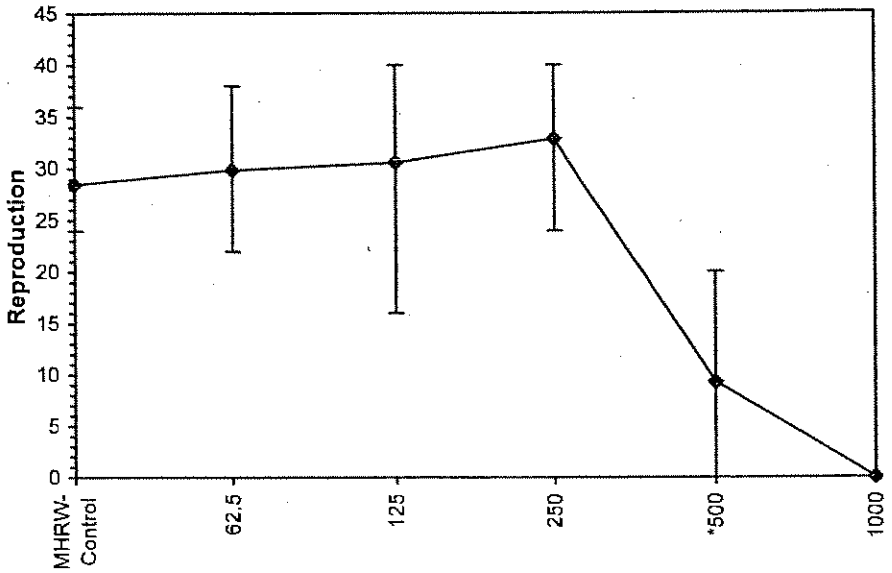
Linear Interpolation (200 Resamples)

Point	ppm	SD	95% CL		Skew
IC05	262.50	0.00	262.50	262.50	#DIV/0!
IC10	275.00	0.00	275.00	275.00	#DIV/0!
IC15	287.50	0.00	287.50	287.50	#DIV/0!
IC20	300.00	0.00	300.00	300.00	#DIV/0!
IC25	312.50	0.00	312.50	312.50	#DIV/0!
IC40	350.00	0.00	350.00	350.00	#DIV/0!
IC50	375.00	0.00	375.00	375.00	#DIV/0!



Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Ser	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Sen	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

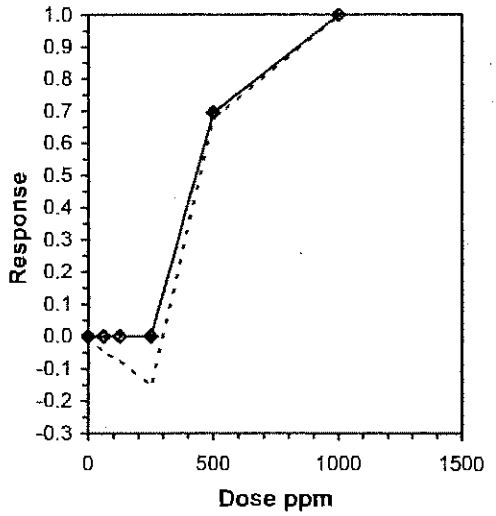
Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	26.000	24.000	28.000	31.000	34.000	36.000	24.000	34.000	24.000	24.000
62.5	36.000	22.000	24.000	36.000	22.000	23.000	36.000	38.000	38.000	24.000
125	36.000	30.000	40.000	40.000	24.000	36.000	34.000	24.000	26.000	16.000
250	36.000	38.000	24.000	38.000	26.000	30.000	36.000	24.000	37.000	40.000
500	7.000	20.000	12.000	16.000	3.000	16.000	4.000	12.000	0.000	3.000
1000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					Isotonic	
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	Mean	N-Mean
MHRW-Control	28.500	1.0000	28.500	24.000	36.000	16.969	10	30.475	1.0000
62.5	29.900	1.0491	29.900	22.000	38.000	24.549	10	30.475	1.0000
125	30.600	1.0737	30.600	16.000	40.000	25.971	10	30.475	1.0000
250	32.900	1.1544	32.900	24.000	40.000	19.033	10	30.475	1.0000
500	9.300	0.3263	9.300	0.000	20.000	73.289	10	9.300	0.3052
1000	0.000	0.0000	0.000	0.000	0.000	0.000	10	0.000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.92096	0.93	-0.1566	-1.2261
Bartlett's Test indicates equal variances (p = 0.68)	2.28709	13.2767		

Linear Interpolation (200 Resamples)

Point	ppm	SD	95% CL		Skew
IC05	267.99	32.28	109.42	273.42	-5.5156
IC10	285.98	7.11	261.47	296.84	-1.5196
IC15	303.97	8.40	280.11	320.26	-0.3490
IC20	321.96	10.02	296.61	343.68	0.3348
IC25	339.95	11.85	316.21	367.61	0.6972
IC40	393.92	17.87	367.17	438.99	1.0550
IC50	429.90	22.57	398.29	486.24	1.2762



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Ser	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

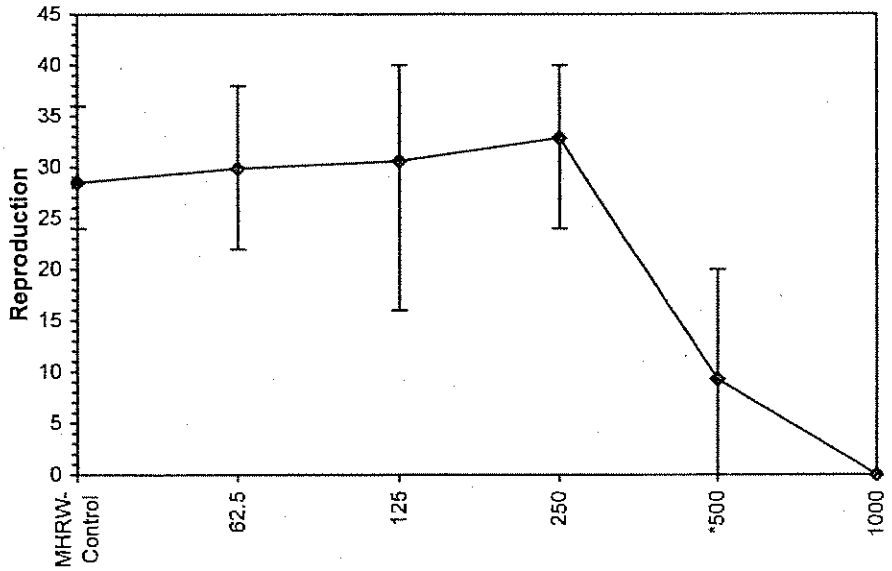
Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	26.000	24.000	28.000	31.000	34.000	36.000	24.000	34.000	24.000	24.000
62.5	36.000	22.000	24.000	36.000	22.000	23.000	36.000	38.000	38.000	24.000
125	36.000	30.000	40.000	40.000	24.000	36.000	34.000	24.000	26.000	16.000
250	36.000	38.000	24.000	38.000	26.000	30.000	36.000	24.000	37.000	40.000
500	7.000	20.000	12.000	16.000	3.000	16.000	4.000	12.000	0.000	3.000
1000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

			Transform: Untransformed					Rank	1-Tailed
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MHRW-Control	28.500	1.0000	28.500	24.000	36.000	16.969	10		
62.5	29.900	1.0491	29.900	22.000	38.000	24.549	10	107.50	76.00
125	30.600	1.0737	30.600	16.000	40.000	25.971	10	116.50	76.00
250	32.900	1.1544	32.900	24.000	40.000	19.033	10	128.50	76.00
*500	9.300	0.3263	9.300	0.000	20.000	73.289	10	55.00	76.00
1000	0.000	0.0000	0.000	0.000	0.000	0.000	10		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.92096	0.93	-0.1566	-1.2261
Bartlett's Test indicates equal variances (p = 0.68)	2.28709	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	250	500	353.553	

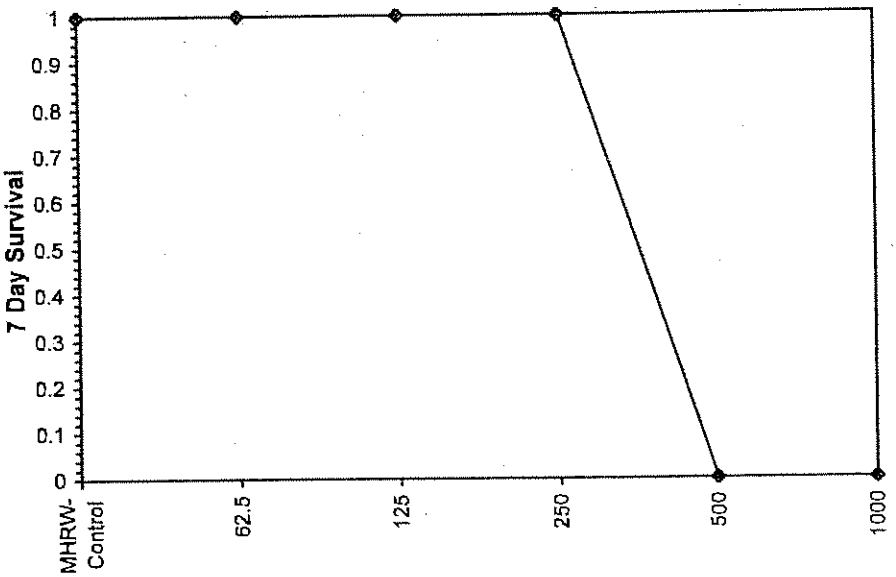
Dose-Response Plot



Ceriodaphnia Survival and Reproduction Test-7 Day Survival

Start Date:	3/9/2004	Test ID:	559DdC	Sample ID:	REF-Ref Toxicant
End Date:	3/16/2004	Lab ID:	ALSI-Aquatic Laboratory Ser	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CD-Ceriodaphnia dubia
Comments:					

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by:

APPENDIX D

Chain-of-Custody Forms

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

3450 Schuylkill Road
Spring City, PA 19475
Phone 610-792-1828 • Fax 610-792-1829

Client: TETRA T[illegible]: FW, INC.
Address: 1000 The American Rd.
MORRIS PLAINS, NJ 07950
Phone: 973.630.8000
Samplers: GRACE KIM + KELLY MILLET
Project No.: 1172.0003.0000.00000.

Client Contact: DON CAMPBELL
973.630.8332

Sample Disposal - **Return To Client** [ ] **Disposal by Lab** [X]

CHAIN OF CUSTODY

No. Container						1GAL								
Container Size						1								
SAMPLE INFORMATION						**Toxicity Test Requested**								
SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification 032904	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Othe
	2.1	MM-SW14-~~032904~~	SW	3-29-04	1101		X							
	2.3	MM-SW15-032904	↓	↓	0950		↓							
	2.0	MM-SW17-032904	↓	↓	0927		↓							
	2.2	MM-SW19-032904	↓	↓	1322		↓							
	1.9	MM-SW21-032904	↓	↓	0849		↓							
	1.5	MM-SW22-032904	↓	↓	1008		↓							
		3-29-04 gm				3-29-04 gm					gm 3-29-04			

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished by:	Print Name	Received by:	Print Name	Date:	Time
[signature] Grace Kim	GRACE KIM	Rebecca S. Hill	Rebecca S. Hill	3/29/04	163

Special Instructions: All samples are iced, 72-HR ceriodaphnia test
1 gallon jug for each sample, total 6 jugs/containers

Matrix Codes:

S	-	soil	GW	-	ground water
SE	-	sediment	ST	-	stormwater
SL	-	sludge	PW	-	processed wate
O	-	oil	DW	-	dilution water
WW	-	waste water	RW	-	receiving water
SW	-	surface water	X	-	other

ALSI Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - B-H Labs Yellow Copy - Client

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 057
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW14

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (1101)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories

Temperature °C: 2.1 Visual Description: pale yellow, dark matter (sinks) (floating)

Dissolved Oxygen: 12.2 Odor (if any): N/A

pH: 7.45 Total Residual Chlorine: N/A

Conductivity: 466 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): 90 Hardness (as mg/L $CaCO_3$): 166

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	24.7	9.8	7.48	476
3-31-04	~~24.7~~ RSH 26.0	9.4	7.19	477

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-31	RSH	None

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW14

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
4-1	25.7	9.3	7.13	476
4-2	25.4	9.1	7.18	476
4-3	24.8	9.4	7.21	478
4-4	25.2	9.2	7.22	476

DATE	TECH ID	NOTES/COMMENTS
4-1	RJB	None
4-2	RJB	None
4-3	RJB	None
4-4	RJB	None
4-5	RJB	None

Reviewed By: _____ Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 057
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW15

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (0950)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories

Temperature °C: 2.3 Visual Description: yellowtint, dark floating (sinks) matter

Dissolved Oxygen: 13.0 Odor (if any): N/A

pH: 7.69 Total Residual Chlorine: N/A

Conductivity: 633 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): 115 Hardness (as mg/L $CaCO_3$): 202

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	24.0	9.5	7.68	642
3-31-04	25.6	9.0	7.50	632

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-31	RSH	None

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW15

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
4-1	25.5	9.5	7.45	638
4-2	25.1	9.3	7.47	642
4.3	24.7	9.2	7.51	644
4-4	25.1	9.3	7.56	641
~~4-5~~				

DATE	TECH ID	NOTES/COMMENTS
4-1	RJZ	None
4.2	RJZ	None
4.3	RJZ	None
4-4	RJZ	None
4.5	RJZ	None

Reviewed By: RJZ Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 05
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW17

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (0927)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories

Temperature °C: 2.0 Visual Description: clear, dark (sinks), debri

Dissolved Oxygen: 12.4 Odor (if any): ~~None~~ N/A

pH: 7.48 Total Residual Chlorine: N/A

Conductivity: 576 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): 102 Hardness (as mg/L $CaCO_3$): 174

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	25.7	9.1	7.51	585
3-31-04	26.0	9.1	7.42	588

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-21	RSH	None

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
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AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW17

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
4-1	24.9	9.3	7.38	588
4-2	25.4	9.2	7.37	589
4-3	24.9	9.4	7.39	592
4-4	25.0	9.3	7.42	594
4-				

DATE	TECH ID	NOTES/COMMENTS
4-1	RJZ	None
4-2	RJZ	None
4-3	RJZ	None
4-4	RJZ	None
4-5	RJZ	None

Reviewed By: RJZ Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
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Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 057(
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW19

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (1322)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories

Temperature °C: 2.2 Visual Description: light yellow, dark (sinks) debri

Dissolved Oxygen: 13.6 Odor (if any): N/A

pH: RSH 8.00 Total Residual Chlorine: N/A

Conductivity: 563 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): 116 Hardness (as mg/L $CaCO_3$): 194

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	24.2	9.9	7.88	573
3-31-04	26.0	9.4	7.67	576

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-31	RSH	None

Reviewed By: RSH Date: 4-7-04

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Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW19

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
4-1	24.0	9.9	7.63	574
4-2	24.4	9.5	7.58	575
4-3	24.8	9.6	7.63	578
4-4	25.1	9.8	7.65	581

DATE	TECH ID	NOTES/COMMENTS
4-1	RJZ	None
4-2	RJZ	None
4-3	RJZ	None
4-4	RJZ	None
4-5	RJZ	None

Reviewed By: RJZ Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 057
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW21

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (0849)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories (sink to bottom)

Temperature °C: 1.9 Visual Description: yellow, dark debri

Dissolved Oxygen: 9.4 Odor (if any): N/A

pH: 7.28 Total Residual Chlorine: N/A

Conductivity: 645 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): 214 Hardness (as mg/L $CaCO_3$): 294

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	24.0	8.3	7.32	658
3-31-04	24.4	9.4	7.25	660

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-31	RSH	None

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW21

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
4-1	24.0	9.1	7.27	RJB 7.93 658
4-2	24.5	9.4	7.28	659
4-3	24.9	9.2	7.31	662
4-4	25.2	9.4	7.36	666

DATE	TECH ID	NOTES/COMMENTS
4-1	RJB	None
4-2	RJB	None
4-3	RJB	None
4-4	RJB	None
4-5	RJB	None

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 05
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW22

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

Collection Start Date/Time: __/__/__ ( ) Collection End Date/Time: 3/29/04 (1008)

Sample Type: Composite [ ] Grab [X] Continuous [ ]

Compositing Period: 2-Hour [ ] 24-Hour [ ] Flow-proportioned: Yes [ ] No [X]

Sample: Hand delivered: [ ] Shipped: [X]

If shipped: Federal Express [X] UPS [ ] Other [ ] Tracking No.: 8434-7046-0498

SAMPLE INFORMATION: Upon Arrival at B-H Laboratories' Aquatic Toxicology Laboratories

Temperature °C: 1.5 Visual Description: brown, cloudy, dark deb (sink to bot

Dissolved Oxygen: 7.4 Odor (if any): N/A

pH: 6.40 Total Residual Chlorine: N/A

Conductivity: 132 Ammonia (if required): N/A

Alkalinity (as mg/L $CaCO_3$): N/A Hardness (as mg/L $CaCO_3$): N/A

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)
3-30-04	24.5	7.0	6.43	132
3-31-04	26.0	8.5	6.36	133

DATE	TECH ID	NOTES/COMMENTS
3-30	RSH	None
3-31	RSH	None

Reviewed By: RJB Date: 4-7-04

rgz-c:msword/datasheets/troksheet.mms/3-04

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC LABORATORY SERVICES STUDY NO. 0574
FACILITY: MAGNA METALS SITE

INTERNAL TRACKING SHEET

SAMPLE COLLECTION:

Sample ID: MM-SW22

Sample Collector ID: Grace Kim Company: Tetra Tech – FW, Inc.

SAMPLE PHYSICAL/CHEMICAL PARAMETERS (after warming to test temperature)

DATE	TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	pH (standard units)	CONDUCTIVITY (µmhos/cm)

DATE	TECH ID	NOTES/COMMENTS

Reviewed By: [signature] Date: 4-7-04

rgz-c:msword/datasheets/traksheet.mms/3-04

ATTACHMENT I-3

Whole Sediment Toxicity Test Reports

AQUATIC LABORATORY SERVICES, INC.

Aquatic and Terrestrial Toxicity Testing

11 May 2004

Mr. George Christian
Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, PA 19475

SUBJECT: Magna Metals Site
Whole Sediment Toxicity Evaluation
Aquatic Laboratory Services Study No.: 0574HAC

Dear Mr. Christian:

Enclosed please find one bound and one unbound copy of the results of the 10-day Whole Sediment Toxicity tests conducted on sediment collected at the Magna Metals Site. The testing was conducted 16 through 26 April 2004 using the freshwater amphipod *Hyalella azteca*.

Please do not hesitate to contact me at 610.792.1828 or rzirkalsi@aol.com should you have any questions regarding this report.

Sincerely,

Roger G. Zirk,
Laboratory Manager

Enclosures

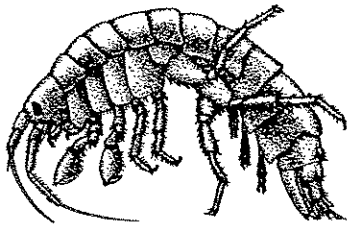
Cc: S. Brunk, ALSI

rgz-c:msword/letters/0574hac.nei.rz1/5-04

Results of Whole Sediment Toxicity Testing for the

Magna Metal Site
Cortlandt, New York

Aquatic Laboratory Services Study No. 0574HAC



Prepared for:

Normandeau Associates, Inc.

Aquatic Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

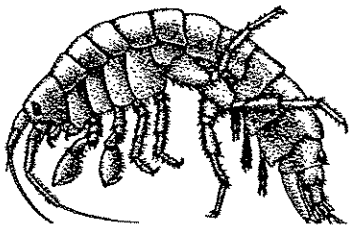
May 2004

Results of 10-Day Whole Sediment
Toxicity Testing for the

Magna Metals Site
Cortlandt, New York

Using the

Freshwater amphipod, *Hyalella azteca*



16 through 26 April 2004,

Prepared for:

Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, Pennsylvania 19475

Report Prepared By: _____ 11 May 2004
Roger G. Zirk, Date
Laboratory Manager

Aquatic Laboratory Services, Inc.
3450 Schuylkill Road
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New Jersey Certification No. PA021

Aquatic Laboratory Services Study No. 0574HaC

May 2004

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   - Daily Observation Data
   - Daily Temperature, Dissolved Oxygen, pH and Conductivity Data Weight Data

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INTRODUCTION

Whole sediment toxicity testing was conducted on sediment samples collected from the Magna Metals Site in Cortlandt, New York. Whole sediment toxicity testing was conducted 16 through 26 April 2004 using the freshwater amphipod, *Hyalella azteca (H. azteca)*. The samples were collected by Tetra Tech-FW, Inc. personnel and transported to Aquatic Laboratory Services Spring City, Pennsylvania. The objective of this testing was to determine chronic toxicity of the sediments to *H. azteca*.

All testing was conducted in accordance with procedures outlined in Ingersoll, C.G., G.T. Ankley, G.A. Burton, F.J. Dwyer, R.A. Hoke, T.J. Norbert-King and P.V. Winger. 1994. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates.* EPA/600/R-99/064. U.S. EPA Office of Research and Development, Duluth, MN, ASTM. 1995 and *Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates.* E1706-95. American Society for Testing and Materials, Philadelphia, PA and ASTM. 1994.

MATERIALS

TEST ORGANISMS

Freshwater Amphipod, *Hyalella azteca*

Immature *H. azteca* (8-days old) used in testing were obtained from Aquatic Research Organisms (ARO), a commercial culture facility located in Hampton, New Hampshire. This species is a representative invertebrate and a United States Environmental Protection Agency (EPA) accepted test organism. Prior to shipping, the amphipods were fed Yeast/Cerophyll/Trout chow (YCT) during acclimation and holding at ARO. The amphipods were placed in a plastic cubitainer with moderately-hard reconstituted water and shipped overnight to Aquatic Laboratory Services in Spring City, Pennsylvania. The amphipods were received at Aquatic Laboratory Services on 16 April 2004. Upon receipt at Aquatic Laboratory Services, the amphipods were inspected for mortality and transferred to several 2-liter crystallizing dishes. The amphipods were fed YCT and gentle aeration was provided to the crystallizing dish. The amphipods were acclimated to the overlying water by partial replacements with moderately-hard reconstituted water. Amphipods were fed 1.0-mL YCT daily during the test, unless otherwise noted (see Daily Observation Data Sheets, Appendix A). The amphipods were held in moderately-hard reconstituted water until test initiation.

NEGATIVE CONTROL SEDIMENT

Sediment to be used as the negative controls was collected from Spruce Run Reservoir located in Clinton, New Jersey. The sediment was collected on 14 April 2004 and transported to the Spring City laboratory. The sediments were collected from a cove west of the boat launch at N 40° 39.649', W 74° 55.431' (estimated accuracy 15 meters). The sediments were collected approximately five-feet from the shoreline in two-feet of water.

Control sediment was collected by Aquatic Laboratory Services personnel and placed in three 2½-gallon plastic buckets. The sediment was covered with overlying water from the reservoir and sealed with the liner and a plastic lid.

Aquatic Laboratory Services personnel transported the sediment to the Spring City, PA office on the day of collection. Chain-of-Custody forms accompanied all sediments. Prior to use, the control sediments were homogenized and sieved through a no. 6 (3.35-mm) stainless steel sieve to remove large pebbles, stones, twigs and plant clumps.

TEST SEDIMENTS

Sediments were collected on 30 March, 31 March and 3 April 2004 by Tetra Tec-FW, Inc. personnel. The sediments were identified as reference sediment no(s): MM-SD-13, MM-SD-17 and sediment sites MM-SD-14, MM-SD-15, MM-SD-19A, MM-SD-21 and MM-SD-23. Sediment samples were shipped overnight via Federal Express and delivered to to Aquatic Laboratory Services Spring City office on 1, 2 and 6 April 2004. Chain-of-Custody forms accompanied all sediments. All sediments were stored at 1° to 4.4°C in their original containers when not being used. Sediments were warmed to test temperature prior to test initiation. Prior to use, the sediments were homogenized and sieved through a no. 6 (3.35-mm) stainless steel sieve to remove large pebbles, stones, twigs and plant clumps.

OVERLYING WATER

Moderately-Hard Reconstituted Water

Reconstituted water is prepared in accordance to procedures outlined in EPA/600/R-99/064 to be used as acclimation and overlying water for the toxicity tests. Water is decanted through a mixed bed de-ionizing system (U. S. Filter, Inc.) consisting of carbon, mixed resin-bed and membrane filters. A 190-liter Nalgene tank is filled with about 150-liters of de-ionized water. In a five-gallon bucket of de-ionized water, 9.5-grams of $CaSO_4$ and 9.5-grams $CaCl_2$ is mixed into solution by vigorously aerating for 30-minutes or until the salts dissolve.. Into a second 5-gallon bucket of de-ionized water, 5.7-grams of $MgSO_4$, 18.2-grams of $NaHCO_3$ and 0.76-grams KCl is mixed by aerating for 30-minutes or until the salts dissolve. The two five-gallon aliquots are added to the 150-liters of de-ionized water and the volume is brought to 190-liters with de-ionized water. Reconstituted water is aerated for at least 24-hours prior to use.

METHODS

HYALELLA AZTECA, 10-DAY WHOLE SEDIMENT TOXICITY TEST METHOD

Sediments were warmed to test temperature prior to test initiation. The day prior to test initiation, 100-mL of sediment and 175-mL of overlying water (moderately-hard reconstituted water) were placed into the each test chamber. Renewal of overlying water was begun 24-hours prior to introduction of the test organisms. *H. azteca* (8-days old) were exposed to the sediment under static renewal conditions for 10-days. The amphipods were exposed in-groups of ten in 300-mL high-form lip-less Kimax beakers with eight replicates per sample (80 amphipods per sample). Test chambers were placed in a temperature controlled environmental chamber maintained at 23 ± 1°C. Negative control sediments were also tested. Test organisms were fed 1.0-mL of YCT suspension daily unless otherwise noted on the raw data sheets. Water renewals were accomplished by siphoning off the old solution and replacing it with fresh overlying water renewed overlying water twice daily (A.M. and P.M.).

Dead organisms observed during the renewal process were removed and recorded. Dissolved oxygen and pH were measured daily in the fresh overlying water. Temperature, dissolved oxygen, pH and conductivity were measured in the pooled replicates after each 24-hour exposure period. Alkalinity and hardness were measured in the overlying water on day 0. Ammonia was measured in the pooled replicates from each sample on days 0 and 10. The lighting regime was 16-hours light, 8-hours dark using cool white fluorescent lights.

The test was terminated at the end of 10-days. Surviving amphipods within each replicate were collected with a U.S. Standard No. 50 stainless steel sieve. The amphipods were counted, rinsed with de-ionized water and transferred as a group to pre-weighed pans. The number of surviving amphipods was recorded on the *Hyalella azteca* Weight Data sheet. Amphipods were dried in an oven at 90° C to a constant weight and then transferred to a desiccator until weighing.

Each pan containing amphipods was weighed to the nearest 0.01-mg on an Ohaus Model AP250D Plus analytical balance. The total amphipod dry weight was divided by the number of surviving amphipods to obtain the average amphipod weight (growth) per replicate. In addition, the total dry weight divided by the initial number of amphipods (biomass) was calculated and the statistical printouts are included in Appendix B of this report.

STATISTICAL ANALYSES

Statistical comparisons for the toxicity testing were performed between the negative control and site sediments to identify statistically significant differences in survival. Arc-sine transformed survival data were tested for normal distribution using either Shapiro-Wilk's Test or Kolmogorov D Test. Survival data were tested for equality of variance using Bartlett's Test. If the data met the assumptions for normality and equality of variance, the parametric Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences in survival between the test samples and reference sediments. If these assumptions were not met, the non-parametric Steels Many-One Rank Test was used to identify significant differences in survival between the test samples and reference sediments. A summary of survival data for *H. azteca* can be found in Tables 1a.

Statistical comparisons for the toxicity testing were performed between the negative control and site sediments to identify statistically significant differences in growth. Non-transformed growth data were tested for normal distribution using either Shapiro-Wilk's Test or Kolmogorov D Test. Growth data were tested for equality of variance using Bartlett's Test. If the data met the assumptions for normality and equality of variance, the parametric Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences in survival between the test samples and reference sediments. If these assumptions were not met, the non-parametric Steels Many-One Rank Test was used to identify significant differences in survival between the test samples and reference sediments. A summary of growth data for *H. azteca* can be found in Tables 1b.

RESULTS (continued)

Table 2a. Summary of Survival Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using Reference Sediment MM-SD-17 vs. Sediment MM-SD-15, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-17	9	6	8	6	3	8	8	4	54.00%	N/A
Sediment Site MM-SD-15	8	3	7	4	7	9	4	7	61.25%	NO

Table 2b. Summary of Growth Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using Reference Sediment MM-SD-17 vs. Sediment MM-SD-15, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-17	0.0500	0.0667	0.0738	0.0733	0.0600	0.0438	0.0775	0.0575	0.0628	N/A
Sediment Site MM-SD-15	0.0175	0.0400	0.0429	0.0425	0.0214	0.0333	0.0300	0.0329	0.0326	YES

RESULTS

Table 1a. Summary of Survival Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Negative Control	9	8	10	8	10	9	8	10	90.00%	N/A
Sediment Site MM-SD-13	5	6	6	8	8	8	5	7	66.25%	YES
Sediment Site MM-SD-17	9	6	8	6	3	8	8	4	65.00%	YES

Table 1b. Summary of Growth Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Negative Control	0.0733	0.0900	0.0660	0.0662	0.0560	0.0800	0.0763	0.0880	0.0745	N/A
Sediment Site MM-SD-13	0.0560	0.0267	0.0317	0.0287	0.0375	0.0375	0.0460	0.0329	0.0371	YES
Sediment Site MM-SD-17	0.0500	0.0667	0.0738	0.0733	0.0600	0.0438	0.0775	0.0575	0.0628	YES

RESULTS (continued)

Table 3a. Summary of Survival Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-13	5	6	6	8	8	8	5	7	66.25%	N/A
Sediment Site MM-SD-14	6	3	8	7	7	8	8	7	67.50%	NO
Sediment Site MM-SD-19A	10	9	8	6	10	8	10	9	87.50%	NO
Sediment Site MM-SD-21	2	8	8	8	8	5	9	8	70.00%	NO
Sediment Site MM-SD-23	5	4	9	7	8	8	7	6	67.50%	NO

Table 3b. Summary of Growth Data – *Hyalella azteca* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 16 through 26 April, 2004

Sample No./ Sample Location	Amphipod Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-13	0.0560	0.2670	0.0317	0.0287	0.0375	0.0375	0.0460	0.0329	0.0371	N/A
Sediment Site MM-SD-14	0.0617	0.0467	0.0538	0.0371	0.0271	0.0463	0.0475	0.0714	0.0489	NO
Sediment Site MM-SD-19A	0.0900	0.0800	0.0825	0.1067	0.1240	0.0975	0.0690	0.0844	0.0918	NO
Sediment Site MM-SD-21	0.0300	0.0362	0.0425	0.0463	0.0425	0.0300	0.0389	0.0375	0.0380	NO
Sediment Site MM-SD-23	0.0580	0.0900	0.0344	0.0900	0.0650	0.0925	0.0843	0.0750	0.0737	NO

Table 4a. Daily Observation Data – *Hyalella azteca*

PROJECT: NJMC-MERI Wetland Ecological Risk Assessment
TEST: 28-Day Whole Sediment Toxicity Test Conducted at 10-ppt
DATE: 16 through 26 April 2004

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Final Live Count
MM-SD-13 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	5
	B	10	N	N	N	N	N	N	N	N	N	N	N	6
	C	10	N	N	N	N	N	N	N	N	N	N	N	6
	D	10	N	N	N	N	N	N	N	N	N	N	N	8
	E	10	N	N	N	N	N	N	N	N	N	N	N	8
	F	10	N	N	N	N	N	N	N	N	N	N	N	8
	G	10	N	N	N	N	N	N	N	N	N	N	N	5
	H	10	N	N	N	N	N	N	N	N	N	N	N	7
MM-SD-14 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	6
	B	10	N	N	N	N	N	N	N	N	N	N	N	3
	C	10	N	N	N	N	N	N	N	N	N	N	N	8
	D	10	N	N	N	N	N	N	N	N	N	N	N	7
	E	10	N	N	N	N	N	N	N	N	N	N	N	7
	F	10	N	N	N	N	N	N	N	N	N	N	N	8
	G	10	N	N	N	N	N	N	N	N	N	N	N	8
	H	10	N	N	N	N	N	N	N	N	N	N	N	7
MM-SD-15 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	8
	B	10	N	N	N	N	N	N	N	N	N	N	N	3
	C	10	N	N	N	N	N	N	N	N	N	N	N	7
	D	10	N	N	N	N	N	N	N	N	N	N	N	4
	E	10	N	N	N	N	N	N	N	N	N	N	N	7
	F	10	N	N	N	N	N	N	N	N	N	N	N	9
	G	10	N	N	N	N	N	N	N	N	N	N	N	4
	H	10	N	N	N	N	N	N	N	N	N	N	N	7
MM-SD-17 033104	A	10	N	N	N	N	N	N	N	N	N	N	N	9
	B	10	N	N	N	N	N	N	N	N	N	N	N	6
	C	10	N	N	N	N	N	N	N	N	N	N	N	8
	D	10	N	N	N	N	N	N	N	N	N	N	N	6
	E	10	N	N	N	N	N	N	N	N	N	N	N	3
	F	10	N	N	N	N	N	N	N	N	N	N	N	8
	G	10	N	N	N	N	N	N	N	N	N	N	N	8
	H	10	N	N	N	N	N	N	N	N	N	N	N	4

Observation Codes: N – Normal, D – Number Amphipods Observed Dead, E – Number Amphipods Observed Emerged,
A – Number Amphipods Observed Avoiding Sediment, F – Number Amphipods Observed Floating on Surface

Table 4b. Daily Observation Data – *Hyalella azteca*

PROJECT: NJMC-MERI Wetland Ecological Risk Assessment
TEST: 28-Day Whole Sediment Toxicity Test Conducted at 10-ppt
DATE: 16 through 26 April 2004

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Final Live Count
MM-SD-19A 033104	A	10	N	N	N	N	N	N	N	N	N	N	N	10
	B	10	N	N	N	N	N	N	N	N	N	N	N	9
	C	10	N	N	N	N	N	N	N	N	N	N	N	8
	D	10	N	N	N	N	N	N	N	N	N	N	N	6
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	8
	G	10	N	N	N	N	N	N	N	N	N	N	N	10
	H	10	N	N	N	N	N	N	N	N	N	N	N	9
MM-SD-21 040304	A	10	N	N	N	N	N	N	N	N	N	N	N	2
	B	10	N	N	N	N	N	N	N	N	N	N	N	8
	C	10	N	N	N	N	N	N	N	N	N	N	N	8
	D	10	N	N	N	N	N	N	N	N	N	N	N	8
	E	10	N	N	N	N	N	N	N	N	N	N	N	8
	F	10	N	N	N	N	N	N	N	N	N	N	N	5
	G	10	N	N	N	N	N	N	N	N	N	N	N	9
	H	10	N	N	N	N	N	N	N	N	N	N	N	8
MM-SD-23 040304	A	10	N	N	N	N	N	N	N	N	N	N	N	5
	B	10	N	N	N	N	N	N	N	N	N	N	N	4
	C	10	N	N	N	N	N	N	N	N	N	N	N	9
	D	10	N	N	N	N	N	N	N	N	N	N	N	7
	E	10	N	N	N	N	N	N	N	N	N	N	N	8
	F	10	N	N	N	N	N	N	N	N	N	N	N	8
	G	10	N	N	N	N	N	N	N	N	N	N	N	7
	H	10	N	N	N	N	N	N	N	N	N	N	N	6
Negative Control Sediment Spruce Run Reservoir	A	10	N	N	N	N	N	N	N	N	N	N	N	9
	B	10	N	N	N	N	N	N	N	N	N	N	N	8
	C	10	N	N	N	N	N	N	N	N	N	N	N	10
	D	10	N	N	N	N	N	N	N	N	N	N	N	8
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	9
	G	10	N	N	N	N	N	N	N	N	N	N	N	8
	H	10	N	N	N	N	N	N	N	N	N	N	N	10

Observation Codes: N – Normal, D – Number Amphipods Observed Dead, E – Number Amphipods Observed Emerged,
A – Number Amphipods Observed Avoiding Sediment, F – Number Amphipods Observed Floating on Surface

Table 4a. Daily Physical and Chemical Data – *Hyalella azteca*
PROJECT: Magna Metals Site
TEST: 10-Day Whole Sediment Toxicity Test
DATE: 16 through 26 April 2004

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-13 033004	Temperature	22.5	23.0	23.1	22.5	22.6	23.0	22.9	22.5	22.4	22.0
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	6.0	5.4	5.2	4.6	4.9	5.2	5.5	5.3	5.6	5.2
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.1	7.0	6.6	7.0	6.9	6.9	7.1	7.2	7.2	6.9
	Conductivity	254	270	257	251	266	264	264	273	269	296
	Ammonia	0.51									N/A
MM-SD-14 033004	Temperature	22.6	22.8	22.9	22.3	22.5	22.7	22.7	22.4	22.4	22.0
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.2	5.8	5.4	4.7	4.9	5.2	5.8	5.1	5.8	4.9
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.0	6.7	7.0	7.1	7.0	7.1	7.2	7.3	6.9
	Conductivity	254	258	252	248	263	265	265	269	266	290
	Ammonia	0.72									N/A
MM-SD-15 033004	Temperature	22.6	22.6	22.7	22.0	22.3	22.6	22.4	22.2	22.3	22.7
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.0	5.0	4.9	4.8	4.6	5.0	5.7	5.3	5.9	5.2
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.2	6.8	7.1	7.1	7.0	7.2	7.3	7.3	7.1
	Conductivity	254	297	272	258	272	272	270	280	283	290
	Ammonia	0.50									N/A
MM-SD-17 033104	Temperature	22.4	22.5	22.5	22.4	22.1	22.5	22.3	22.1	22.2	22.7
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.8	5.4	5.2	4.7	4.6	5.4	5.7	5.3	6.2	5.3
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.1	7.2	6.8	7.1	7.1	7.1	7.3	7.5	7.3	7.6
	Conductivity	254	276	258	252	267	268	269	283	264	337
	Ammonia	0.47									N/A
MM-SD-19A 033104	Temperature	22.6	22.8	22.9	22.4	22.4	22.8	22.6	22.5	22.4	22.1
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.6	6.8	5.3	5.0	5.1	5.7	5.9	5.5	6.1	5.6
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.1	6.8	7.0	7.0	6.9	7.1	7.2	7.2	7.0
	Conductivity	254	255	246	245	259	261	261	264	268	275
	Ammonia	0.33									N/A

N/D = Not Detected at the Reporting Detection Limit (RDL).
N/A = Results not available at the time of printing this report. Ammonia results for day 10 will be forwarded as soon as they become available.

Table 4a. Daily Physical and Chemical Data – *Hyalella azteca*
PROJECT: Magna Metals Site
TEST: 10-Day Whole Sediment Toxicity Test
DATE: 16 through 26 April 2004

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 14
MM-SD-21 040304	Temperature	22.5	22.7	22.7	22.3	22.2	22.7	22.6	22.3	22.3	22.1
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.4	5.8	5.5	4.7	5.4	5.5	5.6	5.0	5.8	4.6
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.0	6.8	7.0	7.0	7.0	7.1	7.3	7.3	7.3
	Conductivity	254	260	250	246	259	260	265	267	271	296
	Ammonia	0.43									N/A
MM-SD-23 040304	Temperature	22.3	22.6	22.7	22.1	22.2	22.5	22.5	22.2	22.2	22.3
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.3	5.1	5.2	4.5	5.0	4.9	5.2	4.5	6.2	4.7
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.1	6.8	7.0	7.0	6.9	7.1	7.1	7.3	7.0
	Conductivity	254	275	256	249	263	264	268	270	265	287
	Ammonia	0.44									N/A
Negative Control Sediment Spruce Run Reservoir	Temperature	22.5	22.5	22.5	22.0	22.2	22.4	22.6	22.2	22.4	22.3
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	6.1	6.2	5.9	5.3	5.8	6.0	6.1	6.2	6.4	6.4
	Initial pH	7.7	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.3	7.0	7.3	7.2	7.2	7.2	7.3	7.3	7.1
	Conductivity	254	249	242	246	259	259	262	265	268	273
	Ammonia	N/D									N/A

N/D = Not Detected at the Reporting Detection Limit (RDL).
N/A = Results not available at the time of printing this report. Ammonia results for day 10 will be forwarded as soon as they become available.

APPENDIX A

ORIGINAL DATA – Amphipod, *Hyalella azteca*

Aquatic Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

Hyalella azteca

DAILY OBSERVATION DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574HAC

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-13 033004	A	10	2	2	2	2	1	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-14 033004	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-15 033004	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-17 033104	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2

Observation Codes: N – Normal, # D – Number Amphipods Observed Dead, # A – Number Amphipods Observed Avoiding Sediment, # F – Number Amphipods Observed Floating on Surface

Date	4-16-04	4-17-04	4-18	4-19-04	4-20-04	4-21-04	4-22	4-23	4-24	4-25	4-26
Tech ID	RSH	GLB3	RSH	DT	DT	DT	RSH	RSH	RSH	GLB3	RSH
Renewal A.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Renewal P.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Reviewed By: _____

Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Hyalella azteca

DAILY OBSERVATION DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574HAC

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-19A 033104	A	10	N	N	N	N	N	N	N	N	N	N	N
	B	10	N	N	N	N	N	N	N	N	N	N	N
	C	10	N	N	N	N	N	N	N	N	N	N	N
	D	10	N	N	N	N	N	N	N	N	N	N	N
	E	10	N	N	N	N	N	N	N	N	N	N	N
	F	10	N	N	N	N	N	N	N	N	N	N	N
	G	10	N	N	N	N	N	N	N	N	N	N	N
	H	10	N	N	N	N	N	N	N	N	N	N	N
MM-SD-21 040304	A	10	N	N	N	N	N	N	N	N	N	N	N
	B	10	N	N	N	N	N	N	N	N	N	N	N
	C	10	N	N	N	N	N	N	N	N	N	N	N
	D	10	N	N	N	N	N	N	N	N	N	N	N
	E	10	N	N	N	N	N	N	N	N	N	N	N
	F	10	N	N	N	N	N	N	N	N	N	N	N
	G	10	N	N	N	N	N	N	N	N	N	N	N
	H	10	N	N	N	N	N	N	N	N	N	N	N
MM-SD-23 040304	A	10	N	N	N	N	N	N	N	N	N	N	N
	B	10	N	N	N	N	N	N	N	N	N	N	N
	C	10	N	N	N	N	N	N	N	N	N	N	N
	D	10	N	N	N	N	N	N	N	N	N	N	N
	E	10	N	N	N	N	N	N	N	N	N	N	N
	F	10	N	N	N	N	N	N	N	N	N	N	N
	G	10	N	N	N	N	N	N	N	N	N	N	N
	H	10	N	N	N	N	N	N	N	N	N	N	N
Negative Control Sediment	A	10	N	N	N	N	N	N	N	N	N	N	N
	B	10	N	N	N	N	N	N	N	N	N	N	N
	C	10	N	N	N	N	N	N	N	N	N	N	N
	D	10	N	N	N	N	N	N	N	N	N	N	N
	E	10	N	N	N	N	N	N	N	N	N	N	N
	F	10	N	N	N	N	N	N	N	N	N	N	N
	G	10	N	N	N	N	N	N	N	N	N	N	N
	H	10	N	N	N	N	N	N	N	N	N	N	N

Observation Codes: N – Normal, # D – Number Amphipods Observed Dead, # A – Number Amphipods Observed Avoiding Sediment, # F – Number Amphipods Observed Floating on Surface

Date	4-16-04	4-17-04	4-18	4-19-04	4-20-04	4-21-04	4-22	4-23	4-24	4-25	4-26
Tech ID	RSH	GWS	RSH	DK	DK	DK	RSH	RSH	RSH	GWS	RSH
Renewal A.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Renewal P.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Reviewed By: _____ Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *HYALELLA AZTECA*

Tare Date: 4-26-04 Tech ID: RJG
Start Dry Date/Time: 4-26 /2020 Tech ID: RJG
End Dry Date/Time: 4-27 /900 Tech ID: RJG
RJG

Dry Temp (°C): 98.2°C Dry Time: 12.4-hrs
Drying Oven ID: A OV-01 RJG
Balance ID: AB-01

Conc.	Rep	N_o	Survival # / %	Tare Weight (gm)	Total Dry Weight (gm)	Organism Dry Weight (gm)	Mean Organism Dry Weight (mg)
QA Blank A				0.79072	0.79069		
MM-SW-13 033004	A	10	5 /50	0.79049	0.79077		0.0380 560
	B	10	6 /60	0.78983	0.78999		0.0160 267
	C	10	6 /60	0.79934	0.79953		0.0190 317
	D	10	8 /80	0.79608	0.79631		0.0300 230 297 RJG
	E	10	8 /80	0.79558	0.79588		0.0300 375 RJG
	F	10	8 /80	0.78737	0.78767		0.0230 300 375 RJG
	G	10	5 /50	0.79675	0.79698		0.0230 460
	H	10	7 /70	0.79494	RJG ~~0.795~~ 0.79517		0.0230 329
MM-SW-14 033004	A	10	6 /60	0.80156	0.80193		0.0617
	B	10	3 /30	0.79957	0.79971		0.0467
QA Blank B				0.78805	0.78803		
MM-SW-14 033004	C	10	8 /80	0.80026	0.80069		0.0538
	D	10	7 /70	0.79788	0.79814		0.0371
	E	10	7 /70	0.80230	0.80249		0.0271
	F	10	8 /80	0.79716	0.79753		0.0463
	G	10	8 /80	0.79944	0.79982		0.0467
	H	10	7 /70	0.79915	0.79965		0.0714
MM-SW-15 033004	A	10	8 /80	0.79558	0.79572		0.0175
	B	10	3 /30	0.80109	0.80121		0.0400
	C	10	7 /70	0.79173	0.79203		0.0429
	D	10	4 /40	0.79811	0.79828		0.0425
QA Blank C				0.80209	0.80207		
MM-SW-15 033004	E	10	7 /70	0.78977	0.78992		0.0214
	F	10	9 /90	0.79136	0.79166		0.0333
	G	10	4 /40	0.80175	0.80187		0.0300
	H	10	7 /70	0.79802	0.79825		0.0329

Reviewed By: RJG Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574H
SPECIES: *HYALELLA AZTECA*

Tare Date: 4-26-04 Tech ID: RDS
Start Dry Date/Time: 4-26/2020 Tech ID: RDS
End Dry Date/Time: 4-27/900 Tech ID: RDS

Dry Temp (°C): 98.2°C Dry Time: 12-4-hrs
Drying Oven ID: OV-01
Balance ID: AB-01

Conc.	Rep	N_o	Survival # / %	Tare Weight (gm)	Total Dry Weight (gm)	Organism Dry Weight (gm)	Mean Organism Dry Weight (mg)
QA Blank A				0.80668	0.80670		
MM-SW-17 033104	A	10	9 /90	0.80443	0.80488		0.0500
	B	10	6 /60	0.79516	0.79556		0.0667
	C	10	8 /80	0.79340	0.79399		0.0738
	D	10	6 /60	0.79855	0.79899		0.0733
	E	10	3 /30	0.79887	0.79905		0.0600
	F	10	8 /80	0.79302	0.79337		0.0438
QA Blank D				0.79360	0.79361		
MM-SW-17 033104	G	10	8 /80	0.79336	0.79398		0.0775
	H	10	4 /40	0.80178	0.80201		0.0575
MM-SW-19A 033104	A	10	10 /100	0.79201	0.79291		0.0900
	B	10	9 /90	0.79582	0.79654		0.0800
	C	10	8 /80	0.79594	0.79660		0.0825
	D	10	6 /60	0.79611	0.79675		0.1067
	E	10	10 /100	0.79544	0.79668		0.1240
	F	10	8 /80	0.79290	0.79368		0.0975
	G	10	10 /100	0.80284	0.80353		0.0690
	H	10	9 /90	0.80068	0.80144		0.0844
QA Blank E				0.79256	0.79259		
MM-SW-21 040304	A	10	2 /20	0.78966	0.78972		0.0300
	B	10	8 /80	RDS 0.79987	0.80016		0.0362
	C	10	8 /80	0.78901	0.78935		0.0425
	D	10	8 /80	0.80074	0.80111		0.0463
	E	10	8 /80	0.79171	0.79205		0.0425
	F	10	5 /50	0.79283	0.79298		0.0300
	G	10	9 /90	0.79907	0.79942		0.0389
	H	10	8 /80	0.79512	0.79542		0.0375

Reviewed By: RDS Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *HYALELLA AZTECA*

Tare Date: 4-26-04 Tech ID: RJS
Start Dry Date/Time: 4-26 / 2020 Tech ID: RJS
End Dry Date/Time: 4-27 / 900 Tech ID: RJS

Dry Temp (°C): 98.2°C Dry Time: 12.4 hrs
Drying Oven ID: OV-01
Balance ID: AB-01

23 MM-SW-~~22~~ RJS 040304	A	10	5 /50	0.79249	0.79278	~~0.0580~~	0.0580
	B	10	4 /40	0.7891~~41~~ RJS	0.78947	~~0.0900~~	0.0900
QA Blank F				0.79341	0.79344		
MM-SW-23 040304	C	10	9 /90	0.80043	0.80074	~~0.0344~~	0.0344
	D	10	7 /70	0.80380	0.80443	~~0.0900~~	0.0900
	E	10	8 /80	0.79937	0.79989	~~0.0650~~	0.0650
	F	10	8 /80	0.78896	0.78970	~~0.0912~~	0.0925
	G	10	7 /70	0.79508	0.79567		0.0843
	H	10	6 /60	0.80110	0.80155		0.0750
Negative Control	A	10	9 /90	0.79855	0.79921		0.0733
	B	10	8 /80	0.80156	0.80228		0.0900
	C	10	10 /100	0.79449	0.79515		0.0660
	D	10	8 /80	0.79072	0.79125		0.0662
QA Blank G				0.79000	0.79004		
Negative Control	E	10	10 /100	0.80077	0.80133		0.0560
	F	10	9 /90	0.80074	0.80146		0.0800
	G	10	8 /80	0.80202	0.80263		0.0763
	H	10	10 /100	0.80275	0.80363		0.0880

Reviewed By: RJS Date: 4-28-04

rgz-c:msword/datasheets/wgtdata.hyalella/4-04

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Hyalella azteca

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574HAC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Date	4-16	4-17	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25
	Tech ID	RSH	[illegible]	RSH	DF	DF	DF	RSH	RSH	RSH	[illegible]
MM-SD-13 033004	Temperature	22.5	23.0	23.1	22.5	22.6	23.0	22.9	22.5	~~22.5~~ 22.4	22.0
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	6.0	5.4	5.2	4.6	4.9	5.2	5.5	5.3	5.6	5.2
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.1	7.02	6.6	7.0	6.9	6.9 RSH	7.1	7.2	7.2	6.9
	Conductivity	254	270	257	251	266	264	264	273	269	296
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-14 033004	Temperature	22.6	22.8	22.9	22.3	22.5	22.7	22.7	22.4	~~22.4~~ 22.4	22.0
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.2	5.8	5.4	4.7	4.9	5.2	5.8	RSH ~~7.25~~	5.8	4.9
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.0	6.7	7.0	7.1	7.0 RSH	7.1	7.2	7.3	6.9
	Conductivity	254	258	252	248	263	265	265	269	266	290
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-15 033004	Temperature	22.6	22.6	22.7	22.0	22.3	22.6	22.4	22.2	22.3	22.7
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.0	5.0	4.9	4.8	4.6	5.0	~~6.75~~ 7	5.3	5.9	5.2
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.2	6.8	7.1	7.1	7.0 RSH	7.17	7.27	7.3	7.1
	Conductivity	254	297	272	258	272	272	270	280	283	319
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										

Reviewed By: [signature]

Date: 4-28-04

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Hyalella azteca

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574HAC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Date	4-16	4-17	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25
	Tech ID	RSH	RSH	RSH	DF	DF	DF	RSH	RSH	RSH	RSH
MM-SD-17 033104	Temperature	22.4	22.5	22.5	22.4	22.1	22.5	22.3	22.1	22.2	22.7
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.8	5.4	5.2	4.7	4.6	5.4	5.7	5.3	6.2	5.3
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.1	7.2	6.8	7.1	7.1	7.09	7.3	7.5	7.3	7.6
	Conductivity	254	276	258	252	267	268	269	283	264	337
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-19A 033104	Temperature	22.6	22.8	22.9	22.4	22.4	22.8	22.6	22.5	22.4	22.1
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	5.6	5.8	5.3	5.0	5.1	5.7	5.9	5.5	6.1	5.6
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.1	6.8	7.0	7.0	6.9	7.1	7.2	7.2	7.0
	Conductivity	254	255	246	245	259	261	261	264	268	275
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-21 040304	Temperature	22.5	22.7	22.7	22.3	22.2	22.7	22.6	22.3	22.3	22.1
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.4	5.8	5.5	4.7	5.4	5.5	5.6	5.0	5.8	4.6
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.0	6.8	7.0	7.0	7.0	7.1	7.3	7.3	7.3
	Conductivity	254	260	250	246	259	260	265	267	271	296
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										

Reviewed By: _____

Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Hyalella azteca

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574HAC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
[redacted]	Date	4-16	4-17	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25
	Tech ID	RSH	[redacted]	RSH	DH	DH	DH	RSH	RSH	RSH	[redacted]
MM-SD-23 040304	Temperature	22.3	22.6	22.7	22.1	22.2	22.5	22.95 RSH	22.2	22.2	22.3
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	4.3	5.1	5.2	4.5	5.0	4.9	5.82 RSH	4.5	6.2	4.7
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	6.9	7.1	6.8	7.0	7.0	6.9	7.1	7.1	7.3	7.0
	Conductivity	254	275	256	249	263	264	268	270	265	287
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
Negative Control Sediment	Temperature	22.5	22.5	22.5	22.0	22.2	22.4	22.6	22.2	22.4	22.3
	Initial D.O.	8.4	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8
	Final D.O.	6.1	6.2	5.9	5.3	5.8	6.0	6.1	6.2 RSH	6.4	6.4
	Initial pH	7.66	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8
	Final pH	7.0	7.30	7.0	7.3	7.2	7.2	7.2	7.3	7.3	7.1 RSH
	Conductivity	254	249	242	246	259	259	262	265	268	273
	Salinity (ppt)	<1	<1	<-	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
	Temperature		~~8~~								
	Initial D.O.	8.4	~~7.8~~								
	Final D.O.										
	Initial pH	7.66	~~7.3~~								
	Final pH										
	Conductivity	254									
	Salinity (ppt)	<1									
	Ammonia										

Reviewed By: [signature]

Date: 4-28-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *HYALELLA AZTECA*

Alkalinity (mg/L $CaCO_3$)

Tech ID	RSH										
Date/Day	4-16 / 0		/		/		/		Tech ID:		
Titrant	0.02N HCl		0.02N HCl		0.02N HCl		0.02N HCl		Date:	4-28-04	
Concentration	Buret Reading	Alkalinity	Buret Reading	Alkalinity	Buret Reading	Alkalinity	Buret Reading	Alkalinity	n	Mean	s
Reconstituted Water	6.5	65							1	65	

Hardness (mg/L $CaCO_3$)

Tech ID	RSH										
Date/Day	4-16 / 0		/		/		/		Tech ID:		
Titrant	EDTA		EDTA		EDTA		EDTA		Date:	4-28-04	
Concentration	Buret Reading	Hard.	Buret Reading	Hard.	Buret Reading	Hard.	Buret Reading	Hard.	n	Mean	s
Reconstituted Water	4.1	82							1	82	

NOTES/COMMENTS

Day	Date	Tech ID	Notes/Comments
Day 0 / 1-hrs	4-16-04	RSH	None, fed 1.0mL YCTmix
Day 1 / 24-hrs	4-17-04	[illegible]	None, Fed 1.0 ml YCT
Day 2 / 48-hrs	4-18-04	RSH	fed 1.0mL YCT mix
Day 3 / 72-hrs	4-19-04	DH	none, fed 1.0-mL YCTmix (RSH)
Day 4 / 96-hrs	4-20-04	DH	none, fed 1.0 mL
Day 5 / 120-hrs	4-21-04	DH	none, " "
Day 6 / 144-hrs	4-22-04	RSH	None, fed 1.0mL YCTmix
Day 7 / 168-hrs	4-23-04	RSH	None, fed 1.0mL YCTmix
Day 8 / 192-hrs	4-24-04	RSH	None, fed 1.0mL YCTmix
Day 9 / 216-hrs	4-25-04	[illegible]	None, fed 1.0mL YCT
Day 10 / 240-hrs	4-26-04	RSH	None

Reviewed By: [signature] Date: 4-28-04

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APPENDIX B

STATISTICAL ANALYSES – Amphipod, *Hyalella azteca*

Amphipod Growth and Survival Test-10 Day Survival

Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

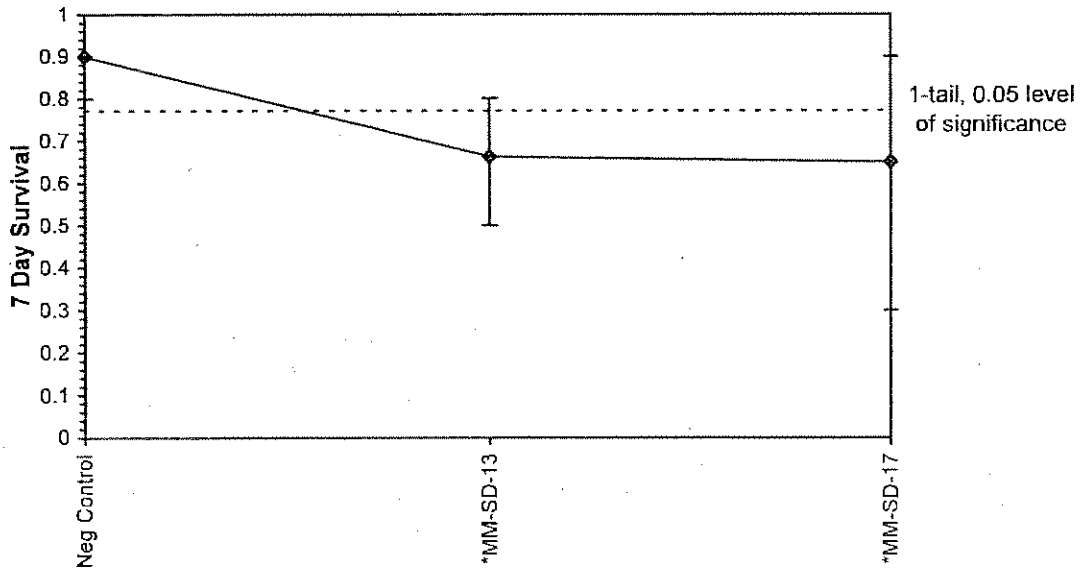
Conc-	1	2	3	4	5	6	7	8
Neg Control	0.9000	0.8000	1.0000	0.8000	1.0000	0.9000	0.8000	1.0000
MM-SD-13	0.5000	0.6000	0.6000	0.8000	0.8000	0.8000	0.5000	0.7000
MM-SD-17	0.9000	0.6000	0.8000	0.6000	0.3000	0.8000	0.8000	0.4000

			Transform: Arcsin Square Root					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Neg Control	0.9000	1.0000	1.2569	1.1071	1.4120	11.234	8			
*MM-SD-13	0.6625	0.7361	0.9569	0.7854	1.1071	14.659	8	3.393	2.024	0.1790
*MM-SD-17	0.6500	0.7222	0.9509	0.5796	1.2490	24.478	8	3.462	2.024	0.1790

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92312	0.884	-0.3157	-0.6428
Bartlett's Test indicates equal variances (p = 0.30)	2.38896	9.21035		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences	0.12852	0.14206	0.24496	0.03126	0.00287	2, 21

Dose-Response Plot



Amphipod Growth and Survival Test-10 Day Growth

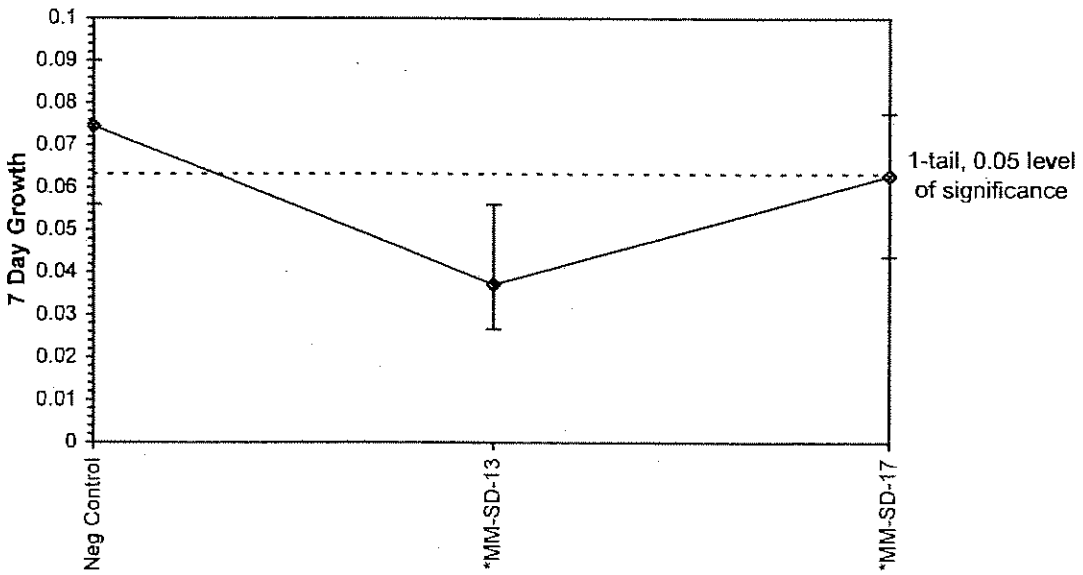
Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
Neg Control	0.0733	0.0900	0.0660	0.0662	0.0560	0.0800	0.0763	0.0880
MM-SD-13	0.0560	0.0267	0.0317	0.0287	0.0375	0.0375	0.0460	0.0329
MM-SD-17	0.0500	0.0667	0.0738	0.0733	0.0600	0.0438	0.0775	0.0575

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Neg Control	0.0745	1.0000	0.0745	0.0560	0.0900	15.557	8			
*MM-SD-13	0.0371	0.4984	0.0371	0.0267	0.0560	26.217	8	6.681	2.024	0.0113
*MM-SD-17	0.0628	0.8434	0.0628	0.0438	0.0775	19.261	8	2.086	2.024	0.0113

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96998		0.884		0.03376	-0.824
Bartlett's Test indicates equal variances (p = 0.85)	0.33544		9.21035			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates significant differences	0.01132	0.152	0.00292	0.00013	4.6E-06	2, 21

Dose-Response Plot



Amphipod Growth and Survival Test-10 Day Survival

Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

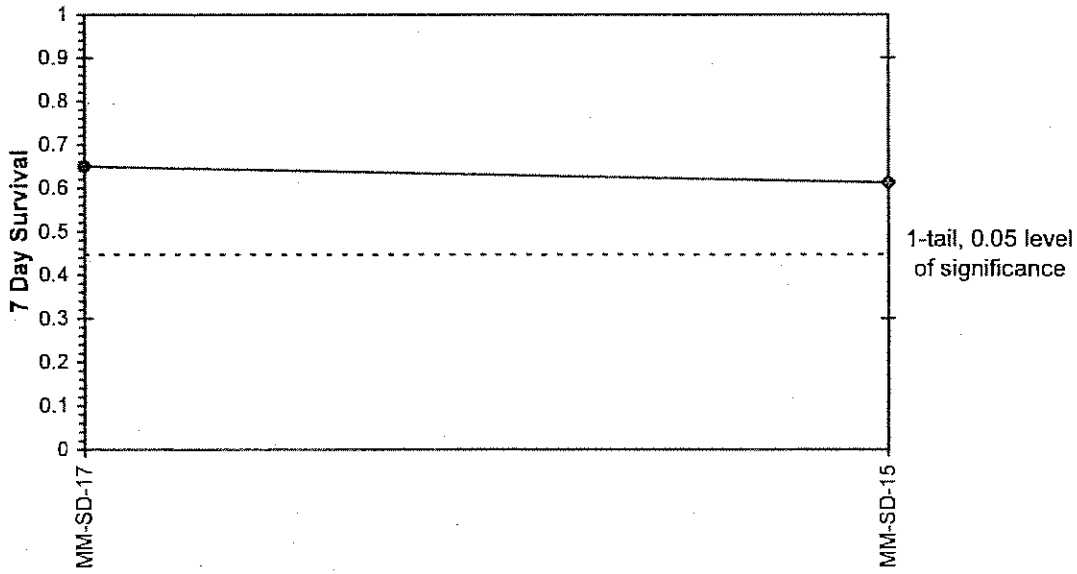
Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.9000	0.6000	0.8000	0.6000	0.3000	0.8000	0.8000	0.4000
MM-SD-15	0.8000	0.3000	0.7000	0.4000	0.7000	0.9000	0.4000	0.7000

			Transform: Arcsin Square Root					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-17	0.6500	1.0000	0.9509	0.5796	1.2490	24.478	8			
MM-SD-15	0.6125	0.9423	0.9098	0.5796	1.2490	25.750	8	0.351	1.761	0.2057

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9304	0.844	-0.286	-1.1837
F-Test indicates equal variances (p = 0.99)	1.01318	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.2026	0.30583	0.00673	0.05453	0.7305	1, 14

Dose-Response Plot



Amphipod Growth and Survival Test-10 Day Growth

Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

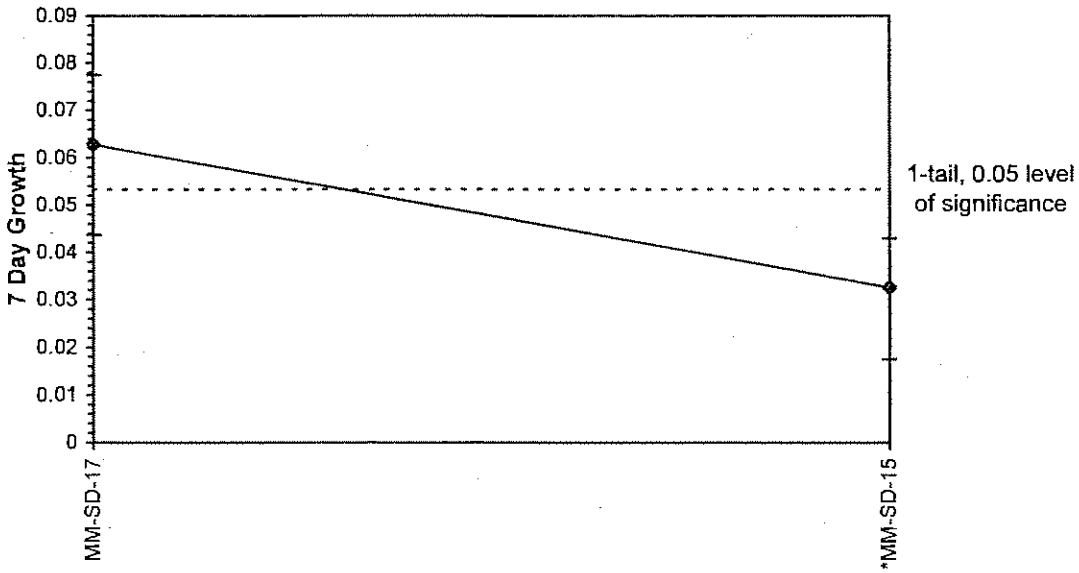
Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.0500	0.0667	0.0738	0.0733	0.0600	0.0438	0.0775	0.0575
MM-SD-15	0.0175	0.0400	0.0429	0.0425	0.0214	0.0333	0.0300	0.0329

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-17	0.0628	1.0000	0.0628	0.0438	0.0775	19.261	8			
*MM-SD-15	0.0326	0.5184	0.0326	0.0175	0.0429	28.861	8	5.586	1.761	0.0095

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93933	0.844	-0.3875	-1.0166
F-Test indicates equal variances (p = 0.52)	1.6575	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.00954	0.15187	0.00366	0.00012	6.7E-05	1, 14

Dose-Response Plot



Amphipod Growth and Survival Test-10 Day Biomass

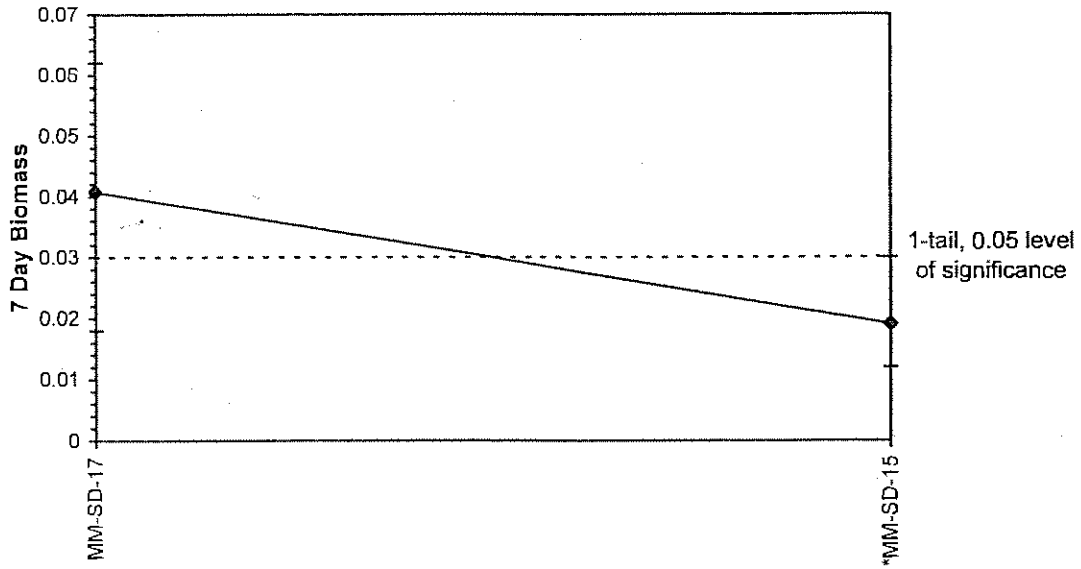
Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.0450	0.0400	0.0590	0.0440	0.0180	0.0350	0.0620	0.0230
MM-SD-15	0.0140	0.0120	0.0300	0.0170	0.0150	0.0300	0.0120	0.0230

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-17	0.0408	1.0000	0.0408	0.0180	0.0620	38.011	8			
*MM-SD-15	0.0191	0.4693	0.0191	0.0120	0.0300	39.569	8	3.548	1.761	0.0107

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97054		0.844		-0.0037	0.00951
F-Test indicates equal variances (p = 0.08)	4.18959		8.88531			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences	0.01074	0.26344	0.00187	0.00015	0.00321	1, 14

Dose-Response Plot



Amphipod Growth and Survival Test-10 Day Survival

Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-13	0.5000	0.6000	0.6000	0.8000	0.8000	0.8000	0.5000	0.7000
MM-SD-14	0.6000	0.3000	0.8000	0.7000	0.7000	0.8000	0.8000	0.7000
MM-SD-19A	1.0000	0.9000	0.8000	0.6000	1.0000	0.8000	1.0000	0.9000
MM-SD-21	0.2000	0.8000	0.8000	0.8000	0.8000	0.5000	0.9000	0.8000
MM-SD-23	0.5000	0.4000	0.9000	0.7000	0.8000	0.8000	0.7000	0.6000

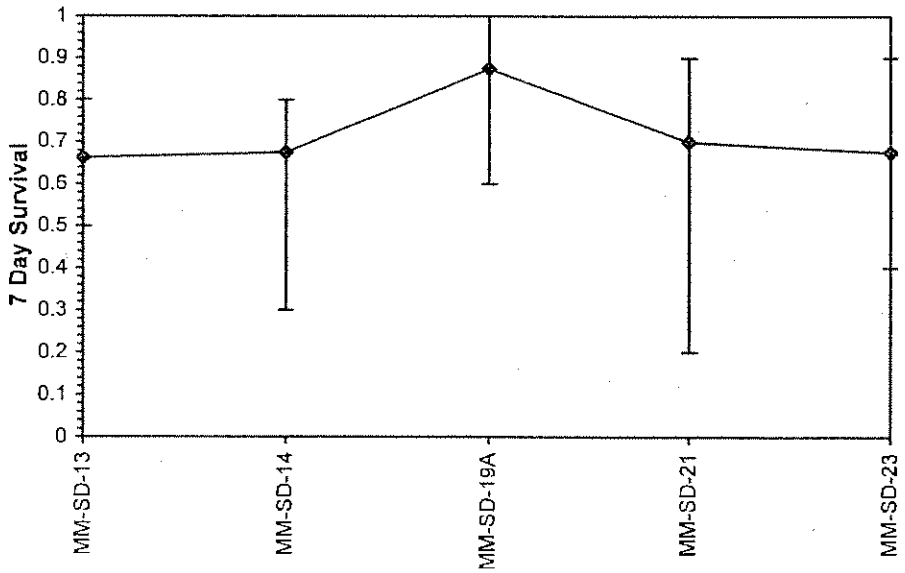
			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MM-SD-13	0.6625	1.0000	0.9569	0.7854	1.1071	14.659	8		
MM-SD-14	0.6750	1.0189	0.9701	0.5796	1.1071	18.158	8	72.00	47.00
MM-SD-19A	0.8750	1.3208	1.2293	0.8861	1.4120	15.329	8	92.00	47.00
MM-SD-21	0.7000	1.0566	1.0042	0.4636	1.2490	25.332	8	77.50	47.00
MM-SD-23	0.6750	1.0189	0.9752	0.6847	1.2490	18.934	8	70.00	47.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.91574	0.919	-1.0436	0.87323
Bartlett's Test indicates equal variances (p = 0.65)	2.46273	13.2767		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates no significant differences

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Growth

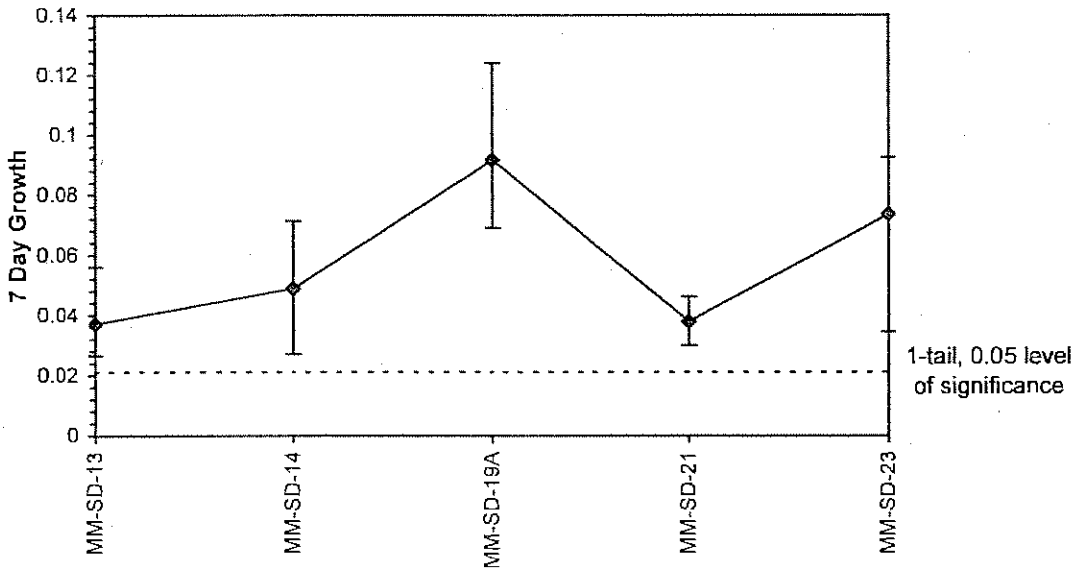
Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-13	0.0560	0.0267	0.0317	0.0287	0.0375	0.0375	0.0460	0.0329
MM-SD-14	0.0617	0.0467	0.0538	0.0371	0.0271	0.0463	0.0475	0.0714
MM-SD-19A	0.0900	0.0800	0.0825	0.1067	0.1240	0.0975	0.0690	0.0844
MM-SD-21	0.0300	0.0362	0.0425	0.0463	0.0425	0.0300	0.0389	0.0375
MM-SD-23	0.0580	0.0900	0.0344	0.0900	0.0650	0.0925	0.0843	0.0750

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-13	0.0371	1.0000	0.0371	0.0267	0.0560	26.217	8			
MM-SD-14	0.0489	1.3186	0.0489	0.0271	0.0714	28.053	8	-1.652	2.239	0.0160
MM-SD-19A	0.0918	2.4723	0.0918	0.0690	0.1240	18.845	8	-7.632	2.239	0.0160
MM-SD-21	0.0380	1.0234	0.0380	0.0300	0.0463	15.436	8	-0.121	2.239	0.0160
MM-SD-23	0.0737	1.9843	0.0737	0.0344	0.0925	27.452	8	-5.103	2.239	0.0160

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98367		0.919		-0.206	1.02058
Bartlett's Test indicates equal variances (p = 0.03)	10.4362		13.2767			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates no significant differences	0.01603	0.43185	0.00461	0.00021	2.9E-09	4, 35

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

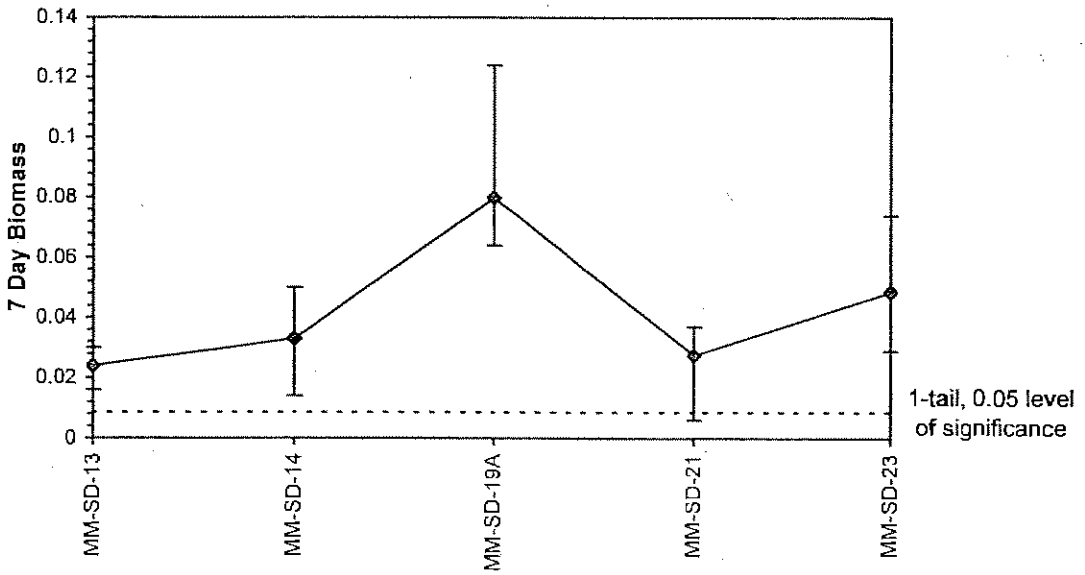
Start Date:	4/16/2004	Test ID:	574HaC	Sample ID:	Magna Metals Site
End Date:	4/26/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPASED 99-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-13	0.0280	0.0160	0.0190	0.0230	0.0300	0.0300	0.0230	0.0230
MM-SD-14	0.0370	0.0140	0.0430	0.0260	0.0190	0.0370	0.0380	0.0500
MM-SD-19A	0.0900	0.0720	0.0660	0.0640	0.1240	0.0780	0.0690	0.0760
MM-SD-21	0.0060	0.0290	0.0340	0.0370	0.0340	0.0150	0.0350	0.0300
MM-SD-23	0.0290	0.0360	0.0310	0.0630	0.0520	0.0740	0.0590	0.0450

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-13	0.0240	1.0000	0.0240	0.0160	0.0300	21.129	8			
MM-SD-14	0.0330	1.3750	0.0330	0.0140	0.0500	37.149	8	-1.309	2.239	0.0154
MM-SD-19A	0.0799	3.3281	0.0799	0.0640	0.1240	24.555	8	-8.125	2.239	0.0154
MM-SD-21	0.0275	1.1458	0.0275	0.0060	0.0370	40.259	8	-0.509	2.239	0.0154
MM-SD-23	0.0486	2.0260	0.0486	0.0290	0.0740	33.323	8	-3.581	2.239	0.0154

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94454		0.919		0.85224	2.13641
Bartlett's Test indicates equal variances (p = 0.03)	10.7395		13.2767			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates no significant differences	0.01539	0.64143	0.00418	0.00019	3.6E-09	4, 35

Dose-Response Plot



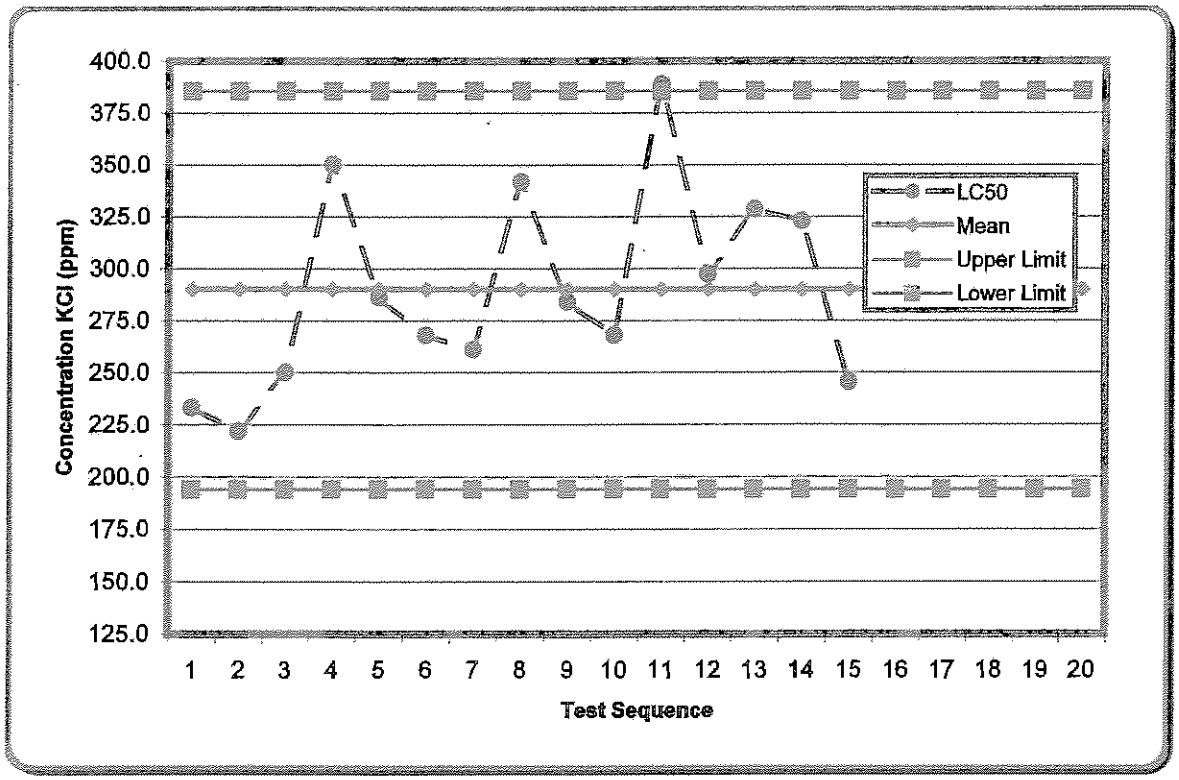
APPENDIX C

QA/QC – Acute Control Chart

Aquatic Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing
***Hyalella azteca* 96-Hour Acute Test**
April-04

Date	Test Sequence	LC_{50}	Mean	Upper Limit	Lower Limit	Biological Effect
9/5/01	1	233.3	289.9	385.6	194.2	Survival
9/5/01	2	221.9	289.9	385.6	194.2	Survival
9/5/01	3	250.0	289.9	385.6	194.2	Survival
9/5/01	4	350.2	289.9	385.6	194.2	Survival
9/5/01	5	286.2	289.9	385.6	194.2	Survival
11/1/01	6	267.9	289.9	385.6	194.2	Survival
2/5/02	7	261.1	289.9	385.6	194.2	Survival
10/10/02	8	342.0	289.9	385.6	194.2	Survival
10/15/02	9	284.1	289.9	385.6	194.2	Survival
1/6/03	10	267.9	289.9	385.6	194.2	Survival
4/4/03	11	389.0	289.9	385.6	194.2	Survival
9/5/03	12	297.3	289.9	385.6	194.2	Survival
9/26/03	13	328.7	289.9	385.6	194.2	Survival
10/1/03	14	323.0	289.9	385.6	194.2	Survival
4/16/04	15	245.5	289.9	385.6	194.2	Survival
	16		289.9	385.6	194.2	Survival
	17		289.9	385.6	194.2	Survival
	18		289.9	385.6	194.2	Survival
	19		289.9	385.6	194.2	Survival
	20		289.9	385.6	194.2	Survival
		%C.V. =	14.46			

Toxicant: *Potassium chloride*



AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

96-Hour Acute Bioassay

Potassium Chloride Standard Reference Toxicant Test
Test Species: *Hyalella azteca*
Organism Age: 8-days
Organism Source: Aquatic Research Organisms

Study No.: 0464HaA
Dilution Water Source: EPA Moderately Hard Water
Test Start Date/Time: 4-16-04 / 1630
Test End Date/Time: 4-20-04 / 1750

Conc.	Rep.	Number of Live Organisms 0-hr	24-hr	48-hr	72-hr	96-hr
Control	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	1	1
	G	1	1	1	1	1
	H	1	1	1	1	0
	I	1	1	1	1	1
	J	1	1	1	1	1
62.5 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	1	1
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1
125 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	1	1
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	0			

Conc.	Rep.	Number of Live Organisms 0-hr	24-hr	48-hr	72-hr	96-hr
250 ppm	A	1	1	1	0	
	B	1	0			
	C	1	1	1	1	1
	D	1	1	0		
	E	1	1	1	1	1
	F	1	0			
	G	1	1	0		
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1
500 ppm	A	1	0			
	B	1	0			
	C	1	1	0		
	D	1	0			
	E	1	0			
	F	1	1	0		
	G	1	0			
	H	1	0			
	I	1	1	0		
	J	1	0			
1000 ppm	A	1	0			
	B	1	0			
	C	1	0			
	D	1	0			
	E	1	0			
	F	1	0			
	G	1	0			
	H	1	0			
	I	1	0			
	J	1	0			

Conc. ppm	Temperature °C 0-hr	24-hr	48-hr	72-hr	96-hr	Dissolved Oxygen (mg/L) 0-hr	96-hr	pH (Standard Units) 0-hr	96-hr	Conductivity (µmhos/cm) 0-hr	96-hr
Control	23.0	22.6	22.9	22.6	22.5	8.0	8.2	7.50	7.36	276	283
62.5	23.0	22.7	22.8	22.8	22.8	7.6	8.1	7.61	7.42	377	384
125	23.0	22.5	23.0	22.8	22.6	7.4	7.9	7.61	7.52	474 ~~665~~	486
250	23.0	22.5	22.8	22.6	22.6	7.8	7.9	7.63	7.63	665 ~~1047~~	681
500	23.0	22.6	22.9	22.5	22.7	7.9	7.7	7.71	7.79	1047 ~~1782~~	1063
1000	23.0	22.6				7.8	7.9	7.75	7.81	1782	1798

Date	4-16	4-17	4-18	4-19	4-20
Time	1630	1650	1710	1615	1750
Tech ID	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Page 1 of 1

Reviewed By: [signature]

Date: 4-26-04

rgz-c:msword/datasheets/acute.ha/4-04

Acute Fish Test-96 Hr Survival

Start Date:	4/16/2004	Test ID:	575HaA	Sample ID:	REF-Ref Toxicant
End Date:	4/20/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	HA-Hyalella azteca
Comments:					

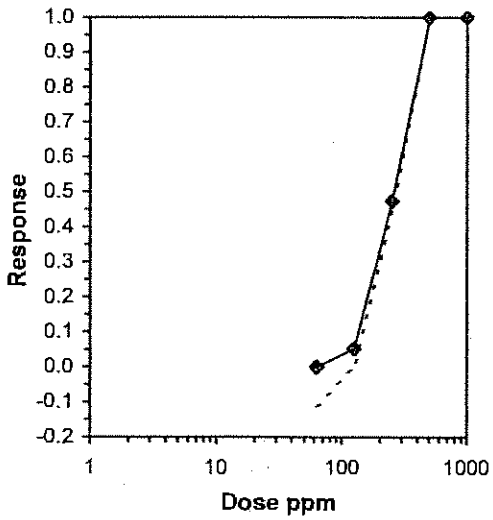
Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
62.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
125	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
250	0.0000	0.0000	1.0000	0.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000
500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
MHRW-Control	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	1	10
62.5	1.0000	1.1111	1.0472	1.0472	1.0472	0.000	10	0	10
125	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	1	10
250	0.5000	0.5556	0.7854	0.5236	1.0472	35.136	10	5	10
500	0.0000	0.0000	0.5236	0.5236	0.5236	0.000	10	10	10
1000	0.0000	0.0000	0.5236	0.5236	0.5236	0.000	10	10	10

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.79486	0.919	-1.0616	1.52512
Equality of variance cannot be confirmed				

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	245.48	193.14	312.00
5.0%	250.45	195.17	321.37
10.0%	251.49	191.09	330.98
20.0%	253.55	176.46	364.32
Auto-0.0%	245.48	193.14	312.00



APPENDIX D

Organism Receipt/Holding Logs



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: Hyalella azteca

Source: Lab reared ✓ Hatchery reared ____ Field collected ____

Hatch date 4-8-04 Receipt date ____

Lot number 040804HA Strain ____

Brood Origination USF+WS MO

II. Water Quality

Temperature 23 °C Salinity <1 ppt DO 7.8

pH 7.2 Hardness ≈180 ppm

III. Culture Conditions

System: Static Renewal

Diet: Flake Food ✓ Phytoplankton ____ Trout Chow ✓

Brine Shrimp ____ Rotifers ____ Other ____

Prophylactic Treatments: ____

Comments: ____

IV. Shipping Information

Client: Aquatic Laboratory Services # of Organisms: 1000+

Carrier: FEA X Date Shipped: 4-15-04

Biologist: Mark Rosengvist

1 - 800 - 927 - 1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC TOXICOLOGY ORGANISM RECEIPT LOG

Species: *Hyalella azteca*

Receipt Date: 4-16-04 Receiving Tech ID: RSH

Source: ~~AquaTox, Inc~~ 003 Aquatic Research Org.

Requisition/PO #: N/A

Number Ordered: 1000+ Number Received: 1000+

Number Dead Upon Receipt: No Significant

Organism Age Upon Receipt: 8 days

Temperature: 20.6 °C

Dissolved Oxygen: 8.1

pH: 7.12

Conductivity: 883

Condition Upon Receipt:

✓ Apparent Good Condition

____ Poor Condition (explain actions taken):

_____

_____

_____

attach organism history data sheet

****

Reviewed By: [signature] Date: 4-17-04

rgz-c:msword//datasheets/organismreceiptlog.mysid/4-04

APPENDIX E

Certificate of Analyses
Ammonia-nitrogen, Total

ANALYTICAL LABORATORY SERVICES, INC.

www.analyticallab.com
NELAP Accredited
PA 22-293
NJ PA010 NY 11759

ACCREDITED IN ACCORDANCE WITH nelac

34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID#: 263926

Project Name: **Routine Sample Submission**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

ALSI is a NELAC accredited laboratory. ALSI certifies that all applicable test results meet the requirements of NELAC. For an inventory of our NELAC accreditations and Scope of Work please visit our website at www.analyticallab.com or contact your Project Manager at (717)944-5541 for a complete listing.

If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager

ANALYTICAL LABORATORY SERVICES, INC.

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NJ PA010 NY 11759

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-14

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926001
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 HAC Day 14 SD-13**
Matrix: Water
Date Collected: 04/26/04 07:30
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.33	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

his report relates only to the sample as received by the laboratory, and may only be
eproduced in full.

Raymond J. Martrano
Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926002
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: 0574 HAC Day 14 SD-14
Date Collected: 04/26/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.25	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-14

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926003
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 HAC Day 14 SD-15
Matrix: Water
Date Collected: 04/26/04 07:30
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.35	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263926004**
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 HAC Day 14 SD-17**
Matrix: Water
Date Collected: 04/26/04 07:30
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.68	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926005
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 HAC Day 14 SD-19A
Date Collected: 04/26/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.58	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

his report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

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NJ PA010 NY 11759

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926006
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 HAC Day 14 SD-21**
Date Collected: 04/26/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.26	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

ANALYTICAL LABORATORY SERVICES, INC.

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PA 22-293
NJ PA010 NY 11759

ACCREDITED IN ACCORDANCE WITH nelac

34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-14

Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263926007
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 HAC Day 14 SD-23**
Matrix: Water
Date Collected: 04/26/04 07:30
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.44	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

his report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 20, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263926008**
Received: 04/29/04 22:00
Discard: 06/03/04

Project Name: **Routine Sample Submission**
PO#:

Sample ID: **0574 HAC Day 14 NC**
Matrix: Water
Date Collected: 04/26/04 07:30
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.16	mg/L	0.10	EPA 350.3	05/14/04 08:00	05/14/04	MBR

his report relates only to the sample as received by the laboratory, and may only be eproduced in full.

Raymond J. Martrano
Laboratory Manager

Cooler # 3345

ANALYTICAL LABORATORY SERVICES, INC.
Environmental + Industrial Hygiene + Field Services
34 Dogwood Lane Middletown, PA 17057 717.944.5541 Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT. INSTRUCTIONS ON THE BACK.

COC #: 003920

ALSI Quote #:

Client Name: Aquatic Laboratory Services
Address: 3460 Schuylkill Rd. Spring City, PA 19475
Contact: Roger Zirk
Phone #: (610) 792-1828
Project Name/#: Magna metals
Bill to:
TAT: Normal- ☐ Standard TAT is 10-12 calendar days.
Rush- ☐ Rush TAT subject to ALSI approval and surcharges.
Date Required: _____ Approved by: _____
E-mail? Y- ☐ _____
Fax Results? Y- ☐ No.: _____

SAMPLE DESCRIPTION/LOCATION (as it will appear on the lab report)	Sample Date	Time	*G or C	**MATRIX	Container Type	Preservative Type	# of Containers									
					500mL											
					H_2SO_4											
					1											
					ANALYSES/METHOD REQUESTED											
105-74 Hac Day 14 SD-13	4-26-04	0730			✓											
2 " " SD-14	"	"			✓											
3 " " SD-15	"	"			✓											
4 " " SD-17	"	"			✓											
5 " " SD-19A	"	"			✓											
6 " " SD-21	"	"			✓											
7 " " SD-23	"	"			✓											
8 " " NC	"	"			✓											
9																
10																

RECEIVING INFORMATION (completed by the Receiving Lab)
COOLER TEMP.: 4°C SEAL INTACT? Y or N
SHIPPING CARRIER/NO. _____

PROJECT INFORMATION
DATA DELIVERABLES: Standard-☐ CLP-like-☐ USACE-☐ Other-☐
EDDS: Format Type- _____
REPORTABLE TO PADEP? ☐ If yes, PWSID NO.(7-digit no.): _____
STATE WHERE SAMPLES COLLECTED: NC-☐ NJ-☐ NY-☐ PA-☐ USACE-☐ Navy-☐ Other- _____
SAMPLE DISPOSAL: SPECIAL-☐ LAB-☐ (disposed 2 weeks after completion)

Sample Comments

Print Name and Company	Signature	Date/Time	
Sampled by: R Hill	Rebecca Hill	4-29-04 ~~4-26-04~~	1130 ~~0730~~
Received for ALSI Custody by: Chad Ransom	Chad Ransom	4-29-04	14:30
Relinquished by: Chad Ransom	Chad Ransom	4-29-04	
Received by: D. Blouch AIST		4-29-04	1735
Relinquished by:		4-29-04	2200
Received by: MRH		4-29-04	2200

PROJECT COMMENTS:
Ammonia Analysis 4/30/04
4/30/04

ALSI FIELD SERVICES: Pickup-☐ Composite Sampling-☐ Labor-☐ Rental Equipment-☐ Other-

*G=Grab; C=Composite **Matrix – S=Solid; WW=Wastewater; D=Drinking Water; A=Air; GW=Groundwater; LW=Liquid Waste; O=Oil; WP=Wipe; P=Paint

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Rev 12/02

ANALYTICAL LABORATORY SERVICES, INC.

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID#: 263408

Project Name: **Routine Sample Submission**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

ALSI is a NELAC accredited laboratory. ALSI certifies that all applicable test results meet the requirements of NELAC. For an inventory of our NELAC accreditations and Scope of Work please visit our website at www.analyticallab.com or contact your Project Manager at (717)944-5541 for a complete listing.

If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager

ANALYTICAL LABORATORY SERVICES, INC.

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408001**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl SD-13**
Matrix: Water
Date Collected: 04/18/04 13:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.51	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

nis report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408002**
Received: 04/23/04 15:11
Discard: 05/21/04

PO#:

Project Name: **Routine Sample Submission**

Sample ID: **0574 Hac Dayl SD-14**
Date Collected: 04/18/04 13:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.72	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408003**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl SD-15**
Matrix: Water
Date Collected: 04/18/04 13:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.50	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408004**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl SD-17**
Matrix: Water
Date Collected: 04/18/04 13:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.47	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408005**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl SD-19A**
Matrix: Water
Date Collected: 04/18/04 13:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.33	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263408006
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Day1 SD-21**
Date Collected: 04/18/04 13:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.43	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

his report relates only to the sample as received by the laboratory, and may only be eproduced in full.

Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408007**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl SD-23**
Date Collected: 04/18/04 13:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.44	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

his report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263408008**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 Hac Dayl NC**
Matrix: Water
Date Collected: 04/18/04 13:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	ND	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

APPENDIX F

Chain-Of-Custody Forms

ANALYTICAL LABORATORY SERVICES, INC.
Environmental ✦ Industrial Hygiene ✦ Field Services

34 Dogwood Lane Middletown, PA 17057 717.944.5541 Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT. INSTRUCTIONS ON THE BACK.

COC #: 2634

ALSI Quote #:

Client Name: Aquatic Laboratory Services
Address: 3450 Schuylkill Rd. Spring City, PA 19475
Contact: Roger Zirk
Phone #: (610-792-~~8182~~ 1828
Project Name/#: Maana metals
Bill to: Roger Zirk
TAT: Normal- ☐ Standard TAT is 10-12 calendar days.
Rush- ☐ Rush TAT subject to ALSI approval and surcharges.
Date Required: _____ Approved by: _____
E-mail? Y- ☐ _____
Fax Results? Y- ☐ No.: _____

SAMPLE DESCRIPTION/LOCATION (as it will appear on the lab report)	Sample Date	Time	*G or C	**MATRIX	Container Type	Preservative Type	# of Containers	ANALYSES/METHOD REQUESTED: Ammonia
					500mL	H_2SO_4	1	
1 0574 Hac Day1 SD-13	4-18-04	1300						✓
2 " SD-14	"	"						✓
3 " SD-15	"	"						✓
4 " SD-17	"	"						✓
5 " SD-19A	"	"						✓
6 " SD-21	"	"						✓
7 " SD-23	"	"						✓
8 " NC	"	"						✓
9								
10								

RECEIVING INFORMATION (completed by the Receiving Lab)
COOLER TEMP.: 4 SEAL INTACT? Y or N
SHIPPING CARRIER/NO. _____

PROJECT INFORMATION
DATA DELIVERABLES: Standard- ☐
CLP-like- ☐ USACE- ☐ Other- ☐
EDDS: Format Type- _____
REPORTABLE TO PADEP? ☐ If yes,
PWSID NO.(7-digit no.): _____
STATE WHERE SAMPLES COLLECTED:
NC- ☐ NJ- ☐ NY- ☐ PA- ☐
USACE- ☐ Navy- ☐ Other- _____
SAMPLE DISPOSAL: SPECIAL- ☐
LAB- ☐ (disposed 2 weeks after completion)

Sample Comments

4-23-04 1150

TG 4/26/04

	Print Name and Company	Signature	Date/Time
Sampled by:	R. Hill		
Received for ALSI Custody by:			
Relinquished by:	R Hill	Rebecca Hill	4-23-04 1310
Received by:	BG/Shuler ALSI	BG Shuler	4-23-04 1310
Relinquished by:	BG/Shuler ALSI	BG Shuler	4-23-04 1511
Received by:			4/23/04 1511

PROJECT COMMENTS:
Ammonia analysis

ALSI FIELD SERVICES: Pickup- ☐ Composite Sampling- ☐ Labor- ☐
Rental Equipment- ☐ Other-

*G=Grab; C=Composite **Matrix – S=Solid; WW=Wastewater; D=Drinking Water; WT=Water; A=Air; GW=Groundwater; LW=Liquid Waste; O=Oil; WP=Wipe; P=Paint

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Rev 12/02

CHAIN OF CUSTODY

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

3450 Schuylkill Road
Spring City, PA 19475
Phone 610-792-1828 • Fax 610-792-1829

Client: TETRA TECH . INC
Address: 1000 AMERICAN RD
MORRIS PLAINS, NJ 07052
Phone: 973.630.8530
Samplers: GKM + K MILLET
Project No.: 1175.0003.00000

Client Contact: JOHN SHAFFER

Sample Disposal	Return To Client	[ ]
	Disposal by Lab	[X]

No. Container			1									
Container Size			1 gal									

SAMPLE INFORMATION | **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elutriate	Bioaccumulation	Product Efficacy	Other	Other	Other
		mm-SD13-033004	SE	3-30-04	1100		X							
		mm-SD14-033004	↓	↓	0930		↓							
		mm-SD15-033004	↓	↓	1615		↓							
		mm-SD17-033104	↓	3-31-04	1225		↓							
				AM	3-31-04									

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished by:	Print Name	Received by:	Print Name	Date:	Time:
		Rebecca Stitt	Rebecca Stitt	4-1-04	1400

Special Instructions: *All samples tested w/ Hyalella azteca & Chironomus tentans as per the contract.
2 COOLERS !!!

Matrix Codes:

S	-	soil	GW	-	ground water
SE	-	sediment	ST	-	stormwater
SL	-	sludge	PW	-	processed water
O	-	oil	DW	-	dilution water
WW	-	waste water	RW	-	receiving water
SW	-	surface water	X	-	other

ALSI Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer pack Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - B-H Labs Yellow Copy - Client

AQUATIC LABORATORY SERVICES, INC.

Aquatic and Terrestrial Toxicity Testing

3450 Schuylkill Road
Spring City, PA 19475
Phone 610-792-1828 • Fax 610-792-1829

Client: TETRA TECH, W, INC
Address: 1000 THE AMERICAN RD
MORRIS PLAINS NJ
Phone: 973.630 8530
Samplers: G. KIM + J K MILLET
Project No.: 1173.0003.0000.00000

Client Contact: JOHN SCHAFFER

Sample Disposal - **Return To Client** [ ] **Disposal by Lab** [X]

No. Container							2							
Container Size							igal							

SAMPLE INFORMATION / **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
		MM-SD19-033104	SE	03-31-04	1000/ ~~1723~~		X ← Hyalella azteca + chironomus tentans							
		MM-SD19A-033104	↓	↓	1723		X							

gm 3-31-04

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished by:	Print Name	Received by:	Print Name	Date:	Time:
		Rebecca Sithill	Rebecca Sithill	4-2-04	1035

Special Instructions:

(A) collected SD19 twice - pls composite before analysis.
(A) PLS. CALL JOHN SCHAFFER 973.630.8530 before you
one is MMSD19-033104, the other is MMSD19A-033104 analyze!!!

Matrix Codes:

S	-	soil	GW	-	ground water
SE	-	sediment	ST	-	stormwater
SL	-	sludge	PW	-	processed water
O	-	oil	DW	-	dilution water
WW	-	waste water	RW	-	receiving water
SW	-	surface water	X	-	other

ALSI Use Only

Samples Were:
1. Shipped or hand delivered — Notes:
2. Chilled or ambient — Notes:
3. Received broken / leaking — Yes No
4. Received within holding times — Yes No
5. Discrepancies between sample labels and COC record? — Yes No

COC Tape Was:
1. Present on outer package — Yes No
2. Unbroken on outer package — Yes No
3. Present on sample — Yes No
4. Unbroken on sample — Yes No

White Copy - B-H Labs Yellow Copy - Client

CHAIN OF CUSTODY

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

Client: TETRA TECH-FW
Address: 1000 THE AMERICAN RD
MORRIS PLAINS, NJ
Phone: 973.630.8530
Samplers: G. KIM + K. MILLET
Project No.: 1172.0003.0000.00000

Client Contact: JOHN SCHAFFER

Sample	**Return To Client**	[ ]
Disposal	**Disposal by Lab**	[X]

No. Container						1 each								
Container Size						2 gal								

SAMPLE INFORMATION / **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
		MM-SD21-040304	SE	04-3-04	1105		X	Hyalella azteca + chironomide a tentative test as per contract						
		MM-SD23-040304	↓	↓	1200		↓							

Potential Hazard Identification:
Non- Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
				[signature]	R. Zirk	955	4-6-04

Special Instructions: Both samples are iced.

***Matrix Codes:**

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tag Items:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - RMC Yellow Copy - Client

CHAIN OF CUSTODY

AQUATIC LABORATORY SERVICES, INC.

Aquatic and Terrestrial Toxicity Testing

12 May 2004

Mr. George Christian
Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, PA 19475

SUBJECT: Magna Metals Site
Whole Sediment Toxicity Evaluation
Aquatic Laboratory Services Study No.: 0574CTC

Dear Mr. Christian:

Enclosed please find one bound and one unbound copy of the results of the 10-day Whole Sediment Toxicity tests conducted on sediment collected at the Magna Metals Site. The testing was conducted 17 through 27 April 2004 using the freshwater midge *Chironomus tentans.*

Please do not hesitate to contact me at 610.792.1828 or rzirkalsi@aol.com should you have any questions regarding this report.

Sincerely,

Roger G. Zirk,
Laboratory Manager

Enclosures

Cc: S. Brunk, ALSI

rgz-c:msword/letters/0574ctc.nai.rz1/5-04

Results of Whole Sediment Toxicity Testing for the

Magna Metal Site
Cortlandt, New York

Aquatic Laboratory Services Study No. 0574CtC



Prepared for:

Normandeau Associates, Inc.

Aquatic Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

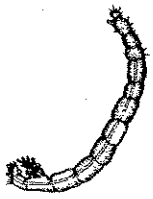
May 2004

Results of 10-Day Whole Sediment
Toxicity Testing for the

Magna Metals Site
Cortlandt, New York

Using the

Midge, *Chironomus tentans*



17 through 27 April 2004,

Prepared for:

Normandeau Associates, Inc.
3450 Schuylkill Road
Spring City, Pennsylvania 19475

Report Prepared By: _____ 12 May 2004

Roger G. Zirk,
Laboratory Manager

Date

Aquatic Laboratory Services, Inc.
3450 Schuylkill Road
Spring City, Pennsylvania 19475
Phone: 610.792.1828
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New Jersey Certification No. PA021

Aquatic Laboratory Services Study No. 0574CtC

May 2004

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   - Daily Observation Data
   - Daily Temperature, Dissolved Oxygen, pH and Conductivity Data Weight Data

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INTRODUCTION

Whole sediment toxicity testing was conducted on sediment samples collected from the Magna Metals Site in Cortlandt, New York. Whole sediment toxicity testing was conducted 17 through 27 April 2004 using the midge, *Chironomus tentans (C. tentans)*. The samples were collected by Tetra Tech-FW, Inc. personnel and transported to Aquatic Laboratory Services Spring City, Pennsylvania. The objective of this testing was to determine chronic toxicity of the sediments to *C. tentans*.

All testing was conducted in accordance with procedures outlined in Ingersoll, C.G., G.T. Ankley, G.A. Burton, F.J. Dwyer, R.A. Hoke, T.J. Norbert-King and P.V. Winger. 1994. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates.* EPA/600/R-99/064. U.S. EPA Office of Research and Development, Duluth, MN, ASTM. 1995 and *Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates.* E1706-95. American Society for Testing and Materials, Philadelphia, PA and ASTM. 1994.

MATERIALS

TEST ORGANISMS

Freshwater Midge, *Chironomus tentans*

Immature *C. tentans* (9-days old) used in testing were obtained from Aquatic Research Organisms (ARO), a commercial culture facility located in Hampton, New Hampshire. This species is a representative invertebrate and a United States Environmental Protection Agency (EPA) accepted test organism. Prior to shipping, the midges were fed Tetra Fin® flake fish food during acclimation and holding at ARO. The midges were placed in a plastic cubitainer with moderately-hard reconstituted water and shipped overnight to Aquatic Laboratory Services in Spring City, Pennsylvania. Midges were received at Aquatic Laboratory Services on 17 April 2004. Upon receipt at Aquatic Laboratory Services, the midge were inspected for mortality and transferred to several 2-liter crystallizing dishes. The midges were fed Tetra Fin® flake fish food and gentle aeration was provided to the crystallizing dish. The midges were acclimated to the overlying water by partial replacements with moderately-hard reconstituted water. Midges were fed 1.5-mL of Tetra Fin® flake fish food suspension daily during the test, unless otherwise noted (see Daily Observation Data Sheets, Appendix A). The midges were held in moderately-hard reconstituted water until test initiation.

NEGATIVE CONTROL SEDIMENT

Sediment to be used as the negative controls was collected from Spruce Run Reservoir located in Clinton, New Jersey. The sediment was collected on 14 April 2004 and transported to the Spring City laboratory. The sediments were collected from a cove west of the boat launch at N 40° 39.649', W 74° 55.431' (estimated accuracy 15 meters). The sediments were collected approximately five-feet from the shoreline in two-feet of water.

Control sediment was collected by Aquatic Laboratory Services personnel and placed in three 2½-gallon plastic buckets. The sediment was covered with overlying water from the reservoir and sealed with the liner and a plastic lid.

Aquatic Laboratory Services personnel transported the sediment to the Spring City, PA office on the day of collection. Chain-of-Custody forms accompanied all sediments. Prior to use, the control sediments were homogenized and sieved through a no. 6 (3.35-mm) stainless steel sieve to remove large pebbles, stones, twigs and plant clumps.

TEST SEDIMENTS

Sediments were collected on 30 March, 31 March and 3 April 2004 by Tetra Tec-FW, Inc. personnel. The sediments were identified as reference sediment no(s): MM-SD-13, MM-SD-17 and sediment sites MM-SD-14, MM-SD-15, MM-SD-19A, MM-SD-21 and MM-SD-23. Sediment samples were shipped overnight via Federal Express and delivered to Aquatic Laboratory Services Spring City office on 1, 2 and 6 April 2004. Chain-of-Custody forms accompanied all sediments. All sediments were stored at 1° to 4.4°C in their original containers when not being used. Sediments were warmed to test temperature prior to test initiation. Prior to use, the sediments were homogenized and sieved through a no. 6 (3.35-mm) stainless steel sieve to remove large pebbles, stones, twigs and plant clumps.

OVERLYING WATER

Moderately-Hard Reconstituted Water

Reconstituted water is prepared in accordance to procedures outlined in EPA/600/R-99/064 to be used as acclimation and overlying water for the toxicity tests. Water is decanted through a mixed bed de-ionizing system (U. S. Filter, Inc.) consisting of carbon, mixed resin-bed and membrane filters. A 190-liter Nalgene tank is filled with about 150-liters of de-ionized water. In a five-gallon bucket of de-ionized water, 9.5-grams of $CaSO_4$ and 9.5-grams $CaCl_2$ is mixed into solution by vigorously aerating for 30-minutes or until the salts dissolve.. Into a second 5-gallon bucket of de-ionized water, 5.7-grams of $MgSO_4$, 18.2-grams of $NaHCO_3$ and 0.76-grams KCl is mixed by aerating for 30-minutes or until the salts dissolve. The two five-gallon aliquots are added to the 150-liters of de-ionized water and the volume is brought to 190-liters with de-ionized water. Reconstituted water is aerated for at least 24-hours prior to use.

METHODS

CHIRONOMUS TENTANS, 10-DAY WHOLE SEDIMENT TOXICITY TEST METHOD

Sediments were warmed to test temperature prior to test initiation. The day prior to test initiation, 100-mL of sediment and 175-mL of overlying water (moderately-hard reconstituted water) were placed into the each test chamber. Renewal of overlying water was begun 24-hours prior to introduction of the test organisms. *C. tentans* (9-days old) were exposed to the sediment under static renewal conditions for 10-days. The midges were exposed in-groups of ten in 300-mL high-form lip-less Kimax beakers with eight replicates per sample (80 midges per sample). Test chambers were placed in a temperature controlled environmental chamber maintained at 23 ± 1°C. Negative control sediments were also tested. Test organisms were fed 1.0-mL of Tetra Fin® flake fish food suspension daily unless otherwise noted on the raw data sheets. Water renewals were accomplished by siphoning off the old solution and replacing it with fresh overlying water renewed overlying water twice daily (A.M. and P.M.).

Dead organisms observed during the renewal process were removed and recorded. Dissolved oxygen and pH were measured daily in the fresh overlying water. Temperature, dissolved oxygen, pH and conductivity were measured in the pooled replicates after each 24-hour exposure period. Alkalinity and hardness were measured in the overlying water on day 0. Ammonia was measured in the pooled replicates from each sample on days 0 and 10. The lighting regime was 16-hours light, 8-hours dark using cool white fluorescent lights.

The test was terminated at the end of 10-days. Surviving midges within each replicate were collected with a U.S. Standard No. 50 stainless steel sieve. The midges were counted, rinsed with de-ionized water and transferred as a group to pre-weighed pans. The number of surviving midges was recorded on the *Chironomus tentans* Weight Data sheet. Midges were dried in an oven at 90° C to a constant weight and then transferred to a desiccator until weighing.

Each pan containing midges was weighed to the nearest 0.01-mg on an Ohaus Model AP250D Plus analytical balance. The total midge dry weight was divided by the number of surviving midges to obtain the average midge weight (growth) per replicate. In addition, the total dry weight divided by the initial number of midges (biomass) was calculated and the statistical printouts are included in Appendix B of this report.

STATISTICAL ANALYSES

Statistical comparisons for the toxicity testing were performed between the negative control and site sediments to identify statistically significant differences in survival. Arc-sine transformed survival data were tested for normal distribution using either Shapiro-Wilk's Test or Kolmogorov D Test. Survival data were tested for equality of variance using Bartlett's Test. If the data met the assumptions for normality and equality of variance, the parametric Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences in survival between the test samples and reference sediments. If these assumptions were not met, the non-parametric Steels Many-One Rank Test was used to identify significant differences in survival between the test samples and reference sediments. A summary of survival data for *C. tentans* can be found in Tables 1a.

Statistical comparisons for the toxicity testing were performed between the negative control and site sediments to identify statistically significant differences in growth. Non-transformed growth data were tested for normal distribution using either Shapiro-Wilk's Test or Kolmogorov D Test. Growth data were tested for equality of variance using Bartlett's Test. If the data met the assumptions for normality and equality of variance, the parametric Analysis of Variance (ANOVA)/Dunnett's Test was used to identify significant differences in survival between the test samples and reference sediments. If these assumptions were not met, the non-parametric Steels Many-One Rank Test was used to identify significant differences in survival between the test samples and reference sediments. A summary of growth data for *C. tentans* can be found in Tables 1b.

RESULTS

Table 1a. Summary of Survival Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Negative Control	9	10	9	6	9	10	9	9	88.75%	N/A
Sediment Site MM-SD-13	7	9	10	10	10	10	9	8	91.25%	NO
Sediment Site MM-SD-17	9	7	10	7	10	10	9	10	90.00%	NO

Table 1b. Summary of Growth Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Negative Control	0.7711	1.0360	1.0322	1.1183	1.1078	1.2440	1.1567	1.1078	1.0717	N/A
Sediment Site MM-SD-13	1.0543	1.1211	1.0650	1.0760	1.0240	0.9560	0.9089	1.1350	1.0425	NO
Sediment Site MM-SD-17	0.9844	1.3500	1.2010	1.0329	0.9900	1.2230	1.1667	0.9120	1.1075	NO

RESULTS (continued)

Table 2a. Summary of Survival Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using Reference Sediment MM-SD-17 vs. Sediment MM-SD-15, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-17	9	7	10	7	10	10	9	10	90.00%	N/A
Sediment Site MM-SD-15	7	10	9	8	10	10	9	10	91.25%	NO

Table 2b. Summary of Growth Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using Reference Sediment MM-SD-17 vs. Sediment MM-SD-15, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-17	0.9844	1.3500	1.2010	1.0329	0.9900	1.2230	1.1667	0.9120	1.1075	N/A
Sediment Site MM-SD-15	0.7586	0.7550	0.7678	1.2425	0.8570	0.8290	0.9756	0.7100	0.8619	YES

RESULTS (continued)

Table 3a. Summary of Survival Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Survival, By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Survival %	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-13	7	9	10	10	10	10	9	8	91.25%	N/A
Sediment Site MM-SD-14	10	10	10	10	7	7	10	9	91.25%	NO
Sediment Site MM-SD-19A	10	9	10	9	10	9	8	10	93.75%	NO
Sediment Site MM-SD-21	9	8	9	10	10	10	10	10	95.00%	NO
Sediment Site MM-SD-23	7	8	6	8	8	9	10	9	81.25%	NO

Table 3b. Summary of Growth Data – *Chironomus tentans* 10-Day Whole Sediment Toxicity Test for the Magna Metals Site using the Negative Control Sediment vs. Reference Sediments MM-SD-13 and MM-SD-17, 17 through 27 April, 2004

Sample No./ Sample Location	Midge Weight (mg), By Replicate, At 10-Days (10 organisms per replicate at test initiation)								Mean Weight (mg)	Significant Difference from Negative Control $\alpha = 0.05$
	A	B	C	D	E	F	G	H		
Reference Site MM-SD-13	1.0543	1.1211	1.0650	1.0760	1.0240	0.9560	0.9089	1.1350	1.0425	N/A
Sediment Site MM-SD-14	0.5950	0.5200	0.5470	0.6340	0.8929	1.1600	0.6590	0.6367	0.7056	YES
Sediment Site MM-SD-19A	0.6260	0.7267	0.7010	0.7011	0.5290	0.7833	0.6937	0.6650	0.6782	YES
Sediment Site MM-SD-21	0.9089	1.3888	0.9411	1.0290	0.8590	0.8750	1.0290	0.9410	0.9965	NO
Sediment Site MM-SD-23	1.2243	1.2287	1.2617	1.1113	1.1363	1.0522	1.0780	1.2222	1.1643	NO

Table 4a. Daily Observation Data – *Chironomus tentans*

PROJECT: NJMC-MERI Wetland Ecological Risk Assessment
TEST: 28-Day Whole Sediment Toxicity Test Conducted at 10-ppt
DATE: 17 through 27 April 2004

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Final Live Count
MM-SD-13 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	7
	B	10	N	N	N	N	N	N	N	N	N	N	N	9
	C	10	N	N	N	N	N	N	N	N	N	N	N	10
	D	10	N	N	N	N	N	N	N	N	N	N	N	10
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	10
	G	10	N	N	N	N	N	N	N	N	N	N	1 A	9
	H	10	N	N	N	N	N	N	N	N	N	N	N	8
MM-SD-14 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	10
	B	10	N	N	N	N	N	N	N	N	N	N	N	10
	C	10	N	N	N	N	N	N	N	N	N	N	N	10
	D	10	N	N	N	N	N	N	N	N	N	N	N	10
	E	10	N	N	N	N	N	N	N	N	N	N	N	7
	F	10	N	N	N	N	N	N	N	N	N	N	N	7
	G	10	N	N	N	N	N	N	N	N	N	N	N	10
	H	10	N	N	N	N	N	N	N	N	N	N	N	9
MM-SD-15 033004	A	10	N	N	N	N	N	N	N	N	N	N	N	7
	B	10	N	N	N	N	N	N	N	N	N	N	N	10
	C	10	N	N	N	N	N	N	N	N	N	N	N	9
	D	10	N	N	N	N	N	N	N	N	N	N	N	8
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	10
	G	10	N	N	N	N	N	N	N	N	N	N	N	9
	H	10	N	N	N	N	N	N	N	N	N	N	N	10
MM-SD-17 033104	A	10	N	N	N	N	N	N	N	N	N	N	N	9
	B	10	N	N	N	N	N	N	N	N	N	N	N	7
	C	10	N	N	N	N	N	N	N	N	N	N	N	10
	D	10	N	N	N	N	N	N	N	N	1 A	N	N	7
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	1 A	N	N	N	10
	G	10	N	N	N	N	N	N	N	1 A	N	N	N	9
	H	10	N	N	N	N	N	N	N	N	N	N	N	10

Observation Codes: N – Normal, D – Number Midges Observed Dead, E – Number Midges Observed Emerged,
A – Number Midges Observed Avoiding Sediment, F – Number Midges Observed Floating on Surface

Table 4b. Daily Observation Data – *Chironomus tentans*

PROJECT: NJMC-MERI Wetland Ecological Risk Assessment
TEST: 28-Day Whole Sediment Toxicity Test Conducted at 10-ppt
DATE: 17 through 27 April 2004

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Final Live Count
MM-SD-19A 033104	A	10	N	N	N	N	N	N	N	N	N	N	N	10
	B	10	N	N	N	N	N	N	N	N	N	N	N	9
	C	10	N	N	N	N	N	N	N	N	N	N	N	10
	D	10	N	N	N	N	N	N	N	N	N	N	N	9
	E	10	N	N	N	N	N	N	N	N	1 A	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	9
	G	10	N	N	N	N	N	N	N	N	N	N	N	8
	H	10	N	N	N	N	N	N	N	N	N	N	N	10
MM-SD-21 040304	A	10	N	N	N	N	N	N	N	N	N	N	N	9
	B	10	N	N	N	N	N	N	N	N	N	N	N	8
	C	10	N	N	N	N	N	N	N	N	N	N	N	9
	D	10	N	N	N	N	N	N	N	N	N	N	N	10
	E	10	N	N	N	N	N	N	N	N	N	N	N	10
	F	10	N	N	N	N	N	N	N	N	N	N	N	10
	G	10	N	N	N	N	N	N	N	N	N	N	N	10
	H	10	N	N	N	N	N	N	N	N	N	N	N	10
MM-SD-23 040304	A	10	N	N	N	N	N	N	N	N	N	N	N	7
	B	10	N	N	N	N	N	N	N	N	N	N	N	8
	C	10	N	N	N	N	N	N	N	N	N	N	N	6
	D	10	N	N	N	N	N	N	N	N	N	N	N	8
	E	10	N	N	N	N	N	N	N	N	N	N	N	8
	F	10	N	N	N	N	N	N	N	N	N	N	N	9
	G	10	N	N	N	N	N	N	N	N	N	N	N	10
	H	10	N	N	N	N	N	N	N	N	N	N	N	9
Negative Control Sediment Spruce Run Reservoir	A	10	N	N	N	N	N	N	N	1 A	1 A	N	N	9
	B	10	N	N	N	N	N	N	N	N	1 A	N	N	10
	C	10	N	N	N	N	N	N	N	1 F	N	N	N	9
	D	10	N	N	N	N	N	N	N	N	N	N	N	6
	E	10	N	N	N	N	N	N	N	N	1 A	N	N	9
	F	10	N	N	N	N	N	N	N	N	N	N	N	10
	G	10	N	N	N	N	N	N	N	N	N	N	N	9
	H	10	N	N	N	N	N	N	N	N	N	N	N	9

Observation Codes: N – Normal, D – Number Midges Observed Dead, E – Number Midges Observed Emerged,
A – Number Midges Observed Avoiding Sediment, F – Number Midges Observed Floating on Surface

Table 4a. Daily Physical and Chemical Data – *Chironomus tentans*
PROJECT: Magna Metals Site
TEST: 10-Day Whole Sediment Toxicity Test
DATE: 17 through 27 April 2004

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-13 033004	Temperature	22.8	22.8	22.5	22.5	22.7	22.8	22.4	22.3	22.2	22.1
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.0	2.8	3.0	2.7	3.7	3.8	3.5	3.9	3.8	3.7
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.6	6.8	6.8	6.9	6.9	7.0	7.0	6.7	6.4
	Conductivity	266	259	254	268	265	267	269	266	287	252
	Ammonia	0.50									N/A
MM-SD-14 033004	Temperature	22.6	22.6	22.3	22.2	22.6	22.6	22.3	22.2	22.0	22.4
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.3	3.3	3.7	3.0	3.7	4.5	3.7	3.9	3.7	2.6
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.8	6.6	6.8	6.7	6.9	6.9	6.9	6.9	6.7	6.4
	Conductivity	255	250	247	258	261	262	263	266	270	246
	Ammonia	0.95									N/A
MM-SD-15 033004	Temperature	22.2	22.6	22.0	22.0	22.6	22.6	22.1	22.2	22.0	22.3
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.9	3.8	3.9	3.3	3.8	4.1	2.7	3.2	3.0	2.9
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.2	6.9	7.1	7.0	6.9	7.1	7.1	7.2	7.0	6.6
	Conductivity	272	287	268	280	276	275	280	278	310	269
	Ammonia	0.48									N/A
MM-SD-17 033104	Temperature	22.4	22.5	22.5	22.3	22.5	22.4	22.0	22.2	22.3	22.4
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	5.6	3.4	3.5	4.3	4.5	5.1	4.2	4.6	2.6	2.5
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.2	6.8	6.8	7.0	7.0	7.1	7.1	7.1	7.0	6.6
	Conductivity	292	262	243	266	268	268	273	270	312	266
	Ammonia	0.52									N/A
MM-SD-19A 033104	Temperature	22.8	22.9	22.0	22.4	22.7	22.9	22.3	22.3	22.1	22.1
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.6	4.4	4.1	3.5	3.9	4.5	3.9	4.2	4.1	4.1
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.6	7.0	6.8	6.8	6.9	6.9	6.9	6.7	6.4
	Conductivity	251	247	253	255	259	259	258	261	259	243
	Ammonia	0.49									N/A

N/D = Not Detected at the Reporting Detection Limit (RDL).
N/A = Results not available at the time of printing this report. Ammonia results for day 10 will be forwarded as soon as they become available.

Table 4a. Daily Physical and Chemical Data – *Chironomus tentans*
PROJECT: Magna Metals Site
TEST: 10-Day Whole Sediment Toxicity Test
DATE: 17 through 27 April 2004

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 14
MM-SD-21 040304	Temperature	22.7	22.6	22.4	22.3	22.6	22.9	22.2	22.4	22.0	22.1
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.0	2.8	2.8	2.6	3.4	4.4	3.4	4.1	3.9	4.2
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.7	6.8	6.8	6.8	6.9	6.9	7.0	6.7	6.4
	Conductivity	262	254	247	260	261	261	259	263	261	244
	Ammonia	0.87									N/A
MM-SD-23 040304	Temperature	22.5	22.4	22.2	22.1	22.4	22.8	22.1	22.3	22.0	22.0
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.4	3.0	2.7	2.8	3.0	3.6	2.5	3.1	3.5	3.3
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.0	6.8	6.9	6.9	6.8	6.9	6.9	7.0	6.7	6.4
	Conductivity	294	280	259	267	262	260	257	261	256	243
	Ammonia	0.84									N/A
Negative Control Sediment Spruce Run Reservoir	Temperature	22.3	22.3	22.0	22.1	22.3	22.8	22.1	22.2	22.0	22.3
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	5.8	4.6	5.0	5.8	5.6	6.3	6.4	6.6	5.5	3.8
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.1	7.0	7.2	7.1	7.0	7.2	7.3	7.3	7.0	6.7
	Conductivity	244	243	243	256	259	262	261	266	274	251
	Ammonia	0.19									N/A

N/D = Not Detected at the Reporting Detection Limit (RDL).
N/A = Results not available at the time of printing this report. Ammonia results for day 10 will be forwarded as soon as they become available.

APPENDIX A

ORIGINAL DATA – Midge, *Chironomus tentans*

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Chironomus tentans

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574

DAILY OBSERVATION DATA SHEET

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-13 033004	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	1A
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-14 033004	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-15 033004	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	2	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	2	2	2	2
	G	10	2	2	2	2	2	2	2	2	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2
MM-SD-17 033104	A	10	2	2	2	2	2	2	2	2	2	2	2
	B	10	2	2	2	2	2	2	2	2	2	2	2
	C	10	2	2	2	2	2	2	2	2	2	2	2
	D	10	2	2	2	2	2	2	2	2	1D	2	2
	E	10	2	2	2	2	2	2	2	2	2	2	2
	F	10	2	2	2	2	2	2	2	1A	2	2	2
	G	10	2	2	2	2	2	2	2	1A	2	2	2
	H	10	2	2	2	2	2	2	2	2	2	2	2

Observation Codes: N – Normal, # D – Number Midges Observed Dead, # A – Number Midges Observed Avoiding Sediment, # F – Number Midges Observed Floating on Surface

Date	4-17-04	4-18	4-19-04	4-20-04	4-21-04	4-22	4-23	4-24	4-25	4-26	4-27
Tech ID	RSH	RSH	DA	DA	DA	RSH	RSH	RSH	RSH	DA	RSH
Renewal A.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Renewal P.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Reviewed By: _____

Date: 5-10-04

rgz-c:msword/datasheets/sedobservations-ct.ltr/w/4-04

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Chironomus tentans

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574

DAILY OBSERVATION DATA SHEET

Sample Identification	Rep	N_o	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
MM-SD-19A 033104	A	10	2	N	N	N	N	N	N	N	N	N	N
	B	10	2	N	N	N	N	N	N	N	N	N	N
	C	10	2	N	N	N	N	N	N	N	N	N	N
	D	10	2	N	N	N	N	N	N	N	N	N	N
	E	10	2	N	N	N	N	N	N	N	1A	N	N
	F	10	2	N	N	N	N	N	N	N	N	N	N
	G	10	2	N	N	N	N	N	N	N	N	N	N
	H	10	2	N	N	N	N	N	N	N	N	N	N
MM-SD-21 040304	A	10	2	N	N	N	N	N	N	N	2	N	N
	B	10	2	N	N	N	N	N	N	N	2	N	N
	C	10	2	N	N	N	N	N	N	N	2	N	N
	D	10	2	N	N	N	N	N	N	N	2	N	N
	E	10	2	N	N	N	N	N	N	N	2	N	N
	F	10	2	N	N	N	N	N	N	N	2	N	N
	G	10	2	N	N	N	N	N	N	N	2	N	N
	H	10	2	N	N	N	N	N	N	N	2	N	N
MM-SD-23 0430304	A	10	2	N	N	N	N	N	N	N	2	N	N
	B	10	2	N	N	N	N	N	N	N	2	N	N
	C	10	2	N	N	N	N	N	N	N	2	N	N
	D	10	2	N	N	N	N	N	N	N	2	N	N
	E	10	2	N	N	N	N	N	N	N	2	N	N
	F	10	2	N	N	N	N	N	N	N	2	N	N
	G	10	2	N	N	N	N	N	N	N	2	N	N
	H	10	2	N	N	N	N	N	N	N	2	N	N
Negative Control Sediment	A	10	2	N	N	N	N	N	N	1A	1	N	N
	B	10	2	N	N	N	N	N	N	1F	1	N	N
	C	10	2	N	N	N	N	N	N	N	1	N	N
	D	10	2	N	N	N	N	N	N	N	1	N	N
	E	10	2	N	N	N	N	N	N	N	1	N	N
	F	10	2	N	N	N	N	N	N	N	1	N	N
	G	10	2	N	N	N	N	N	N	N	2	N	N
	H	10	2	N	N	N	N	N	N	N	2	N	N

Observation Codes: N – Normal, # D – Number Midges Observed Dead, # A – Number Midges Observed Avoiding Sediment, # F – Number Midges Observed Floating on Surface

Date	4-17-04	4-18	4-19-04	4-20-04	4-21-04	4-22	4-23	4-24	4-25	4-26	4-27
Tech ID	RGZ	RSH	DA	DA	DA	RSH	RSH	RSH	RGZ	DA	RSH
Renewal A.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Renewal P.M.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Reviewed By: _____

Date: 5-10-04

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *CHIRONOMUS TENTANS*

Tare Date: 4-27-04 Tech ID: RJR
Start Dry Date/Time: 4-27-04 / 1800 Tech ID: RJR
End Dry Date/Time: 4-28-04 / 0830 Tech ID: RSH

Dry Temp (°C): 99.6 Dry Time: 14.5 hrs
Drying Oven ID: OV-01
Balance ID: AB-01

Conc.	Rep	N_o	Survival # / %	Tare Weight (gm)	Total Dry Weight (gm)	Organism Dry Weight (gm)	Mean Organism Dry Weight (mg)
QA Blank A				0.80231	0.80235		
MM-SW-13 033004	A	10	7 / 70	0.79911	0.80649	0.00738	1.0543
	B	10	9 / 90	0.80089	0.81098	0.01009	1.1211
	C	10	10 RJR 8 / 100	0.80060	0.81125	0.01065	1.0650
	D	10	10 / 100	0.80201	0.81277	0.01076	1.0760
	E	10	10 / 100	0.80076	0.81100	0.01024	1.0240
	F	10	10 / 100	0.80599	0.81555	0.00956	0.9560
	G	10 RJR	9 8 / 90	0.79059	0.79877	0.00818	0.9089
	H	10	8 / 80	0.80156	0.81064	0.00908	1.1350
MM-SW-14 033004	A	10	10 / 100	0.79877	0.80472	0.00555	0.5550
	B	10	10 / 100	0.79229	0.79749 RJR	0.00560	0.5600
QA Blank B				0.79742	0.79738		
MM-SW-14 033004	C	10	10 / 100	0.79340	0.79887	0.00547	0.5470
	D	10	10 / 100	0.79087	0.79721	0.00634	0.6340
	E	10	7 / 70	0.79096	0.79721	0.00625	0.8929
	F	10	7 / 70 RJR	0.797847	0.80659	0.00782	1.1171
	G	10	10 / 100	0.79214	0.79873	0.00659 RJR	0.6590
	H	10	9 / 90	0.79920	0.80493	0.00573	0.6367
MM-SW-15 033004	A	10	7 / 70	0.79365	0.79896	0.00531	0.7586
	B	10	10 / 100 RJR	0.798022	0.80976	0.00755	0.7550
	C	10	9 / 90	0.80327	0.81018	0.00691	0.7678
	D	10	8 / 80	0.79434	0.80428	0.00994	1.243
QA Blank C				0.79594	0.79597		
MM-SW-15 033004	E	10	10 / 100	0.79362	0.80219	0.00857	0.8570
	F	10	10 / 100	0.79678	0.80507	0.00829	0.8290
	G	10	9 / 90	0.78928	0.79806	0.00838	0.9311
	H	10	10 / 100	0.80082	0.80792	0.00710	0.7100

Reviewed By: RJR Date: 5-10-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SI
ALSI STUDY NO. 0574H
SPECIES: *CHIRONOMUS TENTANS*

Tare Date: 4-27-04 Tech ID: RJR
Start Dry Date/Time: 4-27-04 /1800 Tech ID:
End Dry Date/Time: 4-28-04/0830 Tech ID: RSH

Dry Temp (°C): 99.6 Dry Time: 14.5 hrs
Drying Oven ID: OV-01
Balance ID: AB-01

Conc.	Rep	N_o	Survival # / %	Tare Weight (gm)	Total Dry Weight (gm)	Organism Dry Weight (gm)	Mean Organism Dry Weight (mg)
QA Blank A				0.80065	0.80069		
MM-SW-17 033104	A	10	9 /90	0.80182	① ~~0.80886~~	0.00886	0.9844
	B	10	7 /70	0.80070	0.81015	0.00945	1.293
	C	10	10 /100	0.80181	0.81382	0.01201	1.201
	D	10	7 /70	0.80337	0.81060	0.00723	1.03293 RJR
	E	10	10 /100	0.80014	0.81004	0.00990	0.990
	F	10	10 / 100	0.80328	0.81551	0.01223	1.223
QA Blank D				0.79984	0.79981		
MM-SW-17 033104	G	10	9 /90	0.80117	0.81167	0.0105	1.167
	H	10	10 /100	0.79381	0.80293	0.00912	0.912
MM-SW-19A 033104	A	10	10/100	0.81385	0.82011	0.00626	0.0626 RJR
	B	10	9 /90	0.80579	0.81233	0.00654	0.726
	C	10	10 /100	0.80873	0.81574	0.00701	0.701
	D	10	9 /90	0.81244	0.81875	0.00631	0.7011
	E	10	10 /100	0.81455	0.81984	0.00529	0.529
	F	10	9 /90 RJR 8 ~~9813~~	0.81321	0.82026	0.00705	0.7833
	G	10	8 /80	0.80745	0.81300	0.00555	0.6938
	H	10	10 /100	0.81245	0.81910	0.00665	0.665
QA Blank E				0.80917	0.80913		
MM-SW-21 040304	A	10 RJR	98/90	0.81086	0.81904	0.00818	0.9089
	B	10	8 /80	0.81766	0.82877	0.01111	1.389
	C	10	9 /90	0.81496	0.82343	0.00847	0.9411
	D	10	10/100	0.81378	0.82407	0.01029	1.029
	E	10 RJR	9[0]/100	0.81413	0.82272	0.00859	0.859
	F	10	10 /100	0.81421	0.82296	0.00875	0.875
	G	10	10 /100	0.80618	0.81647	0.01029	1.029
	H	10	10 /100	0.80673	0.81614	0.00941	0.941

① 0.81068 - RJR 4-28-04

Reviewed By: RJR Date: 5-10-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *CHIRONOMUS TENTANS*

Tare Date: 4-27-04 Tech ID: RJJ
Start Dry Date/Time: 4-27-04 /1800 Tech ID: RJS
End Dry Date/Time: 4-28-04/0830 Tech ID: RSH

Dry Temp (°C): 99.6 Dry Time: 14.5-hrs
Drying Oven ID: OV-01
Balance ID: AB-01

MM-SW-~~22~~ 23 040304 RJS	A	10	7 /70	0.81193	0.82050	0.00857	1.224
	B	10	8 /80	0.81120	0.82103	0.00983	1.229
QA Blank F				0.80950	0.80946		
MM-SW-23 040304	C	10	6 /60	0.81721	0.82478	0.00757	1.262
	D	10	8 /80	0.81028	0.81917	0.00889	1.111
	E	10	8 /80	0.80899	0.81808	0.00909	1.136
	F	10	9 /90	0.81766	0.82713	0.00947	1.052
	G	10	10 /100	0.81410	0.82488	0.01078	1.078
	H	10	9 /90	0.81542	0.82642	0.0110	1.222
Negative Control	A	10	9 /90	0.81074	0.81768	0.00694	0.7711
	B	10	10 /100	0.81181	0.82217	0.01036	1.036
	C	10	9 /90	0.81388	0.82317	0.00929	1.032
	D	10	6 /60	0.81331	① 0.~~82512~~	② ~~0.01181~~	1.118
QA Blank G				0.81854	0.81859		
Negative Control	E	10	9 /90	0.81271	0.82268	0.00997	1.108
	F	10	10 /100	0.81177	0.82421	0.01244	~~1.0~~ 1.244
	G	10	9 /90	0.81490	0.82531	0.01041	1.157
	H	10	9 /90	0.81515	③ ~~0.83186~~	0.0997	1.108

⑥ 0.82002 - RJS 4-27-04
② 0.00671 - RJS 4-27-04
③ 0.82512 - RJS 4-27-04

Reviewed By: RJZ Date: 5-10-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Chironomus tentans

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574CTC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Date	4-17	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25	4-26
	Tech ID	RJB	RSH	DT	DT	DT	RSH	RSH	RSH	RJB	DT
MM-SD-13 033004	Temperature	22.8	22.8	22.5	22.5	22.7	22.8	22.4	22.3	22.2	22.1
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.0	2.8	3.0	2.7	3.7	3.8	3.5	3.9	3.8	3.7
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.6	6.8	6.8	6.9	6.9	7.0	7.0	6.71	6.4
	Conductivity	266	259	254	268	265	267	269	266	287	252
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-14 033004	Temperature	22.6	22.6	22.3	22.2	22.6	22.6	22.3	22.2	22.0	22.4
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.3	3.3	3.7	3.0	3.7	4.5	3.7	3.9	3.7	2.6
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.83	6.6	6.8	6.7	6.9	6.9	6.9	6.9	6.7	6.4
	Conductivity	255	250	247	258	261	262	263	266	270	246
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-15 033004	Temperature	22.2	22.6	22.0	22.0	22.6	22.6	22.1	22.2	22.0	22.3
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.9	3.8	3.9	3.3	3.8	4.1	2.7	3.2	3.0	2.9
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.2	6.9	7.1	7.0	6.9	7.1	7.1	7.2	7.0	6.6
	Conductivity	272	287	268	280	276	275	280	278	310	269
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										

Reviewed By: RGZ

Date: 5-4-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Chironomus tentans

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574CTC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Date	4-17-04	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25	4-26
	Tech ID	DDB	RSH	DT	DT	DT/RSH	RSH	RSH	RSH	DDB	DT
MM-SD-17 033104	Temperature	22.4	22.5	22.5	22.3	22.5	22.4	22.0	22.2	22.3	22.4
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	5.6	3.4	3.5	4.3	4.5	5.1	4.2	4.6	2.6	2.5
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.2	6.8	6.8	7.0	7.0	7.1	7.1	7.1	7.0	6.6
	Conductivity	292	262	243	266	268	268	273	270	312	266
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-19A 033104	Temperature	22.8	22.9	22.0	22.4	22.7	22.9	22.3	22.3	22.1	22.1
	Initial D.O.	8.2	7.8	7.7 DO	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.6	4.4	4.1	3.5	3.9	4.5	3.9	4.2	4.1	4.1
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.6	7.0	6.8	6.8	6.9	6.9	6.9	6.7	6.4
	Conductivity	251	247	253	255	259	259	258	261	259	243
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
MM-SD-21 040304	Temperature	22.7	22.6	22.4	22.3	22.6	22.9	22.2	22.4	22.0	22.1
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.0	2.8	2.8	2.6	3.4	4.4	3.4	4.1	3.9	4.2
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	6.9	6.7	6.8	6.8	6.8	6.9	6.9	7.0	6.7	6.4
	Conductivity	262	254	247	260	261	261	259	263	261	244
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										

Reviewed By: _____

Date: 5-4-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

Chironomus tentans

PHYSICAL/CHEMICAL PARAMETER DATA SHEET

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METAL SITE
ALSI STUDY NO. 0574CTC

Sample Identification	P/Chem Parameter	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
	Date	4-17-04	4-18	4-19	4-20	4-21	4-22	4-23	4-24	4-25	4-26
	Tech ID	RSH	RSH	DT	DT	DT	RSH	RSH	RSH	JDB	DT/RSH
MM-SD-23 040304	Temperature	22.5	22.4	22.2	22.1	22.4	22.8	22.1	22.3	22.0	22.0
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	4.4	3.0	2.7	2.8	3.0	3.6	2.5	3.1	3.5	3.3
	Initial pH	7.8	7.3	7.6	7.4	7.8	7.5	7.5	7.8	7.8	7.4
	Final pH	7.0	6.8	6.9	6.9	6.8	6.9	6.9	7.0	6.7	6.4
	Conductivity	294	280	259	267	262	260	257	261	256	243
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
Negative Control Sediment	Temperature	22.3	22.3	22.0	22.1	22.3	22.8	22.1	22.2	22.0	22.3
	Initial D.O.	8.2	7.8	7.7	7.2	7.8	7.8	7.8	8.0	7.8	7.7
	Final D.O.	5.8	4.6	5.0	5.8	5.6	6.3	6.4	6.6	5.5	3.8
	Initial pH	7.8	7.3	7.6	7.7	7.8	7.5	7.6	7.8	7.8	7.4
	Final pH	7.23	7.0	7.2	7.1	7.0	7.2	7.3	7.3	7.0	6.7
	Conductivity	244	243	243	256	259	262	261	266	274	251
	Salinity (ppt)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ammonia										
	Temperature										
	Initial D.O.										
	Final D.O.										
	Initial pH										
	Final pH										
	Conductivity										
	Salinity (ppt)										
	Ammonia										

Reviewed By: _____

Date: 5-4-04

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AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

CLIENT: TETRA TECH FW, INC.
PROJECT: MAGNA METALS SITE
ALSI STUDY NO. 0574HAC
SPECIES: *CHIRONOMUS TENTANS*

Alkalinity (mg/L $CaCO_3$)

Tech ID	RDB										
Date/Day	4-17 / 0		/		/		/		Tech ID: RDB		
Titrant	0.02N HCl		0.02N HCl		0.02N HCl		0.02N HCl		Date: 4-30		
Concentration	Buret Reading	Alkalinity	Buret Reading	Alkalinity	Buret Reading	Alkalinity	Buret Reading	Alkalinity	n	Mean	s
Reconstituted Water	6.5	65							1	65	

Hardness (mg/L $CaCO_3$)

Tech ID	RDB										
Date/Day	4-17 / 0		/		/		/		Tech ID: RDB		
Titrant	EDTA		EDTA		EDTA		EDTA		Date: 4-30		
Concentration	Buret Reading	Hard.	Buret Reading	Hard.	Buret Reading	Hard.	Buret Reading	Hard.	n	Mean	s
Reconstituted Water	4.1	82							1	82	

NOTES/COMMENTS

Day	Date	Tech ID	Notes/Comments
Day 0 / 1-hrs	4-17-04	RDB	fed 1.5ml TetraFin
Day 1 / 24-hrs	4-18-04	RSH	fed 1.0mL Tetra flake mix
Day 2 / 48-hrs	4-19-04	DH	none, fed 0.5-mL (RSH) due to low DO readings
Day 3 / 72-hrs	4-20-04	DH	fed 0.5mL of tetraflake mix
Day 4 / 96-hrs	4-21-04	DH	fed 0.5mL of tetraflake mix
Day 5 / 120-hrs	4-22-04	RSH	None, fed 0.5mL of Tetra flakemix
Day 6 / 144-hrs	4-23-04	RSH	None, fed 0.5mL of Tetraflakemix
Day 7 / 168-hrs	4-24-04	RSH	None, fed 0.3mL Tetraflakemix
Day 8 / 192-hrs	4-25-04	RDB	None, fed 1.0ml TetraFin
Day 9 / 216-hrs	4-26-04	RDB	None, fed 1.0ml TetraFin
Day 10 / 240-hrs	4-27-04	RSH	None

Reviewed By: RDB Date: 4-30-04

APPENDIX B

STATISTICAL ANALYSES – Midge, *Chironomus tentans*

Midge Growth and Survival Test-10 Day Survival

Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
NEG-Control	0.9000	1.0000	0.9000	0.6000	0.9000	1.0000	0.9000	0.9000
MM-SD-13	0.7000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	0.8000
MM-SD-17	0.9000	0.7000	1.0000	0.7000	1.0000	1.0000	0.9000	1.0000

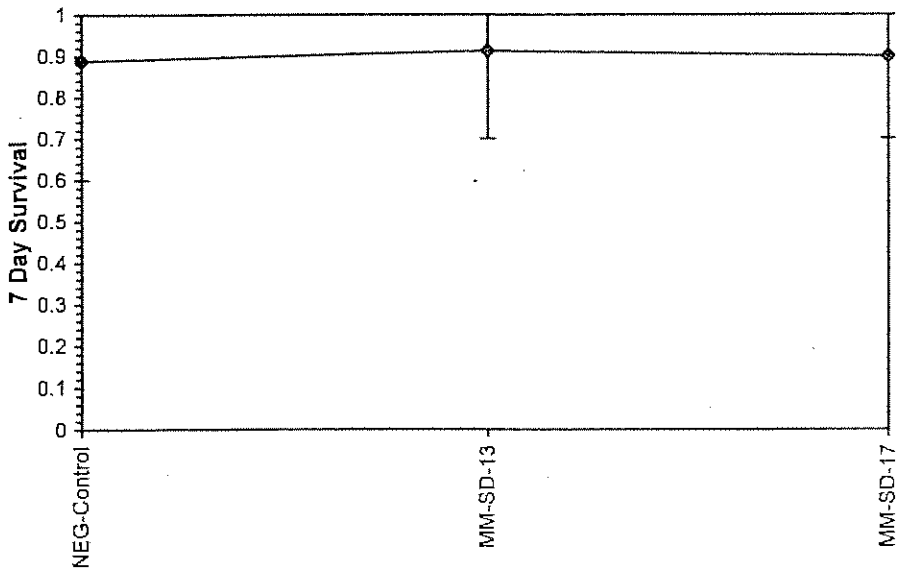
			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
NEG-Control	0.8875	1.0000	1.2444	0.8861	1.4120	13.053	8		
MM-SD-13	0.9125	1.0282	1.2806	0.9912	1.4120	12.693	8	73.00	49.00
MM-SD-17	0.9000	1.0141	1.2661	0.9912	1.4120	14.532	8	73.00	49.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.83919	0.884	-0.9541	-0.1536
Bartlett's Test indicates equal variances (p = 0.93)	0.13891	9.21035		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates no significant differences

Dose-Response Plot



Midge Growth and Survival Test-10 Day Growth

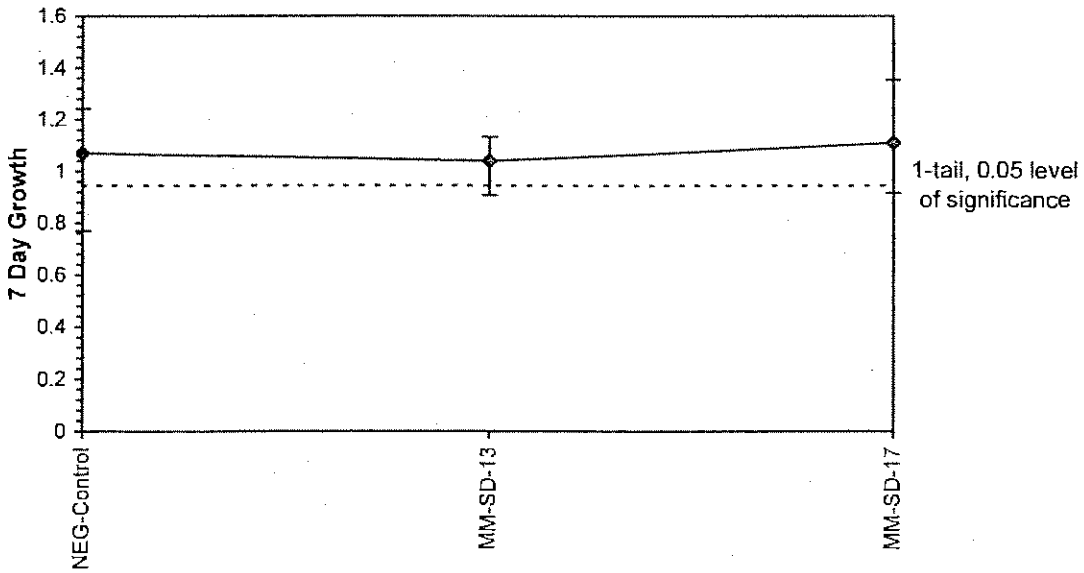
Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
NEG-Control	0.7711	1.0360	1.0322	1.1183	1.1078	1.2440	1.1567	1.1078
MM-SD-13	1.0543	1.1211	1.0650	1.0760	1.0240	0.9560	0.9089	1.1350
MM-SD-17	0.9844	1.3500	1.2010	1.0329	0.9900	1.2230	1.1667	0.9120

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
NEG-Control	1.0717	1.0000	1.0717	0.7711	1.2440	12.952	8			
MM-SD-13	1.0425	0.9728	1.0425	0.9089	1.1350	7.446	8	0.463	2.024	0.1277
MM-SD-17	1.1075	1.0334	1.1075	0.9120	1.3500	13.528	8	-0.567	2.024	0.1277

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97548		0.884		-0.4771	0.64039
Bartlett's Test indicates equal variances (p = 0.24)	2.86898		9.21035			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates no significant differences	0.12768	0.11913	0.00847	0.01591	0.59505	2, 21

Dose-Response Plot



Midge Growth and Survival Test-10 Day Biomass

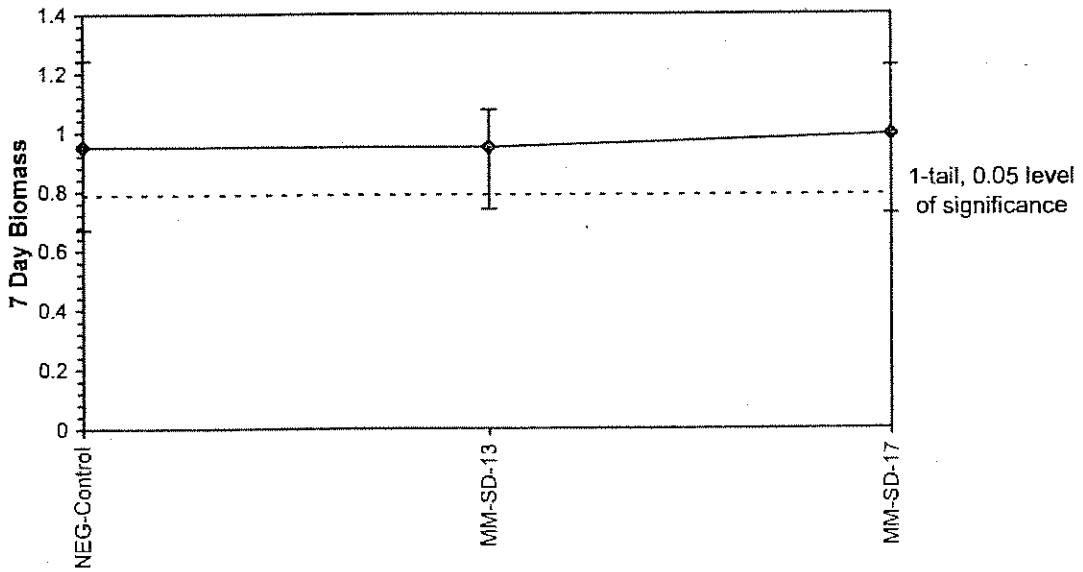
Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
NEG-Control	0.6940	1.0360	0.9290	0.6710	0.9970	1.2440	1.0410	0.9970
MM-SD-13	0.7380	1.0090	1.0650	1.0760	1.0240	0.9560	0.8180	0.9080
MM-SD-17	0.8860	0.9450	1.2010	0.7230	0.9900	1.2230	1.0500	0.9120

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
NEG-Control	0.9511	1.0000	0.9511	0.6710	1.2440	19.883	8			
MM-SD-13	0.9492	0.9980	0.9492	0.7380	1.0760	12.730	8	0.023	2.024	0.1631
MM-SD-17	0.9912	1.0422	0.9912	0.7230	1.2230	16.734	8	-0.498	2.024	0.1631

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96343		0.884		-0.2478	-0.3234
Bartlett's Test indicates equal variances (p = 0.52)	1.29558		9.21035			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Dunnett's Test indicates no significant differences	0.16308	0.17146	0.0045	0.02596	0.84193	2, 21

Dose-Response Plot



Midge Growth and Survival Test-10 Day Survival

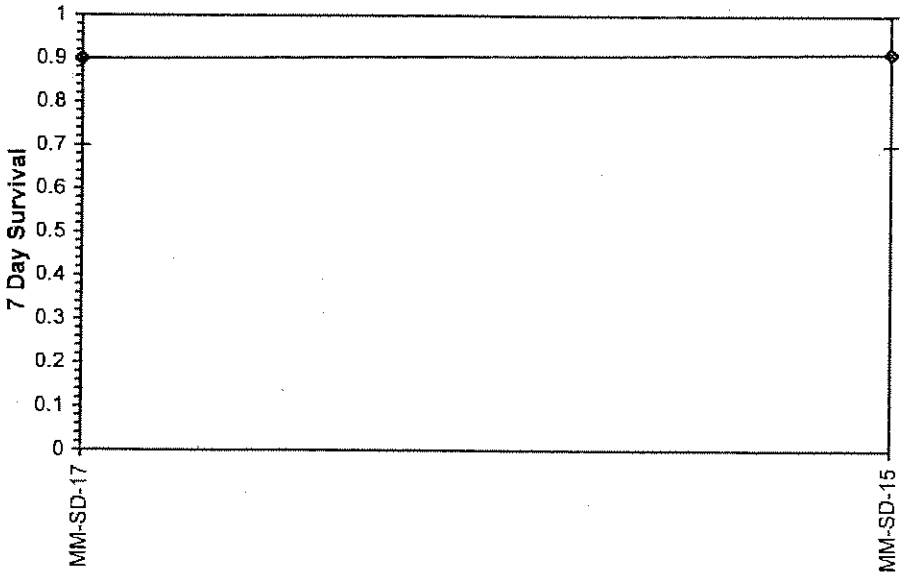
Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.9000	0.7000	1.0000	0.7000	1.0000	1.0000	0.9000	1.0000
MM-SD-15	0.7000	1.0000	0.9000	0.8000	1.0000	1.0000	0.9000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MM-SD-17	0.9000	1.0000	1.2661	0.9912	1.4120	14.532	8		
MM-SD-15	0.9125	1.0139	1.2806	0.9912	1.4120	12.693	8	69.00	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.79268	0.844	-0.8004	-0.8932
F-Test indicates equal variances (p = 0.75)	1.28118	8.88531		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				

Dose-Response Plot



Midge Growth and Survival Test-10 Day Growth

Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

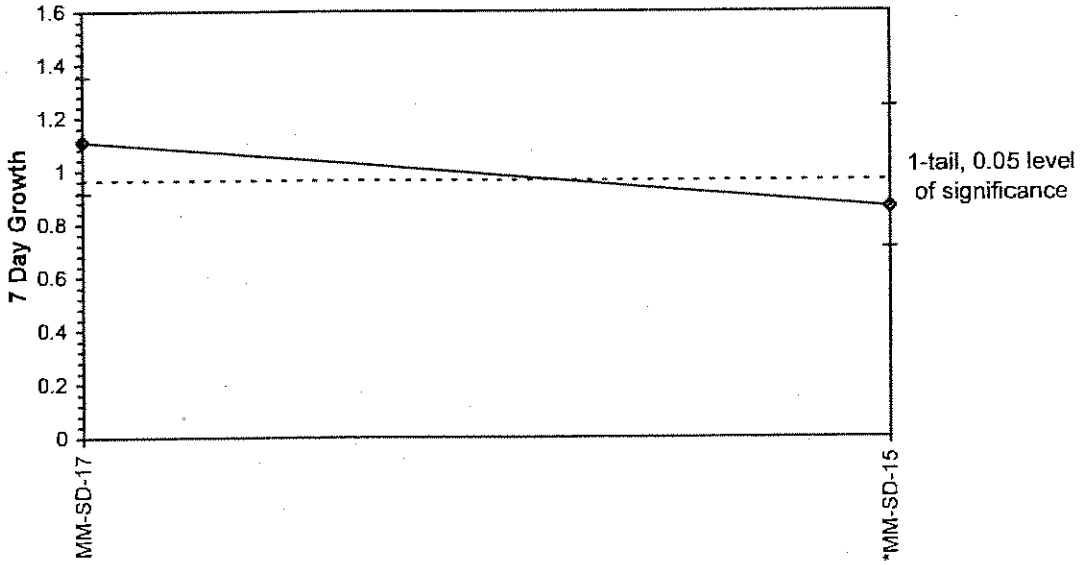
Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.9844	1.3500	1.2010	1.0329	0.9900	1.2230	1.1667	0.9120
MM-SD-15	0.7586	0.7550	0.7678	1.2425	0.8570	0.8290	0.9756	0.7100

			Transform: Untransformed						1-Tailed	
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-17	1.1075	1.0000	1.1075	0.9120	1.3500	13.528	8			
*MM-SD-15	0.8619	0.7783	0.8619	0.7100	1.2425	20.234	8	3.021	1.761	0.1432

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90103	0.844	1.08813	0.81588
F-Test indicates equal variances (p = 0.70)	1.35504	8.88531		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates significant differences	0.14318	0.12928	0.24122	0.02643	0.00916	1, 14

Dose-Response Plot



ToxCalc v5.0.23

Reviewed by:

Midge Growth and Survival Test-10 Day Biomass

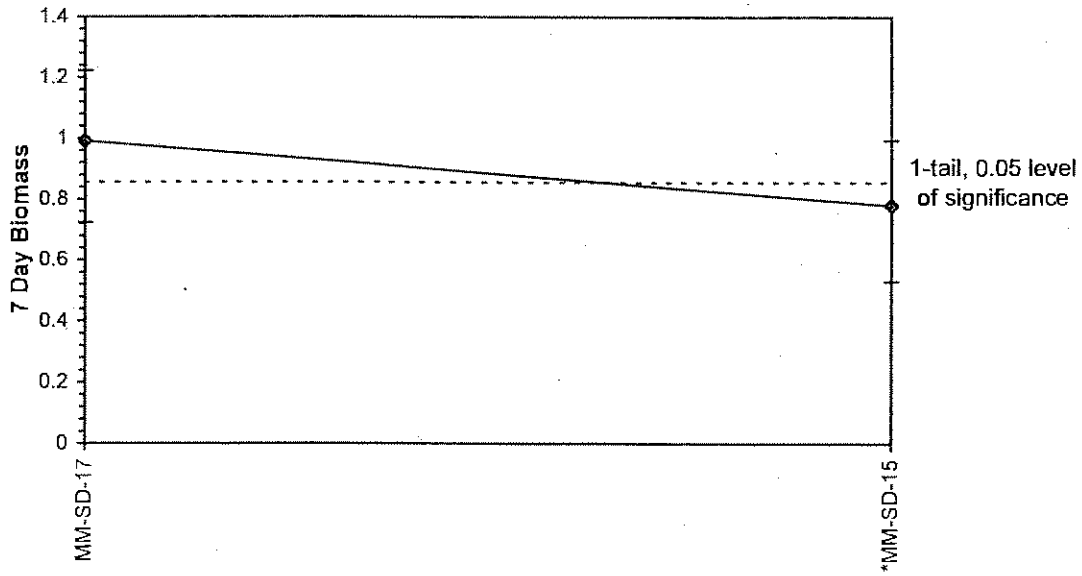
Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-17	0.8860	0.9450	1.2010	0.7230	0.9900	1.2230	1.0500	0.9120
MM-SD-15	0.5310	0.7550	0.6910	0.9940	0.8570	0.8290	0.8780	0.7100

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-17	0.9912	1.0000	0.9912	0.7230	1.2230	16.734	8			
*MM-SD-15	0.7806	0.7875	0.7806	0.5310	0.9940	18.063	8	2.736	1.761	0.1356

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95334		0.844		-0.1073	-0.3788
F-Test indicates equal variances (p = 0.68)	1.38396		8.88531			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences	0.13557	0.13677	0.17745	0.0237	0.01607	1, 14

Dose-Response Plot



Midge Growth and Survival Test-10 Day Survival

Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-13	0.7000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	0.8000
MM-SD-14	1.0000	1.0000	1.0000	1.0000	0.7000	0.7000	1.0000	0.9000
MM-SD-19A	1.0000	0.9000	1.0000	0.9000	1.0000	0.9000	0.8000	1.0000
MM-SD-21	0.9000	0.8000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000
MM-SD-23	0.7000	0.8000	0.6000	0.8000	0.8000	0.9000	1.0000	0.9000

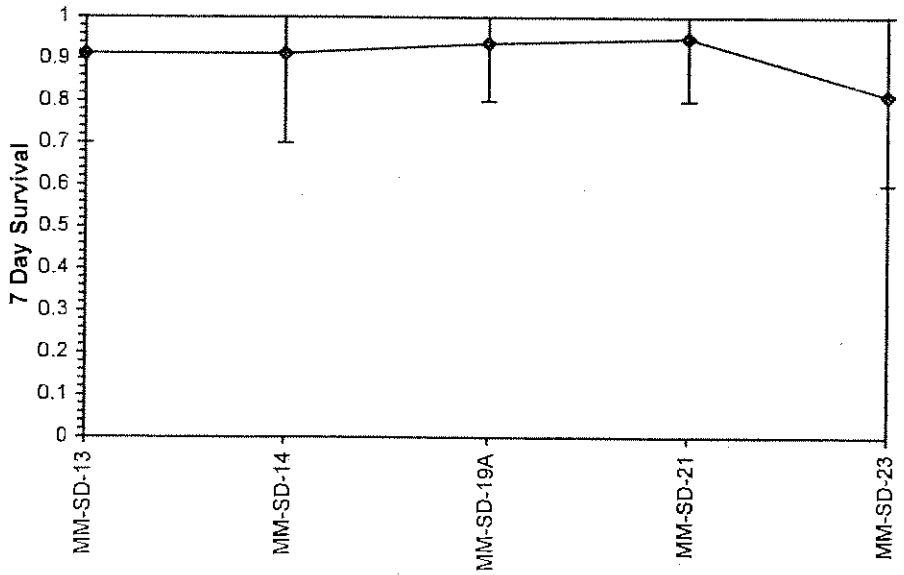
			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MM-SD-13	0.9125	1.0000	1.2806	0.9912	1.4120	12.693	8		
MM-SD-14	0.9125	1.0000	1.2864	0.9912	1.4120	14.826	8	70.00	47.00
MM-SD-19A	0.9375	1.0274	1.3128	1.1071	1.4120	8.821	8	70.50	47.00
MM-SD-21	0.9500	1.0411	1.3332	1.1071	1.4120	8.799	8	73.50	47.00
MM-SD-23	0.8125	0.8904	1.1386	0.8861	1.4120	14.379	8	53.00	47.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.8893	0.919	-0.6599	-0.4455
Bartlett's Test indicates equal variances (p = 0.64)	2.51297	13.2767		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates no significant differences

Dose-Response Plot



Midge Growth and Survival Test-10 Day Growth

Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

Conc-	1	2	3	4	5	6	7	8
MM-SD-13	1.0543	1.1211	1.0650	1.0760	1.0240	0.9560	0.9089	1.1350
MM-SD-14	0.5950	0.5200	0.5470	0.6340	0.8929	1.1600	0.6590	0.6367
MM-SD-19A	0.6260	0.7267	0.7010	0.7011	0.5290	0.7833	0.6937	0.6650
MM-SD-21	0.9089	1.3888	0.9411	1.0290	0.8590	0.8750	1.0290	0.9410
MM-SD-23	1.2243	1.2287	1.2617	1.1113	1.1363	1.0522	1.0780	1.2222

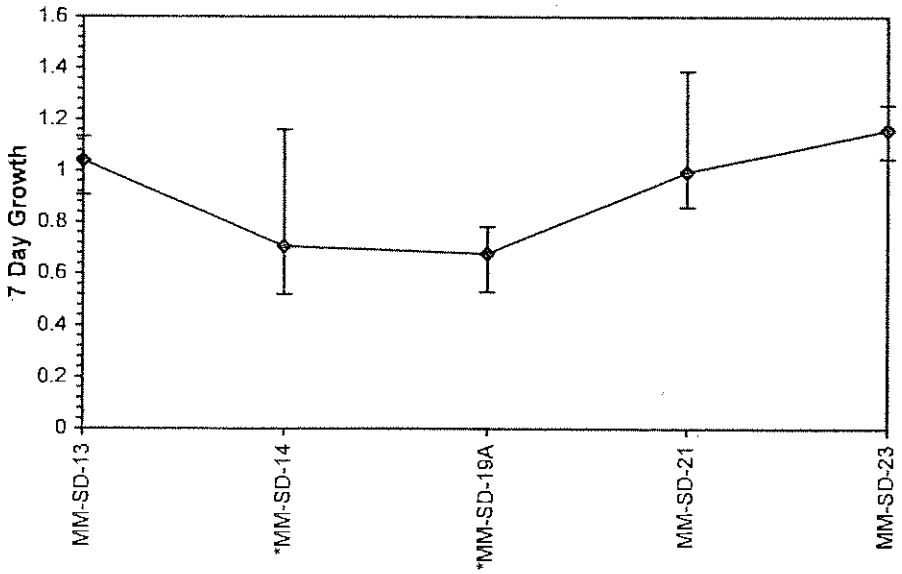
			Transform: Untransformed					Rank	1-Tailed
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
MM-SD-13	1.0425	1.0000	1.0425	0.9089	1.1350	7.446	8		
*MM-SD-14	0.7056	0.6768	0.7056	0.5200	1.1600	30.559	8	44.00	47.00
*MM-SD-19A	0.6782	0.6506	0.6782	0.5290	0.7833	11.124	8	36.00	47.00
MM-SD-21	0.9965	0.9558	0.9965	0.8590	1.3888	17.109	8	52.50	47.00
MM-SD-23	1.1643	1.1168	1.1643	1.0522	1.2617	6.825	8	91.00	47.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.85909	0.919	1.71602	4.35505
Bartlett's Test indicates unequal variances (p = 8.52E-03)	13.6443	13.2767		

Hypothesis Test (1-tail, 0.05)

Steel's Many-One Rank Test indicates significant differences

Dose-Response Plot



Midge Growth and Survival Test-10 Day Biomass

Start Date:	4/17/2004	Test ID:	574CtC	Sample ID:	Magna Metals Site
End Date:	4/27/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	FSED-Freshwater Sediment
Sample Date:		Protocol:	EPAF 94-EPA Freshwater	Test Species:	CT-Chironomus tentans
Comments:					

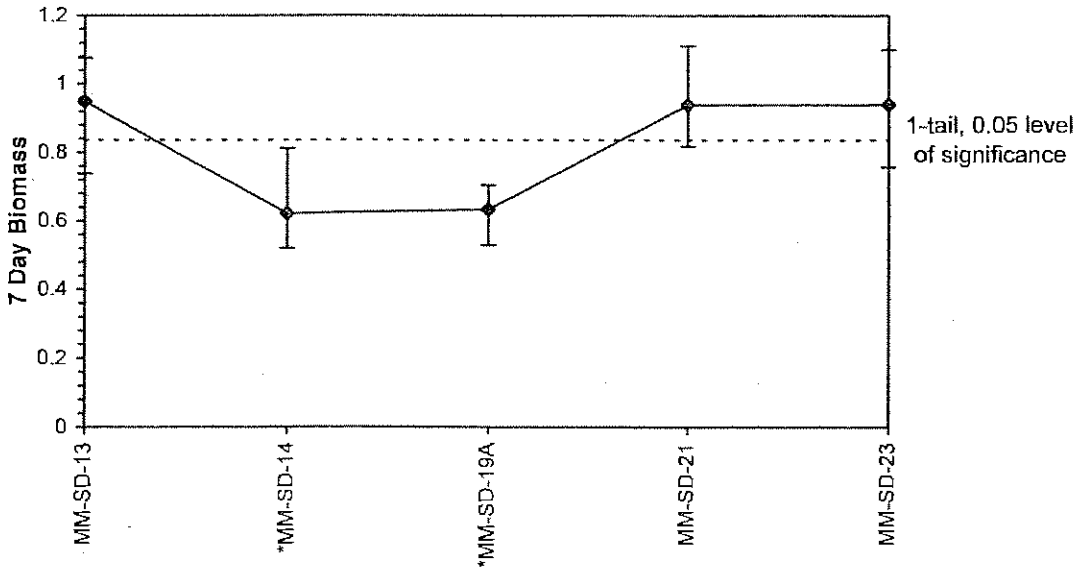
Conc-	1	2	3	4	5	6	7	8
MM-SD-13	0.7380	1.0090	1.0650	1.0760	1.0240	0.9560	0.8180	0.9080
MM-SD-14	0.5950	0.5200	0.5470	0.6340	0.6250	0.8120	0.6590	0.5730
MM-SD-19A	0.6260	0.6540	0.7010	0.6310	0.5290	0.7050	0.5550	0.6650
MM-SD-21	0.8180	1.1110	0.8470	1.0290	0.8590	0.8750	1.0290	0.9410
MM-SD-23	0.8570	0.9830	0.7570	0.8890	0.9090	0.9470	1.0780	1.1000

			Transform: Untransformed					1-Tailed		
Conc-	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
MM-SD-13	0.9492	1.0000	0.9492	0.7380	1.0760	12.730	8			
*MM-SD-14	0.6206	0.6538	0.6206	0.5200	0.8120	14.510	8	6.507	2.239	0.1131
*MM-SD-19A	0.6333	0.6671	0.6333	0.5290	0.7050	10.028	8	6.257	2.239	0.1131
MM-SD-21	0.9386	0.9888	0.9386	0.8180	1.1110	11.346	8	0.210	2.239	0.1131
MM-SD-23	0.9400	0.9903	0.9400	0.7570	1.1000	12.095	8	0.183	2.239	0.1131

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.98454	0.919	0.01067	-0.3872
Bartlett's Test indicates equal variances (p = 0.55)	3.02508	13.2767		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test indicates significant differences	0.11306	0.1191	0.23947	0.0102	1.7E-09	4, 35

Dose-Response Plot



APPENDIX C

QA/QC – Acute Control Chart

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

96-Hour Acute Bioassay

Potassium Chloride Standard Reference Toxicant Test
Test Species: *Chironomus tentans*
Organism Age: 9- Days old
Organism Source: Aquatic Research Organisms

Study No.: 0576CtA
Dilution Water Source: EPA Moderately Hard Water
Test Start Date/Time: 4-17-04 / 1645
Test End Date/Time: 4-21-04 / 1655

Conc.	Rep.	Number of Live Organisms				
		0-hr	24-hr	48-hr	72-hr	96-hr
Control	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	1	1
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1
625 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	0	
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1
1250 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	1	1	1	1
	G	1	0			
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1

Conc.	Rep.	Number of Live Organisms				
		0-hr	24-hr	48-hr	72-hr	96-hr
2500 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	1	1	1	1
	D	1	1	1	1	1
	E	1	1	1	1	1
	F	1	0			
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	1	1	1	1
	J	1	1	1	1	1
5000 ppm	A	1	1	1	1	1
	B	1	1	1	1	1
	C	1	0			
	D	1	1	1	1	1
	E	1	1	0		
	F	1	1	1	1	1
	G	1	1	1	1	1
	H	1	1	1	1	1
	I	1	0			
	J	1	1	0		
10,000 ppm	A	1	0			
	B	1	0			
	C	1	0			
	D	1	0			
	E	1	0			
	F	1	0			
	G	1	0			
	H	1	0			
	I	1	0			
	J	1	0			

Conc. ppm	Temperature °C					Dissolved Oxygen (mg/L)		pH (Standard Units)		Conductivity (µmhos/cm)	
	0-hr	24-hr	48-hr	72-hr	96-hr	0-hr	96-hr	0-hr	96-hr	0-hr	96-hr
Control	23.5	23.2	23.1	23.8	23.7	7.8	4.4	7.57	6.92	272	307
625	23.6	23.3	23.3	23.9	23.4	7.9	4.4	7.81	7.14	1827	1884
1250	23.5	23.3	23.5	23.8	23.4	7.9	4.9	7.87	7.21	2890	2949
2500	25.5	23.3	23.6	23.9	23.4	7.9	4.4	7.89	7.22	4396	4410
5000	23.5	23.3	23.6	23.9	23.4	7.9	4.7	7.91	7.24	5850	5900
10000	23.3	23.2				8.0	4.2	7.91	7.13	15240	15350

Date					
Time	1645	1600	1620	1650	1655
Tech ID	RDR	RDR	RDR	RDR	RDR

Reviewed By: RDR

Date: 4-23-04

rgz-c:msword/datasheets/acute.ct/4-04

Acute Midge Test-96 Hr Survival

Start Date:	4/17/2004	Test ID:	576CtA	Sample ID:	REF-Ref Toxicant
End Date:	4/21/2004	Lab ID:	Aquatic Lab. Services	Sample Type:	KCL-Potassium chloride
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	CT-Chironomus tentans
Comments:					

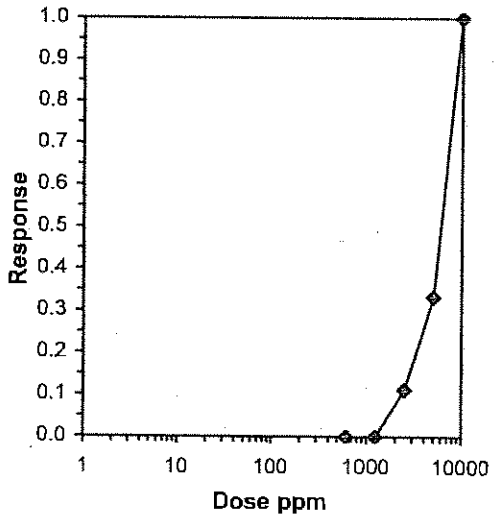
Conc-ppm	1	2	3	4	5	6	7	8	9	10
MHRW-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
625	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000
1250	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
2500	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000
5000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	0.0000	0.0000
10000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Number	Total
Conc-ppm	Mean	N-Mean	Mean	Min	Max	CV%	N	Resp	Number
MHRW-Control	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	1	10
625	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	1	10
1250	0.9000	1.0000	0.9948	0.5236	1.0472	16.644	10	1	10
2500	0.8000	0.8889	0.9425	0.5236	1.0472	23.424	10	2	10
5000	0.6000	0.6667	0.8378	0.5236	1.0472	32.275	10	4	10
10000	0.0000	0.0000	0.5236	0.5236	0.5236	0.000	10	10	10

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.68732	0.93	-1.5136	1.09466
Bartlett's Test indicates equal variances (p = 0.44)	3.73942	13.2767		

Trimmed Spearman-Karber

Trim Level	EC50	95% CL	
0.0%	5196.3	4053.48	6661.31
5.0%	5384.44	4122.2	7033.18
10.0%	5538.51	4206.05	7293.09
20.0%	5765.65	4027.1	8254.75
Auto-0.0%	5196.3	4053.48	6661.31



Aquatic Laboratory Services, Inc.

Aquatic and Terrestrial Toxicity Testing

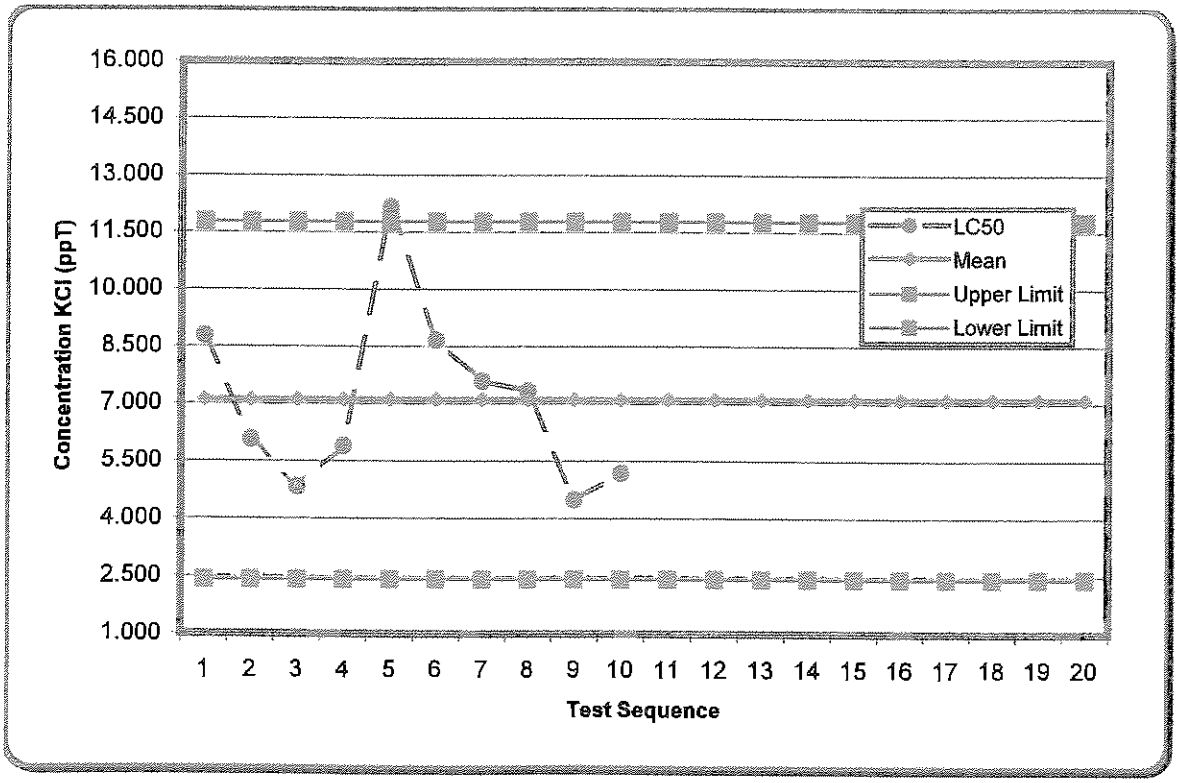
***Chironomus tentans* 96-Hour Acute Test**

April-04

Date	Test Sequence	LC_{50}	Mean	Upper Limit	Lower Limit	Biological Effect
5/8/02	1	8.791	7.110	11.794	2.426	Survival
5/8/02	2	6.078	7.110	11.794	2.426	Survival
5/8/02	3	4.837	7.110	11.794	2.426	Survival
5/8/02	4	5.903	7.110	11.794	2.426	Survival
5/8/02	5	12.173	7.110	11.794	2.426	Survival
5/23/02	6	8.672	7.110	11.794	2.426	Survival
10/15/02	7	7.602	7.110	11.794	2.426	Survival
11/4/02	8	7.345	7.110	11.794	2.426	Survival
10/3/03	9	4.499	7.110	11.794	2.426	Survival
4/17/04	10	5.196	7.110	11.794	2.426	Survival
	11		7.110	11.794	2.426	Survival
	12		7.110	11.794	2.426	Survival
	13		7.110	11.794	2.426	Survival
	14		7.110	11.794	2.426	Survival
	15		7.110	11.794	2.426	Survival
	16		7.110	11.794	2.426	Survival
	17		7.110	11.794	2.426	Survival
	18		7.110	11.794	2.426	Survival
	19		7.110	11.794	2.426	Survival
	20		7.110	11.794	2.426	Survival

%C.V. = 32.04354

Toxicant: *Potassium chloride*



APPENDIX D

Organism Receipt/Holding Logs



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: *Chironomus tentans*

Source: Lab reared ✓ Hatchery reared _____ Field collected _____

Hatch date *4-8-04* Receipt date _____

Lot number *040604CT* Strain _____

Brood Origination _____ *USF+WS MO*

II. Water Quality

Temperature *22* °C Salinity *<1* ppt DO _____

pH *7.2* Hardness _____ ppm

III. Culture Conditions

System: *Static*

Diet: Flake Food _____ Phytoplankton _____ Trout Chow ✓

Brine Shrimp _____ Rotifers _____ Other *R166.4 Pellets*

Prophylactic Treatments: _____

Comments: _____

IV. Shipping Information

Client: *Aquatic Laboratory Services* # of Organisms: *10001*

Carrier: *FEDEX* Date Shipped: *4-16-04*

Biologist: *Mark Hoenguard*

1 - 800 - 927 - 1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

Aquatic
Laboratory Services, Inc.
Aquatic and Terrestrial Toxicity Testing

AQUATIC TOXICOLOGY ORGANISM RECEIPT LOG

Species: *Chironomus tentans*

Receipt Date: 4-17-04 Receiving Tech ID: RJS

Source: Aquatic Research Organisms

Requisition/PO #: N/A

Number Ordered: 1000+ Number Received: 1000+

Number Dead Upon Receipt: No Significant

Organism Age Upon Receipt: 9-days

Temperature: 23.2

Dissolved Oxygen: 9.2

pH: 6.83

Conductivity: 972

Condition Upon Receipt:

✓ Apparent Good Condition

_____ Poor Condition (explain actions taken):

attach organism history data sheet

****

Reviewed By: RJS Date: 4-17-04

rgz-c:msword//datasheets/organismreceiptlog.mysid/4-04

APPENDIX E

Certificate of Analyses
Ammonia-nitrogen, Total

ANALYTICAL LABORATORY SERVICES, INC.

www.analyticallab.com
NELAP Accredited
PA 22-293
NJ PA010 NY 11759

ACCREDITED IN ACCORDANCE WITH nelac

34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID#: 263409

Project Name: **Routine Sample Submission**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

ALSI is a NELAC accredited laboratory. ALSI certifies that all applicable test results meet the requirements of NELAC. For an inventory of our NELAC accreditations and Scope of Work please visit our website at www.analyticallab.com or contact your Project Manager at (717)944-5541 for a complete listing.

If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager

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NJ PA010 NY 11759
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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-14

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263409001**
Received: 04/23/04 15:11
Discard: 05/21/04

Page: 1 Of 1

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-13**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.50	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

his report relates only to the sample as received by the laboratory, and may ouly be reproduced in full.

Raymond J. Martrano
Laboratory Manager

ANALYTICAL LABORATORY SERVICES, INC.

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NJ PA010 NY 11759

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263409002
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-14**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.95	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

his report relates only to the sample as received by the laboratory, and may only be
eproduced in full.

Raymond J. Martrano
Laboratory Manager

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NJ PA010 NY 11759

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-14_

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263409003
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-15**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.48	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

his report relates only to the sample as received by the laboratory, and may only be eproduced in full.

Raymond J. Martrano
Laboratory Manager

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NJ PA010 NY 11759

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263409004**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-17**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.52	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263409005**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-19A**
Matrix: Water
Date Collected: 04/18/04 14:00
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.49	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263409006
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-21**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.87	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: **263409007**
Received: 04/23/04 15:11
Discard: 05/21/04

Project Name: **Routine Sample Submission**

PO#:

Sample ID: **0574 CTC Day 1 SD-23**
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.84	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

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Laboratory Manager

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Certificate of Analysis

May 7, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263409008
Received: 04/23/04 15:11
Discard: 05/21/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day 1 NC
Date Collected: 04/18/04 14:00

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.19	mg/L	0.10	EPA 350.3	05/05/04 10:00	05/05/04	MBR

This report relates only to the sample as received by the laboratory, and may only be produced in full.

Raymond J. Martrano
Laboratory Manager

ANALYTICAL LABORATORY SERVICES, INC.
Environmental ✦ Industrial Hygiene ✦ Field Services

34 Dogwood Lane Middletown, PA 17057 717.944.5541 Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT. INSTRUCTIONS ON THE BACK.

COC #: 2634

ALSI Quote #:

Client Name: Aquatic Laboratory Services
Address: 3450 Schuylkill Rd. Spring City, PA 19475
Contact: Roger Zirk
Phone #: 610-792-1828
Project Name/#: Magna Metals
Bill to: Roger Zirk
TAT: Normal- ☐ Standard TAT is 10-12 calendar days.
Rush- ☐ Rush TAT subject to ALSI approval and surcharges.
Date Required: _____ Approved by: _____
E-mail? Y- ☐ _____
Fax Results? Y- ☐ No.: _____

Container Type	500ml
Preservative Type	H_2SO_4
# of Containers	1

ANALYSES/METHOD REQUESTED

RECEIVING INFORMATION (completed by the Receiving Lab)
COOLER TEMP.: 4 SEAL INTACT? Y or N
SHIPPING CARRIER/NO. _____

PROJECT INFORMATION
DATA DELIVERABLES: Standard-☐ CLP-like-☐ USACE-☐ Other-☐
EDDS: Format Type- _____
REPORTABLE TO PADEP? ☐ If yes, PWSID NO.(7-digit no.): _____
STATE WHERE SAMPLES COLLECTED: NC-☐ NJ-☐ NY-☐ PA-☐ USACE-☐ Navy-☐ Other- _____
SAMPLE DISPOSAL: SPECIAL-☐ LAB-☐ (disposed 2 weeks after completion)

	SAMPLE DESCRIPTION/LOCATION (as it will appear on the lab report)	Sample Date	Time	*G or C	**MATRIX										Sample Comments
1						✓									
2	0574 Ctc Day1 SD-13	4-18-04	1400			✓									
3	" SD-14	"	"			✓									
4	" SD-15	"	"			✓									
5	" SD-17	"	"			✓									
6	" SD-19A	"	"			✓									
7	" SD-21	"	"			✓									
8	" SD-23	"	"			✓									
9	" NC	"	"			✓									
10															

Print Name and Company		Signature	Date/Time	
Sampled by: R. Hill				
Received for ALSI Custody by:				
Relinquished by: R. Hill		[signature]	4-23-04	1310
Received by: B.K. Shoede	ALSI	[signature]	4-23-04	1310
Relinquished by: JBGS	ALSI	[signature]	4-23-04	1511
Received by: [signature]			4/23/04	1511

PROJECT COMMENTS: 06/26/04
Ammonia Analysis

ALSI FIELD SERVICES: Pickup-☐ Composite Sampling-☐ Labor-☐ Rental Equipment-☐ Other-

* G=Grab; C=Composite **Matrix – S=Solid; WW=Wastewater; D=Drinking WT=Water; A=Air; GW=Groundwater; LW=Liquid Waste; O=Oil; WP=Wipe; P=Paint

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PA 22-293
NJ PA010 NY 11759
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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925001
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day 14 SD-13
Date Collected: 04/27/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.92	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925002
Received: 04/29/04 22:00
Discard: 05/26/04

Project Name: Routine Sample Submission PO#:

Sample ID: 0574 CTC Day 14, SD-14 Matrix: Water
Date Collected: 04/27/04 07:30 Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.07	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925003
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day 14, SD-15
Date Collected: 04/27/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	1.05	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925004
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day 14, SD-17
Date Collected: 04/27/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.63	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925005
Received: 04/29/04 22:00
Discard: 05/26/04

Project Name: Routine Sample Submission PO#:

Sample ID: 0574 CTC Day 14, SD-19A Matrix: Water
Date Collected: 04/27/04 07:30 Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.24	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925006
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission PO#:

Sample ID: 0574 CTC Day ~~14~~ 10, SD-21 Matrix: Water
Date Collected: 04/27/04 07:30 Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.76	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925007
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day ~~14~~ 10, SD-23
Date Collected: 04/27/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	0.86	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Laboratory Manager

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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 12, 2004

Mr. Roger Zirk
Aquatic Laboratory Services
3540 Schuykill Road
Spring City, PA 19475

Lab ID #: 263925008
Received: 04/29/04 22:00
Discard: 05/26/04

Page: 1 Of 1

Project Name: Routine Sample Submission

PO#:

Sample ID: 0574 CTC Day 14, NC
Date Collected: 04/27/04 07:30

Matrix: Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
WET CHEMISTRY							
Ammonia-nitrogen, Total	ND	mg/L	0.10	EPA 350.3	05/11/04 03:00	05/10/04	NJW

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Raymond J. Martrano
Laboratory Manager

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WED 01:46 PM ALSI FAX NO. 7179442250 P. 10/10

COOLER #: 2345 255925

ANALYTICAL LABORATORY SERVICES, INC.
Environmental ✦ Industrial Hygiene ✦ Field Services

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT. INSTRUCTIONS ON THE BACK.

COC #:

ALSI Quote #:

34 Dogwood Lane Middletown, PA 17057 717.944.5541 Fax: 717.944.1430

Client Name: Aquatic Laboratory Services
Address: 3450 Schuylkill Rd. Spring City, PA 19475
Contact: Roger Zirk
Phone #: (610-792-1828
Project Name/#: magna metals
Bill to:
TAT: Normal- ☐ Standard TAT is 10-12 calendar days.
Rush- ☐ Rush TAT subject to ALSI approval and surcharges.
Date Required: _____ Approved by: _____
E-mail? Y- ☐ _____
Fax Results? Y- ☐ No.: _____

Container Type	500mL
Preservative Type	H_2SO_4
# of Containers	1

ANALYSES/METHOD REQUESTED

RECEIVING INFORMATION (completed by the Receiving Lab)
COOLER TEMP.: 4°C SEAL INTACT? Y or N
SHIPPING CARRIER/NO. _____

PROJECT INFORMATION
DATA DELIVERABLES: Standard- ☐ CLP-like- ☐ USACE- ☐ Other- ☐
EDDS: Format Type- _____
REPORTABLE TO PADEP? ☐ If yes, PWSID NO.(7-digit no.): _____
STATE WHERE SAMPLES COLLECTED: NC- ☐ NJ- ☐ NY- ☐ PA- ☐ USACE- ☐ Navy- ☐ Other- _____
SAMPLE DISPOSAL: SPECIAL- ☐ LAB- ☐ (disposed 2 weeks after completion)

	SAMPLE DESCRIPTION/LOCATION (as it will appear on the lab report)	Sample Date	Time	*G or C	**MATRIX											Sample Comments
1	0574 Ctc Day 14 SD-13	4-27-04	0730			✓										
2	" " SD-14	↓	↓			✓										
3	" " SD-15	↓	↓			✓										
4	" " SD-17	↓	↓			✓										
5	" " SD-19A	↓	↓			✓										
6	" " SD-21	↓	↓			✓										
7	" " SD-23	↓	↓			✓										
8	" " NC	↓	↓			✓										
9																
10																

Print Name and Company	Signature	Date/Time	
Sampled by: R. Hill	Rebecca Hill	4-29-04 ~~4-27-04~~	1430 ~~0730~~
Received for ALSI Custody by: CHAD RANSOM	[signature]	4-29-04	14:30
Relinquished by: CHAD RANSOM	[signature]	4-29-04	
Received by: D. Blouch ALSI	[signature]	4-29-04	1725
Relinquished by:			2200
Received by: MRH	[signature]	4-29-04	2200

PROJECT COMMENTS:
Ammonia Analysis
TG 11/30/04
4/30/04 DRU

ALSI FIELD SERVICES: Pickup- ☐ Composite Sampling- ☐ Labor- ☐ Rental Equipment- ☐ Other-

* G=Grab; C=Composite **Matrix – S=Solid; WW=Wastewater; D=Drinking Water; WT=Water; A=Air; GW=Groundwater; LW=Liquid Waste; O=Oil; WP=Wipe; P=Paint

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APPENDIX F

Chain-Of-Custody Forms

AQUATIC LABORATORY SERVICES, INC.

Aquatic and Terrestrial Toxicity Testing

3450 Schuylkill Road
Spring City, PA 19475
Phone 610-792-1828 • Fax 610-792-1829

Client: TETRA TECH FW INC
Address: 1000 AMERICAN RD
MORRIS PLAINS, NJ 07052
Phone: 973.630.8530
Samplers: GKIM + K MILLET
Project No.: 1175.0003.00000

Client Contact: JOHN SCHAFFER

Sample Disposal - **Return To Client** [ ] **Disposal by Lab** [X]

CHAIN OF CUSTODY

No. Container		1 wm							
Container Size									

SAMPLE INFORMATION / **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
		MM-SD13-033004	SE	3-30-04	1100		X							
		MM-SD14-033004	↓	↓	0930		↓							
		MM-SD15-033004	↓	↓	1615		↓							
		MM-SD17-033104	↓	3-31-04	1225		↓							

gfm 3-31-04

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished by:	Print Name	Received by:	Print Name	Date:	Time:
		Rebecca Hill	Rebecca S. Hill	4-1-04	1400

Special Instructions: *All samples tested w/ Hyalella azteca + chironomus tentans as per the contract.
2 COOLERS !!!

Matrix Codes:

S	-	soil	GW	-	ground water
SE	-	sediment	ST	-	stormwater
SL	-	sludge	PW	-	processed water
O	-	oil	DW	-	dilution water
WW	-	waste water	RW	-	receiving water
SW	-	surface water	X	-	other

ALSI Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

White Copy - B-H Yellow Copy - Client

NORMANDEAU ASSOCIATES, INC.
RMC ENVIRONMENTAL SERVICES DIVISION
AQUATIC TOXICOLOGY LABORATORY

3450 Schuylkill Road
Spring City, PA 19475-1124
(610) 948-4700 • Fax: (610) 948-4752

CHAIN OF CUSTODY

Client: TETRA TECH, INC
Address: 1000 THE AMERICAN RD MORRIS PLAINS, NJ
Phone: 973. 630. 8230
Samplers: G. KIM + F. MILLET
Project No.: 1172.0003.0000.0000

Client Contact: JOHN SHAFFER

Sample Disposal	Return To Client	[ ]
	Disposal by Lab	[X]

No. Container	1 each									
Container Size	2 gal									

SAMPLE INFORMATION | **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elutriate	Bioaccumulation	Product Efficacy	Other	Other	Other
		MM-SD21-040304	SE	04-3-04	1105		X	Hyalella azteca + Chironomus tentans test as per contract						
		MM-SD23-040304	↓	↓	1200		↓							

Potential Hazard Identification:
Non- Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished By:	Received By:	Time:	Date:	Relinquished By:	Received By:	Time:	Date:
				DAVE	R. Zirk	955	4-6-04

Special Instructions: Both Samples are Ref.

***Matrix Codes:**

S - soil		GW - ground water	
SE - sediment		ST - stormwater	
SL - sludge		PW - processed water	
O - oil		DW - dilution water	
WW - waste water		RW - receiving water	
SW - surface water		X - other	

RMC Use Only

Samples Were:
1. Shipped or hand delivered Notes:
2. Chilled or ambient Notes:
3. Received broken / leaking Yes No
4. Received within holding times Yes No
5. Discrepancies between sample labels and COC record? Yes No

COC Tape Was:
1. Present on outer package Yes No
2. Unbroken on outer package Yes No
3. Present on sample Yes No
4. Unbroken on sample Yes No

AQUATIC LABORATORY SERVICES, INC.
Aquatic and Terrestrial Toxicity Testing

3450 Schuylkill Road
Spring City, PA 19475
Phone 610-792-1828 • Fax 610-792-1829

Client: TETRA TECH FW, INC
Address: 1000 THE AMERICAN RD
MORRIS PLAINS, NJ
Phone: 973.630 8530
Samplers: G. KIM + J K MILLET
Project No.: 1178.0003.0000.00000

Client Contact: JOHN SCHAFFER

Sample Disposal - Return To Client [ ] Disposal by Lab [X]

CHAIN OF CUSTODY

No. Container							2							
Container Size							igal							

SAMPLE INFORMATION — **Toxicity Test Requested**

SAMPLE TEMP. IN SAMPLER	SAMPLE TEMP. AT LAB.	Sample Identification	Matrix Code*	Sample Date	Sample Time	Acute	Chronic	Whole Sediment	Elu-triate	Bioaccu-mulation	Product Efficacy	Other	Other	Other
		MM-SD19-033104	SE	03-31-04	1000/ ~~1723~~		X ← Hyalella azteca + chironomus tentans							
		MM-SD19A-033104	↓	↓	1723		X							

gu 3-31-04

Potential Hazard Identification:

Non-Hazard [ ] Flammable [ ] Unknown [ ] Skin-Irritant [ ] Poison [ ]

Relinquished by:	Print Name	Received by:	Print Name	Date:	Time:
		Rebecca Sithill	Rebecca Sithill	4-2-04	1035

Special Instructions:

(A) Collected SD19 twice - pls composite before analysis.
(A) PLS. CALL JOHN SCHAFFER 973.630.8530 before you one is MMSD19-033104, the other is MMSD19A-033104 analyze!!!

Matrix Codes:

S	soil	GW	ground water
SE	sediment	ST	stormwater
SL	sludge	PW	processed water
O	oil	DW	dilution water
WW	waste water	RW	receiving water
SW	surface water	X	other

ALSI Use Only

Samples Were:
1. Shipped or hand delivered — Notes:
2. Chilled or ambient — Notes:
3. Received broken / leaking — Yes No
4. Received within holding times — Yes No
5. Discrepancies between sample labels and COC record? — Yes No

COC Tape Was:
1. Present on outer package — Yes No
2. Unbroken on outer package — Yes No
3. Present on sample — Yes No
4. Unbroken on sample — Yes No

White Copy - B-H Yellow Copy - Client

APPENDIX J

DATA USABILITY SUMMARY REPORTS

Foster Wheeler Environmental Corporation
Data Validation Report

Project: Magna Metals Site

Laboratory: IEA

Job No.: 20970-65807

Client Sample ID.	IEA – NJ ID	IEA – CT ID
MMSFB0101	65807001	
MMSSB0101	65807002	962803A01
MMSSB0201	65807003	962803A02
MMSSB0301	65807004	962803A03
MMSSB0401	65807005	962803A04
MMSFB0201	65807006	
MMSSB0501	65807007	962803A05
MMSSB0601	65807008	962803A06
MMSSB0701	65807009	962803A07
MMDSB0701	65807010	962803A08

Two aqueous and eight soil samples were analyzed by IEA for volatiles, semivolatiles, pesticides/PCBs, metals and cyanide using EPA CLP protocols. A Level IV data validation was performed on the package using CLP Organics Data Review and Preliminary Review, SOP No. HW-6, Revision #11 (5/96), Evaluation of Metals Data for the Contract Laboratory Program, SOW Revision XI (1/92) and best professional judgement. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ The analysis indicates the presence of an analyte that has been "tentatively identified"and the associated numerical value represents its approximate concentration.

— The sample results (inorganic) are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Sample Condition
- Holding Time
- System Monitoring Compound/Surrogate Recoveries
- Matrix Spike
- Blank Contamination
- Instrument Performance
- Initial and Continuing Calibrations
- Internal Standards
- Interference Check Sample
- Duplicates
- Laboratory Control Sample
- Serial Dilution

Sample Condition

Each department in both labs performed separate % moisture/% solid determinations which account for the discrepancies observed in values reported among the various analyses for a given sample.

Volatiles

Blank Contamination

The following were qualified "U" due to similar contamination in an associated blank:

methylene chloride: MMSSB0501, MMSSB0601, MMSSB0701, MMDSB0701
acetone: all soils

Matrix Spike

The lab did not perform the MS/MSD analysis on a soil from this sample batch. No action was required.

Calibrations

The following were estimated (J/UJ) for exceeding %RSD criteria in the associated initial calibration.

acetone: all samples
2-butanone: all soils

The following were estimated for exceeding %D criteria.

chloromethane: all samples
2-hexanone: MMSFB0101, MMSFB0201

Semivolatiles

Blank Contamination
The following were qualified "U" due to similar contamination in the associated blank:
diethylphthalate, bis(2-ethylhexyl)phthalate: all soil samples
di-n-butylphthalate: all samples except MMSSB0401.

Calibrations
The following were qualified as estimated (J/UJ) because the %D exceeded 25%:
hexachlorocyclopentadiene: all samples

Pesticides/PCBs

Calibrations
Alpha-BHC and gamma-BHC were estimated (UJ) in all samples for exceeding %RSD criteria.

Sample Identification
The following actions were taken because the %D between values derived from the 2 dissimilar columns exceeded 25%.

Qualified "U" (%D > 50% and sample value < CRQL)
dieldrin: MMSSB0401
DDT: MMSSB0401, MMSSB0601

Qualified "JN" (%D > 70)
alpha-chlordane: MMSSB0401

Qualified "J" (%D > 25%)
Ar1254: MMSSB0301, MMSSB0401, MMSSB0701, MMDSB0701

Metals

Calibrations
The following were estimated (J/UJ) due to low recovery in the CRDL standard:
Tl: all samples
Se: MMSSB0101, MMSSB0201, MMSSB0301, MMSSB0401

Interference Check Sample (ICS)
Calcium, Se and Pb exhibited low recoveries in the ICS, but no action was required.

Matrix Spike
The following were qualified as estimated (J/UJ) due to low spike recovery (< 75%):
Sb, Mn and Ag: all samples
The reviewer applied the "N" qualifier to Ag on the Form 1 since the lab omitted it.

Serial Dilution
The following elements were qualified as estimated (J) because the serial dilution analysis exceeded 10% for concentrations greater than 10 times IDL.

As: MMSSB0101, MMSSB0201, MMSSB0301, MMSSB0401
Co: MMSSB0101, MMSSB0701, MMDSB0701
Ni: all samples
K: MMSSB0701, MMDSB0701

Cyanide

Miscellaneous
The reviewer corrected the non-detect value reported for the prep blank because it was reported in the wrong units.

Reviewed by: Cecelia N. Minch Date: 12/21/97
Cecelia N. Minch

Group #	Date	Sample No.	Matrix	VOA	BNA	Pest/PCB	Metals	CN	Non-Compliancy
65807	12/10/96	SFB0101	W	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C
65807	12/10/96	SSB0101	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B @ M #
65807	12/10/96	SSB0201	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B @ M #
65807	12/10/96	SSB0301	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D @ M #
65807	12/10/96	SSB0401	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D @ M #
65807	12/11/96	SFB0201	W	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C
65807	12/11/96	SSB0501	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B @ M #
65807	12/11/96	SSB0601	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D @ M #
65807	12/11/96	SSB0701	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D @ M #
65807	12/11/96	DSB0701	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D @ M #

B Blank contamination C Calibration
D %D
@ CRDL standard M Matrix spike F Field duplicate L LCS # Serial dilution

Foster Wheeler Environmental Corporation
Data Validation Report

Project: Magna Metals Site

Laboratory: IEA

Job No.: 20970-71589

Client Sample ID.	IEA – NJ ID	IEA – CT ID
MMSSS0101	71589001	970835A01
MMDSS0101	71589002	970835A02
MMSSS0201	71589003	970835A03
MMSSS0301	71589004	971121A04
MMSFB041197	71589007	970835A05
MMSSS0401	71589008	970835A06
MMSSS0501	71589009	970835A07

One aqueous and six soil samples were analyzed by IEA for volatiles, semivolatiles, pesticides/PCBs, metals and cyanide using EPA CLP protocols. A Level IV data validation was performed on the package using CLP Organics Data Review and Preliminary Review, SOP No. HW-6, Revision #11 (5/96), Evaluation of Metals Data for the Contract Laboratory Program, SOW Revision XI (1/92) and best professional judgement. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ The analysis indicates the presence of an analyte that has been "tentatively identified"and the associated numerical value represents its approximate concentration.

— The sample results (inorganic) are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Sample Condition
- Holding Time
- System Monitoring Compound/Surrogate Recoveries
- Matrix Spike
- Blank Contamination
- Instrument Performance
- Initial and Continuing Calibrations
- Internal Standards
- Interference Check Sample
- Duplicates
- Laboratory Control Sample
- Serial Dilution

Sample Condition
Each department in both labs performed separate % moisture/% solid determinations which account for the discrepancies observed in values reported among the various analyses for a given sample.

Volatiles

Calibrations
Acetone was estimated (UJ) in all soil samples for exceeding %RSD criteria in the initial calibration.
Acetone was estimated (J) in MMSFB041197 for exceeding %D in the associated continuing calibration.

Semivolatiles

Matrix Spike
The MSD exceeded recovery for 2,4-dinitrotoluene, but no action was required.

Blank Contamination
The following were qualified "U" due to similar contamination in an associated blank:
diethylphthalate: MMSSS0201, MMSSS0301, MMSSS0401, MMSSS0501
di-n-butylphthalate: MMSSS0201, MMSSS0301, MMSSS0401, MMSSS0501
bis(2-ethylhexyl)phthalate: MMSSS0301, MMSSS0401, MMSSS0501
TICs identified as "unknown" at retention time 4.4 were qualified "R" in MMSSS0101, MMDSS0101, MMSSS0201, MMSSS0301 and MMSSS0401 due to similar contamination in the method blank.

Calibrations
The following were qualified as estimated (J/UJ) because the %D exceeded 25%:

2,4-dinitrophenol: MMSSS0101, MMDSS0101

Pesticides/PCBs

Sample Identification
The following actions were taken because the %D between values derived from the 2 dissimilar columns exceeded 25%.

Qualified "U" (%D > 50% and sample value < CRQL)
delta-BHC: MMSSS0201
heptachlor: MMSSS0101
DDE: MMSSS0501

Qualified "JN" (%D > 100, interference observed)
DDT: MMSSS0101, MMDSS0101, MMSSS0201

Qualified "J" (%D > 25%)
DDE: MMSSS0101
DDD: MMSSS0201 – (also qualified "N" due to aroclor interference)

The positive results for aroclors 1260 and 1254 were estimated (J) in samples MMSSS0101, MMDSS0101 and MMSSS0201 due to coelution of the quantitation peaks.

Metals

Calibrations
Zinc was estimated (J) in MMSFB041197 for exceeding recovery in the CRDL standard.

Matrix Spike
The following were qualified as estimated (J/UJ) due to low spike recovery (< 75%):

Sb, Cd, Se: all soils

Laboratory Control Sample (LCS)
Silver was estimated (UJ) in MMSFB041197 due to LCS recovery.

Serial Dilution
Zinc was qualified as estimated (J) in all soil samples because the serial dilution analysis exceeded 10% for concentrations greater than 10 times IDL.

Duplicate
Copper was estimated (J) in MMSSS0101 and MMDSS0101 for exceeding field duplicate criteria.

Cyanide

Matrix Spike
All soil samples were estimated (UJ) due to low spike recovery.

Miscellaneous
The reviewer corrected the non-detect value reported for MMSSS0101, as well as all % solid values on the Form 1s.

Reviewed by: Cecelia N. Mfnch Date: 12/21/97
Cecelia N. Mfnch

Group #	Date	Sample No.	Matrix	VOA	BNA	Pest/PCB	Metals	CN	Non-Compliancy
71589	4/11/97	SSS0101	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C D M # F
71589	4/11/97	DSS0101	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C D M # F
71589	4/11/97	SSS0201	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D M #
71589	4/11/97	SSS0301	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B M #
71589	4/11/97	SFB041197	W	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C @ L
71589	4/11/97	SSS0401	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B M #
71589	4/11/97	SSS0501	S	OLMO3.2	OLMO3.1	OLMO3.2	ILMO4.0	ILMO4.0	C B D M #

B Blank contamination C Calibration
D %D
@ CRDL standard M Matrix spike F Field duplicate L LCS # Serial dilution

Foster Wheeler Environmental Corporation
Data Validation Report

Project: Magna Metals Site

Laboratory: IEA

Job No.: 20970-72054, 72085, 72093, 72184

Client Sample ID.	IEA – NJ ID	IEA – CT ID
MMSSW1001	72054001	971121A01
MMSSD1001	72054004	971121A02
MMSSW1101	72054007	971121A03
MMSSD1101	72054008	971121A04
MMSSW0201	72054009	971121A05
MMSSD0201	72054010	971121A06
MMSSW0101	72054012	971121A07
MMSSW0301	72054013	971121A08
MMSSW0801	72054014	971121A09
MMSSW0901	72054015	971121A10
MMSFB051297	72054016	971121A11
MMSSD0801	72054017	971121A12
MMSSD0901	72054018	971121A13
MMSSD0101	72054019	971121A14
MMSSD0301	72054020	971121A15
MMSSPAQ01	72085001	971144A13
MMSSPSL01	72085002	971144A14
MMSLPAQ01	72085003	971144A15
MMSSW0401	72093001	971144A01
MMSSD0401	72093002	971144A02
MMSSW0501	72093003	971144A03
MMSSD0501	72093004	971144A04
MMSSW0601	72093005	971144A05
MMSSD0601	72093006	971144A06
MMSSW0701	72093007	971144A07
MMSSD0701	72093008	971144A08
MMSSW1201	72093009	971144A09
MMSSD1201	72093010	971144A10
MMDSW0101	72093011	971144A11
MMDSD0101	72093012	971144A12
Trip Blank	72184001	
MMSFB051297	72184002	
MMSSPAQ01	72184003	
MMSLPAQ01	72184004	
MMSSW0101	72184005	
MMSSW0201	72184006	
MMSSW0301	72184007	
MMSSW0401	72184008	
MMDSW0101	72184009	
MMSSW0501	72184010	
MMSSW0601	72184011	
MMSSW0701	72184012	
MMSSW0801	72184013	
MMSSW0901	72184014	
MMSSW1001	72184015	
MMSSW1101	72184018	
MMSSW1201	72184019	

Seventeen aqueous and fourteen soil samples were analyzed by IEA for volatiles, semivolatiles, pesticides/PCBs, metals, cyanide, TOC and hardness using NYSASP protocols 95.1, 95.3 – 95.6, OLMO3.1, ILMO4.0, Lloyd Kahn and Standard Methods 2340B methodologies. A Level IV data validation was performed on the package using CLP Organics Data Review and Preliminary Review, SOP No. HW-6, Revision #11 (5/96), Evaluation of Metals Data for the Contract Laboratory Program, SOW Revision XI (1/92) and best professional judgement. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ The analysis indicates the presence of an analyte that has been "tentatively identified"and the associated numerical value represents its approximate concentration.

— The sample results (inorganic) are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Sample Condition
- Holding Time
- System Monitoring Compound/Surrogate Recoveries
- Matrix Spike
- Blank Contamination
- Instrument Performance
- Initial and Continuing Calibrations
- Internal Standards
- Interference Check Sample
- Duplicates
- Laboratory Control Sample
- Serial Dilution

Sample Condition

All data were qualified as unusable (R) in the volatile analysis of MMSSD0301 because the % moisture exceeded 90%. All data not previously qualified "R" in all other analyses of MMSSD0301 have been estimated (J/UJ) due to a moisture content greater than 50%.
All data in the volatile analysis of sample MMSSD0201 were estimated (J/UJ) because the % moisture exceeded 50%.
All data in the volatile and semivolatile analyses of MMSSD0801 were estimated (J/UJ) due to % moisture > 50%.
All data not previously rejected were estimated (J/UJ) in the metals analysis of sample MMSSD0101 due to % solid <50%.
All data not previously rejected or qualified unusable (R) were estimated (J/UJ) in all analyses of the following samples because the % moisture exceeded 50 % for organic analyses and % solids < 50% for inorganic analyses:

MMSSD0401, MMSSD0501, MMSSD0601, MMSSD0701, MMSSD0901, MMDSD0101, MMSSPSL01

NOTE: Each department in both labs performed separate % moisture/% solid determinations which account for the discrepancies observed in values reported among the various analyses for a given sample.

Volatiles

Blank Contamination

The following were qualified "U" because the sample concentration was less than 10 times the concentration found in an associated blank:

methylene chloride: MMSSD1001, MMSSD0201, MMSSD0801, MMSSD0901, MMSSD0901RE, MMSSD0101, MMSSPSL01, MMSSD0501, MMSSD0501RE, MMSSD1201, MMSSD0601, MMSSD0701

acetone: MMSSD1001, MMSSD1101, MMSSD0201, MMSSD0901RE, MMSSD0101, MMDSD0101, MMSSPSL01, MMSSD0601, MMSSD0701, MMSSD1201

Calibrations

Acetone, 2-butanone and 2-hexanone exhibited RRFs < 0.05 and were, therefore, qualified as unusable (R) in all aqueous samples.

The following were estimated (J/UJ) due to %RSD >30%:

methylene chloride, acetone, dibromochloromethane, 2-hexanone: MMSSD1001, MMSSD1101, MMSSD0101, MMSSD1201

Several samples would also have been qualified for %RSD, as well as %D, but were previously qualified for other criteria.

Internal Standards
The following samples exhibited low internal standard areas as indicated, but the associated analytes were previously qualified for other criteria:

IS#2 – MMSSD0901
IS#3 – MMDSD0101, MMSSD0501, MMSSD0501RE, MMSSD0901, MMSSD0901RE

Semivolatiles

Holding Time
Sample MMSSD0701RE was re-extracted out of holding time and would have been qualified as estimated (J/UJ), but was previously qualified for other criteria.

Surrogates
All acid compounds were qualified as unusable (R) in sample MMSSD0701 because 2 surrogates exhibited low recovery, 1 of which was less than 10%.

Blank Contamination
The following were qualified "U" due to similar contamination in an associated method blank:

diethylphthalate: MMSSW0401, MMSSW0501, MMSSPAQ01, MMSLPAQ01, MMDSW0101
di-n-butylphthalate: all aqueous samples except MMSFB051297, MMSSD1001, MMSSD1101, MMSSD0201, MMSSD0901, MMSSD0301, MMSSD0701RE
bis(2-ethylhexyl)phthalate: MMSSD1001, MMSSD1101, MMSSD0201, MMSSD0101, MMSSD0301, MMSSD0701RE, MMSSD0801, MMSSD0901, MMSSW1001, MMSSW0301, MMSSW0801, MMSSW0901

Matrix Spike
Both the soil and aqueous spikes exhibited recoveries out of limits, but no action was required. Clerical errors were corrected on the aqueous Form 3 by the reviewer.

Calibrations
The following were qualified as estimated (J/UJ) because the %D exceeded 25%:

butylbenzylphthalate, bis(2-ethylhexyl)phthalate, di-n-octylphthalate: MMSSW1001, MMSSW1101, MMSSW0101, MMSSW0201, MMSSW0301, MMSSW0401, MMSSW0501, MMSSW0601, MMSSW0710, MMSSW0801, MMSSW0910, MMSSW1201, MMDSW0101, MMSSPAQ01, MMSLPAQ01
hexachlorocyclopentadiene, 4-nitrophenol, di-n-octylphthalate: MMSSD1001, MMSSD1101, MMSSD0101, MMSSD0201, MMSSD1201, MMSFB051297
2,4-dinitrophenol, pentachlorophenol: MMSSD1001, MMSSD1101, MMSSD0101, MMSSD0201
benzo(b)fluoranthene: MMSFB051297, MMSSD1201

All other affected samples were previously qualified for other criteria.

Internal Standards
Samples MMSSPSL01 and MMSSPSL01DL exhibited low area for IS#4. All associated compounds (4,6-dinitro-2-methylphenol → fluoranthene) would have been estimated (J/UJ), but were previously qualified for other criteria.

Pesticides/PCBs

Sample Identification
Alpha-chlordane was estimated (J) in sample MMSSD1001 because the %D between values derived from the 2 dissimilar columns exceeded 25%. The results for aroclors 1248, 1260 and DDE reported in MMSSPSL01 would also have been estimated, but were previously qualified for other criteria.

Miscellaneous
The sample identification was documented incorrectly on the extraction log for samples MMSSW0101 and MMDSD0101.
The lab did not extract the aqueous samples using the 95-6 protocol. The extracts were concentrated by a factor of 5 to compensate for the error.

Metals

Calibrations
The following actions were taken based upon CRDL standard recovery:

Rejected %R < 50%:
Tl: MMSSD1001

Rejected, %R > 150%:
Pb: MMSSW0501, MMSSW1201, MMDSW0101, MMSSPAQ01, MMSLPAQ01

Estimated (J/UJ), 50% < %R < 80%:
Tl: all aqueous samples
MMSSD1101, MMSSD0201, MMSSD0801

Estimated (J), 120% < %R < 150%:
Pb: MMSSW0201, MMSSW0301

All other affected samples were previously qualified.

Matrix Spike
The following positive results were rejected due to spike recovery > 200%:
Mn: MMSSD1001, MMSSD1101, MMSSD0201, MMSSD0801, MMSSD0901, MMSSD0101, MMSSD0301
Cr: MMSSD0401, MMSSD0501, MMSSD0601, MMSSD0701, MMSSD1201, MMDSD0101, MMSSPLS01

The following were qualified as estimated (J/UJ) due to low spike recovery (< 75%):
Fe: MMSSW0401, MMSSW0501, MMSSW0601, MMSSW0701, MMSSW1201, MMDSW0101, MMSSPAQ01, MMSLPAQ01
Sb: MMSSD1201

All other affected samples were previously qualified for other criteria.

Laboratory Control Sample (LCS)
The following actions were taken due to low LCS recovery.
Estimated (J):
K: MMSSW0401, MMSSW0501, MMSSW0601, MMSSW0701, MMSSW1201, MMDSW0101, MMSSPAQ01, MMSLPAQ01
Estimated (UJ):
Ag: all aqueous samples

Serial Dilution
The following elements were qualified as estimated (J) in the samples indicated because the serial dilution analysis exceeded 10% for concentrations greater than 10 times IDL.

K: MMSSD0801, MMSSW0901
Zn: MMSSD1201, MMSSW0501, MMSSW0601, MMSSW0701, MMSSW1201, MMDSW0101, MMSSPAQ01, MMSLPAQ01

All other affected elements/samples were previously qualified for other criteria.

Cyanide

Duplicates
Samples MMSSW0401 and MMDSW0101 were estimated (J/UJ) for exceeding field duplicate criteria. The soil field duplicate pair (MMSSD0401/MMDSD0101) also failed criteria, but was previously qualified.

Miscellaneous
The reviewer corrected a false negative reported for sample MMSSD0601.

TOC

Miscellaneous
The lab reported results for sample MMSSPSL01, though no TOC analysis was requested on the chain-of-custody.

Hardness

All data were acceptable.

Reviewed by: Cecelia N. Minch Date: 11/26/97
Cecelia N. Minch

MAGNA METALS
VALIDATION REPORT

Group #	Date	Sample No.	Matrix	BNA Protocol	Pest/PCB Protocol	Metals Protocol	CN Protocol	Hardness Protocol	Page No. in the CLP	Non-Compliancy
72054	5/13/97	SSW1001	W	95-5	95-3	ILMO4.0	ILMO4.0	2340B		C R @ L
72054	5/13/97	SSW1101	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L
72054	5/13/97	SSW0201	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L
72054	5/13/97	SSW0101	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L
72054	5/13/97	SSW0301	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L
72054	5/13/97	SFB051297	W	95-5	95-3	ILMO4.0	ILMO4.0			C R @ L
72054	5/13/97	SSW0801	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L
72054	5/13/97	SSW0901	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ L #
72085	5/15/97	SSPAQ01	W	95-5	95-3	ILMO4.0	ILMO4.0			C R @ M L #
72085	5/15/97	SLPAQ01	W	95-5	95-3	ILMO4.0	ILMO4.0			C R @ M L #
72093	5/15/97	SSW0401	W	95-5	95-3	ILMO4.0	ILMO4.0	2340B		C R @ M L F
72093	5/15/97	SSW0501	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ M L #
72093	5/15/97	SSW0601	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ M L #
72093	5/15/97	SSW0701	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ M L #
72093	5/15/97	SSW1201	W	95-5		ILMO4.0	ILMO4.0	2340B		C @ M L #
72093	5/15/97	DSW0101	W	95-5	95-3	ILMO4.0	ILMO4.0	2340B		C R @ M L # F

BNA H - Holding time S - Surrogate B - Blank Contamination C - Calibration * - Internal standard
Pest R - %RSD
Metals @ - CRDL standard M - Matrix spike F - Field duplicate L - LCS # - Serial dilution

MAGNA METALS
VALIDATION REPORT

Group #	Date	ASP Proto #	Sample No.	Matrix	VOA	BNA	Pest/PCB	Metals	CN	Hardness	Page No. in the CLP	Non-Compliancy
72184	5/22/97	95-4	SSW1001	W	X							+
72184	5/22/97	95-4	SSW1101	W	X							+
72184	5/22/97	95-4	SSW0201	W	X							+
72184	5/22/97	95-4	SSW0101	W	X							+
72184	5/22/97	95-4	SSW0301	W	X							+
72184	5/22/97	95-4	SFB051297	W	X							+
72184	5/22/97	95-4	SSW0801	W	X							+
72184	5/22/97	95-4	SSW0901	W	X							+
72184	5/22/97	95-4	SSPAQ01	W	X							+
72184	5/22/97	95-4	SLPAQ01	W	X							+
72184	5/22/97	95-4	SSW0401	W	X							+
72184	5/22/97	95-4	SSW0501	W	X							+
72184	5/22/97	95-4	SSW0601	W	X							+
72184	5/22/97	95-4	SSW0701	W	X							+
72184	5/22/97	95-4	SSW1201	W	X							+
72184	5/22/97	95-4	DSW0101	W	X							+
72184	5/22/97	95-4	Trip Blank	W	X							+

+ RRF < 0.05

Group #	Date	Sample No.	Matrix	VOA	BNA	Pest/PCB	Metals	CN	TOC	Page No. in the CLP	Non-Compliancy
72054	5/13/97	SSD1001	S	95-1	OLMO3.1	95-3	ILMO4.0	ILMO4.0	L Kahn		C B D @ M
72054	5/13/97	SSD1101	S	95-1	OLMO3.1		ILMO4.0	ILMO4.0	L Kahn		C B @ M
72054	5/13/97	SSD0201	S	* 95-1	OLMO3.1		ILMO4.0	ILMO4.0	L Kahn		C B @ M
72054	5/13/97	SSD0801	S	* 95-1	* OLMO3.1		ILMO4.0	ILMO4.0	L Kahn		C B @ M #
72054	5/I3/97	SSD0901	S	* 95-1	* OLMO3.1		* ILMO4.0	* ILMO4.0	* L Kahn		C B I @M
72054	5/13/97	SSD0101	S	95-1	OLMO3.1		* ILMO4.0	ILMO4.0	L Kahn		C B @ M
72054	5/13/97	SSD0301	S	* 95-1	* OLMO3.1		* ILMO4.0	* ILMO4.0	* L Kahn		C B @ M
72085	5/15/97	SSPSL01	S	* 95-1	* OLMO3.1	* 95-3	* ILMO4.0	* ILMO4.0			C B I D M #
72093	5/15/97	SSD0401	S	* 95-1	* OLMO3.1	* 95-3	* ILMO4.0	* ILMO4.0	* L Kahn		CB @ M # F
72093	5/15/97	SSD0501	S	* 95-1	* OLMO3.1		* ILMO4.0	* ILMO4.0	* L Kahn		C S B I M #
72093	5/15/97	SSD0601	S	* 95-1	* OLMO3.1		* ILMO4.0	* ILMO4.0	* L Kahn		C B M #
72093	5/15/97	SSD0701	S	* 95-1	* OLMO3.1		* ILMO4.0	* ILMO4.0	* L Kahn		H S C M #
72093	5/15/97	SSD1201	S	95-1	OLMO3.1		ILMO4.0	ILMO4.0	L Kahn		C M #
72093	5/15/97	DSD0101	S	* 95-1	* OLMO3.1	* 95-3	* ILMO4.0	* ILMO4.0	* L Kahn		C B I M # F

H Holding time S Surrogate C Calibration I Internal standard
D %D
@ CRDL standard M Matrix spike F Field duplicate L LCS # Serial dilution
* %moisture > 50%

Foster Wheeler Environmental Corporation
Data Validation Report

Project: Magna Metals Site

Laboratory: IEA

Job No.: 20970-75528

Client Sample ID.	IEA – NJ ID	IEA – CT ID
MMS-MW3-01	75528001	972897A-01
MMS-SS02-02	75528002	972897A-02
MMS-MW4-01	75528003	972897A-03
MMS-MW4-02	75528004	972897A-04
MMS-MW4-03	75528005	
MMS-MW2-01	75528006	972897A-05
MMD-MW2-01	75528007	972897A-06
MMS-MW2-02	75528008	972897A-07
MMS-MW1-01	75528009	972897A-08
MMS-MW1-02	75528010	972897A-09
MMS-MW-FB	75528011	

One aqueous and ten soil samples were analyzed by AEN for volatiles, semivolatiles, pesticides/PCBs, metals, cyanide, TOC and grain size using NYSASP and EPA CLP protocols. A Level IV data validation was performed on the package using CLP Organics Data Review and Preliminary Review, SOP No. HW-6, Revision #11 (5/96), Evaluation of Metals Data for the Contract Laboratory Program, SOW Revision XI (1/92) and best professional judgement. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ The analysis indicates the presence of an analyte that has been "tentatively identified"and the associated numerical value represents its approximate concentration.

— The sample results (inorganic) are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Sample Condition
- Holding Time
- System Monitoring Compound/Surrogate Recoveries
- Matrix Spike
- Blank Contamination
- Instrument Performance
- Initial and Continuing Calibrations
- Internal Standards
- Interference Check Sample
- Duplicates
- Laboratory Control Sample
- Serial Dilution

Sample Condition

Each department in both labs performed separate % moisture/% solid determinations which account for the discrepancies observed in values reported among the various analyses for a given sample.

Volatiles

Blank Contamination

The following were qualified "U" due to similar contamination in an associated blank:

methylene chloride: all soils except MMS-MW2-01 and MMS-MW1-01
acetone: all soils

Matrix Spike

The lab did not perform the MS/MSD analyses on a soil from this sample batch. All criteria were met.

Calibrations

2-Butanone and 2-hexanone were qualified unusable (R) in MMS-MW-FB because the RRFs were less than 0.05.

The following were estimated (J/UJ) for exceeding %RSD criteria in the associated initial calibration.

acetone: all samples

The following were estimated for exceeding %D criteria.

methylene chloride: MMS-MW-FB

Semivolatiles

Blank Contamination

The following were qualified "U" due to similar contamination in the associated blank:

diethylphthalate: MMS-MW4-01, MMS-MW2-01
di-n-butylphthalate: all samples.
bis(2-ethylhexyl)phthalate : all soil samples except MMS-MW1-01

Calibrations

The following were qualified as estimated (J/UJ) because the %D exceeded 25%:

hexachlorocyclopentadiene, 4-nitrophenol, pentachlorophenol: MMS-MW4-02, MMS-MW2-01
2,2'-oxybis(1-chloropropane), 2-nitrophenol: all samples except MMS-MW4-02 and MMSMW2-01
hexachlorobutadiene: MMS-MW3-01, MMD-MW2-01, MMS-MW2-02, MMS-MW1-01, MMS-MW1-02

Pesticides/PCBs

Holding Time

Sample MMS-MW4-02 was estimated (J/UJ) for exceeding holding times (both technical and contractual).

Calibrations

DDT would have been estimated (J) for exceeding %RSD criteria, but was previously qualified for other criteria.

Sample Identification

The following actions were taken because the %D between values derived from the 2 dissimilar columns exceeded 25%.

Qualified "U" (%D > 50% and sample value < CRQL)
MMS-MW4-02: alpha-BHC, dieldrin, heptachlor, endosulfan I, alpha-chlordane

Endosulfan II and DDD would have been estimated (J), but were previously qualified.

Metals

Calibrations

The following were estimated (J/UJ) for failing CRI recovery criteria:

50% < %R < 80%:
Tl: all samples

120% < %R < 150%:
Pb: MMS-MW4-02, MMS-MW2-02, MMS-MW1-01

Matrix Spike

The following were qualified as estimated (J/UJ) due to low spike recovery (< 75%):

Se and Ag: all samples

The reviewer applied the "N" qualifier to Ag on the Form 1 since the lab omitted it.

Duplicates

Mercury was estimated (J/UJ) in all samples for failing lab duplicate criteria

Serial Dilution

The following elements were qualified as estimated (J) because the serial dilution analysis exceeded 10% for concentrations greater than 10 times IDL.

As: MMS-MW3-01, MMS-MW4-02, MMS-MW2-02
Zn: all samples

Cyanide

Matrix Spike

All sample results were qualified as unusable (rejected) due to extremely low spike recovery.

TOC

All data were acceptable.

Grain Size

All data were acceptable.

Reviewed by: Cecelia N. Minch Date: 1/21/98
Cecelia N. Minch

MAGNA METALS

Group #	Date	Sample No.	Matrix	VOA	BNA	Pest/PCB	Metals/CN	TOC	Grain Size	Non-Compliancy
75528	11/17/97	MW3-01	S	95-1	95-2		ILMO4.0		D-421,422	C B @ M L #
75528	11/17/97	SS02-02	S					L. Kahn		
75528	11/18/97	MW4-01	S	95-1	95-2		ILMO4.0			C B @ M L #
75528	11/18/97	MW4-02	S	95-1	95-2	95-3	ILMO4.0	L. Kahn		C B H D @ M L #
75528	11/18/97	MW4-03	S	95-1					D-421,422	
75528	11/18/97	MW2-01	S	95-1	95-2		ILMO4.0			C B @ M L #
75528	11/18/97	D-MW2-01	S	95-1	95-2		ILMO4.0			C B @ M L #
75528	11/18/97	MW2-02	S	95-1	95-2		ILMO4.0	L. Kahn	D-421,422	C B D @ M L #
75528	11/19/97	MW1-01	S	95-1	95-2		ILMO4.0			C B D @ M L #
75528	11/19/97	MW1-02	S	95-1	95-2		ILMO4.0	L. Kahn	D-421,422	C B D @ M L #
75528	11/19/97	MW-FB	W	95-4						C

H Holding Time C Calibration D %D B Blank contamination
@ CRDL standard M Matrix spike L Lab duplicate # Serial dilution

TETRA TECH FW, INC.

Interoffice Memorandum

To: Cindy Snyder, Donald Campbell
From: Julienne Loppnow

Date: December 08, 2003

Subject: Magna Metals
Data Validation Report

The following cases of analytical data generated by Chemtech in Mountainside, New Jersey for the project site Magna Metals were validated by an EPA Region II certified validator utilizing applicable criteria specified in EPA Region II Standard Operating Procedure (SOP) HW-22, Rev. 2, June 2001, and best professional judgment.

The analytical data were reviewed and evaluated based on the following parameters (as applicable):

	Data Completeness
	Sample Preservation and Holding Times
	Initial and Continuing Calibrations
	CRDL Check Standard
	Serial Dilutions
	Compound Identification
	Surrogates
	Interference Check Sample
	GC/MS Performance Check
	Blanks
	Matrix Spike/Matrix Spike Duplicates
	Laboratory Control Spike/ Laboratory Control Spike Duplicates
	Internal Standards
	Field Duplicates

Based upon this review, the following narratives summarizes the acceptability and usability status of each individual analytical fraction result:

Project# R3601
There were seven (7) soil and one (1) water samples collected July 29, 2003 in sample delivery group R3601 - "MM-SS-" 14-072903, 13-072903, 15-072903, 11-072903, 12-072903, 08-072903, 07-072903; MM-FB-072903. The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B and Metals/Cyanide - SW-846.6010/9012.

VOLATILES
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications
1. One of the surrogate recoveries in sample MM-SS15-072903 and MM-SS07-072903RE was below recommended limits. The results were flagged "UJ/J" estimated.
2. Acetone was detected in one of the method blanks and some of its associated samples. The compound was flagged "U" for contamination - MM-SS11-072903, MM-SS12-072903, and MM-SS15-072903.
3. A few of the internal standard (IS) area counts in the samples were also below recommended limits and all associated compounds were flagged "UJ/J" estimated.

Sample	*IS Outlier*
MM-SS11-072903RE	3
MM-SS14-072903	3
MM-SS14-072903RE	1,2,3

Comments
1. The soil samples were reanalyzed and its data were also provided. One of each sample was determined usable - MM-SS14-072903, MM-SS13-072903, MM-SS15-072903RE, MM-SS11-072903, MM-SS07-072903, and MM-SS08-072903.

INORGANICS
The samples, for the most part, were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications
1. The CRI standard was noted to have a high recovery for selenium. The metal was flagged "J" for positive results between 0-2xCRDL - MM-SS08-072903, MM-SS14-072903, and MM-SS15-072903. A very high recovery was reported for mercury - positive results between 0-0.2 for this metal were rejected - MM-SS12-072903.
2. Mercury spike analysis was also outside limits, but low. All the samples not already qualified for the metal were flagged "UJ/J" estimated.
3. Potassium, sodium, and zinc serial dilution results were > 10%D. Samples > CRDL were flagged "J" - K: MM-SS11-072903, MM-SS12-072903, and MM-SS08-072903, Na: MM-SS07-072903, and Zn: all.

Comments
1. The "E" qualifiers were omitted from the Form Is (serial dilution QC).

Project# R3602
There were nine (9) soil and one (1) water samples collected July 30, 2003 in sample delivery group R3602 - "MM-SS-" 06-073003, 09-073003, 10-073003; MM-LP-" 02-073003, 03-073003, 13-073003, 05-073003, 0A-073003, 09-073003; MM-FB-073003. There was a field duplicate set included - MM-LP03-073003/MM-LP13-073003.
The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B, Semi-Volatiles (BNA) - SW846.8270C, Pesticides/PCBs (P/P) - SW-846.8081/8082, Total Organic Carbon (TOC) - SW-846.9060, and Metals/Cyanide - SW-846.6010/9012.

GENERAL
1. Samples MM-SS10-073003, MM-LP03-073003, MM-LP02-073003, and MM-LP13-073003 have %Solids < 50%. All volatile and inorganic results for these samples were flagged "UJ/J" unless otherwise specified as rejected.
2. It should be noted that the contractual holding times for the laboratory is different from the technical holding times for the reviewer. Consequently, all the semi-volatile and pesticide/PCB results were flagged "UJ/J" estimated.

VOLATILES
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
There were some discrepancies noted by the reviewer. Clarification was requested from the laboratory.
1. Sample MM-SS10-073003RE's (VJ081263.D) 2-butanone confirmation spectra showed the presence of cis-(1,2)dichloroethene, yet was not reported. *Compound was detected but result was below detection limit and therefore not reported.*
2. The method blank VBLK01 (VJ080903.D) had a peak @ 3.1 min. that was not checked - methylene chloride? *Adjusted blank with supporting data provided.*

Qualifications
1. The first three internal standards for MM-SS09-073003RE and the second and third standards in MM-LP02-073003RE were below recommended area counts. The associated compounds with the internal standards were flagged "UJ/J" estimated.
2. Methylene chloride in one of the continuing calibrations was > 25%D - samples "MM-LP" 03-073003, 09-073003, 05-073003, and 13-073003.
3. Acetone and methylene chloride were detected in the various method blanks and samples. The samples were flagged "U" for contamination.

Compound	*Sample(s) - "MM- -073003"*
Acetone	LP03, LP13, LP02, SS09, SS06
Methylene Chloride	LP03, LP05, LP0A, LP09, LP13, SS10RE

Comments

1. The soil samples were reanalyzed and its data were also provided. One of each sample was determined usable - MM-SS06-073003RE, MM-SS09-073003RE, MM-SS10-073003, and MM-LP02-073003RE.

SEMI-VOLATILES

The samples, for the most part, were successfully analyzed, though there were some qualifications needed. The data is acceptable for use.

There were some discrepancies noted by the reviewer and clarification requested from the laboratory.

1. The confirmation spectra of bis(2-ethylhexyl)phthalate in SBLK01 (BE004691.D) was omitted from the data package. *Provided.*
2. Confirmation spectra and quant report noted the presence of indeno(1,2,3-cd)pyrene, but the Form I did not indicate a detection in sample MM-LP02--073003 (BE004721.D). Same for chrysene, benzo(k)fluoranthene, and benzo(g,h,i)perylene in MM-LP09-073003 (BE004724.D) *Compounds were below detection limit and so not reported.*

Qualifications

1. Due to poor spectral confirmation, pyrene in MM-LP09-073003 was flagged "JN" presumptive.

Comments

1. The sixth internal standard for MM-LP09-073003 was below minimum area count; however, due to previous qualifications, no further action was necessary.

PESTICIDES/PCBS

The samples, for the most part, were successfully analyzed with minimal qualifications. The data is acceptable for use.

Some questions arose during the review process. Clarification was requested from the laboratory.

1. Surrogate recoveries extremely high for MM-LP09-073003DL. *Confirmed.*
2. Matrix spike/matrix spike duplicate recoveries also extremely high. *Confirmed, probably due to sample matrix interferences.*
3. Were endrin/DDT breakdowns performed and calculated? *They were analyzed, but were not required as deliverables. Results were acceptable.*

Comments

1. MM-LP09-073003DL's aroclor 1254 would have been flagged "J" estimated for high surrogate recoveries, but had been previously qualified.
2. MM-LP09-073003's aroclor 1254 result was > high standard and also would have been flagged "J" estimated.

INORGANICS

The samples, for the most part, were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The CRI standard for selenium had a high recovery. Only sample MM-SS06-073003 required estimation "J".
2. Low recoveries for mercury were noted - all samples not already qualified were flagged "UJ/J" estimated.
3. Potassium, sodium, and zinc serial dilutions were > 10%D. Results > CRDL not already qualified were flagged "J" - K: MM-SS09-073003 and MM-LP09-073003, Na: MM-LP02-073003, MM-LP03-073003, MM-LP13-073003, and MM-LP05-073003, and all for Zn.
4. The matrix duplicate %RPD for cyanide was high. Samples not already flagged were "J" estimated.

Comments

1. The difference between the field duplicate %Solids was > 1%.
2. The "E" qualifiers for K and Zn serial dilution were omitted from the Form Is .

Project# R4008

There were four (4) soil and one (1) water samples collected August 26, 2003 in sample delivery group R4008 - MM-ST01-082603, MM-ST02-082603(0-1), MM-ST02-082603(1-1.25), MM-LP02-082603(10.0-10.75), and MM-FB-082603.

The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B, Semi-Volatiles (BNA) - SW846.8270C, Pesticides/PCBs (P/P) - SW-846.8081/8082, Total Organic Carbon (TOC) - SW-846.9060, and Metals/Cyanide - SW-846.6010/9012.

GENERAL

1. Samples MM-ST02-082603(0-1) and MM-ST01-082603 have %Solids < 50%. All volatile and inorganic results for these samples were flagged "UJ/J" unless otherwise specified as rejected.
2. It should be noted that the contractual holding times for the laboratory is different from the technical holding times for the reviewer. Consequently, all the semi-volatile and pesticide/PCB results were flagged "UJ/J" estimated.

VOLATILES

The samples were, for the most part, successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. Methylene chloride in the soil initial calibration was > 30% RSD. Sample MM-LP02-082603(10.0-10.75) was flagged "UJ/J" estimated. Sample MM-ST01-082603 would have been qualified, but was flagged for other exceedences.

Comments

1. Sample MM-ST01-082603 had xylenes reported over the high standard; they would have been flagged, but were already qualified elsewhere.

SEMI-VOLATILES

The samples were, for the most part, successfully analyzed with some qualifications. The data is acceptable for use. There was one discrepancy that required further laboratory clarification:

1. Both the quant report and reference spectras demonstrated the presence of anthracene, indeno(1,2,3-cd)pyrene, and benzo(k)fluoranthene in sample MM-ST02-082603(1-1.25) (BE005545.D), yet were reported on the Form I as non-detected. *Present, but below detection limits, and so were not reported.*

ESTICIDES/PCBS

The samples were, for the most part, successfully analyzed with some qualifications. The data is acceptable for use. There was one discrepancy that required further laboratory clarification:

1. Sample MM-LP02-082603(10.0-10.75)'s (4PC2058.D) chromatogram showed a series of peaks with a "fingerprint" of aroclor 1254. Recheck. *Positive presence but below detection level, so was not reported.*

Comments

1. There were several calibrations outside recommended limits, but as the samples were qualified for other exceedences, no further action was needed.

INORGANICS

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The matrix spike recovery for chromium was low, all the samples were flagged "UJ/J" estimated. The recoveries for manganese and mercury were high, all the samples except MM-LP02-082603(10.0-10.75) for mercury were also flagged "UJ/J".
2. Potassium and selenium serial dilutions exceeded limits. All the samples > CRDL were flagged "J" estimated for selenium and MM-ST02-082603(1-1.25) only for potassium.

Comments

1. The "E" qualifiers for potassium and selenium were omitted from the Form Is .

Project# R4142

There were nine (9) soil and one (1) water samples collected September 05, 2003 in sample delivery group R4142 - "MM-LP" 03-090503(1.3-2.0), 05-090503(1.0-1.2), 06-090503(0.3-0.8), 06-090503(0-0.3), 07-090503(0-0.1), 07-090503(0.1-0.5).

18-090503(0-0.3), 08-090503(0-0.3), 08-090503(0.3-0.6), and MM-FB-090503-03. A field duplicate set was included in the data package - MM-LP08-090503(0-0.3)/MM-LP18-090503(0-0.3).
The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B, Semi-Volatiles (BNA) - SW846.8270C, Pesticides/PCBs (P/P) - SW-846.8081/8082, Total Organic Carbon (TOC) - SW-846.9060, and Metals/Cyanide - SW-346.6010/9012.

GENERAL

1. Sample MM-LP06-090503(0.3-0.8) has %Solids < 50%.
   All volatile and inorganic results for the sample was flagged "UJ/J" unless otherwise specified as rejected.

VOLATILES

The samples were successfully analyzed for the most part with some qualifications. The data is acceptable for use.

Qualifications

1. One surrogate recovery for MM-LP07-090503(0-0.1) was reported low. The sample was flagged "UJ/J" estimated.
2. Methylene chloride was detected in the method blanks. The associated samples were flagged "U" - MM-LP07-090503(0-0.1), MM-LP06-090503(0-0.3), MM-LP06-090503(0.3-0.8), MM-LP07-090503(0-0.1)RE, MM-LP03-090503(1.3-2.0), and MM-LP05-090503(1.0-1.2).
3. Methylene chloride's initial calibration for soil samples was >50% RSD. The samples were flagged "UJ/J" estimated. Acetone, chloroethane, and 1,1-Dichloroethane's continuing calibrations were > 25% D - the associated samples were flagged "UJ/J" estimated. Acetone in MM-LP07-090503(0-0.1)RE was rejected due to very high %D continuing calibration.

Analyte	*Sample(s)*
Methylene chloride	all except MM-FB-090503-03
Acetone	MM-LP07-090503(0.1-0.5), MM-LP18-090503(0-0.3), MM-LP08-090503(0-0.3), MM-LP08-090503(0.3-0.6)
Chloroethane	"
1,1-Dichloroethane	all except MM-LP0709503(0-0.1)RE amd MM-FB090503-03

Comments

1. The initial RRFs for soil's acetone were not always > 0.05, but the average was acceptable. No further action was needed.

SEMI-VOLATILES

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The sixth internal standard for the diluted sample had low area counts. The associated compounds were flagged "UJ/J" estimated.
2. The analyte bis(2-ethylhexyl)phthalate in sample MM-LP07-090503(0-0.1) was > high standard and was flagged "J" estimated.
3. The initial calibration of 2,4-dinitrophenol was > 30% RSD and all samples except MM-LP07-090503(0-0.1)DL were flagged "UJ/J" estimated. The excepted sample was rejected for very high %RSD. This sample was also flagged "UJ/J" for 4,6-dinitro-2-methylphenol due to continuing calibration > 25%D.

Comments

1. It was noted that the original sample of the field duplicate set has low concentrations of the various phthalates, but the duplicate was clean. No action was taken.
2. Use the diluted value for bis(2-ethylhexyl)phthalate in sample MM-LP07-090503(0-0.1).

PESTICIDES/PCBS

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
The only discrepancy the reviewer noted and requested clarification from the laboratory was the possible presence of aroclor 1254 in sample MM-LP03-090503(1.3-2.0). *Adjusted Form I was submitted.*

Qualifications

1. The initial calibration of 4,4'-DDT was > 30% RSD. The samples were flagged "UJ/J" estimated. The β-BHC continuing calibration was > 25% D, the samples except MM-LP03-090503(1.3-2.0) and MM-LP05-090503(1.0-1.2) were flagged "UJ/J" estimated.

INORGANICS

For the most part, the samples were analyzed successfully with minimal qualifications except for some chromium, cobalt, and mercury. Other than the exceptions, the data is acceptable for use.

The reviewer found one discrepancy for the laboratory to clarify:

1. The two samples MM-LP07-090503(0-0.1) and MM-LP06-090503(0.3-0.8) have chromium > high standard and were analyzed diluted. Nickel also had the "H" notation in the raw data, yet wasn't reported as diluted. *New Form Is were submitted.*

Qualifications

1. High CRI recovery for cobalt resulted in "J" estimated flags for those concentrations < 2XCRDL for MM-LP06-090503(0-0.3) and MM-LP18-090503(-0-0.3). Mercury was rejected in sample MM-LP07-090503(0.1-0.5) due to very high CRI - recovery.
2. The serial dilutions for chromium and cobalt were very high (> 100% D) - all the samples were rejected for chromium and all except MM-LP06-090503(0-0.3), MM-LP18-090503(0-0.3), and MM-LP08-090503(0.3-0.6) for cobalt. Potassium was > 10% D and was flagged "J" estimated for samples MM-LP03-090503(1.3-2.0), MM-LP05-090503(1.0-1.2), MM-LP06-090503(0-0.3), and MM-LP07-090503(0.1-0.5).
3. The cyanide matrix duplicate was outside limits. The samples were flagged "J" estimated.
4. The field duplicate set for TOC was > 35% RPD. The two samples were flagged "J" estimated.

Project# R4548

There were one (1) soil and six (6) water samples collected October 06 and 07, 2003 in sample delivery group R4548 - "MM-GWMW" 05-100603, 01-100603, 08-100703, 07-100703, RA(2.5-3.0)-100703, MM-TB-100603, and MM-FB-100703. The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B, Semi-Volatiles (BNA) - SW846.8270C, Pesticides/PCBs (P/P) - SW-846.8081/8082, Total Organic Carbon (TOC) - SW-846.9060, and Metals/Cyanide - SW-846.6010/9012.

GENERAL

There was one general question that was not addressed in the package for which the reviewer requested laboratory clarification:

1. The cooler temperature was not provided in the data package. *Acceptable.*

VOLATILES

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The soil method blank had methylene chloride reported. Sample MM-RA(2.5-3.0)-100703 was flagged "U" contamination.
2. Several of the continuing calibrations exceeded the limits (50% D). The affected samples were flagged "UJ/J" estimated.

Analyte	Sample(s)
Tetrachloroethene	all except MM-FB-100703 and MM-RA(2.5-3.0)-100703
Bromoform	"
2-Butanone	MM-RA(2.5-3.0)-100703
2-Hexanone	"

SEMI-VOLATILES

The samples, for the most part, were successfully analyzed, though there was some contamination and one rejection. Other than those specified, the data is acceptable for use.

Qualifications

1. Bis(2-ethylhexyl)phthalate was detected in the method blank. The samples were flagged "U" contamination.
2. The sixth internal standard area count was low, the associated compounds with the standard in sample MM-RA(2.5-3.0)-100703 were flagged "UJ/J" estimated.
3. 2,4-Dinitrophenol's initial calibration was > 50% RSD; the sample was flagged "UJ" estimated. The continuing calibrations of hexachlorocyclopentadiene and 4,6-dinitro-2-methylphenol were > 50% D; the sample and its reanalysis were flagged "UJ" estimated. The continuing calibration of 2,4-dinitrophenol for MM-RA(2.5-3.0)-100703RE was very high (>100% D), and consequently was rejected.

Comments

1. Use the original analysis, not the reanalysis.

PESTICIDES/PCBS

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
The only discrepancy noted by the reviewer was the possible presence of aroclor 1260 in the sample, but not reported. *The concentration was below detection limit.*

Qualifications
1. The initial calibration of 4,4'-DDT and the continuing calibration of 4,4'-DDD exceeded their control limits. Consequently, these two analytes were flagged "UJ" estimated.

INORGANICS
The samples were successfully analyzed with only a few qualifications. The data is acceptable for use.
The one discrepancy the reviewer noted for laboratory clarification was minor:
1. The serial dilution's "E" qualifiers were not reported on the Form Is for potassium and sodium water samples and calcium, magnesium, potassium, and sodium soil samples. *Not required as part of the deliverables, but submitted.*

Qualifications
1. The water matrix serial dilutions for sodium and zinc were high; all the samples were flagged "J" estimated. Only MM-MW07-100703's potassium concentration was > CRDL and flagged "J". The soil QC had calcium, magnesium, potassium, sodium, and cadmium where %D's were > 10%; all five analytes were flagged "J" in the sample.

Comments
1. Potassium matrix spike was not required, the Form I's "N" qualifier was not necessary.

Project# R4604 (This project should go after the following, R4573)
There were two (2) soil and one (1) water samples collected October 10, 2003 in sample delivery group R4604 - "MM-LP" 06A-101003, 06A-101003(2-2.5), and MM-FB-101003.
The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B, Semi-Volatiles (BNA) - SW846.8270C, Pesticides/PCBs (P/P) - SW-846.8081/8082, Total Organic Carbon (TOC) - SW-846.9060, and Metals/Cyanide - SW-846.6010/9012.

VOLATILES
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
Some discrepancies were noted by the reviewer and requested from the laboratory:
1. Sample MM-LP06A-101003 (VH101508.D) reported acetone on the Form I, but no supporting data was provided. *Adjusted quant report and reference spectra submitted.*
2. The continuing calibration run 10/13/03 (VD101302.D) was omitted from the data package. *Submitted.*

Qualifications
The continuing calibration of acetone exceeded the limits (25% D). Only sample MM-LP06A-101003 was flagged "J" estimated.

SEMI-VOLATILES
The samples, for the most part, were successfully analyzed, though there was some contamination. The data is acceptable for use.
There was one discrepancy noted by the reviewer for laboratory resubmittal:
1. The Form Is indicate %Moisture = 100% for soil samples. *Adjusted Form Is resubmitted.*

Qualifications
1. Bis(2-ethylhexyl)phthalate was detected in the method blank. The sample MM-LP06A-101003 was flagged "U" contamination.

Comments
1. The matrix spike/matrix duplicate (MS/MSD) QC showed poor to very poor recoveries for some compounds. This may be due to sample (from another project) matrix interferences. As qualifications are not based on this QC, no further action was taken.

PESTICIDES/PCBS
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

The only discrepancy noted by the reviewer was the omission of endrin/4,4'-DDT breakdown QCs from the data package. *Not a required part of the contract deliverables, but was submitted.*

Qualifications
1. The initial calibration of 4,4'-DDT and the continuing calibration of 4,4'-DDD exceeded their control limits. Consequently these two analytes were flagged "UJ" estimated.

Comments
1. The MS/MSD QC for pesticides showed recoveries and % RPDs in a wide range of values. The QC used a sample from another project that had serious matrix interferences. No action was needed.
2. The MS/MSD for the PCBs were all very high. The sample from that project showed a possible presence of an aroclor that could interfere with the QC analysis. No action was required.

INORGANICS
The samples were successfully analyzed with only a few qualifications. The data is acceptable for use.
The one discrepancy the reviewer noted for laboratory clarification was minor:
1. The serial dilution's "E" qualifiers were not reported on the Form Is for potassium. *Not required as part of the deliverables, but submitted.*

Qualifications
1. The serial dilutions for potassium and lead were high; the samples with concentrations > CRDL were flagged "J" estimated.

Comments
1. Potassium matrix spike was not required, the Form I's "N" qualifier was not necessary.
2. The lead duplicate QC had high %RPD. The samples would have been flagged but were previously qualified. No further action was needed.

Project# R4573
There were six (6) water samples collected October 08, 2003 in sample delivery group R4573 - MM-GWMW" 02-100803, 04D-100803, 05D-100803, 04-100803, MM-FB-100803, and MM-TB-100803. Samples MM-GWMW04D-100803/MM-GWMW05D-100803 were field duplicates.
The following analyses were requested for analysis: Volatiles (VOC) - SW-846.8260B and Metals/Cyanide - SW-846.6010/9012.

VOLATILES
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications
1. The compound trichloroethene was flagged "J" estimated since the reported values were > high standard in samples MM-GWMW04D-100803, MM-GWMW05D-100803, and MM-GWMW04-100803.

Comments
1. Use the diluted results for trichloroethene only.

INORGANICS
The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
Again the reviewer noted that the potassium and sodium serial dilution exceedences were not flagged with "E" qualifiers on the Form Is. *Not required as part of the contract deliverables, but submitted.*

Qualifications
1. The field duplicate set had high %RPD for cyanide. Only the two samples were flagged "J" estimated.
2. Potassium and sodium serial dilutions exceeded control limits. All the samples except MM-FB-100803 were flagged "J". Zinc also exceeded limits, but only samples with concentrations > CRDL were flagged "J" estimated - MM-GWMW02-100803, MM-GWMW04-100803(total), and MM-GWMW04-100803(dissolved).

Comments
1. The "N" qualifier for potassium was not required to be reported on the Form Is .

TETRA TECH FW, INC.

Interoffice Memorandum

To: Donald Campbell
From: Julienne Loppnow

Date: May 26, 2004

Subject: Magna Metals
Data Validation Report

The following cases of analytical data generated by Chemtech in Mountainside, New Jersey for the project site Magna Metals were validated by an EPA Region II certified validator utilizing applicable criteria specified in EPA Region II Standard Operating Procedure (SOP) HW-22, Rev. 2, June 2001, and best professional judgment.

The analytical data were reviewed and evaluated based on the following parameters (as applicable):

	Data Completeness
	Sample Preservation and Holding Times
	Initial and Continuing Calibrations
	CRDL Check Standard
	Serial Dilutions
	Compound Identification
	Surrogates
	Interference Check Sample
	GC/MS Performance Check
	Blanks
	Matrix Spike/Matrix Spike Duplicates
	Laboratory Control Spike/ Laboratory Control Spike Duplicates
	Internal Standards
	Field Duplicates

Based upon this review, the following narratives summarizes the acceptability and usability status of each individual analytical fraction result:

Project# S1950
There were eleven (11) water samples collected March 29, 2004 in sample delivery group S1950 - "MM-SW-" 13-032904, 14-032904, 15-032904, 16-032904, 17-032904, 18-032904, 19-032904, 20-032904, 21-032904, 22-032904, and 18D-032904. There was a field duplicate set included in this data package - MM-SW18-032904/MM-SW18D-032904. The following analyses were requested: Metals - SW-846.6010/7471.

INORGANICS
The samples, for the most part, were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications
1. The chromium and zinc CRI standards were noted to have a high recovery and low recovery for lead. Lead was flagged "UJ/J" estimated for all samples. All samples were estimated "J" except MM-SW13-032904 and MM-SW22-032904. Chromium was flagged "J" estimated for samples "MM-SW" 14-032904, 17-032904, 19-032904, 21-032904, and 22-032904.
2. Iron spike recoveries were all low and all the samples were flagged "J" estimated. Aluminum, copper, and zinc in one spike QC were also low; samples "MM-SW" 19-032904, 20-032904, 21-032904, 22-032904, and 18D-032904 were flagged

"UJ/J" estimated for the three analytes above. Manganese spike recovery for the same samples was not detected and therefore those samples only were rejected.

3. Potassium, sodium, and copper dilution results were > 10%D. Samples > CRDL were flagged "J" - K: MM-SW18-032904, 18D-032904, and 21--032904, Na: all, and Cu: MM-SW14-032904.

Comments

1. The "N" qualifiers for magnesium and potassium should not have been reported as these analytes were not required (matrix spike QC).
2. For the zinc spike QC MS/MSD, the MS recovery was outside limits but the average of the two was acceptable. No further action was taken.
3. It should be noted that the iron results in the field duplicate set were > 20% RPD and would have been qualified if not already in other QCs.

Job No.	Sample(s)	Qual.
S1950	MM-SW13-032904	J1, J2, J3
	MM-SW14-032904	J1, J2, J3
	MM-SW15-032904	J1, J2, J3
	MM-SW16-032904	J1, J2 , J3
	MM-SW17-032904	J1, J2, J3
	MM-SW18-032904	J1, J2, J3
	MM-SW19-032904	R1, J1, J2, J3
	MM-SW20-032904	R1, J1, J2, J3
	MM-SW21-032904	R1, J1, J2, J3
	MM-SW22-032904	R1, J1, J2, J3
	MM-SW18D-032904	R1, J1, J2, J3

Notes:

J1 = Estimated "UJ/J" due to low lead and high chromium and zinc CRI recoveries.

J2 = Estimated "UJ/J" due to poor iron, aluminum, copper, and zinc spike recoveries.

J3 = Estimated "J" > CRDL due to high serial dilution.

R1 = Rejected due to no manganese spike recovery.

Project# S2003

There were nine (9) sediment samples collected March 30 and 31, 2004 in sample delivery group S2003 - "MM-SD" 13-033004, 14-033004, 15-033004, 16-033004, 17-033104, 18-033104, 19A-033104, 20-033104, and 18D-033104. There was a field duplicate set included in this data package - MM-SD18-033104/MM-SD18D-033104.
The following analyses were requested: Semi-Volatiles (PAH) - SW846.8270C, Total Organic Carbon (TOC) - SW-846.9060, Acid Volatile Sulfides/SEM, and Metals - SW-846.6010/7471.

GENERAL

1. All the samples except MM-SD17-033104 have %Solids < 50%. All results for these samples were flagged "UJ/J" unless otherwise specified as rejected.

SEMI-VOLATILES

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The sixth internal standard for "M-SD" 17-033104, 16-033004, 16-033004RE, 15-033004, 15-033004RE were below recommended area counts. The associated compounds with the internal standards were flagged "UJ/J" estimated if not already flagged for % Solids. The sixth standard in MM-SD17-33004RE had very low area counts; the non-detects were rejected and the positive results estimated "J".
2. While there were several continuing calibration exceedances, no additional action was required as other qualifications were already in use.

Comments

1. Some of the samples were reanalyzed and their data were also provided. One of each sample was determined usable - MM-SD15-033004, MM-SD16-033004, and MM-SD17-033104.
2. The results between the field duplicate pair were not comparable, though no further action was required.

NORGANICS

The samples, for the most part, were successfully analyzed with minimal qualifications. The data is acceptable for use.

Qualifications

1. The CRI standard for selenium had a high recovery. Samples " MM-SD" 13-033004, 16-033004, 20-033104, 18D-033104, and 19A-033104 would have required estimation "J", if not already flagged for % Solids. All the samples would have been qualified "UJ/J" for thallium as well.
2. Low spike recovery for antimony and high for chromium were noted - all samples not already qualified were flagged "UJ/J" estimated.
3. Cobalt serial dilution was > 10%D. Results > CRDL not already qualified were flagged "J" - MM-SD" 16-033004, 18-033104, 18D-033104, and 19A-033104.
4. The field duplicate %RPD for manganese was high. The set had already been qualified.

Comments

1. The difference between the field duplicate %Solids was > 1%.

Job No.	Sample(s)	Qual.
S2003	MM-SD13-032904	*J1, *J2, J4, *J6
	MM-SD14-032904	*J1, *J2, J4, *J6
	MM-SD15-032904	*J1, *J2, J4, *J5, *J6
	MM-SD16-032904	*J1, *J2 , *J3, J4, *J5, *J6
	MM-SD17-032904	J1, J2, J6
	MM-SD18-032904	*J1, *J2, *J3, J4, *J6
	MM-SD19A-032904	*J1, *J2, *J3, J4, *J6
	MM-SD20-032904	*J1, *J2, J4, *J6
	MM-SD18D-032904	*J1, *J2, *J3, J4, J6
	MM-SD15-033004RE	J4, *J5, J6
	MM-SD16-033004RE	J4, *J5, *J6
	MM-SD17-033104RE	J5, J6, R1

Notes:

J1 = Estimated "UJ/J" due to selenium and thallium CRI recoveries outside limits

J2 = Estimated "UJ/J" due to low antimony and high chromium spike recoveries.

J3 = Estimated "J" > CRDL due to high cobalt serial dilution.

J4 = Estimated "UJ/J" due to % Solids < 50%.

J5 = Estimated due to poor sixth internal standard area counts.

J6 = Estimated due to high %D in the continuing PAH calibrations.

R1 = Rejected due to very poor sixth internal area count.

* = Sample/compound was qualified previously, therefore it does not need to be flagged again.

Project# S2041

There were six (6) sediment samples collected April 03, 2004 in sample delivery group S2041 - "MM-SD" 21-040304, 22-040304, 23-040304, 24-040304, 25-040304, and 26-040304.

The following analyses were requested: Semi-Volatiles (BNA) - SW846.8270C, Total Organic Carbon (TOC) - SW-846.9060, Acid Volatile Sulfides/SEM, and Metals - SW-846.6010/7471.

GENERAL

1. All the samples except MM-SD25-040304 and MM-SD26-040304 have %Solids < 50%. All results for these samples were flagged "UJ/J" unless otherwise specified as rejected.

SEMI-VOLATILES

The samples were, for the most part, successfully analyzed with some qualifications. The data is acceptable for use.

Qualifications

1. Sample MM-SD24-040304 had one very poor surrogate recovery, and as such the non-detects were rejected and the positive results flagged "J" estimated.

INORGANICS

The samples were successfully analyzed with minimal qualifications. The data is acceptable for use.
There was a discrepancy in the data package, page 429 in the metals section was incomplete. The laboratory resubmitted it.

Qualifications

1. The matrix spike recoveries for barium, copper, silver, and vanadium were low, all the samples not already qualified were flagged "UJ/J" estimated.
2. Potassium, lead, and vanadium serial dilutions exceeded limits. All the samples > CRDL were flagged "J" estimated if not already qualified - MM-SD25-040304 and MM-SD26-040304.
3. The CRI standard for thallium had a low recovery. All the samples would have been qualified "UJ/J" for thallium if not already.

Job No.	Sample(s)	Qual.
S2003	MM-SD21-040304	*J1, *J2, *J3, J4
	MM-SD22-040304	*J1, *J2, *J3, J4
	MM-SD23-040304	*J1, *J2, *J3, J4
	MM-SD24-040304	*J1, *J2, *J3, J4, R1
	MM-SD25-040304	J1, J2, J3
	MM-SD26-040304	J1, J2, J3

Notes:

J1 = Estimated "UJ/J" due to low thallium CRI recoveries.

J2 = Estimated "UJ/J" due to low barium, copper, silver, and vanadium recoveries.

J3 = Estimated "J" > CRDL due to high lead and vanadium serial dilutions.

J4 = Estimated "UJ/J" due to % Solids < 50% if not rejected elsewhere.

R1 = Rejected due to very poor sixth internal area count.

* = Sample/compound was qualified previously, therefore it does not need to be flagged again.

TETRA TECH EC, INC.

Interoffice Memorandum

TO: Mark Sielski, Project Manager

FROM: Lynn Arabia, Sr. Environmental Chemist

DATE: August 24, 2007

RE: Data Usability Summary Report
Magna Metals, Data Package No. X1726

Review has been performed on the data for the groundwater sampling conducted at the Magna Metals Site on February 23 and 24, 2006. One package (X1726) was generated by Chemtech Consulting Group, Mountainside, New Jersey. Samples were analyzed for volatile organic compounds (VOCs).

This report discusses quality issues generated from review of the data package, including application of validation qualifiers. The review was performed based on best professional judgment, method-specific and laboratory-specific quality control (QC) limits, and the U.S. Environmental Protection Agency (EPA) National Functional Guidelines for Data Review. A full validation was not performed. The following items were reviewed:

- Laboratory narrative discussion;
- Custody documentation/holding times;
- Calibrations/instrument performance checks;
- Method blanks;
- Surrogate recoveries;
- Internal standard recoveries and retention times;
- Laboratory control samples;
- Matrix spike recoveries/duplicate correlations;
- Dilutions/reanalyses; and
- Field duplicate correlations (MM-GWMW04-022406/MM-GWMW94-022406).

Items that showed deficiencies are discussed within the narrative text below. All other items were determined to be acceptable during data review. Any required edits and qualifications were applied in red to the Reports of Analysis, presented in the data packages.

Continuing Calibration

Results for carbon disulfide and tetrachloroethene were qualified as estimated (J/UJ) in the following samples for %D values greater than 25%:

- MM-GWMW02-022406
- MM-GWMW03-022406
- MM-GWMW04-022406
- MM-GWMW06-022306
- MM-GWMW09-022406
- MM-GWMW10-022406
- MM-GWMW11-022306
- MM-GWMW94-022406
- MM-TRIPBLANK

Results for chloroethane and carbon disulfide were qualified as estimated (J/UJ) in the following samples for %D values greater than 25%:

- MM-GWMW04-022406DL
- MM-GWMW06-022306DL
- MM-GWMW94-022406DL

Laboratory Control Samples

All positive occurrence results ("hits") for carbon disulfide were qualified as estimated (J) in the following samples for a %R value above limits (70-130%R):

- MM-FB-022406
- MM-GWMW02-022406
- MM-GWMW03-022406
- MM-GWMW04-022406
- MM-GWMW04-022406DL
- MM-GWMW06-022306
- MM-GWMW06-022306DL
- MM-GWMW09-022406
- MM-GWMW10-022406
- MM-GWMW11-022306
- MM-GWMW94-022406
- MM-GWMW94-022406DL
- MM-TRIPBLANK

Results for 2-butanone were qualified as estimated (J) for all positive occurrences ("hits") and rejected (R) for all non-detects in the following samples for a %R value below limits (70-130%R):

- MM-FB-022406
- MM-GWMW02-022406
- MM-GWMW03-022406
- MM-GWMW04-022406
- MM-GWMW04-022406DL
- MM-GWMW06-022306
- MM-GWMW06-022306DL
- MM-GWMW09-022406
- MM-GWMW10-022406
- MM-GWMW11-022306
- MM-GWMW94-022406
- MM-GWMW94-022406DL
- MM-TRIPBLANK

Dilutions/Reanalyses

Results for trichloroethene were obtained from dilution analyses, and modified on the Reports of Analysis, for the following pairs:

- MM-GWMW04-022406
- MM-GWMW04-022406DL
- MM-GWMW06-022306
- MM-GWMW06-022306DL
- MM-GWMW94-022406
- MM-GWMW94-022406DL

No other constituent results were obtained from the dilution analyses, and these values should not be used.

APPENDIX K

INDOOR AIR QUESTIONNAIRE AND BUILDING INVENTORY

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name DONALD CAMPBELL + KELLY MILLET Date/Time Prepared 01/04/06 @0915

Preparer's Affiliation TETRA TECH EC Phone No. 973.630.8000

Purpose of Investigation MAGNA METALS (SITE #360003) SOIL VAPOR SURVEY

1. OCCUPANT:

Interviewed: Y / (N)

COMPANY NAME
~~Last Name:~~ POLYMETCO, INC. ~~First Name:~~

Address: 510 FURNACE DOCK ROAD, CORTLANDT MANOR, NY

County: WESTCHESTER

~~Home Phone:~~ N/A Office Phone: (914) 739-5400

Number of Occupants/persons at this location 0 Age of Occupants N/A
– BUILDING IS CURRENTLY ONLY USED FOR STORAGE.

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: (Y) / N

COMPANY NAME
~~Last Name:~~ BAKERS PROPERTIES, LP ~~First Name:~~ REPRESENTATIVE INTERVIEWED: DOUG GRIMMER

Address: 485 WASHINGTON AVE, PLESANTVILLE, NY 10570

County: WESTCHESTER

Home Phone: N/A Office Phone: (914) 747-1550

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
(Industrial)	Church	Other:

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) STORAGE OF POLYMEDCO EQUIPMENT

Does it include residences (i.e., multi-use)? Y / (N) If yes, how many? _____

Other characteristics:

Number of floors 1 Building age ~50 YEARS

Is the building insulated? (Y) / N ONLY ROOF INSULATED How air tight? Tight / (Average) / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

N/A

Airflow near source

N/A

Outdoor air infiltration

Outdoor air enters around roll-style garage doors & doorways & at windows (single pane glass).

Infiltration into air ducts

Air infiltrates at cold air return located along western wall - ajoining the furnace room.

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	(concrete blocks)	stone	brick w/steel frame
b. Basement type:	full	crawlspace	(slab)	other _____
c. Basement floor:	(concrete)	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with paint (old)	
e. Concrete floor:	unsealed	sealed	sealed with party w/ paint	
f. Foundation walls: (Building)	poured	(block)	stone	other _____
g. ~~Foundation~~ walls: (Building)	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy (N/A)
i. The basement is:	finished	unfinished	partially finished (N/A)	
j. Sump present?	Y (N)			
k. Water in sump?	Y / N / (not applicable)			

Basement/Lowest level depth below grade: ___/___(feet) BUILDING IS AT GRADE.

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

WATER ENTERS BUILDING THROUGH FLOOR @ NW CORNER + ELECTRIC ENTERS AT CENTER OF EASTERN WALL.

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

(Hot air circulation)	Heat pump	Hot water baseboard
Space Heaters	Stream radiation	Radiant floor
Electric baseboard	Wood stove	Outdoor wood boiler

Other _____

The primary type of fuel used is:

Natural Gas	(Fuel Oil)	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: N/A

Boiler/furnace located in: Basement Outdoors Main Floor

Other IN ADDINING STRUCTURE - SHARES PART OF WESTERN WALL.

Air conditioning: Central Air Window units Open Windows (None)

Are there air distribution ducts present? (Y) / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

Air ducts associated with the heating system run along the ceiling. Cold air return is along the western wall adjacent to the furnace room.

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	N/A
1st Floor	Storage
2nd Floor	N/A
3rd Floor	N/A
4th Floor	N/A

8. FACTORS THAT MAY influence INDOOR AIR QUALITY

a. Is there an attached garage? Y (N)

b. Does the garage have a separate heating unit? Y / N / (NA)

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) / N / NA Please specify 3 generators are stored in the southern portion of the building.

d. Has the building ever had a fire? Y / (N) When? _____

e. Is a kerosene or unvented gas space heater present? Y / (N) Where? _____

f. Is there a workshop or hobby/craft area? Y / (N) Where & Type? _____

g. Is there smoking in the building? Y / (N) How frequently? _____

h. Have cleaning products been used recently? Y / (N) When & Type? _____

i. Have cosmetic products been used recently? Y (N) When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / (N) Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? Y / (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / (N) If yes, where vented? _____

o. Is there a clothes dryer? Y (N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y (N) / (N/A)
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N (N/A)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown (N/A)
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y (N) Date of Installation: _____
Is the system active or passive? Active/Passive N/A

9. WATER AND SEWAGE

Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: Public Sewer (Septic Tank) Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: N/A

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y/N (N/A)

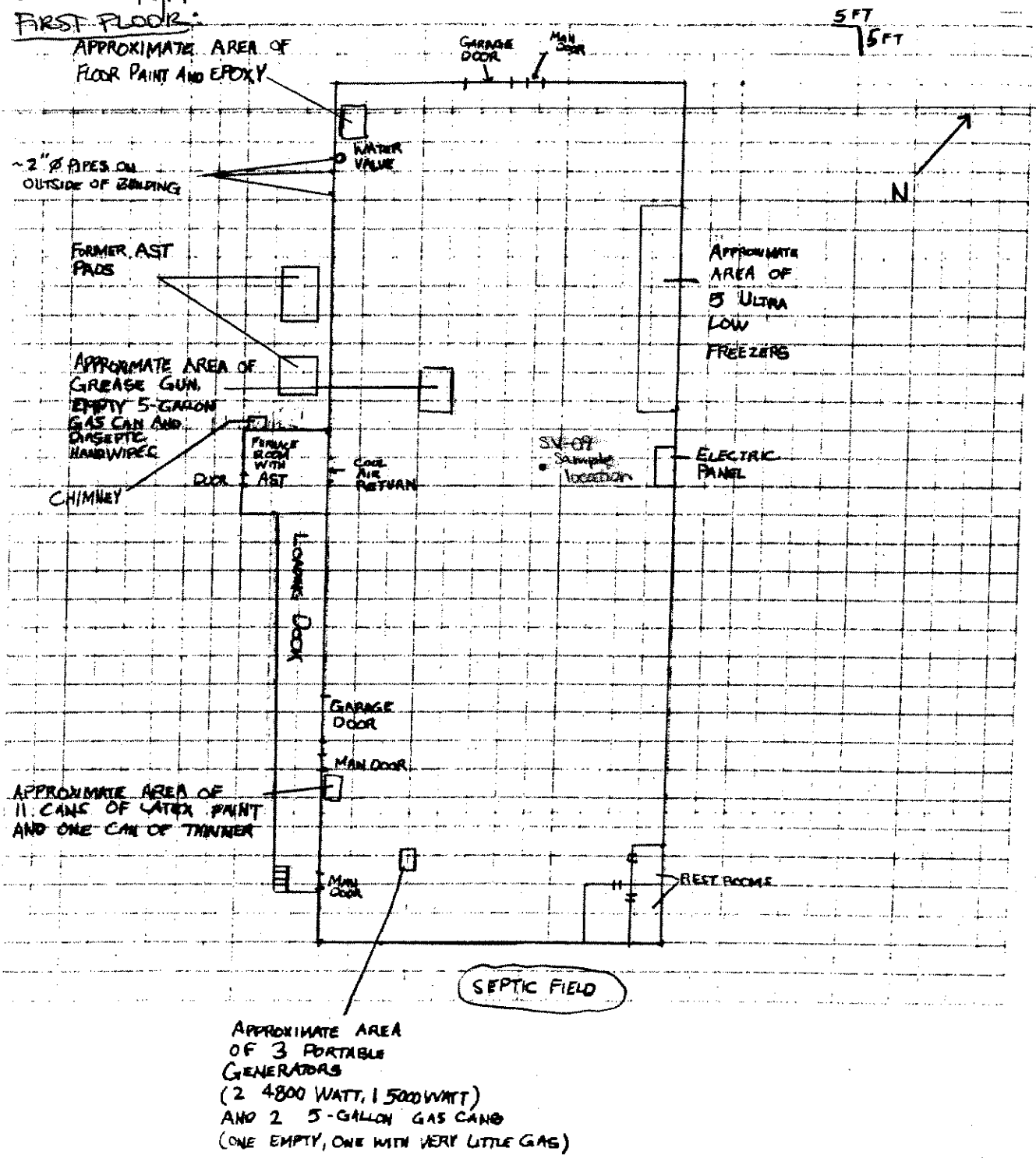
d. Relocation package provided and explained to residents? Y/N (N/A)

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement: N/A

FIRST FLOOR:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

See attached figure (FIGURE 1).

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: MINI RAE 2000 PHOTOIONIZATION DETECTOR

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
Southern Corner	portable generators (3)	3	U	gasoline	0.1	Y
Southern corner	5-gallon gas cans	2	U	gasoline	0.2	Y
SW along w/ wall	1-gallon paint cans (Latex + Acrylic)	11	U	Acrylic polymer, 2(2methoxyethoxy)-ethanol,	0.0	Y
—	—	—	—	oxatridecyl acetate, carbon black 2(2-Butoxyethoxy)-ethanol,	—	—
—	—	—	—	oxo-tridecyl Acetate, ethylene glycol.	—	—
Center/ northern portion	DisAseptic Handwipes	160 towelette	U	Benzalkonium chloride, Isopropyl alcohol, Lauramine Oxide,	0.0	Y
—	—	—	—	Octoxynol 9, Myristalkonium Chloride, Quaternium	—	—
Center/ northern portion	Grease Gun	~1L	U	no label	0.0	Y
thwest rner	1 - 1-gallon epoxy concrete paint 4 - 1-gallon epoxy coat hardner	—	UO	Ethylene Glycol	0.0	Y
↓	3 5gallon Buckets of epoxy batting	—	UO	none listed - see photos	0.0	Y
	1 5 gallon Bucket of paint	—	U	none listed	0.0	Y
V	1 5-gallon bucket of primer	—	U	none listed	0.0	Y.

* Describe the condition of the product containers as **Unopened (UO), Used (U), or Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

Remedial Investigation/ Feasibility Study Report

for the

Magna Metals Site

Town of Cortlandt
Westchester County, New York

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION

November 1998

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EXECUTIVE SUMMARY

This Remedial Investigation/Feasibility Study (RI/FS) was prepared by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) to present the findings generated from the various tasks performed during the investigation and also to consider various remedial measure options for mitigation of environmental concerns associated with the former Magna Metals site.

The former Magna Metals site is located near the intersection of Furnace Dock Road and Maple Avenue in the Town of Cortlandt, Westchester County, New York. The site is part of a larger commercial property having several operating businesses. Generally, the site is bordered on the north, south and east by residential areas, on the west by an egg farm, and on the north-northwest by an inactive emery mine. There is a wetland area located between the site and the residential area to the south.

The objectives of the investigation were to delineate the nature and extent of leach pit/septic tank/holding tank, surface water, sediment, surface soil, subsurface soil, and groundwater contamination at the site. The field investigation program consisted of the drilling of soil borings, the installation and development of monitoring wells, the performance of a habitat-based assessment, and the sampling and analysis of various environmental media including septic tank/leach pit sludge and water, surface soil, subsurface soil, surface water, sediment, and groundwater. A geophysical survey was added to the field investigation to improve location accuracy of the leach pit/septic tank/holding tank sampling.

The primary geologic characteristics of subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet in thickness which overlies bedrock. Groundwater flow from the site is interpreted to have a strong westerly component due to the steeply sloping terrain and due to the presence of a stream and wetland area. Hydraulic conductivities in the overburden aquifer ranged from 2.2×10^{-3} cm/sec to 5.3×10^{-5} cm/sec which are slightly less than anticipated for a sandy matrix, and are most likely due to the fact that the overburden aquifer is very limited in horizontal and vertical extent.

Chlorinated aliphatic VOCs (e.g., trichloroethene, cis-1,2-dichloroethene, vinyl chloride) were detected at concentrations less than 5 ug/L in the septic tank/leach pit water and were not present in the sludge from the tank/pit samples during the RI/FS sampling investigation. This indicates a decrease from the previous investigation events, as this class of VOCs was present up to 15,000 ug/L in the tank/pit waters and 2,600 ug/kg in the sludge. A decrease of up to 7.2 times and 10.8 times in concentration was noted for the surface water and sediments, respectively. Presently, occurrences were noted up to 18 ug/L (surface water) and 25 ug/kg (sediment). The groundwater beneath the former Magna Metals property contained concentrations of trichloroethene (maximum of 4,700 ug/L) and tetrachloroethene (maximum of 90 ug/L) during the RI/FS investigation; no previous groundwater samples were collected.

The investigation indicated concentrations of PAH constituents. In general, PAH compounds occur from the burning of oils, wood, coal, gas, etc.; from wood processing and treating

operations; and from the manufacture of plastics, chemicals and dyes. PAHs are generally not typical of the bi-products found in the waste stream from metals plating operations. The septic tank/leach pit sludge contained 8 PAHs, up to 1,500 ug/kg. In addition, concentrations greater than applicable criteria occurred in 7 of the 11 sediment samples (64 percent) and 1 of the 5 surface soil samples (20 percent). A majority of the maximum sediment concentrations (16 of 18, or 89 percent) for this class of compounds occurred at location SD-1 (the drainage culvert). Runoff from nearby Cross Road Avenue may be a contributing factor to the culvert concentrations. Concentrations of PAHs less than 4 ug/L and 160 ug/kg, respectively, were detected in the surface water and subsurface soils. Previous investigations at the site did not analyze samples for PAHs. The exact source of the PAHs is currently unknown, and these constituents were possibly introduced into the areas by actions after ISC Properties sold the site in 1982.

Pesticides and PCBs were not detected in the septic tank/leach pit water or surface water historically sampled in May 1984. Neither of these matrices contained pesticides or PCBs during the RI/FS investigation. Pesticides and PCBs occurred, though, in the other matrices sampled (i.e., the septic tank/leach pit sludge, sediments, surface and subsurface soils, and groundwater). The existence of pesticides on the site has no historical documentation. PCBs were used in capacitors and transformers, and in the manufacture of hydraulic fluids, lubricants, inks, adhesives, and pesticide extenders. The exact source of the pesticides and PCBs is currently unknown, and these constituents were possibly introduced into the areas by actions after ISC Properties sold the site in 1982.

Investigations conducted in 1982 (and prior to) indicated that inorganic constituents were generally confined to the septic tanks and leach pits. In 1982, after an extensive investigation, NYSDEC concluded that the site did not pose a threat to the environment. Water and sludge samples from the tanks/pits collected during 1984 had noted elevated concentrations of arsenic, copper, nickel, seleniuim, and/or zinc. Occurrences at reduced concentrations were detected for the nearby surface water and sediments during the previous investigations. During the RI/FS sampling, metals and cyanide were present in the water and sludge samples from the tanks/pits. Detection of inorganic constituents in the post-1982 investigations suggests that metals may have been further introduced after 1982. During the current investigation, exceedance concentrations for the inorganics were also detected in the tributary (SW-6/SD-6) and/or wetlands (SW-7/SD-6 and SW-9/SD-9) samples. In addition, the surface soils, subsurface soils and groundwater samples collected downgradient from the tanks/pits contained inorganic exceedance concentrations.

The chemical data collected during the RI indicated that all media sampled, i.e., groundwater, surface water, surface soil, sediment, and subsurface soil were affected by inorganic and organic contaminants of concern. With regards to groundwater, specifically off-site overburden groundwater, on-site bedrock groundwater, and off-site bedrock groundwater, contaminant concentrations, if any, are unknown at this time. Based on exceedances of NYSDEC Water Quality Standards (Class GA) in two of the three downgradient overburden monitoring wells, additional downgradient investigation of overburden is warranted. Since it is also possible that the contaminated overburden aquifer and underlying bedrock aquifer are hydraulically

migrate downwards. Therefore, an on-site bedrock well should be installed, and if contamination is found, additional bedrock groundwater delineation should be performed.

Should off-site overburden and/or bedrock contamination become apparent, it should be noted that there are significant limitations in achieving remedial action success as fractured bedrock systems tend to act as heterogeneous groundwater units making contaminant removal difficult to achieve. Similarly, based on the presence of wetlands off-site, overburden is anticipated to have a high silt/clay content which has a tendency to "hold" contaminants. As a result, prior to performance of any future feasibility study analysis, an assessment should be made regarding actual risk posed to current and future human and environment populations potentially exposed to groundwater contamination and the pathways which would potentially be exposed. To evaluate human health risks, several exposure pathways should be considered which would include the following:

- Ingestion of groundwater,
- Dermal contact with groundwater, and
- Inhalation of volatiles from groundwater.

Any future field investigation activity should also consider correlating the relationship of groundwater flow and its potential discharge to the wetlands area downgradient of the site. Should a connection exist and COCs warrant further evaluation, the risk assessment should consider the following exposure pathways.

- Ingestion/direct contact with surface water,
- Inahalation of volatiles from surface water, and
- Ingestion of fish from the pond and stream.

With respect to the results of the Habitat Based Assessment which incorporated surface soil, sediment, and surface water data, the following was noted:

Down-gradient concentrations of the metals aluminum, copper, iron, mercury, zinc, and cyanide exceeded the NYSDEC Water Quality Standards, and selenium exceeded EPA chronic and acute criteria in the surface water samples. Down-gradient levels of copper, nickel, chromium, and zinc surpassed the NYSDEC severe effect level for sediments. In the down-gradient surface soil samples, aluminum, chromium, copper, selenium, vanadium, and zinc were detected at concentrations that were greater than the screening benchmark concentrations. Concentrations of aluminum, chromium, selenium, and vanadium were also higher than the screening benchmark concentrations in the background surface soil samples. In addition, levels of PCBs aroclor- 1254 and aroclor-1260, and the semi-volatile organic compound di-n-butylphthalate exceeded the screening benchmark concentrations in the down-gradient surface soil samples.

Based upon these results, the following conclusions were drawn:

- Within the boundaries of the site perimeter, no significant areas for supporting ecological receptors was documented. However, surface drainage from the site is directed into

adjoining wetlands and streams deemed as sensitive environments (including a NYSDEC regulated wetland) supporting ecological receptors. Given that the principal fate and transport mechanism for site related contaminants is the surface water pathway, the potential for exposure of ecological receptors to site related contaminants remains viable.

- Elevated concentrations of aluminum, chromium, copper, selenium, vanadium, and zinc were associated with on-site surface soils. While present at elevated concentrations, the developed nature of the site limits the surface soil exposure pathway for most ecological receptors. However, contaminated soils may function as a potential source for exposing ecological receptors downstream via erosion and runoff into adjoining streams and wetlands.

- Site related contaminants including aluminum, copper, iron, mercury, zinc, and cyanide are present in surface water at elevated concentrations above background and corresponding acute and chronic AWQC in the adjoining streams and wetlands.

- Site related contaminants including copper, nickel, chromium, and zinc are present in the sediments at concentrations above background and corresponding low and severe sediment quality criteria in the adjoining streams and wetlands.

The presence of these site related contaminants exceeding applicable ecological benchmarks in the surface water and sediments of adjoining sensitive environments likely presents a pathway for exposure of ecological receptors to site related contaminants. It also suggests that impacts may be occurring in the streams and or wetland area. It is recommended that the Fish and Wildlife Impact Assessment (FWIA) continue through a Step IIC Toxic Effects Analysis, which should focus on the aquatic communities, surface water and sediments of the tributaries and adjoining wetlands to determine if the exposure to these related contaminants may impact aquatic communities and if remedial actions are warranted.

On-site subsurface soil and overburden groundwater were adequately delineated and therefore, an evaluation of potential remedial measures to address these affected media was performed. The objectives developed in the screening analysis consisted of restoring contaminated subsurface soil in the leach pit/holding tank area to background conditions (which in their current condition provides a continued additive source to overburden groundwater levels via either groundwater flow or precipitation infiltration) and containment of overburden groundwater in order to prevent further migration off-site. However, prior to implementation of the containment option, a 72-Hour Aquifer Pumping Test Program should be performed to verify the feasibility of groundwater extraction due to low hydraulic conductivity values derived from the RI slug tests and also due to slow monitoring well recharge effects observed in the field.

1.0 INTRODUCTION

Presented herein is the Remedial Investigation (RI) Report for the Magna Metals site, Town of Cortlandt, New York. This document has been prepared by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) pursuant to the New York State Department of Environmental Conservation (NYSDEC)-approved Work Plan, dated August 1995.

1.1 PROJECT OBJECTIVES

The objectives of the project were to delineate the nature and extent of leach pit/septic tank/holding tank, surface water, sediment, surface soil, subsurface soil, and groundwater contamination at the site, such that an evaluation of (1) the nature and extent of site contamination, (2) the potential impacts, if any, and (3) the remedial measure options could be performed.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. Nearby towns include Peekskill, 2 miles northeast, and Croton-on-Hudson, 5 miles southwest. The Hudson River is located 3 miles west of the site.

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Con Edison and Silverman Furniture. Baker Properties acquired the property from ISC Properties, Inc. in 1982, and has leased it to various tenants. The identify of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south and east are residential areas. A wetland area is located between the site and the residential area south of the site.

1.2.2 Abbreviated Site History and Sampling Data

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed.

A water pollution investigation was performed in October 1978 by the Westchester County Health Department (WCHD). Five standing water/wastewater samples were collected on October 3, 1978 and analyzed for pH, iron, copper, zinc, cadmium, chromium, cyanide, lead, manganese, and nickel. Concentrations of iron, copper, zinc, chromium, cyanide, and nickel exceeded groundwater standards. Lead concentrations also exceeded groundwater standards in one sample; however, the detection limit used in the lead analysis was higher than the

groundwater standard. Results of this sampling episode are shown in Table 1-1. Soil and bottom sediment samples were collected on the site and upstream and downstream of the site, respectively, on October 13, 1978. These samples were analyzed for the same parameters as the water samples collected earlier in the month. Copper and zinc were the only metals present at concentrations above the common range maximum for native soils and/or the oral exposure health-based criteria. These metals were found in the two soil samples downslope of the wastewater overflow, or effluent site. The results from this sampling event are presented on Table 1-2.

WCHD returned to the site on December 15, 1978, with personnel from the NYSDEC. At this time, five core samples were collected from the sewage overflow area, and the analytical results of this sampling are shown in Table 1-3. These samples were analyzed for iron, copper, zinc, chromium and manganese. Copper concentrations exceeded the common range maximum for native soils in two samples. Zinc concentrations were also above the common range maximum for native soils in two samples.

On August 19, 1982, William Cosulich collected leaching pit samples for analyses of selected trace metals, cyanide, chlorides, phenolics, sulfates, and nitrates by General Testing Corporation (see Table 1-4). The results of an EP toxicity analysis for four samples indicated no apparent metal leaching problems. Sulfates, nitrates and chlorides were present at concentrations less than their New York State (NYS) Ambient Water Quality Standards of 250, 10 and 250 mg/l, respectively (NYSDEC, 1991). In addition, these inorganics generally have low toxicity and are present as background constituents.

In 1982, based partly on the results of this investigation, the NYSDEC determined that hazardous wastes disposed of at the site did not constitute a significant threat to the environment. Accordingly, no remedial action was required and the site classification was changed to Code "F".

The NYSDEC collected four samples on November 16, 1982, for EP toxicity analysis by RECRA Environmental Laboratory. The results for this 1982 sampling event are also shown in Table 1-4.

On December 29, 1982; February 1 and 2, 1983; and March 15, 1983, the WCHD conducted additional water pollution investigations on the site property and in Furnace Brook immediately to the west of the property. The results for the February and March 1983 sampling events are displayed in Tables 1-5, 1-6 and 1-7. Except for aesthetic considerations of iron and manganese concentrations at several locations, trace metals were not found to be elevated in the surface waters (i.e., when compared to NYS Ambient Water Quality Standards). However, as shown in Tables 1-6 and 1-7, several chlorinated volatile organics were detected in Furnace Brook. Of concern were the levels of trichloroethene (TCE) detected in the samples from the septic tank, from the leaching pit off the septic tank, and from the downstream sample locations along Furnace Brook and the unnamed tributary.

TABLE 1-1

WESTCHESTER COUNTY DEPARTMENT OF HEALTH
WATER POLLUTION INVESTIGATION ON 10/3/78

Concentrations presented in ug/L.

Parameter	Groundwater Standards	1	2	3	4	5
pH	--	10.9	10.3	11.3	9.5	7.8
Iron	300	10,000	5,900	9,300	4,000	3,800
Copper	200	150,000	320,000	170,000	87,000	76,000
Zinc	300	49,000	18,000	46,000	10,000	8,900
Cadmium	10	(5)	(5)	(5)	(5)	(5)
Chromium	50	2,800	3,600	3,100	(30)	(30)
Cyanide	100	1,700,000	640,000	2,700,000	210,000	170,000
Lead	25	(30)	(30)	(30)	(30)	60
Manganese		120	110	120	90	110
Nickel	700	66,000	33,000	93,000	18,000	10,000

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION
1	Ponded liquid near 1st leaching pit.
2	Influent wastewater to industrial disposal system.
3	Overflow or effluent from industrial disposal system.
4	Influent wastewater.
5	Overflow or effluent wastewater.

TABLE 1-2

METALS ANALYSES FROM WESTCHESTER COUNTY DEPARTMENT OF HEALTH WATER POLLUTION INVESTIGATION SOILS AND BOTTOM SEDIMENT SAMPLING ON 10/13/78

Concentrations presented in mg/kg.

Parameter	Common Range in Soil	Oral Exposure Health-Based Criteria	A	B	1	2	3
Iron	5,000-50,000		70	160	110	640	330
Copper	1-100		2.3	13	60	270	115
Zinc	10-300		2.9	95	240	980	320
Cadmium	0.01-0.7		(0.2)	(0.2)	0.2	0.7	0.4
Chromium	1-1000		0.2	0.6	23	24	7.7
Cyanide		300	0.7	9.2	38	14	20
Lead	2-200		(1.2)	(1.2)	5.8	3.3	(1.2)
Manganese	200-10,000		78	70	46	67	115
Nickel	5-500	300	15	35	75	31	80

NOTES:
(#) Concentration less than detection limit shown in parenthesis.

SAMPLE	LOCATION
A	100 yards upstream of Magna Metals building.
B	300 yards downstream of Magna Metals building in pond.
1	Base of slope.
2	150 feet from overflow site.
3	250 feet from overflow site.

TABLE 1-3

METAL ANALYSES FROM WESTCHESTER COUNTY DEPARTMENT OF HEALTH AND
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CORE SAMPLING BELOW (WEST OF) FORMER OUTFLOW/OVERFLOW AREA (LAST LEACHING PIT) ON 12/15/78

Concentrations presented in mg/kg.

Parameter	Common Range in Soil	Core 1A	Core 1B	Core 1C	Core 2A	Core 2B	Core 3A	Core 3B
Iron	5,000-50,000	1,200	230	680	1,320	170	700	70
Copper	1-100	520	30	160	100	10	60	10
Zinc	10-300	300	6	70	1,500	10	630	20
Chromium	1-1,000	10	0.6	3	25	0.6	10	1
Manganese	200-10,000	40	20	20	140	25	90	10

SAMPLE	LOCATION
Core 1A	Top inch
Core 1B	6"-7"
Core 1C	9"-10"
Core 2A	Top inch
Core 2B	7"-8"
Core 3A	Top inch
Core 3B	6"-7"

TABLE 1-4

COSULICH AND NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
EP TOXICITY EXTRACTS TAKEN ON 8/19/82 AND 11/16/82, RESPECTIVELY

Concentrations presented in mg/L.

Parameter	TCL	Pit A	Pit 1	Pit 2	Pit 4	Pit 5	R001201	R001202	R001203EX	R00120
pH		7.9	9.4	8.2	6.4	6.9	8.89			7.22
Iron		5.5	0.9	(0.05)	(0.05)	0.82	1.9			37,000
Copper		3.66	23.9	176	38.4	0.60	16.8			490
Zinc		50	0.42	75	81	14	0.60			360
Cadmium	1.0	(0.025)	0.03	(0.025)	(0.025)	(0.025)	(0.004)		(0.004)	2.2
Chromium	5.0	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)				490
Chromium, Hex		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.004		(0.004)	130
Cyanide		0.54	0.42	2.3	0.91	0.38		23		36
Lead	5.0	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	9.4		0.017	6,500
Manganese		3.3	0.04	1.52	1.73	1.9	0.05			470
Nickel		10.4	4.2	26.6	94	8.3	4.1			500
Chlorides		4	62	44	9	3	42		2.9	88
Phenolics		0.015	0.009	0.015	0.010	0.012		0.07		3.1
Sulfates		(5)	42	134	182	(10)	40			
Nitrates		12.4	0.67	1.29	4.5	0.94	9.0		1.3	1.6
Arsenic	5.0						26		(0.005)	
Selenium	1.0						(20)		(0.005)	0.085
Mercury	0.2						(0.9)		(0.002)	
Barium	100.0						0.82		1.7	130
Silver	5.0						0.010		(0.004)	0.38

NOTES:
(#) Concentration less than detection limit shown in parenthesis.

COSULICH COLLECTED

SAMPLE	LOCATION
Pit A	Manhole cover, sand
Pit 1	Water only
Pit 2	Soil, sludge
Pit 4	Soil mix
Pit 5	Sand

NYSDEC COLLECTED

SAMPLE	LOCATION OR DESCRIPTION
R001201	Pit 1 Extraction
R001202	Pit 1 Extraction
R001203	Pit 5 Extraction
R001203EX	Pit 5 Extraction

TABLE 1-5

METALS ANALYSES FROM WESTCHESTER COUNTY HEALTH DEPARTMENT
WATER POLLUTION INVESTIGATION ON 2/1/83 AND 2/2/83

Concentrations presented in ug/L.

	NYS AWQ Standard[1]		2/1/83					2/2/83			
Parameter	Human Health	Aquatic Life	1	2	3	4	5	3	4A	6	7
Iron	300	300	330	400	210	280	320	300	340	700	580
Copper	200	*	20	(20)	(20)	(20)	(20)	90	100	(20)	70
Zinc	300	30	(50)	(50)	(50)	(50)	(50)	(50)	50	(50)	(50)
Cadmium	10	*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Chromium	50	*	(10)	(10)	(10)	(10)	10)	(10)	(10)	(10)	(10)
Cyanides	100	*	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Lead	50	*	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Manganese	300	-	80	60	50	60	80	70	30	52	70
Nickel	-	5.2	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

NOTES:

[1] Human health-based and aquatic life-based New York State (NYS) Ambient Water Quality (AWQ) Standards for surface water (fresh).

* Aquatic life-based NYS AWQ Standard or Guidance Value is dependent on water hardness.

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
1	Maple Ave.
2	Field pond outlet.
3	100' above field pond.
4	Where Furnace Brook and brooklet meet.
4A	In brooklet southwest of pits.
5	Along brooklet 30' from where Furnace Brook and brooklet meet.
6	Tributary behind Magna Metals building.
7	Furnace brook above all Magna Metals Site drainage.

TABLE 1-6

VOLATILE ORGANIC ANALYSES FROM WESTCHESTER COUNTY HEALTH DEPARTMENT
WATER POLLUTION INVESTIGATION ON 2/1/83 AND 2/2/83

Concentrations presented in ug/L.

		2/1/83					2/2/83			
Parameter	**Groundwater Standards**	**1**	**2**	**3**	**4**	**5**	**3**	**4A**	**6**	**7**
Trichloroethene	5	7	90	50	30	(1)	130	65	11	(1)
cis-1,2-Dichloroethene	5	1.5	20	8	7	(1)	15	7	4	(1)
1,1,1-Trichloroethane	5	(1)	(1)	(1)	1.0	(1)	43	(1)	(1)	(1)

NOTES:
(#) Concentration less than detection limit shown in parentheses

SAMPLE	LOCATION OR DESCRIPTION
1	Maple Ave.
2	Field pond outlet.
3	100' Above field pond.
4	Where Furnace Brook & brooklet meet.
4A	In brooklet southwest of pits.
5	Along brooklet 30' from where brook & brooklet meet.
6	Tributary behind Magna Metals building.
7	Furnace Brook above all Magna Metals Site drainage.

TABLE 1-7

VOLATILE ANALYSES FROM WESTCHESTER COUNTY HEALTH DEPARTMENT
WATER POLLUTION INVESTIGATION ON 3/15/83

Concentrations presented in ug/l, except for Sample P2 and Health Based Criteria presented in mg/kg.

Parameter	Groundwater Standard	2	3	4	4A	4B	8	10	ST	11	P2 (mg/kg)	Health Based Criteria (mg/kg) (Sample P2 only)
Trichloroethene	5	32	10.5	1.9	31	1.4	(1)	8.8	1,400	(1)	110	32
cis-1,2-Dichloroethene	5	12	13	1.1	3.1	(1)	(1)	3	(1)	(1)		
1,1,1 Trichloroethane	5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	110	61

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
2	Field pond outlet.
3	100' above field pond.
4	Where Furnace Brook & brooklet meet.
4A	In brooklet southwest of pits.
4B	200' above #4.
8	Well supply house, #480 Furnace Dock Road.
10	Pond off Maple Ave.
11	Drainage Channel in front of #480.
ST	Septic Tank.
P2	Soil-Leachate Pit 2.

On May 15, 1984, the NYSDEC Division of Environmental Enforcement sampled at the site for metals and volatile organic compounds. Water samples were also analyzed for pesticides and PCBs. Surface water samples were collected from locations along Furnace Brook/tributary, from the septic tank, and from leaching pit A. Four sediment and two sludge samples were also collected at this time, from the Brook/tributary and from leaching pits 2 and 4, respectively. The sample results are summarized in Tables 1-8, 1-9, and 1-10 for metals, and in Tables 1-11 and 1-12 for volatile organics.

Analyses for twelve of the thirteen priority pollutant metals analyzed in the surface water samples consistently resulted in low concentrations (i.e., generally less than detection limits). Water samples from the septic tank (sample 05) and leaching pit A (sample 08) contained elevated concentrations of arsenic, selenium, copper, nickel, and zinc. Trace metals in sediment samples indicated similar trends, i.e., the twelve priority pollutants were essentially present at background levels; copper was slightly elevated. Sludge samples collected from leaching pits 4 (sample 06) and 2 (sample 07), however, contained elevated arsenic, selenium, cadmium, chromium, copper, nickel, silver, and zinc. Pesticides and PCBs were not detected in any of the water samples. EP Toxicity tests for the two sludge samples (Table 1-10) resulted in concentrations below the allowable maximum EP toxicity concentration and generally less than detection limits. The results of trace metal analyses for NYSDEC samples basically confirm findings by the WCHD that metals known to be in the leaching pits have apparently not reached Furnace Brook.

The results for the volatile organic analyses of the May 15, 1984 NYSDEC water samples indicated elevated trichloroethene levels in the septic tank (15,000 ppb) and in leaching pit 4 (190 ppb). Trans-1,2-dichloroethene was also detected in the surface water samples, with concentrations in the downstream and in the septic tank samples (see Table 1-11). Sediment and sludge samples contained detectable concentrations of six volatile organic compounds. Acetone, trans-1,2-dichloroethene, trichloroethene, and vinyl chloride were present in the brook sediments, while trichloroethene, xylenes, and ethylbenzene were detected in the sludge samples collected from leaching pit 2 and/or leaching pit 4; see Table 1-12.

1.3 ORGANIZATION OF REPORT

The organization of the RI Report presented herein is as follows:

Section 1.0, Introduction, describes the purpose and objectives of the RI Report. In addition, it presents a description and an abbreviated history of the Magna Metals site.

Section 2.0, Scope of Investigation, presents the specific activities performed as part of the field investigation. Descriptions of the sampling procedures, installation procedures, and surveying techniques are provided. The chemical sampling program is outlined, with the sampling locations, sample types and analytical parameters described.

Section 3.0, Physical Characteristics of the Study Area, describes the physical characteristics of the site area, including topography, surface and groundwater hydrology, and geology.

TABLE 1-8

SUMMARY OF TOTAL METAL ANALYSES FROM
NYSDEC SURFACE WATER SAMPLING ON 5/15/84

Concentrations presented in ug/L.

	NYS AWQ Standard [1]		Sample No.						
Parameter	Human Health	Aquatic Life	01	02	03	04	05	08	Detection Limit
pH				5	5-6	5	6-7	6	
Arsenic	50	190	(10)	(10)	(10)	(10)	550	(10)	10
Antimony	3[2]	-	(10)	(10)	(10)	(10)	(10)	(10)	10
Selenium	10	1.0	(10)	(10)	(10)	(10)	237	91	10
Thallium	4[2]	8	(10)	(10)	(10)	(10)	(10)	(10)	10
Mercury	2	0.2[2]	(0.4)	(0.2)	(0.2)	(0.4)	(0.2)	0.2	0.2-0.4
Beryllium	3[3]	11 or 1,100	(1)	(1)	(1)	(1)	(1)	(1)	1
Cadmium	10	*	(10)	(10)	(10)	11	(10)	(10)	10
Chromium	50	*	(4)	(4)	(4)	(4)	4.2	4	4
Copper	200	*	(4)	(4)	(4)	6.9[b]	7,810[b]	670[b]	4
Nickel	-	*	(15)	(15)	(15)	(15)	610	508	15
Silver	50	0.1	(3)	(3)	(3)	(3)	(3)	(3)	3
Zinc	300	30	21[b]	(10)[b]	(10[b])	17[b]	261	1,570[b]	10

NOTES:

[b] Blank corrected.

1 Human health-based and aquatic life-based NYS Ambient Water Quality (AWQ) Standards are for surface water (fresh).

2 Guidance Value.

* Aquatic life-based AWQ Standard or Guidance Value is dependent on water hardness.

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream, north of Magna Metals.
02	Mid-stream, west of Magna Metals.
03	Marsh area southwest.
04	Downstream southwest.
05	Distribution tank adjacent to building.
08	Leaching Pit A.

TABLE 1-9

SUMMARY OF TOTAL METAL ANALYSES FROM
NYSDEC SEDIMENT/SLUDGE SAMPLING ON 5/15/84

Concentrations presented in mg/kg.

Parameter [1]	Global Median Soil Concentration [2]	Detection Limit	01	02	03	04	06 (Sludge)	07 (Sludge)
Arsenic	6	0.5	(0.5)	0.65	(0.5)	(0.5)	27.5	5.0
Antimony	1	0.5	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Selenium	0.4	0.5	(0.5)	1.8	0.61	(0.5)	7.55	13.0
Thallium	0.2	0.5	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Mercury	0.06	0.1	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Beryllium	0.3	0.1	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Cadmium	0.35	1.0	(1)	(1)	1.2	(1)	3.1	1.6
Chromium	70	0.4	7.5	8.6	21.9	16.9	223	5.7
Copper	30	0.4	5.7[b]	115	36.5	100[b]	3,690[b]	15,800[b]
Nickel	50	1.5	30.1	40.3	56.2	39.8	27,500	13,800
Silver	0.05	0.3	0.30	(0.3)	(0.3)	(0.3)	0.81	0.70
Zinc	90	1.0	22.3[b]	28.2[b]	37.3	39.9	8,310[b]	9,500[b]

NOTES:

[b] Blank corrected.

1 Iron, lead, manganese, barium, chlorides, sulfates, and nitrates were not detected.

2 Bowen (1979).

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals - Sediment.
02	Mid-stream west of Magna Metals - Sediment.
03	Marsh area southwest - Sediment.
04	Downstream southwest - Sediment.
06	Leaching pit 4 - Sludge.
07	Leaching pit 2 - Sludge.

TABLE 1-10

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL ENFORCEMENT
EP TOXICITY EXTRACTS OF 5/15/84

Concentrations presented in mg/L.

Parameter	Detection Limit	EP Toxicity Maximum Concentration	06	07
Arsenic	0.01	5.0	0.100	0.037
Barium	0.5	100.0	(0.5)	(0.5))
Cadmium	0.1	1.0	(0.1)	(0.1)
Chromium	0.2	5.0	(0.2)	(0.2)
Lead	0.5	5.0	(0.5)	(0.5)
Mercury	0.002	0.2	(0.002)	(0.002)
Selenium	0.01	1.0	0.220	0.180
Silver	0.01	5.0	(0.01)	(0.01)

NOTES:
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
06	Leaching Pit 4 - Sludge.
07	Leaching Pit 2 - Sludge.

TABLE 1-11

SUMMARY OF VOLATILE ORGANIC ANALYSES FROM
NYSDEC SURFACE WATER SAMPLING ON 5/15/84

Concentrations presented in ug/L.

Parameter [1]	01	02	03	04	05	08
Acetone	(5)	(5)	(5)	(5)	(5)	(5)
trans-1,2-Dichloroethene	(5)	(5)	(5)	25	(5)	16
Trichloroethene	(5)	6.6	16	62	15,000	190
Vinyl chloride	(10)	(10)	(10)	(10)	(10)	(10)
Total xylenes	(5)	(5)	(5)	(5)	(5)	(5)
Ethylbenzene	(5)	(5)	(5)	(5)	(5)	(5)

NOTES:

[1] Only those volatile compounds detected are listed.

(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals.
02	Mid-stream west of Magna Metals.
03	Marsh area southwest.
04	Downstream southwest.
05	Distribution septic tank adjacent to building.
08	Leaching Pit A.

TABLE 1-12

SUMMARY OF VOLATILE ORGANIC ANALYSES FROM
NYSDEC SEDIMENT/SLUDGE SAMPLING ON 5/15/84

Concentrations presented in ug/L.

Parameter [1]	01	02	03	04	06	07
Acetone	(5)	(5)	190	1,400	(5)	(5)
trans-1,2-Dichloroethene	(5)	(5)	300	(5)	(5)	(5)
Trichloroethene	(5)	(5)	30	2,700	680	2,600
Vinyl chloride	(10)	(10)	(10)	(5)	(10)	(10)
Total xylenes	(5)	(5)	(5)	(5)	42	7,100
Ethylbenzene	(5)	(5)	(5)	(5)	(5)	3,300

NOTES:
[1] Only those volatile compounds detected are listed.
(#) Concentration less than detection limit shown in parentheses.

SAMPLE	LOCATION OR DESCRIPTION
01	Upstream north of Magna Metals - Sediment.
02	Mid-stream west of Magna Metals - Sediment.
03	Marsh area southwest - Sediment.
04	Downstream southwest - Sediment.
06	Leaching Pit 4 - Sludge.
07	Leaching Pit 2 - Sludge.

Section 4.0, Nature and Extent of Contamination, summarizes the analytical results of the sampling investigation performed at the site. The type and concentration of the detected constituents are described for each matrix sampled.

Section 5.0, Habitat Based Assessment, presents an analysis of the potential impacts to wildlife resources in the vicinity of the site.

Section 6.0, Evaluation of Remedial Measures, describes the remedial options for affected media at the Magna Metals site.

Section 7.0, Summary and Conclusions, presents a summary of the major points and conclusions of the RI Report.

Section 8.0, References, provides the references used in preparation of the RI Report.

Appendices to this report include the geophysical data (Appendix A), the soil boring logs and monitoring well construction diagrams (Appendix B), analytical data (Appendix C) and remedial measure cost estimating data (Appendix D).

2.0 SCOPE OF INVESTIGATION

2.1 INTRODUCTION

This section describes the tasks performed during the field investigation program, along with the associated methods and/or procedures which were utilized. Detailed descriptions of the field methods approved by NYSDEC are presented in the Remedial Investigation/Feasibility Study Work Plan for the Magna Metals site (August 1995).

2.2 PIT LOCATION SURVEY

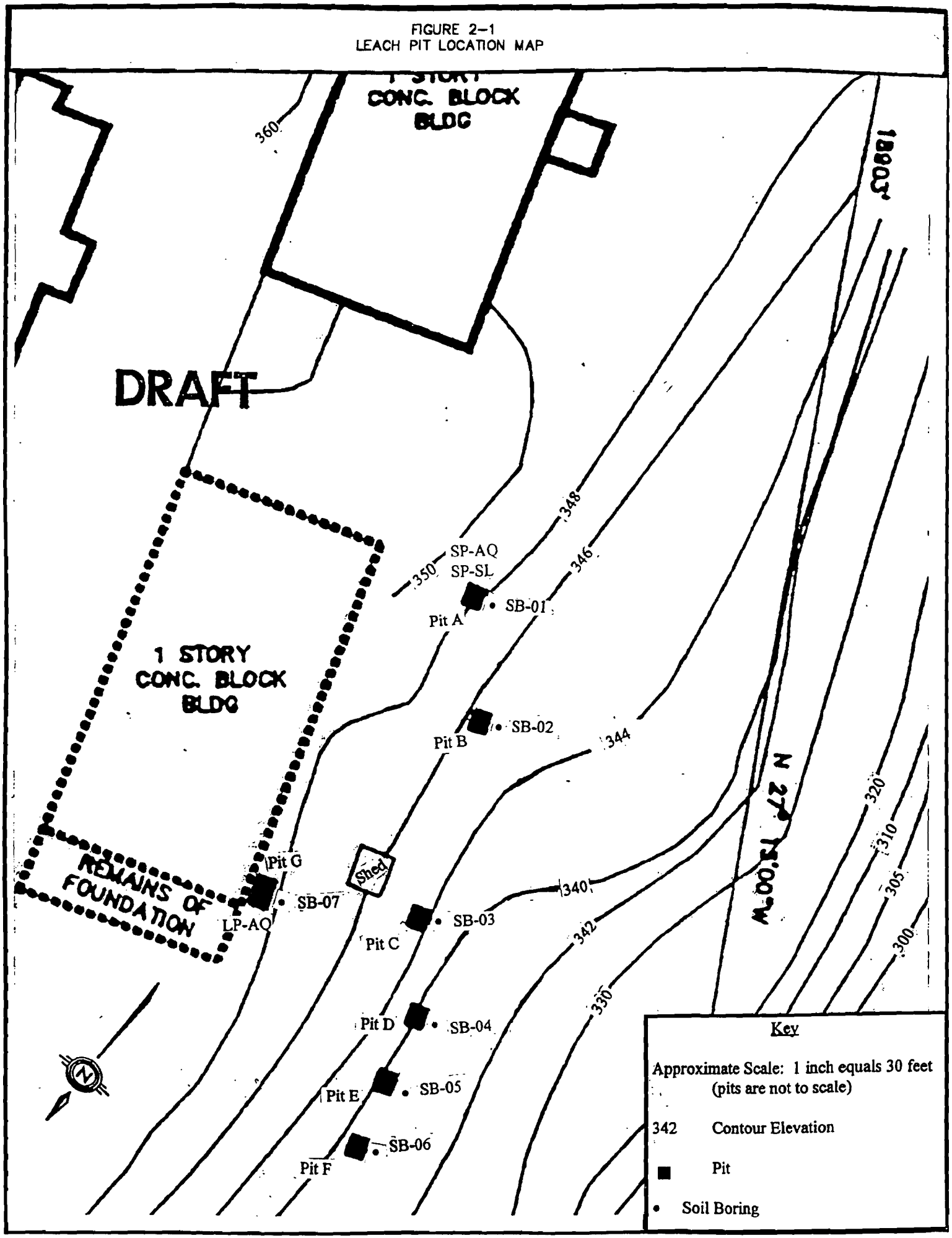
Historical information indicated that possibly up to nine leach pits/septic tanks existed on site at one time. As of September 1996, Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) had been able to positively identify only six pits/tanks. Four of the known structures (historically identified as Pits C, D, E, and F on Figure 2-1) are concrete cinderblock pits and were apparently used for leaching solids from the electroplating process water. The fifth structure (Pit G, Figure 2-1) is a concrete tank with internal baffles believed to increase the flow path of water through the tank and promote the settling of solids. This tank is located on the northwest corner of the Magna Metals building and was apparently the first tank in the series of settling tanks/leach pits. The sixth structure (Pit A, Figure 2-1) is a small concrete tank that appears to be a septic system distribution or storage tank, but it may have also served as part of the leaching system. During brush clearing activities, a fifth concrete, cinderblock pit (Pit B, Figure 2-1), similar to pits C, D, E, and F, (Figure 2-1) was located. Thus, a total of 7 pits/tanks were identified during the field reconnaissance survey.

In order to verify the number of pits/tanks on site and the sampling of those pits, Foster Wheeler Environmental performed a geophysical survey on November 20 and 21, 1996. Ground penetrating radar (GPR) data were collected along 34 mutually orthogonal lines. Lines parallel to the former Magna Metals building (roughly east-west) were spaced 10 feet apart. Multiple GPR lines were collected over locations of known subsurface pits to identify the characteristic GPR signature of these features. The GPR data confirmed the existence of only seven (7) pits/tanks.

The data were collected and digitally stored with a Geophysical Survey Systems Incorporated (GSSI) Subsurface Interface Radar (SIR) System II control unit, coupled with a GSSI Model 5103 transducer. The GSSI Model 5103 transducer, with a center frequency of 400 MHz, is ideally suited for moderately shallow geophysical investigations and is routinely used for the detection and location of subsurface tanks, pits, utilities and voids.

The technique of GPR provides an effective non-invasive method of detecting and mapping small-scale variations in the very high frequency (VHF) electromagnetic (EM) properties of subsurface materials, which are often associated with geologic boundaries and/or man-made artifacts. Variation in these properties may also be related to changes in other physical properties of the subsurface, such as bulk density and water content. GPR systems commonly generate short pulses of VHF (10 to 1,000 MHz) EM energy at the earth's surface which is transmitted into the ground at velocities proportional to the VHF EM properties of the ground through which it

FIGURE 2–1
LEACH PIT LOCATION MAP



propagates. Variations in the VHF EM properties of subsurface materials cause some of the transmitted EM energy to be reflected, or backscattered. GPR systems measure the relative amplitude of this backscattered energy, as well as the time interval between pulse generation and detection to a very high degree of accuracy.

The overall effectiveness of GPR is a function of site geology. The effective depth of EM propagation with GPR is controlled primarily by the electrical conductivity of the ground, as well as the frequency of the transmitted energy. In general, the technique of GPR works best in soils of low electrical conductivity, such as clay-free coarse sands above the water table. The higher the electrical conductivity of the subsurface materials, the greater the amount of transmitted energy that is converted into thermal energy. Since GPR systems are not capable of detecting the thermal energy, the effective depth of EM penetration is reduced. Attenuation of the transmitted EM energy with depth in geologic materials of low electrical conductivity is approximated by:

$$\text{EM Attenuation} = (\text{dB/m} = 1.69\text{x}10^{3} / (\text{K})^{1/2}$$

Where K is the dielectric permittivity of the subsurface materials surveyed, or relative ability of these materials to store charge.

The technique of GPR is likely to provide useful information to depths of about 100 feet with transducer-dependent resolution of less than 10 cm in clay-free coarse sands above the water table. Clay, due to its high electrical conductivity and high EM attenuation, severely limits the depth of GPR penetration. Another limiting factor in the overall effectiveness of GPR is the effect of scattering of the transmitted energy due to geologic materials and the consequent increase in attenuation of the transmitted energy.

GPR is sensitive to variation in the dielectric permittivity of subsurface materials. The velocity of EM propagation through subsurface materials of low electrical conductivity is approximated by:

$$V_{BM} = C/(K)^{1/2}$$

Where $C = 3\text{x}10^{8}$ meters / second (1 foot / nanosecond), the velocity of EM propagation in air.

The velocity of EM propagation through subsurface materials may be estimated based upon a knowledge of local geologic conditions and an estimate of the dielectric permittivity of these materials. This velocity may also be directly measured, or calculated based upon the GPR data collected, by:

- collecting GPR data over a representative number of targets buried at known depth within the survey area; or
- measuring the aspect ratio of strong hyperbolic reflectors observed in the GPR data collected.

The estimated velocity of EM propagation for subsurface materials existing at the site was determined based upon the aspect ratio of a strong hyperbolic reflection. Analyses of these hyperbolae indicate the approximate velocity of EM propagation through subsurface materials existing at the site to be about 0.22 feet per nanosecond. This velocity was used to convert recorded time intervals between pulse transmission and detection into depths to subsurface features of interest.

Raw GPR data collected over the site are presented in Appendix A. These data are displayed with the time scale of the recording depicted on the vertical scale, in nanoseconds. The distance along the scan line is displayed as fiducials in the data along the top of each file. These data indicate that, based upon the velocity of EM propagation estimated for subsurface materials at the site, adequate resolution of subsurface features of interest may be expected to an average limiting depth of about ten feet below ground surface.

The digitally recorded GPR data were then post-processed using the GSSI RADAN for Windows™ GPR processing package. Raw data recorded along each scan were:

- stacked using an average of 4 traces per stack in the horizontal, or distance along the scan direction;
- normalized for distance along scan;
- vertically filtered with triangular finite impulse response filters using respective cutoff frequencies of 100 and 500 MHz; and
- vertically transformed from EM travel time to depth below ground surface using the velocity of EM propagation estimated for subsurface materials at the site.

The processed digital files were then analyzed for characteristic signatures that may be associated with potential subsurface tanks and appurtenant piping. A characteristic signature of a subsurface tank was determined by collecting a number of scans over the known location of a subsurface tank and comparing this signature to subsequent data collected.

2.3 HOLDING TANK/SEPTIC TANK/LEACHING PIT SAMPLING

One septic tank, Pit A, and one leach pit, Pit G, were sampled on May 14 and 22, 1997. As shown on Figure 2-1, Pit A is located northeast of the building and is the northwestern-most leach pit/septic tank. Pit G is located adjacent to the building, and is connected to the plating tank/leach pit network. Standing water from both of these tank pits were collected, and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, and cyanide. In addition, a sludge sample was collected from Pit A; no sample could be collected from Pit G due to an absence of sludge. The Pit A sludge sample was analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide and total organic carbon (TOC).

A light track rig was used for drilling soil borings adjacent (approximately two feet away) to the septic tanks/leach pits. The seven soil borings were advanced on December 10 and 11, 1996 using hollow-stem auger and continuous 2-inch split-spoon drilling methods. The targeted sampling depth was the interval extending from the elevation of the bottom of the structure to two feet below the bottom of the structure.). Soil samples were collected from the interval equivalent to the bottom of the tank/pit. The samples were field screened visually, and with an organic vapor analyzer (OVA) and a combustible gas indicator (CGI). A total of seven samples and one duplicate were collected, and the soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, and cyanide. Soils were classified according to Burmeister Soil Classification System. Organic vapors in the soil were monitored with a Foxboro OVA 128. Logs for the soil borings, including soil descriptions, field instrumentation readings, observations, and analytical sampling intervals, are provided in Appendix B.

2.4 SURFACE WATER SAMPLING

A total of 12 surface water samples (and one duplicate) were collected by grab at the Magna Metals site on May 12, 14 and 22, 1997. Locations were as follows: four surface water samples from the tributary, one sample after the confluence of the stream and tributary; one sample from the confluence of the stream and pond; two samples from the pond; one sample at the drainage culvert from the pond along Cross Roads Avenue; two samples in the wetlands area; and one upgradient sample from the stream. Surface water sampling locations are presented on Figure 2-2. Samples were collected prior to sediment samples and by moving in an upstream direction. Field analyses of pH, specific conductance, and temperature were taken at each sampling location with a Hydac water quality meter. The surface water samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (three locations), TAL metals, cyanide, and hardness.

2.5 SEDIMENT SAMPLING

Twelve surface sediment samples (and one duplicate) were collected at the same locations as the surface water ones presented in Section 2.4; see Figure 2-2. A stainless steel scoop was used to obtain those sediment samples with only standing water less than four inches deep. When the water above the sediments was flowing or was greater than four inches in depth, a corer was used to collect the sediment sample so that washing of the sample was minimized. Sediment samples were collected moving in an upstream direction and after then surface water samples were collected. The sediment samples were field screened visually and with a photoionization (HNu) instrument. Samples for volatile analysis were collected without homogenization. The sediment samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (three locations), TAL metals, cyanide, and TOC.

Figure 2-2 Oversize

2.6 SURFACE SOIL SAMPLING

Five surface soil samples and one duplicate were collected at the locations displayed on Figure 2-2 on April 11, 1997. An additional surface soil sample was collected from loction SS-2 on November 17, 1997. Samples SS-1, SS-2 and SS-3 were collected downgradient of the on-site tanks/pits. Samples SS-4 and SS-5 are upgradient background surface soils. A material classification using the Burmeister Classification system was performed at each sampling location, and the soil descriptions are presented on logs in Appendix B. In addition, the surface soil samples were field screened visually and with a photoionization (HNu) instrument.

A stainless steel soil coring device/silver bullet sampler was used to obtain the surface (i.e., 0 to 12 inches in depth) samples. Volatile samples were collected first without homogenization, from the 6 to 12-inch interval. The April 1997 surface soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, and cyanide. The November 1997 surface soil sample was analyzed for TOC.

2.7 SUBSURFACE SOIL SAMPLING

Soil borings were drilled in conjunction with the monitoring well installation program at the site on November 17 through 21, 1997, utilizing hollow stem augers. Split spoon sampling was performed continuously from the surface to the bottom of the boring to provide a continuous boring log. These logs are provided in Appendix B and include the following:

- Physical characteristics and grain size distribution of samples (using the Burmeister Soil Classification System),
- Blow counts for driving the sampler (standard penetration resistance),
- Presence of any visible contaminants,
- Color changes,
- Groundwater level,
- Thickness of individual units, and
- Any other conditions encountered during drilling.

A total of seven samples and one duplicate were analyzed for volatile organics, TCL VOCs, TCL SVOCs, TCL pesticides and PCBs (one sample) and TAL metals, cyanide, and total organic carbon. Soil samples were collected continuously at all test borings. Two samples were collected for analysis at each location wherever possible. Sample intervals were from surface (0 to 2'), at the water table interface (approximately 6 to 8 feet below ground surface [bgs]) and at the midpoint of the screened interval (10 to 12 feet bgs).

2.8 MONITORING WELL INSTALLATION

The monitoring well program was designed to provide groundwater sampling points immediately downgradient of the potential source area (leach pits and tanks), and a sampling point upgradient to provide background data for comparative analytical purposes. Downgradient wells were positioned to intercept groundwater flow from the disposal area in the overburden aquifer. Since

the site area contains a large topographic low area which consists of wetlands, groundwater flow is anticipated to be in this southerly direction. Therefore, three monitoring wells, MW-2, MW-3, and MW-4, were installed southwest of the tanks/leach pits to intercept groundwater flow. Monitoring well MW-1 was installed at a location upgradient/sidegradient of the sources. The locations of the monitoring wells are shown in Figure 2-2.

On November 17 through 21, 1997, the monitoring wells were installed in the overburden aquifer to screen the water table. Monitoring well borings were drilled utilizing hollow stem augers. Wells were constructed in the boreholes using two-inch diameter stainless steel riser and No. 20 slot stainless steel screens.

Well development was conducted until the well responded to water level changes in the formation and produced clear, sediment-free water to the extent possible. The wells were developed with a goal of producing water of not more than 10% variation between successive field parameters. The following data were recorded in the field logbook as part of the development procedures:

- The static water level measured from the top of the well casing before, during and after development is completed,
- The calculated quantity of fluid standing in the well prior to development,
- The sounded depth of the well before and after development to determine if silt has accumulated inside the well,
- The physical character of water removed including changes during development such as water clarity, color, particulates and odor,
- The pH, Eh, dissolved oxygen, and specific conductance of the discharge during development of the well,
- The type and size/capacity of pump used,
- The surging technique(s) used,
- The quantity of fluid/water removed and the time for removal (both incremental and total values).

2.9 GROUNDWATER SAMPLING

The groundwater sampling program was designed to provide information (1) for a more precise understanding of overburden groundwater at the site, and (2) on the presence, nature and extent of a contamination plume. One round of sampling was performed on May 11 and 12, 1998, at the four newly installed monitoring wells (see Figure 2-2). The wells were sampling using NYSDEC approved USEPA Low Flow Sampling Procedures. Specific conductance, pH, and temperature were measured at the start of purging operations and after each purged volume. Stabilization of these parameters of ± 10 percent from successive purged volumes indicated that the groundwater within the well was at equilibrium.

Groundwater samples were obtained by using a stainless steel or Teflon bailer suspended on stainless steel Teflon coated wire. All four wells were sampled for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals and cyanide.

2.10 HYDRAULIC CONDUCTIVITY TESTING

Instantaneous displacement tests or slug tests were conducted at the four Magna Metals site monitoring wells on May 11 and 12, 1998 following completion of the groundwater sampling. These tests were conducted in order to provide a general indication of relative hydraulic conductivity in the shallow unconsolidated aquifer. Slug tests influence aquifer fluids within a small radius of the well or piezometer tested. Slug tests are conducted by the injection or the removal of a measured quantity of water and observing the resultant response of the water table over time. The criterion for the performance of either the slug injection or the slug withdrawal test is dependent on the pre-test water level in the observation well relative to the well screen intake.

Each slug test was conducted by dropping a sealed PVC cylinder (i.e., slug) into the well and measuring the resultant water level displacement. First, the static water level was measured with a hand-held instrument from the top of the casing prior to the test. The slug was then dropped into the well and completely submerged within a few seconds. Water levels were measured by hand-held instrument at regular intervals after displacement by the slug. Measurements were continued until approximately 90 percent recovery had occurred. After recovery from the first test was achieved, the slug was removed within a few seconds and recovering water levels were again monitored with a hand-held instrument.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 SITE GEOLOGY

Topography is fairly steep throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from 360 feet MSL along the eastern site boundary, to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area. Figure 3-1 depicts the site drainage pattern.

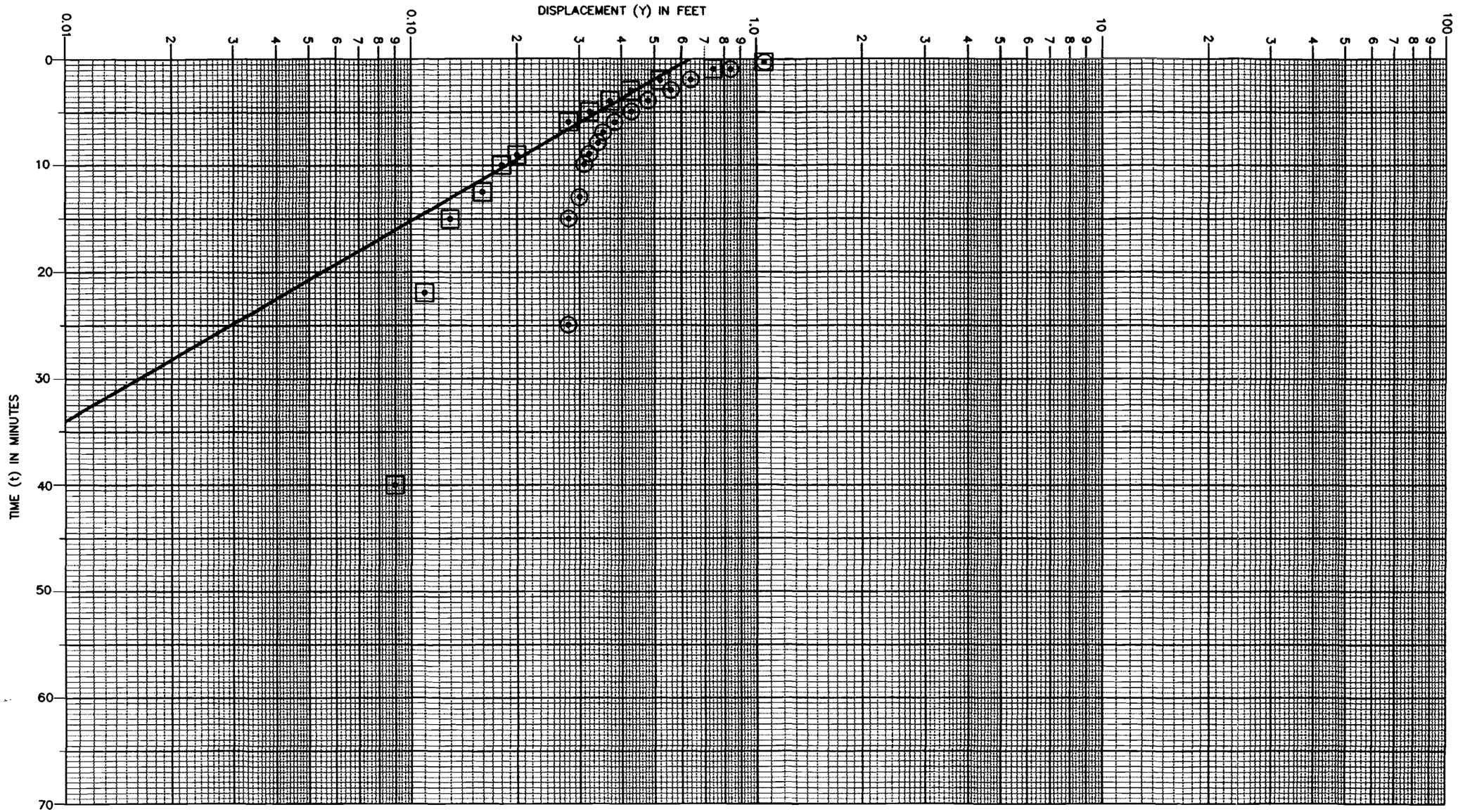
Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed on the former site property. This basin is located in the central western portion of the site and drains a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was not located. Therefore, it is believed the catch basin discharges into a collection system on Furnace Dock Road, which in turn, discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The primary geologic characteristics of the subsurface conditions at the site consists primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock, which is likely to be granitic in origin and associated with the New England Upland geologic unit. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is interpreted to have a strong westerly component due to the steeply sloping terrain and due to the presence of the stream and wetland area.

3.2 SITE HYDROLOGY

Instantaneous displacement test or slug test data are presented in Figures 3-2 through 3-5. Data recorded from slug tests conducted in the unconfined aquifer consisting of the fill material were analyzed via the Bouwer and Rice (1976) method, a modified version of Hvorslev (1951) and Bouwer (1989) which applies to wells with water-table or unconfined conditions (Bouwer, 1989).

In order to calculate the hydraulic conductivity by the Bouwer and Rice method, the displacement (Y) or elevation of the water column in the riser from the static water level is plotted on a logarithmic scale against time, which is plotted on an linear scale. The other parameters are illustrated as follows:



LEGEND:

- ⊙ FALLING HEAD TEST
- ⊡ RISING HEAD TEST

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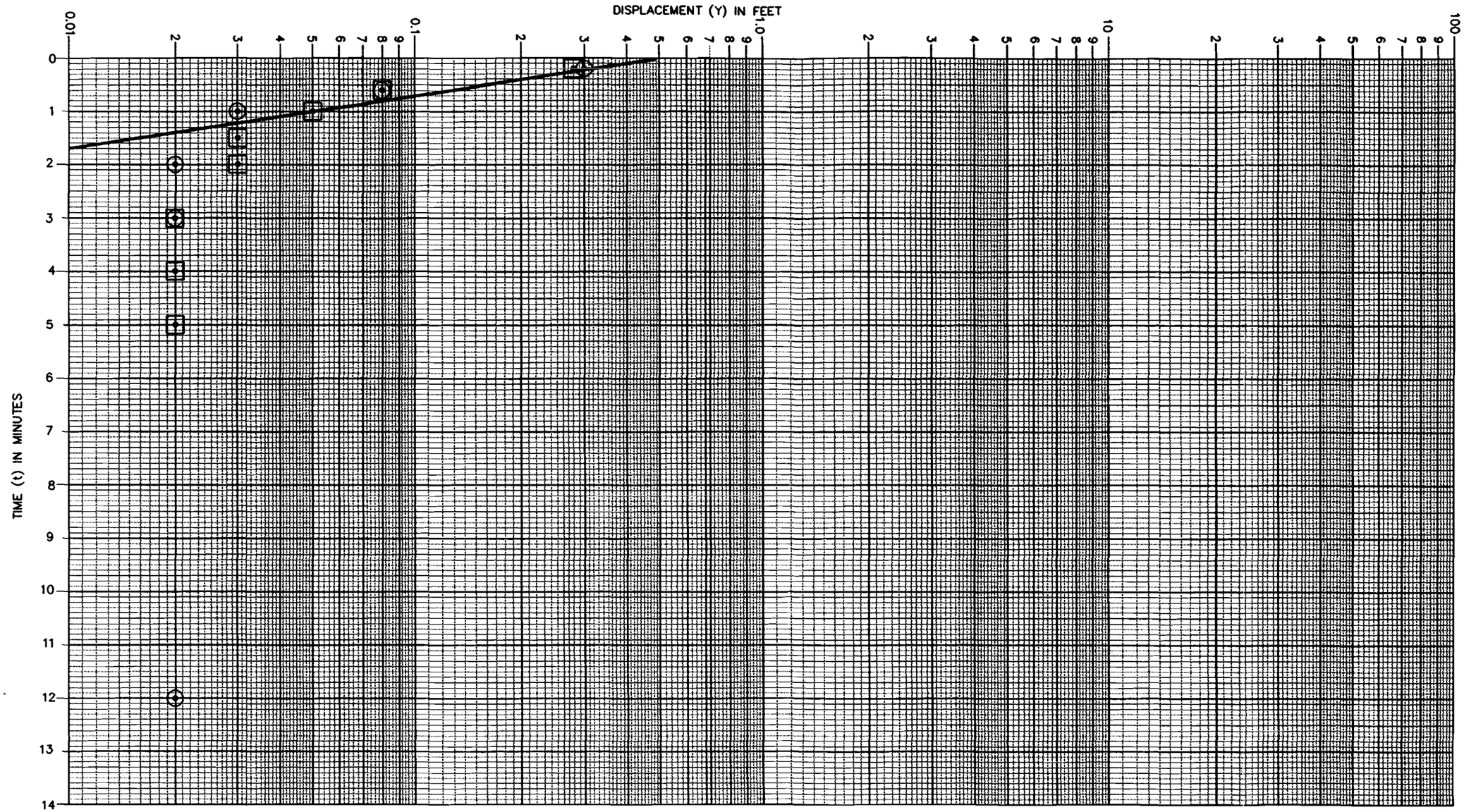
FIGURE 3-2 MW-1 INSTANTANEOUS DISPLACEMENT AQUIFER TEST MAY 11, 1998
FOSTER WHEELER ENVIRONMENTAL CORPORATION LIVINGSTON, NEW JERSEY

CAD FILE NAME: MM6298A.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:00 AM

FWB3R12.DWG



LEGEND:

- FALLING HEAD TEST
- RISING HEAD TEST

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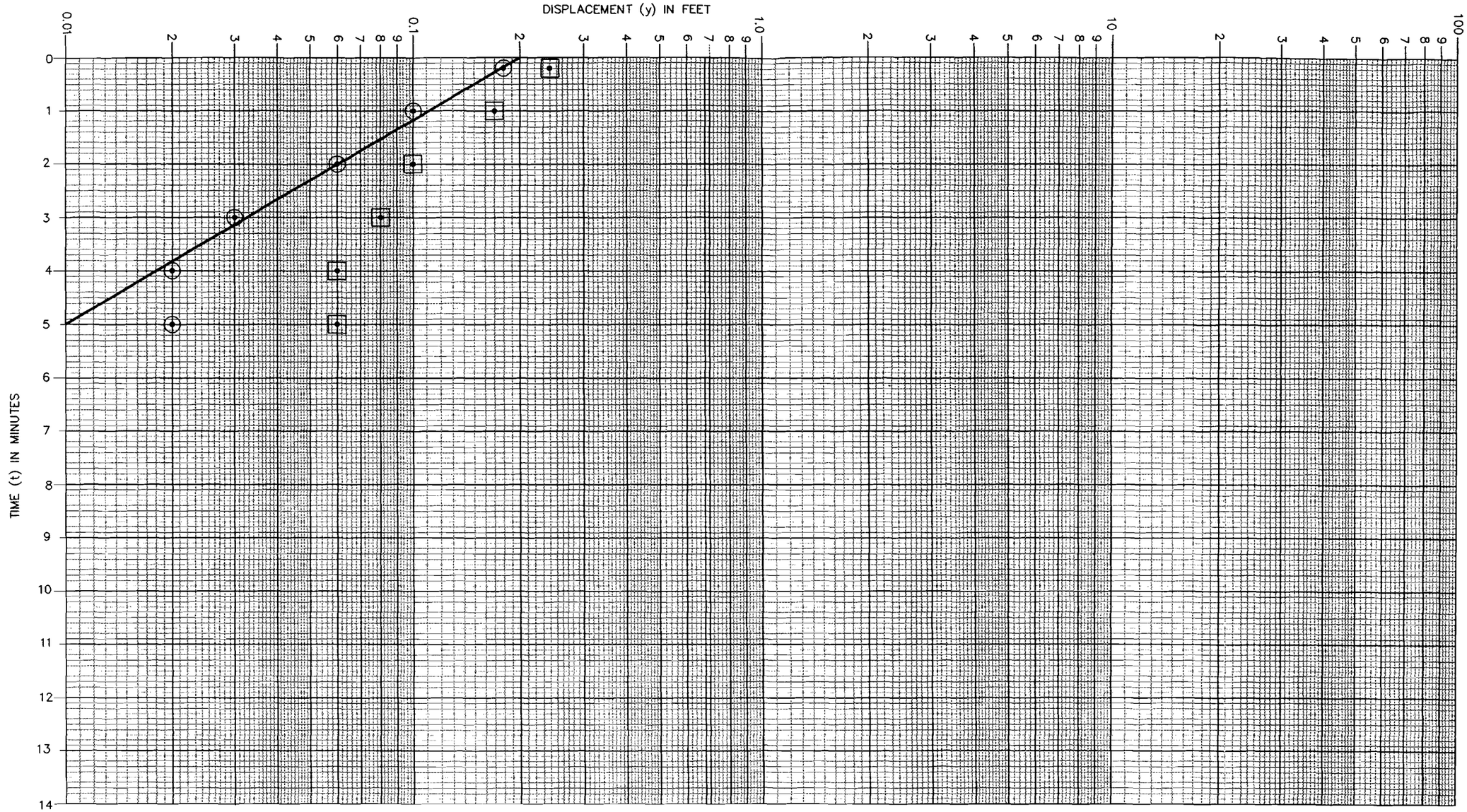
FIGURE 3-3 MW-2 INSTANTANEOUS DISPLACEMENT AQUIFER TEST
FOSTER WHEELER ENVIRONMENTAL CORPORATION LIVINGSTON, NEW JERSEY

CAD FILE NAME: MM6298.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:12 AM

FWE3R12.DWG



LEGEND:

- ⊙ FALLING HEAD TEST
- ⊡ RISING HEAD TEST

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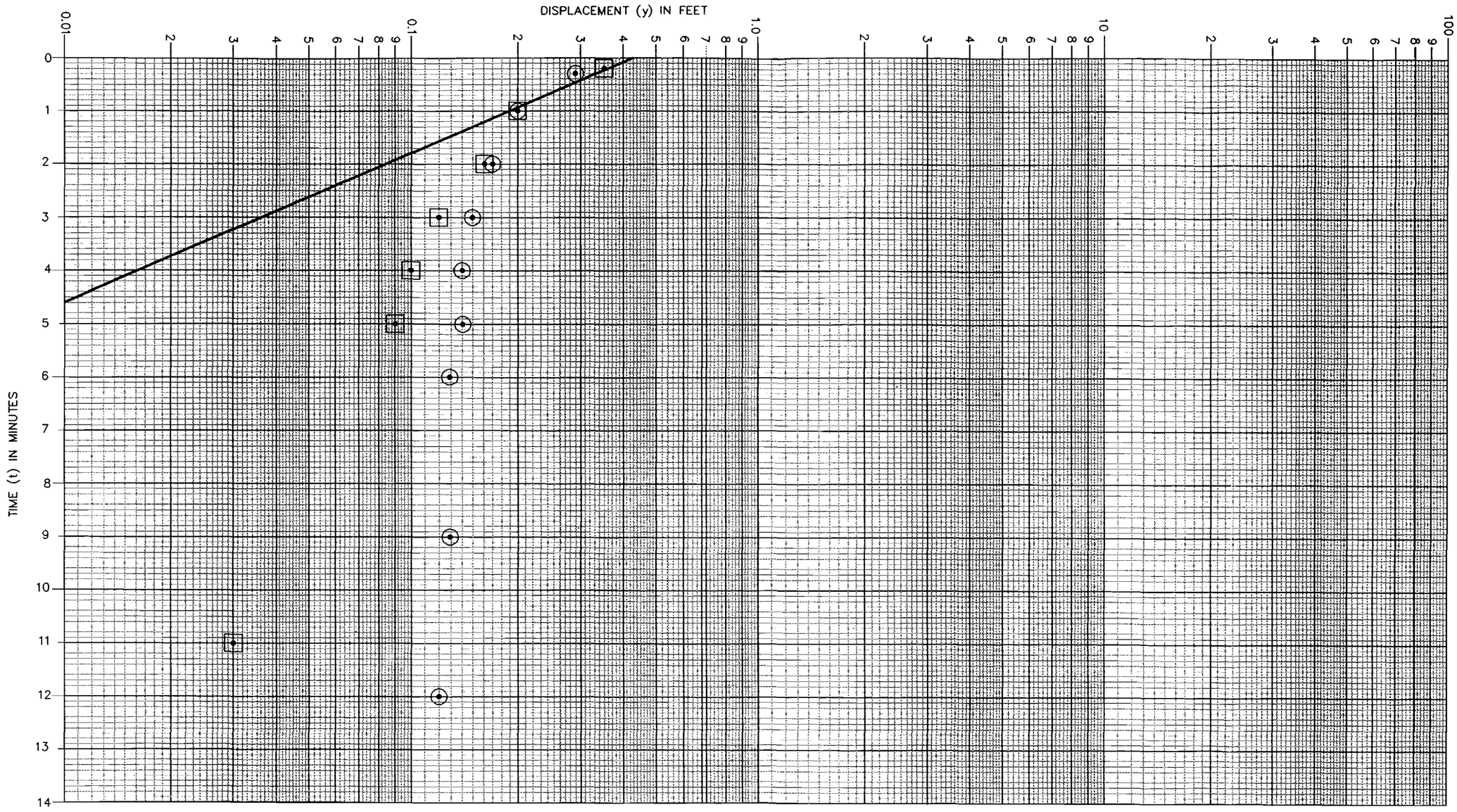
FIGURE 3-4

MW-3 INSTANTANEOUS DISPLACEMENT
AQUIFER TEST

FOSTER WHEELER ENVIRONMENTAL CORPORATION
LIVINGSTON, NEW JERSEY

CAD FILE NAME: MM6298B.DWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:05 AM



LEGEND:

- ⊙ FALLING HEAD TEST
- ⊡ RISING HEAD TEST

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FIGURE 3-5

MW-4 INSTANTANEOUS DISPLACEMENT
AQUIFER TEST

FOSTER WHEELER ENVIRONMENTAL CORPORATION
LIVINGSTON, NEW JERSEY

CAD FILE NAME: MM6298CDWG DATE: 10/21/98
PLOT SCALE: 1=1 TIME: 10:10 AM

Effective radius Re, or radius of influence, is calculated based on an analogy to electrical current.

$$\ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/r_w)} + \frac{A+(B)\ln(D-H/r_w)}{(L/r_w)} \right]^{-1}$$

For H < D cases A and B are derived graphically. A and B are dimensionless parameters that are a function of L/r_w (Bower and Rice, 1976).

$$\text{or } \ln (R_e/r_w) = \left[\frac{1.1}{\ln(H/rw)} + \frac{C}{L/r_w} \right]^{-1}$$

C (a dimensionless parameter that is a function of L/r_w) is derived graphically (Figure 3-6)

The hydraulic conductivity, K, is as follows:

$$K = \frac{r_c^2 \ln}{2Lt} \left(\ln \frac{Y_o}{Y_t} \right)$$

where:
- r_c = the radius of the riser casing (feet)
- r_w = the radius of the well and gravel pack combined (feet)
- L = the screen length (feet)
- H = saturated thickness above the bottom of the well (feet)
- D = saturated thickness above the bottom of the aquifer (feet)
- Y_o = maximum displacement (feet)
- Y_t = displacement at time t (feet)
- t = time since displacement (minutes)

These parameters are illustrated on Figure 3-7.

A gravel pack correction is calculated for the r value (casing radius) if the water level rises or falls within the screened interval instead of the casing above the screen (Bouwer, 1989). The corrected radius = $[(1-p)\ r_c^2 + p r_w^2]^{1/2}$, where p is porosity typically estimated at 0.30. This correction was applied to the MW-3 calculation.

The parameters and resultant hydraulic conductivities are summarized in Table 3-1.

Results of the slug tests indicate a range in hydraulic conductivity values from 5.3×10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2×10^{-3} cm/sec (6.2 ft/day) at MW-3 in the center of the three monitoring wells in the lower portion of the leach pit area. These values are representative of a range (Freeze and Cherry, 1979) from predominant sand with silt to predominant silt with sand. Values at MW-2 and MW-4, located near MW-3, were somewhat less at 1.0×10^{-4} cm/sec (0.29 ft/day) and 3.6×10^{-4} cm/sec (1.0 ft/day), respectively. MW-3 was the only monitoring well requiring correction of r_c because it was the only well with the water level within the screen rather than the riser casing and therefore, the corrected r_c value may be elevated.

TYPE CURVES USED IN BOUWER AND RICE CALCULATION

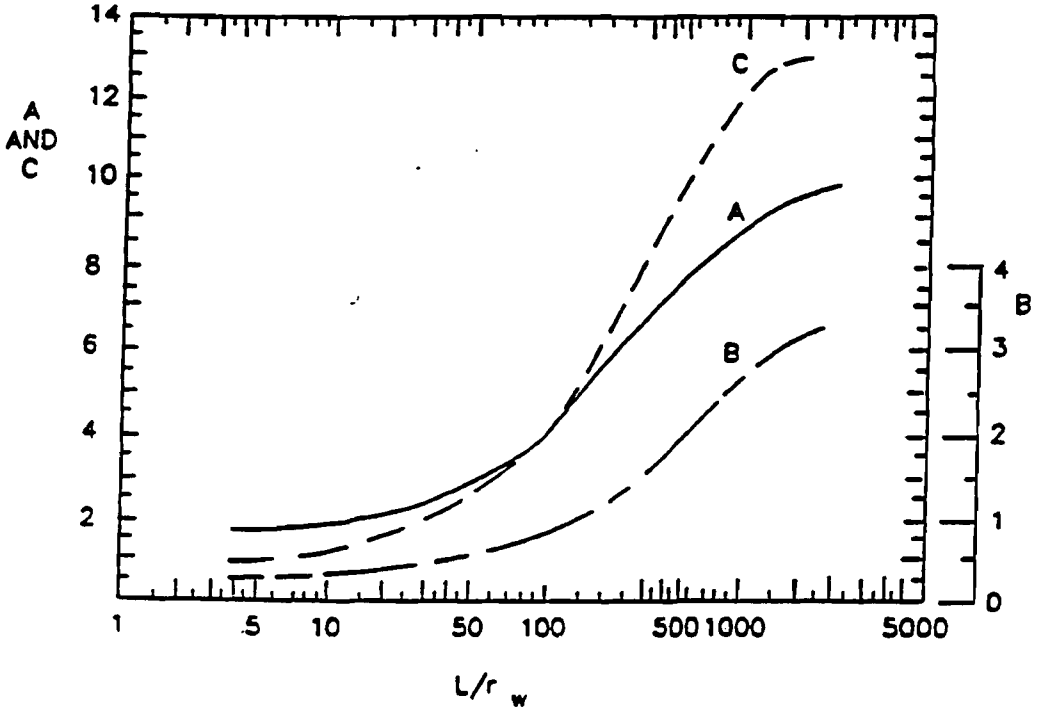

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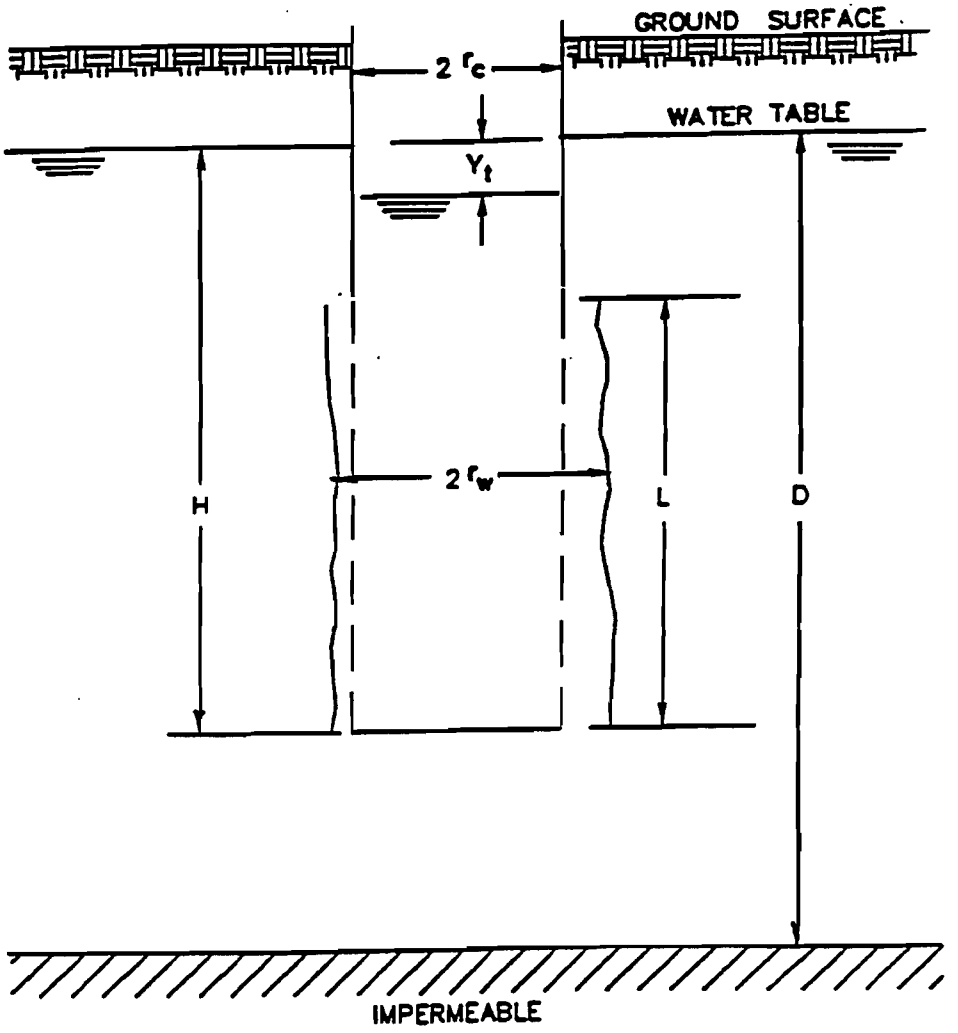
FIGURE 3-6
FOSTER WHEELER ENVIRONMENTAL CORPORATION LIVINGSTON, NEW JERSEY

FWA3R12.DWG

WELL PARAMETERS USED PARTICULARLY WITH BOUWER AND RICE METHOD



LEGEND

r_c = 0.083 FT
r_w = 0.25 FT
L = 10 FT
H = 9 FT
D = 22 FT

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FIGURE 3-7

FOSTER WHEELER ENVIRONMENTAL CORPORATION
LIVINGSTON, NEW JERSEY

FWA3R12.DWG

It appears that the calculated hydraulic conductivity values for these monitoring wells are not consistent with the sand and silty sand encountered during drilling and well installation which typically have a range of hydraulic conductivity between 10^{-2} cm/sec and 10^{-3} cm/sec. The lower range of conductivity values is likely attributable to the limited aquifer thickness and aerial extent. The potential limited quantity of water was noted following installation of the monitoring wells where sampling had to be postponed until Spring 1998 since immediately following installation, these wells appeared dry.

TABLE 3-1
MW-1 INSTANTANEOUS DISPLACEMENT TEST
May 11-12, 1998

Falling Head Test

Time (5/11/98)	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1454	0	5.02	0
1455	0	Slug in	
1456	1	4.18	0.84
1457	2	4.39	0.63
1458	3	4.47	0.55
1459	4	4.54	0.48
1500	5	4.59	0.43
1501	6	4.63	0.39
1502	7	4.66	0.36
1503	8	4.68	0.34
1504	9	4.70	0.32
1505	10	4.71	0.31
1508	13	4.72	0.30
1510	15	4.74	0.28
1520	25	4.74	0.28

Rising Head Test

0718	0	4.44	0
0720	0	Slug out	
0720.2	0.2	5.49	1.05
0721	1	5.19	0.73
0722	2	4.96	0.52
0723	3	4.87	0.43
0724	4	4.81	0.37
0725	5	4.76	0.32
0726	6	4.72	0.28
0729	9	4.64	0.20
0730	10	4.62	0.18
0732	12	4.60	0.16
0735	15	4.57	0.13
0742	22	4.55	0.11
0800	40	4.53	0.09
1046	146	4.52	0.08

TABLE 3-2
MW-2 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1319	0		
1320	0	Slug in	
1320.2	0.2	11.24	0.30
1321	1	11.51	0.03
1322	2	11.52	0.02
1323	3	11.52	0.02
1332	12	11.52	0.02

Rising Head Test

1333	0	Slug out	
1333.2	0.2	11.80	0.28
1333.6	0.6	11.60	0.08
1334	1	11.57	0.05
1334.5	1.5	11.55	0.03
1335	2	11.55	0.03
1336	3	11.54	0.02
1337	4	11.54	0.02
1338	5	11.54	0.02

TABLE 3-3
MW-3 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1154	0	11.56	0
1157	0	Slug in	
1157.2	0.2	11.38	0.18
1158	1	11.46	0.10
1159	2	11.50	0.06
1200	3	11.53	0.03
1201	4	11.54	0.02
1202	5	11.54	0.02
1256	59	11.52	0.04

Rising Head Test

1257	0	Slug out	
1257.2	0.2	11.76	0.24
1258	1	11.69	0.17
1259	2	11.62	0.10
1300	3	11.60	0.08
1301	4	11.58	0.06
1302	5	11.58	0.06
1312	15	11.54	0.02
1331	34	11.54	0.02

TABLE 3-4
MW-4 INSTANTANEOUS DISPLACEMENT TEST
May 12, 1998

Falling Head Test

Time	Elapsed Time (t) in minutes	Depth to Water (ft)	Displacement (y) in ft
1304		10.112	0
1305	Slug in	0	0
1305.3	0.3	9.83	0.29
1306	1	9.92	0.20
1307	2	9.95	0.17
1308	3	9.97	0.15
1309	4	9.98	0.14
1310	5	9.98	0.14
1311	6	9.99	0.13
1314	9	9.99	0.13
1317	12	10.00	0.12
1318	0	Slug out	0.35
1318.2	0.2	10.35	0.35
1319	1	10.20	0.20
1320	2	10.16	0.16
1321	3	10.12	0.12
1322	4	10.10	0.10
1323	5	10.09	0.09
1329	11	10.00	0.03

TABLE 3-5
SLUG TEST RESULTS
BOUWER AND RICE PARAMETERS AND RESULTANT HYDRAULIC CONDUCTIVITIES

Monitoring Well	r_c (ft)	corrected r_c (ft)	r_w (ft)	L (ft)	H (ft)	D (ft)	ft/day	Hydraulic Conductivity cm/sec
MW-1	0.083	0.083	0.34	10	11.17	11.17	0.16	5.3×10^{-5}
MW-2	0.083	0.083	0.34	10	12.38	12.38	0.29	1.0×10^{-4}
MW-3	0.083	0.20	0.34	5.16	5.16	5.16	6.2	2.2×10^{-3}
MW-4	0.083	0.083	0.34	10	10.15	10.15	1.0	3.6×10^{-4}

4.0 CHEMICAL SAMPLING RESULTS

4.1 INTRODUCTION

The Magna Metals site investigation was a multimedia environmental sampling and analysis program which included the collection and analysis of septic tank/leach pit water and sludge samples, surface water and sediment samples, surface and subsurface soil samples, and groundwater samples to determine the presence, nature and extent of contamination at the site.

Samples were submitted to Industrial Environmental Analysts of Whippany, New Jersey (now American Environmental Network) for laboratory analysis of the various chemical parameters. A subset of the data generated by the laboratory were validated by a Foster Wheeler Environmental chemist familiar with the analyses and certified by US Environmental Protection Agency (EPA) Region II personnel to perform organic and inorganic data validation. The samples were analyzed by methods stated in the New York State Department of Environmental Conservation (NYSDEC)-Analytical Services Protocol (ASP), and the laboratory program included the following analyses:

- Target Compound List (TCL) Volatile Organic Compounds (VOCs);
- TCL Semi-Volatile Organic Compounds (SVOCs);
- TCL Pesticides and Polychlorinated Biphenyls (PCBs);
- Target Analyte List (TAL) Metals;
- Cyanide;
- Total Organic Carbon; and
- Hardness

The tabulated results of the sampling investigation are summarized by environmental medium in Appendix C.

Data qualifiers are noted throughout the text and tables to indicate concentrations which are undetected (designated with a "U", "ND" or "--"); estimated ("J"); and/or rejected ("R"). A "B" found in the organics data indicates that the compound was also detected in an associated laboratory blank, possibly showing inter-laboratory contamination. In contrast, a "B" found in the inorganics data indicates that the element was detected above the instrument detection limit but below the method-specific and matrix-specific quantitation limit.

4.2 APPLICABLE CRITERIA LEVELS

The analytical results were compared to NYSDEC standards and/or guidance values to assist in the interpretation of data results.

Surface and subsurface soil concentrations, discussed in Sections 4.3, 4.6 and 4.7, were reviewed against the recommended soil clean-up objectives given in Appendix A of the NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Clean-up Objectives and Clean-up Levels (January 1994, revised from November 1992).

Sediment results, presented in Section 4.5, were reviewed against the proposed criteria in Tables 1 (organics) and 2 (inorganics) of the NYSDEC Technical Guidance for Screening Contaminated Sediments, November 1993. For the organic constituents, the most conservative (i.e., lowest) guidance value for protection of human health, benthic aquatic life or wildlife was used. These values have been normalized, as per the technical guidance requirements, using the average TOC concentration in the sediment samples (85.36 gOC/kg). For the inorganics, both the lowest effect level and the severe effect level criteria are presented on the tables for comparison; the sediment data for the inorganics were reviewed against the severe effect level.

Surface water and groundwater analytical data, discussed in Sections 4.4 and 4.8 respectively, were reviewed against the standards and guidance values given in NYSDEC Ambient Water Quality Standards and Guidance Values, October 1993. Surface water criteria were obtained from the most conservative (i.e., lowest) of the Class D values, as Furnace Brook and its tributaries are classified as Class D waters by NYSDEC. An average hardness concentration of 155.25 mg/L was utilized for the hardness-dependent metals criteria. Class GA groundwater values were applied for the groundwater results, as Class GA waters are defined as fresh groundwaters which are used as a source of potable water supply (NYSDEC, 1986).

To assist in the comparison of results, compound concentrations on the summary result tables in the following subsections and on the data tables in Appendix C that are above applicable criteria levels are highlighted with shading. In addition, Figure 4-1 presents the constituents detected during the site investigation at concentrations exceeding the applicable criteria levels. The results of the analysis of the sludge and water samples collected from the septic tank/leach pit field are also plotted on the figure; however, no applicable criteria levels for comparison exist for these samples.

4.3 HOLDING TANK/SEPTIC TANK/LEACHING PIT ANALYTICAL RESULTS

One sludge and one water tank sample were collected from one Septic Tank, Pit A. In addition, a water sample was collected from one leach pit, Pit G, during the May 1997 site investigation. The samples were analyzed for TCL organics, TAL metals and cyanide, and/or TOC (sludge only). A summary of the detected constituents is presented in Table 4-1 and on Figure 4-1 for the samples. Complete analytical results are presented in Tables C-2 through C-6 of Appendix C.

Three VOC constituents were present in the septic tank sludge samples (see Tables 4-1 and C-2). 2-Butanone, toluene and xylenes were detected at concentrations of 37 ug/kg, 14 ug/kg and 30 ug/kg, respectively. The water sampled from the septic tank contained none of these VOCs. 1,4-Dichlorobenzene was detected in SP-AQ at a concentration of 0.76 ug/L, as shown in Tables 4-1 and C-2. Analysis of sample LP-AQ from Pit G indicated concentrations of three chlorinated aliphatics (chlorine-substituted hydrocarbon compounds). These detected compounds were vinyl chloride at 2.2 ug/L, cis-1,2-dichloroethene at 4.8 ug/L, and trichloroethene at 0.92 ug/L.

TABLE 4-1
Summary of Detected Constituents
Holding Tank/Septic Tank/Leaching Pit Analytical Results
Page 1 of 2

	Septic Tank A Sludge (SP-SL)	Septic Tank A Water (SP-AQ)	Leach Pit G Water (LP-AQ)
Volatile Organic Compounds (ug/kg sludge; ug/L water)			
Vinyl Chloride	--	--	2.2
cis-1,2-Dichloroethene	NA	--	4.8
2-Butanone	37 J	R	R
Trichloroethene	--	--	0.92 J
Toluene	14 J	--	--
Xylene (total)	30 J	--	--
1,4-Dichlorobenzene	NA	0.76 J	--
Semi-Volatile Organic Compounds (ug/kg sludge; ug/L water)			
1,4-Dichlorobenzene	4,200 J	--	--
2-Methylnaphthalene	1,500 J	--	--
Fluoranthene	1,200 J	--	--
Pyrene	300 J	--	--
Benzo(a)anthracene	230 J	--	--
Chrysene	280 J	--	--
bis(2-Ethylhexyl)phthalate	12,000 JD	2 J	2 J
Di-n-octylphthalate	330 J	--	--
Benzo(b)fluoranthene	330 J	--	--
Benzo(k)fluoranthene	240 J	--	--
Benzo(a)pyrene	200 J	--	--
Pesticide/PCB Compounds (ug/kg sludge; ug/L water)			
4,4'-DDE	11 JP	--	--
Aroclor-1248	150 JP	--	--
Aroclor-1260	72 JP	--	--
Inorganics (mg/kg sludge; ug/L water)			
Aluminum	16,100 J	80.8 B	162 B
Antimony	5.9 JB	3.1 B	--
Arsenic	402 J	3.4 B	88.8
Barium	174 J	20.4 B	23.8 B

TABLE 4-1
Summary of Detected Constituents
Holding Tank/Septic Tank/Leaching Pit Analytical Results
Page 2 of 2

	Septic Tank A Sludge (SP-SL)	Septic Tank A Water (SP-AQ)	Leach Pit G Water (LP-AQ)
Cadmium	6.4 J	--	--
Calcium	9,760 J	22,000	9,500
Chromium	R	2 B	--
Cobalt	34 JB	1.8 B	--
Copper	1,160 J	167	154
Iron	30,400 J	582 J	256 J
Lead	228 J	R	R
Magnesium	5,940 J	2,560 B	536 B
Manganese	815 J	72.5	28.2
Mercury	0.49 J	--	--
Nickel	10,400 J	788	45.9
Potassium	1,120 JB	2,900 JB	704 JB
Selenium	200 J	14.3	3.2 B
Silver	0.97 JB	--	--
Sodium	717 JB	4,500 B	--
Thallium	--	--	--
Vanadium	32.9 JB	1.1 B	1.4 B
Zinc	9,660 J	230 J	286 J
Cyanide	2,420 J	39.3	12.7

Notes:

-- = Constituent not detected.

J = Constituent value is estimated.

R = Constituent value is rejected and deemed unusable.

D = Constituent value is from a dilution analysis.

P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NA = Not analyzed/not available.

Figure 4-1

As presented in Tables 4-1 and C-3, the septic tank sludge in Pit A contained occurrences of eleven SVOCs, of which eight were polycyclic aromatic hydrocarbons (PAHs). Concentrations for the PAH constituents ranged from 200 ug/kg (benzo(a)pyrene) to 1,500 ug/kg (2-methylnaphthalene). The other three detected SVOCs were 1,4-dichlorobenzene at 4,200 ug/kg, bis(2-ethylhexyl)phthalate at 12,000 ug/kg, and di-n-octylphthalate at 330 ug/kg. The water samples from the septic tank (SP-AQ) and from the leach pit (LP-AQ) both contained bis(2-ethylhexyl)phthalate at concentrations of 2 ug/L. PAH compounds generally consist of two or more fused benzene rings, and occur from the burning of oils, wood, coal, gas, etc.; from wood processing and treating operations; and from the manufacture of plastics, chemicals and dyes. 1,4-Dichlorobenzene is utilized as a disinfectant, deodorant and chemical intermediate. The manufacture of plastics and rubber materials use phthalate compounds. It is noted that the existence of the PAH compounds is not typical of bi-products found in metals plating waste stream.

One pesticide and two PCBs were detected in the septic tank sludge (see Tables 4-1 and E-4). Sample SP-SL contained 11 ug/kg of 4,4'-DDE, 150 ug/kg of Aroclor-1248 and 72 ug/kg of Aroclor-1260. The septic tank water and the leach pit water samples contained no detectable levels of pesticide or PCB constituents.

As shown on Tables 4-1 and C-5, analysis of the septic tank sludge indicated detectable occurrences of 20 metals. Concentrations ranged from 0.49 mg/kg for mercury to 30,400 mg/kg for iron. In addition, cyanide was detected in the sludge at a concentration of 2,420 mg/kg. The septic tank water sample contained 18 inorganics (17 metals and cyanide), at concentrations up to 22,000 ug/L (see Tables 4-1 and E-5). Thirteen metal analytes and cyanide were detected in LP-AQ. Concentrations for the leach pit sample ranged from 1.4 ug/L (vanadium) to 9,500 ug/L (calcium); see Tables 4-1 and C-5. The concentration of TOC in the septic tank sludge was 52,000 mg/kg

4.4 SURFACE WATER ANALYTICAL RESULTS

Twelve surface water samples and one duplicate sample were collected from the following locations: four surface water samples from the tributary, one sample after the confluence of the stream and tributary, one sample from the confluence of the stream and pond, two samples from the pond, one sample at the drainage culvert from the pond along Cross Roads Avenue, two samples in the wetlands area, and one upgradient sample from the stream. All of the surface water samples were analyzed for full NYSDEC-ASP TCL/TAL constituents and hardness. Results for these analyses are provided in Appendix C, Tables C-7 through C-11. Table 4-2 presents a summary of the detected constituents and their range of concentrations in the surface water samples. Constituents present at concentrations exceeding applicable criteria levels are plotted on Figure 4-1.

Five VOC compounds were detected in at least one of the surface water samples, and with the exception of the upstream background location (SW-12), every surface water sample contained at least one of the chlorinated aliphatic VOCs (see Table 4-2 and C-7). Cis-1,2-dichloroethene and trichloroethene were present in a majority of the downgradient surface water samples (9 of 11 samples, or 82 percent). As indicated on Table 4-2, concentrations for the VOCs ranged up to 18

TABLE 4-2
Summary of Detected Constituents
Surface Water Analytical Results
Page 1 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class D)	Wetlands (SW-7, SW-9)	Tributary (SW-6, SW-8, SW-10, SW-11)	Confluence of Tributary and Stream (SW-5)	Confluence of Pond and Stream (SW-4)	Pond (SW-2, SW-3)	Drainage Culvert (SW-1, SW-1DUP)	Upsteam (SW-12)
Volatile Organics (ug/L)								
Vinyl Chloride	NC	ND - 2.5	ND - 0.91 J	--	0.7 J	--	--	--
Methylene Chloride	NC	ND - 2.3	--	--	--	--	--	--
cis-1,2-Dichloroethene	NC	ND - 18	5.1 - 9	2.1	4.5	3.2 - 3.3	3.5 - 4.2	--
Chloroform	NC	--	0.77 J - 1.6	--	--	--	--	--
Trichloroethene	11	ND - 0.73 J	ND - 1.4	2.2	2.6	2.3 - 2.4	2.7 - 5.5	--
Semi-Volatile Organics (ug/L)								
4-Methylphenol	5	ND - 0.2 J	--	--	--	--	--	--
Diethylphthalate	NC	--	ND - 0.2 J	--	--	ND - 0.2 J	ND - 0.3 J	--
Hexachlorobenzene	NC	--	ND - 0.3 J	--	--	ND - 0.3 J	ND - 0.2 J	--
Fluoranthene	NC	ND - 0.3 J	--	--	--	--	--	--
Pyrene	NC	ND - 0.3 J	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	NC	ND - 1 J	ND - 0.7 J	0.6 J	--	--	ND - 2 J	3 J
Inorganics (ug/L)								
Aluminum	NC	8,960 - 13,100	41.9 B - 2,660	178 B	103 B	126 B - 454	54.2 B - 135 B	64.8 B
Antimony	NC	ND - 4.9 B	ND - 3.5 B	3.1 B	3.5 B	--	--	3.6 B
Arsenic	360	4.1 B - 18.3	ND - 4 B	--	--	--	--	--
Barium	NC	250 - 631	52.4 B - 154 B	68 B	37.7 B	25.4 B - 33.7 B	27.2 B - 56 B	33.4 B
Cadmium	6.4	1.1 B - 1.7 B	--	--	--	--	--	--
Calcium	NC	18,800 - 40,600	16,300 - 21,800	23400	22600	20,700 - 21,500	22,200 - 23,500	23000
Chromium	2,490	69.7 - 253	ND - 39.6	1.5 B	--	1.4 B - 3.5 B	--	--
Cobalt	110	31.4 B - 32.8 B	ND - 6.7 B	1.4 B	--	--	--	--
Copper	26.8	95.4 - 3,960	2.8 B - 491	14.1 B	4.3 B	8 B - 14 B	4.9 B - 6.5 B	2.7 B
Iron	300	24,000 - 34,100 J	94.2 B - 7,240 J	1110 J	856 J	908 - 1,510	658 - 1,060 J	363 J
Lead	144	43.6 - 88	ND - 14.2	R	--	2 JB - 2.2 JB	--	R
Magnesium	NC	13,800 - 68,600	14,200 - 20,200	15,200	18,200	17,300 - 17,900	18,800 - 18,900	13,800
Manganese	NC	1,010 - 1,760	57.4 - 625	888	336	182 - 188	209 - 422	60.3

TABLE 4-2
Summary of Detected Constituents
Surface Water Analytical Results
Page 2 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class D)	Wetlands (SW-7, SW-9)	Tributary (SW-6, SW-8, SW-10, SW-11)	Confluence of Tributary and Stream (SW-5)	Confluence of Pond and Stream (SW-4)	Pond (SW-2, SW-3)	Drainage Culvert (SW-1, SW-1DUP)	Upsteam (SW-12)
Mercury	0.2	ND - 0.22	--	--	--	--	--	--
Nickel	2,577	204 - 558	5.5 B - 136	15.7 B	8.9 B	4 B - 4.6 B	2.3 B - 10.6 B	3.5 B
Potassium	NC	2,790 JB - 5,980 J	1,510 B - 1,990 J	2060 JB	2360 JB	2,080 B - 2,160 B	2,230 B - 2,300 JB	1970 B
Selenium	NC	3 B - 40.1	ND - 10.2	--	--	ND - 4.5 B	ND - 3.4 B	--
Sodium	NC	21,700 - 30,300	23,600 - 27,900	18800	19600	18,600 - 19,200	20,300 - 20,400	17600
Vanadium	190	25.7 B - 29.6 B	ND - 8.6 B	1.3 JB	--	ND - 1.6 B	--	--
Zinc	463	146 - 2,090 J	18.3 B - 232 J	28.1 J	17.8 B	16.7 B - 37	10.7 B - 21.8 B	27.3 J
Cyanide	22	18.7 - 858	ND - 220	--	--	--	ND - 39.6 J	--

Notes:

--/ND = Constituent not detected.

J = Constituent value is estimated.

R = Constituent value is rejected and deemed unusable.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NC = No criteria available.

NA = Not analyzed/not available.

Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

ug/L (cis-1,2-dichloroethene in SW-9 from the wetlands). With the exception of trichloroethene, maximum concentrations for the VOCs were present in samples from the wetlands to the west of the site or the tributary to the south. Trichloroethene's maximum concentration (5.5 ug/L), in comparison, was detected in the furthest downgradient sample, the drainage culvert, SW-1.

As shown on Tables 4-2 and C-8, six SVOCs were detected in the surface water samples, at concentrations less than 4 ug/L. Bis(2-ethylhexyl)phthalate was the only SVOC constituent present in the upstream sample, SW-12, and this sample contained the maximum concentration of this constituent (3 ug/L). 4-Methylphenol, fluoranthene and pyrene were only detected in one of the two wetland surface water samples. One sample from each of the tributary, pond and drainage culvert locations contained diethylphthalate and hexachlorobenzene; see Tables 4-2 and C-8.

None of the surface water samples analyzed for pesticides and PCBs contained detectable levels of these constituents (see Table C-9).

Twenty metals and cyanide were detected in at least one of the surface water samples collected during the investigation, and five inorganics (copper, iron, mercury, zinc, and cyanide) were present at concentrations greater than their respective applicable criteria levels (see Tables 4-2 and C-10 and Figure 4-1). With the exception of iron, which exceeded in 10 of 12 sampled locations, criteria exceedances for the inorganics were generally located in the tributary, wetlands and drainage culvert samples. As shown in Table 4-2, concentrations of a majority of metals were greater, i.e., from approximately 3 to 1,467 times greater, in the downgradient tributary (SW-6 specifically) and/or wetlands (SW-7 and SW-9) surface water samples in comparison to the upstream sample (SW-12).

Hardness of the surface water samples ranged from approximately 102 mg/L (SW-11) to 479 mg/L (SW-9); see Table C-11 of Appendix C. With the exception of location SW-9, the hardness concentrations were only from 0.8 times less to 1.11 times greater in comparison to the upstream sample. Analysis of the surface water sample from SW-9 indicated a concentration of hardness more than 3.7 times higher than the background. As stated above, this location contained elevated levels of numerous metals, and had calcium (40,600 ug/L) and magnesium (68,600 ug/L) concentrations which were greater than background (see Tables 4-2 and C-10).

4.5 SEDIMENT ANALYTICAL RESULTS

Twelve sediment samples and one duplicate sample were collected from the same locations as the surface water samples. The sediment samples were analyzed for NYSDEC-ASP TCL organics, TAL inorganics and/or TOC. Results for these analyses are provided in Appendix C, Tables C-12 through C-16. A summary of the detected constituents and their range of concentrations in the sediment samples is presented in Table 4-3. Constituents present at concentrations exceeding applicable criteria levels are plotted on Figure 4-1.

TABLE 4-3
Summary of Detected Constituents
Sediment Analytical Results
Page 1 of 3

	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria ug/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
Volatile Organics (ug/kg)									
Chloromethane	NC	NC	ND - 7 J	--	--	--	--	--	--
Vinyl Chloride	0.07 HH	5.98	ND - 25 J	--	--	--	--	--	--
Acetone	NC	NC	ND - 530 J	ND - 150 J	770 J	340 J	--	--	--
Carbon Disulfide	NC	NC	--	--	--	12 J	--	--	--
2-Butanone	NC	NC	39 J - 160 J	ND - 36 J	260 J	95 J	11 J	21 - 74	--
Trichloroethene	2 HH	171	ND - 22 J	--	20 J	--	--	--	--
4-Methyl-2-Pentanone	NC	NC	--	ND - 5 J	--	--	12 J	--	--
2-Hexanone	NC	NC	--	ND - 10 J	--	--	18 J	--	--
Tetrachloroethene	0.8 HH	68.3	--	ND - 4 J	--	--	--	--	--
Toluene	NC	NC	ND - 12 J	--	--	--	--	--	--
Semi-Volatile Organics (ug/kg)									
Hexachloroethane	NC	NC	--	ND - 960	--	--	--	--	--
Naphthalene	NC	NC	--	--	--	--	--	ND - 42 J	--
4-Chloro-3-methylphenol	0.6 CTY	51.2	--	--	--	--	ND - 160 J	--	--
2-Methylnaphthalene	NC	NC	--	--	--	--	--	ND - 38 J	--
Acenaphthylene	NC	NC	--	ND - 19 J	--	--	--	ND - 180 J	--
Acenaphthene	140 CT	11,951	--	ND - 53 J	--	--	ND - 88 J	ND - 140 J	--
Dibenzofuran	NC	NC	--	ND - 29 J	--	--	--	ND - 220 J	--
Fluorene	NC	NC	--	ND - 74 J	--	--	--	ND - 540	--
Phenanthrene	120 CT	10,243	250 J - 350 J	35 J - 950 J	270 J	--	--	ND - 2,700	--
Anthracene	NC	NC	37 J - 45 J	ND - 130 J	35 J	--	--	ND - 700	--
Carbazole	NC	NC	--	ND - 120 J	--	--	--	ND - 340 J	--
Di-n-butylphthalate	NC	NC	--	ND - 97 J	92 J	85 J	--	ND - 170 J	--
Fluoranthene	1,020 CT	87,069	590 J - 650 J	71 J - 1,400 J	490 J	280 J	--	270 J - 2,400	--
Pyrene	NC	NC	640 J - 710 J	72 J - 1,500 J	390 J	220 J	ND - 180 J	220 J - 2,300	--
Butylbenzylphthalate	NC	NC	--	--	--	--	ND - 1,000 J	--	--
Benzo(a)anthracene	1.3 HH	111	260 J - 300 J	31 J - 710 J	180 J	--	--	ND - 1,200	--
Chrysene	1.3 HH	111	370 J - 410 J	46 J - 1,000 J	300 J	--	--	ND - 1,300	--

TABLE 4-3
Summary of Detected Constituents
Sediment Analytical Results
Page 2 of 3

	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria ug/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
bis(2-Ethylhexyl)phthalate	199.5 CT	17,030	--	ND - 140 J	250 J	210 J	--	ND - 300 J	--
Benzo(b)fluoranthene	1.3 HH	111	320 J - 360 J	32 J - 820 J	260 J	150 J	--	ND - 840	--
Benzo(k)fluoranthene	1.3 HH	111	300 J - 320 J	38 J - 780 J	210 J	150 J	--	ND - 950	--
Benzo(a)pyrene	1.3 HH	111	300 J - 320 J	ND - 810 J	180 J	120 J	ND - 58 J	230 J - 1,000	--
Indeno(1,2,3-cd)pyrene	1.3 HH	111	150 J - 290 J	ND - 87 J	--	--	--	ND - 110 J	--
Benzo(g,h,i)perylene	NC	NC	120 J - 250 J	ND - 51 J	--	--	--	ND - 55 J	--
Pesticides/PCBs (ug/kg)									
alpha-Chlordane	0.001 HH	0.09	NA	3.5 JP	NA	--	NA	--	NA
gamma-Chlordane	0.001 HH	0.09	NA	3.4	NA	--	NA	--	NA
	NYSDEC Sediment Criteria Severe Effect Level mg/kg								
Inorganics (mg/kg)									
Aluminum	NC		12,700 J - 14,900 J	4,970 - 34,090	19,800 J	10,600 J	7,770 J - 9,900	10,100 J - 11,700 J	2920
Arsenic	33		5.8 JB - 16.9 J	1.1 B - 19.3 J	7 J	9.1 J	3 B - 4.4 JB	3.2 JB - 10.6 J	--
Barium	NC		142 J - 604 J	32.6 B - 460 J	364 J	256 J	135 - 261 J	132 J - 289 J	33.8 B
Beryllium	NC		--	ND - 0.6 JB	0.62 JB	--	--	--	--
Cadmium	9		1 JB - 1.8 JB	0.31 B - 1.4 JB	1.1 JB	1 JB	0.78 J - 1.1 JB	1 JB - 1.3 JB	--
Calcium	NC		4,020 J - 11,200 J	2,590 - 13,000	7,760 J	9,530 J	4,490 J - 4,600	7,560 J - 11,500 J	882 B
Chromium	110		144 J	11.4 - 34	R	R	43 - 106 J	78.1 J	R
Cobalt	NC		20.4 J - 41.7 J	4.9 B - 24.7 JB	22.2 JB	24.6 JB	14.2 B - 37.3 J	31.9 JB - 35.6 J	4.6 B
Copper	110		129 J - 2,080 J	12.3 - 2,330 J	690 J	603 J	162 - 398 J	374 J - 493 J	4.4 B
Iron	40,000 (4%)		23,600 J - 38,600 J	9,820 - 20,200 J	28,000 J	19,500 J	2,160 - 27,000 J	21,100 J - 34,200 J	7,320
Lead	110		62.9 J - 63.2 J	3.9 - 48.2 J	46.2 J	29.3 J	15.4 J - 19.4	16.6 J - 29.2 J	3
Magnesium	NC		7,120 J - 9,420 J	3,950 - 7,830 J	7,000 J	8,670 J	6,160 - 21,800 J	10,700 J - 23,400 J	2,130
Manganese	1,100		220 J	841 J	321 J	167 J	R	154 J	87
Nickel	50		264 J - 494 J	26.9 - 835 J	231 J	234 J	180 - 212 J	166 J - 284 J	17.3
Potassium	NC		831 JB - 1,040 JB	413 B - 1,880 J	1,400 JB	894 JB	668 JB - 976 B	906 JB - 1,240 JB	207 B

TABLE 4-3
Summary of Detected Constituents
Sediment Analytical Results
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	NYSDEC Sediment Criteria Severe Effect Level mg/kg	Wetlands (SD-7, SD-9)	Tributary (SD-6, SD-8, SD-10, SD-11)	Confluence of Tributary and Stream (SD-5)	Confluence of Pond and Stream (SD-4)	Pond (SD-2, SD-3)	Drainage Culvert (SD-1, SD-1DUP)	Upsteam (SD-12)
Selenium	NC	9.6 J - 46 J	ND - 68.2 J	19.2 J	14 J	4.8 J - 8.4	3.2 J - 14.6 J	--
Silver	2.2	ND - 0.66 JB	ND - 0.72 JB	0.66 JB	1.3 JB	ND - 0.58 JB	ND - 1.4 JB	0.26 B
Sodium	NC	311 JB - 454 JB	92.7 B - 586 JB	546 JB	343 JB	193 B - 324 JB	228 JB - 384 JB	59.8 B
Vanadium	NC	30.6 J - 49.5 J	8.1 B - 36.2 J	41.6 J	39.8 JB	25.4 - 26.9 J	23.5 J - 44.1 JB	5.8 B
Zinc	270	226 J - 1,890 J	36.8 - 938 J	441 J	209 J	133 J - 155	142 J - 180 J	29.3 J
Cyanide	NC	ND - 519 J	ND - 52.4 J	--	--	ND - 3.33 J	ND - 45.3 J	--

Notes:

--/ND = Constituent not detected.

J = Constituent value is estimated.

R = Constituent value rejected and deemed unusable.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NA = Not analyzed/not available.

NC = No criteria available.

Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

The sediment samples contained occurrences of ten VOCs, as shown in Tables 4-3 and C-12. Of these ten, two of the chlorinated aliphatic volatiles (vinyl chloride and trichloroethene) were also detected during the surface water investigation. The concentration of vinyl chloride from sample SD-9 (25 ug/kg) was greater than its normalized sediment criteria level. The surface water from this wetlands location had contained the maximum concentration for vinyl chloride (2.5 ug/L).

Twenty-three SVOCs were detected in the sediments, and there were eighteen PAH compounds, three phthalate compounds, one phenolic compound, and one chlorinated aliphatic compound (see Tables 4-3 and E-13). The PAHs were detected at concentrations less than 2,701 ug/kg, in all of the sediment samples, with the exception of the upstream location SD-12. As presented on Table 4-3 and Figure 4-1, six PAHs (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene) were present at concentrations exceeding applicable criteria levels. These exceedances occurred in 64 percent of the locations (i.e., 7 of 11). A majority of the maximum concentrations (16 of 18, or 89 percent) for all of the PAH compounds occurred in the sediment sample collected from the drainage culvert near Cross Road Avenue (SD-1). Since these levels are greater than those upgradient, there is a strong potential that road runoff acts as a contributor. As shown on Table 4-3, the three phthalate compounds were generally detected below 1,000 ug/kg, and were present in the further downstream sediment samples (SD-6 through SD-1). Analysis of pond sediment sample SD-3 indicated 160 ug/kg of 4-chloro-3-methylphenol, which exceeds its normalized sediment criteria level of 50.5 ug/kg. Location SD-10 contained hexachloroethane at 960 ug/kg. No other detections of these two SVOCs were found during the sediment investigation (see Table C-13).

Alpha-chlordane and gamma-chlordane were detected in tributary sediment sample SD-10, as presented in Tables 4-3 and C-14. Concentrations for these two pesticides were 3.5 ug/kg and 3.4 ug/kg, respectively, and both are greater than applicable criteria levels. No detections of pesticides or PCBs were found in the downgradient samples analyzed (SD-1DUP and SD-4); see Table C-14.

Twenty-one of the twenty-four TAL inorganics were detected in at least one of the sediment locations (see Tables 4-3 and C-14). Chromium, copper, nickel, and zinc had concentrations that exceeded their respective guidance sediment criteria values. As present on Figure 4-1, the exceedance for chromium occurred at SD-9 (144 mg/kg), while those for zinc were at SD-5 (441 mg/kg), SD-6 (938 mg/kg) and SD-7 (1,890 mg/kg). Both copper and nickel were detected above criteria at locations SD-1 through SD-7 and SD-9 (see Figure 4-1 and Table C-14). Exceedance concentrations for these metals were found from approximately 1.2 to 21.2 times (copper) and 3.3 to 16.7 times (nickel) greater than criteria. As with the surface water investigation, numerous metals were present in locations SD-6 (tributary), SD-7 (wetlands) and SD-9 (wetlands) at more elevated concentrations in comparison to upgradient levels. Concentrations for these samples were up to almost 530 times greater than the SD-12 samples, as shown in Tables 4-3 and C-14.

Total organic carbon for the sediments ranged considerably in concentration (see Table C-15 of Appendix C). The upstream background sample contained 2,590 mg/kg. TOC concentrations ranged from 2,510 mg/kg to 160,000 mg/kg for the samples directly to the west, southwest and

south of the site (SD-5 through SD-11). Analysis of the further downgradient sediment samples indicated TOC from 38,100 mg/kg to 169,000 mg/kg.

4.6 SURFACE SOIL ANALYTICAL RESULTS

Five surface (i.e., 0 to 12 inches in depth) soil samples and one duplicate were collected on April 11, 1997, and one surface soil sample was collected on November 17, 1997. Samples SS-1, SS-2 and SS-3 were collected to the west and downgradient of the on-site tanks/pits. Samples SS-4 and SS-5 are upgradient background surface soils, collected north and southeast of the site, respectively. The surface soil samples were analyzed for NYSDEC-ASP TCL/TAL constituents and/or TOC. Results for these analyses are provided in Appendix C, Tables C-17 through C-21. Table 4-4 presents a summary of the detected constituents and their range of concentrations in the surface soil samples, and Figure 4-1 plots the constituents detected at concentrations exceeding applicable criteria levels.

No volatile organics were detected in the surface soils (see Table C-17 of Appendix C).

As shown in Tables 4-4 and C-18, the surface soils collected from the three on-site locations (SS-1, SS-2 and SS-3) contained concentrations of 14 SVOCs, including 11 PAH and 3 phthalate compounds. Detected levels ranged from 8 ug/kg (anthracene) to 4,900 ug/kg (bis(2-ethylhexyl)phthalate). Benzo(a)pyrene was the only SVOC to exceed its applicable criteria value, and it was present at 97 ug/kg in SS-1 (see Figure 4-1). The concentrations of di-n-butylphthalate and bis(2-ethylhexyl)phthalate may not be related to site activities, as these constituents were present in associated blank samples. Analysis of the off-site surface soils indicated concentrations of ten SVOCs, of which nine were also detected in the on-site samples. In general, the on-site concentrations were relatively equivalent or less than the off-site concentrations.

Three pesticides and two PCBs, as presented in Tables 4-4 and C-19, were detected in the on-site and/or off-site surface soil locations. 4,4'-DDE and 4,4'-DDT were present in 4 and 5 samples, respectively, at relatively equivalent concentrations for both the on-site (detected range: 5 ug/kg to 10 ug/kg) and off-site (detected range: 4.3 ug/kg to 8.9 ug/kg) surface soils. Sample SS-2 also contained 7.1 ug/kg of 4,4'-DDD. PCB analysis of the surface soils indicated Aroclor-1254 and Aroclor-1260 in the surface soils from locations SS-1 and SS-2. As shown on Table 4-4, concentrations ranged up to 62 ug/kg for Aroclor-1254 and up to 46 ug/kg for Aroclor-1260.

Analysis of the surface soils indicated concentrations of eighteen metals (see Tables 4-4 and C-20). Fourteen of these analytes were present at levels of equal or lesser magnitude on-site in comparison to off-site samples. Calcium, copper, potassium and zinc were detected at concentrations greater than background/applicable criteria levels. Exceedance concentrations of calcium and potassium occurred in all three on-site locations, and ranged from 1,280 mg/kg to 1,540 mg/kg for calcium and from 526 mg/kg to 768 mg/kg for potassium. Copper was 177 mg/kg in SS-1 (with a duplicate of 51.7 mg/kg) and 39 mg/kg in SS-2. These two locations also contained exceedance concentrations of zinc, 124 mg/kg in SS-1 and 68.7 mg/kg in SS-2. Sample SS-3 had a zinc concentration of 41.5 mg/kg, which just exceeds its applicable criteria level of 41.1 mg/kg.

TABLE 4-4
Summary of Detected Constituents
Surface Soil Analytical Results
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	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Downgradient (SS-1, SS-2, SS-3)	Background (SS-4, SS-5)
Semi-Volatile Organics (ug/kg)				
2-Methylphenol	100	NA	--	ND - 39 J
Phenanthrene	50,000	NA	11 J - 45 J	21 J - 55 J
Anthracene	50,000	NA	ND - 8 J	--
Di-n-butylphthalate	8,100	NA	ND - 610 JB	--
Fluoranthene	50,000	NA	19 J - 57 J	27 J - 97 J
Pyrene	50,000	NA	22 J - 86 J	66 J - 100 J
Butylbenzylphthalate	50,000	NA	ND - 370 J	--
Benzo(a)anthracene	224	NA	ND - 23 J	13 J - 39 J
Chrysene	400	NA	ND - 28 J	19 J - 62 J
bis(2-Ethylhexyl)phthalate	50,000	NA	ND - 4,900 B	--
Benzo(b)fluoranthene	1,100	NA	ND - 21 J	ND - 49 J
Benzo(k)fluoranthene	1,100	NA	ND - 26 J	ND - 48 J
Benzo(a)pyrene	61	NA	ND - 97 J	ND - 29 J
Indeno(1,2,3-cd)pyrene	3,200	NA	ND - 81 J	ND - 41 J
Benzo(g,h,i)perylene	50,000	NA	ND - 46 J	--
Semi-Volatile TICs	NA	NA	8,550 JN - 28,330 JN	14,090 JN - 15,990 JN
Pesticides/PCBs (ug/kg)				
4,4'-DDE	2,100	NA	5.3 - 10	ND - 8
4,4'-DDD	2,900	NA	ND - 7.1 JPN	--
4,4'-DDT	2,100	NA	5 JP - 6.6 JPN	4.3 - 8.9
Aroclor-1254	1,000	NA	ND - 62 J	--
Aroclor-1260	1,000	NA	ND - 46 J	--
Inorganics (mg/kg)				
Aluminum	SB	19,100	7,510 - 8,830	12,600 - 19,100
Arsenic	7.5 or SB	7.5	1.6 B - 2.5	2.9 - 3.1

TABLE 4-4
Summary of Detected Constituents
Surface Soil Analytical Results
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	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Downgradient (SS-1, SS-2, SS-3)	Background (SS-4, SS-5)
Barium	300 or SB	300	42.6 B - 52	70 - 83.2
Beryllium	0.16 or SB	0.59	0.3 B - 0.35 B	0.54 B - 0.59 B
Calcium	SB	847	1,280 - 1,540	808 B - 847 B
Chromium	10 or SB	21.1	10.5 - 19	14.1 - 21.1
Cobalt	30 or SB	30	5.2 B - 7.3 B	7.6 B - 8.5 B
Copper	25 or SB	25	18 - 177 J	12.8 - 14.8
Iron	2,000 or SB	19,100	10,900 - 13,700	14,800 - 19,100
Lead	SB	18.1	8 - 10.8	12.2 - 18.1
Magnesium	SB	3,270	2,130 - 2,880	2,380 - 3,270
Manganese	SB	241	168 - 225	161 - 241
Nickel	13 or SB	18.8	10.2 - 15	16.2 - 18.8
Potassium	SB	475	526 B - 768 B	385 B - 475 B
Selenium	2 or SB	2	1 J - 1.3 J	1.2 J - 1.6 J
Sodium	SB	96.4	74.4 B - 93.1 B	72.3 B - 96.4 B
Vanadium	150 or SB	150	ND - 18.8	24.1 - 38.8
Zinc	20 or SB	41.1	41.5 J - 124	34.2 J - 41.1 J

Notes:

--/ND = Constituent not detected.

J = Constituent value is estimated.

P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.

N = Presumptive evidence exists for the presence of the constituent.

B (organics) = Constituent also present in an associated blank sample.

B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.

NA = Not analyzed/not available.

Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Total organic carbon content of the SS-2 surface soils is 8,760 mg/kg. Results for TOC are presented in Table C-21 of Appendix C.

4.7 SUBSURFACE SOIL ANALYTICAL RESULTS

Seven soil borings (SB-1 through SB-7) were drilled adjacent to the septic tanks/leach pits on December 10 and 11, 1996. Soil samples were collected from the interval equivalent to the bottom of the tank/pit. A total of seven samples and one duplicate were collected, and the soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, and TAL metals and cyanide. Additional subsurface soil samples were collected during the installation of the monitoring wells on November 17 through 19, 1997. Boring MW-1 was located sidegradient to the site as background. Locations MW-1 through MW-4 were sampled from the 6 to 8-foot and/or 12 to 14-foot bgs depth intervals. Seven subsurface soil samples and one duplicate were analyzed for TCL/TAL constituents and/or TOC. Results for these analyses are provided in Appendix C, Tables C-22 through C-26. A summary of the detected constituents and their range of concentrations in the subsurface soil samples is presented in Table 4-5. Figure 4-1 plots the constituents detected at concentrations exceeding applicable criteria levels.

Seven VOCs were detected in the subsurface soils collected from the site, and the analytical results are presented in Tables 4-5 and C-22. Methylene chloride and/or acetone were present in a majority of the samples (i.e., almost 79 percent for methylene chloride and 50 percent for acetone), including the background boring MW-1. Due to their widespread occurrence, their presence in associated blank samples, and their laboratory and decontamination use, these constituents are likely not related to site activities. Four VOCs (2-butanone, 4-methyl-2-pentanone, 2-hexanone and 1,1,2,2-tetrachloroethane) were detected at concentrations less than 6 ug/L, in the duplicate soil sample from MW-2 at 6 to 8 feet bgs. The 3.5 to 5.5-foot soils from SB-7, drilled to the southwest of Leach Pit G, contained trichloroethene (35 ug/kg, with a duplicate of 29 ug/kg).

Analysis of the subsurface soils indicated detectable levels of six PAHs and five phthalates (see Tables 4-5 and C-23). The PAHs were present from 4 feet bgs to 9.5 feet bgs, at locations SB-1, SB-2, SB-5 and MW-4. Concentrations of these constituents ranged up to only 160 ug/kg, and were below applicable criteria levels. The concentrations of diethylphthalate, di-n-butylphthalate and bis(2-ethylhexyl)phthalate may not be related to site activities, as these constituents were present in associated blank samples; see Tables 4-5 and C-23. The other two phthalate compounds (butylbenzylphthalate and di-n-octylphthalate) were detected at concentrations from 13 ug/kg to 43 ug/kg.

Pesticide/PCB results for the subsurface soil analyses are presented in Appendix E, Table C-24, and are summarized on Table 4-5. One pesticide (alpha-chlordane) was detected at 2 ug/kg in soil boring SB-4. The samples from the soil borings installed near the septic tank/leach pit area also contained Aroclor-1254. This PCB was found in SB-3 at 8 to 9.5 feet bgs (24 ug/kg), SB-4 at 6.5 to 8.5 feet bgs (160 ug/kg), and SB-7 at 3.5 to 5.5 feet bgs (280 ug/kg, with a duplicate of 240 ug/kg). In addition, as shown in Table 4-5, analysis of the 12 to 14-foot bgs soils of

TABLE 4-5
Summary of Detected Constituents
Subsurface Soil Analytical Results
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	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)
Volatile Organics (ug/kg)					
Methylene Chloride	100	NA	ND - 8 J	ND - 4 JB	ND - 5 JB
Acetone	200	NA	--	5 JB - 7 JB	5 JB - 6 JB
2-Butanone	300	NA	--	ND - 4 J	--
Trichloroethene	700	NA	ND - 35	ND - 4 J	--
4-Methyl-2-Pentanone	1,000	NA	--	ND - 4 J	--
2-Hexanone	NC	NA	--	ND - 5 J	--
1,1,2,2-Tetrachloroethane	600	NA	--	ND - 3 J	--
Volatile TICs	NC	NA	21 JN - 200 JN	--	--
Semi-Volatile Organics (ug/kg)					
Diethylphthalate	7,100	NA	--	ND - 13 JB	--
Phenanthrene	50,000	NA	ND - 19 J	--	--
Anthracene	50,000	NA	ND - 4 J	--	--
Di-n-butylphthalate	8,100	NA	ND - 660 B	12 JB - 42 JB	22 JB - 31 JB
Fluoranthene	50,000	NA	ND - 17 J	--	--
Pyrene	50,000	NA	ND - 16 J	--	--
Butylbenzylphthalate	50,000	NA	ND - 43 J	--	--
bis(2-Ethylhexyl)phthalate	50,000	NA	--	12 JB - 100 JB	ND - 43 JB
Di-n-octylphthalate	50,000	NA	--	--	--
Benzo(a)pyrene	61	NA	--	ND - 18 J	--
Benzo(g,h,i)perylene	50,000	NA	--	ND - 160 J	--
Pesticides/PCBs (ug/kg)					
alpha-BHC	110	NA	--	0.05 JP	NA
Heptachlor	100	NA	--	0.19 JP	NA
Endosulfan I	900	NA	--	0.32 JP	NA
Dieldrin	44	NA	--	0.28 JP	NA
Endosulfan II	900	NA	--	0.15 JP	NA

TABLE 4-5
Summary of Detected Constituents
Subsurface Soil Analytical Results
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	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)
4,4'-DDD	2,900	NA	--	0.98 JP	NA
4,4'-DDT	2,100	NA	--	0.92 JP	NA
alpha-Chlordane	NC	NA	ND - 2 JPN	0.27 JP	NA
Aroclor-1254	10,000	NA	ND - 280 JP	--	NA
Inorganics (mg/kg)					
Aluminum	SB	5,040	4,554.3 - 21,295	3,190 - 8,480	2,260 - 5,040
Arsenic	7.5 or SB	7.5	3.5 - 30.8 J	0.87 B - 20.4	ND - 1.6 B
Barium	300 or SB	300	34.1 B - 721	19.7 B - 434	74 - 81.9
Beryllium	0.16 or SB	0.32	ND - 0.43 B	ND - 0.4 B	0.24 B - 0.32 B
Calcium	SB	1,690	925 - 5,124.1	664 B - 5,110	1,560 - 1,690
Chromium	10 or SB	10	5.7 - 48.7	3.1 - 61.1	2.2 B - 6.8
Cobalt	30 or SB	30	3.2 B - 24.3 J	2.3 B - 20.8	3.2 B - 4.6 B
Copper	25 or SB	25	40.4 - 1,309	19.4 - 695	13.7 - 20.6
Iron	2,000 or SB	10,000	6,198.5 - 24,435	3,880 - 13,400	4,350 - 10,000
Lead	SB	3.7	2.9 - 12.9	1.1 - 5.2	2.2 - 3.7
Magnesium	SB	2,100	1,408.3 - 11,389	770 B - 5,480	1,030 B - 2,100
Manganese	SB	250	140 J - 282 J	121 - 304	171 - 250
Mercury	0.1	0.1	ND - 0.12	ND - 0.25	--
Nickel	13 or SB	15	11.9 J - 108 J	7.4 B - 39	6.7 B - 15.2
Potassium	SB	864	398 B - 6,993.6 J	267 B - 3,190	487 B - 864 B
Selenium	2 or SB	2	ND - 11.7	ND - 8.6	ND - 0.9 B
Sodium	SB	86.8	98.7 B - 485 B	52.8 B - 548 B	50 B - 86.8 B
Thallium	SB	ND	ND - 1.8 J	--	--
Vanadium	150 or SB	150	8.2 - 69	4.5 B - 37.3	7.2 B - 11.6
Zinc	20 or SB	23.3	28.7 - 764	10.3 - 39.3	11.2 - 23.3
Cyanide	NC	NA	ND - 225	ND - 19.9	--

TABLE 4-5
Summary of Detected Constituents
Subsurface Soil Analytical Results
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	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	Septic Tank/Leach Pit Soil Borings (SB-1 through SB-7)	Monitoring Well Soil Borings (MW-2 through MW-4)	Background Monitoring Well Soil Boring (MW-1)

Notes:
--/ND = Constituent not detected.
J = Constituent value is estimated.
P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
E = Constituent value exceeded calibration range.
N = Presumptive evidence exists for the presence of the constituent.
B (organics) = Constitent also present in an associated blank sample.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
ND (criteria) = Not to be detected above the detection limit for the applicable analytical method.
NC = No criteria available.
NA = Not analyzed/not available.
Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

monitoring well boring MW-4 indicated eight pesticides. Concentrations for these pesticides ranged up to 0.98 ug/kg. The existence of pesticides on the site has no historical documentation.

Eighteen of the twenty-one inorganics detected in the subsurface soils had concentrations that exceeded applicable criteria levels. As shown in Tables 4-5 and C-25, only cobalt, vanadium and cyanide were present at concentrations less than their respective criteria. Exceedance concentrations were found in all on-site locations, and ranged from 1.006 (potassium) to 52.4 (copper) times greater (see Figure 4-1 and Table 4-5). Maximum concentrations for the metals and cyanide were distributed throughout the boring locations, with the highest number (8) present in SB-7 at 3.5 to 5.5 feet bgs.

Samples for TOC analysis were collected from MW-1 (12 to 14 feet bgs), MW-2 (12 to 14 feet bgs), MW-3 (6 to 8 feet bgs), and MW-4 (12 to 14 feet bgs) in November 1997. The result concentrations were relatively equivalent, with the detected levels ranging from 806 mg/kg to 1,360 mg/kg (see Appendix E, Table C-26).

4.8 GROUNDWATER ANALYTICAL RESULTS

One round of groundwater samples was obtained from the four newly installed monitoring wells in May 1998. The samples and a duplicate were analyzed for TCL organics and TAL inorganics, and tabulated results are provided in Tables C-27 through C-30 of Appendix C. Sample GW-1 was collected from a sidegradient well for a background sample. Table 4-6 presents a summary of the detected groundwater constituents and their range of concentrations. Those constituents found at concentrations exceeding applicable criteria levels are plotted on Figure 4-1.

The groundwater collected from beneath the site contained trichloroethene and tetrachloroethene, two chlorinated aliphatic solvents (see Tables 4-6 and C-27). Trichloroethene was detected in all of the sampling locations but the background (GW-1), with concentrations ranging from 3.7 ug/L to 4,700 ug/L. As shown in Figure 4-1, it exceeded its applicable criteria level of 5 ug/L in GW-3 (68 ug/L) and GW-4 (4,700 ug/L). The subsurface soils from this location had contained 4 ug/kg of trichloroethene. Tetrachloroethene was present in the duplicate sample from location GW-4, at an exceedance concentration of 90 ug/L.

As shown in Tables 4-6 and C-28, bis(2-ethylhexyl)phthalate was the only identifiable SVOC detected in the groundwater (0.9 ug/L), and it was present in sample GW-5, the duplicate of GW-4. Due to its presence in associated blank samples, bis(2-ethylhexyl)phthalate may not be related to site activities.

The groundwater was analyzed for pesticides/PCBs, and the results are presented in Appendix C, Table C-29. As shown in the summary table (Table 4-6), 11 pesticides were detected at concentrations ranging from 0.00022 ug/L to 0.11 ug/L. Three of these constituents, beta-BHC in GW-3 and GW-4, heptachlor epoxide in GW-2 and GW-3, and 4,4'-DDT in GW-3, were present at concentrations greater than the method detection levels, indicating exceedances of the groundwater criteria. The existence of pesticides in the groundwater may be related to their distribution in the surface and subsurface soils from non-point sources.

TABLE 4-6
Summary of Detected Constituents
Groundwater Analytical Results
Page 1 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	Downgradient (GW-2, GW-3, GW-4)	Background (GW-1)
Volatile Organics (ug/L)			
Trichloroethene	5	3.7 - 4,700	--
Tetrachloroethene	5	ND - 90 E	--
Semi-Volatile Organics (ug/L)			
bis(2-Ethylhexyl)phthalate	50	ND - 0.9 JB	--
Semi-Volatile TICs	NC	ND - 13 J	--
Pesticides/PCBs (ug/L)			
beta-BHC	ND	0.00022 JP - 0.11 P	0.00078 JP
delta-BHC	ND	ND - 0.0013 JPB	0.00088 JP
gamma-BHC (Lindane)	ND	ND - 0.009 J	--
Heptachlor	ND	ND - 0.0029 J	--
Heptachlor epoxide	ND	ND - 0.035 P	0.001 JP
Dieldrin	ND	ND - 0.0038 JP	0.00072 JP
Endrin	ND	0.003 JP - 0.019 JP	--
Endosulfan II	NC	ND - 0.0044 JP	--
4,4'-DDT	ND	0.0046 JP - 0.026 P	--
alpha-Chlordane	0.1	ND - 0.004 JP	--
gamma-Chlordane	0.1	ND - 0.0063 JP	--
Inorganics (ug/L)			
Aluminum	NC	965 - 7,400	51.1 B
Antimony	3	ND - 5.1 B	--
Arsenic	25	15.7 - 64.3	--
Barium	1,000	56.5 B - 204	89.5 B
Cadmium	10	ND - 1.5 B	1.4 B
Calcium	NC	16,500 - 28,100	10,700
Chromium	50	14.5 - 112	2.2 B
Cobalt	NC	1.4 B - 20.2 B	--
Copper	200	8.3 B - 148	1.7 B

TABLE 4-6
Summary of Detected Constituents
Groundwater Analytical Results
Page 2 of 2

	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	Downgradient (GW-2, GW-3, GW-4)	Background (GW-1)
Iron	300	1,420 - 18,900	122
Lead	25	1.3 B - 3.2	1.2 B
Magnesium	35,000	2,140 B - 18,300	6,980
Manganese	300	56.6 - 1,600	5.9 B
Nickel	NC	7.9 B - 262	6.1 B
Potassium	NC	1,640 B - 8,250	1,210 B
Selenium	10	60.1 - 96.8	2.5 B
Sodium	20,000	7,950 - 57,600	27,700
Vanadium	NC	2.8 B - 37.3 B	--
Zinc	300	4 B - 516	7.8 B
Cyanide	100	14 - 416	--

Notes:
--/ND = Constituent not detected.
J = Constituent value is estimated.
P = Constituent had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
E = Constituent value exceeded calibration range.
N = Presumptive evidence exists for the presence of the constituent.
B (organics) = Constitent also present in an associated blank sample.
B (inorganics) = Constituent value is less than the required detection limit but greater than the instrument detection limit.
ND (criteria) = Not to be detected above the detection limit for the applicable analytical method.
NC = No criteria available.
NA = Not analyzed/not available.
Shaded entries exceed the comparison criteria in at least the maximum amount per concentration range.

Of the 24 TAL inorganics, only four (beryllium, mercury, silver and thallium) were not detected in the samples collected during the groundwater investigation (see Table 4-6 and C-30). In general, maximum concentrations for the inorganics were located in the GW-2 sample, which is located to the south-southeast of the septic tanks/leach pits. As shown in Figure 4-1, among the detected metals, exceedances occurred for antimony, arsenic, chromium, iron, manganese, selenium, sodium, zinc, and cyanide. Only sodium had a concentration in the background sample GW-1 that also exceeded applicable criteria levels.

5.0 HABITAT BASED ASSESSMENT

5.1 PRELIMINARY QUALITATIVE IMPACT ANALYSiS

This analysis was performed following guidance provided by the NYSDEC in the *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (FWIA)(NYSDEC, 1994). The report represents a Step I - Site Description impact analysis which is the first step of the phased approach. The objectives of the Step I - Site Description are to 1) identify fish and wildlife resources that may potentially be affected by site-related contaminants, and 2) if resources are present, provide the appropriate information for designing additional investigation studies (NYSDEC, 1994). To achieve these objectives, information regarding fish and wildlife resources is provided in the form of maps, habitat descriptions, and an evaluation of the value of such resources.

Identification of applicable fish and wildlife regulatory criteria, both contaminant-specific and site-specific, was also prepared for this Step-1 Site Description. This information is necessary to identify potential pathways of contamination migration that may affect fish and wildlife resources. The information obtained in Step I would be used in subsequent phases of the assessment should they be required.

5.2 DESCRIPTION OF FISH AND WILDLIFE RESOURCES

Pursuant to the NYSDEC guidance, documented fish and wildlife resources within a two-mile radius of the site were identified as part of the Step I - Site Description. An in-office document search was performed within a two-mile radius of the site to identify documented fish and wildlife resources including, but not limited, to NYSDEC Significant Habitats; habitats supporting endangered, threatened, or rare species, species of concern; regulated wetlands; wild and scenic rivers, streams, lakes; and other major resources.

A qualitative field assessment of vegetation covertypes and habitats was performed on October 3 and 4, 1996, on the Magna Metals site and within a 0.5 mile radius of the site perimeter. This assessment included documentation of vegetation communities and wildlife observations. Observations at a total of eight sample stations were recorded during the investigation. Sample stations chosen were representative of vegetation throughout the general area. At each station, vegetation was identified and observations of wildlife were noted. The information obtained from this qualitative assessment was then used to identify fish and wildlife resources and habitats within a 0.5-mile radius study area.

5.2.1 Terrestrial Habitats

Most of the site provides little wildlife habitat, because of the impervious structures and surfaces on-site. The north, west, and east boundaries of the site consist of a broad-leaf deciduous woodland. An extensive wetland area is present to the northwest and west of the site. This wetland complex is composed of broad-leaf deciduous forest and emergent communities, which could provide habitat to a variety of wildlife species. The wetland complex comprises approximately 15

acres, including several stream channels, two ponds, and several additional small ponded areas. It is not a New York State (NYS) regulated wetland area.

Wetlands and stream channels account for approximately five percent of the 0.5-mile radius. Wetlands within the study area are located in low lying or depressional areas usually associated with streams or other water bodies. Approximately 75 percent of the 0.5-mile radius is composed of broad-leaf deciduous forest habitat. Secondary growth hardwood species, i.e. black cherry (*Prunus serotina*), red and white oak (*Quercus rubra*, and *Q. alba*), shagbark hickory (*Carya ovata*), gray birch (*Betula populifolia*), American beech (*Fagus grandifolia*), and sassafras (*Sassafras albidum*) dominate the forest canopy. Ironwood (*Carpinus caroliniana*), spicebush (*Lindera benzoin*), young sassafras and black cherry dominated the shrub layer, and multiflora rose (*Rosa multiflora*), dewberry (*Rubus flagellaris*), black raspberry (*Rubus occidentalis*), ferns and violets (*Viola* sp.) make up the herbaceous layer.

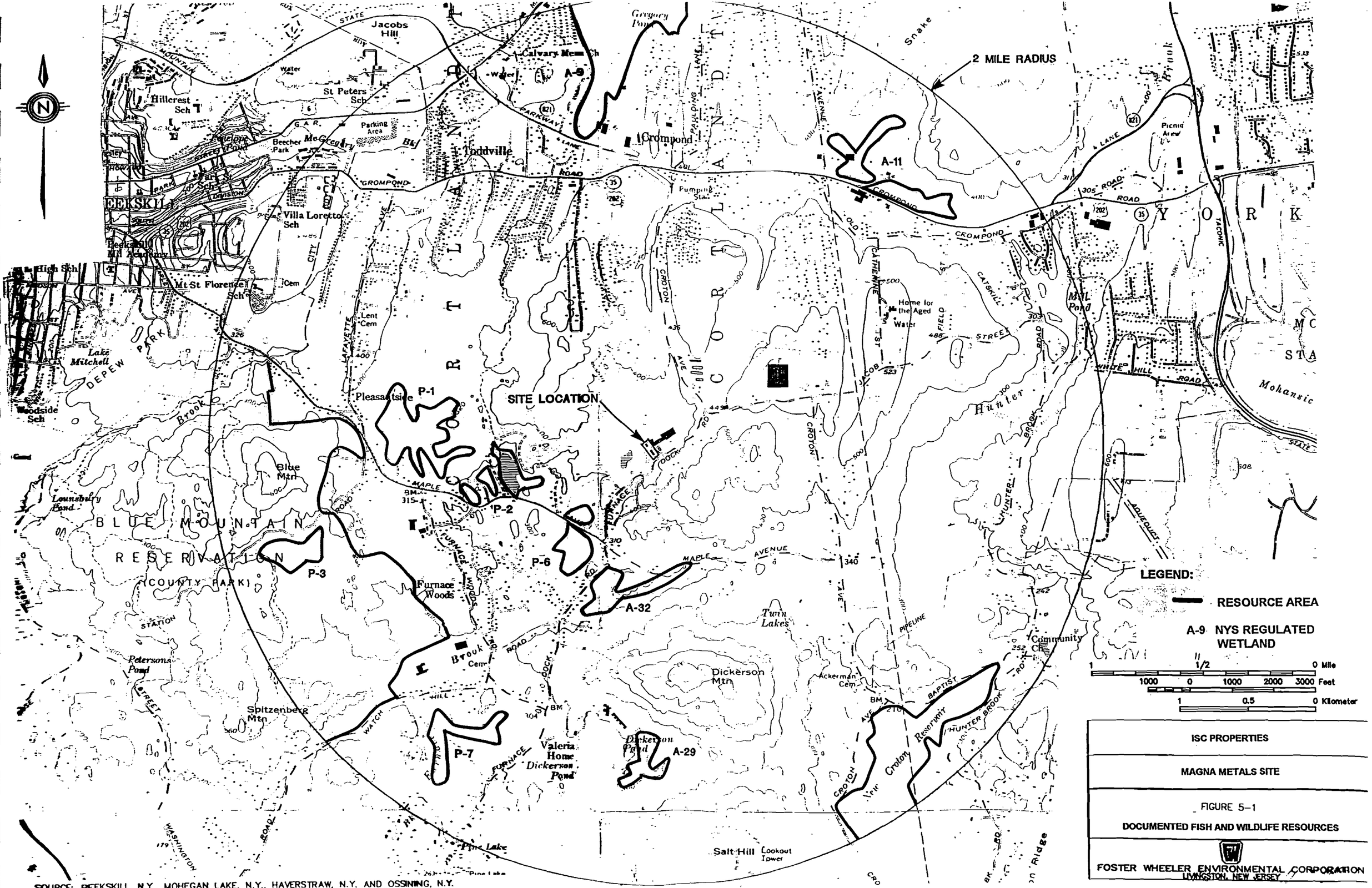
Approximately 20 percent of the study area is composed of residential properties consisting of single family dwellings. Large mowed lawns and wooded lots are scattered throughout the residential areas. These areas provide limited wildlife habitat for urban/suburban species.

Several documented fish and wildlife resources are present within the two-mile radius study area, including: nine NYS regulated wetland areas, the New Croton Reservoir, and Blue Mountain Reservation County Park (Figure 5-1).

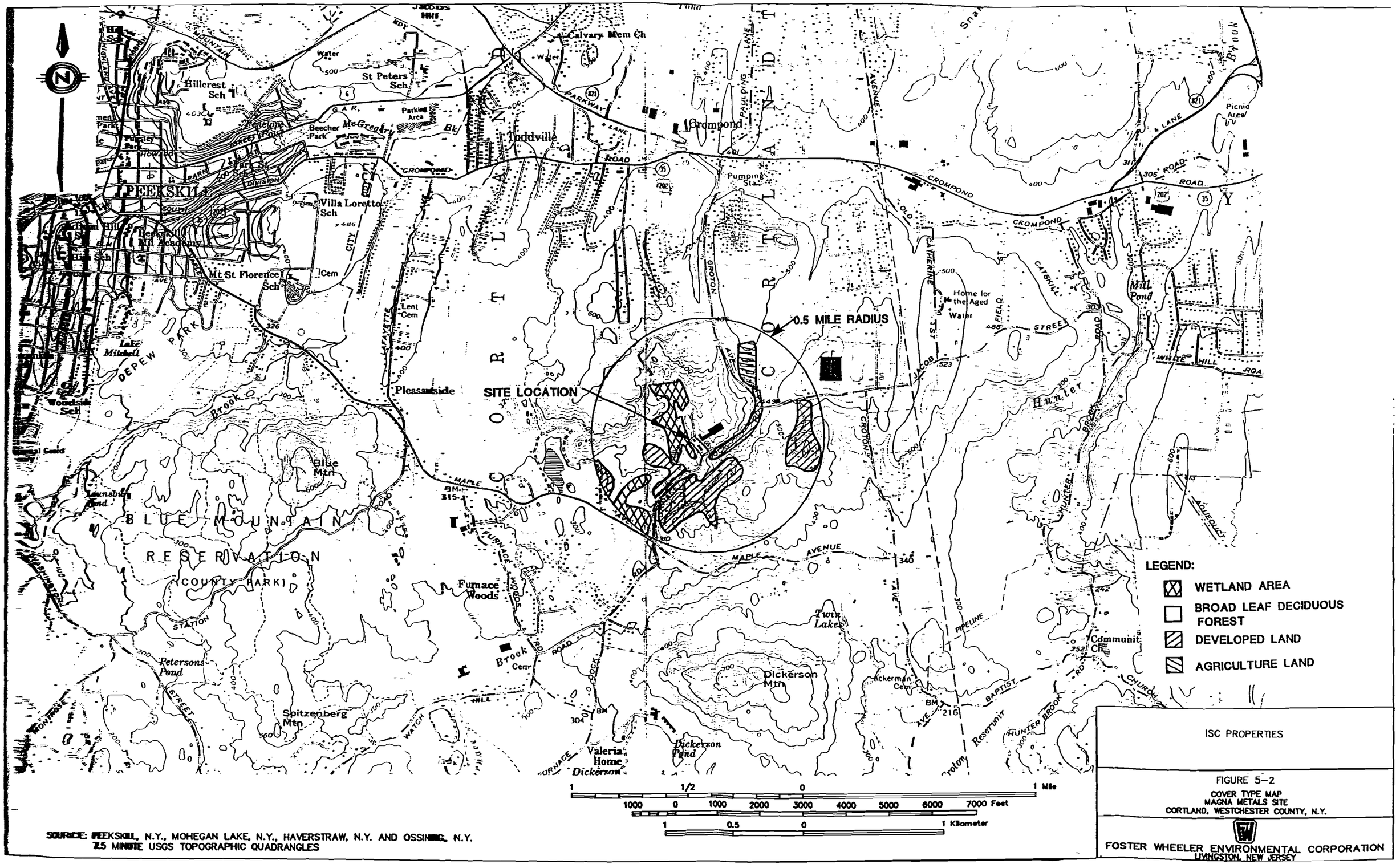
5.2.2 Aquatic Habitats

Within the 0.5-mile radius study area, several streams, ponds and wetland areas are present. A large wetland is located to the northwest of the Magna Metals site. Two streams enter this wetland area and one stream exits the pond via an outlet pipe located near the southwest end of the pond (Figure 5-2). The first stream channel, Stream #1, is located to the southwest of the Magna Metals site. The stream flows to the north into the large wetland complex. It converges with the second stream, Stream #2, and continues flowing southwest through the wetland complex into the man-made pond (Figure 5-2). The stream exits the pond via a conduit and continues flowing to the southwest. Stream #2 flows from the north into the wetland complex.

Stream #1 was approximately 1.5 feet wide and six inches deep at the center of the channel. Stream substrate consisted of silt. Chemical and physical parameters of the stream are listed in the following table. Aquatic vegetation was not present within the stream channel. Fish and aquatic life were not observed in the stream during the field investigation. Raccoon tracks were observed along the stream banks. Limited amounts of emergent vegetation, consisting of common reed (*Phragmites australis*), white grass (*Leersia virginica*), and sedges (*Carex* spp.) were present within the channel. The stream channel was surrounded by a broad-leaf deciduous forest. The area was predominantly vegetated by red oak (*Quercus rubra*), cottonwood (*Populus deltoides*), with tuliptree (*Liriodendron tulipifera*), gray birch (*Betula populifolia*), and white oak (*Quercus alba*). Spicebush (*Lindera bezoin*), northern arrowwood (*Viburnum recognitum*), and New York fern (*Thelypteris noveboracensis*) made up the sparse understory.



SOURCE: PEEKSKILL, N.Y., MOHEGAN LAKE, N.Y., HAVERSTRAW, N.Y. AND OSSINING, N.Y.



LEGEND:

- WETLAND AREA
- BROAD LEAF DECIDUOUS FOREST
- DEVELOPED LAND
- AGRICULTURE LAND

ISC PROPERTIES

FIGURE 5-2
COVER TYPE MAP
MAGNA METALS SITE
CORTLAND, WESTCHESTER COUNTY, N.Y.

FOSTER WHEELER ENVIRONMENTAL CORPORATION
LIVINGSTON, NEW JERSEY

SOURCE: PEEKSKILL, N.Y., MOHEGAN LAKE, N.Y., HAVERSTRAW, N.Y. AND OSSINING, N.Y.
7.5 MINUTE USGS TOPOGRAPHIC QUADRANGLES

FWL3RH2.DWG

Water Parameter Results Collected on October 3 and 4, 1996
Magna Metals Site
Town of Cortlandt, Westchester County, New York

Water Parameters	Stream #1	Stream #2	Pond #1	Pond #2
Water Temperature (°C)	15	14	14	16
Dissolved Oxygen (mg/L)	8.9	8.5	0.36	0.38
Conductivity (mS)	0.46	0.36	0.36	0.38
Turbidity	0	0	0	0
Salinity (o/oo)	0	0	0	0

Stream #2 was approximately three feet wide and six to eight inches deep at the center of the channel. Stream substrate consisted of silty sand with leaf litter. Chemical and physical parameters of the stream are also listed. Aquatic vegetation was not present in the channel during the field investigation. Fingernail clams and caddisflies were observed during the stream characterization. Deer tracks and a buck rub were also observed along the stream banks. The stream channel is immediately surrounded by a broad-leaf deciduous wetland forest. This area was predominantly vegetated by red maple (*Acer rubrum*) and elm (*Ulmus sp.*) in the canopy layer. Within the shrub layer, alder (*Alnus sp.*), winterberry (*Ilex verticillata*), and blackhaw (*viburnum prunifolium*) were present. Skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), false nettles (*Boehmeria cylindrica*), and halberd-leaf tearthumb (*Polygonum arifolium*) made up the sparse herbaceous layer.

Streams #1 and #2 converge within the southwestern portion of the wetland complex and discharge into a man-made pond, Pond #1. The pond was approximately 2.0 acres in size. It was approximately one foot deep near the edge. Due to turbidity and distance limitations, the depth at the center of the pond could not be determined. Aquatic vegetation within the pond consisted of duckweed (*Lemna sp.*). Filamentous algae was also dominant within the pond. Emergent aquatic vegetation along the pond's shoreline consisted of purple loosestrife (*Lythrum salicaria*). Vegetation surrounding the pond was primarily composed of tree and shrub/scrub species.

Cottonwood, oaks, and willow (*Salix sp.*) were dominant in the canopy layer; and staghorn sumac (*Rhus typhina*), catalpa (*Catalpa speciosa*), alder, and red-osier dogwood (*Cornus stolonifera*) in the shrub layer. An island vegetated by scrub/shrub species was present within the center of the pond. Canada geese and mallards were observed foraging and wading on the pond.

Two pipes were located along the southern boundary of the pond. The northern pipe appeared to be an outlet discharging water from the pond. Water exiting the pond flowed southwest through the conduit under Cross Road and several private properties. It is believed that the conduit discharges into a wetland south of the pond. However, this wetland was surrounded by private properties and not accessible. The southern pipe appears to be an inlet to the pond. Stormwater runoff from Cross Road is discharged into the pond through this pipe.

A second man-made pond, Pond #2, was present within the 0.5-mile radius study area. The pond was located to the north of the Magna Metals site on Stream #2. The stream entered the pond on the north side and exited the pond on the west side. A dam and spillway were present on the western side. The pond was approximately 2.0 acres in size. Water depth varied throughout the pond. Near the dam and spillway, the depth of the pond is approximately three feet deep. The pond substrate was composed of a thick organic layer several feet deep. The organic layer was primarily composed of leaf litter from the broad-leaf deciduous forest surrounding the pond. Dominant tree species surrounding the pond consisted of red and white oaks, gray birch, and beech. The shrub layer was composed of young shagbark hickory, and American beech. Stream #2 continued flowing west past the pond, then turned sharply to the south and converges with Stream #1. The stream channel flowed through the large wetland complex.

Percent saturation of oxygen at the measured temperature was determined by using an oxygen saturation nomogram (Wetzel 1983). Results for the streams and ponds located within the 0.5-mile radius study area are indicated below.

Percent Oxygen Saturation for Streams and Ponds within Magna Metals Site Study Area
Town of Cortlandt, Westchester County, New York.

Water Body	Percent Saturation of Oxygen
Stream #1	88%
Stream #2	83%
Pond #1	89%
Pond #2	85%

5.2.3 Wetlands

Wetlands within the 0.5 mile radius are located in the north and southwest portion of the study area. These wetlands are not classified as New York State regulated wetlands. The largest wetland area within the 0.5-mile radius study area is the wetland complex located to the northwest of the Magna Metals site. The wetland complex is approximately 15 acres in size, and includes the two stream channels and ponds. Streams #1 and #2 converge within this wetland area, and Pond #1 is located within the southwest portion of the wetland complex (Figure 5-2). This wetland complex is composed of a bottomland hardwoods, surrounded to the east by a steep, fairly rocky slope, which is predominantly vegetated by a broad-leaved deciduous upland forest. The bottomland hardwood forest is composed of red maple and elm in the canopy layer; alder, winterberry, and to a lesser degree blackhaw in the shrub layer. A sparse herbaceous layer was dominated by sensitive fern, and New York fern, smartweeds (*Polygonum sp.*). Sedges were present in the open woodland areas. The two stream channels, Streams #1 and #2, flow through the forested wetland. To the west of Stream #2, within the vicinity of the Magna Metals site, an emergent wetland is present. This wetland is predominantly vegetated by sedges, rushes (*Juncus spp.*), smartweeds, and arrow-leaf tearthumb (*Polygonum sagittatum*). Young red maple trees are also present throughout. To the south and southwest of the emergent wetland is Pond #1.

A broad-leaf deciduous woodland composed of red and white oak, gray birch, and beech in the canopy surrounds man-made pond #2. Submergent vegetation was not observed in the pond. The pond discharges into Stream #2, which flows through a bottomland hardwood in the large wetland complex. The bottomland hardwood is predominately vegetated by red maple, elm, and green ash (*Fraxinus pennsylvanica*) in the canopy, and ironwood (*Carpinsus caroliniana*), northern arrowwood, spicebush, New York fern, and sensitive fern in the understory.

Nine NYS regulated wetland areas are present within the two-mile radius study area (Figure 5-1). The NYS regulated wetland areas have all been classified as Class II wetlands, with the exception of A-9, which was classified as a Class I wetland. The wetland areas identified as P-2 and P-6 are both located within the 0.5-mile radius study area. Wetland P-2 is composed of an open water/emergent wetland and surrounded by broad-leaf deciduous forest wetlands. Wetland P-6 consists of a mixed scrub/shrub and broad-leaf deciduous forest wetlands

5.2.4 Fauna Expected Within Each Covertype and Aquatic Habitat

A total of ten bird species, and six mammal species, were observed within the 0.5 mile radius area of the Magna Metals site during the October 3 and 4, 1996 site investigation. The species observed within the study area are included in Table 5-1. Most of the birds observed during the October 3 and 4, 1996 field investigation of the 0.5-mile radius study area are considered year-round or winter residents. By October, most migrating birds would have departed from the area. Thus, the bird species observed during the field investigation do not accurately reflect the breeding and transient species which may also be present in the study area during the spring, summer, and fall.

Four of the ten bird species recorded were observed in the hardwood forest habitat. These species included the black-capped chickadee (*Pares articapillus*), red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchos*), and wood duck (*Aix sponsa*). The gray catbird (*Dumetella carolinensis*), blue jay (*Cyanocitta cristata)* and northern cardinal (*Cardinalis cardinalis*) were observed within an ecotone, or edge habitat. An ecotone is the zone between two adjacent habitat areas. In this study area, the ecotone is generally the interface between hardwoods and more open habitats; i.e. lawns and fields. The gray catbird, blue jay, and northern cardinal typically inhabit edge habitats and open woods, feeding primarily on berries, seed stock, and insects. Other species often associated with edge habitats include the American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), brown thrasher (*Toxostoma rufum*), various warblers and sparrows.

The green heron (*Butorides striatus*), Canada goose (*Branta canadensis*), and mallard (*Anas platyrhynchos*) were observed using the open water and wetland habitats for foraging and resting. Mallards and Canada geese were observed within two ponds in the large wetland complex located to the northwest of the Magna Metals site and a ponded area located downslope to the west of the Magna Metals site. These species were also observed in the ponds and wetlands outside of the 0.5-mile radius.

The green heron was observed within one of the ponded areas located in the large wetland complex. Mallards, Canada geese, and green herons inhabit marshes, bays, estuaries, ponds, rivers, and lakes

TABLE 5-1
Wildlife Species Observed in the Magna Metals Site Study Area
Town of Cortlandt, Westchester County, New York

Common Name	Scientific Name
BIRDS	
Black-capped Chickadee	*Pares articapillus*
Red-tailed Hawk	*Buteo jamaicensis*
Blue Jay	*Cyanocitta cristata*
Green-backed Heron	*Butorides striatus*
Wood Duck	*Aix sponsa*
Mallard	*Anas platyrhynchos*
Canada Goose	*Branta canadensis*
American Crow	*Corvus brachyrhynchos*
Gray Catbird	*Dumetella carolinensis*
Northern Cardinal	*Cardinalis cardinalis*
MAMMALS	
Raccoon	*Procyon lotor*
Eastern Chipmunk	*Tamias striatus*
Gray Squirrel	*Sciurus carolinensis*
White-tail Deer	*Odocoileus virginianus*
Beaver	*Castor canadensis*
Vole	*Microtus* sp.

throughout northeastern North America. The mallard and Canada geese are surface feeders, primarily herbivores with the bulk of their diets consisting of aquatic vegetation, and a limited amount of mollusks, insects, and small fish. Additional duck species, such as the American black duck (*Anas rubripes*), may also inhabit ponds and wetlands within the study area.

The green heron inhabits nearly all fresh and salt water habitats, including lakes, ponds, wetlands, wooded wetlands, and streams. Their diet is primarily carnivorous with main food sources consisting of small fish, crustaceans (mainly crayfish), frogs, salamanders, and an occasional mouse or shrew. Additional wading bird species that could be found in the wetlands, ponds, and streams within the study area include great blue heron (*Ardea herodias*), and black-crowned night-heron (*Nycticorax nycticorax*)

Several mammal species including the raccoon (*Procyon lotor*), eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), and vole (*Microtus sp.*) were observed in the hardwood forest areas near the wetlands and stream channels. A beaver lodge was observed on one of the ponded areas within the large wetland complex located to the northwest of the Magna Metals site.

The hardwood forests within the 0.5-mile radius study area provide habitat conditions suitable for the gray squirrel, and eastern chipmunk. Eastern gray squirrels are primarily arboreal, rarely venturing far from trees; and chipmunks are ground dwellers. Both species typically feed on nuts, seeds, fungi, and fruits. The large portion of nut and seed bearing trees within the study area provide a substantial food source for these species. Raccoon, white-tailed deer, and voles were also observed in the forest habitats. Tracks of the raccoon and white-tailed deer were observed in the open woodland areas and near water bodies. The mole was observed in an open woodland area. The variety of covertypes, i.e., successional fields, open woodland, and upland and bottomland forests; and presence of water sources throughout provide suitable habitat for wildlife species. These woodland areas could also provide habitat for the striped skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), woodchuck (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), and various mice (*Microtus sp.*) species.

A beaver (*Castor canadensis)* lodge was observed on the northern most ponded area in the large wetland complex. Beavers are chiefly aquatic; their habitats are usually associated with open water, i.e., slow flowing streams, rivers, lakes, and ponds. The beaver is a herbivore whose diet consists mainly of bark from deciduous trees and some herbaceous vegetation. The pond and wetland habitats within the 0.5-mile radius study area, would also provide ideal habitat for muskrats (*Ondatra zibethica*), which reside in marshes, and along open water. They are chiefly aquatic and feed on aquatic vegetation, and occasionally clams, frogs and fish.

Herpetofauna species were not encountered during the field investigation. The wetland and pond habitats throughout the 0.5-mile radius study area would provide necessary requirements for several species common throughout the Northeast, including the bullfrog (*Rana catesbeiana*), and green frog (*Rana clamitans*), snapping turtle (*Chelydra serpentina*), and stinkpot (*Sternothaerus odoratus*). Additional herpetofuana species which could utilize the upland forest and successional fields include the Eastern painted turtle (*Chrysemys picta picta*), and the common garter snake

(*Thamnophis sirtalis*). Herpetofauna species feed on a variety of food sources, from insects, small mammals, and fish, to mushrooms and berries.

5.3 ENDANGERED AND THREATENED SPECIES

The U.S. Fish and Wildlife Service (USFWS) and the New York State Department of Environmental Conservation (NYSDEC) were contacted to determine the presence of endangered and threatened species, or species of special concern within a two-mile radius of the Magna Metals site. The NYSDEC, Natural Heritage Program has documented habitat for the bog turtle (*Clemmys muhlenbergii*), a New York State and Federal endangered species, within the northern portion of two-mile radius (NYSDEC, 1996). The documented habitat is located upslope from the Magna Metals site in a separate watershed. The USFWS has no documented records of endangered or threatened species within a two-mile radius of the Magna Metals site (USFWS, 1996).

5.4 OBSERVATIONS OF STRESS

As part of the site investigation, vegetation and wildlife within the 0.5 mile radius were investigated for signs of stress potentially related to site contaminants. Vegetation and wildlife within the 0.5 mile radius study area did not show signs of stress. Two areas used for dumping were observed to the north and northwest of the site. The larger dump area was located to the north of the Magna Metals site, within the same industrial/commercial park as the Magna Metals site. This area was being used to dispose of building material. Several excavated underground storage tanks were also present. A second smaller dump area was also encountered within the commercial park. This area was observed in the woodland adjacent to the northwest portion of the Magna Metals site. Two empty 55-gallon drums were observed at this location. A small intermittent drainage channel was noticed coming from the dump area and discharging into the large wetland complex.

5.5 DESCRIPTION OF FISH AND WILDLIFE RESOURCE VALUE

As part of a Fish and Wildlife Impact Analysis, Step I - Site Description, the habitat value for both wildlife and humans is assessed. Wildlife habitat is assessed, within the 0.5 mile study area, based on availability of food, seasonal cover, bedding areas, breeding and roosting sites, etc. For humans, the value of habitats within the 0.5-mile study area is assessed based on the current and potential use of fish and wildlife resources. Human resources may include hunting, fishing, observation of wildlife, scientific studies, agriculture, forestry, and other recreational and economic activities.

5.5.1 Value of Habitat to Associated Fauna

The broad-leaf deciduous forests and bottomland hardwood wetlands provide valuable wildlife habitat within the 0.5 mile radius study area. The stream and ponds within the study area provide important water sources for the wildlife that resides within the study area. Two NYS regulated, Class II wetlands, P-2 and P-6, are both located within the southwest portion of the 0.5-mile radius, documented fish and wildlife resources are not present within the 0.5-mile. Habitat for the bog

turtle, State and Federal endangered species, was identified within the northern most portion of the 2.0-mile radius.

Furnace Brook and its tributaries adjacent to Magna Metals site have been classified by NYSDEC as Class D waters and are subject to Class D New York water quality standards. The best usage for these waters is fishing. Although water conditions are usually not conducive for the propagation of game fish, these waters are suitable for fish survival.

5.5.2 Value of Resources to Humans

For humans, the value of habitats within the 0.5 mile study area is assessed based on the current and potential use of fish and wildlife resources for such activities as hunting, fishing, observation of wildlife, agriculture, forestry, scientific study, and other recreational and economic opportunities. The 0.5-mile radius is largely forested, however, due to private ownership and steep slopes, access to much of the area is limited. Several wetland and pond areas, which could be used for recreational fishing and wildlife observation, have limited access due to private ownership of the properties and surrounding areas. Two farm areas, an egg farm to the west of the site, and an agricultural farm to the northeast of the site, are also located within the 0.5-mile radius (Figure 5-2).

5.6 IDENTIFICATION OF APPLICABLE FISH AND WILDLIFE REGULATORY CRITERIA

Both contaminant-specific and site-specific criteria applicable to the remediation of fish and wildlife resources were identified for the Magna Metals site. Contaminant-specific criteria involves reviewing NYSDEC rules, regulations, and guidance to identify regulatory compliance, permits, or standards which may be applicable to the site. Soils, sediment, and surface and ground water samples were collected on the Magna Metals site. Sample results should be compared to the following rules, regulations, and guidances:

- Water Quality Standards and Guidance Values for the Protection of Aquatic Life (6 New York Codes, Rules, and Regulations [NYCRR] Part 701);
- Technical Guidance for Screening Contaminated Sediment;
- Division of Water, Technical and Operational Guidance Series (TOGS) 1.1.1., Ambient Water Quality Standards and Guidance Values; and
- Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels.

5.7 PATHWAY ANALYSIS

The Magna Metals facility historically conducted metal plating, polishing and lacquering processes for the period of 1955 to 1979. Spent liquid wastes generated as a result of these operations would be expected to contain iron, lead, copper, nickel and zinc chlorides, cyanides

and sulfide salts. The primary means for disposal of the above wastes was allegedly by discharge to a series of leaching pits and possibly a facility septic system. The principal media to which ecological receptors may be exposed to site-related contaminants include:

- Surface soils which may have been contaminated as a result of historical operations, spills or disposal practices;
- Surface water through direct contact or consumption of contaminants through drinking; and
- Sediments through direct contact or incidental consumption of contaminants during feeding.

Currently upland environments, wetlands and streams located downgradient from and adjacent to the site provide limited potential to support populations of ecological receptors. The wetlands and streams located downgradient from the site receive drainage from the site and act as both potential pathways and sinks for site related contaminants. Migratory pathways which could act as conduits for transporting site-related contaminants to areas supporting ecological receptors include:

- Mobilization of site-related contaminants via surface water runoff into the adjoining channels and wetlands; and

- Introduction of site-related contaminants via groundwater to surface water discharge.

Direct contact with groundwater and deep subsurface soils are not considered as complete exposure pathways as these media typically remain unavailable to most ecological receptors. Ecological receptors may be exposed to contaminants in groundwater if the potential migration pathway for groundwater to surface water discharge is complete. The point of exposure for ecological receptors for the groundwater to surface water discharge pathway will be considered as the surface water exposure as this represents the exposure point for ecological receptors. If groundwater contaminants are not detected in surface waters, then the groundwater to surface water pathway will not be considered as complete for these contaminants or that the fate and transport characteristics of the contaminants do not result in significant exposure concentrations in surficial media.

The site is located within a cluster of buildings in an industrial park in Cortlandt, New York. The industrial park represents the only significant development in the surrounding area and the former Magna Metals facility is located on the outer perimeter of the developed area. Surface water drainage is directed via several small unnamed tributaries of Furnance Brook and includes a 15-acre forested wetland to the southwest of the site. Additional forested wetland was found to the north as was undeveloped, forested uplands.

The unnamed tributaries, ponds and wetland areas adjacent to the site offer the only surface water resources within the two-mile radius which could be affected by site-related contaminants. No fish kills or wildlife mortality have been documented in the streams or wetlands within the vicinity of the site. Site-related constituents (heavy metals) were identified in surface water and sediments of the unnamed tributaries and ponds. Elevated concentrations of heavy metals and volatile organics were detected at concentrations above applicable NYDEC groundwater

standards. Additionally, elevated concentrations of metals were detected in site surface soils which were potentially susceptible to erosion into the adjacent aquatic and wetland environments.

The presence of site-related constituents in the surface soils, surface water and groundwater environments suggest that the groundwater to surface water discharge pathway and the surface water runoff pathway are complete for exposing aquatic receptors in the streams, ponds and wetlands.

Since the surface water pathway is both the principle migratory pathway and exposure pathway for aquatic receptors, resident aquatic (i.e., benthic communities in the sediments) species would have a greater potential for adverse ecological effects than migratory species or species which have large home ranges due to longer periods of exposure. For surface soils, the principle exposure source is contaminated surficial soil material and the exposure pathway would be contact with surface soils by ecological receptors.

Results of the Phase I Site investigation revealed that both fish and wildlife resources were associated with areas adjacent to the site but that the Site itself provides limited value for fish and wildlife resources based upon the following observations:

- The small size of the site and absence of any significant vegetation communities on the site proper;
- The majority of the site is paved and developed for storage and maintenance operations; and
- The site boundary is partially enclosed by a chain linked fence.

Surface soil, surface water and sediment contamination were evaluated as potential exposure sources for ecological receptors. The majority of the site is covered by impervious structures which would limit wildlife contact with soils. Surface soil samples were collected from the outer fringes of the developed portions of site near the on-site leach pits. The extremely limited vegetation on the site proper provides limited feeding and resting habitat for transient species, and therefore, habitation of the developed portions of the site by wildlife is not anticipated. The primary focus of the Fish and Wildlife Impact Assessment (FWIA) were the streams and wetlands receiving drainage from the site with a limited focus on soils from the leach pit area.

5.8 CRITERIA SPECIFIC ANALYSIS

The primary media of concern for ecological receptors were identified as surface water, sediments, and surface soils. These media were sampled down-gradient from the site to the southwest. Surface water and sediment samples were obtained from two unnamed tributaries to Furnace Brook and an unnamed pond. Analytical results from surface water, sediment, and surface soil samples collected were used to compare concentrations of contaminants to numerical criteria. Furnace Brook and its tributaries adjacent to the Magna Metals site are classified as Class D waters by the NYSDEC.

For the surface water evaluation. NYSDEC Class D AWQC values, and USEPA acute and chronic water quality criteria values were used to screen detected contaminants. Criteria for metals that were hardness dependent were normalized using an average hardness value (155.25 mg/L $CaCO_3$). NYSDEC sediment criteria were used in screening sediment contamination. For screening the sediment data, where applicable, benchmarks were normalized using an average TOC value (85.36 gOC/kg). The hardness and TOC values were derived from site-specific samples obtained during the field effort. Ambient background soil concentration data NYSDEC benchmarks were utilized for the screening of surface soils.

5.8.1 Surface Water Evaluation

Table 5-2 provides the comparisons of surface water data to applicable benchmarks. NYSDEC water quality standards were used for surface water criteria when possible. NYSDEC water quality criteria were not available for the detected volatile organic compounds (VOCs). USEPA water quality criteria were available for chloroform, trichloroethene, and cis-1,2-dichloroethene (acute only). VOCs were not detected at the background location in the surface water samples. Vinyl chloride was present in the surface water at sites SW-4, SW-9, and SW-10. Methylene chloride was detected at site SW-7. Cis-1,2-dichloroethene occurred in samples SW-1, SW-1 DUP, SW-2 through SW-6, and SW-8 through SW-10. Chloroform was found in surface water samples from sites SW-6, SW-8, SW-10, and SW-11. Trichloroethene was detected in samples SW-1, SW-1 DUP, SW-2 through SW-6, and SW-8 through SW-10. Detected volatile organic compounds did not exceed either chronic or acute criteria. However, the detection of methylene chloride and chloroform is likely to be associated with laboratory cleaning.

Table 5-3 provides the comparison of detected semivolatile compounds to applicable benchmarks. NYSDEC water quality criteria were not available for the detected semi-volatile organic compounds. USEPA water quality criteria were available for the semi-volatile organic compounds 4-methylphenol, hexachlorobenzene, and fluoranthene (acute only). Bis(2-ethylhexyl)phthalate was the only semi-volatile detected at the background location. It also occurred in the down-gradient samples SW-1 DUP, and SW-5 through SW-7. Fluoranthene and pyrene were present at site SW-9, and 4-methylphenol was detected at site SW-7. Hexachlorobenzene occurred in samples SW-1 DUP, SW-3, and SW-6, and diethylphthalate was present in samples SW-1, SW-3, and SW-8. Detected semi-volatile organic compounds did not exceed either chronic or acute criteria.

Table 5-4 provides the comparison of metals detected in surface water to applicable benchmarks. NYSDEC water quality criteria were not available for antimony, barium, calcium, magnesium, manganese, potassium, selenium and sodium. USEPA chronic and acute data were substituted for antimony and selenium. Arsenic, cadmium, chromium, cobalt, mercury, selenium, vanadium, and cyanide were not detected at the background location.

TABLE 5-2
TCL Volatile Organic Compounds
Detected in Surface Water of the Magma Metals Site

Sample ID	USEPA	USEPA	SW-12	SW-1	SW-1 DUP	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11
Laboratory ID	Surface Water Criteria	Surface Water Criteria	72184019 Background	72184005	72184009	72184006	72184007	72184008	721840010	721840011	72184012	72184013	72184014	72184015	72184018
Date Sampled	Acute	Chronic	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97	05/22/97
Volatiles															
Vinyl Chloride	NC	NC	ND	ND	ND	ND	ND	0.7 J	ND	ND	ND	ND	2.5	0.91 J	ND
Methylene Chloride	NC	NC	ND	ND	ND	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND
cis-1,2-Dichloroethene	11600	NC	ND	3.5	4.2	3.2	3.3	4.5	2.1	5.1	ND	7.4	18	9	ND
Chloroform	28900	1240	ND	ND	ND	ND	ND	ND	ND	0.79 J	ND	0.77 J	ND	0.89 J	1.6
Trichloroethene	45000	21900	ND	5.5	2.7	2.4	2.3	2.6	2.2	0.97 J	ND	1.4	0.73 J	1	ND

Surface water results are presented in ug/L (ppb)
ND = Not detected
NC = No criteria available
J=Estimated Concentration

TABLE 5-3
TCL Semi-Volatile Organic Compounds
Detected in Surface Water of the Magna Metals Site

Sample ID	USEPA	USEPA	SW-12	SW-1	SW-1 DUP	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11
Laboratory ID	Water Quality Criteria	Water Quality Criteria	971144A-09 Background	971121A-07	971144A-11	971121A-05	971121A-08	971144A-01	971144A-03	971144A-05	971144A-07	971121A-09	971121A-10	971121A-01	971121A-03
Date Sampled	Acute	Chronic	05/13/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97
Semi-Volatiles															
4-Methylphenol[1]	10200	2560	ND	ND	ND	ND	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND
Diethylphthalate	NC	NC	ND	0.3 J	ND	ND	0.2 J	ND	ND	ND	ND	0.2 J	ND	ND	ND
Hexachlorobenzene	6	3.68	ND	ND	0.2 J	ND	0.3 J	ND	ND	0.3 J	ND	ND	ND	ND	ND
Fluoranthene	3980	NC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND
Pyrene	NC	NC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3 J	ND	ND
bis(2-Ethylhexyl)phthalate	NC	NC	3 J	ND	2 J	ND	ND	ND	0.6 J	0.7 J	1 J	ND	ND	ND	ND

Phenol acute and chronic criteria used for 4-Methylphenol
Surface water results are presented in ug/L (ppb)
ND = Not detected
NC = No criteria available
J=Estimated Concentration

TABLE 5-4
TAL Metals and Cyanide
Detected in Surface Water of the Magna Metals Site

Sample ID	NYSDEC Water	USEPA	USEPA	SW-12	SW-1	SW-1 DUP	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10	SW-11
Laboratory ID	Quality Standards/	ater Quality	Water Quality	971144A-09	971121A-07	971144A-11	9711121A-05	971121A-08	971144A-01	971144A-03	971144A-05	971144A-07	971121A-09	971121A-10	971121A-01	971121A-03
Depth	Guidance Values	Criteria	Criteria	Background												
Date Sampled	(Class D)	Acute	Chronic	05/12/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97
Metals																
Aluminum	100	-	-	64.8 B	54.2 B	135 B	126 B	454	103 B	178 B	2660	13100	84.8 B	8960	118 B	41.9 B
Antimony	-	88	30	3.6 B	ND	ND	ND	ND	3.5 B	3.1 B	3.5 B	4.9 B	ND	ND	ND	ND
Arsenic	360	-	-	ND	ND	ND	ND	ND	ND	ND	4 B	18.3	ND	4.1 B	ND	ND
Barium	NC	-	-	33.4 B	27.2 B	56 B	25.4 B	33.7 B	37.7 B	68 B	154 B	250	69.7 B	631	68.5 B	52.4 B
Cadmium	6.4	-	-	ND	ND	ND	ND	ND	ND	ND	ND	1.7 B	ND	1.1 B	ND	ND
Calcium	NC	-	-	23000	22200	23500	20700	21500	22600	23400	21800	18800	18700	40600	18100	16300
Chromium	2490	-	-	ND	ND	ND	1.4 B	3.5 B	ND	1.5 B	39.6	253	ND	69.7	1.1 B	ND
Cobalt	110	-	-	ND	ND	ND	ND	ND	ND	1.4 B	6.7 B	32.8 B	ND	31.4 B	ND	ND
Copper	27	-	-	2.7 B	4.9 B	6.5 B	8 B	14 B	4.3 B	14.1 B	491	3960	6.2 B	95.4	5.3 B	2.8 B
Iron	300	-	-	363 J	658	1060 J	908	1510	856 J	1110 J	7240 J	34100 J	272	24000	346	94.2 B
Lead	144	-	-	R	ND	R	2.2 JB	2 JB	ND	R	14.2	88	ND	43.6	ND	ND
Magnesium	NC	-	-	13800	18900	18800	17300	17900	18200	15200	20200	13800	19300	68600	19300	14200
Manganese	NC	-	-	60.3	209	422	188	182	336	888	625	1010	109	1760	110	57.4
Mercury	0.2	-	-	ND	ND	ND	ND	ND	ND	ND	ND	0.22	ND	ND	ND	ND
Nickel	2577	-	-	3.5 B	2.3 B	10.6 B	4.6 B	4 B	8.9 B	15.7 B	136	558	11.9 B	204	6.2 B	5.5 B
Potassium	NC	-	-	1970 JB	2230 B	2300 JB	2080 B	2160 B	2360 JB	2060 JB	1990 JB	2790 JB	1900 B	5980 J	1820 B	1510 B
Selenium	-	20	5	ND	ND	3.4 B	ND	4.5 B	ND	ND	10.2	40.1	6.7	3 B	ND	ND
Sodium	NC	-	-	17600	20300	20400	18600	19200	19600	18800	27000	21700	27900	30300	26400	23600
Vanadium	190	-	-	ND	ND	ND	ND	1.6 B	ND	1.3 JB	8.6 B	25.7 B	ND	29.6 B	ND	ND
Zinc	463	-	-	27.3 J	10.7 B	21.8 J	16.7 B	37	17.8 B	28.1 J	232 J	2090 J	20.8	146	27.3	18.3 B
Cyanide	22	-	-	ND	ND	39.6 J	ND	ND	ND	ND	220	858	ND	18.7	ND	ND

Surface water results are presented in ug/L (ppb)
ND = Not detected
NC = No criteria available
B = Element detected below CRDL but above IDL
J=Estimated Concentration
R=Rejected Data

Mercury was detected in only the site SW-7 sample, this level exceeded the NYSDEC water quality standard. Arsenic, cadmium, and cobalt occurred at the down-gradient sites SW-7 and SW-9. In addition, arsenic was also present at site SW-6, and cobalt was also present at sites SW-5 and SW-6. Selenium and cyanide were present in samples SW-1 DUP, SW-6, SW-7, and SW-9. Selenium was also detected at sites SW-3 and SW-8. Levels of selenium exceeded the USEPA chronic water quality criteria at sites SW-6 and SW-8, and exceeded the severe effects level at site SW-7. Cyanide levels were above the NYSDEC water quality standard in samples SW-1 DUP,SW-6, and SW-7. Lead was detected at sites SW-2, SW-3, SW-6, SW-7, and SW-9. Data regarding the presence of lead were rejected in the background samples, SW-1 DUP, and SW-5.

Chromium and vanadium were present at sites SW-3, SW-5 through SW-7, and SW-9. In addition, chromium also occurred at detectable levels at sites SW-2 and SW-10. Antimony was detected at the background location and at down-gradient sites SW-4 through SW-7. The level of antimony exceeded the background level at site SW-7.

The remaining 11 metals (aluminum, barium, calcium, copper, iron, magnesium, manganese, nickel, potassium, sodium, and zinc) were detected in samples from the background location and from all down-gradient sites. Concentrations of aluminum exceeded the background level at site SW-8, and exceeded the NYSDEC criteria value in samples SW-1 DUP, SW-2 through SW-7, SW-9 and SW-10. Levels of barium exceeded the background concentration in all samples but SW-1 and SW-2. Metals occurred in the following samples at a greater concentration than at the background location: calcium, SW-1 DUP, SW-5, and SW-9; copper, SW-1, SW-1 DUP, SW-2 through SW-5, SW-8, SW-10, and SW-11; magnesium, all samples except SW-7; manganese, all samples except SW-11; nickel, all samples except SW-1; potassium, SW-1,SW-1 DUP, SW-2 through SW-7, and SW-9; sodium, all samples; and zinc, SW-3, Table 5. SVOAs in surface SW-5, SW-6, and SW-9. The background level of zinc exceeded the NYSDEC criteria as did all the down-gradient samples except SW-8 and SW-11. The concentration of copper at sites SW-6, SW-7, and SW-9, and zinc at site SW-7 exceeded the NYSDEC water quality criteria.

5.8.2 Sediment Evaluation

Samples from 11 down-gradient sites and one background site were analyzed for the presence of volatile organic compounds (VOC). Table 5-5 provides the comparison of detected volatile organics in sediments to applicable benchmarks. Severe effects level and lowest effect level was not available for VOCs. All volatile organic compounds data were rejected for site SD-3. No VOCs were detected at the background location or at site SD-11. Chloromethane and toluene were present only at site SD-7. Vinyl chloride was detected in the sample from SD-9. Carbon disulfide and tetrachloroethene were detected only at sites SD-4 and SD-10 respectively. 4-Methyl-2-pentanone and 2-Hexanone were detected at site SD-2 and SD-10. Trichloroethane was present in samples from sites SD-5 and SD-9. Acetone was found in samples from sites SD-4, SD-5, SD-8, and SD-9. 2 Butanone was found in the following samples: SD-1, SD-1 DUP, SD-2, and SD-4 through SD-9.

TABLE 5-5
TCL Volatile Organic Compounds
Detected in Sediments of the Magna Metals Site

Sample ID	NYSDEC	Normalized	SD-12	SD-1	SD-1 DUP	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11
Laboratory ID	Sediment	Sediment	72093010	72054019	72093012	72054010	72054020	72093002	72093004	72093006	72093008	72054017	72054018	72054004	72054008
Depth	Criteria	Criteria*	Background												
Date Sampled	ug/gOC	ug/kg	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97
Volatiles															
Chloromethane	NC	NC	ND	ND	ND	ND	R	ND	ND	ND	7 J	ND	ND	ND	ND
Vinyl Chloride	NC	NC	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	25 J	ND	ND
Acetone	NC	NC	ND	ND	ND	ND	R	340 JB	770 JB	ND	ND	150 JB	530 JB	ND	ND
CarbonDisulfide	NC	NC	ND	ND	ND	ND	R	12 J	ND	ND	ND	ND	ND	ND	ND
2-Butanone	NC	NC	ND	21	74	11 J	R	95 J	260 J	22 J	39 J	36 J	160 J	ND	ND
Trichloroethene	NC	NC	ND	ND	ND	ND	R	ND	20 J	ND	ND	ND	22 J	ND	ND
4-Methyl-2-Pentanone	NC	NC	ND	ND	ND	12 J	R	ND	ND	ND	ND	ND	ND	5 J	ND
2-Hexanone	NC	NC	ND	ND	ND	18 J	R	ND	ND	ND	ND	ND	ND	10 J	ND
Tetrachloroethene	NC	NC	ND	ND	ND	ND	R	ND	ND	ND	ND	ND	ND	4 J	ND
Toluene	NC	NC	ND	ND	ND	ND	R	ND	ND	ND	12 J	ND	ND	ND	ND

Sediment results are presented in ug/kg (ppb)
* = Criteria normalized using average TOC concentration in sediments
ND = Not detected
NC = No criteria available

Table 5-6 provides the comparison of detected semi-volatile organics in sediments to applicable benchmarks. Semi-volatile organic compounds were not detected at the background location. Severe effects level was not available for the detected compounds, and lowest effect level was only available for 4-Chloro-3-methylphenol, acenaphthene, phenanthrene, fluoranthene, and bis(2-Ethylhexyl)phthalate. 4-Chloro-3-methylphenol was the only compound that exceeded the lowest effect level. This concentration occurred in the sample from site SD-3.

The following compounds were detected at only one of the down-gradient locations: naphthalene and 2-methylnaphthalene, site SD-1; 4-chloro-3-methylphenol and butylbenzylphthalate, site SD-3; and hexachloroethane, site SD-10. Acenaphthylene, acenaphthene, dibenzofuran, fluorene, and carbazole were present at sites SD-1 and SD-8. Acenaphthene was also detected in the sample from site SD-3. Indeno(1,2,3-cd)pyrene and benzo(g,h,i)perylene were found at sites SD-1, and SD-7 through SD-11. Phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected at sites SD-1 and SD-5 through SD-11. Benzo(b)fluoranthene, and benzo(k)fluoranthene were also present in samples from site SD-4. Fluoranthene, pyrene, and benzo(a)pyrene were found in samples SD-1, SD-1 DUP, SD-4, SD-5, and SD-7 through SD-11. In addition, benzo(a)pyrene was present at site SD-2, fluoranthene was detected in samples from site SD-6, and pyrene was found at sites SD-3 and SD-6. Di-n-butylphthalate and bis-2-ethylhexyl)phthalate were present in samples SD-1 DUP, and SD-4 through SD-6. Anthracene was detected at sites SD-1, SD-5, and SD-7 through SD-11.

Table 5-7 provides the comparisons of detected pesticides/PCBs in sediments to applicable benchmarks. Samples from three down-gradient sites were tested for pesticides. The pesticides alpha-Chlordane and gamma-Chlordane were detected in the site SD-10 sample at concentrations that exceed the lowest effect level.

Table 5-8 provides the comparisons of detected TAL metals and cyanide in sediments to applicable benchmarks. No severe effects level or lowest effect level was available for aluminum, barium, beryllium, calcium, cobalt, magnesium, potassium, selenium, sodium, vanadium, and cyanide. Arsenic and cadmium were not detected at the background location, but they were detected in samples from all of the down-gradient sites. The concentration of arsenic in samples SD-1 DUP, and SD-4 through SD-7, also exceeded the lowest effect level. The concentration of cadmium exceeded the lowest effect level in samples from all sites except SD-10 and SD-11. Beryllium, selenium, and cyanide were also not detected at the background location. Beryllium was detected in samples from three sites (SD-5, SD-6, and SD-8). Selenium was detected at all sites except SD-11, and cyanide was detected in samples SD-1 DUP, SD-3, and SD-6 through SD-8.

Aluminum, calcium, cobalt, lead, magnesium, nickel, potassium, sodium, vanadium, and zinc were detected at higher levels in all the down-gradient samples than at the background location. The lowest effect level for lead was exceeded in samples from sites SD-5 through SD-7, and SD-9. All sites, including the background, exceeded the lowest effect level for nickel. Nickel levels also exceeded the severe effects level at all down-gradient sites except SD-8, SD-10, and SD-11. The lowest effect level for zinc was exceeded in samples from all sites except SD-8, SD-10, and SD-11, and the severe effects level was exceeded at sites SD-5 through SD-7. Levels of barium were higher than at the background location in all sites but SD-10. Chromium data was rejected

TABLE 5-6
TCL Semi-Volatile Organic Compounds
Detected in Sediments of the Magna Metals Site

Sample ID	NYSDEC	NYSDEC	SD-12	SD-1	SD-1 DUP	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11
Laboratory ID	Criteria	Criteria	971144A-10	971121A-14	971144A-12	971121A-06	971121A-15	971144A-02	971144A-04	971144A-06	971144A-08	971121A-12	971121A-13	971121A-02	971121A-04
Depth	Acute*	Chronic*	Background												
Date Sampled	ug/kg	ug/kg	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97	05/14/97	05/14/97	05/12/97	05/12/97	05/12/97
Semi-Volatiles															
Hexachloroethane	NC	NC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	960	ND
Naphthalene	NC	NC	ND	42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	NC	51.23	ND	ND	ND	ND	160 J	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	NC	NC	ND	38 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	NC	NC	ND	180 J	ND	ND	ND	ND	ND	ND	ND	19 J	ND	ND	ND
Acenaphthene	NC	11950.68	ND	140 J	ND	ND	88 J	ND	ND	ND	ND	53 J	ND	ND	ND
Dibenzofuran	NC	NC	ND	220 J	ND	ND	ND	ND	ND	ND	ND	29 J	ND	ND	ND
Fluorene	NC	NC	ND	540	ND	ND	ND	ND	ND	ND	ND	74 J	ND	ND	ND
Phenanthrene	NC	10243.44	ND	2700	ND	ND	ND	ND	270 J	100 J	350 J	950 J	250 J	87 J	35 J
Anthracene	NC	NC	ND	700	ND	ND	ND	ND	35 J	ND	45 J	130 J	37 J	17 J	6 J
Carbazole	NC	NC	ND	340 J	ND	ND	ND	ND	ND	ND	ND	120 J	ND	ND	ND
Di-n-butylphthalate	NC	NC	ND	ND	170 J	ND	ND	85 J	92 J	97 J	ND	ND	ND	ND	ND
Fluoranthene	NC	87069.24	ND	2400	270 J	ND	ND	280 J	490 J	230 J	650 J	1400 J	590 J	140 J	71 J
Pyrene	NC	NC	ND	2300	220 J	ND	180 J	220 J	390 J	200 J	710 J	1500 J	640 J	140 J	72 J
Butylbenzylphthalate	NC	NC	ND	ND	ND	ND	1000 J	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	NC	NC	ND	1200	ND	ND	ND	ND	180 J	95 J	300 J	710 J	260 J	62 J	31 J
Chrysene	NC	NC	ND	1300	ND	ND	ND	ND	300 J	150 J	410 J	1000 J	370 J	81 J	46 J
bis(2-Ethylhexyl)phthalate	NC	17029.72	ND	ND	300 J	ND	ND	210 J	250 J	140 J	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	NC	NC	ND	840	ND	ND	ND	150 J	260 J	130 J	360 J	820 J	320 J	60 J	32 J
Benzo(k)fluoranthene	NC	NC	ND	950	ND	ND	ND	150 J	210 J	120 J	320 J	780 J	300 J	65 J	38 J
Benzo(a)pyrene	NC	NC	ND	1000	230 J	58 J	ND	120 J	180 J	ND	300 J	810 J	320 J	60 J	33 J
Indeno(1,2,3-cd)pyrene	NC	NC	ND	110 J	ND	ND	ND	ND	ND	ND	290 J	87 J	150 J	41 J	20 J
Benzo(g,h,i)perylene	NC	NC	ND	55 J	ND	ND	ND	ND	ND	ND	250 J	51 J	120 J	34 J	18 J

Sediment results are presented in ug/kg (ppb)
* = Criteria normalized using average TOC concentration in sediments
ND = Not detected
NC = No criteria available

TABLE 5-7
TCL Pesticide/PCB Compounds
Detected in Sediments of the Magna Metals Site

Sample ID			SD-1 DUP	SD-4	SD-10
Laboratory ID	Sediment	Sediment	72093012	72093002	72054004
Depth	Criteria	Criteria			
Date Sampled	Acute (ug/kg)	Chronic (ug/kg)	05/12/97	05/14/97	05/12/97
Pesticides					
alpha-Chlordane	119.51	2.56	ND	ND	3.5 J
gamma-Chlordane	119.51	2.56	ND	ND	3.4

Sediment results are presented in ug/kg (ppb)
Criteria normalized using average TOC concentration in sediments
ND = Not detected
NC = No criteria available
J=Estimated Concentration

TABLE 5-8
TAL Metals and Cyanide
Detected in Sediments of the Magna Metals Site

Sample ID	NYSDEC	NYSDEC	SD-12	SD-1	SD-1 DUP	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11
Laboratory ID	Sediment Criteria	Sediment Crtiteria	971144A-10	971121A-14	971144A-12	971121A-06	971121a-15	971144A-02	971144A-04	971144A-06	971144A-08	971121A-12	971121A-13	971121A-02	971121A-04
Depth	Severe Effect Level	Lowest Effect Level	Background												
Date Sampled	mg/kg	mg/kg	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97
Metals															
Aluminum	NC	NC	2920	11700 J	10100 J	9900	7770 J	10600 J	19800 J	17800 J	12700 J	9370	14900 J	3490	4970
Arsenic	33	6	ND	3.2 JB	10.6 J	3 B	4 4 JB	9.1 J	7 J	19.3 J	16.9 J	4.7	5.8 BJ	1.1 B	1.2 B
Barium	NC	NC	33.8 B	132 J	289 J	135	261 J	256 J	364 J	460 J	142 J	91.6	604 J	32.6 B	52
Beryllium	NC	NC	ND	ND	ND	ND	ND	ND	0.62 JB	0.6 JB	ND	0.28 B	ND	ND	ND
Cadmium	9	0.6	ND	1 JB	1.3 JB	0.78 B	1 1 JB	1 JB	1.1 JB	1.4 JB	1 JB	0.63 B	1.8 BJ	0.31 B	0.37 B
Calcium	NC	NC	882 B	7560 J	11500 J	4600	4490 J	9530 J	7760 J	13000 J	4020 J	2750	11200 J	3840	2590
Chromium	110	26	R	78.1 J	R	43	106 J	R	R	R	R	34	144 J	11 4	13.1
Cobalt	NC	NC	4.6 B	35.6 J	31.9 JB	14.2 B	37 3 J	24.6 JB	22.2 JB	24.7 JB	20 4 J	13	41.7 J	4.9 B	7 9 B
Copper	110	16	4 4 B	374 J	493 J	162	398 J	603 J	690 J	2330 J	2080 J	46.2	129 J	12.3	17.2
Iron	40,000 (4%)	20,000 (2%)	7320	34200 J	21100 J	2160	27000 J	19500 J	28000 J	20200 J	23600 J	17900	38600 J	9820	12800
Lead	110	31	3	16.6 J	29.2 J	19.4	15 4 J	29.3 J	46.2 J	48.2 J	62.9 J	7.9	63.2 J	3.9	5
Magnesium	NC	NC	2130	23400 J	10700 J	6160	21800 J	8670 J	7000 J	7830 J	7120 J	7080	9420 J	4060	3950
Manganese	1100	460	87	R	154 J	R	R	167 J	321 J	841 J	220 J	R	R	R	R
Nickel	50	16	17.3	166 J	284 J	180	212 J	234 J	231 J	835 J	494 J	45.6	264 J	26.9	36
Potassium	NC	NC	207 B	1240 JB	906 JB	976 B	668 JB	894 JB	1400 JB	906 JB	831 JB	1880 J	1040 BJ	413 B	805 B
Selenium	NC	NC	ND	3.2 J	14.6 J	8 4	4.8 J	14 J	19.2 J	68.2 J	46 J	2.7	9.6 J	0.61 B	ND
Silver	2.2	1	0.26 B	ND	1.4 JB	ND	0.58 JB	1.3 JB	0.66 JB	0.72 JB	0.66 JB	ND	ND	ND	ND
Sodium	NC	NC	59.8 B	228 JB	384 JB	193 B	324 JB	343 JB	546 JB	586 JB	311 JB	208 B	454 BJ	92 7 B	104 B
Vanadium	NC	NC	5.8 B	23.5 J	44.1 JB	25 4	26.9 J	39.8 JB	41.6 J	36.2 J	30.6 J	32.8	49.5 J	8.1 B	14 1
Zinc	270	120	29.3 J	142 J	180 J	155	133 J	209 J	441 J	938 J	1890 J	67 7	226 J	36.8	47 2
Cyanide	NC	NC	ND	ND	45.3 J	ND	3.33 J	ND	ND	52.4 J	519 J	1.43	ND	ND	ND

Sediment results are presented in mg/kg (ppm)
ND = Not detected
NC = No criteria available
B=Element detected below CRDL but above IDL
J=Estimated Concentration
R=Rejected Data

for samples from the background station and five down-gradient stations. The levels of chromium exceeded the lowest effect level in samples SD-1, SD-3, SD-7, SD-8, and SD-9, and levels exceeded the severe effects level at SD-9. Copper was detected at levels higher than at the background at all down-gradient locations. Levels of copper exceeded the lowest effect level at all sites but SD-10 and exceeded the severe effects level at all sites but SD-8 and SD-11. Site SD-2 was the only down-gradient site that had lower iron levels than the background site. Iron levels exceeded lowest effect level in samples SD-1, SD-1 DUP, SD-3, SD-5 through SD-7, and SD-9. Silver was detected in samples SD-1 DUP, and SD-3 through SD-7. These levels were all higher than the level at the background location. Silver levels in samples SD-1 DUP and SD-4 also exceeded the lowest effect level.

5.8.3 Surface Soil Evaluation

Two background and three down-gradient locations were sampled for concentrations of semi-volatiles. No regional background data were available for semi-volatiles in surface soils, and benchmark criteria were available for only di-n-butylphthalate. Table 5-9 provides the comparisons of detected semi-volatiles and applicable benchmarks. The compound 2-methylphenol was detected only at the background station SS-05. Phenanthrene, fluoranthene, and pyrene were detected in all background and down-gradient samples. Down-gradient levels did not exceed the background range. Anthracene and benzo(g,h,i)perylene were present only in the sample from site SS-03. Di-n-butylphthalate and butylbenzylphthalate occurred only in samples SS-01 and SS-01 DUP from site SS-01. Levels of di-n-butylphthalate exceeded the benchmark criteria in both samples from site SS-01. Benzo(a)anthracene and chrysene were detected at both background locations and at the down-gradient site SS-03. Down-gradient levels did not exceed the background range. Bis(2-ethylhexyl)phthalate was not present in the background samples, but it did occur in the down-gradient samples SS-01, SS-01 DUP, and SS-02. Benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were detected at the background location SS-05 and at the down-gradient station SS-03. Down-gradient levels were lower than background levels. Benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were also present in the SS-01 sample at levels that exceed background levels. Semi-volatile TICs at the SS-03 site exceeded the background range.

Table 5-10 provides the comparison of detected pesticides/PCBs compared to NYSDEC background concentrations. The pesticides 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, and the PCBs Aroclor-1254 and 1260 were also detected in the surface soils. No regional background data were available for pesticides, and benchmark criteria were available only for the PCBs. 4,4'-DDE was present at the background location SS-04, and 4,4'-DDT was detected at both background sites. Levels of 4,4'-DDE in the down-gradient samples SS-01 and SS-03 did not exceed background levels. However, the SS-01 DUP sample from site SS-01 did exceed the background level. 4,4'-DDE was detected in all samples from down-gradient sites at levels below the background range. 4,4'-DDD was present only in the sample from site SS-02. Aroclor-1254 and 1260 were not detected in the background samples, but they were present in samples SS-01, SS-01 DUP, and SS-02. Levels of PCBs in these down-gradient samples exceeded the benchmark criteria.

TABLE 5-9
TCL Semi-Volatile Organic Compounds
Detected in Surface Soils of the Magna Metals Site

Sample ID	Screening Benchmark	Regional Background	SS-04 Background	SS-05 Background	SS-01	SS-01DUP	SS-02	SS-03
Laboratory ID	Concentrations	Data	970835A-06	970835A-07	970835A-01	970835A-02	970835A-03	970835A-04
Depth	solution	Various	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	(mg/kg)	Soils	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Semi-Volatiles								
2-Methylphenol	NC	NC	ND	39 J	ND	ND	ND	ND
Phenanthrene	NC	NC	21 J	55 J	28 J	26 J	11 J	45 J
Anthracene	NC	NC	ND	ND	ND	ND	ND	8 J
Di-n-butylphthalate	200	NC	ND	ND	530 JB	610 JB	ND	ND
Fluoranthene	NC	NC	27 J	97 J	49 J	45 J	19 J	57 J
Pyrene	NC	NC	66 J	100 J	86 J	43 J	22 J	55 J
Butylbenzylphthalate	NC	NC	ND	ND	370 J	360 J	ND	ND
Benzo(a)anthracene	NC	NC	13 J	39 J	ND	ND	ND	23 J
Chrysene	NC	NC	19 J	62 J	ND	ND	ND	28 J
bis(2-Ethylhexyl)phthalate	NC	NC	ND	ND	4900 B	4300 B	780 B	ND
Benzo(b)fluoranthene	NC	NC	ND	49 J	ND	ND	ND	21 J
Benzo(k)fluoranthene	NC	NC	ND	48 J	ND	ND	ND	26 J
Benzo(a)pyrene	NC	NC	ND	29 J	97 J	ND	ND	20 J
Indeno(1,2,3-cd)pyrene	NC	NC	ND	41 J	81 J	ND	ND	22 J
Benzo(g,h,i)perylene	NC	NC	ND	ND	ND	ND	ND	46 J
Semi-Volatile TICs	NC	NC	15990 JN	14090 JN	11260 JN	9860 JN	8550 JN	28330 JN

Soil results are present in mg/kg (ppm)
ND = Not detected
NC = No criteria available

TABLE 5-10
TCL Pesticide/PCB Compounds
Detected in Surface Soils of the Magna Metals Site

Sample ID	Screening Benchmark	Regional Background	SS-04 Background	SS-05 Background	SS-01	SS-01DUP	SS-02	SS-03
Laboratory ID	Concentrations	Data	71589008	71589009	71589001	71589002	71589003	71589004
Depth	solution	Various	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	(mg/kg)	Soils	04/10/97	04/11/97	04/11/97	04/10/97	04/10/97	04/10/97
Pesticides								
4,4'-DDE	NC	NC	8	ND	7.4 JP	10	ND	5.3
4,4'-DDD	NC	NC	ND	ND	ND	ND	7.1 JPN	ND
4,4'-DDT	NC	NC	8.9	4.3	6.6 JPN	5 JP	6.2 JPN	6.2
PCBs								
Aroclor-1254	40	NC	ND	ND	56 J	62 J	46 JP	ND
Aroclor-1260	40	NC	ND	ND	46 J	38 J	46 JP	ND

Soil results are present in mg/kg (ppm)
ND = Not detected
NC = No criteria available

Table 5-11 provides the comparison of detected metals compared to NYSDEC background concentrations. The following metals were detected in the surface soils: aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, vanadium, and zinc. Screening levels were not available for calcium, iron, magnesium, potassium, and sodium. Regional background data were not available for calcium, copper, iron, lead, magnesium, potassium, and sodium. All metals were detected in all background and down-gradient samples with the exception of vanadium, which was not present in the SS-01 sample from site SS-01. Calcium, copper, potassium, and zinc were at greater concentrations in the down-gradient samples than at the background locations. The remaining metals occurred in the down-gradient samples at lower levels than the background range. Levels of arsenic, barium, beryllium, cobalt, manganese, nickel from the background and down-gradient sites, did not exceed either the screening benchmarks or the regional background range. Concentrations of aluminum, chromium, selenium, and vanadium from the background and down-gradient sites, did not exceed the regional background range, but they did exceed the screening benchmark. Zinc levels were present at concentrations lower than the regional background range at the background and down-gradient sites. However, levels of zinc exceeded the screening benchmark level in samples from sites SS-01 and SS-02. Levels of copper and lead, at the background and down-gradient sites, were lower than the screening benchmark.

TABLE 5-11
TAL Metals and Cyanide
Detected in Surface Soils of the Magna Metals Site

Sample ID	Screening Benchmark	Regional Background	SS-04 Background	SS-05 Background	SS-01	SS-01DUP	SS-02	SS-03
Laboratory ID	Concentrations	Data	970835A-06	970835A-07	970835A-01	970835A-02	970835A-03	970835A-04
Depth		Various	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	(mg/kg)	Soils	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Metals								
Aluminum	50	4500 - 100000	19100	12600	8660	8830	7510	8440
Arsenic	10	1.0 - 93 (7)	3.1	2.9	2.4	2.5	2.2	1.6 B
Barium	500	70 - 300 (560)	83.2	70	46	52	46.7	42.6 B
Beryllium	10	1 - 5 (1.6)	0.59 B	0.54 B	0.35 B	0.34 B	0.3 B	0.32 B
Calcium	NC	NC	847 B	808 B	1480	1430	1280	1540
Chromium	1	7 - 1500 (50)	21.1	14.1	19	15.8	11.6	10.5
Cobalt	20	3 - 50 (10.5)	8.5 B	7.6 B	6.8 B	7.3 B	5.2 B	5.5 B
Copper	100	NC	14.8	12.8	177 J	51.7 J	39	18
Iron	NC	NC	19100	14800	13700	12600	10900	11500
Lead	50	NC	12.2	18.1	10.1	10.8	9.5	8
Magnesium	NC	NC	3270	2380	2830	2880	2130	2300
Manganese	500	20 - 3000 (490)	161	241	225	214	168	189
Nickel	30	5 - 150 (18.5)	18.8	16.2	15	13.9	11.4	10.2
Potassium	NC	NC	475 B	385 B	703 B	768 B	526 B	587 B
Selenium	1	.1 - 4 (.31)	1.2 J	1.6 J	1.3 J	1.1 J	1 J	1.3 J
Sodium	NC	NC	96.4 B	72.3 B	78.9 B	81.9 B	74.4 B	93.1 B
Vanadium	2	.7 - 98	38.8	24.1	ND	18.8	16	17
Zinc	50	13 - 300 (73.5)	41.1 J	34.2 J	124	94.9 J	68.7 J	41.5 J

Soil results are present in mg/kg (ppm)
ND = Not detected
NC = No criteria available

6.0 EVALUATION OF REMEDIAL MEASURES

6.1 INTRODUCTION

Chemical data collected during the Remedial Investigation indicated that all media sampled, i.e, groundwater, surface water, surface soil, sediment, and subsurface soil were affected by inorganic and/or organic contaminants of concern. The purpose of this analysis is to focus on media where data exist in sufficient quantity and quality in which a basis for future remedial activity can be developed such as either an Interim Remedial Measure (IRM) or for use in a larger, more comprehensive feasibility study that would need to be performed following completion of site contaminant characterization. Specifically, surface soils, sediments, and surface water have been omitted from this analysis since the results of the Step I and Step I A-B Habitat Assessment shows the presence of contaminants exceeding applicable ecological benchmarks in the surface water and sediments of adjoining environments and that impacts may be occurring in the streams or wetland areas. As a result, further study in the wetlands area is required to determine if remedial measures are warranted. With regards to groundwater, data shows that on-site overburden wells exceed groundwater quality standards. However, no off-site overburden groundwater data are available as well as bedrock groundwater data. Conditions both on-site and off-site in the bedrock are unknown and therefore omitted. These data gaps will be further addressed in Section 7.0, Summary and Recommendations, which provides a path forward for additional data collection. As a result of the data limitations, this remedial measures screening analyses focuses on on-site overburden groundwater and subsurface soils.

6.2 REMEDIAL MEASURE OBJECTIVES

The development of remedial measure objectives requires specification of contaminants of concern (COCs) and media of interest. The contaminants of concern selected for the Magna Metals site with respect to on-site soils and overburden groundwater are based on the validity of the analytical results, frequency of occurrences and concentrations relative to background. COCs were presented in Section 4.0. Inorganic compounds were the most prevalent COCs. Organic compounds were less numerous in type, but exceeded NYSDEC Water Quality Standards/Guidance Value (Class GA) in two of the four monitoring wells.

Based on review of contaminant data, known conditions regarding site geology and comparison of data to NYSDEC Recommended Soil Clean-up Objectives and NYSDEC Water Quality Standards/Guidance Values (Class GA), it is determined that appropriate remedial measure objectives include the following:

- Restore contaminated subsurface soil in the leach pit/holding tank area to pre-existing manufacturing operating conditions (assumed as background) or to the maximum extent practical.

- Contain contaminated overburden groundwater in the leach pit/holding tank area from migrating off-site or to the maximum extent practical.

To fully address the remedial measure objectives developed for this site, no action, limited action, and actions consisting of containment, treatment and/or disposal were considered. The no action alternative involves no treatment but would implement reviews for periodic reevaluation of site conditions. Limited Action categories involve measures that restrict access to contaminated areas and the use of contaminated groundwater, and include long term monitoring. Containment actions include technologies that involve little or no treatment, but provide protection of the environment by reducing the mobility of contaminants and risks of exposure. Containment actions consist of covering contaminated areas and controlling groundwater movement through the use of low permeability barriers, containment walls, or extraction systems. Treatment actions include technologies to reduce the volume and/or toxicity of contaminants. These technologies include pumping, excavation, treatment (physical, chemical, or geological) and disposal technologies.

6.3 IDENTIFICATION AND SCREENING OF REMEDIAL MEASURE TECHNOLOGY TYPES AND PROCESS OPTIONS

The remedial measure technology types associated with each of the general actions typically considered for the cleanup of contaminated soil and groundwater were based on the following documents: Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Technology Screening Guide for Treatment of CERCLA Soils and Sludges, Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites, and the Handbook for Remedial Action at Waste Disposal Sites, as well as experience on other hazardous waste projects, knowledge of new technologies, and the professional judgment in performing feasibility assessments. Most of these remedial technology types contain several different process options that could apply to the contaminated soil and groundwater. These potentially applicable technology types and process options are screened based on technical implementability and effectiveness considering site-specific conditions, and contaminant types.

In the following tables, potential technologies for remediation of the inorganic and organic-contaminated soils and groundwater are briefly described and summarized with the results of the screening and evaluation. For those technologies which were not retained for further evaluation, the rationale for their elimination is included. The screening evaluations for each identified technology are summarized in Tables 6-1 and 6-3. The evaluation and selection of process options for soil and groundwater technologies are presented in Tables 6-2 and 6-4.

6.4 SELECTION OF CRITERION OF REMEDIAL MEASURES

The remedial measure options presented in Tables 6-1 and 6-3 for on-site soils and groundwater were assessed using a streamlined and focused evaluation approach, considering the general criteria of effectiveness, implementability and cost. A discussion of these criterion follows:

TABLE 6-1 (Sheet 1 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Measure Categories	Description	Technically Feasible	Screening Comments
1. No Action	o Site Reviews			
	. Five-year reviews	The site and available data are reviewed to determine if remedial action is needed.	X	Provides baseline against which other remedial technologies can be compared. Required for consideration by NCP.
2. Limited Action (Institutional Controls)	o Monitoring			
	. Monitor and analyze soil, groundwater and sediment	Samples are collected and analyzed for contaminants and migration of contaminants is assessed.	X	Provides baseline against which other remedial technologies can be compared. Required for consideration by NCP.
	o Public Awareness			
	. Post warning signs, inform local officials and hold public meetings, etc.	Community relation activities are performed	X	Required for effective implementation of Limited Action.
	o Restrict Access/Use			
	. Access Restrictions (fence)	Access restricted by fencing the contaminated area.	X	Required for effective implementation of Limited Action.
	. Deed Restrictions	Land use restrictions would be specified in the real estate transactions of the property.	X	Required for effective implementation of Limited Action.
3. Containment	o Capping			
	. Soil Cap	Contaminated soil is covered with clean soil layer		Will not meet RCRA requirements and will not prevent infiltration of surface water.
	. Clay cap	Contaminated soil is covered with low permeability clay layer		Will not meet RCRA requirements. Containment of contaminated soils cannot effectively prevent migration of contaminants since groundwater may enter the containment area from upgradient locations.

X Indicates that option is technically feasible.

TABLE 6-1 (Sheet 2 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Measure Categories	Description	Technically Feasible	Screening Comment
	. Synthetic membranes	Synthetic membranes are thin flexible membranes made of PVC, rubber, etc. used to cover contaminated soil		Same as clay cap
	. Chemical sealants	Chemical sealants are stabilizers and cements are added to top soil to create stronger and less permeable surface seal.		Same as clay cap
	. Multimedia cap	Multimedia cap is a combination of two or more single layer caps to cover contaminated soil.		Will meet RCRA requirements, and has fewer limitations than other capping options regarding groundwater contamination; will not prevent leaching of contaminants into bedrock.
4. Removal	o Removal			
	. Excavation	Excavation involves removing contaminated soil using backhoes, bulldozers, front end loaders,	X	Required component of many potential process options.
5. Treatment	o Thermal Treatment			
	. Incineration	Incineration is a thermal destruction method for all forms of organic contamination involving treatment at high temperatures.		Not feasible for inorganic contaminants of concern
	. Wet oxidation	Wet oxidation process involves oxidizing pumpable aqueous organics at elevated temperatures and pressures.		Not feasible for inorganic contaminants; does not handle soils which can't be pumped.
	. Thermal desorption	Thermal desorption is a thermal (400EF to 900EF) stripping process which promotes volatilization of organics from soil to air.		Not feasible for inorganics.

TABLE 6-1 (Sheet 3 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Technology Categories	Description	Technically Feasible	Screening Comments
	o Chemical Treatment			
	. Alkali metal dechlorination	Alkali metal dechlorination utilizes polyethylene glycol and alkali solution (APEG) to detoxify some chlorinated organics in the contaminated soils		Developed and demonstrated for PCBs-contaminated soil; not feasible for soil contaminated with inorganics.
	. Soil washing and extraction	Soil washing and extraction technology involves the extraction of inorganic and organic contaminants from the soils using solvents, surfactants, chelating agents, etc.		Not feasible with significant silt/or clay content.
	. Supercritical Fluid Extraction	Supercritical extraction is based on the use of certain gases (CO_2 or Propane), which have excellent dissolving characteristics when heated and compressed to or near their critical point, to remove organics from soil. Typical system operates at 70EF to 100EF and 150 to 3000 psi.		Not feasible for inorganic contamination or soils which cannot be pumped.
	. Stabilization	Fixation is a chemical process whereby contaminated soils are converted into a stable cement type matrix in which contaminants are bound and become immobile.	X	Feasible for inorganic contamination in soils.

X Indicates that option is technically feasible

TABLE 6-1 (Sheet 4 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	o Physical Treatment			
	. Mechanical aeration	Mechanical aeration involves extraction of highly volatile organic contaminants mechanically by aeration and air stripping		Applicable only for highly volatile organics, not useful for inorganics.
	o Biological Treatment			
	. Biodegradation	Biological treatment involves the use of native microbes or selectively adapted bacteria to degrade variety of organic compounds.		Not feasible for inorganics.
	o In Situ Treatment			
	. In Situ Soil Flushing	Soil flushing is an *in situ* extraction of organic or inorganic compounds from the soil by passing appropriate extractant solutions to dissolve or mobilize contaminants.		Difficult to implement at site in presence of site specific limiting conditions including low permeability soil and complex geological condition.
	. In Situ Hydrolysis	Hydrolysis is the breakdown of organic molecules to simpler less toxic compounds. Rates can be accelerated by adjustment of pH.		Not feasible in the presence of site specific limiting conditions including inability to control the process in presence of complex geological condition; not feasible for inorganics.
	. In Situ Vitrification	Vitrification is a process whereby contaminated soil is converted into a glassy substance by melting at a high temperature.		Difficult to implement. site area.

X Indicates that option is technically feasible

TABLE 6-1 (Sheet 5 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	. In Situ Volatilization	In situ volatilization is a process in which air is pumped through vadose zone soils or a vacuum is applied to enhance the vaporization of volatile organics from contaminated soil to the air.		Not feasible to implement at site in presence of site specific limiting conditions including low permeability soil and complex geological conditions; not applicable for inorganics.
	o Vapor Phase Volatile Emission Control			
	. Vapor Phase Carbon Adsorption	Carbon adsorption is a process in which contaminants present in the vapor phase will be adsorbed to the carbon granules for final destruction or disposal of contaminants.	X	Feasible for treating vapor phase contaminants resulting from other soil treatment process options.
	. Afterburner (Incineration)	Incineration is a thermal destruction process for contaminants present in the gaseous vapor phase used in emission control.	X	Feasible for treating vapor phase contaminants resulting from other soil treatment process options.
	. Catalytic Oxidation	Gaseous vapor is oxidized in the presence of a catalyst	X	Feasible for treating vapor phase contaminants resulting from other soil treatment process options.
6. Disposal	o Transportation Technologies			
	. Trucks	Trucks can be used to bring equipment and materials to the site and to transport soil.	X	Potentially feasible for off-site transportation of excavated soils.
	. Trains	Trains can be used to bring equipment and materials to the site and to transport soil and rubbles.		Not feasible due to non-existence of rail connection to the site and treatment and disposal facilities.

X Indicates that option is technically feasible

TABLE 6-1 (Sheet 6 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF SOIL REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	o Disposal Technologies			
	. Construction of an on-site RCRA landfill	A new RCRA landfill facility can be constructed within the site boundary for disposal of contaminated soil.		Not feasible due to restrictive site conditions (site usage, wetlands, floodplains, site boundaries).
	. Existing off-site RCRA landfill	The contaminated soil or waste would be hauled to an existing RCRA landfill which is already permitted to accept hazardous material.	X	Feasible for disposal of treated soils.
	. On-site nonhazardous landfill	The treated soil would be redeposited on-site.	X	Potentially feasible
	. Off-site nonhazardous landfill	The treated soil can be hauled to an existing landfill which is already permitted to accept.	X	Feasible for disposal of treated soils.

X Indicates that option is technically feasible

TABLE 6-2 (Sheet 1 of 2)

MAGNA METALS SITE
EVALUATION OF PROCESS OPTIONS FOR SOIL

Remedial Measures	Remedial Measures Process Options	Effectiveness	Implementability	Cost
1. No Action	o Site Reviews . Five-year reviews	- Useful for documenting conditions - Reduction in volume and toxicity of contaminated groundwater left to natural attenuation	- Easily implemented	Low cost, No Operating and Maintenance (O&M), Low periodic cost for reviews
2. Limited Action (Institutional Controls)	o Monitoring . Monitor and analyze groundwater and sediment	- Useful for documenting conditions - Reduction in volume and toxicity of contaminated groundwater left to natural attenuation	- Easily implemented	Low cost, low Operating and Maintenance (O&M)
	o Public Awareness . Post warning signs, inform local officials, hold public meetings, etc.	- Does not actively reduce contamination - Keeps the community involved with issues	- Easily implemented - Public participation required	Low cost, low O&M
	o Restricted Access . Access restrictions (fence)	- Prevents direct contact with the soil, but does not actively reduce contamination	- Easily implemented	Low cost, low O&M
	. Deed restrictions	- Effectiveness depends on continued future implementation - Reduces risks to humans, but does not actively reduce contamination	- Easily implemented	Low cost, low O&M
4. Removal	o Removal . Excavation	- Effective at removing contaminated soil - Will not reduce volume or toxicity of contaminated soil and require subsequent treatment/disposal - Will cause volatilization	- Easily implemented	Moderate cost, no O&M
5. Treatment	o Chemical Treatment . Stabilization	- Stabilization is effective for immobilization of semivolatile and metal contaminants.	- Easily implemented	High cost, no O&M

TABLE 6-2 (Sheet 2 of 2)

MAGNA METALS SITE
EVALUATION OF PROCESS OPTIONS FOR SOIL

Remedial Measures	Remedial Measures Process Options	Effectiveness	Implementability	Cost
	o Vapor Phase Volatile Emission Control . Carbon Adsorption	- Effective in removing vapor phase contaminants - Needs regeneration or final disposal of spent carbon	- Easily implemented	High cost, high O&M
	. Afterburner	- Destroys contaminants in the vapor phase	- Easily implemented	Very high cost, high O&M
	. Catalytic Oxidation	- Destroys organic contaminants in the vapor phase	- Easily implemented	Very high cost, high O&M
6. Disposal	o Transportation Technologies . Trucks	- Effective for transportation	- Easily implemented	Low cost, no O&M
	o Disposal Technologies . Existing off-site RCRA landfill*	- Removes contaminated or treated soil from the site	- Easy to locate	Moderate cost
	. On-Site Landfill	- Effective for on-site redeposition and grading	- Easily implemented	Low cost, low O&M
	. Off-Site Landfill	- Removes contaminated or treated soil from the site	- Easy to locate	Lump cost

TABLE 6-3 (Sheet 1 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
1. No Action	o Site Reviews			
	. Five-year reviews	The site and available data are reviewed to determine if remedial action is needed	X	Provides baseline against which other remedial technologies can be compared. Required for consideration by NCP.
2. Limited Action (Institutional Controls)	o Monitoring			
	. Monitor and analyze groundwater	Samples are collected and analyzed for contaminants and migration of contaminants is assessed	X	Provides baseline against which other remedial technologies can be compared. Required for consideration by NCP.
	o Public Awareness			
	. Post warning signs, inform local officials and hold public meetings, etc.	Community relation activities are performed	X	Required for effective implementation of Limited Action.
	o Restrict Access/Use			
	. Well Permit Requirements	Restrict or regulate the placement of new wells and continued use of existing wells at and around the Site.	X	The overburden groundwater movement may migrate off-site or into bedrock aquifer.
3. Containment	o Barriers			
	. Sheet piling	Sheet piling is driven into soil and can be used as barrier to limit the spread of contaminants.		May not be applicable due to potential pathway to underlying bedrock.
	. Slurry walls	Slurry walls are constructed in vertical trench excavated under bentonite slurry.		May not be applicable due to potential pathway to underlying bedrock.

X Indicates that option is technically feasible

TABLE 6-3 (Sheet 2 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	. Grout curtains	Grouting consists of injecting fluids into soil mass, which set in place, reduce water flow, and strengthen the formation.		May not be applicable due to potential pathway to bedrock layer.
	. Bottom sealing	Bottom sealing is used to place a horizontal barrier beneath site to act as a floor to prevent downward migration of contaminants		Technology not adequately developed for application.
	. Groundwater Interception	Groundwater interception involves active manipulation and management of groundwater in order to prevent formation/and or contained dispersion of a plume.	X	A trench or wells can be installed to collect groundwater in the overburden aquifer.
4. Extraction				
	o Extraction Technologies			
	. Dewatering	Dewatering is a physical unit operation to reduce moisture content in order to facilitate excavation, treatment, and disposal of soils	X	Required component of many potential process options.
	. Pumping	Groundwater pumping and collection technologies involve extraction of contaminated groundwater for subsequent treatment and prevention of downgradient migration.	X	Potentially applicable for interception and recovery of contaminant plume in overburden aquifer.

X Indicates that option is technically feasible

TABLE 6-3 (Sheet 3 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
5. Treatment				
	o Chemical Treatment			
	. Neutralization/pH Adjustment	Neutralization is a chemical process in which acids and alkalies are neutralized to eliminate or reduce their reactivity and corrosiveness. pH adjustment may also be used to optimize other treatment processes.	X	Feasible for metals removal. Potentially required to optimize other treatment processes.
	. Chemical Precipitaton	Chemical precipitation is a pretreatment process in which acid or base is added to the contaminated water to adjust the pH to the point where the lowest solubility of the compounds to be removed is reached. Other precipitants such as sodium sulfide or ferric chloride may be added to precipitate certain metals out of solution.	X	Potentially feasibile for metals removal.
	. Ion Exchange	Ion exchange is a chemical process in which selected contaminant ions in the aqueous phase are exchanged for inocuous ions in a fixed bed ion exchanger or counter-current exchanger.	X	Potentially feasible for metals removal.
	. UV-Chemical Oxidation	When catalyzed by ultraviolet light, a strong oxidant, such as hydrogen peroxide or ozone, reforms into hydroxyl radicals (strong oxidizer) which oxidize the organic contaminants in the groundwater to CO_2 and water.	X	Feasible for treatment of organic contaminants in site groundwater.
	o Physical Treatment			
	. Flocculation	Flocculation is a process to promote agglomeration and settling of suspended solids.	X	Potentially feasible for metals removal.

X Indicates that option is technically feasible

TABLE 6-3 (Sheet 4 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	. Clarification	Clarification is a gravity settling process which allows heavier solids to collect at the bottom of a containment vessel leaving clear liquid at the top.	X	Potentially feasible for metals removal.
	. Filtration	Filtration is a process of separating suspended and colloidal solids from a liquid mixture through a porous medium	X	Potentially feasible for suspended solids and metals removal.
	. Air Stripping	Air stripping is a mass transfer process in which volatile organic contaminants in groundwater are transferred to gaseous (vapor) phase.	X	Effectively removes volatile contaminants.
	. Steam Stripping	Steam stripping is a mass transfer process which uses steam to evaporate volatile organics from aqueous wastes into the gaseous (vapor) phase.	X	Feasible for treatment of volatile organics and some semivolatile organics in site groundwater.
	. Carbon Adsorption	Carbon adsorption is a process in which the organic contaminants in water are adsorbed onto activated carbon granules.	X	Feasible for treatment of organics in site groundwater.
	o Biological			
	. Aerobic	Aerobic treatment involves the use of native microbes or selectively adopted bacteria to degrade a variety of organic compounds under aerobic conditions.		Not feasible due to low levels and mix of contaminants at the site.
	. Anaerobic	Anaerobic treatment is similar to aerobic treatment but takes place in the absence of oxygen.		Not feasible due to low levels and mix of contaminants at the site.

X Indicates that option is technically feasible

TABLE 6-3 (Sheet 5 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
6. Source Control				
	o Removal			
	. Excavation	Contaminated soils are excavated to prevent further leaching of contaminants from the soil into the groundwater.	X	This technology is feasible for eliminating the contaminant source to groundwater and allowing a more rapid groundwater cleanup.
for				
	o Treatment			
	. Thermal Treatment	See Table 6-1	X	Several thermal treatment processes can be used to remove organic contamination from the excavated soils.
	. Physical Treatment	See Table 6-1	X	Mechanical aeration may be used to remove VOCs from excavated soils.
	. Biological Treatment	See Table 6-1	X	Not feasible for low level and mix of contaminants in excavated soils.
	. Chemical Treatment	See Table 6-1	X	Stabilization of the excavated soils is feasible to allow on-site disposal while eliminating the potential for leaching contaminants to the groundwater.
	. In Situ Treatment	See Table 6-1		See Table 2-4
7. Disposal				
	o Disposal Technologies			
	. POTW	Extracted groundwater would be pumped to publicly owned treatment works for treatment and disposal.		Not feasible because a POTW is not capable of removing organic contaminants in site groundwater.

X Indicates that option is technically feasible

TABLE 6-3 (Sheet 6 of 6)

MAGNA METALS SITE
INITIAL SCREENING OF GROUNDWATER REMEDIAL MEASURES

Remedial Measures	Remedial Measures Categories	Description	Technically Feasible	Screening Comments
	. TSD facility	Extracted groundwater would be transported to a commercial facility for treatment, storage and disposal.	X	Potentially feasible for short-term disposal prior to treatment plant construction.
	. Surface Water	Extracted groundwater would be discharged to on-site surface water after treatment to appropriate levels.	X	Potentially feasible for disposal of groundwater.

X Indicates that option is technically feasible

TABLE 6-4 (Sheet 1 of 3)

MAGNA METALS SITE
EVALUATION OF PROCESS OPTIONS FOR GROUNDWATER

Remedial Measures	Remedial Measures Categories and Process Options	Effectiveness	Implementability	Cost
1. No Action	o Site Reviews* . Five-year reviews*	- Useful for documenting conditions - Reduction in volume and toxicity of contaminated groundwater left to natural attenuation	- Easily implemented	Low cost, no Operating and Maintenance (O&M), low periodic cost for reviews
2. Limited Action (Institutional Controls)	o Monitoring* . Monitor and analyze groundwater and sediment*	- Useful for documenting conditions - Reduction in volume and toxicity of contaminated groundwater left to natural attenuation	- Easily implemented	Low cost, low Operating and Maintenance (O&M)
	o Public Awareness* . Post warning signs, inform local officials, hold public meetings, etc.*	- Does not achieve remediation objectives - Keeps the community involved with issues	- Easily implemented - Public participation required	Low cost, low O&M
	o Restrict Access/Use* . Well Permit Requirements*	- Controls current and future use of groundwater - Does not provide treatment	- Easily implemented	Low cost, low O&M
3. Containment	o Barriers* . Groundwater Interception*	- Effectively stops migration of contaminant plume - Allows treatment of contaminated groundwater in overburden aquifer	- Easily implemented	Moderate cost, low O&M
4. Extraction	o Extraction . Dewatering*	- Effectively dewaters soil for subsequent treatment - Support technology-not intended to treat the waste.	- Easily implemented	Moderate cost, no O&M
	. Pumping*	- Effective in extracting contaminated groundwater - Reduces mobility of contaminants	- Easily implemented - Requires continuous maintenance	Moderate cost, moderate O&M

* Technology and process options retained.

TABLE 6-4 (Sheet 2 of 3)

MAGNA METALS SITE
EVALUATION OF PROCESS OPTIONS FOR GROUNDWATER

Remedial Measures	Remedial Measures Categories and Process Options	Effectiveness	Implementability	Cost
5. Treatment	o Chemical Treatment			
	. Neutralization/pH Adjustment*	- Effective in optimizing other treatment processes and also neutralizing treated groundwater	- Easily implemented	Low cost, high O&M
	. Chemical Precipitation*	- Effective in precipitating suspend solids and metals contaminants from groundwater	- Easily implemented	Moderate cost, high O&M
	. Ion Exchange*	- Effective in removing low-level metal contamination - Aqueous specific resin and disposal of resins.	- Easily implemented	High cost, high O&M
	. UV-Chemical Oxidation*	- Effective in oxidizing organic contaminants	- Easily implemented - Requires skilled labor - High power requirement	High cost, high O&M
	o Physical Treatment			
	. Flocculation*	- Effective in flocculating chemical precipitants	- Easily implemented	Low cost, moderate O&M
	. Clarification*	- Effective in separating suspended particles from liquid phase	- Easily implemented	Moderate cost, low O&M
	. Filtration*	- Effective in separating less settlable solids from liquid phase	- Easily implemented	Moderate cost, moderate O&M
	. Air Stripping*	- Effective at removing volatile contaminants - Requires vapor phase air pollution control.	- Easily implemented	Moderate cost, moderate O&M
	. Steam Stripping*	- Effective at removing volatiles and some semivolatiles - Requires vapor phase air pollution control	- Easily implemented	High cost, high O&M

* Technology and process options retained.

TABLE 6-4 (Sheet 3 of 3)

MAGNA METALS SITE
EVALUATION OF PROCESS OPTIONS FOR GROUNDWATER

Remedial Measures	Remedial Measures Categories and Process Options	Effectiveness	Implementability	Cost
	. Carbon Adsorption*	- Effective in removing organics - Needs regeneration or disposal of spent carbon	- Easily implemented	Moderate cost, high O&M
6. Source Control				
	o Removal			
	. Excavation*	- Effective for removal of contaminated source materials	- Easily implemented	Moderate cost, no O&M
	o Treatment			
	. Thermal Treatment*	- Effective for removal of organic contaminants - Off-gas air pollution control required	- Easily implemented	Moderate cost, high O&M
	. Physical Treatment	- Effective for removal of VOCs - Off-gas air pollution control required	- Easily implemented	Moderate cost, low O&M
	. Chemical Treatment*	- Effective for immobilization of SVOCs and inorganics	- Easily implemented	Low capital, High O&M
7. Disposal				
	o Technologies Disposal . TSD Facility*	- Effective for disposal of extracted groundwater during dewatering to facilitate excavation	- Easily implemented	Moderate cost
	. Surface Water*	- Effective for disposal of treated groundwater	- Easily implemented	Low cost, low O&M

* Technology and process options retained.

Effectiveness

A key aspect of the screening evaluation is the effectiveness of each alternative in protecting human health and the environment by achieving the action levels specified for the various media of concern. Alternatives are evaluated as to the protectiveness they will provide and the reductions in toxicity, mobility or volume it would achieve. Both short- and long-term components of protectiveness are also evaluated, short-term referring to the construction and implementation period, and long-term referring to the period after the remedial action is complete. Reduction of toxicity, mobility or volume refers to changes in one or more characteristics of the hazardous substances or contaminated media by the use of treatment that decreases the potential threats or risks associated with the hazardous material.

Implementability

Implementability, as a measure of both the technical and administrative feasibility of constructing, operating and maintaining a remedial measure alternative, is used during screening to evaluate the combinations of process options with respect to conditions at a specific site. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until a remedial measure is complete; it also includes operation, maintenance, replacement and monitoring of technical components of an alternative, if required, into the future after the remedial measure is complete. Administrative feasibility refers to the ability to obtain approvals from other offices and agencies, the availability of treatment, storage, and disposal services and capacity, and the requirements for, and availability of, specific equipment and technical specialists.

Determinations of not technically feasible or not available will often preclude an alternative from further consideration unless steps can be taken to change the conditions responsible for the determination. Often, this type of fatal flaw would have been identified during technology screening, and the alternative would not have been assembled. Negative factors affecting administrative feasibility will normally involve coordination steps to lessen the negative aspects of the alternative but will not necessarily eliminate an alternative from consideration.

Cost

Typically, alternatives will have been defined well enough before screening that some estimates of cost are available for comparisons among alternatives. However, a general comparative analysis can be performed using the broad range of low, moderate, or high costs.

Based on the above analysis of effectiveness, implementability, and costs, the selected alternatives for further evaluation for on-site soils and groundwater are: removal, excavation, disposal and containment/ groundwater interception.

6.5 ANALYSIS OF RECOMMENDED REMEDIAL MEASURES

In order to meet the intent of CERCLA requirements, the following evaluation criteria have been developed. These criteria are discussed and defined in the USEPA Guidance for Conducting RI/FS under CERCLA.

The criteria used in this detailed analysis include:

1. Short-Term Effectiveness
2. Long-Term Effectiveness
3. Reduction of Toxicity, Mobility and Volume
4. Implementability
5. Cost
6. Overall Protection of Human Health and the Environment

Short-Term Effectiveness

This evaluation criterion addresses the impacts of the action during the construction and implementation phase until the remedial measures objectives have been met. Factors to be evaluated include protection of the community during the remedial measures, protection of workers during the remedial measures, environmental impacts resulting from the implementation of the remedial measures, and the time required to achieve protection.

Long-Term Effectiveness

This evaluation criterion addresses the results of the remedial measures in terms of the potential risk remaining at the site after the objectives have been met. The components of this criterion include the magnitude of the remaining risks measured by numerical standards such as action levels and the long-term reliability of management controls for providing continued protection from residuals; i.e., the assessment of potential failure of the technical components.

Reduction of Toxicity, Mobility or Volume

This evaluation criterion addresses the statutory preference that treatment is used to result in the reduction of principal threats of the total mass of toxic contaminants, the irreversible reduction in contaminant mobility, or the reduction of the total volume of contaminated media. Factors to be evaluated in this criterion include the treatment process employed; the amount of hazardous material destroyed or treated; the degree of reduction in toxicity, mobility or volume expected; and the type and quantity of treatment residuals.

Implementability

This criterion addresses the technical and administrative feasibility of implementing a remedial action and the availability of various services and materials required during its implementation. *Technical feasibility* factors include construction and operation difficulties, reliability of

technology, ease of undertaking additional remedial measures, and the ability to monitor the effectiveness of the remedy. *Administrative feasibility* includes the ability and time required for permit approval and for activities needed to coordinate with other agencies. Factors employed in evaluating the *availability of services and materials* include availability of treatment, storage, and disposal services with required capacities; availability of equipment and specialists; and availability of prospective technologies for competitive bid.

Cost

The types of costs that would be addressed include: capital costs, operation and maintenance (O&M) costs, costs of five-year reviews where required, and present value of capital and O&M costs. Capital costs consist of direct and indirect costs. Direct costs include expenditures for the equipment, labor, and materials necessary to install remedial actions. Indirect costs include expenditures for engineering, financial, and other services required to complete the installation of remedial alternatives. Annual O&M costs include auxiliary materials and energy, disposal of residues, purchased services, administrative costs, insurance, taxes, license costs, maintenance reserve and contingency funds, rehabilitation costs, and costs for periodic site review.

This assessment evaluates the costs of the remedial actions on the basis of present worth. Present worth analysis allows remedial measures to be compared on the basis of a single cost representing an amount that, if invested in the base year and disbursed as needed, would be sufficient to cover all costs associated with the remedial action over its planned life. A required operating performance period is assumed for present worth and is a function of the discount rate and time. A discount rate of seven percent is assumed for a base calculation. The "study estimate" costs provided for the remedial actions are intended to reflect actual costs with an accuracy of -30 to +50 percent.

Overall Protection of Human Health and the Environment

This evaluation criterion provides an overall assessment of protection based on a composite of factors such as long-term and short-term effectiveness and compliance with ARARs. Evaluations of the overall protectiveness address:

- How well a specific site remedial action achieves protection over time; and
- How well each source of contamination is to be eliminated, reduced, or controlled for each remedial alternative.

Removal/Excavation/Off-Site Disposal

This alternative consists of excavation and removal of contaminated soils (approximately 580 cy), stabilization and off-site disposal of the soil. Excavation refers to the use of construction equipment such as backhoes, bulldozers, front end loaders that are typically used on land to excavate and handle contaminated soil. Transportation includes the use of trucks, which can be used to deliver equipment and materials for remediation. Trucks will be properly decontaminated, weighed, and manifested before leaving the site. Regulations regarding hauling hazardous, non-

hazardous materials, and oversized and heavy loads over public roads will be taken into consideration. Truck transportation is flexible, as the number of trucks can be increased or decreased depending upon project requirements. This mode of transportation does not require special loading facilities at the site or unloading facilities at the destination. Should material be hazardous, contaminated soil would be hauled to an existing RCRA Subtitle C landfill facility which is permitted to accept hazardous wastes. Hazardous material would also require treatment to meet land disposal restrictions. This assessment assumes that all excavated materials can be disposed of at a non-hazardous landfill. The area and volume of soil is estimated to be five feet out from each pit on all sides and also to have an estimated depth of 10 feet (i.e., top of the water table). A berm would be constructed at the perimeter of the excavation to prevent erosion and to mitigate any potential impacts to the nearby wetlands area. After refilling the excavated area with clean backfill, the surface would then be graded, covered with topsoil and seeded. During excavation, a security fence will be installed around the area and the site.

Removal/Excavation/Off-Site Disposal

Short Term Effectiveness: The potential public health threats to workers and area residents would include direct contact with contaminated soils and inhalation of fugitive dust and organic vapors generated during excavation and soil handling. The area would be secured using a fence and access would be restricted to authorized personnel only. Dust control measures such as wind screens and water sprays would be used to minimize fugitive dust emission resulting from excavation. Air monitoring for particulates and organic vapors would be conducted throughout the site remediation activities.

The risk to workers would be minimized by the use of adequate preventive measures such as enclosed cabs on backhoes and proper personal protection equipment to prevent direct contact with contaminated soil and inhalation of fugitive dust and volatile organics. All site activities would be in accordance with a site-specific health and safety plan. Short-term impacts on the environment resulting from removal of vegetation and destruction of habitat in the soil would be minimal since the plant area has minimal vegetation. Impacts would be temporary and would be mitigated by restoring the remediated area. Erosion and sediment control measures such as silt curtains would be provided during excavation activities to control migration of contaminated soil and sediment.

The short-term impacts on the environment would be due to an increase in traffic and noise pollution resulting from hauling of excavated soil to off-site treatment facilities and bringing new soil in for fill. Transportation of excavated soil may introduce short-term risks with the possibility of spillage along the transport route. A traffic control plan developed with the assistance of local authorities would be implemented to minimize potential traffic problems.

A total period of 12 months is estimated for this remedial measure for design, bidding, selecting a contractor, procurement of off-site disposal facilities, and excavation of soil. The actual excavation period is estimated to be three months.

Long-Term Effectiveness: The excavation and removal of contaminated soil from the site would reduce the and the leaching of contaminants into groundwater. Excavated soil would be replaced

by clean soil. Following remediation, the contaminated area would be restored and the site would not require any further maintenance or monitoring.

Reduction of Toxicity, Mobility or Volume: Excavation and off-site stabilization constitute a treatment which would result in a permanent remedy. Inorganic contaminants in the soil will be immobilized and disposed of in a controlled off-site landfill. Hence this treatment alternative would completely eliminate the toxicity, mobility and volume of contaminants at the site.

Implementability:

Technical Feasibility

All the components of this remedial measure are well developed and commercially available. The contaminated soils would have to undergo a series of analyses prior to acceptance for treatment at the off-site facility. Land is available at the site for staging excavation and transportation. Excavation, transportation, and restoration can be performed with limited difficulty.

Administrative Feasibility

Implementation of this measure would require public access restriction to the site during the remediation process. Contractual procurement of disposal facilities to handle the type and volume of soil on site would be required. Coordination with state and local agencies would also be required. The transportation of waste would require appropriate permits and coordination with the Department of Transportation (DOT) and local traffic department. Traffic control plans would be required before remediation. The off-site disposal facilities would have to be in compliance with appropriate regulations.

Availability of Services and Materials

There are a number of stabilization facilities which can treat soils and sediments contaminated with organic/inorganic contaminants. Excavation and transportation utilize common construction equipments and should not pose any problems.

Cost

Total capital cost of this alternative is estimated to be approximately $270,000. No operation and maintenance is required for this alternative. Detailed supportive data used to derive at these estimates are presented in Appendix D.

Overall Protection of Human Health and the Environment: The excavation and removal of contaminated soil from the site would prevent leaching of contaminants into groundwater. This remedial measure involves off-site treatment which would totally reduce the toxicity, mobility and volume of hazardous contaminants. No secondary waste management would be required on site except for decontamination water from the decontamination of equipment and personnel. This

alternative would restore the contaminated area to its natural state and would result in overall enhanced protection of human health and the environment.

Remedial Measure Containment/Groundwater Interception

In this alternative, contaminated groundwater in the overburden aquifer would be contained from moving off-site by dewatering activities associated with excavation of contaminated soils and from a well extraction line installed downgradient of the contaminated area. The well extraction line would consist of approximately five 4-inch diameter wells constructed out of PVC material installed to the top of bedrock. The wells would discharge to a containment vessel from which the contaminated groundwater would be pumped to the groundwater treatment system. Contaminated water would be pumped at a composite total pumping rate of approximately 2 gpm to 5 gpm (based on the estimated hydraulic conductivity of the overburden aquifer). Some of the wells made need to periodically cycled off to allow the aquifer to recharge the well. In addition, some of the existing monitoring will be assessed for conversion to extraction wells.

The contaminated groundwater would be treated on-site in a water treatment system consisting of pretreatment for removal of metals followed by carbon adsorption for removal of organics. The pretreatment train would consist of neutralization/pH adjustment, chemical precipitation, and filtration. The pretreated water would then be passed through a carbon adsorption system for removal of organic contaminants and then discharged on-site to the surface water. The treatment system would likely be located in an existing building, if structurally sound. Discharge to the POTW would be preferable, if available.

Effectiveness of this alternative will be enhanced by the removal of soils containing high concentrations of contaminants which are contributing to groundwater contamination.

Monitoring of the groundwater treatment system would be performed both to optimize the treatment process and to ensure that the effluent meets all requirements for surface discharge. Since on-site soils will be removed, it is possible that groundwater contamination levels will decrease significantly after a limited time, i.e., (less than 5 year pumping period). A security fence would be installed to restrict access and the site would be subject to 5-year reviews. For estimating purposes, a 30 year treatment period is assumed.

Assessment

Short-Term Effectiveness: Potential short-term risks during implementation of this remedial measure would be from direct contact with contaminated groundwater and inhalation of organic vapors from the groundwater treatment system resulting from leaks or accidental discharges. All pretreatment units would be enclosed and vented through a vapor phase carbon adsorption unit to minimize vapor emissions to air. Significant risk to operators could result from improper handling of reagent chemicals at the site. Proper operating procedures must be followed and precautions must be taken against normal construction hazards during the handling of all reagents and precautions. Exposure risk such as these would be mitigated through proper health and safety training and appropriate process controls such as automatic alarms and fail-safe shutdowns in case

of leaks or overpressurization. The treatment plant construction area would be fenced and access restricted to authorized personnel; therefore, potential exposure to the general public would be minimal. Risks to the community from increased traffic during construction and transportation of treatment residuals are possible. No major environmental impacts would be expected from this alternative.

Total time for implementing this alternative including design, testing, bidding, selecting a contractor and installation of the treatment plant is estimated to be 12 months. Actual installation of the wells and treatment system is estimated to take approximately three months.

Long-Term Effectiveness: The major benefits associated with this alternative include long-term minimization of contaminant migration off-site and the removal of the primary contaminants of concern from the overburden aquifer. The groundwater would be treated prior to disposal to appropriate levels to maintain surface water quality as per NYSDEC requirements. The remediation would continue until concentrations of the primary contaminants of concern in the influent to the treatment plant are equal to or below the target cleanup levels (i.e., per NYSDEC) and/or to their corresponding upgradient concentrations or to the maximum extent possible.

Reduction of Toxicity, Mobility or Volume: This alternative would offer a significant reduction of toxicity, mobility and volume of the contaminants of concern by collecting and treating the contaminated groundwater from the overburden aquifer underlying the site. The treatment plant would be designed to reduce primary contaminant concentrations to target cleanup levels. Removal of soil is expected to eliminate a major source of groundwater contamination and therefore accelerate the groundwater cleanup.

Implementability:

Technical Feasibility

Low hydraulic conductivity values in existing monitoring wells as well as observed slow recharge effects may create technical difficulty in the groundwater extraction process. A 72-hour aquifer pumping test program should be performed to adequately assess the technical feasibility of overburden groundwater extraction. It should be noted that if a sustainable extraction rate cannot be achieved in the testing program, this remedial measure would not be viable.

The primary process steps of this alternative, including groundwater pumping, chemical precipitation, filtration, carbon adsorption and disposal have been used extensively to treat groundwater contaminated with metals and organic contaminants. All components of this alternative are well-developed and commercially available, and major technical problems which would lead to schedule delays are not expected. The treatment processes for this remedial alternative are conventional wastewater treatment processes and can be fabricated from off-the-shelf equipment or be purchased as prefabricated units. Proper operation and routine maintenance of the treatment plant would be required to achieve treatment goals. During the operation of the treatment system, effectiveness would be monitored by periodic analysis of contaminants in the treated groundwater before disposal.

Administrative Feasibility

This alternative would require extensive institutional management to ensure proper operation, maintenance and overall execution. Additionally, this alternative would require compliance with regulations regarding the transport and disposal of process residuals. Long-term institutional management would be required for the groundwater treatment system.

Long-term groundwater monitoring would be required to measure performance of the treatment system. Frequent reviews would be essential in assessing the effectiveness of this alternative in terms of contaminant concentration reductions by groundwater extraction and to implement appropriate alterations in the treatment process.

Availability of Services and Materials

The treatment systems for this alternative are conventional treatment processes and can be fabricated from commercially available equipment. Several suppliers are available for every type of equipment or technology required for this alternative. Competitive bids can thus be obtained. Similarly, specialists are available for the design, construction and operation of this alternative as required. Spent carbon from the adsorption system could be disposed of at an approved off-site disposal facility or regenerated commercially. Pretreatment sludge would be disposed of off site at a landfill. Depending on results of TCLP testing, a RCRA landfill would be required.

Cost

The capital cost for this alternative is estimated to be approximately $300,000. The annual operation and maintenance cost is estimated to be $100,000. However, this number is subject to significant variability. For example, should POTW discharge be available and can be successfully negotiated, the O&M cost will drop significantly. Conversely, based on the contaminant loading frequency of treatment material replenishment, and actual system flow rate, the annual O&M cost could be higher. Refinement of the O&M value cannot be made without additional information typically developed during the Remedial Design stage. Data in support of the capital cost estimate is presented in Appendix D.

Overall Protection of Human Health and the Environment: The treatment system provided would remove the contaminants of concern in the extracted groundwater to state groundwater standard levels and the treated groundwater would be discharged to surface water on site. Treating the contaminated groundwater to state water standards would allow for future use of the aquifer. This alternative would result in protection of the environment.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Chlorinated aliphatic VOCs (e.g., trichloroethene, cis-1,2-dichloroethene, vinyl chloride) were detected at concentrations less than 5 ug/L in the septic tank/leach pit water and were not present in the sludge from the tank/pit samples during the RI/FS sampling investigation. This indicates a decrease from the previous investigation events, as this class of VOCs had been present up to 15,000 ug/L in the tank/pit waters and 2,600 ug/kg in the sludge. A decrease of up to 7.2 times and 108 times in concentration of the chlorinated aliphatic VOCs in surface water and sediments, respectively, was also noted. Presently, occurrences were noted up to 18 ug/L (surface water) and 25 ug/kg (sediment). The groundwater beneath the former Magna Metals property contained concentrations of trichloroethene (maximum of 4,700 ug/L) and tetrachloroethene (maximum of 90 ug/L) during the RI/FS investigation; no previous groundwater samples were collected.

The investigation indicated concentrations of PAH constituents. In general, PAH compounds occur from the burning of oils, wood, coal, gas, etc.; from wood processing and treating operations; and from the manufacture of plastics, chemicals and dyes. PAHs are generally not typical of the bi-products found in the waste stream from metals plating operations. The septic tank/leach pit sludge contained 8 PAHs, up to 1,500 ug/kg. In addition, concentrations greater than applicable criteria occurred in 7 of the 11 sediment samples (64 percent) and 1 of the 5 surface soil samples (20 percent). A majority of the maximum sediment concentrations (16 of 18, or 89 percent) for this class of compounds occurred at location SD-1 (the drainage culvert). Runoff from nearby Cross Road Avenue may be a contributing factor to the culvert concentrations. Concentrations of PAHs less than 4 ug/L and 160 ug/kg, respectively, were detected in the surface water and subsurface soils. Previous investigations at the site did not analyze samples for PAHs. The exact source of the pesticides and PCBs is currently unknown, and these constituents were possibly introduced into the areas by actions after ISC Properties sold the site in 1982.

Pesticides and PCBs were not detected in the septic tank/leach pit water or surface water historically sampled in May 1984. Neither of these matrices contained pesticides or PCBs during the RI/FS investigation. Pesticides and PCBs occurred, though, in the other matrices sampled (i.e., the septic tank/leach pit sludge, sediments, surface and subsurface soils, and groundwater). The existence of pesticides on the site has no historical documentation. PCBs were used in capacitors and transformers, and in the manufacture of hydraulic fluids, lubricants, inks, adhesives, and pesticide extenders. The exact source of the PAHs is currently unknown, and these constituents were possibly introduced into the areas by actions after ISC Properties sold the site in 1982.

Investigations conducted in 1982 (and prior to) at the site indicated that inorganic constituents were generally confined to the septic tanks and leach pits. In 1982, after an extensive investigation, NYSDEC concluded that the site did not pose a threat to the environment. Water and sludge samples from the tanks/pits collected during 1984 had noted elevated concentrations of arsenic, copper, nickel, seleniuim, and/or zinc. Occurrences at reduced concentrations were detected in the nearby surface water and sediments during the previous investigations. During the RI/FS sampling, metals and cyanide were detected in the water and sludge samples from the

tanks/pits. Detection of inorganic constituents in the post-1982 investigations suggests that metals may have been further introduced after 1982. During the current investigation, exceedance concentrations for the inorganics were detected in the tributary (SW-6/SD-6) and/or wetlands (SW-7/SD-6 and SW-9/SD-9) samples. In addition, the surface soils, subsurface soils and groundwater samples collected downgradient from the tanks/pits contained inorganic exceedance concentrations.

The chemical data collected during the RI indicated that all media sampled, i.e., groundwater, surface water, surface soil, sediment, and subsurface soil were affected by organic and inorganic contaminants of concern. With regards to groundwater, specifically off-site overburden groundwater, on-site bedrock groundwater, and off-site bedrock groundwater, contaminant concentration, if any, are unknown at this time. Based on exceedances of NYSDEC Water Quality Standards (Class GA) in two of the three downgradient overburden monitoring wells MW-03 and MW-04, additional downgradient investigation of the overburden is warranted. Since it is also possible that the contaminated overburden aquifer and underlying bedrock aquifer are hydraulically interconnected through a bedrock fracture system, the potential exists for contaminants to migrate downwards. Therefore, an on-site bedrock well should be installed, and if contamination is found, additional bedrock groundwater delineation should be performed.

Should off-site overburden and/or bedrock contamination become apparent, it should be noted that there are significant limitations in achieving remedial action success as fractured bedrock systems tend to act as heterogeneous groundwater units making contaminant removal difficult to achieve. Similarly, based on the presence of wetlands off-site, overburden is anticipated to have a high silt/clay content which has a tendency to "hold" contaminants. As a result, prior to performance of any future feasibility study analysis, an assessment should be made regarding actual risk posed to current and future human and environment populations potentially exposed to groundwater contamination and the pathways which would potentially be exposed. To evaluate human health risks, several exposure pathways should be considered which would include the following:

- Ingestion of groundwater,
- Dermal contact with groundwater, and
- Inhalation of volatiles from groundwater.

Any future field investigation activity should also consider correlating the relationship of groundwater flow and its potential discharge to the wetlands area downgradient of the site. Should a connection exist and Contaminant of Concerns (COCs) warrant further evaluation, the risk assessment should consider the following exposure pathways.

- Ingestion/direct contact with surface water,
- Inahalation of volatiles from surface water, and
- Ingestion of fish from the pond and stream.

With respect to the results of the Habitat Based Assessment which incorporated surface soil, sediment, and surface water data, the following was noted:

Down-gradient concentrations of the metals aluminum, copper, iron, mercury, zinc, and cyanide exceeded the NYSDEC Water Quality Standards, and selenium exceeded EPA chronic and acute criteria in the surface water samples. Down-gradient levels of copper, nickel, chromium, and zinc surpassed the NYSDEC severe effect level for sediments. In the down-gradient surface soil samples, aluminum, chromium, copper, selenium, vanadium, and zinc were detected at concentrations that were greater than the screening benchmark concentrations. Concentrations of aluminum, chromium, selenium, and vanadium were also higher than the screening benchmark concentrations in the background surface soil samples. In addition, levels of PCBs aroclor- 1254 and aroclor-1260, and the semi-volatile organic compound di-n-butylphthalate exceeded the screening benchmark concentrations in the down-gradient surface soil samples.

Based upon these results, the following conclusions were drawn. It should be noted that removal of soils in the source area would likely eliminate the potential for exposure in the first two findings.

- Within the boundaries of the site perimeter, no significant areas for supporting ecological receptors was documented. However, surface drainage from the site is directed into adjoining wetlands and streams deemed as sensitive environments (including a NYSDEC regulated wetland) supporting ecological receptors. Given that the principal fate and transport mechanism for site related contaminants is the surface water pathway, the potential for exposure of ecological receptors to site related contaminants remains viable.

- Elevated concentrations of aluminum, chromium, copper, selenium, vanadium, and zinc were associated with on-site surface soils. While present at elevated concentrations, the developed nature of the site limits the surface soil exposure pathway for most ecological receptors. However, contaminated soils may function as a potential source for exposing ecological receptors downstream via erosion and runoff into adjoining streams and wetlands.

- Site related contaminants including aluminum, copper, iron, mercury, zinc, and cyanide are present in surface water at elevated concentrations above background and corresponding acute and chronic AWQC in the adjoining streams and wetlands.

- Site related contaminants including copper, nickel, chromium, and zinc are present in the sediments at concentrations above background and corresponding low and severe sediment quality criteria in the adjoining streams and wetlands.

The presence of site related contaminants exceeding applicable ecological benchmarks in the surface water and sediments of adjoining sensitive environments appears to present a pathway for exposure of ecological receptors to site related contaminants. It also suggests that impacts may be occurring in the streams and or wetland area. It is recommended that the FWIA continue through a Step IIC Toxic Effects Analysis, which should focus on the aquatic communities, surface water and sediments of the tributaries and adjoining wetlands to determine if the potential exposure to site related contaminants are impacting aquatic communities and if remedial actions are warranted.

On-site subsurface soil and overburden groundwater were adequately delineated and therefore, an evaluation of potential remedial measures to address these affected media was performed. The objectives developed in the screening analysis consisted of restoring contaminated subsurface soil in the leach pit/holding tank area (which also provides a continued additive source to overburden groundwater levels via either groundwater flow or precipitation infiltration) to background conditions and containment of overburden groundwater in order to prevent further migration off-site. However, prior to implementation of the containment option, a 72-Hour Aquifer Pumping Test Program should be performed to verify the feasibility of groundwater extraction due to low hydraulic conductivity values derived from the RI slug tests and also due to slow monitoring well recharge effects seen in the field.

8.0 REFERENCES

Clayton, 1981. Clayton, George and Florence Clayton (editors), Patty's Industrial Hygiene and Toxicology, John Wiley & Sons, Inc., New York. 1981.

NYSDEC, 1986. Water Quality Regulations, Title 6, Chapter X, Parts 701 and 703, New York State Division of Environmental Conservation, March 1986.

NYSDEC, 1993a. Ambient Water Quality Standards and Guidance Values, New York State Division of Environmental Conservation, October 1993.

NYSDEC, 1993b. Technical Guidance for Screening Contaminated Sediments, New York State Division of Environmental Conservation, November 1993.

NYSDEC, 1994. Division Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Clean-up Objectives and Clean-up Levels, New York State Division of Environmental Conservation, January 1994, revised from November 1992.

APPENDIX A

GEOPHYSICAL DATA

GPR DATA FINDINGS

A strong hyperbolic reflection was consistently observed in data along scans depicted in Files 28, 29, 31, 32, and 43 which may be attributed to subsurface pipe, or pipes, estimated to trend in a north-south direction, a distance of between 15 to 20 feet west of the former Magna Metals building (Figure 1). A characteristic signature of a subsurface tank was determined by collecting a number of scans (i.e., Files 10, 11, and 12) over a known location of a subsurface tank and comparing this signature to subsequent data collected. The raw GPR data collected over the site and within this appendix correspond to scan lines depicted in Appendix A, Figure 1. Also included in this map is a geophysical interpretation of the site in which suspected locations of subsurface tanks and potential appurtenant piping are displayed. An area of potential conductive material is displayed that was evidenced by an increase rate of EM attenuation. A shallow reflective zone is also displayed in the figure as evidenced along Files 13 and 14 at a depth of about three feet below ground surface. These findings were later used to guide the leach pit sampling program.

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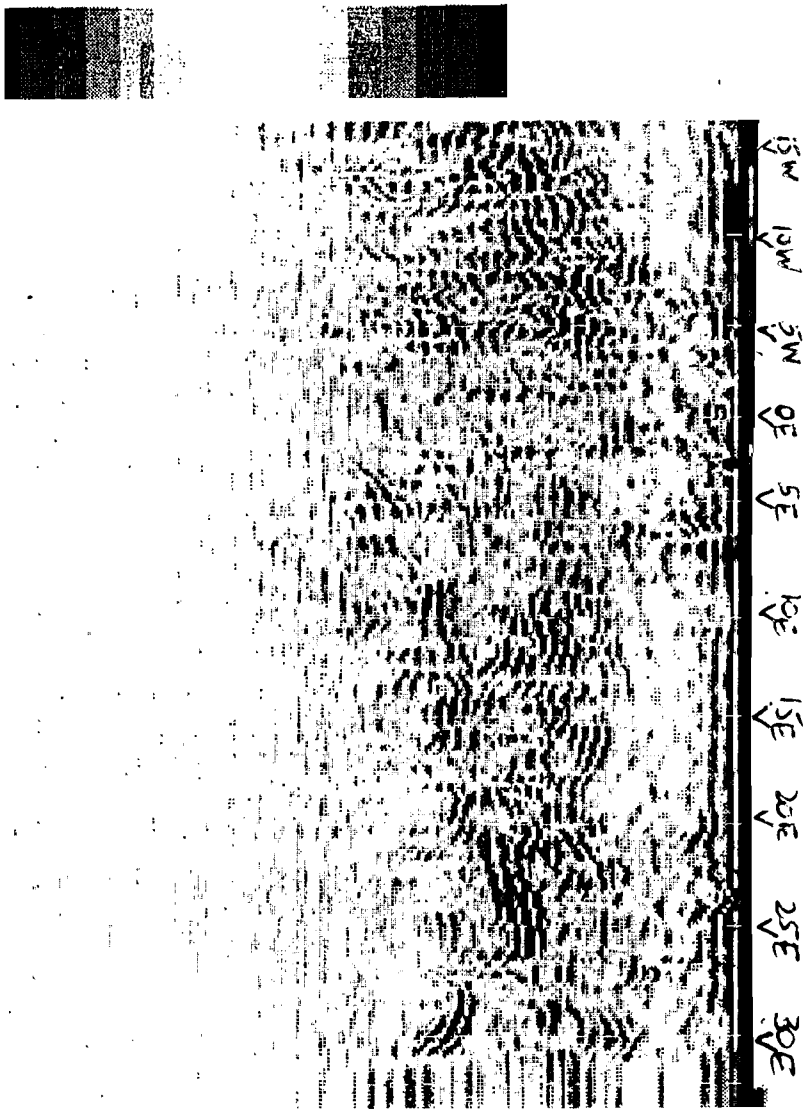

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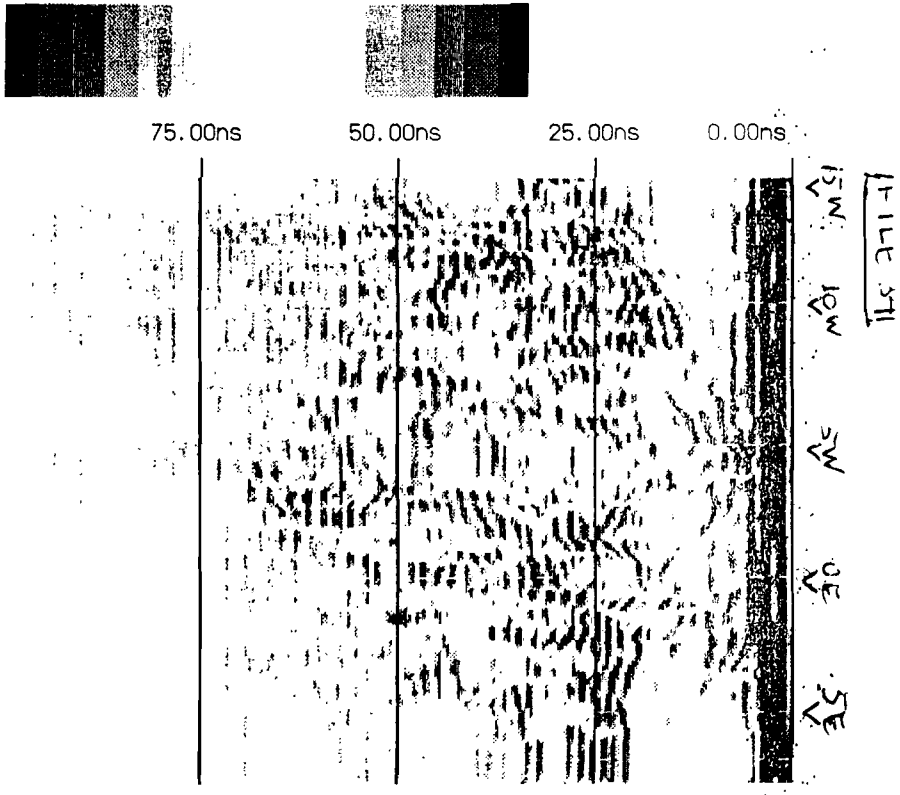

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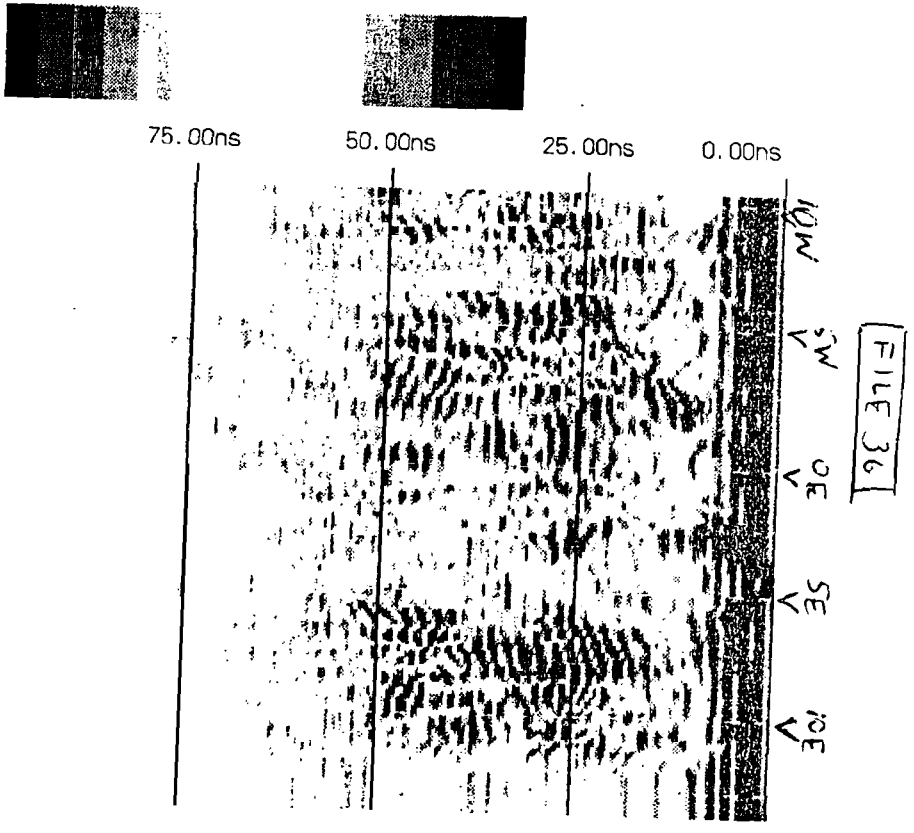

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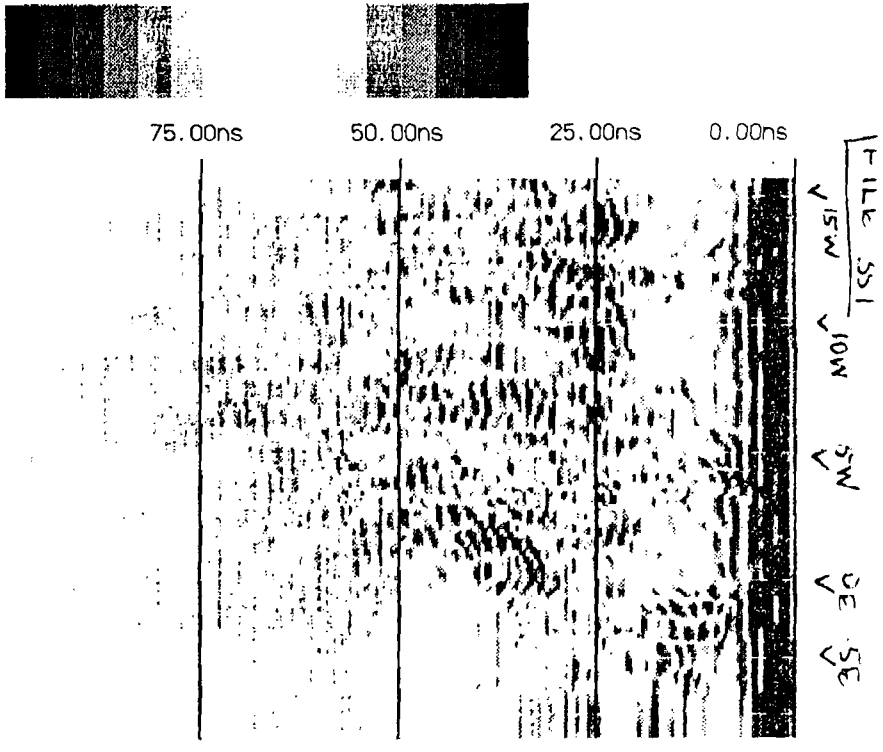

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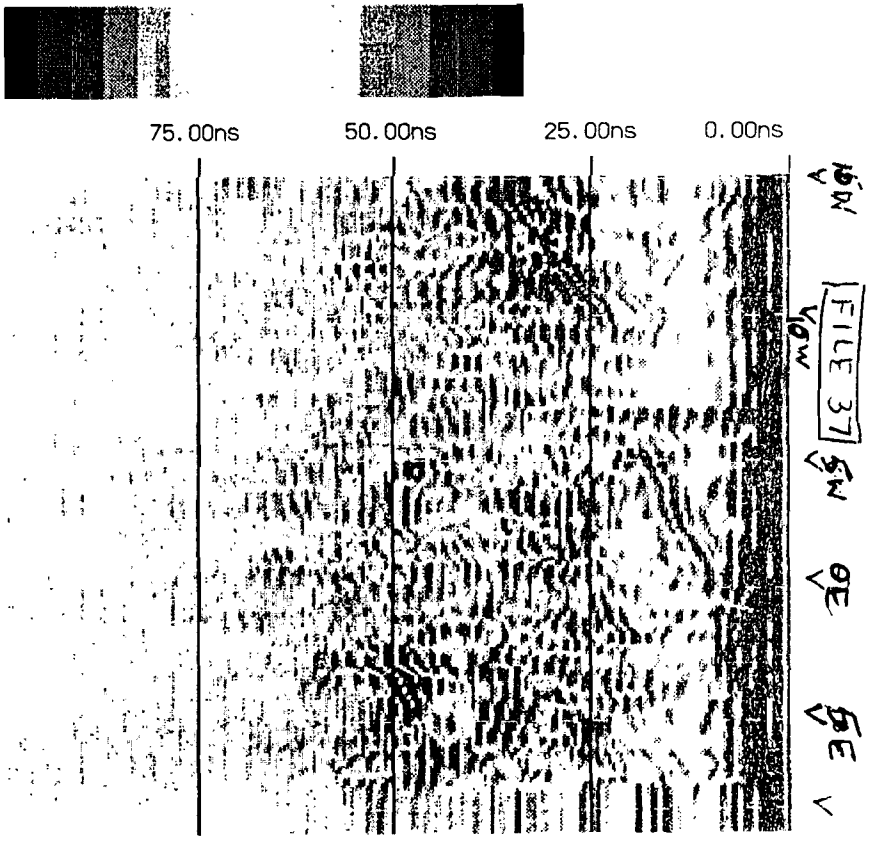

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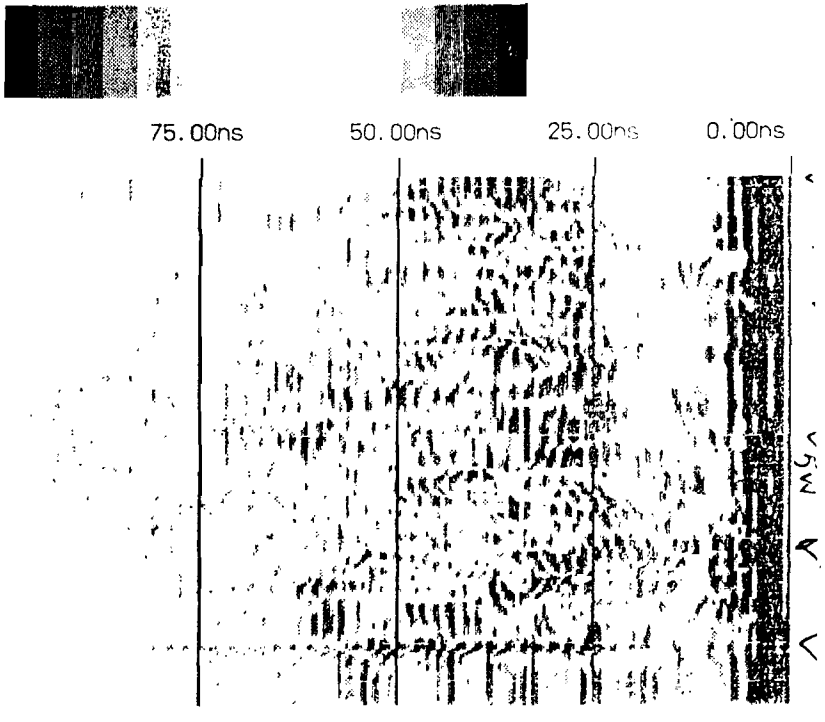

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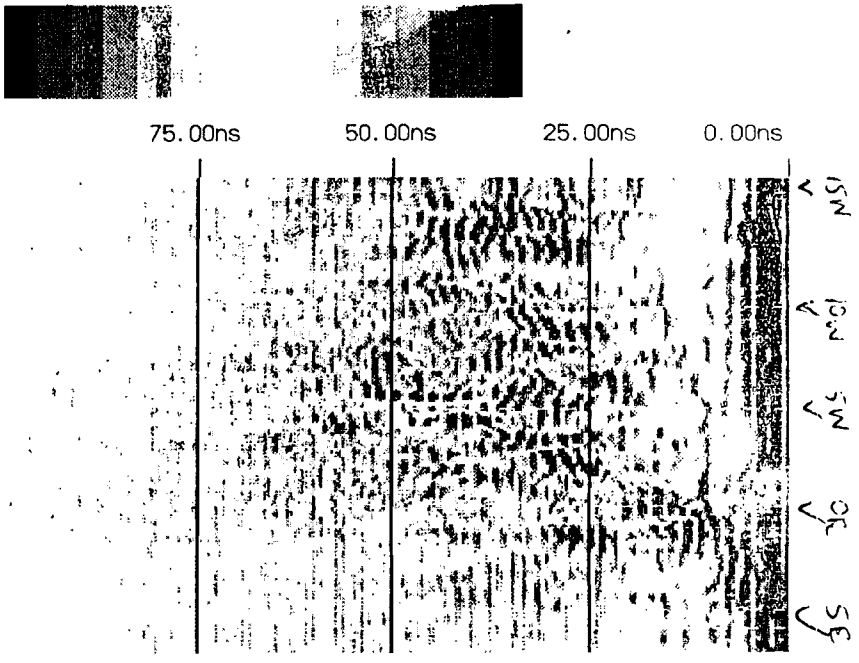

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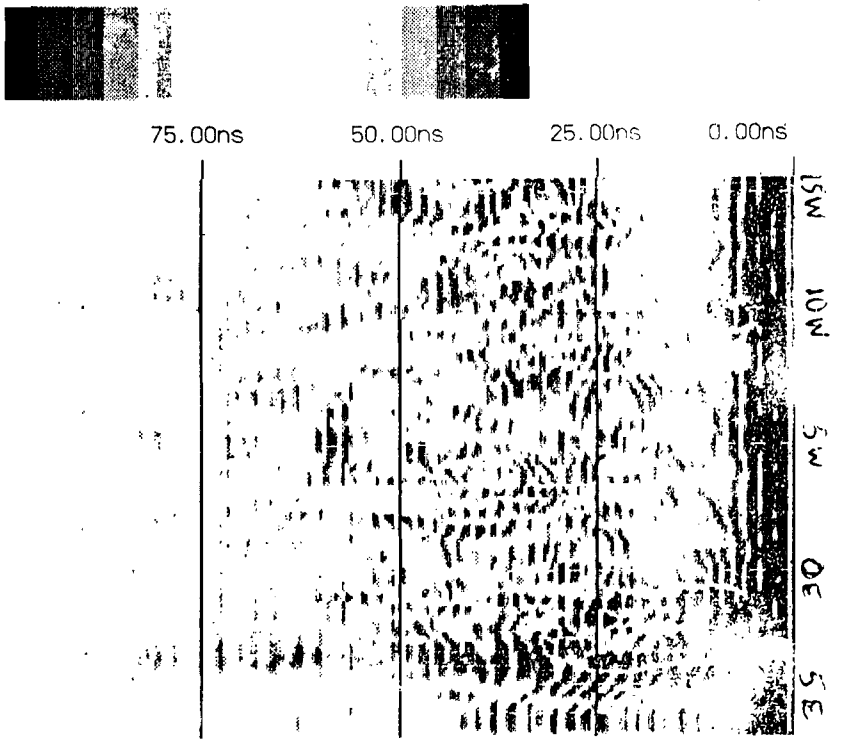

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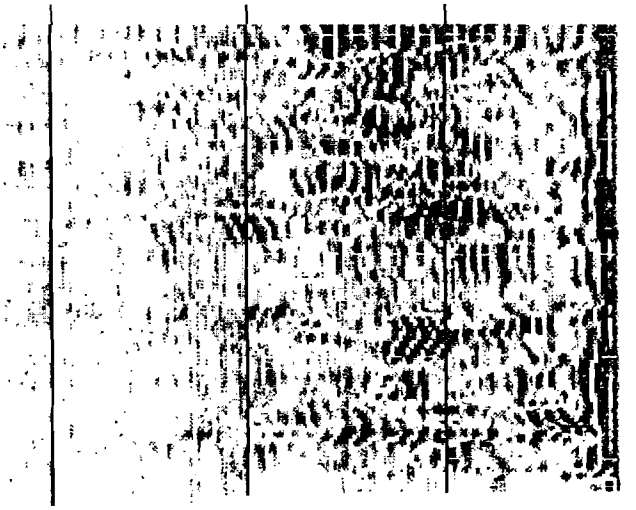

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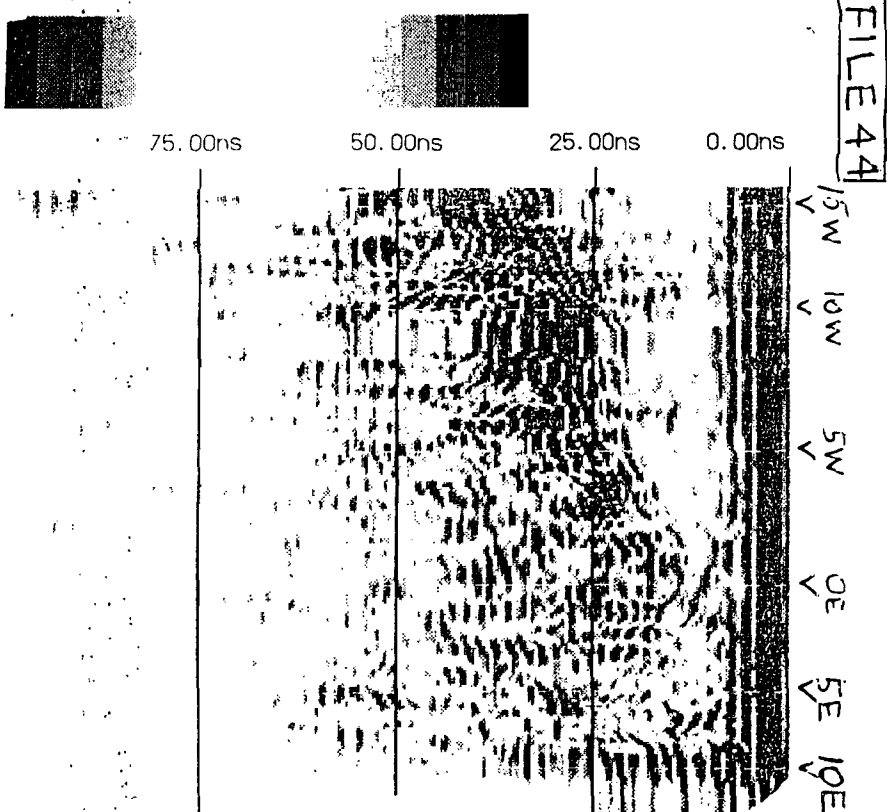

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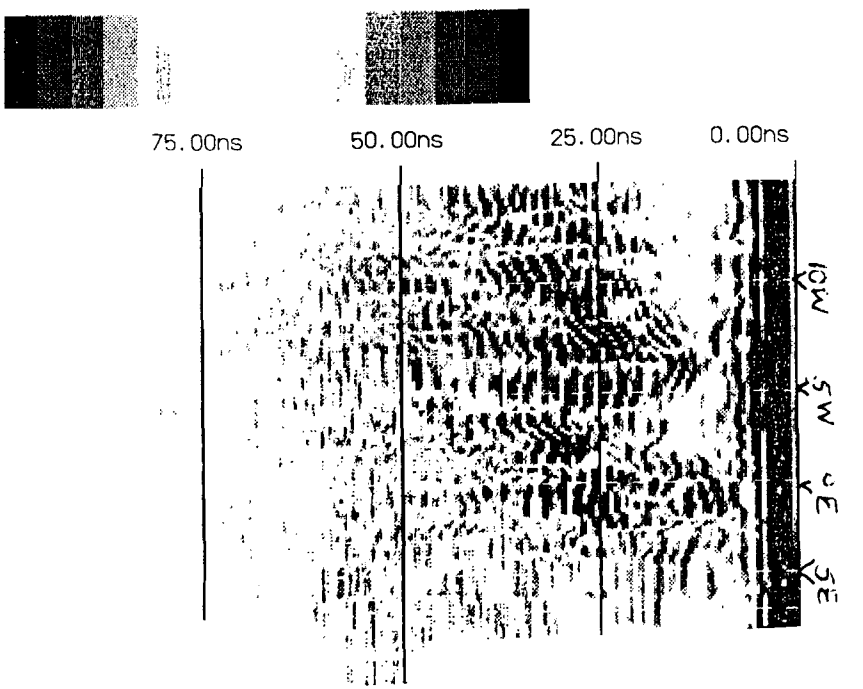
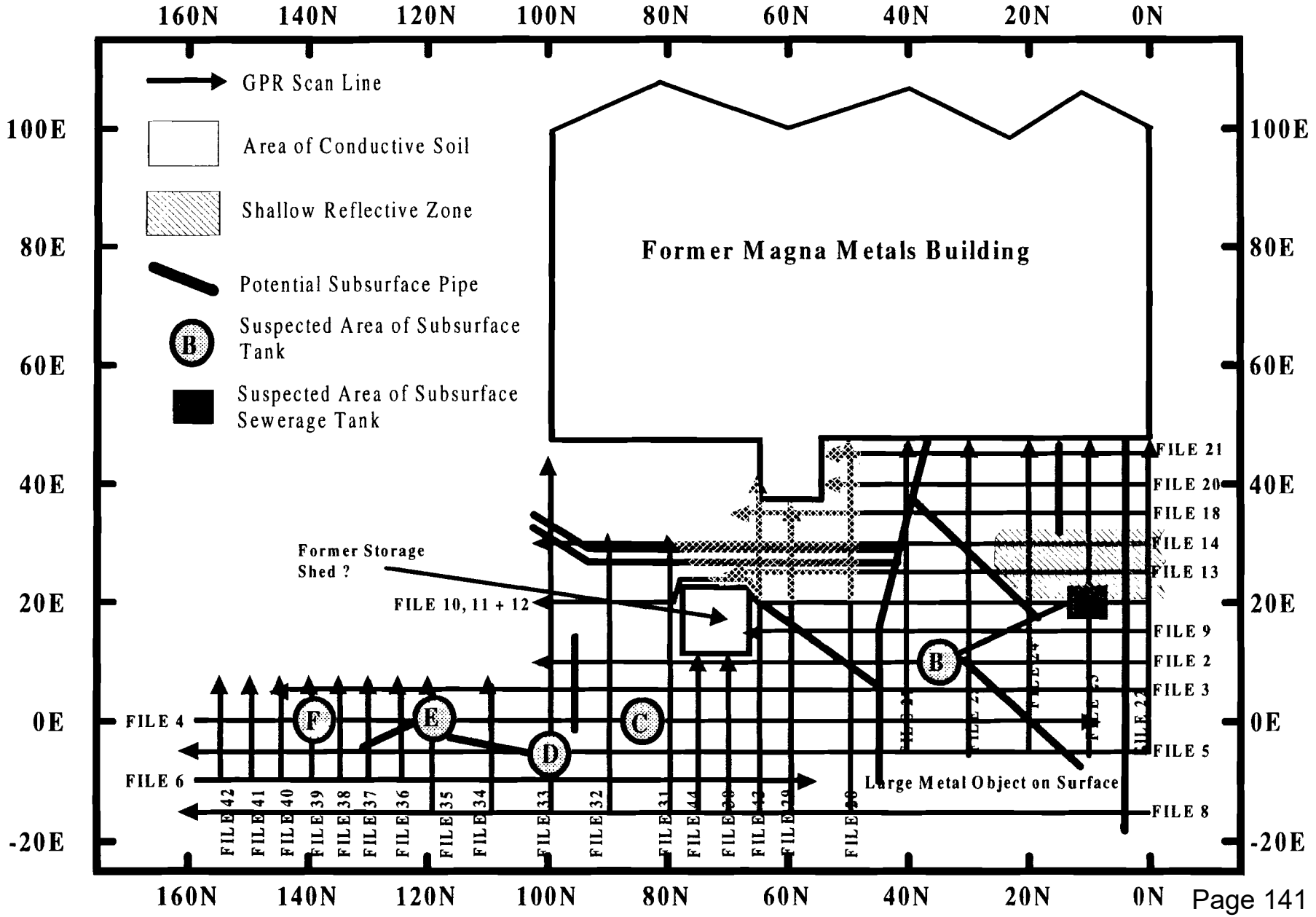


FILE 42

Figure 1: Map of Magna Metals Site Displaying GPR Scan Lines Conducted and and Subsurface Targets of Interest Detected.



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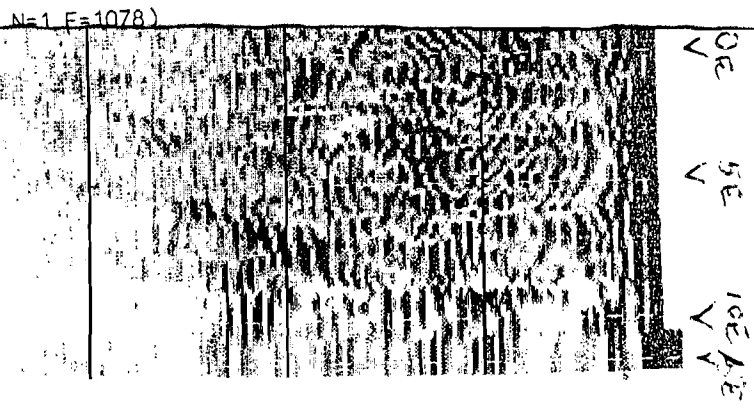

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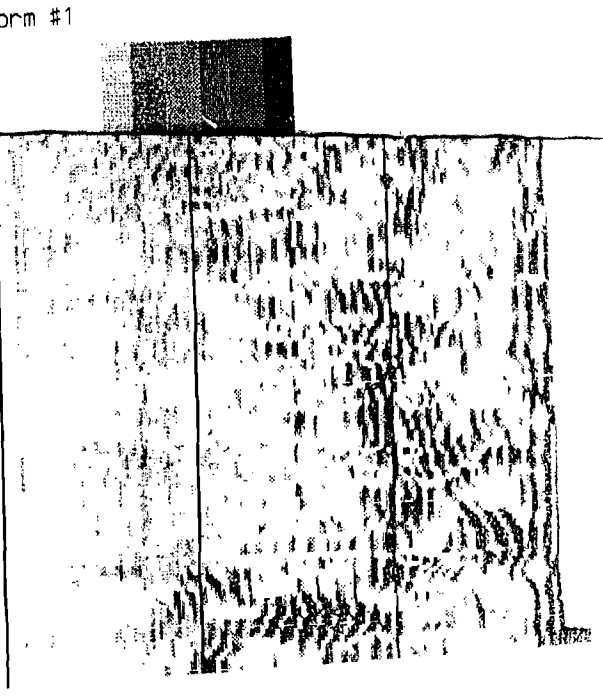

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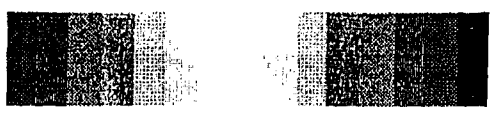

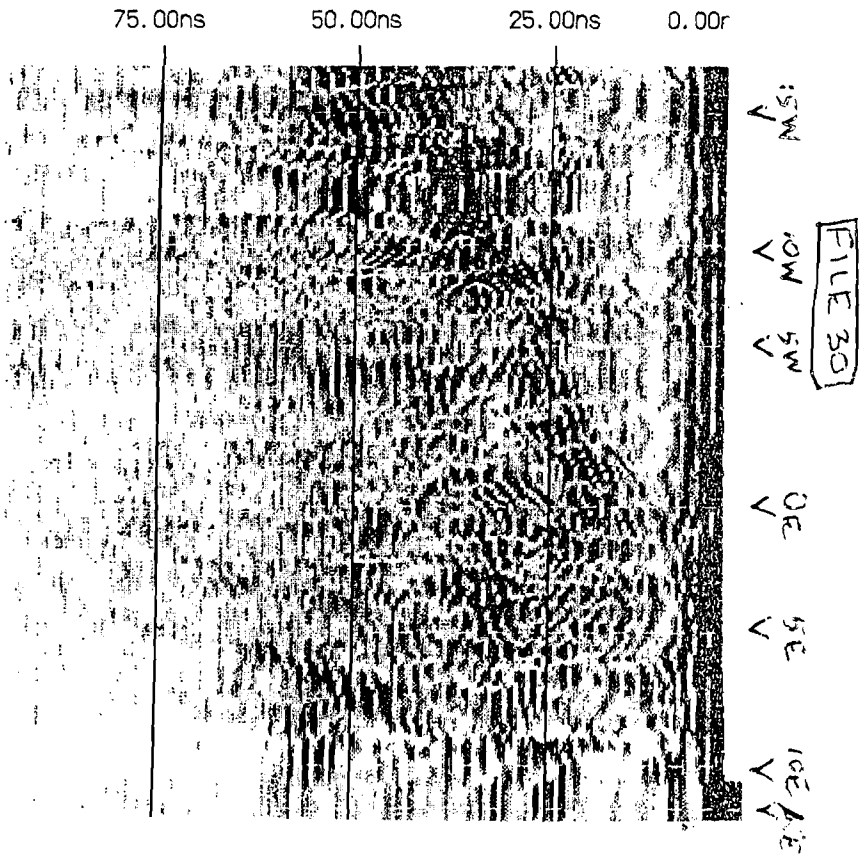

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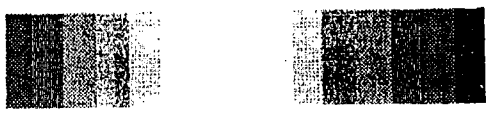
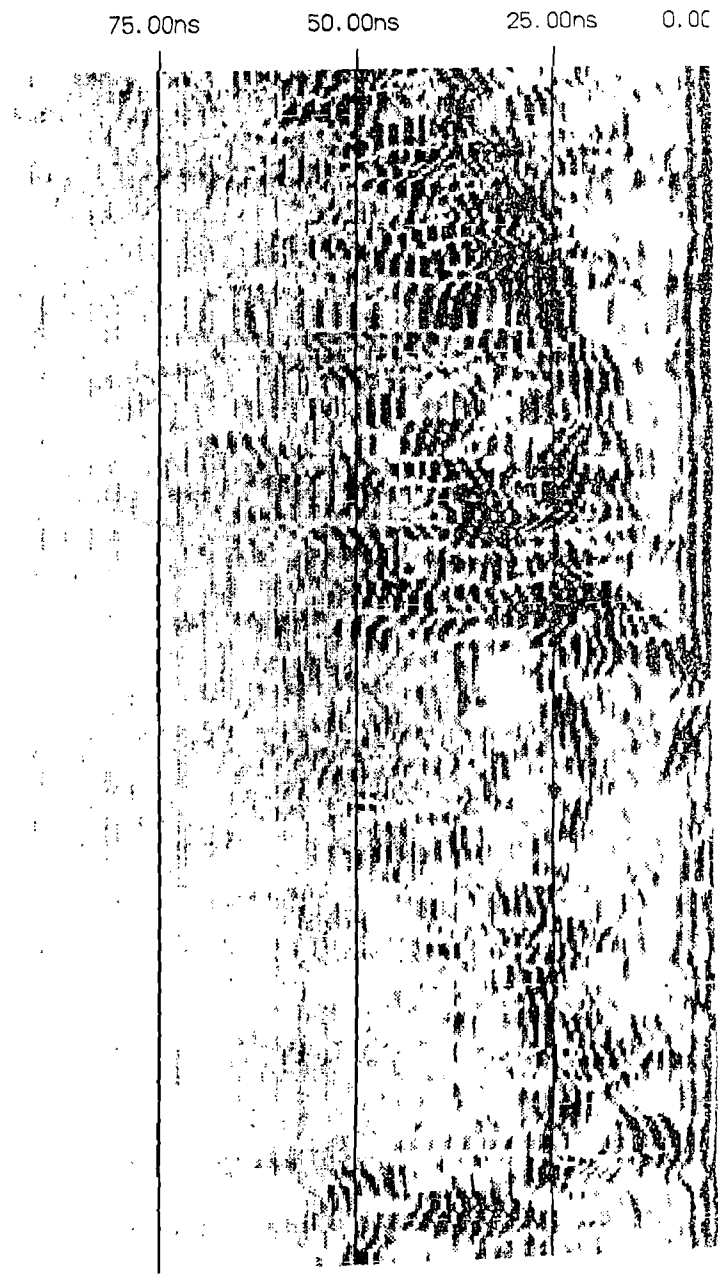


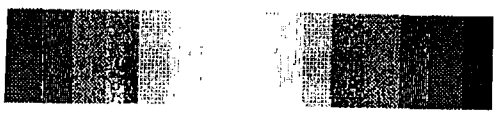


FILE 31

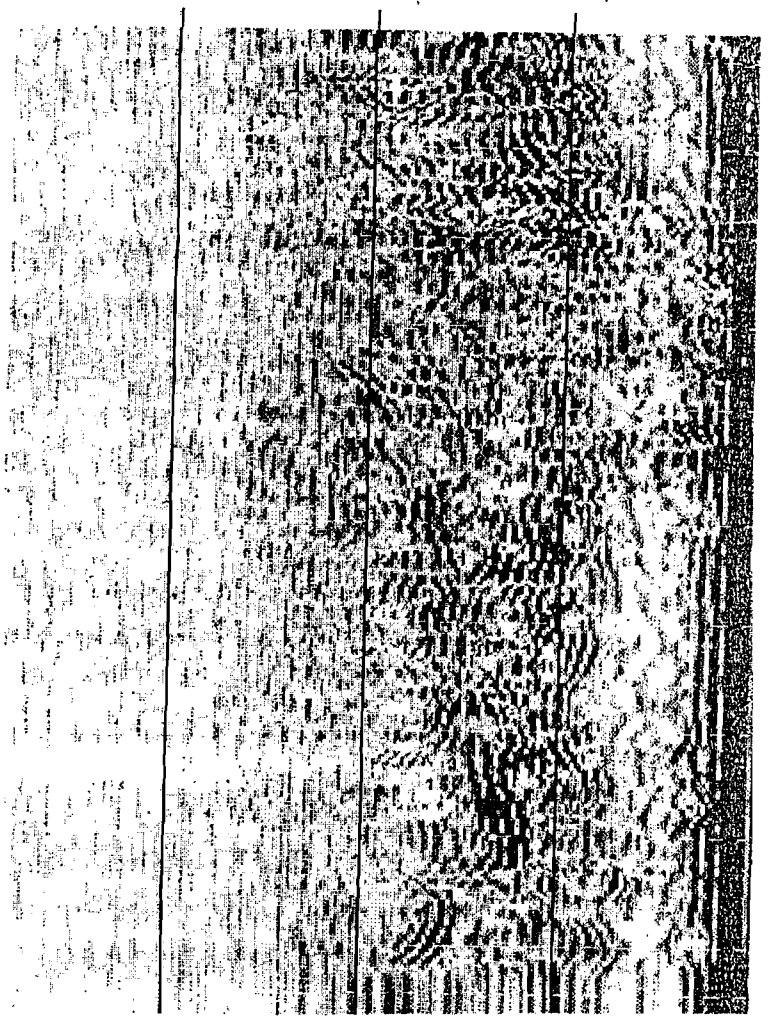
FILE32(11/21/96 13:39:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

)le #15; Transform #1



75.00ns 50.00ns 25.00ns 0.00ns



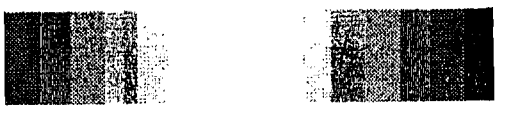
15V 10V 5V 0V 5E 10E 15E 20E 25E 30E 35E

FILE 32

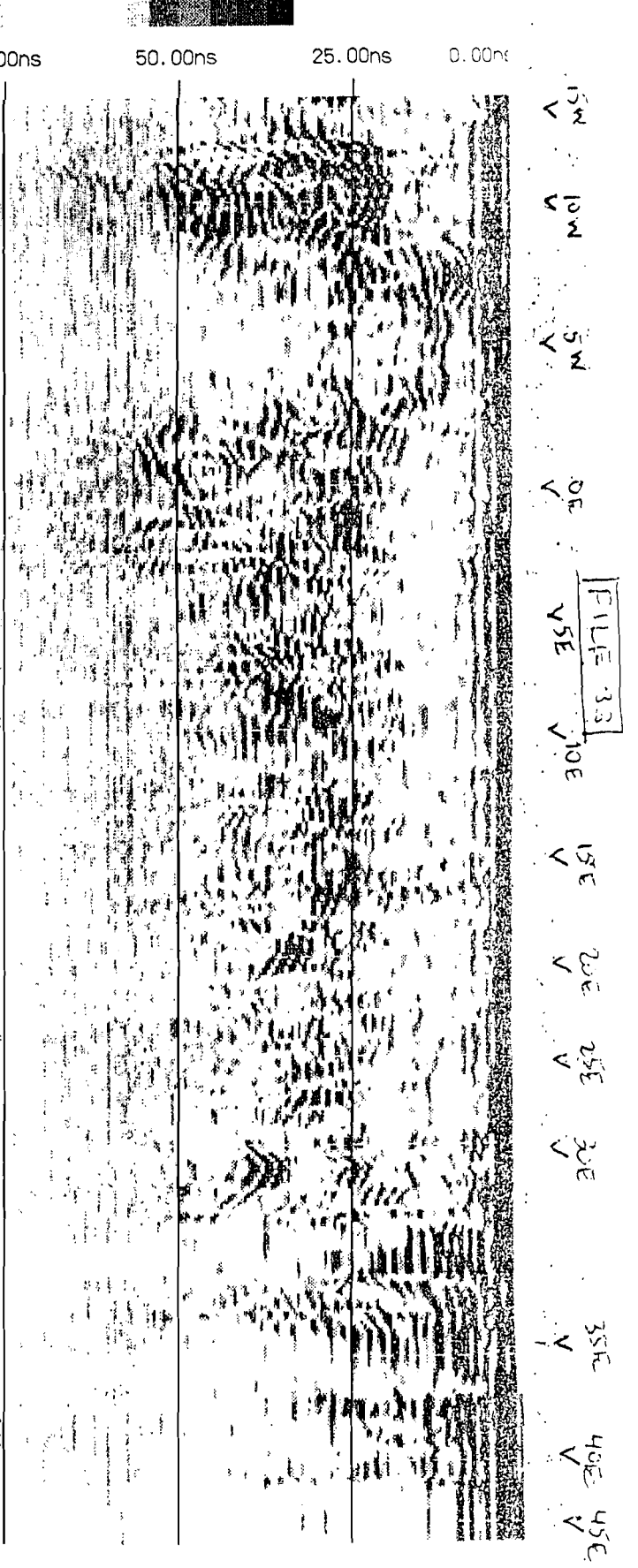
'LE33(11/21/96 13:42:12) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

)le #15; Transform #1



75.00ns 50.00ns 25.00ns 0.00ns



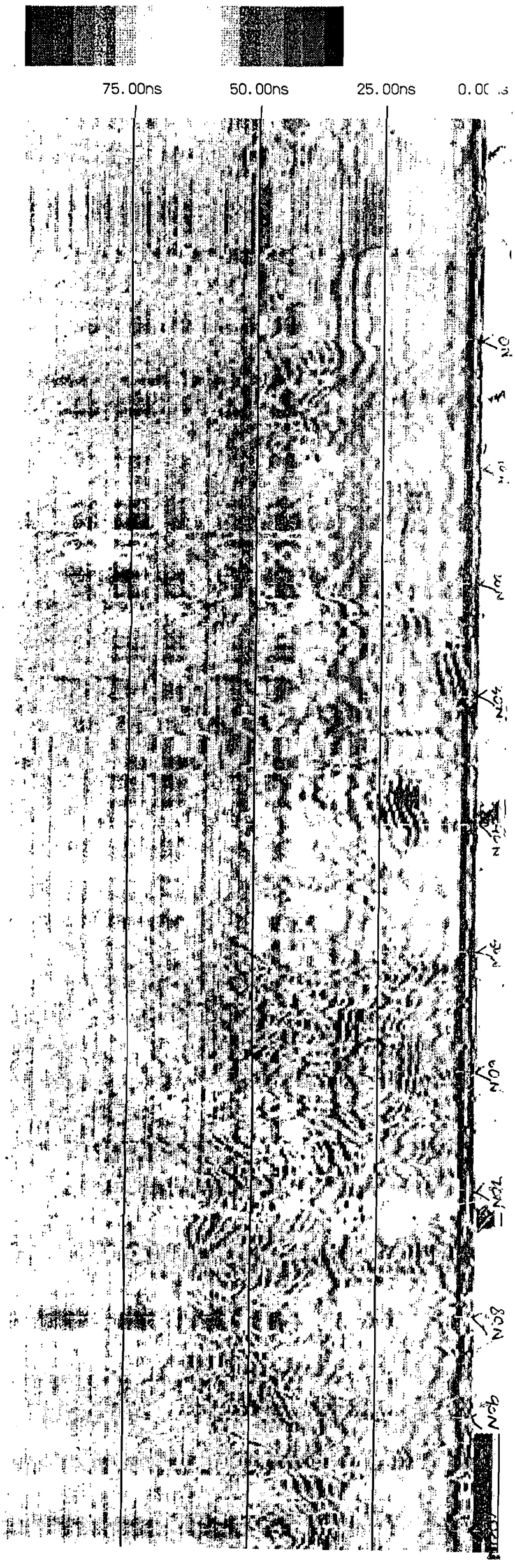
15V 10V 5V 0V 5E 10E 15E 20E 25E 30E 35E 40E 45E

FILE 33

FILE2(11/21/96 11:48:54) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 16 33 49 52 54
(IIR LP N=1 F=1000)
IIR HP N=2 F=10)
IIR STK TC=4)

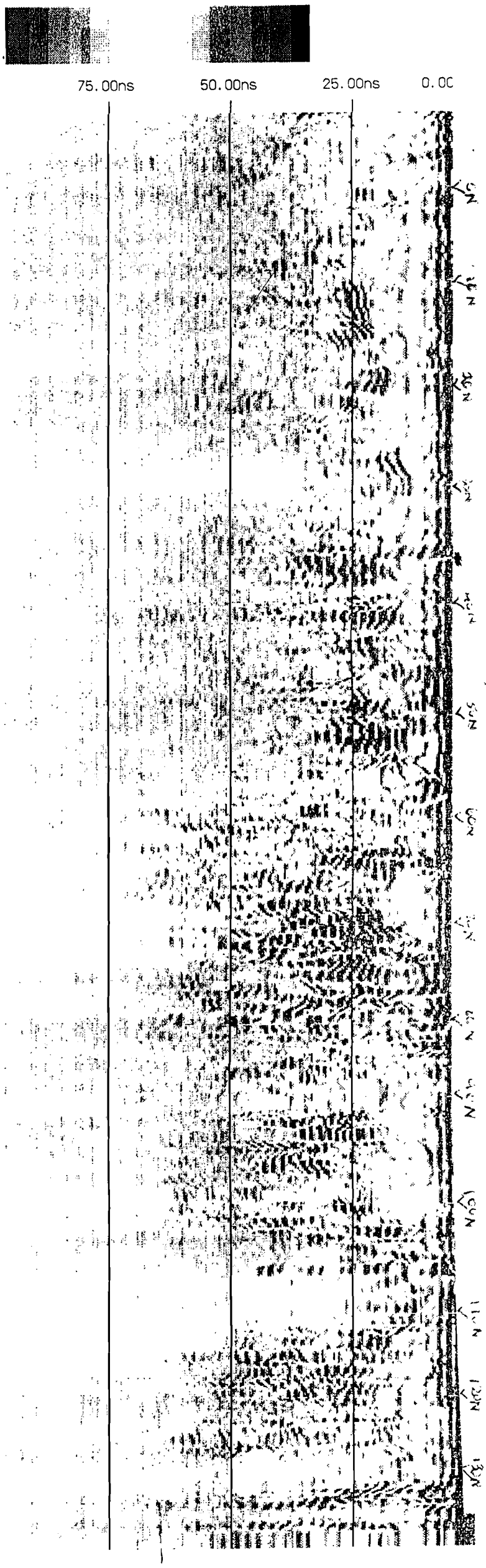
Table #15; Transform #1



FILE3(11/21/96 12:23:48) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
(IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

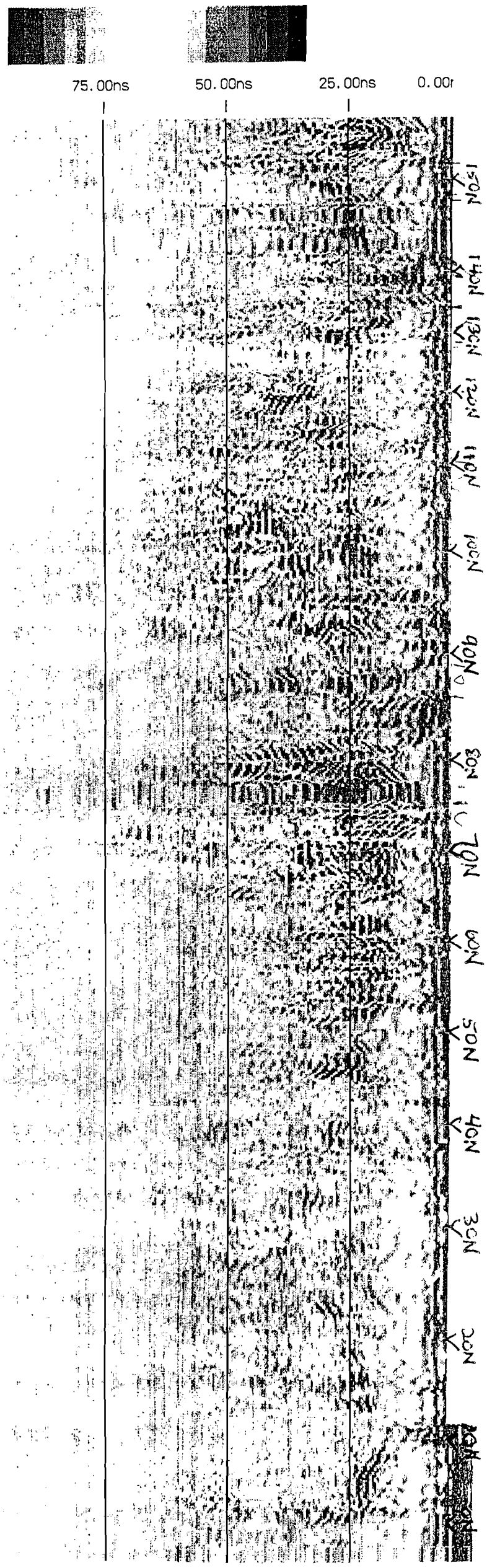
Table #15; Transform #1



FILE 4 (11/21/90) samples/scan: 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15; Transform #1

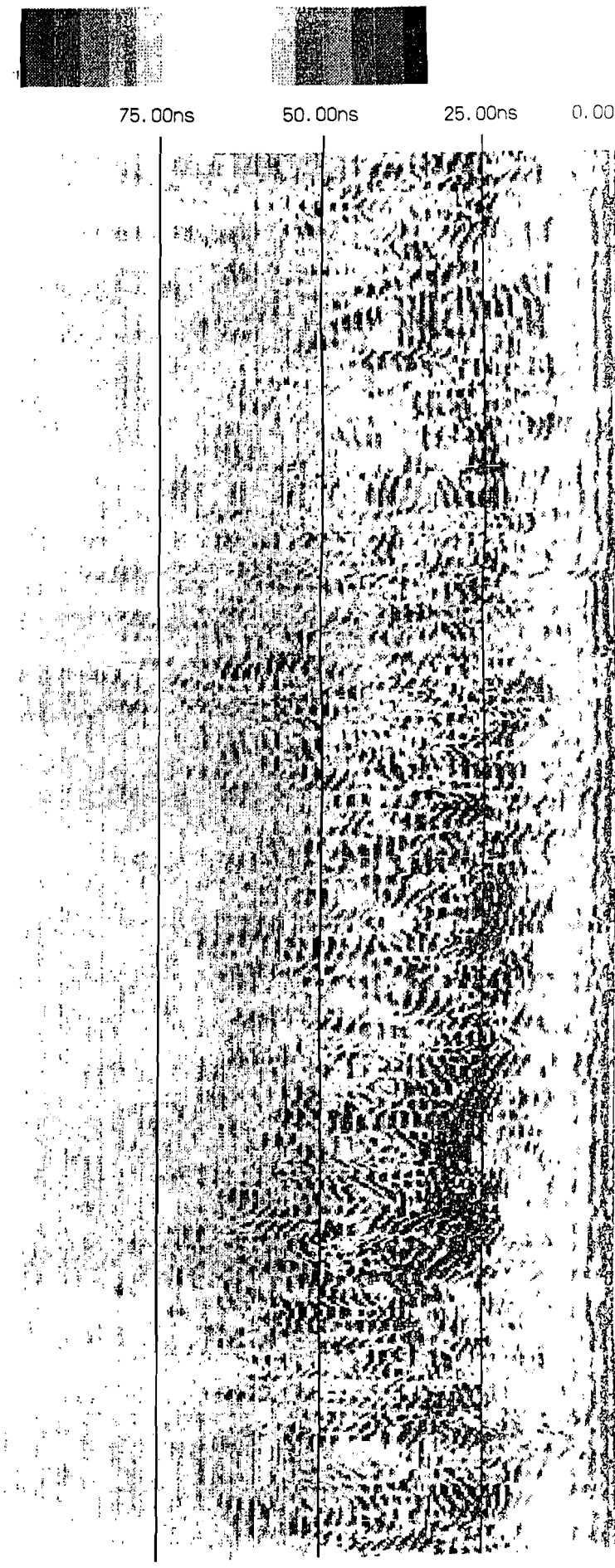


FILE 4

FILE6(11/21/90 12:..
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

Position: 0.0nS Range: 100.0nS
Range Gain 18 40 52 52 55
V(IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

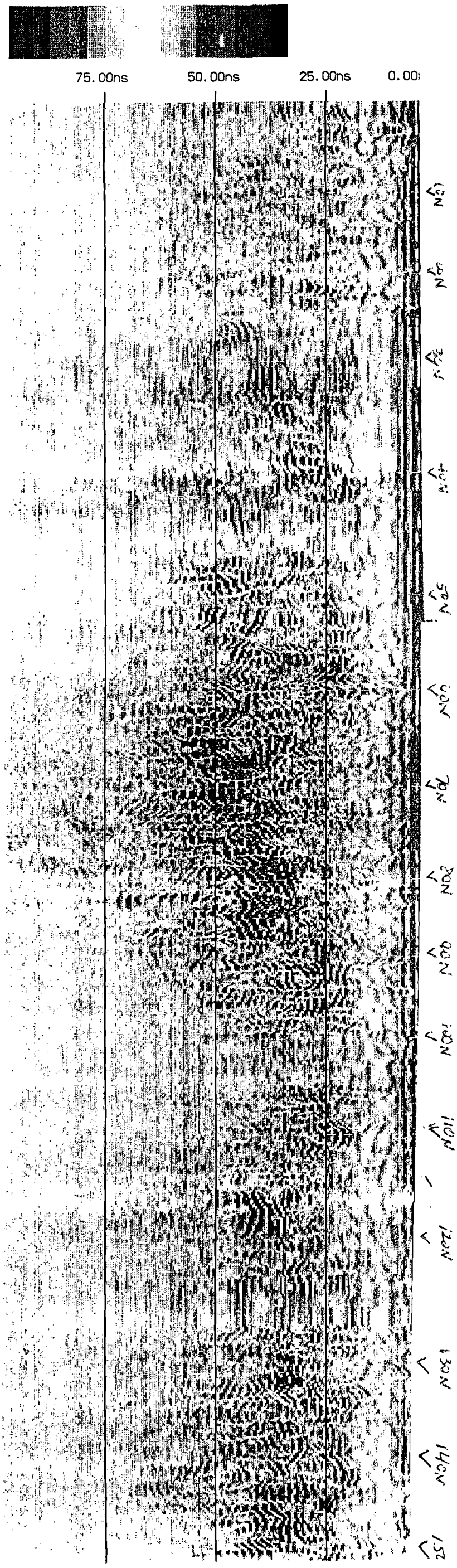


FILE6

FILE 8 (11/21/96) Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

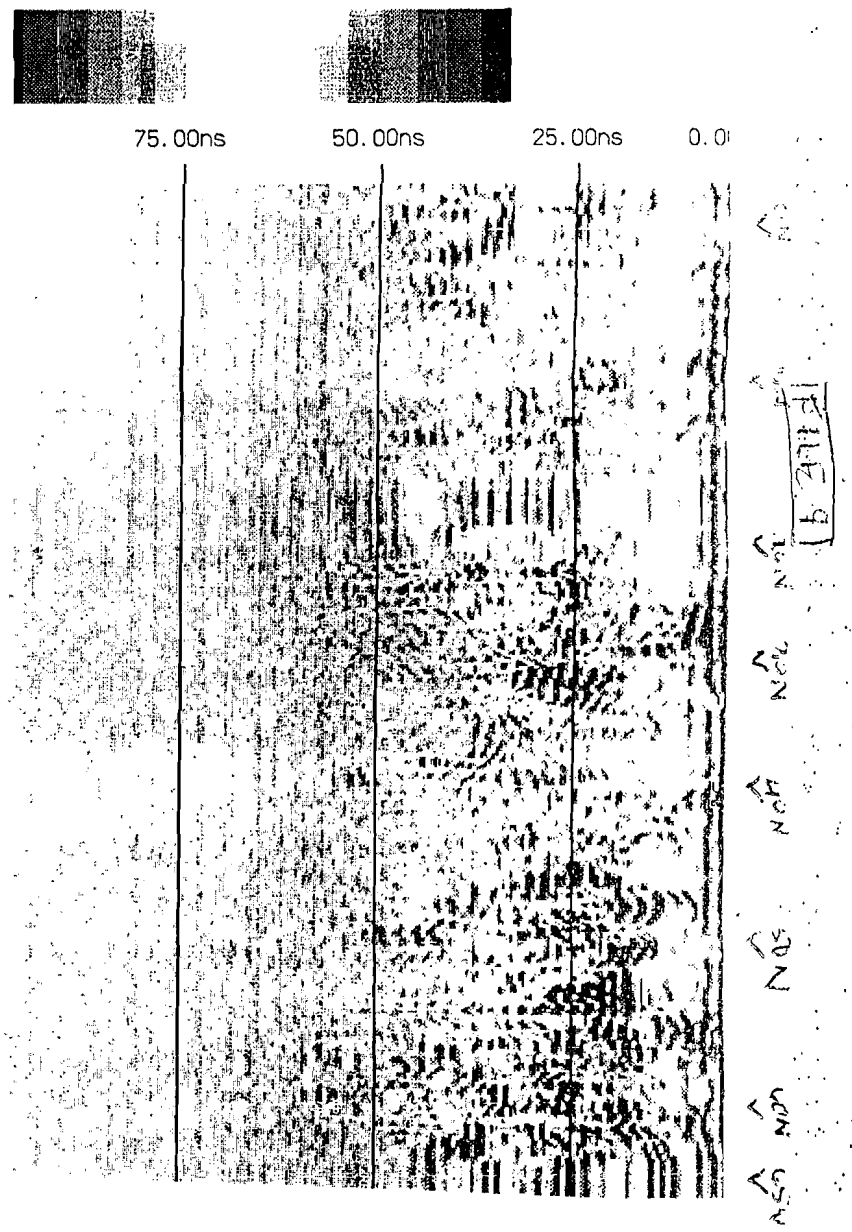


FILE8

FILE9(11/21/96 12:46:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
ielectric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1



FILE9

FILE5(11/21/96 12:31:36) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

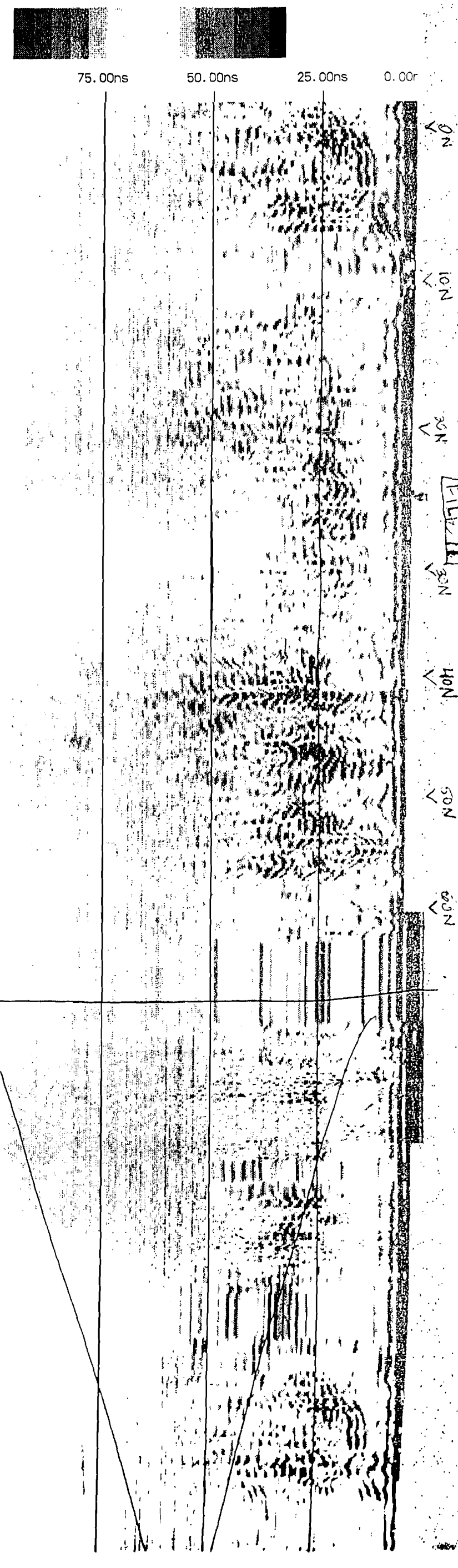


FILE5

FILE4(11/21/96) Samples/Scan: 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

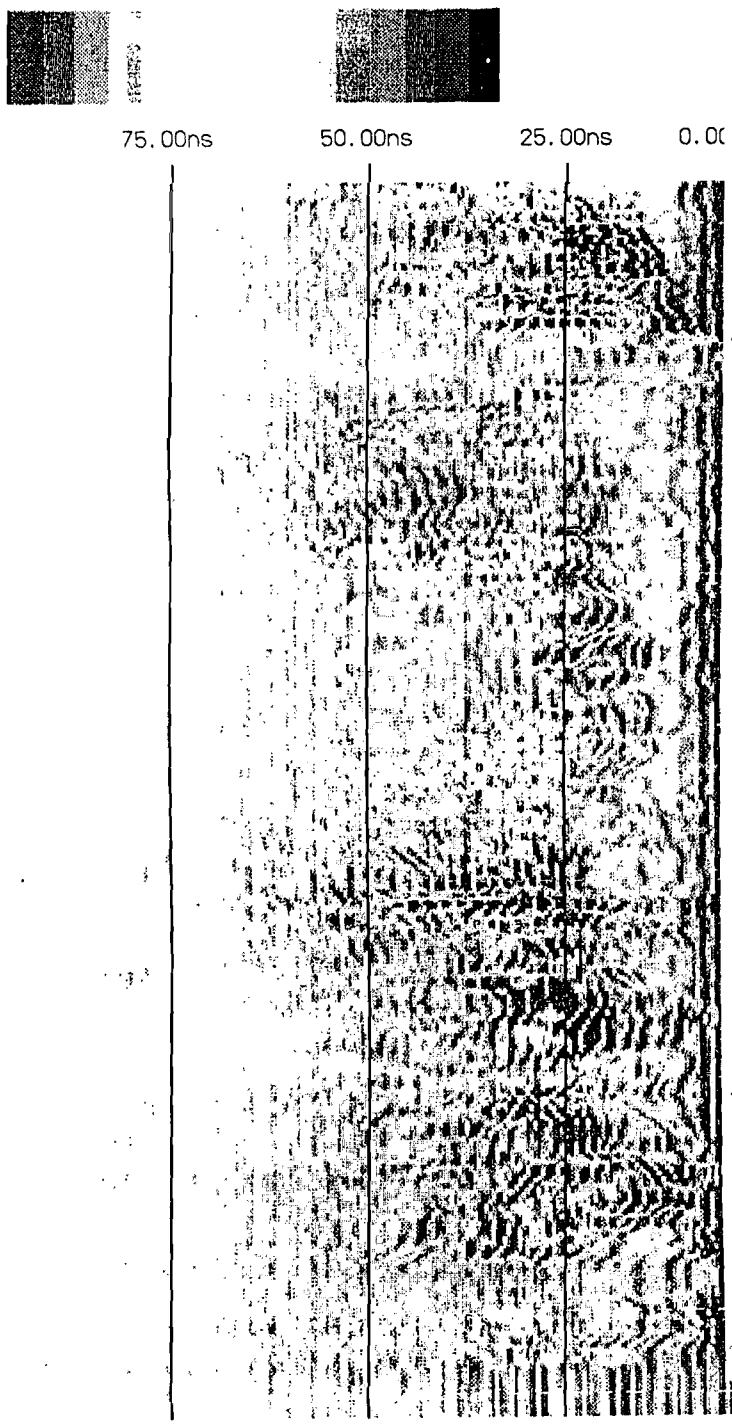


FILE4

_E10(11/21/96 12:49:14) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

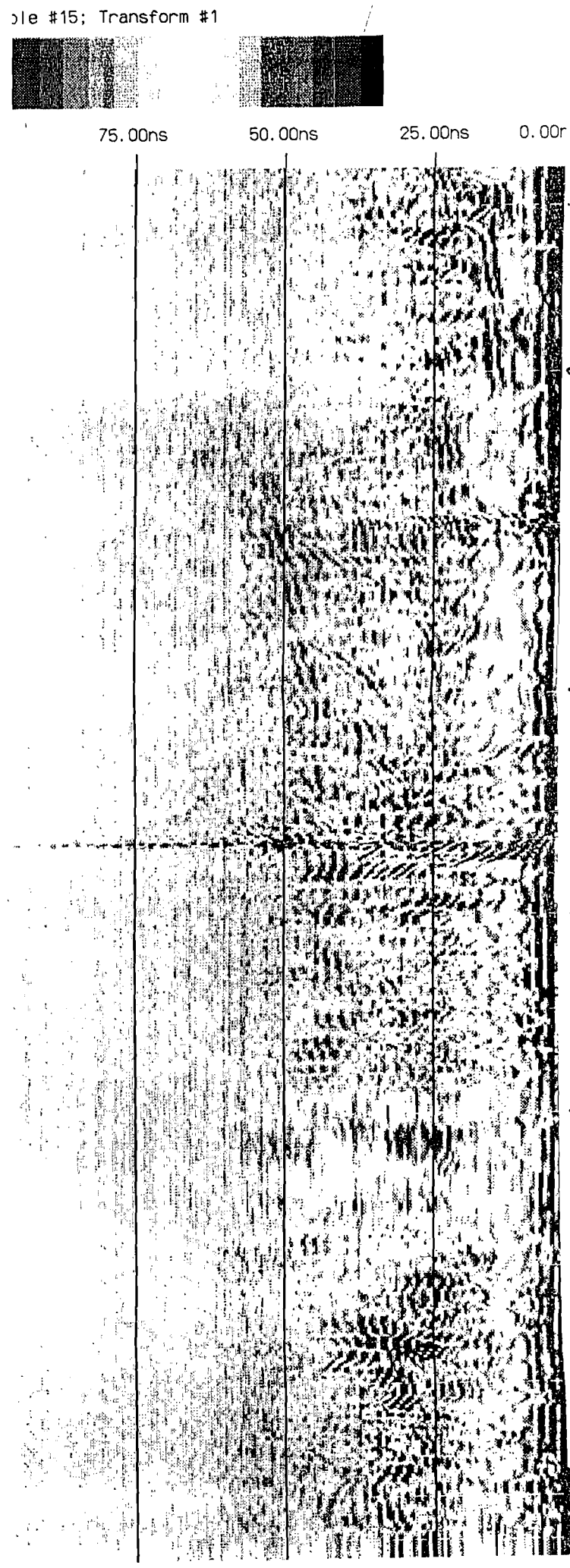


FILE 10

Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

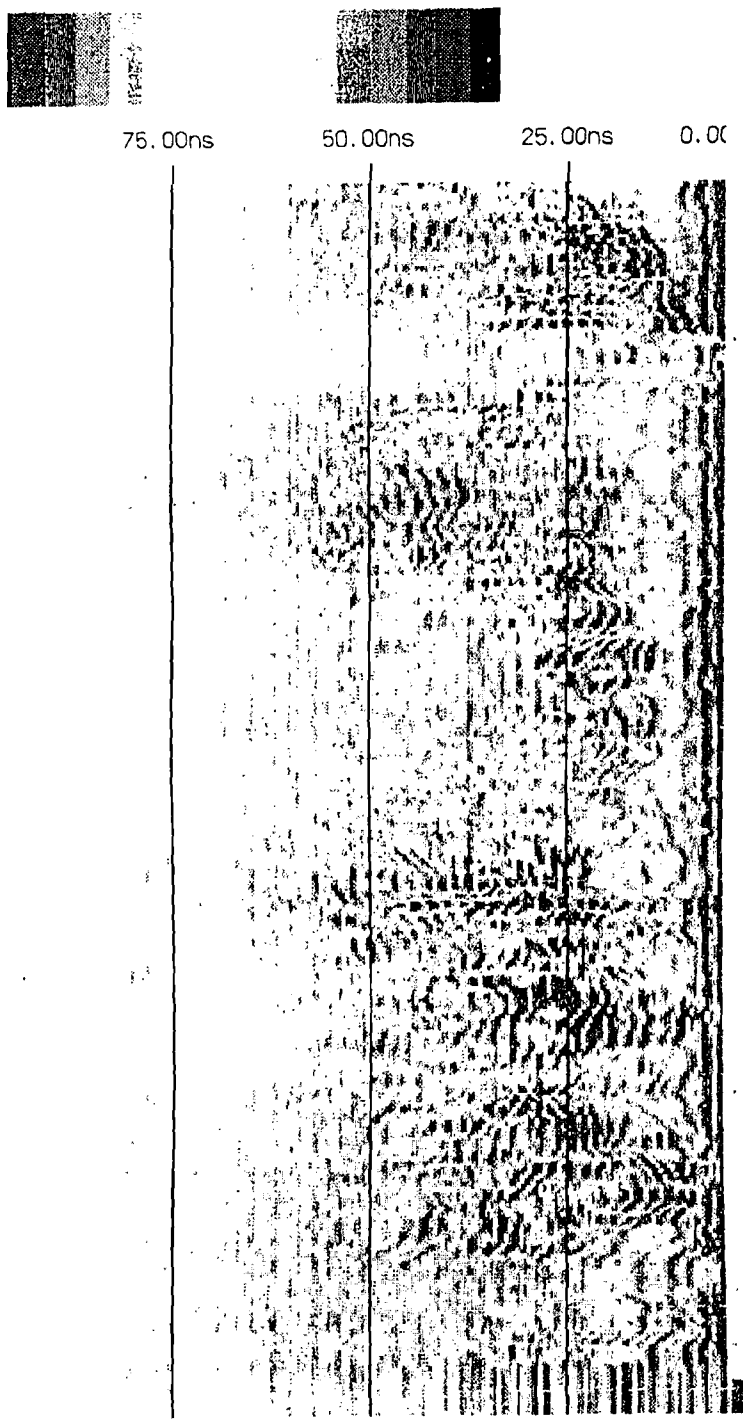


FILE 12

_E10(11/21/96 12:49:14) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

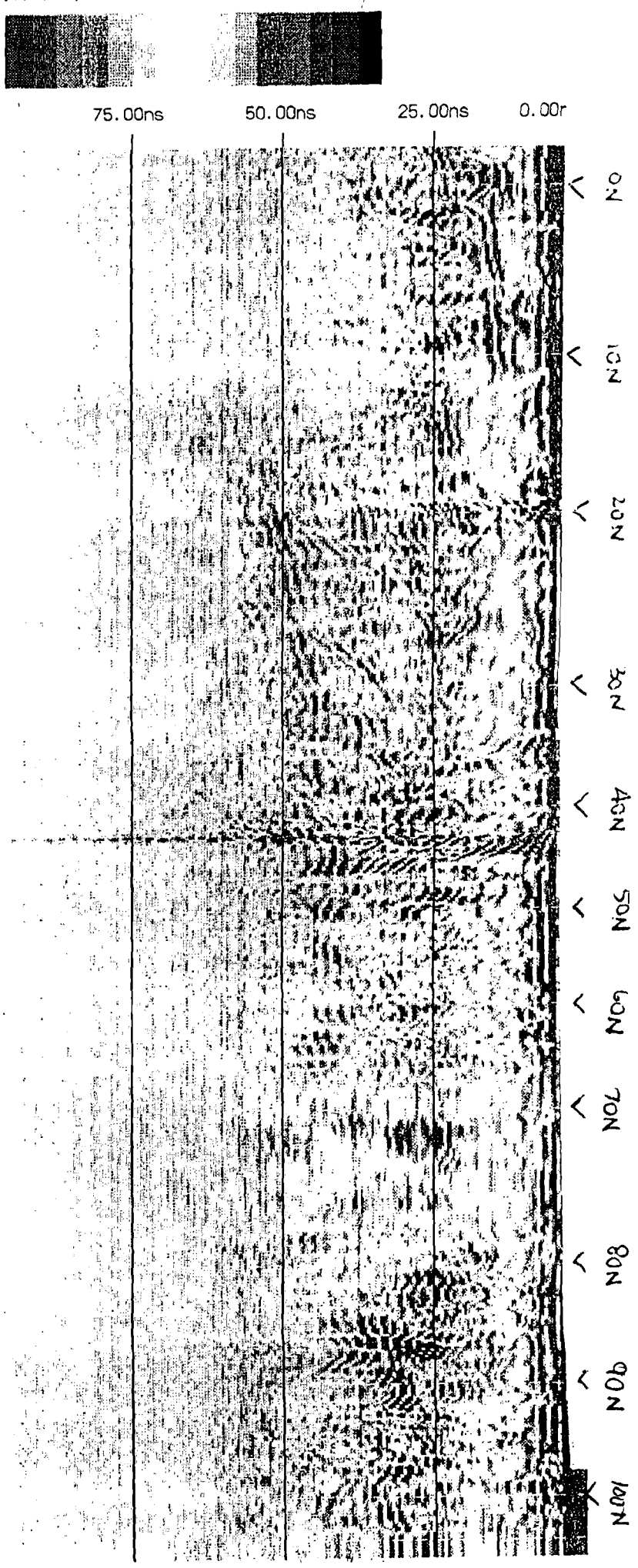


FILE 10

Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ple #15; Transform #1

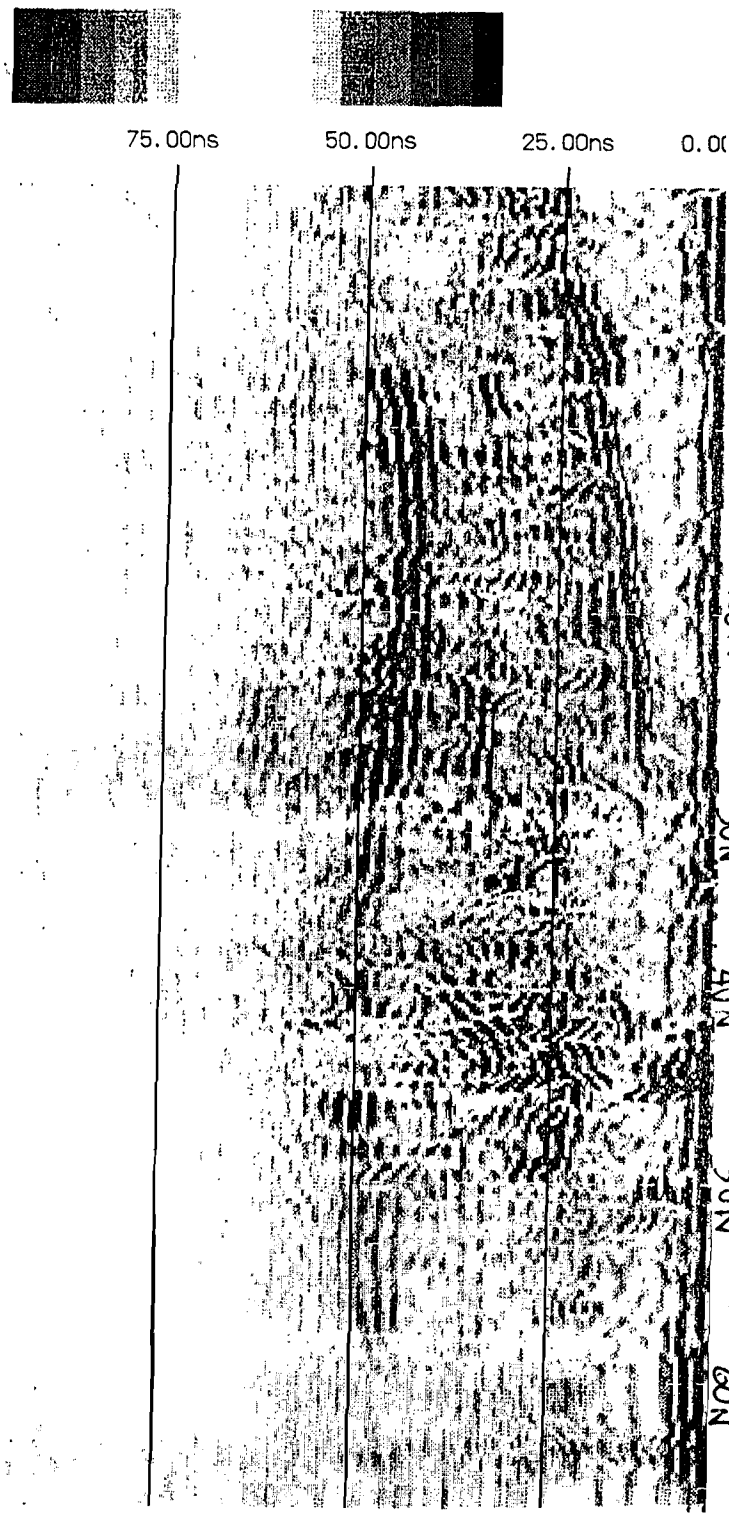


FILE 14

FILE13(11/21/96 13:00:34) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

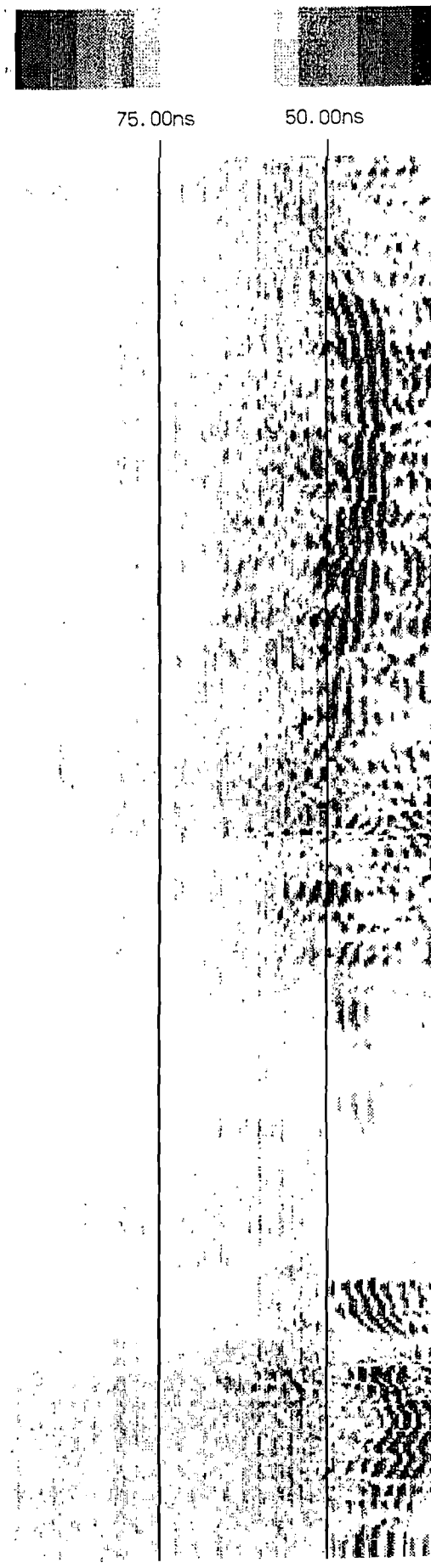


FILE 13

FILE14(11/21/96 13:02:36) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1



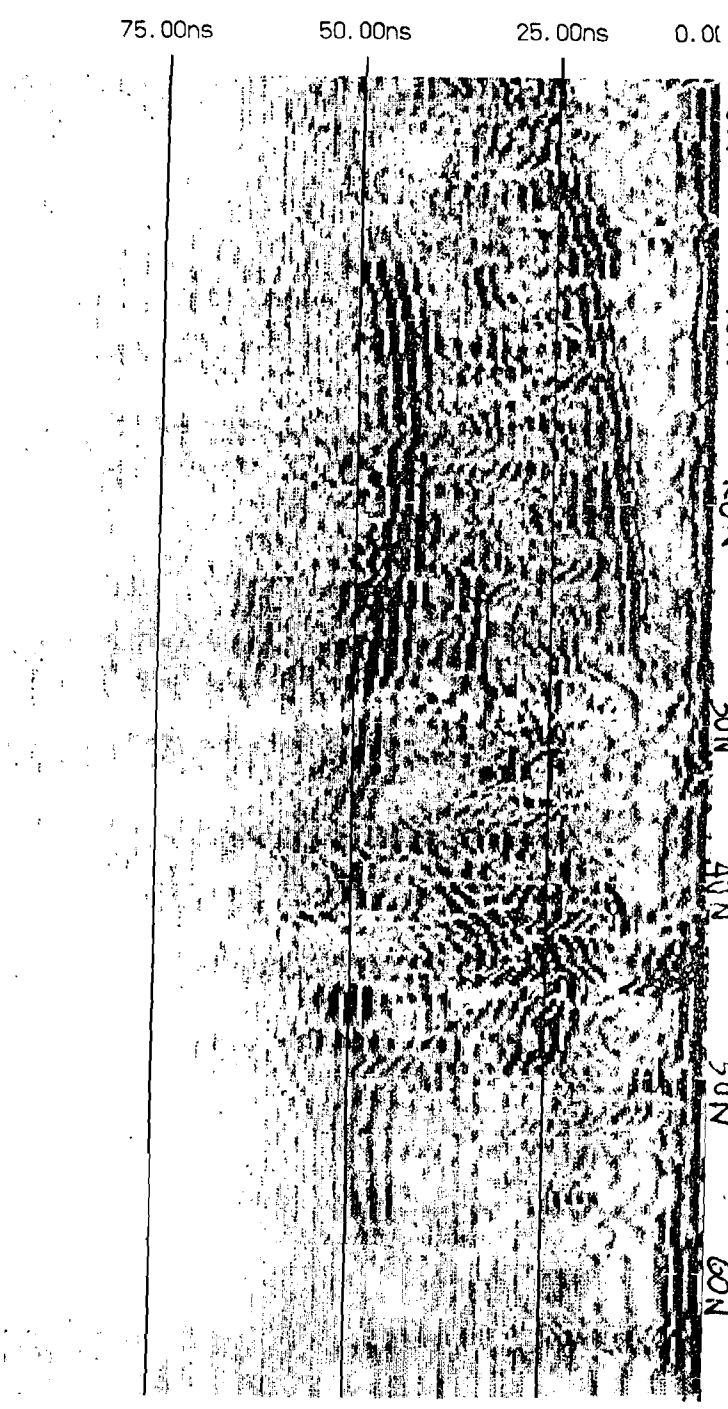
FILE 14

FILE13(11/21/96 13:00:34) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1



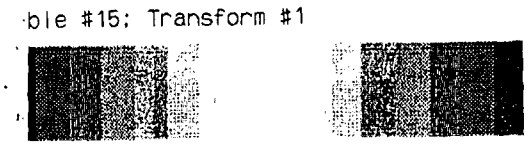


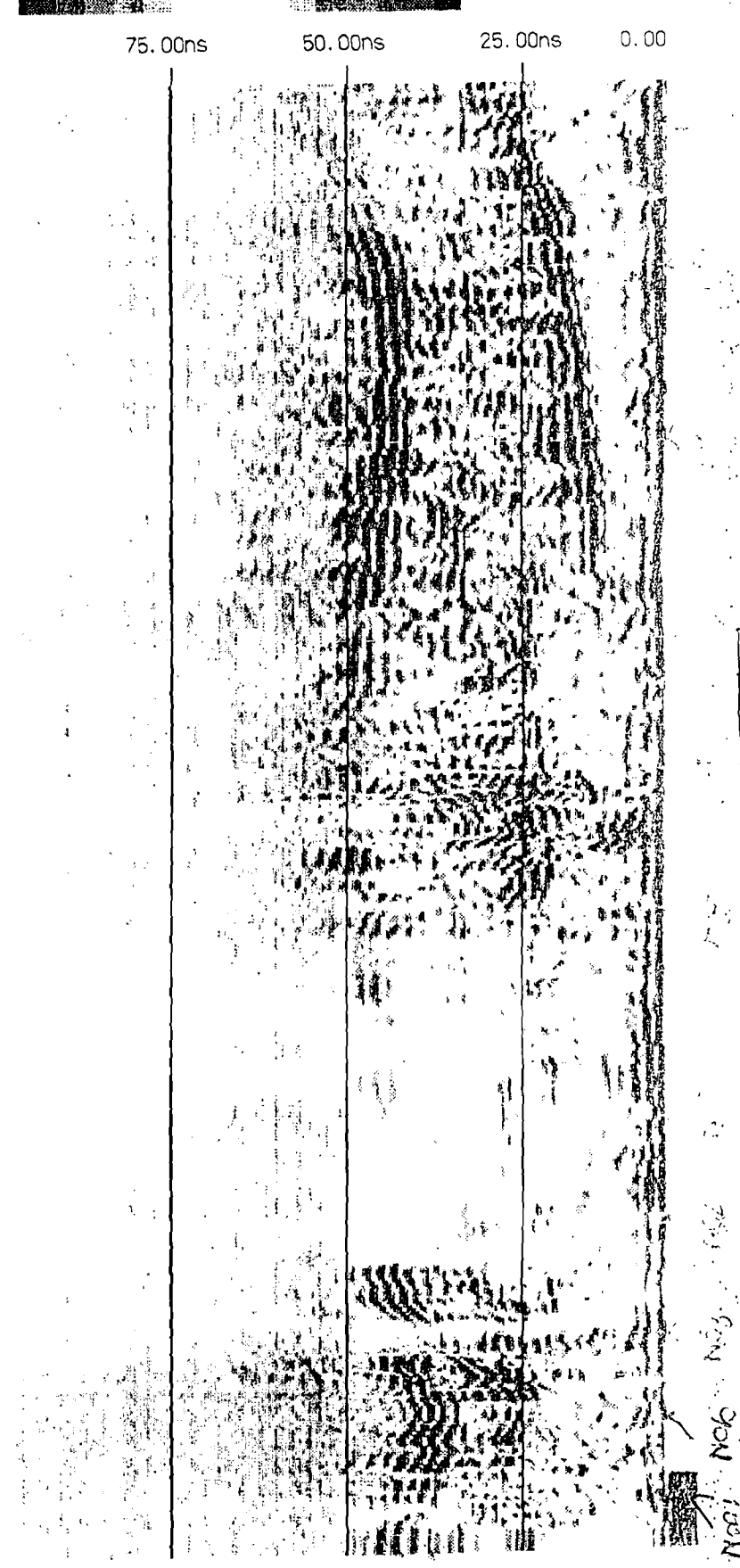
FILE 13

FILE13(11/21/96 13:00:34) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1



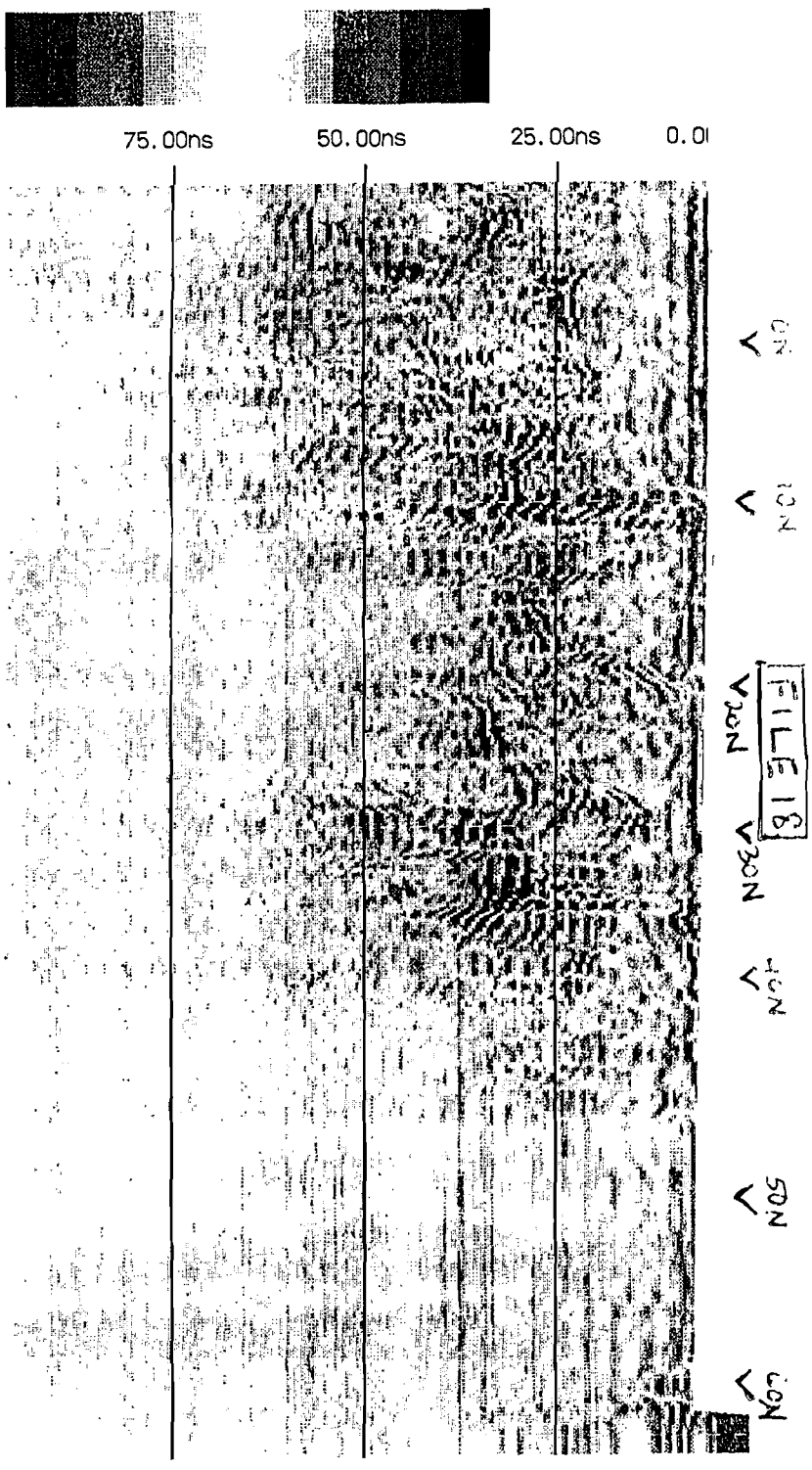


FILE 14

FILE18(11/21/96 13:06:48) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
Dielectric: 1.00

ısition: 0.0nS Range: 100.0nS
ınge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

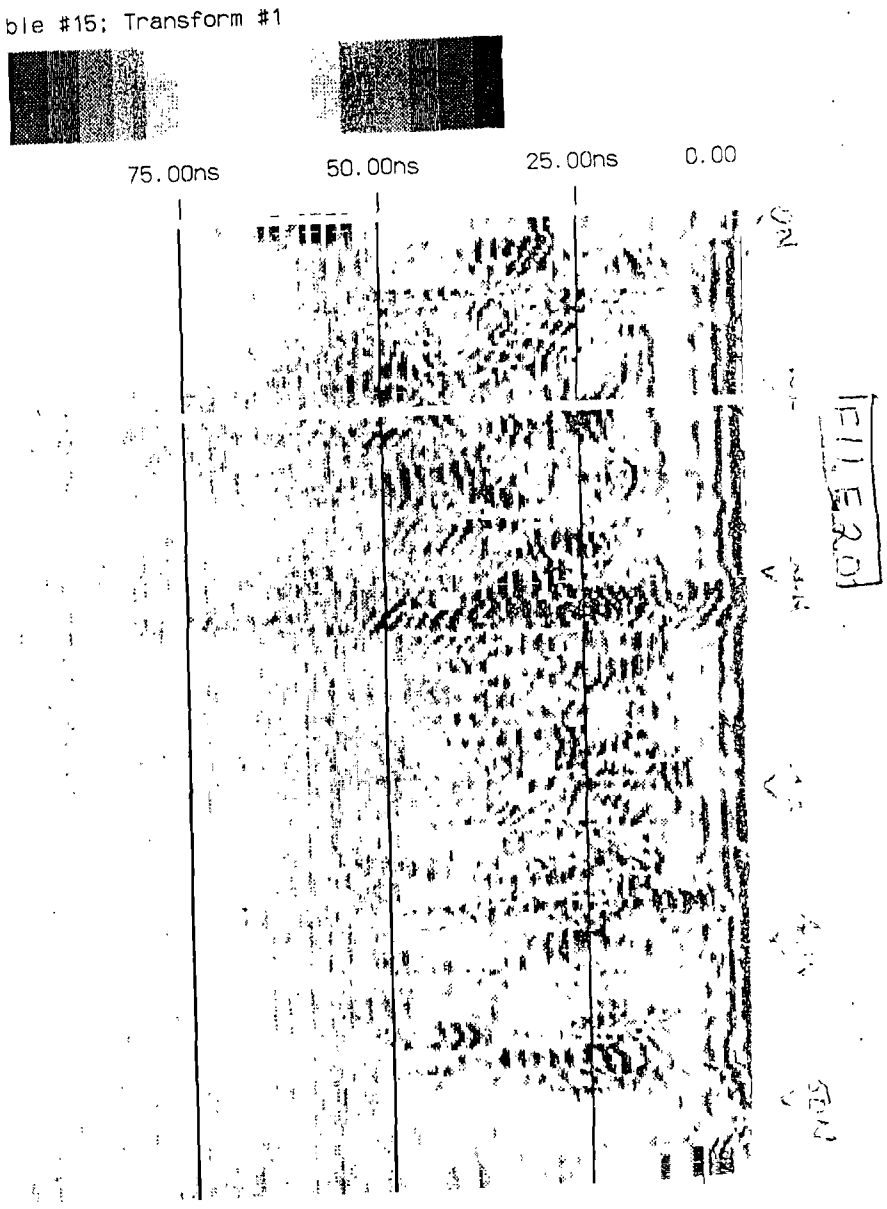
ble #15; Transform #1



FILE20(11/21/96 13:09:22) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

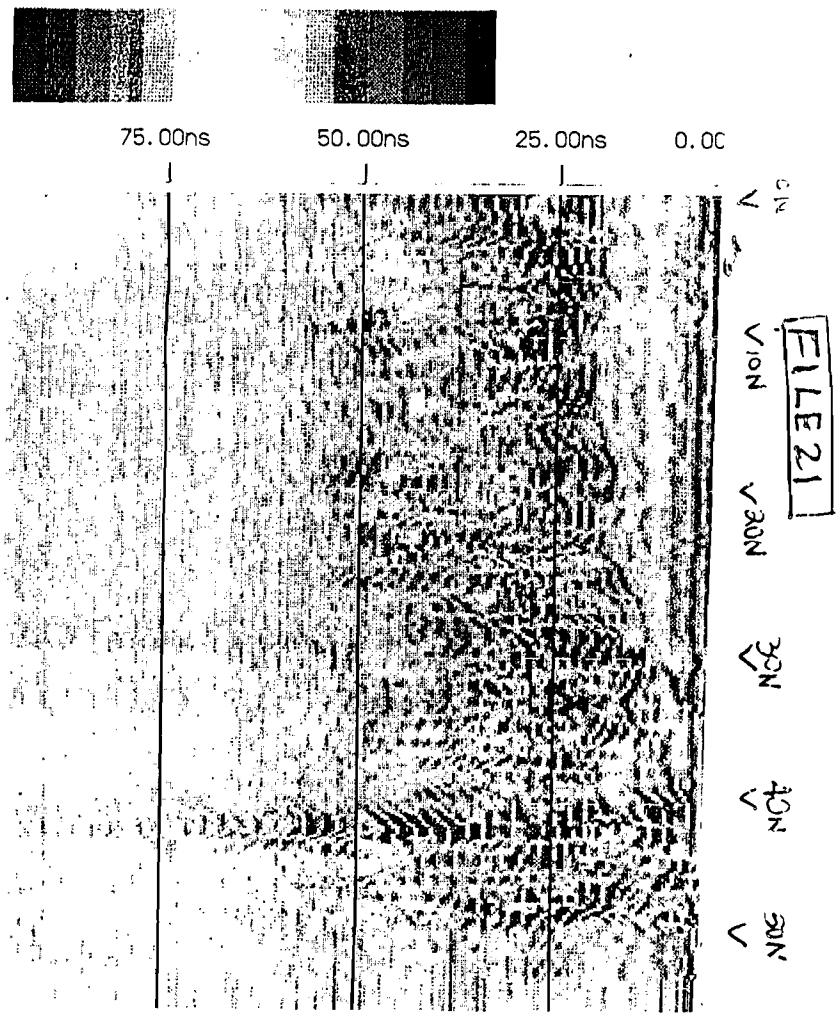
ble #15; Transform #1



FILE21(11/21/96 13:11:10) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

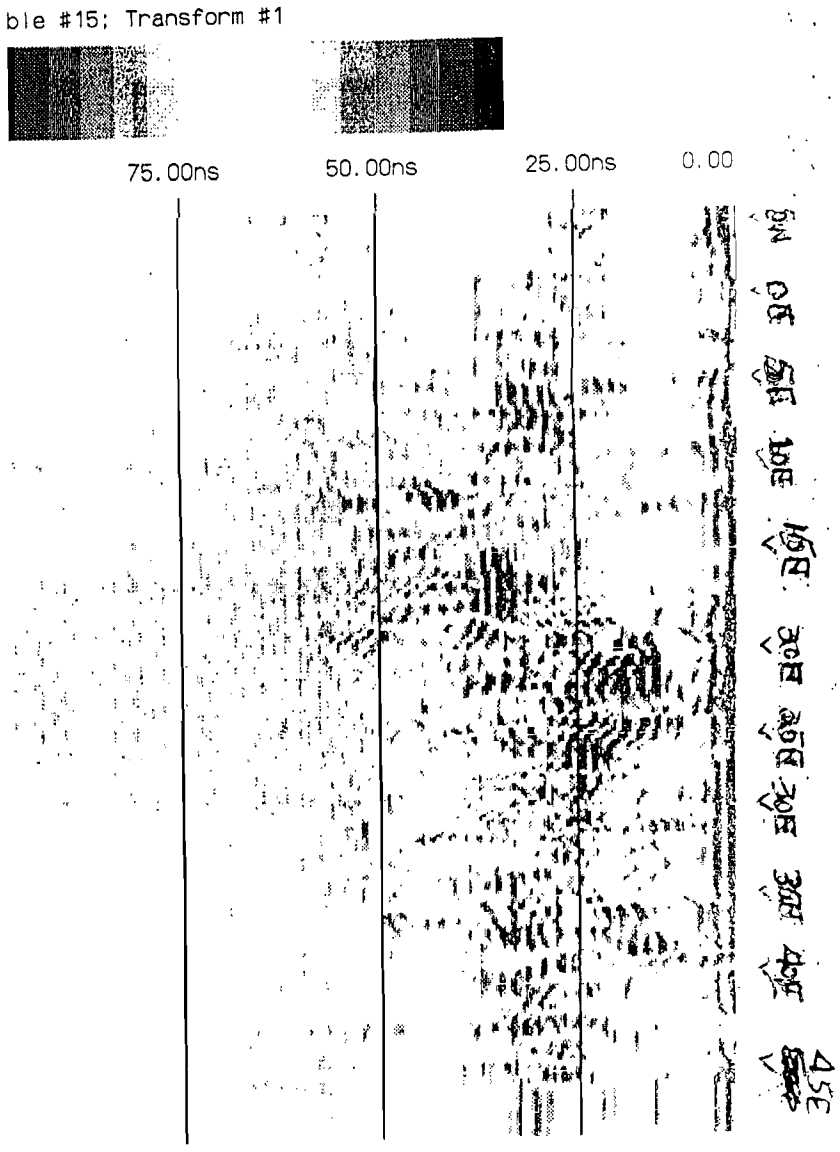
ble #15; Transform #1



FILE22(11/21/96 13:13:32) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

sition: 0.0nS Range: 100.0nS
nge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

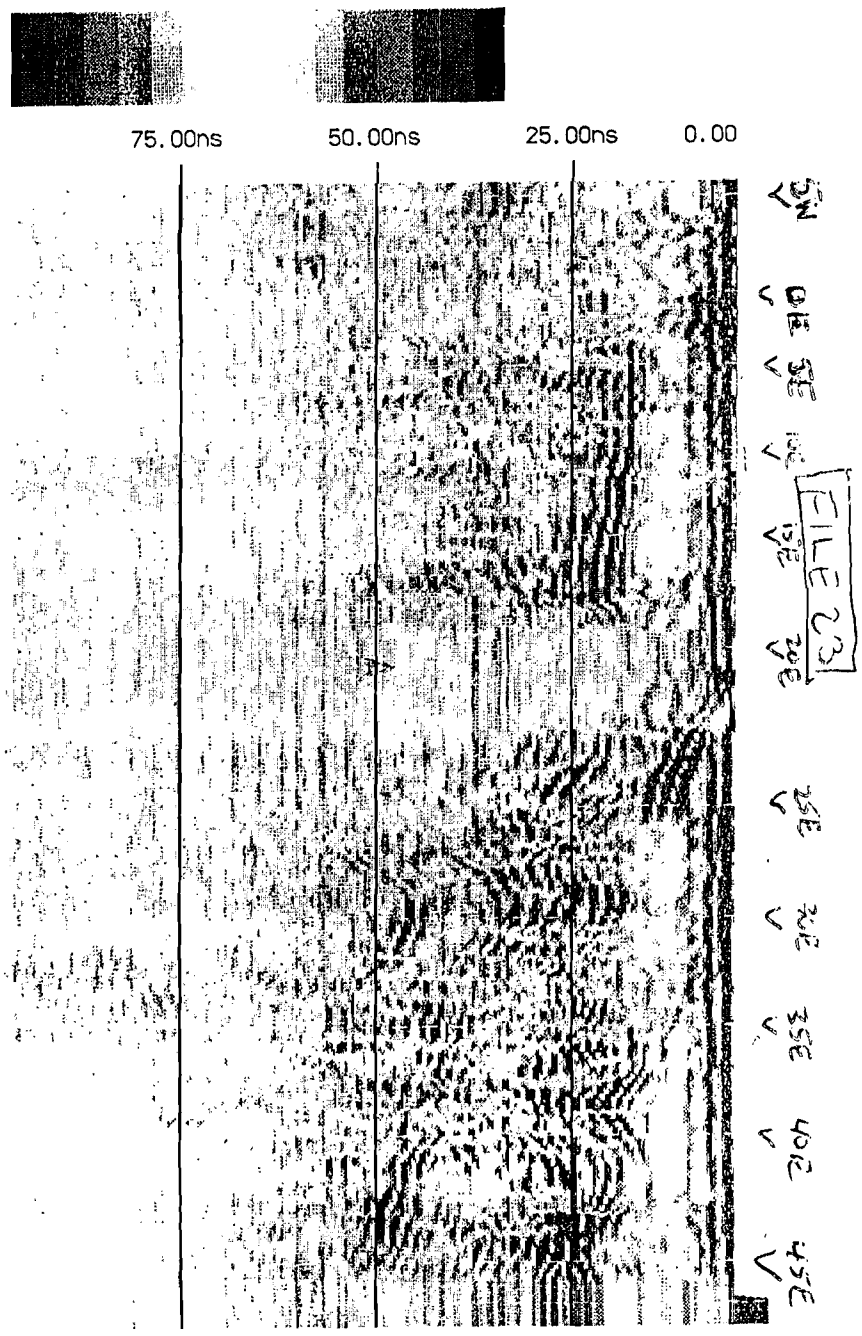
ble #15; Transform #1



FILE23(11/21/96 13:15:00) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
electric: 1.00

)sition: 0.0nS Range: 100.0nS
ınge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

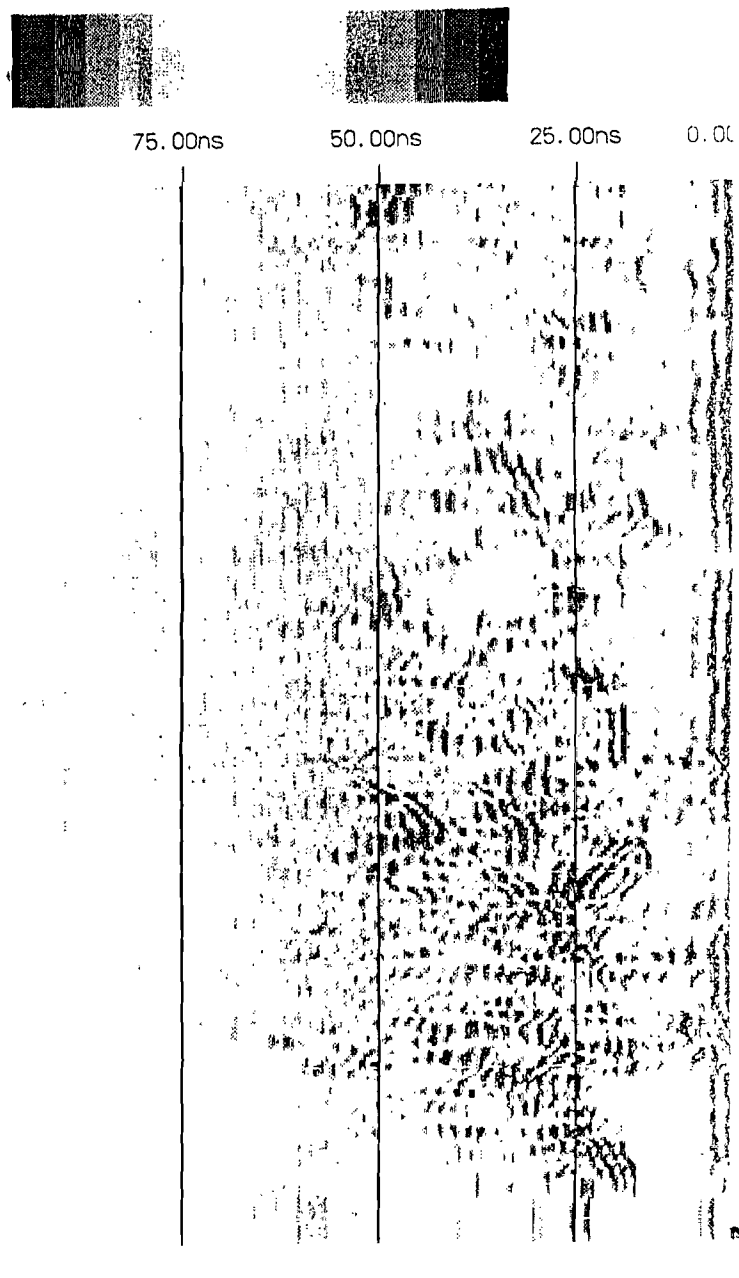


FILE 23

LE24(11/21/96
Scan/Sec 16.0 Bits: 8
electric: 1.00

)sition: 0.0nS Range: 100.0nS
ınge Gain 18 40 52 52 55
IIR LP N=1 F=1078)
IIR HP N=2 F=67)
IIR STK TC=4)

ble #15; Transform #1

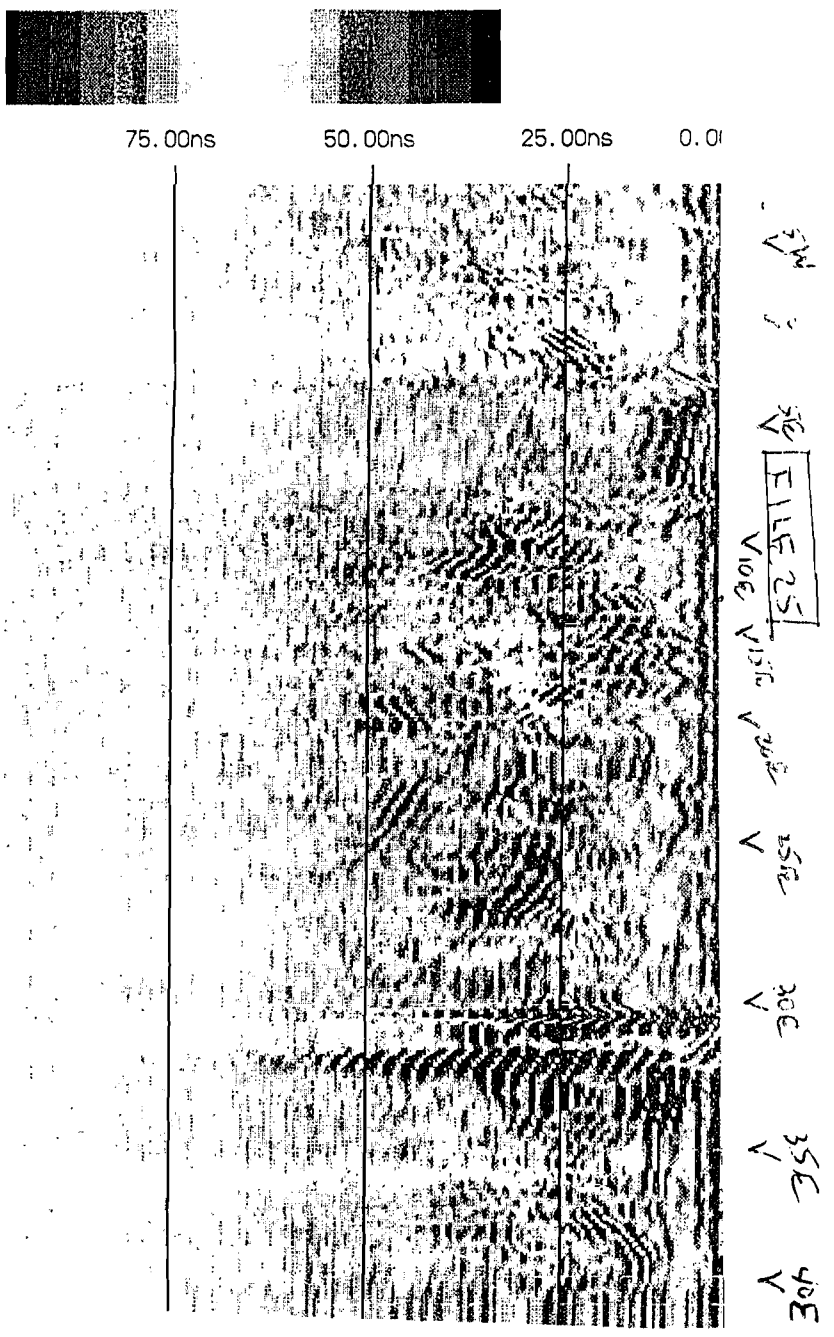


FILE 24

FILE25(11/21/96 13:20:50) Samp/Scan
Scan/Sec 16.0 Bits: 8
ielectric: 1.00

osition: 0.0nS Range: 100.0nS
ange Gain 18 40 52 52 55
(IIR LP N=1 F=1078)
(IIR HP N=2 F=67)
(IIR STK TC=4)

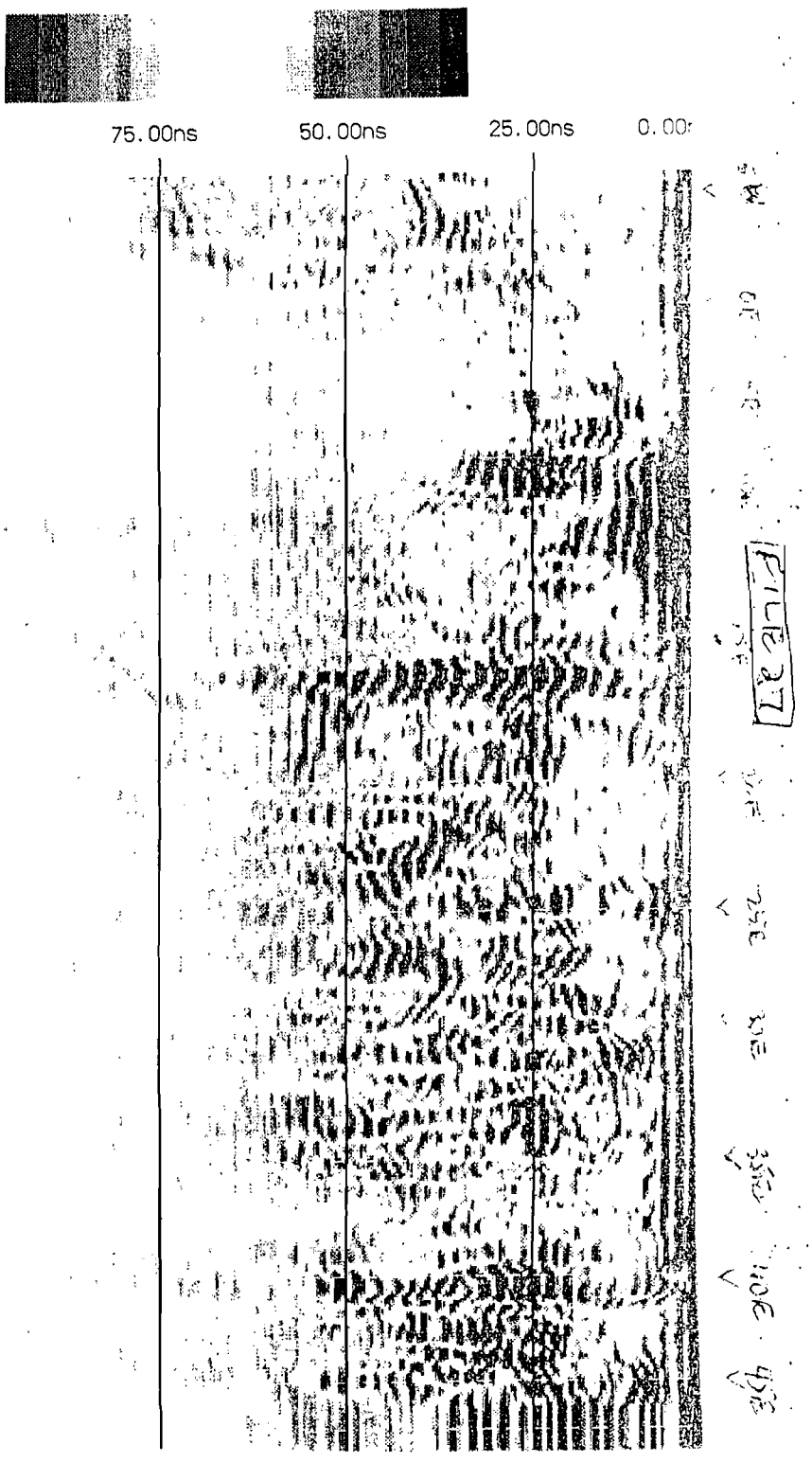
able #15; Transform #1



FILE27(11/21/96 13:24:48) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

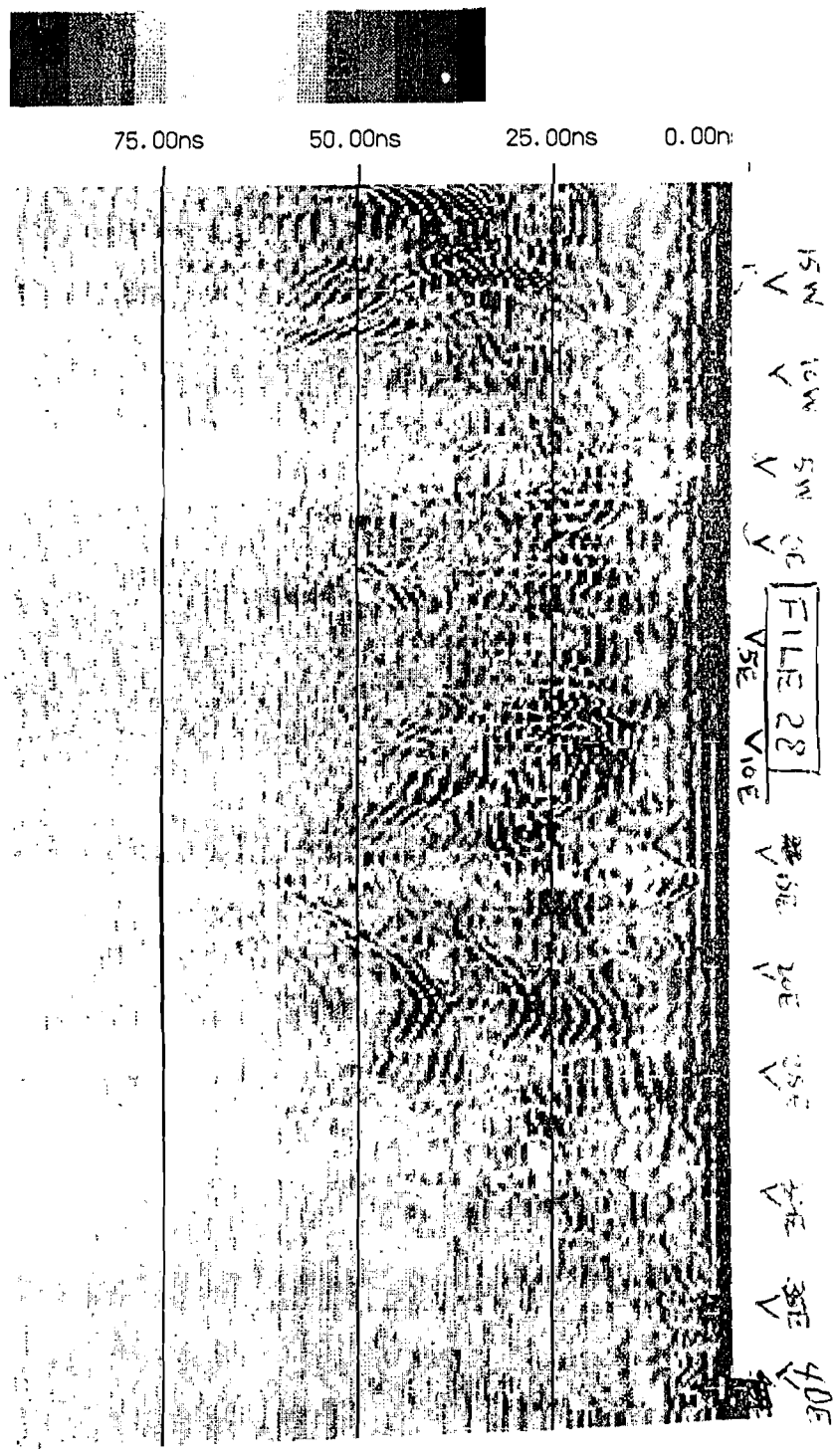
le #15; Transform #1



FILE28(11/21/96 13:27:38) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

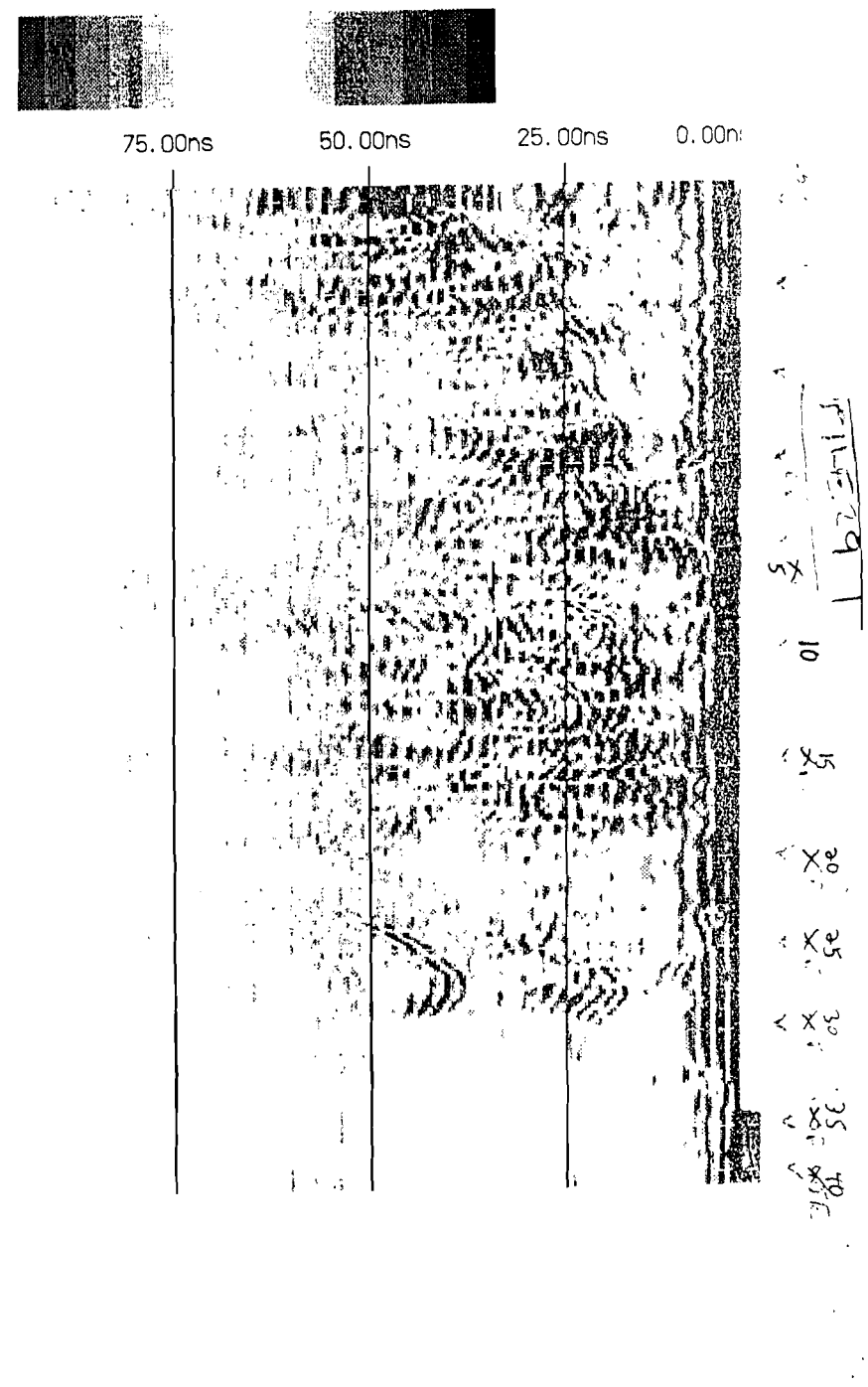
le #15; Transform #1



FILE29(11/21/96 13:30:38) Samp/Scan 1024
Scan/Sec 16.0 Bits: 8
lectric: 1.00

ition: 0.0nS Range: 100.0nS
ge Gain 18 40 52 52 55
IR LP N=1 F=1078)
IR HP N=2 F=67)
IR STK TC=4)

le #15; Transform #1



APPENDIX B

FIELD DATA

PROJECT: **Magna Metals** BORING NUMBER: **MW-1**

PROJECT NO: 1172 DATE STARTED: 11/19/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/19/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: approximately 14 feet bgs.

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		2			Grass, Roots, fine GRAVEL, trace				
	1	2	1.5		Sand, trace Clay, and Silt; moist.	1017	11/19/97	NAB	
		3			Brown fine SAND, and Silt, trace Clay;				
	2	9			moist.				
		34			Orange-brown fine SAND, and Silt, trace				
	3	9	1.5		Clay; moist.	1022	11/19/97	NAB	
		37							
	4	13			Brown medium to fine SAND; moist.				
		21			Brown fine SAND, trace Silt, trace				
	5	38	1.5		medium to fine subrounded Gravel; dry.	1030	11/19/97	NAB	
		30							
	6	25							
		28			Brown medium to fine SAND, trace Silt,				
MMS-MW1-01	7	33	1.5		trace fine subangular to subrounded	1035	11/19/97	NAB	
		38			Gravel; dry.				
	8	29							
		27			Brown fine SAND, trace Silt, Granitic				
	9	30	1.5		fragments (9.0 to 9.3 ft. bgs); dry.	1047	11/19/97	NAB	
		38							
	10	40							
		65			Brown fine SAND, trace Silt, and medium		.		
	11	100/4"	0.67		Gravel; very tight, very dense; dry.	1055	11/19/97	NAB	
		--							
	12	--							
		27			Brown medium to fine SAND, trace Silt,				
MMS-MW1-02	13	28	1.8		some medium to fine subangular Gravel;	1110	11/19/97	NAB	
		30			dry.				
	14	33							
		33			Brown fine SAND, trace Silt; wet.				
	15	100/1"	0.5			1120	11/19/97	NAB	
					End of Boring @ 14.5 feet bgs.				
	16								
	17								
	18								
	19								
	20								

NOTES:

PAGE 1 OF 1

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **MW-2**

PROJECT NO: 1172 DATE STARTED: 11/18/07

LOCATION: Cortlandt, New York DATE COMPLETED: 11/18/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECO-VERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		3			Brown fine SAND, and Silt, some				
	1	5			medium to fine subrounded Gravel;	1315	11/18/97	NAB	
		4			moist.				
	2	5							
		4							
	3	4				1320	11/18/97	NAB	
		3							
	4	3							
		3			Brown to Orange-brown fine SAND, and				
	5	3			Silt, trace fine subrounded Gravel;	1335	11/18/97	NAB	
		3			slightly moist.				
	6	3							
		3			Light Brown to Tan fine SAND, dry.				
MMS-MW2-01	7	5				1350	11/18/97	NAB	
MMD-MW2-01		7							
	8	12							
		10							
	9	12				1415	11/18/97	NAB	
		17							
	10	19							
		12							
	11	15			Brown medium ot fine SAND with mica	1420	11/18/97	NAB	
		18			flakes, some fine subrounded Gravel; dry.				
	12	23							
		17							
MMS-MW2-02	13	25				1435	11/18/97	NAB	
		28							
	14	40							
		145/6"			Granite fragment.				
	15	--				1450	11/18/97	NAB	
		--							
	16	--							
		55			Brown medium to fine SAND, and Silt,				
	17	135			and medium to fine subangular to sub-	1515	11/18/97	NAB	
		--			rounded Gravel; dry.				
	18	--							
		100/6"			Brown medium to fine SAND, trace Silt,				
	19	--			some mica flakes, and subangular to	1535	11/18/97	NAB	
		--			subrounded Gravel; dry.				
	20	--							

NOTES:

PAGE 1 OF 1

PROJECT: **Magna Metals**
PROJECT NO: 1172
LOCATION: Cortlandt, New York
GEOLOGIST: M. Mazza
DRILLER: Advanced Drilling, Inc.
DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

BORING NUMBER: **MW-2**
DATE STARTED: 11/18/97
DATE COMPLETED: 11/18/97
GROUNDWATER DEPTH: NA
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	20								
	21	100/4"	0.25		Medium to fine subrounded GRAVEL, and Brown medium to fine Sand, and Silt; dry, abundant mica flakes.	1600	11/18/97	NAB	Auger refusal @ 22 feet bgs.
	22								
					End of boring @ 22 feet bgs.				
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30								
	31								
	32								
	33								
	34								
	35								
	36								
	37								
	38								
	39								
	40								

NOTES:NAB = not above background.

PAGE 2 OF

PROJECT: **Magna Metals** BORING NUMBER: **MW-3**

PROJECT NO: 1172 DATE STARTED: 11/17/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/17/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		4			Brown fine SAND, and Silt; dry.				
	1	10	1.3			1105	11/17/97	NAB	
		12							
	2	18							
		8			Brown medium to fine SAND, trace				
	3	9	1.3		Silt, trace fine subrounded Gravel; dry.	1110	11/17/97	NAB	
		10							
	4	10							
		3			Brown fine SAND, trace fine				
	5	2	1.0		subrounded Gravel; dry.	1120	11/17/97	NAB	
		3							
	6	4							
		5			Light Brown to Tan fine SAND, trace				
MMS-MW3-01	7	9	1.5		fine subrounded Gravel; dry.	1125	11/17/97	NAB	
		27							
	8	35							
		21			Light Brown to Tan fine SAND, some				
	9	32	2.0		medium to fine subangular Gravel; dry.	1135	11/17/97	NAB	
		40			Dark Brown medium to fine SAND; dry.				
	10	48			SAME as 8.0 to 9.0 ft. bgs interval.				
		75			Light Brown to Tan fine SAND, trace				
	11	100/.4	0.83		subangular to subrounded Gravel; dry.	1140	11/17/97	NAB	
		--							
	12	--							
		15			Light Brown to Tan fine SAND, trace				
	13	19	1.25		subrounded Gravel; dry.	1200	11/17/97	NAB	
		20							
	14	24			Medium subangular GRAVEL; dry.				
		37			Light Brown to Tan fine SAND, and				
	15	100/3"	0.25		medium to fine subangular Gravel; dry.	1214	11/17/97	NAB	
					End of boring @ 14.8 feet bgs				
	16								
	17							NAB	
	18								
	19							NAB	
	20								

NOTES:

PAGE 1 OF 1

PROJECT: **Magna Metals** BORING NUMBER: **MW-4**

PROJECT NO: 1172 DATE STARTED: 11/18/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/18/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: Hollow Stem Auger/2" split spoons

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		3			Brown fine SAND, and Silt, trace fine				
	1	4	1.0		subrounded Gravel; dry.	0905	11/18/97	NAB	
		6							
	2	6							
		6							
	3	6	0			0910	11/18/97	NAB	
		7							
	4	7							
		6			Brown fine SAND, trace Silt, some fine				
	5	7	0.25		Gravel; dry.	0920	11/18/97	NAB	
		8							
	6	8							
		8			Light Brown to Tan fine SAND, trace				
MMS-MW4-01	7	7	1.5		fine subrounded Gravel; dry.	0930	11/18/97	NAB	
		11							
	8	13							
		21							
	9	35	1.3			0940	11/18/97	NAB	
		48							
	10	50			Medium GRAVEL.				
		25			Brown fine SAND, trace Silt, trace fine				
	11	35	1.0		subangular Gravel; dry.	0945	11/18/97	NAB	
		75							
	12	105							
		68			Brown fine SAND, and medium sub-				
MMS-MW4-02	13	83	1.08		angular to subrounded Gravel; dry.	1015	11/18/97	NAB	
		90							
	14	95							
		45			Brown, Black, and White mottled				
MMS-MW4-03	15	74	1.42		medium to fine SAND, some Silt, trace	1033	11/18/97	NAB	
		83			medium to fine subangular Gravel; dry,				
	16	70			very dense, tight.				
		110/6"							
	17	--	0.58			1040	11/18/97	NAB	
		--							
	18	--							
		100/1"	0.08		Bedrock.	1115	11/18/97	NAB	
	19				End of boring @ 17.8 feet bgs				
	20								

NOTES:

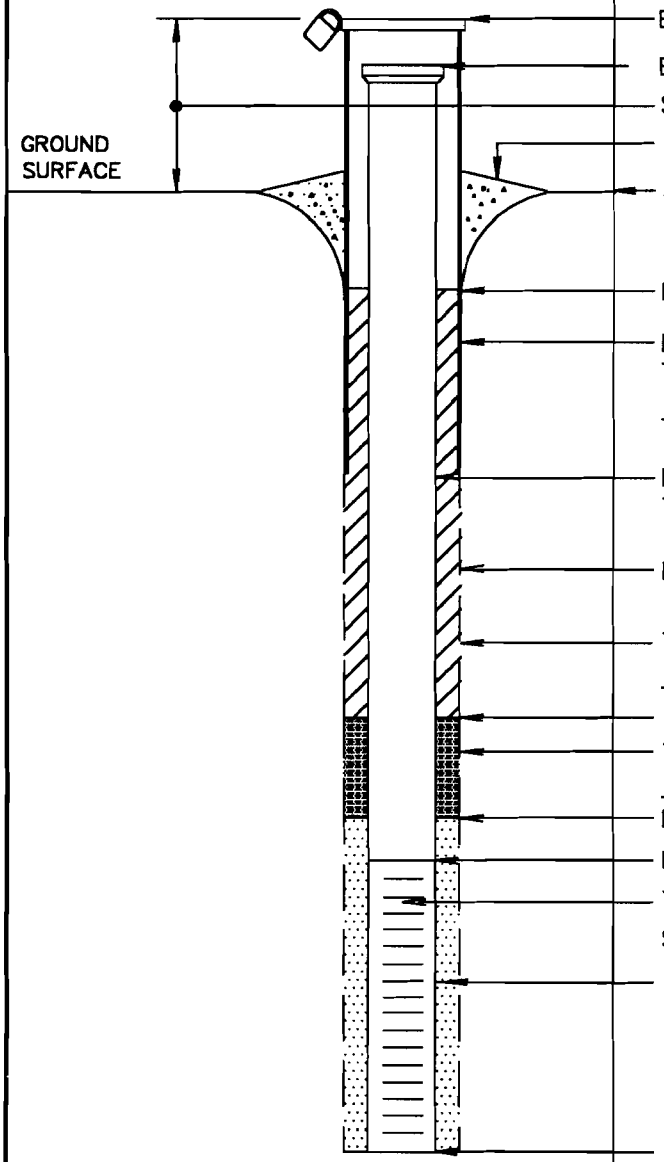
PAGE 1 OF 1

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-1

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-18-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____

DEPTH TO BACKFILL: 0.4' 0
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL

RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC

BOREHOLE DIAMETER: 8 1/4"

TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY

DEPTH TOP OF SEAL: 2.5' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS

DEPTH TOP OF SAND PACK: 3.5' bgs
DEPTH TOP OF SCREEN: 4.5' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1

DEPTH BORING AND BOTTOM OF SCREEN: 14.5' bgs

NOT TO SCALE

CAD FILE NAME: 1MM41098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:11 AM

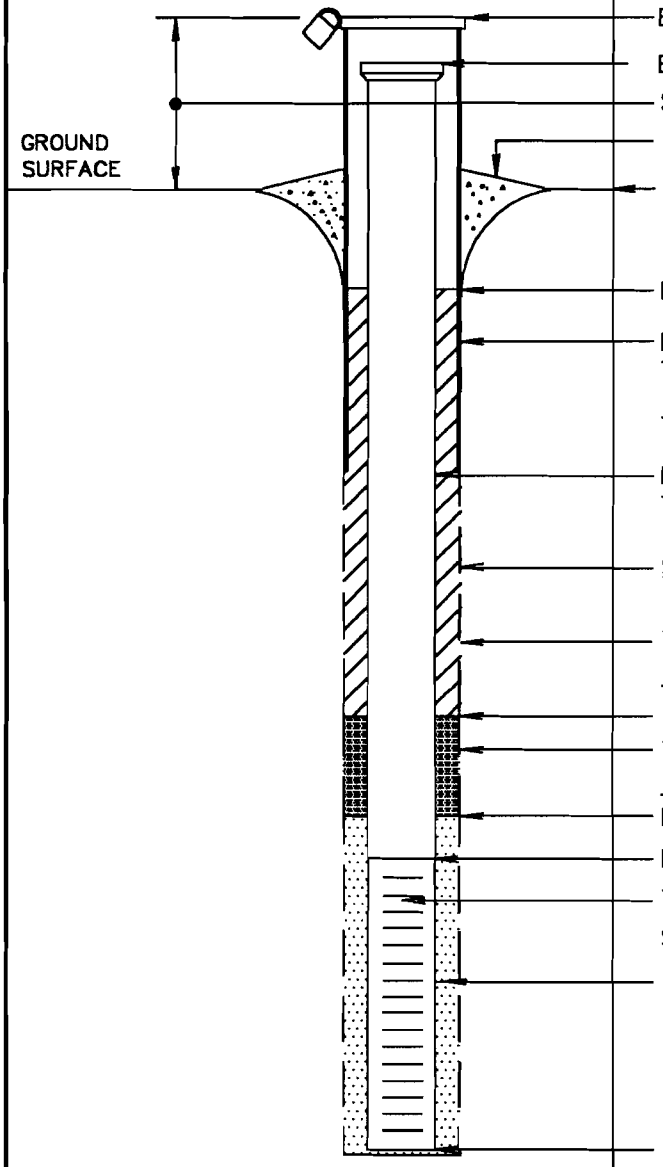
UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-2

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-18-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____
DEPTH TO BACKFILL: 0.4'
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL
RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC
BOREHOLE DIAMETER: 8 1/4"
TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY
DEPTH TOP OF SEAL: 8' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS
DEPTH TOP OF SAND PACK: 10' bgs
DEPTH TOP OF SCREEN: 12' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1
DEPTH BORING AND BOTTOM OF SCREEN: 22' bgs

NOT TO SCALE

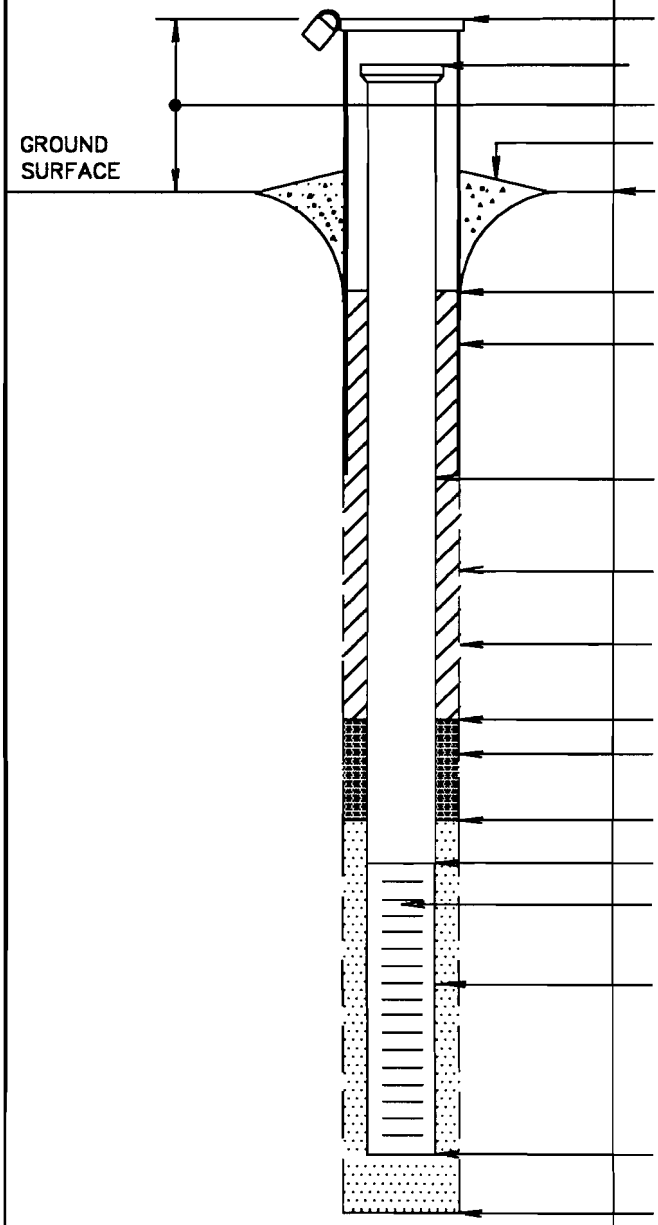
CAD FILE NAME: 2MM4098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:12 AM

UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-3

PROJECT: MAGNA METALS	DRILLER: ADVANCED DRILLING INC.
PROJECT NO.: 1172	DRILLING METHOD: HOLLOW STEM AUGER (HSA)
ELEVATION:	DATE: 11-16-97
FIELD GEOLOGIST: M. MAZZA	DEVELOPMENT METHOD:



- ELEVATION OF TOP OF SURFACE CASING:
- ELEVATION OF TOP OF RISER PIPE:
- STICK-UP TOP OF SURFACE CASING:
- TYPE OF SURFACE SEAL: CONCRETE
- GROUND SURFACE ELEVATION:
- DEPTH TO BACKFILL: 0.4'
- I.D. OF SURFACE CASING: 8 INCH
- TYPE OF SURFACE CASING: STEEL
- RISER PIPE I.D. 2 INCH
- TYPE OF RISER PIPE: SCHEDULE 40 PVC
- BOREHOLE DIAMETER: 8 1/4"
- TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY
- DEPTH TOP OF SEAL: 2.5' bgs
- TYPE OF SEAL: HYDRATED BENTONITE PELLETS
- DEPTH TOP OF SAND PACK: 3.5' bgs
- DEPTH TOP OF SCREEN: 4.5' bgs
- TYPE OF SCREEN: SCHEDULE 40 PVC
- SLOT SIZE X LENGTH: .010 INCH x 10 FT.
- TYPE OF SAND PACK: MORIE #1
- DEPTH BORING AND BOTTOM OF SCREEN: 14.5' bgs
- DEPTH OF BORING: 14.8 bgs

NOT TO SCALE

CAD FILE NAME: 3MM41098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:115 AM

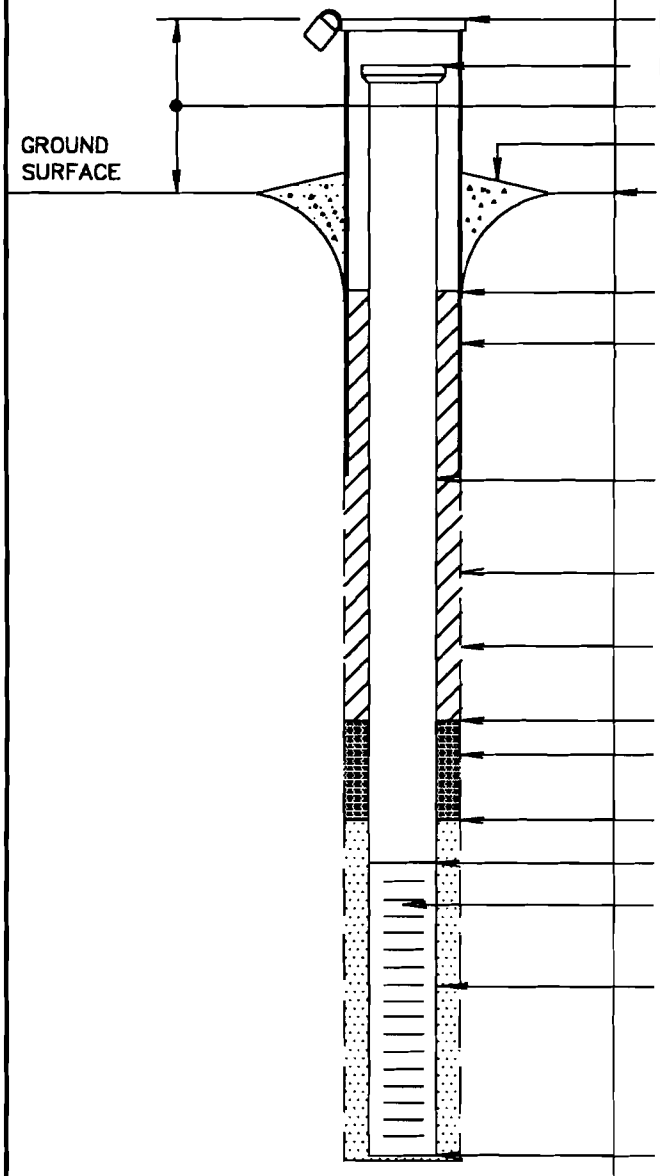
UNMW1.DWG

UNCONSOLIDATED MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO. MW-4

PROJECT MAGNA METALS
PROJECT NO. 1172
ELEVATION _____ DATE 11-17-97
FIELD GEOLOGIST M. MAZZA

DRILLER ADVANCED DRILLING INC.
DRILLING METHOD HOLLOW STEM AUGER (HSA)
DEVELOPMENT METHOD _____



ELEVATION OF TOP OF SURFACE CASING: _____
ELEVATION OF TOP OF RISER PIPE: _____
STICK-UP TOP OF SURFACE CASING: _____
TYPE OF SURFACE SEAL: CONCRETE
GROUND SURFACE ELEVATION: _____

DEPTH TO BACKFILL: 0.4'
I.D. OF SURFACE CASING: 8 INCH
TYPE OF SURFACE CASING: STEEL

RISER PIPE I.D. 2 INCH
TYPE OF RISER PIPE: SCHEDULE 40 PVC

BOREHOLE DIAMETER: 8 1/4"

TYPE OF BACKFILL: BENTONITE/CEMENT SLURRY

DEPTH TOP OF SEAL: 3.5' bgs
TYPE OF SEAL: HYDRATED BENTONITE PELLETS

DEPTH TOP OF SAND PACK: 5.5' bgs
DEPTH TOP OF SCREEN: 7.8' bgs
TYPE OF SCREEN: SCHEDULE 40 PVC
SLOT SIZE X LENGTH: .010 INCH x 10 FT.
TYPE OF SAND PACK: MORIE #1

DEPTH BORING AND BOTTOM OF SCREEN: 17.8' bgs

NOT TO SCALE

CAD FILE NAME: 4MM4098.DWG DATE: 10/13/98
PLOT SCALE: TO FIT TIME: 11:16 AM

UNMW1.DWG

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.0002
LOCATION: 2 Feet west of Pit A
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split spoon driven by 140lb hammer dropped 30 inches. Tripod Rig.

BORING NUMBER: SB-01
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	5-9		0.5 Topsoil			
	1			Brown f SAND, little Silt, trace f Gravel, FILL	1100	12-10-96	OVA: NAB
	1.5	13-11					
	2						
	2.5	9-7					
	3				1110	12-10-96	OVA: NAB
	3.5	8-7					
	4						
MMS-SB01-01	4.5	3-5					4.0-5.5, OVA: NAB
	5				1120	12-10-96	
	5.5	17-22		5.5			5.5-6.0, OVA
	6						
	6.5	41-49		Brown cmf SAND with gold and green grains, angular FILL			
	7				1130	12-10-96	OVA: NAB
	7.5	32-30					
	8						
	8.5			END OF BORING			
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit A: 4 Feet Deep. Target Sampling Depth 4 feet to 6 feet.

PAGE 1 OF 1

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 Feet West of Pit B
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallucky/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-02
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	5-6	12	0.5 Topsoil			OVA: NAB
	1			Brown mf SAND, trace Silt,			
	1.5	9-18		trace f Gravel FILL	1200	12-10-96	
	2						
	2.5	9-8	2				
	3			Pushed Stone			
	3.5	6-6			1205	12-10-96	
	4						
	4.5	9-10	0	No Recovery			
	5						
	5.5	11-10			1210	12-10-96	
	6						
	6.5	9-13	0				
	7						
	7.5	13-16			1215	12-10-96	
	8						
MMS-SB02-01	8.5	30-48	19	Brown f SAND, little Clay moist FILL			OVA: NAB
	9						
	9.5	49-51			1225	12-10-96	
	10						
	10.5			END OF BORING			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit B: 8 feet deep. Target Sampling Depth 8 feet to 10 feet deep.

PAGE 1 OF 1

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0000.0002
LOCATION: 2 feet west of Pit C
GEOLOGIST: Donald Campbell
DRILLER: Gerard Matlack / Advanced Drilling
DRILLING/SAMPLING METHOD: 2" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-03
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	3-6	17	0.2 Topsoil			
	1			Brown-grey f SAND, trace Silt, trace clay	1330	12-10-96	OVA: NAB
	1.5	8-10					
	2						
	2.5	9-6	9	FILL			2.0' to 3.5' OVA: NAB
	3				1340	12-10-96	
	3.5	9-11		3.5			3.5'-4.0' OVA: 3ppm
	4			Black and white organic rich SILT FILL			
	4.5	10-8	14	Light red Brown grading to Ash Grey f SAND, little Silt, Dry, well sorted, well drained FILL	1350	12-10-96	OVA: NAB
	5						
	5.5	12-16					
	6						
	6.5	12-19	24				
	7				1355	12-10-96	OVA: NAB
	7.5	23-39					
	8						
MMS-SB03-01	8.5	27-50	14		1400	12-10-96	OVA: 3ppm
	9	9/6"					
	9.5						
	10			END OF BORING			
	10.5			REFUSAL AT 9.5 FEET			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit C: 8.5 feet deep. Target sampling depth was 8.5 to 10.5 feet, however sample was taken from 8.0' to 9.5 feet due to refusal of boring.

PAGE 1 OF 1

PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 feet west of Pit D
GEOLOGIST: Donald Campbell
DRILLER: Gerard Mallack / Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split Spoon and 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-04
DATE STARTED: 12-10-96
DATE COMPLETED: 12-10-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	6-9	22	0.2' Topsoil			
	1			Brown f SAND, little Silt,	1440	12-10-96	OVA: NAB
	1.5	32-14		little Cky. dry FILL			
	2			trace cm gravel. mediumdense			
	2.5	12-23	17				
	3			grading to	1445	12-10-96	OVA: 0.5 ppm
	3.5	14-12					
	4						
	4.5	13-12	16				
	5						OVA: NAB
	5.5	19-16			1450	12-10-96	
	6			Lt Grey f SAND, little Silt,			
	6.5	23-18	6	well Sorted, loose, dry	1455	12-10-96	OVA: 1.5 ppm
MMS-SB04-01	7			FILL			
	7.5	23-46	12				OVA: NAB
	8	100/6			1520	12-10-96	
	8.5						
	9			END OF BORING			
	9.5			REFUSAL AT 8.5 FEET			
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: organic vapor analyzer
NAB: Not Above Background
Pit D: 7 feet Deep.
Target Sampling depth was 7 to 9 feet, but sample was taken from 6.5' to 8.5' because of refusal

PAGE 1 OF 1

PROJECT: Lightron/Magna Metals
PROJECT NO: 1172.0001.0000.0002
LOCATION: 2 feet west of Pit E.
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split spoons driven by 140 lb hammer dropped 30 inches. Tripod Rig

BORING NUMBER: SB-05
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	2-4	9	0.4 Topsoil			
	1			Brown mf SAND, little silt, trace clay trace f. Gravel medium dense FILL	0900	12-11-96	OVA: NAB
	1.5	4-6					
	2						
	2.5	3-6	11	grading to	0905	12-11-96	OVA: NAB
	3						
	3.5	16-23					
	4						
	4.5	23-31	15	Light Grey f SAND, little Silt, dry, medium dense FILL	0915	12-11-96	OVA: NAB
MMS-SB05-01	5						
	5.5	36-49					
	6						
	6.5	100/6	2		0920	12-11-96	OVA: 1ppm
	7			END OF BORING REFUSAL AT 6.5 FEET			
	7.5						
	8						
	8.5						
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above background.
Pit E: 6 feet deep
Target Sampling Depth was 6 feet to 8 feet, however Sample taken at 4.5 feet to 6.5 feet due to refusal

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PROJECT: Lightron/ Magna Metals
PROJECT NO: 1172-0001-0000-0002
LOCATION: 2 Feet West of Pit F
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack/Advanced Drilling
DRILLING/SAMPLING METHOD: 3" Split Spood (driven by 140 lb hammer dropped 30 inches. Tripal Rig

BORING NUMBER: SB-06
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5			0.5 Topsoil			
	1	3-4	17	Brown mf SAND, little Silt, trace Clay, medium dense dry FILL	1010	12-11-96	OVA: NAB
	1.5	6-6					
	2						
	2.5						
	3	4-4	11		1020	12-11-96	OVA: NAB
	3.5	15-16					
	4						
	4.5						
	5	14-18	0		1030	12-11-96	Pushed Stone
	5.5	15-16					
	6						
	6.5						
	7	19-23	7		1050	12-11-96	OVA: NAB
	7.5	23-25					
MMS-SB06-01	8						
	8.5						
	9	48-61	5	Grey-brown mf SAND, little Silt, trace clay, little C Gravel, medium dense, moist FILL	1110	12-11-96	OVA: 1 ppm
	9.5	100/6"					
	10			END OF BORING			
	10.5			REFUSAL AT 9.5 FEET			
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Back
Pit F: 7.5 feet deep. Target Sampling Depth: 7.5 to 8.5 feet.

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PROJECT: Lightron / Magna Metals
PROJECT NO: 1172.0001.0000.00002
LOCATION: 2 feet west of Pit G
GEOLOGIST: Donald Campbell
DRILLER: Gerrard Mallack
DRILLING/SAMPLING METHOD: 3" Split Spoon driven by 140 lb hammer dropped 30 inches. Tripod Rig.

BORING NUMBER: SB-07
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	3-4	14	Brown mf SAND, little Silt. Organic Rich Roots., loose, dry	1235	12-11-96	OVA: NAB
	1						
	1.5	7-8					
	2						
	2.5	19-19	6		1245	12-11-96	OVA: NAB
	3						
	3.5	12		FILL			
	4			4.0			
MMS-SB07-01 & MMD-SB07-01	4.5	14-10	17	Black to Brown mf SAND, little Silt Black bituminuous sand sized	1300	12-11-96	OVA: 1ppm
	5			5.0 Particles FILL			
	5.5	10-14		5.5 Lt. Grey f SAND, little Silt, dry, loose FILL			
	6			END OF BORING			
	6.5			5.5 FEET			
	7						
	7.5						
	8						
	8.5						
	9						
	9.5						
	10						
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES: OVA: Organic Vapor Analyzer
NAB: Not Above Background
Pit G: 3.5 Feet Deep. Target Sampling Depth: 3.5' to 5.5'.

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LOG OF BORING

PROJECT: Magna Metals
PROJECT NO: 1172.0001.0000.0001
LOCATION: Cortlandt, NY
GEOLOGIST: Donald Campbell
DRILLER: Jerry Malack/Advanced Drilling
DRILLING/SAMPLING METHOD: 2" split spoons

BORING NUMBER: SB05
DATE STARTED: 12-11-96
DATE COMPLETED: 12-11-96
GROUNDWATER DEPTH: Not Encountered
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY	PROFILE	USCS CLASS	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	HNu/ OVA ppm	COMMENTS
	0	2				0"-4" topsoil				
	1	4	9"			4"-9" Brown mf SAND, little silt & clay	0900	12-11-96	NAB	
		4								
	2	6								
		3								
	3	6	11"		SP	Brown mf SAND, little silt and clay, trace gneissic gravel, med dense	0905	12-11-96		
		16								
	4	23								
		23			SP	3.5 Grey mf SAND, angular, little silt, 4.5 little gravel, loose	0915	12-11-96		
MMS-SB05-01	5	31	15"		SP	Light Grey FSAND, little silt, med dense, dry *				
		36								
	6	49				↓	0930	12-11-96	1 ppm	
		100	2"		SP	Rock Fragments Refusal				
	7					END OF BORING @ 7'				
	8					white, coarse grained granitic appearance bedrock with black discoloration.				
	9									
	10									
	11									
	12									
	13									
	14									
	15									

NOTES: * 1 ppm in SB03 & SB04

PAGE 1 OF

PROJECT:
PROJECT NO:
LOCATION:
GEOLOGIST:
DRILLER:
DRILLING/SAMPLING METHOD: 3" split spoon 140lb Hammer

BORING NUMBER: SB-06
DATE STARTED: 12-11-96
DATE COMPLETED:
GROUND WATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	COMMENTS
	0						
	0.5	3		0.0 to 0.6' Topsoil			
	1	4	17"	0.6 to Brown mf SAND, little Silt and clay, med dense, dry	1010	12-11-96	
	1.5	6					
	2	6					
	2.5	4					
	3	4	11"		1020	12-11-96	
	3.5	15					
	4	16					
	4.5	14		No Recovery			Stone pushed
	5	18	0"		1030	12-11-96	
	5.5	15					
	6	16					
	6.5	14		Grey brown mf SAND, little silt, trace clay, moist, medium dense, to little coarse gravel.			
	7	23	7"		1050	12-11-96	
MHS-SB06-01	7.5	23					
	8	25					
	8.5	48					
	9	61	5"		1110	2-11-96	1 ppm (OVA)
	9.5	100/6"		Refusal			
	10			End of Boring			
	10.5						
	11						
	11.5						
	12						
	12.5						
	13						
	13.5						
	14						
	14.5						
	15						

NOTES:

PAGE 1 OF

LOG OF BORING

PROJECT:
PROJECT NO:
LOCATION: 2 ft west of "pit"
GEOLOGIST:
DRILLER: Jerry Mallock
DRILLING/SAMPLING METHOD:

BORING NUMBER: SB07
DATE STARTED:
DATE COMPLETED:
GROUNDWATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY	PROFILE	USCS CLASS	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	HNu/ OVA ppm	COMMENTS
	0									
	1	3 4 7 8	14"		SP	Brown organic rich mf SAND, little silt, roots, loose. dry	1235	12-11-96		
	2									
	3	19 19 12	6"				1245	12-11-96		
MMS& MMD-SB07-01	4	14 10 10	17"		SP	Blacks Brown- Brown mf SAND silt little silt, with Black mf sand sized particles bituminous appearing	1300		1PPM	
	5	14				Lt Grey f SAND, little silt dry, loose				
	6					END OF BORING 5.5'				
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									

NOTES:

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FIGURE 3-2

LOG OF BORING

PROJECT: Magna metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: D. Campbell, M. Petraccia
DRILLER: —
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: mms-ss-01
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH:
ELEVATION:

SAMPLE ID	DEPTH (feet) In 0	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
mms-01-01 and mmD-ss 01-01	1	6	6"/6"	Dk brown f. to m. SAND some Silt, little Gravel abundant organics (roots) slightly cohesive, moist	0947	4/11/97	NAB	Semi-VOA, Pest/PCB, metals, Cyanide
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9		6"/6"				NAB	VOA
	10							
	11							
	12							
	13			Boring terminated 2 ft				
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							

NOTES:
HNu - Background 2 ppm
6"-12" sampled twice 2nd time, adjacent borehole

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EBASCO ENVIRONMENTAL DIVISION

LOG OF BORING

PROJECT: **Magna Metals** BORING NUMBER: **SS02**

PROJECT NO: 1172 DATE STARTED: 11/17/97

LOCATION: Cortlandt, New York DATE COMPLETED: 11/17/97

GEOLOGIST: M. Mazza GROUNDWATER DEPTH: NA

DRILLER: Advanced Drilling, Inc. GROUND SURFACE ELEVATION:

DRILLING/SAMPLING METHOD: 2" split spoon

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (feet)	USCS CLASS.	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	OVA ppm	COMMENTS
	0								
		17			Brown fine SAND, trace Silt, trace fine				
MMS-SS02-02	1	35	0.96		subangular Gravel; dry.	1515	11/17/97	NAB	
		40							
	2	20							
					End of boring @ 2.0 feet bgs				
	3							NAB	
	4								
	5							NAB	
	6								
	7							NAB	
	8								
	9							NAB	
	10								
	11							NAB	
	12								
	13							NAB	
	14								
	15							NAB	
	16								
	17							NAB	
	18								
	19							NAB	
	20								

NOTES:

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FOSTER WHEELER ENVIRONMENTAL CORPORATION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: D. Campbell, M. Sofaccia
DRILLER: —
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SB02
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: N/A
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
MMS-02-01	1			0-2" Black Organic-rich SILT	1037	4/11/97	NAD	Semi-VOA, metals, Pest/PCB, Cyanide
	2							
	3							
	4			2"-6" C. Brown f. SAND, little Silt, Trace gravel, abundant roots				
	5							
	6							
↓	7							
	8							
	9					4/11/97	NAD	VOA
	10							
	11							
	12							
	13			Boring terminated @ 1 ft				
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							

NOTES: 1st attempt - refusal

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EBASCO ENVIRONMENTAL DIVISION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: M. Petaccia, D. Campbell
DRILLER:
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SS03
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: NE.
ELEVATION:

SAMPLE ID	DEPTH ~~(feet)~~ In	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
MMS-SS03-01 (and MS, MSD)	0–6	N/A		Brown organic SILT trace vegetation dry.		4/11/97	NAB	Semi-VOA, Pest/PCB metals cyanide
↓	6–12			Brown f. to m. SAND some silt, trace gravel abundant roots, 100%		4/11/97		VOAs
	12–30			Boring Terminated @ 1 ft				

NOTES:

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EBASCO ENVIRONMENTAL DIVISION

FIGURE 3-2

LOG OF BORING

PROJECT: Magna Metals
PROJECT NO:
LOCATION: Cortlandt, NY
GEOLOGIST: M. Petaccia, D. Campbell
DRILLER: –
DRILLING/SAMPLING METHOD: Soil Corer

BORING NUMBER: MMS-SS04
DATE STARTED: 4/11/97
DATE COMPLETED: 4/11/97
GROUNDWATER DEPTH: N.E.
ELEVATION:

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECOVERY (inches)	MATERIAL DESCRIPTION	COLLECTION Time	COLLECTION Date	VOA ppm	COMMENTS
	0							
MMS-SS04-01	1			DK Brown organic SILT, roots, (Topsoil) moist		4/11/97		Semi-VOA Pest/PCB Metals Cyanide
	2							
	3							
	4							
	5							
	6							
	7			~~Med~~ Brown ~~silty~~ ~~SAND~~, roots, trace mica, SILT, little f ~~SAN~~ sand, organic material (roots), little f Gravel		4/11/97		VOAs
	8							
	9							
	10							
	11							
	12							
	13			Boring terminated @ 1 ft				
	14							
	15							
	16							
	17			trace mica ~~and other mineral~~				
	18			~~[illegible]~~ moist				
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							

NOTES:

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APPENDIX C

CHEMICAL DATA

APPENDIX C - ANALYTICAL DATA

Table	Title
C-1	Abbreviations and Qualifiers Utilized in Result Tables
C-2	TCL Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
C-3	TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
C-4	TCL Pesticide/PCB Compounds - Septic Tank/Leach Pit Sludge and Water
C-5	TAL Metals and Cyanide - Septic Tank/Leach Pit Sludge and Water
C-6	Total Organic Carbon - Septic Tank/Leach Pit Sludge
C-7	TCL Volatile Organic Compounds - Surface Water
C-8	TCL Semi-Volatile Organic Compounds - Surface Water
C-9	TCL Pesticide/PCB Compounds - Surface Water
C-10	TAL Metals and Cyanide - Surface Water
C-11	Hardness - Surface Water
C-12	TCL Volatile Organic Compounds - Sediments
C-13	TCL Semi-Volatile Organic Compounds - Sediments
C-14	TCL Pesticide/PCB Compounds - Sediments
C-15	TAL Metals and Cyanide - Sediments
C-16	Total Organic Carbon - Sediments
C-17	TCL Volatile Organic Compounds - Surface Soils
C-18	TCL Semi-Volatile Organic Compounds - Surface Soils
C-19	TCL Pesticide/PCB Compounds - Surface Soils
C-20	TAL Metals and Cyanide - Surface Soils
C-21	Total Organic Carbon - Surface Soils
C-22	TCL Volatile Organic Compounds - Subsurface Soils
C-23	TCL Semi-Volatile Organic Compounds - Subsurface Soils
C-24	TCL Pesticide/PCB Compounds - Subsurface Soils
C-25	TAL Metals and Cyanide - Subsurface Soils
C-26	Total Organic Carbon - Subsurface Soils
C-27	TCL Volatile Organic Compounds - Groundwater
C-28	TCL Semi-Volatile Organic Compounds - Groundwater
C-29	TCL Pesticide/PCB Compounds - Groundwater
C-30	TAL Metals and Cyanide - Groundwater
C-31	TCL Volatile Organic Compounds - Quality Assurance/Quality Control
C-32	TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
C-33	TCL Pesticide/PCB Compounds - Quality Assurance/Quality Control
C-34	TAL Metals and Cyanide - Quality Assurance/Quality Control

TABLE C-1
ABBREVIATIONS AND QUALIFIERS UTILIZED IN RESULT TABLES

Abbreviation	**Definition**
AQ	Aqueous Sample.
FB	Field Blank.
LP	Leach Pit Location.
mg/kg	milligrams per kilogram.
mg/L	milligrams per liter.
MW	Monitoring Well Location.
ppb	parts per billion (ug/kg or ug/L).
ppm	parts per million (mg/kg or mg/L).
SB	Soil Boring Location.
SD	Sediment Location.
SL	Sludge Sample.
SP	Septic Tank Location.
SS	Surface Soil Location.
SW	Surface Water Location.
TAL	Target Analyte List.
TB	Trip Blank.
TCL	Target Compound List.
TICs	Tentatively Identified Compounds.
TOC	Total Organic Carbon.
ug/kg	micrograms per kilogram.
ug/L	micrograms per liter.
	Compound concentration is above the criteria and/or guidance value provided on the table (see Section 4.0 for selection rationale). To be used for comparison and reference purposes only.

Qualifier	**Definition**
U	Compound not detected at given detection limits.
--	No Tentatively Identified Compounds (TICs) identified in sample.
J	Compound value is estimated.
R	Compound value is rejected and deemed unusable.
B (organics)	Compound was also present in an associated blank sample.
B (inorganics)	Analyte value is less than the required method detection limit but greater than the instrument detection limit.
E	Compound concentration exceeds the calibration range.
D	Compound value reported is from a dilution analysis.
P	Compound had a greater than 25 percent difference for the detected concentration values between two gas chromatograph columns.
N	Presumptive evidence exists for the presence of compound.
NC	No criteria available.
ND (criteria)	Not to be detected above the detection limit for the analytical method.
NA	Not analyzed/not available.

TABLE C-2
TCL Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72184003	72184004
Date Sampled	05/14/97	05/14/97	05/14/97
Chloromethane	40 UJ	1 U	1 U
Bromomethane	40 UJ	1 U	1 U
Vinyl Chloride	40 UJ	1 U	2.2
Chloroethane	40 UJ	1 U	1 U
Methylene Chloride	40 UJ	2 U	2 U
Acetone	110 UJ	R	R
Carbon Disulfide	40 UJ	1 U	1 U
1,1-Dichloroethene	40 UJ	1 U	1 U
1,1-Dichloroethane	40 UJ	1 U	1 U
cis-1,2-Dichloroethene	NA	1 U	4.8
trans-1,2-Dichloroethene	NA	1 U	1 U
1,2-Dichloroethene (total)	40 UJ	NA	NA
Chloroform	40 UJ	1 U	1 U
1,2-Dichloroethane	40 UJ	1 U	1 U
2-Butanone	37 J	R	R
Bromochloromethane	NA	1 U	1 U
1,1,1-Trichloroethane	40 UJ	1 U	1 U
Carbon Tetrachloride	40 UJ	1 U	1 U
Bromodichloromethane	40 UJ	1 U	1 U
1,2-Dichloropropane	40 UJ	1 U	1 U
cis-1,3-Dichloropropene	40 UJ	1 U	1 U
Trichloroethene	40 UJ	1 U	0.92 J
Dibromochloromethane	40 UJ	1 U	1 U
1,1,2-Trichloroethane	40 UJ	1 U	1 U
Benzene	40 UJ	1 U	1 U
trans-1,3-Dichloropropene	40 UJ	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-2
TCL Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site
Page 2 of 2

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72184003	72184004
Date Sampled	05/14/97	05/14/97	05/14/97
Bromoform	40 UJ	1 U	1 U
4-Methyl-2-Pentanone	40 UJ	5 U	5 U
2-Hexanone	40 UJ	R	R
Tetrachloroethene	40 UJ	1 U	1 U
1,1,2,2-Tetrachloroethane	40 UJ	1 U	1 U
Toluene	14 J	1 U	1 U
Chlorobenzene	40 UJ	1 U	1 U
Ethylbenzene	40 UJ	1 U	1 U
Styrene	40 UJ	1 U	1 U
Xylene (total)	30 J	1 U	1 U
!,3-Dichlorobenzene	NA	1 U	1 U
1,4-Dichlorobenzene	NA	0.76 J	1 U
1,2-Dichlorobenzene	NA	1 U	1 U
1,2-Dibromo-3-chloropropane	NA	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Phenol	1300 UJ	5 U	5 U
bis(2-Chloroethyl) ether	1300 UJ	5 U	5 U
2-Chlorophenol	1300 UJ	5 U	5 U
1,3-Dichlorobenzene	1300 UJ	5 U	5 U
1,4-Dichlorobenzene	4200 J	5 U	5 U
1,2-Dichlorobenzene	1300 UJ	5 U	5 U
2-Methylphenol	1300 UJ	5 U	5 U
2,2'-oxybis(1-Chloropropane)	1300 UJ	5 U	5 U
4-Methylphenol	1300 UJ	5 U	5 U
N-Nitroso-di-n-propylamine	1300 UJ	5 U	5 U
Hexachloroethane	1300 UJ	5 U	5 U
Nitrobenzene	1300 UJ	5 U	5 U
Isophorone	1300 UJ	5 U	5 U
2-Nitrophenol	1300 UJ	5 U	5 U
bis (2-Chloroethoxy) methane	1300 UJ	5 U	5 U
2,4-Dimethylphenol	1300 UJ	5 U	5 U
1,2,4-Trichlorobenzene	1300 UJ	5 U	5 U
Naphthalene	1300 UJ	5 U	5 U
4-Chloroaniline	1300 UJ	5 U	5 U
Hexachlorobutadiene	1300 UJ	5 U	5 U
4-Chloro-3-methylphenol	1300 UJ	5 U	5 U
2-Methylnaphthalene	1500 J	5 U	5 U
Hexachlorocyclopentadiene	1300 UJ	5 U	5 U
2,4,6-Trichlorophenol	1300 UJ	5 U	5 U
2,4,5-Trichlorophenol	3200 UJ	20 U	21 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
2-Chloronaphthalene	1300 UJ	5 U	5 U
2-Nitroaniline	3200 UJ	20 U	21 U
Dimethylphthalate	1300 UJ	5 U	5 U
Acenaphthylene	1300 UJ	5 U	5 U
2,6-Dinitrotoluene	1300 UJ	5 U	5 U
3-Nitroaniline	3200 UJ	20 U	21 U
Acenaphthene	1300 UJ	5 U	5 U
2,4-Dinitrophenol	3200 UJ	20 U	21 U
4-Nitrophenol	3200 UJ	20 U	21 U
Dibenzofuran	1300 UJ	5 U	5 U
2,4-Dinitrotoluene	1300 UJ	5 U	5 U
Diethylphthalate	1300 UJ	5 U	5 U
4-Chlorophenyl-phenylether	1300 UJ	5 U	5 U
Fluorene	1300 UJ	5 U	5 U
4-Nitroaniline	3200 UJ	20 U	21 U
4,6-Dinitro-2-methylphenol	3200 UJ	20 U	21 U
N-Nitrosodiphenylamine	1300 UJ	5 U	5 U
4-Bromophenyl-phenylether	1300 UJ	5 U	5 U
Hexachlorobenzene	1300 UJ	5 U	5 U
Pentachlorophenol	3200 UJ	20 U	21 U
Phenanthrene	1300 UJ	5 U	5 U
Anthracene	1300 UJ	5 U	5 U
Carbazole	1300 UJ	5 U	5 U
Di-n-butylphthalate	1300 UJ	5 U	5 U
Fluoranthene	1200 J	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-3
TCL Semi-Volatile Organic Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Pyrene	300 J	5 U	5 U
Butylbenzylphthalate	1300 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	1300 UJ	5 U	5 U
Benzo(a)anthracene	230 J	5 U	5 U
Chrysene	280 J	5 U	5 U
bis(2-Ethylhexyl)phthalate	12000 JD	2 J	2 J
Di-n-octylphthalate	330 J	5 UJ	5 UJ
Benzo(b)fluoranthene	330 J	5 U	5 U
Benzo(k)fluoranthene	240 J	5 U	5 U
Benzo(a)pyrene	200 J	5 U	5 U
Indeno(1,2,3-cd)pyrene	1300 UJ	5 U	5 U
Dibenz(a,h)anthracene	1300 UJ	5 U	5 U
Benzo(g,h,i)perylene	1300 UJ	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-4
TCL Pesticide/PCB Compounds - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site
Page 1 of 1

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	72085002	72085001	72085003
Date Sampled	05/14/97	05/14/97	05/14/97
alpha-BHC	6.8 UJ	0.01 U	0.01 U
beta-BHC	6.8 UJ	0.01 U	0.01 U
delta-BHC	6.8 UJ	0.01 U	0.01 U
gamma-BHC (Lindane)	6.8 UJ	0.01 U	0.01 U
Heptachlor	6.8 UJ	0.01 U	0.01 U
Aldrin	6.8 UJ	0.01 U	0.01 U
Heptachlor epoxide	6.8 UJ	0.01 U	0.01 U
Endosulfan I	6.8 UJ	0.01 U	0.01 U
Dieldrin	13 UJ	0.02 U	0.02 U
4,4'-DDE	11 JP	0.02 U	0.02 U
Endrin	13 UJ	0.02 U	0.02 U
Endosulfan II	13 UJ	0.02 U	0.02 U
4,4'-DDD	13 UJ	0.02 U	0.02 U
Endosulfan sulfate	13 UJ	0.02 U	0.02 U
4,4'-DDT	13 UJ	0.02 U	0.02 U
Methoxychlor	68 UJ	0.11 U	0.11 U
Endrin ketone	13 UJ	0.02 U	0.02 U
Endrin aldehyde	13 UJ	0.02 U	0.02 U
alpha-Chlordane	6.8 UJ	0.01 U	0.01 U
gamma-Chlordane	6.8 UJ	0.01 U	0.01 U
Toxaphene	680 UJ	1.1 U	1.1 U
Aroclor-1016	130 UJ	0.22 U	0.23 U
Aroclor-1221	270 UJ	0.44 U	0.45 U
Aroclor-1232	130 UJ	0.22 U	0.23 U
Aroclor-1242	130 UJ	0.22 U	0.23 U
Aroclor-1248	150 JP	0.22 U	0.23 U
Aroclor-1254	130 UJ	0.22 U	0.23 U
Aroclor-1260	72 JP	0.22 U	0.23 U

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in ug/kg (ppb); water results are presented in ug/L (ppb).

TABLE C-5
TAL Metals and Cyanide - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge	SP-AQ Septic Tank A Water	LP-AQ Leach Pit G Water
Laboratory ID	971144A-14	971144A-13	971144A-15
Date Sampled	05/14/97	05/14/97	05/14/97
Aluminum	16100 J	80.8 B	162 B
Antimony	5.9 JB	3.1 B	3 U
Arsenic	402 J	3.4 B	88.8
Barium	174 J	20.4 B	23.8 B
Beryllium	0.7 UJ	1 U	1 U
Cadmium	6.4 J	1 U	1 U
Calcium	9760 J	22000	9500
Chromium	R	2 B	1 U
Cobalt	34 JB	1.8 B	1 U
Copper	1160 J	167	154
Iron	30400 J	582 J	256 J
Lead	228 J	R	R
Magnesium	5940 J	2560 B	536 B
Manganese	815 J	72.5	28.2
Mercury	0.49 J	0.2 U	0.2 U
Nickel	10400 J	788	45.9
Potassium	1120 JB	2900 JB	704 JB
Selenium	200 J	14.3	3.2 B
Silver	0.97 JB	1 UJ	1 UJ
Sodium	717 JB	4500 B	5750
Thallium	2.1 UJ	3 UJ	3 UJ
Vanadium	32.9 JB	1.1 B	1.4 B
Zinc	9660 J	230 J	286 J
Cyanide	2420 J	39.3	12.7

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in mg/kg (ppm); water results are presented in ug/L (ppb).

TABLE C-6
Total Organic Carbon - Septic Tank/Leach Pit Sludge and Water
Magna Metals Site

Sample ID	SP-SL Septic Tank A Sludge
Laboratory ID	1144014
Date Sampled	05/14/97
Total Organic Carbon	52000 J

See appendix introduction for abbreviations and data qualifiers.
Sludge results are presented in mg/kg (ppm); water results are presented in ug/L (ppb).

TABLE C-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site
Page 1 of 4

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 72184005 05/22/97	SW-1 DUP 72184009 05/22/97	SW-2 72184006 05/22/97	SW-3 72184007 05/22/97	SW-4 72184008 05/22/97	SW-5 721840010 05/22/97	SW-6 721840011 05/22/97
Chloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	NC	1 U	1 U	1 U	1 U	0.7 J	1 U	1 U
Chloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	NC	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Acetone	NC	R	R	R	R	R	R	R
Carbon Disulfide	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	NC	3.5	4.2	3.2	3.3	4.5	2.1	5.1
trans1,2-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	NC	1 U	1 U	1 U	1 U	1 U	1 U	0.79 J
1,2-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	NC	R	R	R	R	R	R	R
Bromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	11	5.5	2.7	2.4	2.3	2.6	2.2	0.97 J
Dibromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	6	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone	NC	5 U	5 U	5 U	5 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-va-sw

TABLE C-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site
Page 2 of 4

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 72184005 05/22/97	SW-1 DUP 72184009 05/22/97	SW-2 72184006 05/22/97	SW-3 72184007 05/22/97	SW-4 72184008 05/22/97	SW-5 721840010 05/22/97	SW-6 721840011 05/22/97
2-Hexanone	NC	R	R	R	R	R	R	R
Tetrachloroethene	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-va-sw

TABLE C-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site
Page 3 of 4

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 72184012 05/22/97	SW-8 72184013 05/22/97	SW-9 72184014 05/22/97	SW-10 72184015 05/22/97	SW-11 72184018 05/22/97	SW-12 72184019 05/22/97
Chloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	NC	1 U	1 U	2.5	0.91 J	1 U	1 U
Chloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	NC	2.3	2 U	2 U	2 U	2 U	2 U
Acetone	NC	R	R	R	R	R	R
Carbon Disulfide	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	NC	1 U	7.4	18	9	1 U	1 U
trans1,2-Dichloroethene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	NC	1 U	0.77 J	1 U	0.89 J	1.6	1 U
1,2-Dichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	NC	R	R	R	R	R	R
Bromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	11	1 U	1.4	0.73 J	1	1 U	1 U
Dibromochloromethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	6	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NC	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-Pentanone	NC	5 U	5 U	5 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-va-sw

TABLE C-7
TCL Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 72184012 05/22/97	SW-8 72184013 05/22/97	SW-9 72184014 05/22/97	SW-10 72184015 05/22/97	SW-11 72184018 05/22/97	SW-12 72184019 05/22/97
2-Hexanone	NC	R	R	R	R	R	R
Tetrachloroethene	1	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	NC	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	NC	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	NC	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	50	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NC	1 U	1 U	1 U	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Phenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Chloroethyl) ether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Chlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Methylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Methylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachloroethane	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Nitrobenzene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Isophorone	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Nitrophenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dimethylphenol	5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dichlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	50	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Naphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Chloroaniline	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorobutadiene	10	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Methylnaphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	4.5	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	1	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	1	25 U	20 U	25 U	22 U	21 U	21 U	21 U
2-Chloronaphthalene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Dimethylphthalate	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Acenaphthylene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-sv-sw

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
2,6-Dinitrotoluene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
3-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Acenaphthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dinitrophenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
4-Nitrophenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Dibenzofuran	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
2,4-Dinitrotoluene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Diethylphthalate	NC	0.3 J	5 U	6 U	0.2 J	5 U	5 U	5 U
4-Chlorophenyl-phenylether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Fluorene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Nitroaniline	NC	25 U	20 U	25 U	22 U	21 U	21 U	21 U
4,6-Dinitro-2-methylphenol	5	25 U	20 U	25 U	22 U	21 U	21 U	21 U
N-Nitrosodiphenylamine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Hexachlorobenzene	NC	6 U	0.2 J	6 U	0.3 J	5 U	5 U	0.3 J
Pentachlorophenol	1	25 U	20 U	25 U	22 U	21 U	21 U	21 U
Phenanthrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Di-n-butylphthalate	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Pyrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Butylbenzylphthalate	NC	6 UJ	5 UJ	6 UJ	6 UJ	5 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(a)anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Chrysene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	NC	6 UJ	2 J	6 UJ	6 UJ	5 UJ	0.6 J	0.7 J
Di-n-octylphthalate	NC	6 UJ	5 UJ	6 UJ	6 UJ	5 UJ	5 UJ	5 UJ

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-sv-sw

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 971121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Benzo(b)fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(k)fluoranthene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(a)pyrene	0.0012	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Dibenz(a,h)anthracene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	NC	6 U	5 U	6 U	6 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-sv-sw

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
Phenol	5	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Chloroethyl) ether	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Chlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2-Methylphenol	5	6 U	6 U	6 U	6 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Methylphenol	5	0.2 J	6 U	6 U	6 U	5 U	5 U
N-Nitroso-di-n-propylamine	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachloroethane	NC	6 U	6 U	6 U	6 U	5 U	5 U
Nitrobenzene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Isophorone	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Nitrophenol	5	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dimethylphenol	5	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Chloroethoxy)methane	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dichlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
1,2,4-Trichlorobenzene	50	6 U	6 U	6 U	6 U	5 U	5 U
Naphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Chloroaniline	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorobutadiene	10	6 U	6 U	6 U	6 U	5 U	5 U
4-Chloro-3-methylphenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2-Methylnaphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorocyclopentadiene	4.5	6 U	6 U	6 U	6 U	5 U	5 U
2,4,6-Trichlorophenol	1	6 U	6 U	6 U	6 U	5 U	5 U
2,4,5-Trichlorophenol	1	22 U	22 U	22 U	25 U	20 U	20 U
2-Chloronaphthalene	NC	6 U	6 U	6 U	6 U	5 U	5 U
2-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U
Dimethylphthalate	NC	6 U	6 U	6 U	6 U	5 U	5 U
Acenaphthylene	NC	6 U	6 U	6 U	6 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-sv-sw

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
2,6-Dinitrotoluene	NC	6 U	6 U	6 U	6 U	5 U	5 U
3-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U
Acenaphthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dinitrophenol	5	22 U	22 U	22 U	25 U	20 U	20 U
4-Nitrophenol	5	22 U	22 U	22 U	25 U	20 U	20 U
Dibenzofuran	NC	6 U	6 U	6 U	6 U	5 U	5 U
2,4-Dinitrotoluene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Diethylphthalate	NC	6 U	0.2 J	6 U	6 U	5 U	5 U
4-Chlorophenyl-phenylether	NC	6 U	6 U	6 U	6 U	5 U	5 U
Fluorene	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Nitroaniline	NC	22 U	22 U	22 U	25 U	20 U	20 U
4,6-Dinitro-2-methylphenol	5	22 U	22 U	22 U	25 U	20 U	20 U
N-Nitrosodiphenylamine	NC	6 U	6 U	6 U	6 U	5 U	5 U
4-Bromophenyl-phenylether	NC	6 U	6 U	6 U	6 U	5 U	5 U
Hexachlorobenzene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Pentachlorophenol	1	22 U	22 U	22 U	25 U	20 U	20 U
Phenanthrene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Di-n-butylphthalate	NC	6 U	6 U	6 U	6 U	5 U	5 U
Fluoranthene	NC	6 U	6 U	0.3 J	6 U	5 U	5 U
Pyrene	NC	6 U	6 U	0.3 J	6 U	5 U	5 U
Butylbenzylphthalate	NC	6 UJ	6 UJ	6 UJ	6 UJ	5 UJ	5 UJ
3,3'-Dichlorobenzidine	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(a)anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Chrysene	NC	6 U	6 U	6 U	6 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	NC	1 J	6 UJ	6 UJ	6 UJ	5 UJ	3 J
Di-n-octylphthalate	NC	6 UJ	6 UJ	6 UJ	6 UJ	5 UJ	5 UJ

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-sv-sw

TABLE C-8
TCL Semi-Volatile Organic Compounds - Surface Water
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/13/97
Benzo(b)fluoranthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(k)fluoranthene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(a)pyrene	0.0012	6 U	6 U	6 U	6 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Dibenz(a,h)anthracene	NC	6 U	6 U	6 U	6 U	5 U	5 U
Benzo(g,h,i)perylene	NC	6 U	6 U	6 U	6 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE C-9
TCL Pesticide/PCB Compounds - Surface Water
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 DUP 72093011 05/12/97	SW-4 72093001 05/14/97	SW-10 72054001 05/12/97
alpha-BHC	2	0.01 U	0.01 U	0.01 U
beta-BHC	2	0.01 U	0.01 U	0.01 U
delta-BHC	2	0.01 U	0.01 U	0.01 U
gamma-BHC (Lindane)	2	0.01 U	0.01 U	0.01 U
Heptachlor	0.001	0.01 U	0.01 U	0.01 U
Aldrin	0.001	0.01 U	0.01 U	0.01 U
Heptachlor epoxide	0.001	0.01 U	0.01 U	0.01 U
Endosulfan I	0.22	0.01 U	0.01 U	0.01 U
Dieldrin	0.001	0.02 U	0.02 U	0.02 U
4,4'-DDE	0.001	0.02 U	0.02 U	0.02 U
Endrin	0.002	0.02 U	0.02 U	0.02 U
Endosulfan II	0.22	0.02 U	0.02 U	0.02 U
4,4'-DDD	0.001	0.02 U	0.02 U	0.02 U
Endosulfan sulfate	NC	0.02 U	0.02 U	0.02 U
4,4'-DDT	0.001	0.02 U	0.02 U	0.02 U
Methoxychlor	NC	0.11 U	0.1 U	0.11 U
Endrin ketone	NC	0.02 U	0.02 U	0.02 U
Endrin aldehyde	NC	0.02 U	0.02 U	0.02 U
alpha-Chlordane	0.002	0.01 U	0.01 U	0.01 U
gamma-Chlordane	0.002	0.01 U	0.01 U	0.01 U
Toxaphene	1.6	1.1 U	1 U	1.1 U
Aroclor-1016	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1221	6.00E-07	0.43 U	0.4 U	0.44 U
Aroclor-1232	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1242	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1248	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1254	6.00E-07	0.21 U	0.2 U	0.22 U
Aroclor-1260	6.00E-07	0.21 U	0.2 U	0.22 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

TABLE C-10
TAL Metals and Cyanide - Surface Water
Magna Metals Site
Page 1 of 2

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-1 971121A-07 05/12/97	SW-1 DUP 971144A-11 05/12/97	SW-2 9711121A-05 05/12/97	SW-3 971121A-08 05/12/97	SW-4 971144A-01 05/14/97	SW-5 971144A-03 05/14/97	SW-6 971144A-05 05/14/97
Aluminum	NC	54.2 B	135 B	126 B	454	103 B	178 B	2660
Antimony	NC	3 U	3 U	3 U	3 U	3.5 B	3.1 B	3.5 B
Arsenic	360	3 U	3 U	3 U	3 U	3 U	3 U	4 B
Barium	NC	27.2 B	56 B	25.4 B	33.7 B	37.7 B	68 B	154 B
Beryllium	NC	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	6.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Calcium	NC	22200	23500	20700	21500	22600	23400	21800
Chromium	2490	1 U	1 U	1.4 B	3.5 B	1 U	1.5 B	39.6
Cobalt	110	1 U	1 U	1 U	1 U	1 U	1.4 B	6.7 B
Copper	26.8	4.9 B	6.5 B	8 B	14 B	4.3 B	14.1 B	491
Iron	300	658	1060 J	908	1510	856 J	1110 J	7240 J
Lead	144	2 U	R	2.2 JB	2 JB	2 U	R	14.2
Magnesium	NC	18900	18800	17300	17900	18200	15200	20200
Manganese	NC	209	422	188	182	336	888	625
Mercury	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2577	2.3 B	10.6 B	4.6 B	4 B	8.9 B	15.7 B	136
Potassium	NC	2230 B	2300 JB	2080 B	2160 B	2360 JB	2060 JB	1990 JB
Selenium	NC	3 U	3.4 B	3 U	4.5 B	3 U	3 U	10.2
Silver	8.6	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Sodium	NC	20300	20400	18600	19200	19600	18800	27000
Thallium	20	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium	190	1 U	1 U	1 U	1.6 B	1 U	1.3 JB	8.6 B
Zinc	463	10.7 B	21.8 J	16.7 B	37	17.8 B	28.1 J	232 J
Cyanide	22	10 U	39.6 J	10 U	10 U	10 UJ	10 U	220

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-mt-sw

TABLE C-10
TAL Metals and Cyanide - Surface Water
Magna Metals Site
Page 2 of 2

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class D)	SW-7 971144A-07 05/14/97	SW-8 971121A-09 05/12/97	SW-9 971121A-10 05/12/97	SW-10 971121A-01 05/12/97	SW-11 971121A-03 05/12/97	SW-12 971144A-09 05/12/97
Aluminum	NC	13100	84.8 B	8960	118 B	41.9 B	64.8 B
Antimony	NC	4.9 B	3 U	3 U	3 U	3 U	3.6 B
Arsenic	360	18.3	3 U	4.1 B	3 U	3 U	3 U
Barium	NC	250	69.7 B	631	68.5 B	52.4 B	33.4 B
Beryllium	NC	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	6.4	1.7 B	1 U	1.1 B	1 U	1 U	1 U
Calcium	NC	18800	18700	40600	18100	16300	23000
Chromium	2490	253	1 U	69.7	1.1 B	1 U	1 U
Cobalt	110	32.8 B	1 U	31.4 B	1 U	1 U	1 U
Copper	26.8	3960	6.2 B	95.4	5.3 B	2.8 B	2.7 B
Iron	300	34100 J	272	24000	346	94.2 B	363 J
Lead	144	88	2 U	43.6	2 U	2 U	R
Magnesium	NC	13800	19300	68600	19300	14200	13800
Manganese	NC	1010	109	1760	110	57.4	60.3
Mercury	0.2	0.22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2577	558	11.9 B	204	6.2 B	5.5 B	3.5 B
Potassium	NC	2790 JB	1900 B	5980 J	1820 B	1510 B	1970 JB
Selenium	NC	40.1	6.7	3 B	3 U	3 U	3 U
Silver	8.6	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Sodium	NC	21700	27900	30300	26400	23600	17600
Thallium	20	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium	190	25.7 B	1 U	29.6 B	1 U	1 U	1 U
Zinc	463	2090 J	20.8	146	27.3	18.3 B	27.3 J
Cyanide	22	858	10 U	18.7	10 U	10 U	10 U

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in ug/L (ppb).

Mm-mt-sw

TABLE C-11
Hardness - Surface Water
Magna Metals Site
Page 1 of 2

Sample ID	SW-1	SW-1 DUP	SW-2	SW-3	SW-4	SW-5	SW-6
Laboratory ID	72054-12	72093-11	72054-9	72054-13	72093-1	72093-3	72093-5
Date Sampled	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97
Hardness	134.17	139.3	131.2	131.87	141.54	131.11	130.55

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in mg/L (ppm).

Mm-hn-sw

TABLE C-11
Hardness - Surface Water
Magna Metals Site
Page 2 of 2

Sample ID	SW-7	SW-8	SW-9	SW-10	SW-11	SW-12
Laboratory ID	72093-7	72054-14	72054-15	72054-1	72054-7	72093-9
Date Sampled	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/12/97
Hardness	103.39	135.1	479	131.54	101.98	127.56

See appendix introduction for abbreviations and data qualifiers.
Surface water results are presented in mg/L (ppm).

Mm-hn-sw

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 72054019 05/12/97	SD-1 DUP 72093012 05/12/97	SD-2 72054010 05/12/97	SD-3 72054020 05/12/97	SD-4 72093002 05/14/97
Chloromethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Bromomethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Vinyl Chloride	0.07 HH	5.98	16 U	67 UJ	34 UJ	R	40 UJ
Chloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Methylene Chloride	NC	NC	18 UJ	67 UJ	34 UJ	R	40 UJ
Acetone	NC	NC	74 UJ	320 UJ	80 UJ	R	340 JB
CarbonDisulfide	NC	NC	16 U	67 UJ	34 UJ	R	12 J
1,1-Dichloroethene	0.02 HH	1.71	16 U	67 UJ	34 UJ	R	40 UJ
1,1-Dichloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloroethene (total)	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Chloroform	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloroethane	0.7 HH	59.75	16 U	67 UJ	34 UJ	R	40 UJ
2-Butanone	NC	NC	21	74	11 J	R	95 J
1,1,1-Trichloroethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Carbon Tetrachloride	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
Bromodichloromethane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
1,2-Dichloropropane	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
cis-1,3-Dichloropropene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Trichloroethene	2 HH	170.72	16 U	67 UJ	34 UJ	R	40 UJ
Dibromochloromethane	NC	NC	16 UJ	67 UJ	34 UJ	R	40 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
Benzene	0.6 HH	51.22	16 U	67 UJ	34 UJ	R	40 UJ
trans-1,3-Dichloropropene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Bromoform	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
4-Methyl-2-Pentanone	NC	NC	16 U	67 UJ	12 J	R	40 UJ
2-Hexanone	NC	NC	16 UJ	67 UJ	18 J	R	40 UJ
Tetrachloroethene	0.8 HH	68.29	16 U	67 UJ	34 UJ	R	40 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

Mm-va-sd

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site
Page 2 of 6

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 72054019 05/12/97	SD-1 DUP 72093012 05/12/97	SD-2 72054010 05/12/97	SD-3 72054020 05/12/97	SD-4 72093002 05/14/97
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	16 U	67 UJ	34 UJ	R	40 UJ
Toluene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Chlorobenzene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Ethylbenzene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Styrene	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ
Xylene (total)	NC	NC	16 U	67 UJ	34 UJ	R	40 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site
Page 3 of 6

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 72093004 05/14/97	SD-6 72093006 05/14/97	SD-7 72093008 05/14/97	SD-8 72054017 05/12/97	SD-9 72054018 05/12/97
Chloromethane	NC	NC	33 UJ	33 UJ	7 J	21 UJ	53 UJ
Bromomethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Vinyl Chloride	0.07 HH	5.98	33 UJ	33 UJ	26 UJ	21 UJ	25 J
Chloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Methylene Chloride	NC	NC	37 UJ	33 UJ	25 UJ	26 UJ	100 UJ
Acetone	NC	NC	770 JB	88 UJ	96 UJ	150 JB	530 JB
CarbonDisulfide	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1-Dichloroethene	0.02 HH	1.71	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1-Dichloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloroethene (total)	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Chloroform	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloroethane	0.7 HH	59.75	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
2-Butanone	NC	NC	260 J	22 J	39 J	36 J	160 J
1,1,1-Trichloroethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Carbon Tetrachloride	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Bromodichloromethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,2-Dichloropropane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
cis-1,3-Dichloropropene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Trichloroethene	2 HH	170.72	20 J	33 UJ	26 UJ	21 UJ	22 J
Dibromochloromethane	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Benzene	0.6 HH	51.22	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
trans-1,3-Dichloropropene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Bromoform	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
4-Methyl-2-Pentanone	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
2-Hexanone	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Tetrachloroethene	0.8 HH	68.29	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

Mm-va-sd

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 72093004 05/14/97	SD-6 72093006 05/14/97	SD-7 72093008 05/14/97	SD-8 72054017 05/12/97	SD-9 72054018 05/12/97
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Toluene	NC	NC	33 UJ	33 UJ	12 J	21 UJ	53 UJ
Chlorobenzene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Ethylbenzene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Styrene	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ
Xylene (total)	NC	NC	33 UJ	33 UJ	26 UJ	21 UJ	53 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 72054004 05/12/97	SD-11 72054008 05/12/97	SD-12 72093010 05/14/97
Chloromethane	NC	NC	12 U	12 U	12 U
Bromomethane	NC	NC	12 U	12 U	12 U
Vinyl Chloride	0.07 HH	5.98	12 U	12 U	12 U
Chloroethane	NC	NC	12 U	12 U	12 U
Methylene Chloride	NC	NC	12 UJ	12 UJ	12 UJ
Acetone	NC	NC	14 UJ	12 UJ	12 UJ
CarbonDisulfide	NC	NC	12 U	12 U	12 U
1,1-Dichloroethene	0.02 HH	1.71	12 U	12 U	12 U
1,1-Dichloroethane	NC	NC	12 U	12 U	12 U
1,2-Dichloroethene (total)	NC	NC	12 U	12 U	12 U
Chloroform	NC	NC	12 U	12 U	12 U
1,2-Dichloroethane	0.7 HH	59.75	12 U	12 U	12 U
2-Butanone	NC	NC	12 U	12 U	12 U
1,1,1-Trichloroethane	NC	NC	12 U	12 U	12 U
Carbon Tetrachloride	0.6 HH	51.22	12 U	12 U	12 U
Bromodichloromethane	NC	NC	12 U	12 U	12 U
1,2-Dichloropropane	NC	NC	12 U	12 U	12 U
cis-1,3-Dichloropropene	NC	NC	12 U	12 U	12 U
Trichloroethene	2 HH	170.72	12 U	12 U	12 U
Dibromochloromethane	NC	NC	12 UJ	12 UJ	12 UJ
1,1,2-Trichloroethane	0.6 HH	51.22	12 U	12 U	12 U
Benzene	0.6 HH	51.22	12 U	12 U	12 U
trans-1,3-Dichloropropene	NC	NC	12 U	12 U	12 U
Bromoform	NC	NC	12 U	12 U	12 U
4-Methyl-2-Pentanone	NC	NC	5 J	12 U	12 U
2-Hexanone	NC	NC	10 J	12 UJ	12 UJ
Tetrachloroethene	0.8 HH	68.29	4 J	12 U	12 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-12
TCL Volatile Organic Compounds - Sediment
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 72054004 05/12/97	SD-11 72054008 05/12/97	SD-12 72093010 05/14/97
1,1,2,2-Tetrachloroethane	0.3 HH	25.61	12 U	12 U	12 U
Toluene	NC	NC	12 U	12 U	12 U
Chlorobenzene	NC	NC	12 U	12 U	12 U
Ethylbenzene	NC	NC	12 U	12 U	12 U
Styrene	NC	NC	12 U	12 U	12 U
Xylene (total)	NC	NC	12 U	12 U	12 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

Mm-va-sd

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
Phenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
bis(2-Chloroethyl) ether	0.03 HH	2.56	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Chlorophenol	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,3-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,4-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,2-Dichlorobenzene	12 CT	1024.34	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Methylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,2'-oxybis(1-Chloropropane)	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Methylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
N-Nitroso-di-n-propylamine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachloroethane	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Nitrobenzene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Isophorone	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2-Nitrophenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dimethylphenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
bis (2-Chloroethoxy) methane		0.00	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dichlorophenol	0.5 CT	42.68	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
1,2,4-Trichlorobenzene	91 CT	7767.94	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Naphthalene	NC	NC	42 J	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chloroaniline	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorobutadiene	0.3 HH	25.61	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chloro-3-methylphenol	0.6 CTY	51.22	530 U	2100 UJ	470 U	160 J	1800 UJ
2-Methylnaphthalene	NC	NC	38 J	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorocyclopentadiene	4.4 CT	375.59	530 UJ	2100 UJ	470 UJ	1000 UJ	1800 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
2,4,5-Trichlorophenol	0.6 CT	51.22	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
2-Chloronaphthalene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
2-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
Dimethylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Acenaphthylene	NC	NC	180 J	2100 UJ	470 U	1000 UJ	1800 UJ
2,6-Dinitrotoluene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
3-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
Acenaphthene	140 CT	11950.68	140 J	2100 UJ	470 U	88 J	1800 UJ
2,4-Dinitrophenol	0.5 CT	42.68	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
4-Nitrophenol	0.5 CT	42.68	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
Dibenzofuran	NC	NC	220 J	2100 UJ	470 U	1000 UJ	1800 UJ
2,4-Dinitrotoluene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Diethylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Chlorophenyl-phenylether	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Fluorene	NC	NC	540	2100 UJ	470 U	1000 UJ	1800 UJ
4-Nitroaniline	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
4,6-Dinitro-2-methylphenol	NC	NC	1300 U	5200 UJ	1200 U	2600 UJ	4600 UJ
N-Nitrosodiphenylamine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
4-Bromophenyl-phenylether	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Hexachlorobenzene	0.15 HH	12.80	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Pentachlorophenol	0.6 CT	51.22	1300 UJ	5200 UJ	1200 UJ	2600 UJ	4600 UJ
Phenanthrene	120 CT	10243.44	2700	2100 UJ	470 U	1000 UJ	1800 UJ
Anthracene	NC	NC	700	2100 UJ	470 U	1000 UJ	1800 UJ
Carbazole	NC	NC	340 J	2100 UJ	470 U	1000 UJ	1800 UJ
Di-n-butylphthalate	NC	NC	530 U	170 J	470 U	1000 UJ	85 J
Fluoranthene	1,020 CT	87069.24	2400	270 J	470 U	59 UJ	280 J
Pyrene	NC	NC	2300	220 J	470 U	180 J	220 J
Butylbenzylphthalate	NC	NC	530 U	2100 UJ	470 U	1000 J	1800 UJ
3,3'-Dichlorobenzidine	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121A-15 05/12/97	SD-4 971144A-02 05/14/97
Benzo(a)anthracene	1.3 HH	110.97	1200	2100 UJ	470 U	1000 UJ	1800 UJ
Chrysene	1.3 HH	110.97	1300	2100 UJ	470 U	1000 UJ	1800 UJ
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	530 U	300 J	470 U	1000 UJ	210 J
Di-n-octylphthalate	NC	NC	530 UJ	2100 UJ	470 UJ	1000 UJ	1800 UJ
Benzo(b)fluoranthene	1.3 HH	110.97	840	2100 UJ	470 U	1000 UJ	150 J
Benzo(k)fluoranthene	1.3 HH	110.97	950	2100 UJ	470 U	1000 UJ	150 J
Benzo(a)pyrene	1.3 HH	110.97	1000	230 J	58 J	1000 UJ	120 J
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	110 J	2100 UJ	470 U	1000 UJ	1800 UJ
Dibenz(a,h)anthracene	NC	NC	530 U	2100 UJ	470 U	1000 UJ	1800 UJ
Benzo(g,h,i)perylene	NC	NC	55 J	2100 UJ	470 U	1000 UJ	1800 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
Phenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
bis(2-Chloroethyl) ether	0.03 HH	2.56	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Chlorophenol	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,3-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,4-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,2-Dichlorobenzene	12 CT	1024.34	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Methylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,2'-oxybis(1-Chloropropane)	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Methylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
N-Nitroso-di-n-propylamine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachloroethane	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Nitrobenzene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Isophorone	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Nitrophenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4-Dimethylphenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
bis (2-Chloroethoxy) methane		0.00	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4-Dichlorophenol	0.5 CT	42.68	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
1,2,4-Trichlorobenzene	91 CT	7767.94	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Naphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chloroaniline	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorobutadiene	0.3 HH	25.61	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chloro-3-methylphenol	0.6 CTY	51.22	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2-Methylnaphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorocyclopentadiene	4.4 CT	375.59	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
2,4,5-Trichlorophenol	0.6 CT	51.22	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
2-Chloronaphthalene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
2-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Dimethylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Acenaphthylene	NC	NC	1300 UJ	1100 UJ	1000 UJ	19 J	1600 UJ
2,6-Dinitrotoluene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
3-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Acenaphthene	140 CT	11950.68	1300 UJ	1100 UJ	1000 UJ	53 J	1600 UJ
2,4-Dinitrophenol	0.5 CT	42.68	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
4-Nitrophenol	0.5 CT	42.68	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Dibenzofuran	NC	NC	1300 UJ	1100 UJ	1000 UJ	29 J	1600 UJ
2,4-Dinitrotoluene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Diethylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Chlorophenyl-phenylether	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Fluorene	NC	NC	1300 UJ	1100 UJ	1000 UJ	74 J	1600 UJ
4-Nitroaniline	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
4,6-Dinitro-2-methylphenol	NC	NC	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
N-Nitrosodiphenylamine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
4-Bromophenyl-phenylether	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Hexachlorobenzene	0.15 HH	12.80	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Pentachlorophenol	0.6 CT	51.22	3200 UJ	2900 UJ	2600 UJ	1700 UJ	4200 UJ
Phenanthrene	120 CT	10243.44	270 J	100 J	350 J	950 J	250 J
Anthracene	NC	NC	35 J	1100 UJ	45 J	130 J	37 J
Carbazole	NC	NC	1300 UJ	1100 UJ	1000 UJ	120 J	1600 UJ
Di-n-butylphthalate	NC	NC	92 J	97 J	1000 UJ	690 UJ	1600 UJ
Fluoranthene	1,020 CT	87069.24	490 J	230 J	650 J	1400 J	590 J
Pyrene	NC	NC	390 J	200 J	710 J	1500 J	640 J
Butylbenzylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
3,3'-Dichlorobenzidine	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/14/97	SD-9 971121A-13 05/12/97
Benzo(a)anthracene	1.3 HH	110.97	180 J	95 J	300 J	710 J	260 J
Chrysene	1.3 HH	110.97	300 J	150 J	410 J	1000 J	370 J
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	250 J	140 J	1100 UJ	690 UJ	1600 UJ
Di-n-octylphthalate	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Benzo(b)fluoranthene	1.3 HH	110.97	260 J	130 J	360 J	820 J	320 J
Benzo(k)fluoranthene	1.3 HH	110.97	210 J	120 J	320 J	780 J	300 J
Benzo(a)pyrene	1.3 HH	110.97	180 J	1100 UJ	300 J	810 J	320 J
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	1300 UJ	1100 UJ	290 J	87 J	150 J
Dibenz(a,h)anthracene	NC	NC	1300 UJ	1100 UJ	1000 UJ	690 UJ	1600 UJ
Benzo(g,h,i)perylene	NC	NC	1300 UJ	1100 UJ	250 J	51 J	120 J

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Phenol	0.5 CT	42.68	410 U	380 U	400 U
bis(2-Chloroethyl) ether	0.03 HH	2.56	410 U	380 U	400 U
2-Chlorophenol	NC	NC	410 U	380 U	400 U
1,3-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
1,4-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
1,2-Dichlorobenzene	12 CT	1024.34	410 U	380 U	400 U
2-Methylphenol	0.5 CT	42.68	410 U	380 U	400 U
2,2'-oxybis(1-Chloropropane)	NC	NC	410 U	380 U	400 U
4-Methylphenol	0.5 CT	42.68	410 U	380 U	400 U
N-Nitroso-di-n-propylamine	NC	NC	410 U	380 U	400 U
Hexachloroethane	NC	NC	960	380 U	400 U
Nitrobenzene	NC	NC	410 U	380 U	400 U
Isophorone	NC	NC	410 U	380 U	400 U
2-Nitrophenol	0.5 CT	42.68	410 U	380 U	400 U
2,4-Dimethylphenol	0.5 CT	42.68	410 U	380 U	400 U
bis (2-Chloroethoxy) methane		0.00	410 U	380 U	400 U
2,4-Dichlorophenol	0.5 CT	42.68	410 U	380 U	400 U
1,2,4-Trichlorobenzene	91 CT	7767.94	410 U	380 U	400 U
Naphthalene	NC	NC	410 U	380 U	400 U
4-Chloroaniline	NC	NC	410 U	380 U	400 U
Hexachlorobutadiene	0.3 HH	25.61	410 U	380 U	400 U
4-Chloro-3-methylphenol	0.6 CTY	51.22	410 U	380 U	400 U
2-Methylnaphthalene	NC	NC	410 U	380 U	400 U
Hexachlorocyclopentadiene	4.4 CT	375.59	410 UJ	380 UJ	400 UJ
2,4,6-Trichlorophenol	0.6 CT	51.22	410 U	380 U	400 U
2,4,5-Trichlorophenol	0.6 CT	51.22	1000 U	950 U	1000 U
2-Chloronaphthalene	NC	NC	410 U	380 U	400 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
2-Nitroaniline	NC	NC	1000 U	950 U	1000 U
Dimethylphthalate	NC	NC	410 U	380 U	400 U
Acenaphthylene	NC	NC	410 U	380 U	400 U
2,6-Dinitrotoluene	NC	NC	410 U	380 U	400 U
3-Nitroaniline	NC	NC	1000 U	950 U	1000 U
Acenaphthene	140 CT	11950.68	410 U	380 U	400 U
2,4-Dinitrophenol	0.5 CT	42.68	1000 UJ	950 UJ	1000 U
4-Nitrophenol	0.5 CT	42.68	1000 UJ	950 UJ	1000 UJ
Dibenzofuran	NC	NC	410 U	380 U	400 U
2,4-Dinitrotoluene	NC	NC	410 U	380 U	400 U
Diethylphthalate	NC	NC	410 U	380 U	400 U
4-Chlorophenyl-phenylether	NC	NC	410 U	380 U	400 U
Fluorene	NC	NC	410 U	380 U	400 U
4-Nitroaniline	NC	NC	1000 U	950 U	1000 U
4,6-Dinitro-2-methylphenol	NC	NC	1000 U	950 U	1000 U
N-Nitrosodiphenylamine	NC	NC	410 U	380 U	400 U
4-Bromophenyl-phenylether	NC	NC	410 U	380 U	400 U
Hexachlorobenzene	0.15 HH	12.80	410 U	380 U	400 U
Pentachlorophenol	0.6 CT	51.22	1000 UJ	950 UJ	1000 U
Phenanthrene	120 CT	10243.44	87 J	35 J	400 U
Anthracene	NC	NC	17 J	6 J	400 U
Carbazole	NC	NC	410 U	380 U	400 U
Di-n-butylphthalate	NC	NC	410 U	380 U	400 U
Fluoranthene	1,020 CT	87069.24	140 J	71 J	400 U
Pyrene	NC	NC	140 J	72 J	400 U
Butylbenzylphthalate	NC	NC	410 U	380 U	400 U
3,3'-Dichlorobenzidine	NC	NC	410 U	380 U	400 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-13
TCL Semi-Volatile Organic Compounds - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Criteria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Benzo(a)anthracene	1.3 HH	110.97	62 J	31 J	400 U
Chrysene	1.3 HH	110.97	81 J	46 J	400 U
bis(2-Ethylhexyl)phthalate	199.5 CT	17029.72	410 U	380 U	400 U
Di-n-octylphthalate	NC	NC	410 UJ	380 UJ	400 UJ
Benzo(b)fluoranthene	1.3 HH	110.97	60 J	32 J	400 UJ
Benzo(k)fluoranthene	1.3 HH	110.97	65 J	38 J	400 U
Benzo(a)pyrene	1.3 HH	110.97	60 J	33 J	400 U
Indeno(1,2,3-cd)pyrene	1.3 HH	110.97	41 J	20 J	400 U
Dibenz(a,h)anthracene	NC	NC	410 U	380 U	400 U
Benzo(g,h,i)perylene	NC	NC	34 J	18 J	400 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
*Criteria normalized using average TOC concentration in sediments.

TABLE C-14
TCL Pesticide/PCB Compounds - Sediment
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Citeria ug/gOC	Normalized Sediment Criteria* ug/kg	SD-1 DUP 72093012 05/12/97	SD-4 72093002 05/14/97	SD-10 72054004 05/12/97
alpha-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
beta-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
delta-BHC	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
gamma-BHC (Lindane)	0.06 HH, CT	5.12	11 UJ	6.8 UJ	2.1 U
Heptachlor	0.0008 HH	0.07	11 UJ	6.8 UJ	2.1 U
Aldrin	0.1 HH	8.54	11 UJ	6.8 UJ	2.1 U
Heptachlor epoxide	0.0008 HH	0.07	11 UJ	6.8 UJ	2.1 U
Endosulfan I	NC	NC	11 UJ	6.8 UJ	2.1 U
Dieldrin	0.1 HH	8.54	22 UJ	13 UJ	4 U
4,4'-DDE	0.01 HH	0.85	22 UJ	13 UJ	4 U
Endrin	0.8 HH, WB	68.29	22 UJ	13 UJ	4 U
Endosulfan II	NC	NC	22 UJ	13 UJ	4 U
4,4'-DDD	0.01 HH	0.85	22 UJ	13 UJ	4 U
Endosulfan sulfate	NC	NC	22 UJ	13 UJ	4 U
4,4'-DDT	0.01 HH	0.85	22 UJ	13 UJ	4 U
Methoxychlor	0.6 CT	51.22	110 UJ	68 UJ	21 U
Endrin ketone	0.8 WB	68.29	22 UJ	13 UJ	4 U
Endrin aldehyde	0.8 WB	68.29	22 UJ	13 UJ	4 U
alpha-Chlordane	0.001 HH	0.09	11 UJ	6.8 UJ	3.5 JP
gamma-Chlordane	0.001 HH	0.09	11 UJ	6.8 UJ	3.4
Toxaphene	0.01 CT	0.85	1100 UJ	680 UJ	210 U
Aroclor-1016	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1221	0.0008 HH	0.07	450 UJ	270 UJ	82 U
Aroclor-1232	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1242	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1248	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1254	0.0008 HH	0.07	220 UJ	130 UJ	40 U
Aroclor-1260	0.0008 HH	0.07	220 UJ	130 UJ	40 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in ug/kg (ppb).
* Criteria normalized using average TOC concentration in sediments.

Mm-pp-sd

TABLE C-15
TAL Metals and Cyanide - Sediment
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-1 971121A-14 05/12/97	SD-1 DUP 971144A-12 05/12/97	SD-2 971121A-06 05/12/97	SD-3 971121a-15 05/12/97	SD-4 971144A-02 05/14/97
Aluminum	NC	NC	11700 J	10100 J	9900	7770 J	10600 J
Antimony	2	25	1.1 UJ	3.1 UJ	1 U	1.6 UJ	2.6 UJ
Arsenic	6	33	3.2 JB	10.6 J	3 B	4.4 JB	9.1 J
Barium	NC	NC	132 J	289 J	135	261 J	256 J
Beryllium	NC	NC	0.37 UJ	1 UJ	0.35 U	0.53 UJ	0.86 UJ
Cadmium	0.6	9	1 JB	1.3 JB	0.78 B	1.1 JB	1 JB
Calcium	NC	NC	7560 J	11500 J	4600	4490 J	9530 J
Chromium	26	110	78.1 J	R	43	106 J	R
Cobalt	NC	NC	35.6 J	31.9 JB	14.2 B	37.3 J	24.6 JB
Copper	16	110	374 J	493 J	162	398 J	603 J
Iron	20,000 (2%)	40,000 (4%)	34200 J	21100 J	2160	27000 J	19500 J
Lead	31	110	16.6 J	29.2 J	19.4	15.4 J	29.3 J
Magnesium	NC	NC	23400 J	10700 J	6160	21800 J	8670 J
Manganese	460	1100	R	154 J	R	R	167 J
Mercury	0.15	1.3	0.18 UJ	0.58 UJ	0.14 U	0.23 UJ	0.32 UJ
Nickel	16	50	166 J	284 J	180	212 J	234 J
Potassium	NC	NC	1240 JB	906 JB	976 B	668 JB	894 JB
Selenium	NC	NC	3.2 J	14.6 J	8.4	4.8 J	14 J
Silver	1	2.2	0.37 UJ	1.4 JB	0.35 U	0.58 JB	1.3 JB
Sodium	NC	NC	228 JB	384 JB	193 B	324 JB	343 JB
Thallium	NC	NC	1.1 UJ	3.1 UJ	1 UJ	1.6 UJ	2.6 UJ
Vanadium	NC	NC	23.5 J	44.1 JB	25.4	26.9 J	39.8 JB
Zinc	120	270	142 J	180 J	155	133 J	209 J
Cyanide	NC	NC	0.99 UJ	45.3 J	0.98 U	3.33 J	2.66 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

TABLE C-15
TAL Metals and Cyanide - Sediment
Magna Metals Site
Page 2 of 3

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-5 971144A-04 05/14/97	SD-6 971144A-06 05/14/97	SD-7 971144A-08 05/14/97	SD-8 971121A-12 05/12/97	SD-9 971121A-13 05/12/97
Aluminum	NC	NC	19800 J	17800 J	12700 J	9370	14900 J
Antimony	2	25	1.5 UJ	1.7 UJ	1.2 UJ	0.76 U	2.4 UJ
Arsenic	6	33	7 J	19.3 J	16.9 J	4.7	5.8 BJ
Barium	NC	NC	364 J	460 J	142 J	91.6	604 J
Beryllium	NC	NC	0.62 JB	0.6 JB	0.4 UJ	0.28 B	0.82 UJ
Cadmium	0.6	9	1.1 JB	1.4 JB	1 JB	0.63 B	1.8 BJ
Calcium	NC	NC	7760 J	13000 J	4020 J	2750	11200 J
Chromium	26	110	R	R	R	34	144 J
Cobalt	NC	NC	22.2 JB	24.7 JB	20.4 J	13	41.7 J
Copper	16	110	690 J	2330 J	2080 J	46.2	129 J
Iron	20,000 (2%)	40,000 (4%)	28000 J	20200 J	23600 J	17900	38600 J
Lead	31	110	46.2 J	48.2 J	62.9 J	7.9	63.2 J
Magnesium	NC	NC	7000 J	7830 J	7120 J	7080	9420 J
Manganese	460	1100	321 J	841 J	220 J	R	R
Mercury	0.15	1.3	0.28 UJ	0.3 UJ	0.24 UJ	0.15 U	0.3 UJ
Nickel	16	50	231 J	835 J	494 J	45.6	264 J
Potassium	NC	NC	1400 JB	906 JB	831 JB	1880 J	1040 BJ
Selenium	NC	NC	19.2 J	68.2 J	46 J	2.7	9.6 J
Silver	1	2.2	0.66 JB	0.72 JB	0.66 JB	0.25 U	0.82 UJ
Sodium	NC	NC	546 JB	586 JB	311 JB	208 B	454 BJ
Thallium	NC	NC	1.5 UJ	1.7 UJ	1.2 UJ	0.76 UJ	2.4 UJ
Vanadium	NC	NC	41.6 J	36.2 J	30.6 J	32.8	49.5 J
Zinc	120	270	441 J	938 J	1890 J	67.7	226 J
Cyanide	NC	NC	1.54 UJ	52.4 J	519 J	1.43	2.37 UJ

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

Mm-mt-sd

TABLE C-15
TAL Metals and Cyanide - Sediment
Magna Metals Site
Page 3 of 3

Sample ID Laboratory ID Date Sampled	NYSDEC Sediment Crtiteria Lowest Effect Level mg/kg	NYSDEC Sediment Criteria Severe Effect Level mg/kg	SD-10 971121A-02 05/12/97	SD-11 971121A-04 05/12/97	SD-12 971144A-10 05/14/97
Aluminum	NC	NC	3490	4970	2920
Antimony	2	25	0.53 U	0.71 U	0.68 UJ
Arsenic	6	33	1.1 B	1.2 B	0.68 U
Barium	NC	NC	32.6 B	52	33.8 B
Beryllium	NC	NC	0.18 U	0.24 U	0.23 U
Cadmium	0.6	9	0.31 B	0.37 B	0.23 U
Calcium	NC	NC	3840	2590	882 B
Chromium	26	110	11.4	13.1	R
Cobalt	NC	NC	4.9 B	7.9 B	4.6 B
Copper	16	110	12.3	17.2	4.4 B
Iron	20,000 (2%)	40,000 (4%)	9820	12800	7320
Lead	31	110	3.9	5	3
Magnesium	NC	NC	4060	3950	2130
Manganese	460	1100	R	R	87
Mercury	0.15	1.3	0.11 U	0.12 U	0.082 U
Nickel	16	50	26.9	36	17.3
Potassium	NC	NC	413 B	805 B	207 B
Selenium	NC	NC	0.61 B	0.71 U	0.68 U
Silver	1	2.2	0.18 U	0.24 U	0.26 B
Sodium	NC	NC	92.7 B	104 B	59.8 B
Thallium	NC	NC	R	0.71 UJ	0.68 U
Vanadium	NC	NC	8.1 B	14.1	5.8 B
Zinc	120	270	36.8	47.2	29.3 J
Cyanide	NC	NC	0.54 U	0.57 U	0.59 U

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

Mm-mt-sd

TABLE C-16
Total Organic Carbon - Sediment
Magna Metals Site
Page 1 of 2

Sample ID	SD-1	SD-1 DUP	SD-2	SD-3	SD-4	SD-5	SD-6
Laboratory ID	1121014	1144012	1121006	1121015	1144002	1144004	1144006
Date Sampled	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97	05/14/97	05/14/97
Total Organic Carbon	38100	> 160000 J	93200	169000 J	>160000 J	88800 J	110000 J

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

Mm-tc-sd

TABLE C-16
Total Organic Carbon - Sediment
Magna Metals Site

Sample ID	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12
Laboratory ID	1144008	1121012	1121013	1121002	1121004	1144010
Date Sampled	05/14/97	05/12/97	05/12/97	05/12/97	05/12/97	05/14/97
Total Organic Carbon	84800 J	32400	160000 J	2510	8300	2590

See appendix introduction for abbreviations and data qualifiers.
Sediment results are presented in mg/kg (ppm).

TABLE C-17
TCL Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 1 of 2

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	71589001	71589002	71589003	71589004	71589008	71589009
Depth	Clean-up	6"-12"	06"-12"	06"-12"	06"-12"	06"-12"	06"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Chloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Bromomethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Vinyl Chloride	200	12 U	12 U	11 U	12 U	12 U	11 U
Chloroethane	1,900	12 U	12 U	11 U	12 U	12 U	11 U
Methylene Chloride	100	12 U	12 U	11 U	12 U	12 U	11 U
Acetone	200	12 UJ	12 UJ	11 UJ	12 UJ	12 UJ	11 UJ
Carbon Disulfide	2,700	12 U	12 U	11 U	12 U	12 U	11 U
1,1-Dichloroethene	400	12 U	12 U	11 U	12 U	12 U	11 U
1,1-Dichloroethane	200	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloroethene (total)	300	12 U	12 U	11 U	12 U	12 U	11 U
Chloroform	300	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloroethane	100	12 U	12 U	11 U	12 U	12 U	11 U
2-Butanone	300	12 U	12 U	11 U	12 U	12 U	11 U
1,1,1-Trichloroethane	800	12 U	12 U	11 U	12 U	12 U	11 U
Carbon Tetrachloride	600	12 U	12 U	11 U	12 U	12 U	11 U
Bromodichloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
1,2-Dichloropropane	NA	12 U	12 U	11 U	12 U	12 U	11 U
cis-1,3-Dichloropropene	300	12 U	12 U	11 U	12 U	12 U	11 U
Trichloroethene	700	12 U	12 U	11 U	12 U	12 U	11 U
Dibromochloromethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
1,1,2-Trichloroethane	NA	12 U	12 U	11 U	12 U	12 U	11 U
Benzene	60	12 U	12 U	11 U	12 U	12 U	11 U
trans-1,3-Dichloropropene	300	12 U	12 U	11 U	12 U	12 U	11 U
Bromoform	NA	12 U	12 U	11 U	12 U	12 U	11 U
4-Methyl-2-Pentanone	1,000	12 U	12 U	11 U	12 U	12 U	11 U
2-Hexanone	NA	12 U	12 U	11 U	12 U	12 U	11 U
Tetrachloroethene	1,400	12 U	12 U	11 U	12 U	12 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-ss

TABLE C-17
TCL Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 2 of 2

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	71589001	71589002	71589003	71589004	71589008	71589009
Depth	Clean-up	6"-12"	06"-12"	06"-12"	06"-12"	06"-12"	06"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
1,1,2,2-Tetrachloroethane	600	12 U	12 U	11 U	12 U	12 U	11 U
Toluene	1,500	12 U	12 U	11 U	12 U	12 U	11 U
Chlorobenzene	1,700	12 U	12 U	11 U	12 U	12 U	11 U
Ethylbenzene	5,500	12 U	12 U	11 U	12 U	12 U	11 U
Styrene	NA	12 U	12 U	11 U	12 U	12 U	11 U
Xylene (total)	1,200	12 U	12 U	11 U	12 U	12 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 1 of 3

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	970835A-01	970835A-02	970835A-03	970835A-04	970835A-06	970835A-07
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Phenol	30	770 U	770 U	390 U	390 U	420 U	390 U
bis(2-Chloroethyl) ether	NA	770 U	770 U	390 U	390 U	420 U	390 U
2-Chlorophenol	800	770 U	770 U	390 U	390 U	420 U	390 U
1,3-Dichlorobenzene	1,600	770 U	770 U	390 U	390 U	420 U	390 U
1,4-Dichlorobenzene	8,500	770 U	770 U	390 U	390 U	420 U	390 U
1,2-Dichlorobenzene	7,900	770 U	770 U	390 U	390 U	420 U	390 U
2-Methylphenol	100	770 U	770 U	390 U	390 U	420 U	39 J
2,2'-oxybis(1-Chloropropane)	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Methylphenol	900	770 U	770 U	390 U	390 U	420 U	390 U
N-Nitroso-di-n-propylamine	NA	770 U	770 U	390 U	390 U	420 U	390 U
Hexachloroethane	NA	770 U	770 U	390 U	390 U	420 U	390 U
Nitrobenzene	200	770 U	770 U	390 U	390 U	420 U	390 U
Isophorone	4,400	770 U	770 U	390 U	390 U	420 U	390 U
2-Nitrophenol	330	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dimethylphenol	400	770 U	770 U	390 U	390 U	420 U	390 U
bis(2-chloroethoxy)methane	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dichlorophenol	400	770 U	770 U	390 U	390 U	420 U	390 U
1,2,4-Trichlorobenzene	NA	770 U	770 U	390 U	390 U	420 U	390 U
Naphthalene	13,000	770 U	770 U	390 U	390 U	420 U	390 U
4-Chloroaniline	220	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorobutadiene	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Chloro-3-methylphenol	240	770 U	770 U	390 U	390 U	420 U	390 U
2-Methylnaphthalene	36,400	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorocyclopentadiene	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4,6-Trichlorophenol	NA	770 U	770 U	390 U	390 U	420 U	390 U
2,4,5-Trichlorophenol	100	1900 U	1900 U	980 U	990 U	1000 U	990 U
2-Chloronaphthalene	NA	770 U	770 U	390 U	390 U	420 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-ss

TABLE C-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 2 of 3

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04	SS-05
						Background	Background
Laboratory ID	Soil	970835A-01	970835A-02	970835A-03	970835A-04	970835A-06	970835A-07
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
2-Nitroaniline	430	1900 U	1900 U	980 U	990 U	1000 U	990 U
Dimethylphthalate	2,000	770 U	770 U	390 U	390 U	420 U	390 U
Acenaphthylene	41,000	770 U	770 U	390 U	390 U	420 U	390 U
2,6-Dinitrotoluene	1,000	770 U	770 U	390 U	390 U	420 U	390 U
3-Nitroaniline	500	1900 U	1900 U	980 U	990 U	1000 U	990 U
Acenaphthene	50,000	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dinitrophenol	200	1900 UJ	1900 UJ	980 U	990 U	1000 U	990 U
4-Nitrophenol	100	1900 U	1900 U	980 U	990 U	1000 U	990 U
Dibenzofuran	6,200	770 U	770 U	390 U	390 U	420 U	390 U
2,4-Dinitrotoluene	NA	770 U	770 U	390 U	390 U	420 U	390 U
Diethylphthalate	7,100	770 U	770 U	390 U	390 U	420 U	390 U
4-Chlorophenyl-phenylether	NA	770 U	770 U	390 U	390 U	420 U	390 U
Fluorene	50,000	770 U	770 U	390 U	390 U	420 U	390 U
4-Nitroaniline	NA	1900 U	1900 U	980 U	990 U	1000 U	990 U
4,6-Dinitro-2-methylphenol	NA	1900 U	1900 U	980 U	990 U	1000 U	990 U
N-Nitrosodiphenylamine	NA	770 U	770 U	390 U	390 U	420 U	390 U
4-Bromophenyl-phenylether	NA	770 U	770 U	390 U	390 U	420 U	390 U
Hexachlorobenzene	410	770 U	770 U	390 U	390 U	420 U	390 U
Pentachlorophenol	1,000	1900 U	1900 U	980 U	990 U	1000 U	990 U
Phenanthrene	50,000	28 J	26 J	11 J	45 J	21 J	55 J
Anthracene	50,000	770 U	770 U	390 U	8 J	420 U	390 U
Carbazole	NA	770 U	770 U	390 U	390 U	420 U	390 U
Di-n-butylphthalate	8,100	530 JB	610 JB	390 U	390 U	420 U	390 U
Fluoranthene	50,000	49 J	45 J	19 J	57 J	27 J	97 J
Pyrene	50,000	86 J	43 J	22 J	55 J	66 J	100 J
Butylbenzylphthalate	50,000	370 J	360 J	390 U	390 U	420 U	390 U
3,3'-Dichlorobenzidine	NA	770 U	770 U	390 U	390 U	420 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-ss

TABLE C-18
TCL Semi-Volatile Organic Compounds - Surface Soils
Magna Metals Site
Page 3 of 3

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	970835A-01	970835A-02	970835A-03	970835A-04	970835A-06	970835A-07
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97	04/11/97
Benzo(a)anthracene	224	770 U	770 U	390 U	23 J	13 J	39 J
Chrysene	400	770 U	770 U	390 U	28 J	19 J	62 J
bis(2-Ethylhexyl)phthalate	50,000	4900 B	4300 B	780 B	390 U	420 U	390 U
Di-n-octylphthalate	50,000	770 U	770 U	390 U	390 U	420 U	390 U
Benzo(b)fluoranthene	1,100	770 U	770 U	390 U	21 J	420 U	49 J
Benzo(k)fluoranthene	1,100	770 U	770 U	390 U	26 J	420 U	48 J
Benzo(a)pyrene	61	97 J	770 U	390 U	20 J	420 U	29 J
Indeno(1,2,3-cd)pyrene	3,200	81 J	770 U	390 U	22 J	420 U	41 J
Dibenz(a,h)anthracene	14	770 U	770 U	390 U	390 U	420 U	390 U
Benzo(g,h,i)perylene	50,000	770 U	770 U	390 U	46 J	420 U	390 U
Semi-Volatile TICs	NA	11260 JN	9860 JN	8550 JN	28330 JN	15990 JN	14090 JN

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-ss

TABLE C-19
TCL Pesticide/PCB Compounds - Surface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SS-01	SS-01DUP	SS-02	SS-03	SS-04 Background	SS-05 Background
Laboratory ID	Soil	71589001	71589002	71589003	71589004	71589008	71589009
Depth	Clean-up	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"	00"-12"
Date Sampled	Objectives	04/11/97	04/10/97	04/10/97	04/10/97	04/10/97	04/11/97
alpha-BHC	110	2 U	2 U	2 U	2 U	2.1 U	2 U
beta-BHC	200	2 U	2 U	2 U	2 U	2.1 U	2 U
delta-BHC	300	2 U	2 U	2 U	2 U	2.1 U	2 U
gamma-BHC (Lindane)	60	2 U	2 U	2 U	2 U	2.1 U	2 U
Heptachlor	100	2 U	2 U	2 U	2 U	2.1 U	2 U
Aldrin	41	2 U	2 U	2 U	2 U	2.1 U	2 U
Heptachlor epoxide	20	2 U	2 U	2 U	2 U	2.1 U	2 U
Endosulfan I	900	2 U	2 U	2 U	2 U	2.1 U	2 U
Dieldrin	44	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDE	2,100	7.4 JP	10	6.5	5.3	8	3.8 U
Endrin	100	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
Endosulfan II	900	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDD	2,900	3.8 U	3.8 U	7.1 JPN	3.9 U	4 U	3.8 U
Endosulfan sulfate	1,000	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
4,4'-DDT	2,100	6.6 JPN	5 JP	6.2 JPN	6.2	8.9	4.3
Methoxychlor	NA	20 U	20 U	20 U	20 U	21 U	20 U
Endrin ketone	NA	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
Endrin aldehyde	NA	3.8 U	3.8 U	3.9 U	3.9 U	4 U	3.8 U
alpha-Chlordane	NA	2 U	2 U	2 U	2 U	2.1 U	2 U
gamma-Chlordane	540	2 U	2 U	2 U	2 U	2.1 U	2 U
Toxaphene	NA	200 U	200 U	200 U	200 U	210 U	200 U
Aroclor-1016	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1221	1,000	78 U	78 U	79 U	79 U	82 U	77 U
Aroclor-1232	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1242	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1248	1,000	38 U	38 U	39 U	39 U	40 U	38 U
Aroclor-1254	1,000	56 J	62 J	46 JP	39 U	40 U	38 U
Aroclor-1260	1,000	46 J	38 J	46 JP	39 U	40 U	38 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-20
TAL Metals and Cyanide - Surface Soils
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	SS-01 970835A-01 00"-12" 04/11/97	SS-01DUP 970835A-02 00"-12" 04/11/97	SS-02 970835A-03 00"-12" 04/11/97	SS-03 970835A-04 00"-12" 04/11/97	SS-04 Background 970835A-06 00"-12" 04/11/97	SS-05 Background 970835A-07 00"-12" 04/11/97
Aluminum	SB	19,100	8660	8830	7510	8440	19100	12600
Antimony	SB	NA	0.52 UJ	0.57 UJ	0.6 UJ	0.64 UJ	0.64 UJ	0.6 UJ
Arsenic	7.5 or SB	7.5	2.4	2.5	2.2	1.6 B	3.1	2.9
Barium	300 or SB	300	46	52	46.7	42.6 B	83.2	70
Beryllium	0.16 or SB	0.59	0.35 B	0.34 B	0.3 B	0.32 B	0.59 B	0.54 B
Cadmium	1 or SB	1	0.18 UJ	0.19 UJ	0.2 UJ	0.21 UJ	0.21 UJ	0.2 UJ
Calcium	SB	847	1480	1430	1280	1540	847 B	808 B
Chromium	10 or SB	21.1	19	15.8	11.6	10.5	21.1	14.1
Cobalt	30 or SB	30	6.8 B	7.3 B	5.2 B	5.5 B	8.5 B	7.6 B
Copper	25 or SB	25	177 J	51.7 J	39	18	14.8	12.8
Iron	2,000 or SB	19,100	13700	12600	10900	11500	19100	14800
Lead	SB	18.1	10.1	10.8	9.5	8	12.2	18.1
Magnesium	SB	3,270	2830	2880	2130	2300	3270	2380
Manganese	SB	241	225	214	168	189	161	241
Mercury	0.1	0.1	0.099 U	0.11 U	0.11 U	0.11 U	0.1 U	0.11 U
Nickel	13 or SB	18.8	15	13.9	11.4	10.2	18.8	16.2
Potassium	SB	475	703 B	768 B	526 B	587 B	475 B	385 B
Selenium	2 or SB	2	1.3 J	1.1 J	1 J	1.3 J	1.2 J	1.6 J
Silver	SB	NA	0.18 U	0.19 U	0.2 U	0.21 U	0.21 U	0.2 U
Sodium	SB	96.4	78.9 B	81.9 B	74.4 B	93.1 B	96.4 B	72.3 B
Thallium	SB	NA	0.52 U	0.57 U	0.6 U	0.64 U	0.64 U	0.6 U
Vanadium	150 or SB	150	20.8 U	18.8	16	17	38.8	24.1
Zinc	20 or SB	41.1	124	94.9 J	68.7 J	41.5 J	41.1 J	34.2 J
Cyanide	NA	NA	0.54 UJ	0.56 UJ	0.58 UJ	0.57 UJ	0.55 UJ	0.55 UJ

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

Mm-mt-ss

TABLE C-21
Total Organic Carbon - Surface Soils
Magna Metals Site
Page 1 of 1

Sample ID	SS-02
Laboratory ID	2897002
Depth	00"-12"
Date Sampled	11/17/97
Total Organic Carbon	8760

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
Page 1 of 6

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	65807003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	07'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Chloromethane	NA	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
Bromomethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
Vinyl Chloride	200	12 U	11 U	11 U	11 U	11 U	11 U
Chloroethane	1,900	12 U	11 U	11 U	11 U	11 U	11 U
Methylene Chloride	100	7 J	8 J	6 J	7 J	11 U	8 U
Acetone	200	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	5 UJ
Carbon Disulfide	2,700	12 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethene	400	12 U	11 U	11 U	11 U	11 U	11 U
1,1-Dichloroethane	200	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethene (total)	300	12 U	11 U	11 U	11 U	11 U	11 U
Chloroform	300	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloroethane	100	12 U	11 U	11 U	11 U	11 U	11 U
2-Butanone	300	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
1,1,1-Trichloroethane	800	12 U	11 U	11 U	11 U	11 U	11 U
Carbon Tetrachloride	600	12 U	11 U	11 U	11 U	11 U	11 U
Bromodichloromethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
1,2-Dichloropropane	NA	12 U	11 U	11 U	11 U	11 U	11 U
cis-1,3-Dichloropropene	300	12 U	11 U	11 U	11 U	11 U	11 U
Trichloroethene	700	12 U	11 U	11 U	11 U	11 U	11 U
Dibromochloromethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
1,1,2-Trichloroethane	NA	12 U	11 U	11 U	11 U	11 U	11 U
Benzene	60	12 U	11 U	11 U	11 U	11 U	11 U
trans-1,3-Dichloropropene	300	12 U	11 U	11 U	11 U	11 U	11 U
Bromoform	NA	12 U	11 U	11 U	11 U	11 U	11 U
4-Methyl-2-Pentanone	1,000	12 U	11 U	11 U	11 U	11 U	11 U
2-Hexanone	NA	12 U	11 U	11 U	11 U	11 U	11 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	65807003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	07'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Tetrachloroethene	1,400	12 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	600	12 U	11 U	11 U	11 U	11 U	11 U
Toluene	1,500	12 U	11 U	11 U	11 U	11 U	11 U
Chlorobenzene	1,700	12 U	11 U	11 U	11 U	11 U	11 U
Ethylbenzene	5,500	12 U	11 U	11 U	11 U	11 U	11 U
Styrene	NA	12 U	11 U	11 U	11 U	11 U	11 U
Xylene (total)	1,200	12 U	11 U	11 U	11 U	11 U	11 U
Volatile TICs	NA	31 JN	29 JN	42 JN	200 JN	21 JN	30 JN

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	65807009	65807010	75528009	75528010	75528006	75528007
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Chloromethane	NA	11 UJ	11 UJ	10 U	10 U	10 U	10 U
Bromomethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
Vinyl Chloride	200	11 U	11 U	10 U	10 U	10 U	10 U
Chloroethane	1,900	11 U	11 U	10 U	10 U	10 U	10 U
Methylene Chloride	100	11 U	11 U	10 U	5 JB	10 U	4 JB
Acetone	200	11 UJ	11 UJ	5 JB	6 JB	5 JB	7 JB
Carbon Disulfide	2,700	11 U	11 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	400	11 U	11 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	200	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	300	11 U	11 U	10 U	10 U	10 U	10 U
Chloroform	300	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	100	11 U	11 U	10 U	10 U	10 U	10 U
2-Butanone	300	11 UJ	11 UJ	10 U	10 U	10 U	4 J
1,1,1-Trichloroethane	800	11 U	11 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	600	11 U	11 U	10 U	10 U	10 U	10 U
Bromodichloromethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	NA	11 U	11 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	300	11 U	11 U	10 U	10 U	10 U	10 U
Trichloroethene	700	35	29	10 U	10 U	10 U	10 U
Dibromochloromethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	NA	11 U	11 U	10 U	10 U	10 U	10 U
Benzene	60	11 U	11 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	300	11 U	11 U	10 U	10 U	10 U	10 U
Bromoform	NA	11 U	11 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	1,000	11 U	11 U	10 U	10 U	10 U	4 J
2-Hexanone	NA	11 U	11 U	10 U	10 U	10 U	5 J

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	65807009	65807010	75528009	75528010	75528006	75528007
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Tetrachloroethene	1,400	11 U	11 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	600	11 U	11 U	10 U	10 U	10 U	3 J
Toluene	1,500	11 U	11 U	10 U	10 U	10 U	10 U
Chlorobenzene	1,700	11 U	11 U	10 U	10 U	10 U	10 U
Ethylbenzene	5,500	11 U	11 U	10 U	10 U	10 U	10 U
Styrene	NA	11 U	11 U	10 U	10 U	10 U	10 U
Xylene (total)	1,200	11 U	11 U	10 U	10 U	10 U	10 U
Volatile TICs	NA	56 JN	50 JN	--	--	--	--

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	75528008	75528001	75528003	75528004
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Chloromethane	NA	10 U	10 U	10 U	10 U
Bromomethane	NA	10 U	10 U	10 U	10 U
Vinyl Chloride	200	10 U	10 U	10 U	10 U
Chloroethane	1,900	10 U	10 U	10 U	10 U
Methylene Chloride	100	4 JB	4 JB	4 JB	4 JB
Acetone	200	5 JB	6 JB	5 JB	7 JB
Carbon Disulfide	2,700	10 U	10 U	10 U	10 U
1,1-Dichloroethene	400	10 U	10 U	10 U	10 U
1,1-Dichloroethane	200	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	300	10 U	10 U	10 U	10 U
Chloroform	300	10 U	10 U	10 U	10 U
1,2-Dichloroethane	100	10 U	10 U	10 U	10 U
2-Butanone	300	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	800	10 U	10 U	10 U	10 U
Carbon Tetrachloride	600	10 U	10 U	10 U	10 U
Bromodichloromethane	NA	10 U	10 U	10 U	10 U
1,2-Dichloropropane	NA	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	300	10 U	10 U	10 U	10 U
Trichloroethene	700	10 U	10 U	4 J	10 U
Dibromochloromethane	NA	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	NA	10 U	10 U	10 U	10 U
Benzene	60	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	300	10 U	10 U	10 U	10 U
Bromoform	NA	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	1,000	10 U	10 U	10 U	10 U
2-Hexanone	NA	10 U	10 U	10 U	10 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-22
TCL Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
Page 6 of 6

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	75528008	75528001	75528003	75528004
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Tetrachloroethene	1,400	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	600	10 U	10 U	10 U	10 U
Toluene	1,500	10 U	10 U	10 U	10 U
Chlorobenzene	1,700	10 U	10 U	10 U	10 U
Ethylbenzene	5,500	10 U	10 U	10 U	10 U
Styrene	NA	10 U	10 U	10 U	10 U
Xylene (total)	1,200	10 U	10 U	10 U	10 U
Volatile TICs	NA	--	--	--	--

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-va-sb

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	962803A-01	962803A-02	962803A-03	962803A-04	962803A-05	962803A-06
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Phenol	30	380 U	370 U	370 U	370 U	360 U	390 U
bis(2-Chloroethyl) ether	NA	380 U	370 U	370 U	370 U	360 U	390 U
2-Chlorophenol	800	380 U	370 U	370 U	370 U	360 U	390 U
1,3-Dichlorobenzene	1,600	380 U	370 U	370 U	370 U	360 U	390 U
1,4-Dichlorobenzene	8,500	380 U	370 U	370 U	370 U	360 U	390 U
1,2-Dichlorobenzene	7,900	380 U	370 U	370 U	370 U	360 U	390 U
2-Methylphenol	100	380 U	370 U	370 U	370 U	360 U	390 U
2,2'-oxybis(1-Chloropropane)	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Methylphenol	900	380 U	370 U	370 U	370 U	360 U	390 U
N-Nitroso-di-n-propylamine	NA	380 U	370 U	370 U	370 U	360 U	390 U
Hexachloroethane	NA	380 U	370 U	370 U	370 U	360 U	390 U
Nitrobenzene	200	380 U	370 U	370 U	370 U	360 U	390 U
Isophorone	4,400	380 U	370 U	370 U	370 U	360 U	390 U
2-Nitrophenol	330	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dimethylphenol	400	380 U	370 U	370 U	370 U	360 U	390 U
bis (2-Chloroethoxy) methane	NA	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dichlorophenol	400	380 U	370 U	370 U	370 U	360 U	390 U
1,2,4-Trichlorobenzene	NA	380 U	370 U	370 U	370 U	360 U	390 U
Naphthalene	13,000	380 U	370 U	370 U	370 U	360 U	390 U
4-Chloroaniline	220	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorobutadiene	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Chloro-3-methylphenol	240	380 U	370 U	370 U	370 U	360 U	390 U
2-Methylnaphthalene	36,400	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorocyclopentadiene	NA	380 UJ	370 UJ	370 UJ	370 UJ	360 UJ	390 UJ
2,4,6-Trichlorophenol	NA	380 U	370 U	370 U	370 U	360 U	390 U
2,4,5-Trichlorophenol	100	960 U	920 U	920 U	930 U	910 U	980 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	962803A-01	962803A-02	962803A-03	962803A-04	962803A-05	962803A-06
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
2-Chloronaphthalene	NA	380 U	370 U	370 U	370 U	360 U	390 U
2-Nitroaniline	430	960 U	920 U	920 U	930 U	910 U	980 U
Dimethylphthalate	2,000	380 U	370 U	370 U	370 U	360 U	390 U
Acenaphthylene	41,000	380 U	370 U	370 U	370 U	360 U	390 U
2,6-Dinitrotoluene	1,000	380 U	370 U	370 U	370 U	360 U	390 U
3-Nitroaniline	500	960 U	920 U	920 U	930 U	910 U	980 U
Acenaphthene	50,000	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dinitrophenol	200	960 U	920 U	920 U	930 U	910 U	980 U
4-Nitrophenol	100	960 U	920 U	920 U	930 U	910 U	980 U
Dibenzofuran	6,200	380 U	370 U	370 U	370 U	360 U	390 U
2,4-Dinitrotoluene	NA	380 U	370 U	370 U	370 U	360 U	390 U
Diethylphthalate	7,100	380 U	370 U	370 U	370 U	360 U	390 U
4-Chlorophenyl-phenylether	NA	380 U	370 U	370 U	370 U	360 U	390 U
Fluorene	50,000	380 U	370 U	370 U	370 U	360 U	390 U
4-Nitroaniline	NA	960 U	920 U	920 U	930 U	910 U	980 U
4,6-Dinitro-2-methylphenol	NA	960 U	920 U	920 U	930 U	910 U	980 U
N-Nitrosodiphenylamine	NA	380 U	370 U	370 U	370 U	360 U	390 U
4-Bromophenyl-phenylether	NA	380 U	370 U	370 U	370 U	360 U	390 U
Hexachlorobenzene	410	380 U	370 U	370 U	370 U	360 U	390 U
Pentachlorophenol	1,000	960 U	920 U	920 U	930 U	910 U	980 U
Phenanthrene	50,000	19 J	6 J	370 U	370 U	360 U	390 U
Anthracene	50,000	4 J	370 U	370 U	370 U	360 U	390 U
Carbazole	NA	380 U	370 U	370 U	370 U	360 U	390 U
Di-n-butylphthalate	8,100	380 U	370 U	370 U	660 B	360 U	390 U
Fluoranthene	50,000	17 J	9 J	370 U	370 U	8 J	390 U
Pyrene	50,000	16 J	8 J	370 U	370 U	8 J	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-sb

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	962803A-01	962803A-02	962803A-03	962803A-04	962803A-05	962803A-06
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Butylbenzylphthalate	50,000	380 U	370 U	13 J	43 J	360 U	390 U
3,3'-Dichlorobenzidine	NA	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(a)anthracene	224	380 U	370 U	370 U	370 U	360 U	390 U
Chrysene	400	380 U	370 U	370 U	370 U	360 U	390 U
bis(2-Ethylhexyl)phthalate	50,000	380 U	370 U	370 U	370 U	360 U	390 U
Di-n-octylphthalate	50,000	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(b)fluoranthene	1,100	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(k)fluoranthene	1,100	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(a)pyrene	61	380 U	370 U	370 U	370 U	360 U	390 U
Indeno(1,2,3-cd)pyrene	3,200	380 U	370 U	370 U	370 U	360 U	390 U
Dibenz(a,h)anthracene	14	380 U	370 U	370 U	370 U	360 U	390 U
Benzo(g,h,i)perylene	50,000	380 U	370 U	370 U	370 U	360 U	390 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Phenol	30	370 U	380 U	370 U	360 U	350 U	360 U
bis(2-Chloroethyl) ether	NA	370 U	380 U	370 U	360 U	350 U	360 U
2-Chlorophenol	800	370 U	380 U	370 U	360 U	350 U	360 U
1,3-Dichlorobenzene	1,600	370 U	380 U	370 U	360 U	350 U	360 U
1,4-Dichlorobenzene	8,500	370 U	380 U	370 U	360 U	350 U	360 U
1,2-Dichlorobenzene	7,900	370 U	380 U	370 U	360 U	350 U	360 U
2-Methylphenol	100	370 U	380 U	370 U	360 U	350 U	360 U
2,2'-oxybis(1-Chloropropane)	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Methylphenol	900	370 U	380 U	370 U	360 U	350 U	360 U
N-Nitroso-di-n-propylamine	NA	370 U	380 U	370 U	360 U	350 U	360 U
Hexachloroethane	NA	370 U	380 U	370 U	360 U	350 U	360 U
Nitrobenzene	200	370 U	380 U	370 U	360 U	350 U	360 U
Isophorone	4,400	370 U	380 U	370 U	360 U	350 U	360 U
2-Nitrophenol	330	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dimethylphenol	400	370 U	380 U	370 U	360 U	350 U	360 U
bis (2-Chloroethoxy) methane	NA	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dichlorophenol	400	370 U	380 U	370 U	360 U	350 U	360 U
1,2,4-Trichlorobenzene	NA	370 U	380 U	370 U	360 U	350 U	360 U
Naphthalene	13,000	370 U	380 U	370 U	360 U	350 U	360 U
4-Chloroaniline	220	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorobutadiene	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Chloro-3-methylphenol	240	370 U	380 U	370 U	360 U	350 U	360 U
2-Methylnaphthalene	36,400	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorocyclopentadiene	NA	370 UJ	380 UJ	370 U	360 U	350 U	360 U
2,4,6-Trichlorophenol	NA	370 U	380 U	370 U	360 U	350 U	360 U
2,4,5-Trichlorophenol	100	920 U	940 U	920 U	910 U	890 U	900 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
2-Chloronaphthalene	NA	370 U	380 U	370 U	360 U	350 U	360 U
2-Nitroaniline	430	920 U	940 U	920 U	910 U	890 U	900 U
Dimethylphthalate	2,000	370 U	380 U	370 U	360 U	350 U	360 U
Acenaphthylene	41,000	370 U	380 U	370 U	360 U	350 U	360 U
2,6-Dinitrotoluene	1,000	370 U	380 U	370 U	360 U	350 U	360 U
3-Nitroaniline	500	920 U	940 U	920 U	910 U	890 U	900 U
Acenaphthene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dinitrophenol	200	920 U	940 U	920 U	910 U	890 U	900 U
4-Nitrophenol	100	920 U	940 U	920 U	910 U	890 U	900 U
Dibenzofuran	6,200	370 U	380 U	370 U	360 U	350 U	360 U
2,4-Dinitrotoluene	NA	370 U	380 U	370 U	360 U	350 U	360 U
Diethylphthalate	7,100	370 U	380 U	370 U	360 U	13 JB	360 U
4-Chlorophenyl-phenylether	NA	370 U	380 U	370 U	360 U	350 U	360 U
Fluorene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
4-Nitroaniline	NA	920 U	940 U	920 U	910 U	890 U	900 U
4,6-Dinitro-2-methylphenol	NA	920 U	940 U	920 U	910 U	890 U	900 U
N-Nitrosodiphenylamine	NA	370 U	380 U	370 U	360 U	350 U	360 U
4-Bromophenyl-phenylether	NA	370 U	380 U	370 U	360 U	350 U	360 U
Hexachlorobenzene	410	370 U	380 U	370 U	360 U	350 U	360 U
Pentachlorophenol	1,000	920 U	940 U	920 U	910 U	890 U	900 U
Phenanthrene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Anthracene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Carbazole	NA	370 U	380 U	370 U	360 U	350 U	360 U
Di-n-butylphthalate	8,100	370 U	380 U	31 JB	22 JB	13 JB	42 JB
Fluoranthene	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Pyrene	50,000	370 U	380 U	370 U	360 U	350 U	360 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Butylbenzylphthalate	50,000	370 U	380 U	370 U	360 U	350 U	360 U
3,3'-Dichlorobenzidine	NA	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(a)anthracene	224	370 U	380 U	370 U	360 U	350 U	360 U
Chrysene	400	370 U	380 U	370 U	360 U	350 U	360 U
bis(2-Ethylhexyl)phthalate	50,000	370 U	380 U	370 U	43 JB	31 JB	38 JB
Di-n-octylphthalate	50,000	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(b)fluoranthene	1,100	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(k)fluoranthene	1,100	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(a)pyrene	61	370 U	380 U	370 U	360 U	350 U	360 U
Indeno(1,2,3-cd)pyrene	3,200	370 U	380 U	370 U	360 U	350 U	360 U
Dibenz(a,h)anthracene	14	370 U	380 U	370 U	360 U	350 U	360 U
Benzo(g,h,i)perylene	50,000	370 U	380 U	370 U	360 U	350 U	360 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-sb

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	972897A-07	972897A-01	972897A-03	972897A-04
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Phenol	30	350 U	350 U	370 U	350 U
bis(2-Chloroethyl) ether	NA	350 U	350 U	370 U	350 U
2-Chlorophenol	800	350 U	350 U	370 U	350 U
1,3-Dichlorobenzene	1,600	350 U	350 U	370 U	350 U
1,4-Dichlorobenzene	8,500	350 U	350 U	370 U	350 U
1,2-Dichlorobenzene	7,900	350 U	350 U	370 U	350 U
2-Methylphenol	100	350 U	350 U	370 U	350 U
2,2'-oxybis(1-Chloropropane)	NA	350 U	350 U	370 U	350 U
4-Methylphenol	900	350 U	350 U	370 U	350 U
N-Nitroso-di-n-propylamine	NA	350 U	350 U	370 U	350 U
Hexachloroethane	NA	350 U	350 U	370 U	350 U
Nitrobenzene	200	350 U	350 U	370 U	350 U
Isophorone	4,400	350 U	350 U	370 U	350 U
2-Nitrophenol	330	350 U	350 U	370 U	350 U
2,4-Dimethylphenol	400	350 U	350 U	370 U	350 U
bis (2-Chloroethoxy) methane	NA	350 U	350 U	370 U	350 U
2,4-Dichlorophenol	400	350 U	350 U	370 U	350 U
1,2,4-Trichlorobenzene	NA	350 U	350 U	370 U	350 U
Naphthalene	13,000	350 U	350 U	370 U	350 U
4-Chloroaniline	220	350 U	350 U	370 U	350 U
Hexachlorobutadiene	NA	350 U	350 U	370 U	350 U
4-Chloro-3-methylphenol	240	350 U	350 U	370 U	350 U
2-Methylnaphthalene	36,400	350 U	350 U	370 U	350 U
Hexachlorocyclopentadiene	NA	350 U	350 U	370 U	350 U
2,4,6-Trichlorophenol	NA	350 U	350 U	370 U	350 U
2,4,5-Trichlorophenol	100	890 U	880 U	920 U	870 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	972897A-07	972897A-01	972897A-03	972897A-04
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
2-Chloronaphthalene	NA	350 U	350 U	370 U	350 U
2-Nitroaniline	430	890 U	880 U	920 U	870 U
Dimethylphthalate	2,000	350 U	350 U	370 U	350 U
Acenaphthylene	41,000	350 U	350 U	370 U	350 U
2,6-Dinitrotoluene	1,000	350 U	350 U	370 U	350 U
3-Nitroaniline	500	890 U	880 U	920 U	870 U
Acenaphthene	50,000	350 U	350 U	370 U	350 U
2,4-Dinitrophenol	200	890 U	880 U	920 U	870 U
4-Nitrophenol	100	890 U	880 U	920 U	870 U
Dibenzofuran	6,200	350 U	350 U	370 U	350 U
2,4-Dinitrotoluene	NA	350 U	350 U	370 U	350 U
Diethylphthalate	7,100	350 U	350 U	13 JB	350 U
4-Chlorophenyl-phenylether	NA	350 U	350 U	370 U	350 U
Fluorene	50,000	350 U	350 U	370 U	350 U
4-Nitroaniline	NA	890 U	880 U	920 U	870 U
4,6-Dinitro-2-methylphenol	NA	890 U	880 U	920 U	870 U
N-Nitrosodiphenylamine	NA	350 U	350 U	370 U	350 U
4-Bromophenyl-phenylether	NA	350 U	350 U	370 U	350 U
Hexachlorobenzene	410	350 U	350 U	370 U	350 U
Pentachlorophenol	1,000	890 U	880 U	920 U	870 U
Phenanthrene	50,000	350 U	350 U	370 U	350 U
Anthracene	50,000	350 U	350 U	370 U	350 U
Carbazole	NA	350 U	350 U	370 U	350 U
Di-n-butylphthalate	8,100	41 JB	12 JB	25 JB	14 JB
Fluoranthene	50,000	350 U	350 U	370 U	350 U
Pyrene	50,000	350 U	350 U	370 U	350 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-sb

TABLE C-23
TCL Semi-Volatile Organic Compounds - Subsurface Soils
Magna Metals Site

Sample ID	NYSDEC Recommended	MW-02	MW-03	MW-04	MW-04
Laboratory ID	Soil	972897A-07	972897A-01	972897A-03	972897A-04
Depth	Clean-up	12'-14'	06'-08'	06'-08'	12'-14'
Date Sampled	Objectives	11/18/97	11/17/97	11/18/97	11/18/97
Butylbenzylphthalate	50,000	350 U	350 U	370 U	350 U
3,3'-Dichlorobenzidine	NA	350 U	350 U	370 U	350 U
Benzo(a)anthracene	224	350 U	350 U	370 U	350 U
Chrysene	400	350 U	350 U	370 U	350 U
bis(2-Ethylhexyl)phthalate	50,000	56 JB	17 JB	100 JB	12 JB
Di-n-octylphthalate	50,000	350 U	350 U	370 U	13 J
Benzo(b)fluoranthene	1,100	350 U	350 U	370 U	350 U
Benzo(k)fluoranthene	1,100	350 U	350 U	370 U	350 U
Benzo(a)pyrene	61	350 U	350 U	18 J	350 U
Indeno(1,2,3-cd)pyrene	3,200	350 U	350 U	370 U	350 U
Dibenz(a,h)anthracene	14	350 U	350 U	370 U	350 U
Benzo(g,h,i)perylene	50,000	350 U	350 U	160 J	350 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-sv-sb

TABLE C-24
TCL Pesticide/PCB Compounds - Subsurface Soils
Magna Metals Site
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Sample ID	NYSDEC Recommended	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	65807002	6587003	65807004	65807005	65807007	65807008
Depth	Clean-up	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
alpha-BHC	110	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ
beta-BHC	200	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
delta-BHC	300	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
gamma-BHC (Lindane)	60	2 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Heptachlor	100	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Aldrin	41	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Heptachlor epoxide	20	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Endosulfan I	900	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Dieldrin	44	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDE	2,100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endrin	100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endosulfan II	900	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDD	2,900	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endosulfan sulfate	1,000	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
4,4'-DDT	2,100	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Methoxychlor	NA	20 U	19 U	19 U	19 U	19 U	19 U
Endrin ketone	NA	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
Endrin aldehyde	NA	3.9 U	3.7 U	3.7 U	3.7 U	3.6 U	3.8 U
alpha-Chlordane	NA	2 U	1.9 U	1.9 U	2 JPN	1.9 U	1.9 U
gamma-Chlordane	540	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Toxaphene	NA	200 U	190 U	190 U	190 U	190 U	190 U
Aroclor-1016	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1221	10,000	80 U	74 U	74 U	74 U	74 U	76 U
Aroclor-1232	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1242	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1248	10,000	39 U	37 U	37 U	37 U	36 U	38 U
Aroclor-1254	10,000	39 U	37 U	24 JP	160 JP	36 U	38 U
Aroclor-1260	10,000	39 U	37 U	37 U	37 U	36 U	38 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-pp-sb

TABLE C-24
TCL Pesticide/PCB Compounds - Subsurface Soils
Magna Metals Site
Page 2 of 2

Sample ID	NYSDEC Recommended	SB-7	SB-7DUP	MW-04
Laboratory ID	Soil	65807009	65807010	75528004
Depth	Clean-up	03.5'-05.5'	03.5'-05.5'	12'-14'
Date Sampled	Objectives	12/11/96	12/11/96	11/18/97
alpha-BHC	110	1.9 UJ	1.9 UJ	0.05 JP
beta-BHC	200	1.9 U	1.9 U	0.86 U
delta-BHC	300	1.9 U	1.9 U	0.86 U
gamma-BHC (Lindane)	60	1.9 UJ	1.9 UJ	0.86 U
Heptachlor	100	1.9 U	1.9 U	0.19 JP
Aldrin	41	1.9 U	1.9 U	0.86 U
Heptachlor epoxide	20	1.9 U	1.9 U	0.86 U
Endosulfan I	900	1.9 U	1.9 U	0.32 JP
Dieldrin	44	3.8 U	3.8 U	0.28 JP
4,4'-DDE	2,100	3.8 U	3.8 U	1.7 U
Endrin	100	3.8 U	3.8 U	1.7 U
Endosulfan II	900	3.8 U	3.8 U	0.15 JP
4,4'-DDD	2,900	3.8 U	3.8 U	0.98 JP
Endosulfan sulfate	1,000	3.8 U	3.8 U	1.7 U
4,4'-DDT	2,100	3.8 U	3.8 U	0.92 JP
Methoxychlor	NA	19 U	19 U	8.6 U
Endrin ketone	NA	3.8 U	3.8 U	1.7 U
Endrin aldehyde	NA	3.8 U	3.8 U	1.7 U
alpha-Chlordane	NA	1.9 U	1.9 U	0.27 JP
gamma-Chlordane	540	1.9 U	1.9 U	0.86 U
Toxaphene	NA	190 U	190 U	86 U
Aroclor-1016	10,000	38 U	38 U	17 U
Aroclor-1221	10,000	76 U	76 U	34 U
Aroclor-1232	10,000	38 U	38 U	17 U
Aroclor-1242	10,000	38 U	38 U	17 U
Aroclor-1248	10,000	38 U	38 U	17 U
Aroclor-1254	10,000	280 JP	240 JP	17 U
Aroclor-1260	10,000	38 U	38 U	17 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in ug/kg (ppb).

Mm-pp-sb

TABLE C-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site
Page 1 of 3

Sample ID	NYSDEC Recommended	Most Stringent of Soil Clean-up	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
Laboratory ID	Soil	Objective or	962803A-01	962803A-02	962803A-03	962803A-04	962803A-05	962803A-06
Depth	Clean-up	Maximum	04'-06'	08'-09.5'	08'-09.5'	06.5'-08.5'	04.5'-06.5'	07'-10'
Date Sampled	Objectives	Site Background	12/10/96	12/10/96	12/10/96	12/10/96	12/11/96	12/11/96
Aluminum	SB	5,040	14471	7099	5274.3	5213.5	4554.3	6426.2
Antimony	SB	ND	0.96 UJ	1.2 UJ	1.2 UJ	1 UJ	0.94 UJ	1.4 UJ
Arsenic	7.5 or SB	7.5	30.8 J	27.6 J	10 J	27.6 J	6	8.4
Barium	300 or SB	300	69.7	53	34.1 B	40.5	43.7	38 B
Beryllium	0.16 or SB	0.32	0.43 B	0.3 B	0.19 U	0.21 B	0.17 B	0.27 B
Cadmium	1 or SB	1	0.16 U	0.19 U	0.19 U	0.17 U	0.16 U	0.23 U
Calcium	SB	1,690	1195.5	1413.2	1660.3	1452	925	1263.3
Chromium	10 or SB	10	36.2	13.8	48.7	48	7.5	36.2
Cobalt	30 or SB	30	9 J	5.1 B	4 B	3.2 B	4 B	4.2 B
Copper	25 or SB	25	40.4	52.2	83.8	249	369	1309
Iron	2,000 or SB	10,000	19186	11697	8393	6463.3	6198.5	7892.7
Lead	SB	3.7	8	4.3	12.9	6.7	2.9	5.3
Magnesium	SB	2,100	3545.3	2201.2	1982.2	1648.8	1408.3	1952.1
Manganese	SB	250	177 J	282 J	140 J	183 J	226 J	156 J
Mercury	0.1	0.1	0.1 U	0.095 U	0.076 U	0.11 U	0.088 U	0.12
Nickel	13 or SB	15.2	46.9 J	108 J	62.5 J	84.2 J	38.9 J	93.5 J
Potassium	SB	864	678 B	869 B	655 B	527 B	398 B	543 B
Selenium	2 or SB	2	2.8 J	0.97 UJ	0.96 UJ	2.2 J	7.8	11.7
Silver	SB	ND	0.16 UJ	0.19 UJ	0.19 UJ	0.17 UJ	0.16 UJ	0.23 UJ
Sodium	SB	86.8	124 B	152 B	209 B	122 B	98.7 B	135 B
Thallium	SB	ND	1.8 J	1.5 UJ	1.5 UJ	1.4 UJ	1.3 UJ	1.8 UJ
Vanadium	150 or SB	150	32.7	12.6	10.2	8.3 B	8.2	10.6 B
Zinc	20 or SB	23.3	77.4	209	123	617	28.7	764
Cyanide	NA	NA	1.95	72	14.9	49.1	0.51 U	225

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

Mm-mt-sb

TABLE C-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site
Page 2 of 3

Sample ID	NYSDEC Recommended	Most Stringent of Soil Clean-up	SB-7	SB-7DUP	MW-01 Background	MW-01 Background	MW-02	MW-02DUP
Laboratory ID	Soil	Objective or	962803A-07	962803A-08	972897A-08	972897A-09	972897A-05	972897A-06
Depth	Clean-up	Maximum	03.5'-05.5'	03.5'-05.5'	06'-08'	12'-14'	06'-08'	06'-08'
Date Sampled	Objectives	Site Background	12/11/96	12/11/96	11/19/97	11/19/97	11/18/97	11/18/97
Aluminum	SB	5,040	21295	18074	2260	5040	3190	3540
Antimony	SB	ND	1.2 UJ	1.1 UJ	1.8 U	1.8 U	1.7 U	1.7 U
Arsenic	7.5 or SB	7.5	3.8	3.5	0.66 U	1.6 B	1.1 B	0.87 B
Barium	300 or SB	300	721	484	74	81.9	19.7 B	20 B
Beryllium	0.16 or SB	0.32	0.24 B	0.23 B	0.24 B	0.32 B	0.29 B	0.3 B
Cadmium	1 or SB	1	0.19 U	0.18 U	0.22 U	0.22 U	0.22 U	0.22 U
Calcium	SB	1,690	5124.1	4792.8	1690	1560	664 B	771 B
Chromium	10 or SB	10	5.9	5.7	2.2 B	6.8	3.1	3.5
Cobalt	30 or SB	30	24.3 J	18 J	3.2 B	4.6 B	2.5 B	2.7 B
Copper	25 or SB	25	87.2	71.2	13.7	20.6	45.9	42.8
Iron	2,000 or SB	10,000	24435	18931	4350	10000	3880	5040
Lead	SB	3.7	4.3	5	2.2	3.7	2.8	2.9
Magnesium	SB	2,100	11389	8583.6	1030 B	2100	770 B	994 B
Manganese	SB	250	179 J	160 J	171	250	121	122
Mercury	0.1	0.1	0.1 U	0.079 U	0.11 U	0.11 U	0.25	0.17
Nickel	13 or SB	15.2	15.5 J	11.9 J	6.7 B	15.2	10.4	10.5
Potassium	SB	864	6993.6 J	4652.7 J	487 B	864 B	267 B	341 B
Selenium	2 or SB	2	0.97 U	0.93 U	0.89 U	0.9 B	1.6	0.99 B
Silver	SB	ND	0.19 UJ	0.18 UJ	0.22 U	0.22 U	0.22 U	0.22 U
Sodium	SB	86.8	481 B	485 B	50 B	86.8 B	53.9 B	52.8 B
Thallium	SB	ND	1.6 UJ	1.5 UJ	1.1 U	1.1 U	1.1 U	1.1 U
Vanadium	150 or SB	150	69	52.4	7.2 B	11.6	4.5 B	5 B
Zinc	20 or SB	23.3	302	282	11.2	23.3	10.3	13.2
Cyanide	NA	NA	6.6	5.12	0.55 U	0.56 U	0.54 U	0.55 U

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

Mm-mt-sb

TABLE C-25
TAL Metals and Cyanide - Subsurface Soils
Magna Metals Site
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Sample ID Laboratory ID Depth Date Sampled	NYSDEC Recommended Soil Clean-up Objectives	Most Stringent of Soil Clean-up Objective or Maximum Site Background	MW-02 972897A-07 12'-14' 11/18/97	MW-03 972897A-01 06'-08' 11/17/97	MW-04 972897A-03 06'-08' 11/18/97	MW-04 972897A-04 12'-14' 11/18/97
Aluminum	SB	5,040	3500	3230	7500	8480
Antimony	SB	ND	1.7 U	1.7 U	1.8 U	1.7 U
Arsenic	7.5 or SB	7.5	18.5	9.5	2 B	20.4
Barium	300 or SB	300	54.4	22.6 B	39.3 B	434
Beryllium	0.16 or SB	0.32	0.21 U	0.25 B	0.36 B	0.4 B
Cadmium	1 or SB	1	0.21 U	0.21 U	0.22 U	0.21 U
Calcium	SB	1,690	1850	927 B	1310	5110
Chromium	10 or SB	10	61.1	4.3	9.4	13.3
Cobalt	30 or SB	30	20.8	2.3 B	5.6 B	10.1 B
Copper	25 or SB	25	114	695	23.2	19.4
Iron	2,000 or SB	10,000	10800	4960	11400	13400
Lead	SB	3.7	1.1	2.7	5.2	2
Magnesium	SB	2,100	5480	970 B	2150	5230
Manganese	SB	250	304	146	177	162
Mercury	0.1	0.1	0.2	0.11 U	0.11 U	0.1 U
Nickel	13 or SB	15.2	39	28.4	11.3	7.4 B
Potassium	SB	864	300 B	358 B	548 B	3190
Selenium	2 or SB	2	1.9	6.7	1.8	8.6
Silver	SB	ND	0.21 U	0.21 U	0.22 U	0.21 U
Sodium	SB	86.8	196 B	62.5 B	115 B	548 B
Thallium	SB	ND	1.1 U	1.1 U	1.1 U	1 U
Vanadium	150 or SB	150	18.4	5.2 B	16.6	37.3
Zinc	20 or SB	23.3	32.4	37.7	39.3	34.3
Cyanide	NA	NA	7.24	19.9	0.6	2.34

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

Mm-mt-sb

TABLE C-26
Total Organic Carbon - Subsurface Soils
Magna Metals Site

Sample ID	MW-01 Background	MW-02	MW-03	MW-04
Laboratory ID	972897A-09	972897A-07	972897A-01	972897A-04
Depth	12'-14'	12'-14'	06'-08'	12'-14'
Date Sampled	11/19/97	11/18/97	11/17/97	11/18/97
Total Organic Carbon	1050	1180	1360	806

See appendix introduction for abbreviations and data qualifiers.
Soil results are presented in mg/kg (ppm).

TABLE C-27
TCL Volatile Organic Compounds - Groundwater
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 82228003 05/11/98	GW-02 82228004 05/11/98	GW-03 82228008 05/12/98	GW-04 82228009 05/12/98	GW-05 Duplicate of GW-04 82228010 05/12/98
Chloromethane	5	1 U	1 U	5 U	250 U	1 U
Bromomethane	5	1 U	1 U	5 U	250 U	1 U
Vinyl Chloride	2	1 U	1 U	5 U	250 U	1 U
Chloroethane	5	1 U	1 U	5 U	250 U	1 U
Methylene Chloride	5	2 U	2 U	10 U	500 U	2 U
Acetone	50	5 U	5 U	25 U	1200 U	5 U
Carbon Disulfide	NA	1 U	1 U	5 U	250 U	1 U
1,1-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
1,1-Dichloroethane	5	1 U	1 U	5 U	250 U	1 U
cis-1,2-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
trans-1,2-Dichloroethene	5	1 U	1 U	5 U	250 U	1 U
Chloroform	7	1 U	1 U	5 U	250 U	1 U
1,2-Dichloroethane	5	1 U	1 U	5 U	250 U	1 U
2-Butanone	50	5 U	5 U	25 U	1200 U	5 U
Bromochloromethane	5	1 U	1 U	5 U	250 U	1 U
1,1,1-Trichloroethane	5	1 U	1 U	5 U	250 U	1 U
Carbon Tetrachloride	5	1 U	1 U	5 U	250 U	1 U
Bromodichloromethane	50	1 U	1 U	5 U	250 U	1 U
1,2-Dichloropropane	5	1 U	1 U	5 U	250 U	1 U
cis-1,3-Dichloropropene	5	1 U	1 U	5 U	250 U	1 U
Trichloroethene	5	1 U	3.7	68	4700	2700 D
Dibromochloromethane	50	1 U	1 U	5 U	250 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	5 U	250 U	1 U
Benzene	0.7	1 U	1 U	5 U	250 U	1 U
trans-1,3-Dichloropropene	5	1 U	1 U	5 U	250 U	1 U
Bromoform	50	1 U	1 U	5 U	250 U	1 U
4-Methyl-2-Pentanone	NA	5 U	5 U	25 U	1200 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-27
TCL Volatile Organic Compounds - Groundwater
Magna Metals Site
Page 2 of 2

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 82228003 05/11/98	GW-02 82228004 05/11/98	GW-03 82228008 05/12/98	GW-04 82228009 05/12/98	GW-05 Duplicate of GW-04 82228010 05/12/98
2-Hexanone	50	5 U	5 U	25 U	1200 U	5 U
Tetrachloroethene	5	1 U	1 U	5 U	250 U	90 E
1,1,2,2-Tetrachloroethane	5	1 U	1 U	5 U	250 U	1 U
1,2-Dibromoethane	NA	1 U	1 U	5 U	250 U	1 U
Toluene	5	1 U	1 U	5 U	250 U	1 U
Chlorobenzene	5	1 U	1 U	5 U	250 U	1 U
Ethylbenzene	5	1 U	1 U	5 U	250 U	1 U
Styrene	5	1 U	1 U	5 U	250 U	1 U
Xylene (total)	5	1 U	1 U	5 U	250 U	1 U
1,3-Dichlorobenzene	5	1 U	1 U	5 U	250 U	1 U
1,4-Dichlorobenzene	4.7	1 U	1 U	5 U	250 U	1 U
1,2-Dichlorobenzene	4.7	1 U	1 U	5 U	250 U	1 U
1,2-Dibromo-3-chloromethane	5	1 U	1 U	5 U	250 U	1 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site
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Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Phenol	1	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethyl) ether	1	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	1	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	1	5 U	5 U	5 U	5 U	5 U
2,2'-oxybis(1-Chloropropane)	5	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	1	5 U	5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	NA	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	5	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	5	5 U	5 U	5 U	5 U	5 U
Isophorone	50	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	1	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	1	5 U	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	5	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	1	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U
Naphthalene	10	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	5	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	5	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	1	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	NA	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	1	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	1	20 U	20 U	20 U	20 U	20 U
2-Chloronaphthalene	10	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U
Dimethylphthalate	50	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	NA	5 U	5 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

Mm-sv-gw

TABLE C-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site
Page 2 of 3

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
2,6-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U
Acenaphthene	20	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	1	20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	1	20 U	20 U	20 U	20 U	20 U
Dibenzofuran	NA	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	5	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	50	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	1	5 U	5 U	5 U	5 U	5 U
Fluorene	50	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	5	20 U	20 U	20 U	20 U	20 U
4,6-Dinitro-2-methylphenol	1	20 U	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	50	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	1	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	0.35	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	1	20 U	20 U	20 U	20 U	20 U
Phenanthrene	50	5 U	5 U	5 U	5 U	5 U
Anthracene	50	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	50	5 U	5 U	5 U	5 U	5 U
Fluoranthene	50	5 U	5 U	5 U	5 U	5 U
Pyrene	50	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	50	5 U	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	0.002	5 U	5 U	5 U	5 U	5 U
Chrysene	0.002	5 U	5 U	5 U	5 U	5 U
bis(2-Ethylhexyl)phthalate	50	5 U	5 U	5 U	5 U	0.9 JB
Di-n-octylphthalate	50	5 U	5 U	5 U	5 U	5 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-28
TCL Semi-Volatile Organic Compounds - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Benzo(b)fluoranthene	0.002	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	0.002	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	ND	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	0.002	5 U	5 U	5 U	5 U	5 U
Dibenz(a,h)anthracene	NA	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	NA	5 U	5 U	5 U	5 U	5 U
Semi-Volatile TICs	NA	--	13 J	--	7 J	7 J

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-29
TCL Pesticide/PCB Compounds - Groundwater
Magna Metals Site
Page 1 of 1

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
alpha-BHC	ND	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
beta-BHC	ND	0.00078 JP	0.00022 JP	0.01 P	0.021 P	0.11 P
delta-BHC	ND	0.00088 JP	0.0013 JPB	0.01 U	0.02 U	0.01 U
gamma-BHC (Lindane)	ND	0.01 U	0.01 U	0.009 J	0.02 U	0.01 U
Heptachlor	ND	0.01 U	0.0029 J	0.01 U	0.02 U	0.01 U
Aldrin	ND	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
Heptachlor epoxide	ND	0.001 JP	0.018	0.035 P	0.014 JP	0.01 U
Endosulfan I	NA	0.01 U	0.01 U	0.01 U	0.02 U	0.01 U
Dieldrin	ND	0.00072 JP	0.02 U	0.0038 JP	0.04 U	0.021 U
4,4'-DDE	ND	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endrin	ND	0.021 U	0.0033 JP	0.019 JP	0.0045 JP	0.003 JP
Endosulfan II	NA	0.021 U	0.02 U	0.02 U	0.0044 JP	0.0026 JP
4,4'-DDD	ND	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endosulfan sulfate	NA	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
4,4'-DDT	ND	0.021 U	0.008 JP	0.026 P	0.0048 JP	0.0046 JP
Methoxychlor	35	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U
Endrin ketone	5	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
Endrin aldehyde	5	0.021 U	0.02 U	0.02 U	0.04 U	0.021 U
alpha-Chlordane	0.1	0.01 U	0.01 U	0.004 JP	0.02 U	0.01 U
gamma-Chlordane	0.1	0.01 U	0.01 U	0.01 U	0.0063 JP	0.0028 JP
Toxaphene	ND	1 U	1 U	1 U	2 U	1 U
Aroclor-1016	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1221	0.1	0.42 U	0.4 U	0.4 U	0.8 U	0.42 U
Aroclor-1232	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1242	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1248	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1254	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U
Aroclor-1260	0.1	0.21 U	0.2 U	0.2 U	0.4 U	0.21 U

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-30
TAL Metals and Cyanide - Groundwater
Magna Metals Site

Sample ID Laboratory ID Date Sampled	NYSDEC Water Quality Standards/ Guidance Values (Class GA)	GW-01 Background 981084A-01 05/11/98	GW-02 981084A-02 05/11/98	GW-02-2 981084A-06 05/12/98	GW-03 981084A-03 05/12/98	GW-04 981084A-04 05/12/98	GW-05 Duplicate of GW-04 981084A-05 05/12/98
Aluminum	NC	51.1 B	7400	965	1190	1910	1540
Antimony	3	4 U	4 U	4 U	5.1 B	4 U	4 U
Arsenic	25	2 U	64.3	54.5	15.7	20.4	19.4
Barium	1,000	89.5 B	204	65.8 B	61.8 B	66.1 B	56.5 B
Beryllium	3	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	10	1.4 B	1 U	1.1 B	1.5 B	1.5 B	1.1 B
Calcium	NC	10700	28100	21400	17100	19100	16500
Chromium	50	2.2 B	112	20	31.6	18.4	14.5
Cobalt	NC	1 U	20.2 B	4.5 B	1.4 B	6.6 B	5.8 B
Copper	200	1.7 B	148	27.6	37.8	9.8 B	8.3 B
Iron	300	122	18900	2270	1420	2090	1660
Lead	25	1.2 B	3.2	1.4 B	1.8 B	2.5 B	1.3 B
Magnesium	35,000	6980	18300	7780	2140 B	6390	5560
Manganese	300	5.9 B	439	71.1	56.6	1600	1380
Mercury	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	NC	6.1 B	169	113	262	10.4 B	7.9 B
Potassium	NC	1210 B	8250	6540	1640 B	3530 B	3030 B
Selenium	10	2.5 B	93.1	91.6	60.1	96.8	88.4
Silver	50	1 U	1 U	1 U	1 U	1 U	1 U
Sodium	20,000	27700	57600	54600	7950	39900	35400
Thallium	4	3 U	3 U	3 U	3 U	3 U	3 U
Vanadium	NC	1 U	37.3 B	5.8 B	2.8 B	4.6 B	3.3 B
Zinc	300	7.8 B	113	39.6	516	7.4 B	4 B
Cyanide	100	10 U	35	14	128	416	382

See appendix introduction for abbreviations and data qualifiers.
Groundwater results are presented in ug/L (ppb).

TABLE C-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	TRIPBLANK	FB-01	FB-02	FB-04	FB-051297	MW-FB
	Trip Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank
Laboratory ID	72184001	65807001	65807006	71589007	72184002	75528011
Date Sampled	--	12/10/96	12/11/96	04/11/97	05/12/97	11/19/97
Chloromethane	1 U	10 UJ	10 UJ	10 U	1 U	1 U
Bromomethane	1 U	10 U	10 U	10 U	1 U	1 U
Vinyl Chloride	1 U	10 U	10 U	10 U	1 U	1 U
Chloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Methylene Chloride	2 U	10 U	3 JB	10 U	2 U	2 U
Acetone	R	3 JB	6 JB	4 J	R	5 U
Carbon Disulfide	1 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	1 U	10 U	10 U	10 U	1 U	1 U
1,1-Dichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	NA	NA	NA	1 U	1 U
1,2-Dichloroethene (total)	NA	10 U	10 U	10 U	NA	NA
trans-1,2-Dichloroethene	1 U	NA	NA	NA	1 U	1 U
Chloroform	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
2-Butanone	R	10 U	10 U	10 U	R	5 U
Bromochloromethane	1 U	NA	NA	NA	1 U	1 U
1,1,1-Trichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Carbon Tetrachloride	1 U	10 U	10 U	10 U	1 U	1 U
Bromodichloromethane	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dichloropropane	1 U	10 U	10 U	10 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	10 U	10 U	10 U	1 U	1 U
Trichloroethene	1 U	10 U	10 U	10 U	1 U	1 U
Dibromochloromethane	1 U	10 U	10 U	10 U	1 U	1 U
1,1,2-Trichloroethane	1 U	10 U	10 U	10 U	1 U	1 U
Benzene	1 U	10 U	10 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	10 U	10 U	10 U	1 U	1 U
Bromoform	1 U	10 U	10 U	10 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	TRIPBLANK	FB-01	FB-02	FB-04	FB-051297	MW-FB
	Trip Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank
Laboratory ID	72184001	65807001	65807006	71589007	72184002	75528011
Date Sampled	--	12/10/96	12/11/96	04/11/97	05/12/97	11/19/97
4-Methyl-2-Pentanone	5 U	10 U	10 U	10 U	5 U	5 U
2-Hexanone	R	10 UJ	10 UJ	10 U	R	5 U
Tetrachloroethene	1 U	10 U	10 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	10 U	10 U	10 U	1 U	1 U
1,2-Dibromoethane	1 U	NA	NA	NA	1 U	1 U
Toluene	1 U	10 U	10 U	10 U	1 U	1 U
Chlorobenzene	1 U	10 U	10 U	10 U	1 U	1 U
Ethylbenzene	1 U	10 U	10 U	10 U	1 U	1 U
Styrene	1 U	10 U	10 U	10 U	1 U	1 U
Xylene (total)	1 U	10 U	10 U	10 U	1 U	1 U
1,3-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,4-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,2-Dichlorobenzene	1 U	NA	NA	NA	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	NA	NA	NA	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-051198	TB-051198	TB-051298
	Field Blank	Trip Blank	Trip Blank
Laboratory ID	980518A2	82228001	82228007
Date Sampled	05/11/98	05/11/98	05/12/98
Chloromethane	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U
Vinyl Chloride	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U
Methylene Chloride	2 U	2 U	2 U
Acetone	5 U	5 U	5 U
Carbon Disulfide	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U
1,2-Dichloroethene (total)	NA	NA	NA
trans-1,2-Dichloroethene	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U
2-Butanone	5 U	5 U	5 U
Bromochloromethane	1 U	1 U	1 U
1,1,1-Trichloroethane	1 U	1 U	1 U
Carbon Tetrachloride	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U
Benzene	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-31
TCL Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-051198	TB-051198	TB-051298
	Field Blank	Trip Blank	Trip Blank
Laboratory ID	980518A2	82228001	82228007
Date Sampled	05/11/98	05/11/98	05/12/98
4-Methyl-2-Pentanone	5 U	5 U	5 U
2-Hexanone	5 U	5 U	5 U
Tetrachloroethene	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U
1,2-Dibromoethane	1 U	1 U	1 U
Toluene	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U
Styrene	1 U	1 U	1 U
Xylene (total)	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Phenol	10 U	10 U	5 U
bis(2-Chloroethyl) ether	10 U	10 U	5 U
2-Chlorophenol	10 U	10 U	5 U
1,3-Dichlorobenzene	10 U	NA	NA
1,4-Dichlorobenzene	10 U	NA	NA
1,2-Dichlorobenzene	10 U	NA	NA
2-Methylphenol	10 U	10 U	5 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U	5 U
4-Methylphenol	10 U	10 U	5 U
N-Nitroso-di-n-propylamine	10 U	10 U	5 U
Hexachloroethane	10 U	10 U	5 U
Nitrobenzene	10 U	10 U	5 U
Isophorone	10 U	10 U	5 U
2-Nitrophenol	10 U	10 U	5 U
2,4-Dimethylphenol	10 U	10 U	5 U
bis(2-Chloroethoxy)methane	10 U	10 U	5 U
2,4-Dichlorophenol	10 U	10 U	5 U
1,2,4-Trichlorobenzene	10 U	10 U	5 U
Naphthalene	10 U	10 U	5 U
4-Chloroaniline	10 U	10 U	5 U
Hexachlorobutadiene	10 U	10 U	5 U
4-Chloro-3-methylphenol	10 U	10 U	5 U
2-Methylnaphthalene	10 U	10 U	5 U
Hexachlorocyclopentadiene	10 U	10 UJ	5 U
2,4,6-Trichlorophenol	10 U	10 U	5 U
2,4,5-Trichlorophenol	26 U	25 U	20 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site
Page 2 of 3

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
2-Chloronaphthalene	10 U	10 U	5 U
2-Nitroaniline	26 U	25 U	20 U
Dimethylphthalate	10 U	10 U	5 U
Acenaphthylene	10 U	10 U	5 U
2,6-Dinitrotoluene	10 U	10 U	5 U
3-Nitroaniline	26 U	25 U	20 U
Acenaphthene	10 U	10 U	5 U
2,4-Dinitrophenol	26 U	25 U	20 U
4-Nitrophenol	26 U	25 UJ	20 U
Dibenzofuran	10 U	10 U	5 U
2,4-Dinitrotoluene	10 U	10 U	5 U
Diethylphthalate	0.4 JB	10 U	5 U
4-Chlorophenyl-phenylether	10 U	10 U	5 U
Fluorene	10 U	10 U	5 U
4-Nitroaniline	26 U	25 U	20 U
4,6-Dinitro-2-methylphenol	26 U	25 U	20 U
N-Nitrosodiphenylamine	10 U	10 U	5 U
4-Bromophenyl-phenylether	10 U	10 U	5 U
Hexachlorobenzene	10 U	10 U	5 U
Pentachlorophenol	26 U	25 U	20 U
Phenanthrene	10 U	10 U	5 U
Anthracene	10 U	10 U	5 U
Carbazole	10 U	10 U	NA
Di-n-butylphthalate	0.4 JB	10 U	5 U
Fluoranthene	10 U	10 U	5 U
Pyrene	10 U	10 U	5 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

Mm-sv-qa

TABLE C-32
TCL Semi-Volatile Organic Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04	FB-051297	FB-051198
	Field Blank	Field Blank	Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Butylbenzylphthalate	10 U	10 U	5 U
3,3'-Dichlorobenzidine	10 U	10 U	5 U
Benzo(a)anthracene	10 U	10 U	5 U
Chrysene	10 U	10 U	5 U
bis(2-Ethylhexyl)phthalate	0.8 JB	10 U	0.8 JB
Di-n-octylphthalate	10 U	10 UJ	5 U
Benzo(b)fluoranthene	10 U	10 UJ	5 U
Benzo(k)fluoranthene	10 U	10 U	5 U
Benzo(a)pyrene	10 U	10 U	5 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	5 U
Dibenz(a,h)anthracene	10 U	10 U	5 U
Benzo(g,h,i)perylene	10 U	10 U	5 U
Semi-Volatile TICs	--	--	5 JN

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-33
TCL Pesticide/PCB Compounds - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04	FB-051297	FB-051198
	Field Blank	Field Blank	Field Blank
Laboratory ID	71589007	72054016	981084A-07
Date Sampled	04/10/97	05/12/97	05/11/98
alpha-BHC	0.05 U	0.05 U	0.01 U
beta-BHC	0.05 U	0.05 U	0.0016 JP
delta-BHC	0.05 U	0.05 U	0.00046 JP
gamma-BHC (Lindane)	0.05 U	0.05 U	0.01 U
Heptachlor	0.05 U	0.05 U	0.01 U
Aldrin	0.05 U	0.05 U	0.01 U
Heptachlor epoxide	0.05 U	0.05 U	0.01 U
Endosulfan I	0.05 U	0.05 U	0.01 U
Dieldrin	0.1 U	0.1 U	0.021 U
4,4'-DDE	0.1 U	0.1 U	0.021 U
Endrin	0.1 U	0.1 U	0.021 U
Endosulfan II	0.1 U	0.1 U	0.021 U
4,4'-DDD	0.1 U	0.1 U	0.021 U
Endosulfan sulfate	0.1 U	0.1 U	0.021 U
4,4'-DDT	0.1 U	0.1 U	0.00092 JP
Methoxychlor	0.5 U	0.5 U	0.1 U
Endrin ketone	0.1 U	0.1 U	0.021 U
Endrin aldehyde	0.1 U	0.1 U	0.021 U
alpha-Chlordane	0.05 U	0.05 U	0.01 U
gamma-Chlordane	0.05 U	0.05 U	0.01 U
Toxaphene	5 U	5 U	1 U
Aroclor-1016	1 U	1 U	0.21 U
Aroclor-1221	2 U	2 U	0.42 U
Aroclor-1232	1 U	1 U	0.21 U
Aroclor-1242	1 U	1 U	0.21 U
Aroclor-1248	1 U	1 U	0.21 U
Aroclor-1254	1 U	1 U	0.21 U
Aroclor-1260	1 U	1 U	0.021 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

TABLE C-34
TAL Metals and Cyanide - Quality Assurance/Quality Control
Magna Metals Site

Sample ID	FB-04 Field Blank	FB-051297 Field Blank	FB-051198 Field Blank
Laboratory ID	970835A-05	971121A-11	981084A-07
Date Sampled	04/11/97	05/12/97	05/11/98
Aluminum	23.1 B	31.2 B	6.0 U
Antimony	3.7 B	3 U	4.0 U
Arsenic	3 U	3 U	2.0 U
Barium	4 U	4 U	1.0 U
Beryllium	1 U	1 U	1.0 U
Cadmium	1 U	1 U	1.0 B
Calcium	84.8 B	197 B	19.9 B
Chromium	1.8 B	1 U	1.3 B
Cobalt	1 U	1 U	1.0 U
Copper	1 U	1.3 B	1.0 U
Iron	48.2 B	56.4 B	18.3 B
Lead	2 U	2 U	1.2 B
Magnesium	5.9 B	43.9 B	12.0 U
Manganese	1 U	2.3 B	1.0 U
Mercury	0.2 U	0.2 U	0.2 U
Nickel	2.8 B	0.2 U	2.5 B
Potassium	27.7 B	29.4 B	15.4 B
Selenium	3 U	3 U	2.0 U
Silver	1 UJ	1 UJ	1.0 U
Sodium	405 B	95.1 B	79.2 B
Thallium	3 U	3 UJ	3.0 U
Vanadium	1 U	1 U	1.0 U
Zinc	3.6 JB	15.7 B	2.5 B
Cyanide	10 U	10 U	10.0 U

See appendix introduction for abbreviations and data qualifiers.
QA/QC results are presented in ug/L (ppb).

APPENDIX D

REMEDIAL MEASURE COST ESTIMATING INFORMATION

MAGNA METALS					
SOIL EXCAVATION AND DISPOSAL					
BUDGETARY COST ESTIMATE					
DESCRIPTION	QUANTITY	UNIT	UNIT COST		TOTAL
DIRECT COSTS					
Excavation	875	tons	$	14.00	$ 12,250
Transportation & Disposal (w/ pretreatment)	1006	tons	$	75	$ 75,450
Pretreatment	1	allowance	$	50,000	$ 50,000
Clean Fill	240	tons	$	25	$ 6,000
Sampling and Analysis (Disposal)	1		$	4,000	$ 4,000
Site Work (Grading & Restoration)	1575	ft 2	$	10	$ 15,750
Erosion and Sediment Control	1	allowance	$	3,000	$ 3,000
Total Direct Costs					$ 166,450
INDIRECT COSTS					
Engineering/Design	1	allowance	$	33,290	$ 33,290
Construction Misc.	1		$	15,000	$ 15,000
Total Indirect Costs					$ 48,290
SUBTOTAL					$ 214,740
Contingency (25%)					$ 53,685
TOTAL ESTIMATED COST					$ 268,425

MAGNA METALS
GROUNDWATER CONTAINMENT
BUDGETARY COST ESTIMATE

DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
DIRECT COSTS				
Wells Installation (4" dia. PVC @15' deep))	4	each	$ 2,500	$ 10,000
Groundwater Collection and Discharge	1	lot	$ 8,000	$ 8,000
Packaged Groundwater Treatment System (1)	1	lot	$ 115,000	$ 115,000
Field Installation	1	lot	$ 40,000	$ 40,000
Site Preparation	1	lot	$ 8,000	$ 8,000
Total Direct Costs				$ 181,000
INDIRECT COSTS				
Engineering/Design	1	allowance	$ 54,300	$ 54,300
Construction Misc.	1		$ 9,500	$ 9,500
Total Indirect Costs				$ 63,800
SUBTOTAL				$ 244,800
Contingency (25%)				$ 61,200
TOTAL ESTIMATED COST				$ 306,000

NOTES:

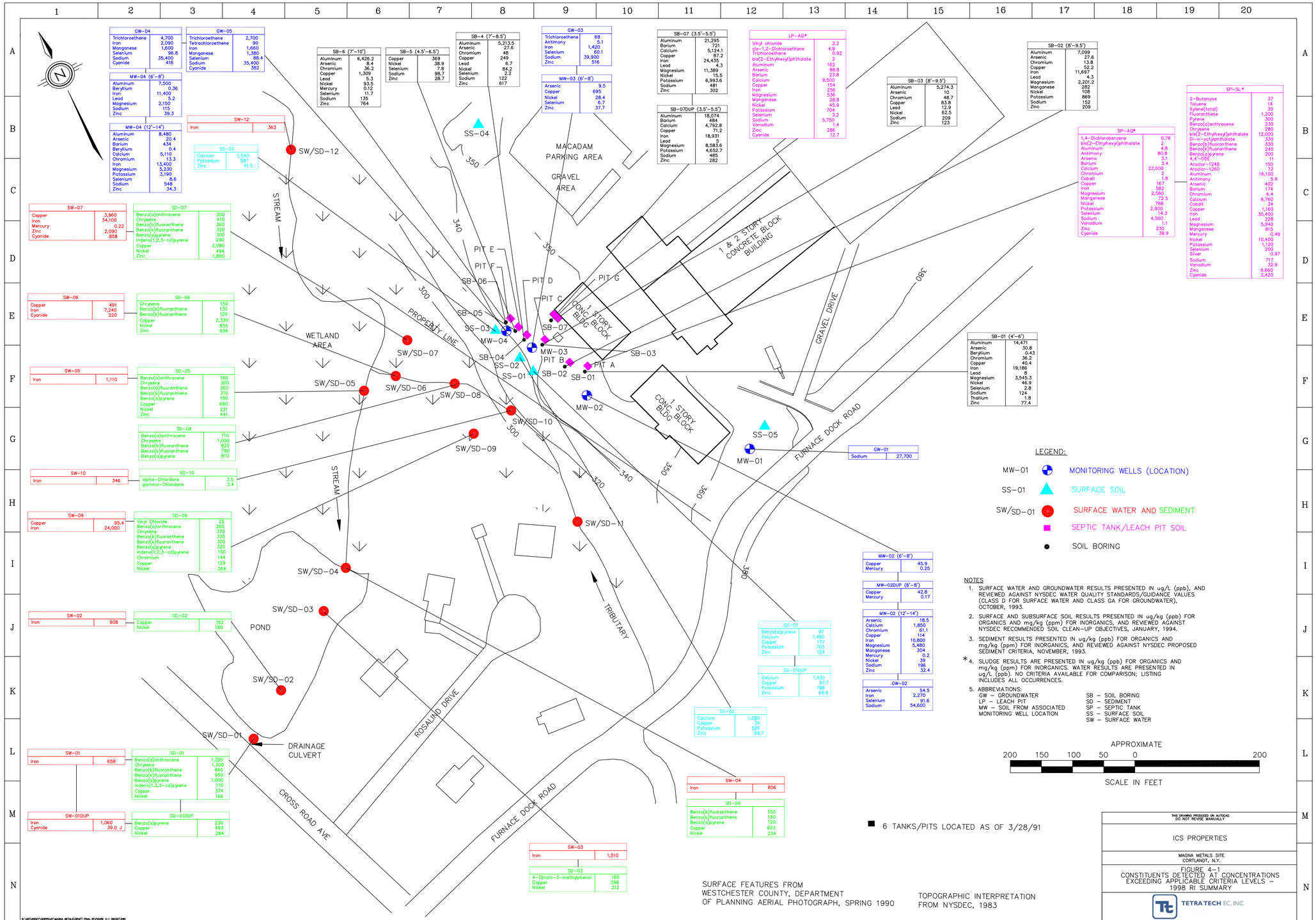
1. Alternative contingent upon feasibility of sustainable groundwater extraction as RI data indicated low permeability sands and recharge rates. A 72 hour aquifer pumping test program should be performed prior to implementation of IRM (Interim Remedial Measure) or RD/RA (Remedial Design/Remedial Action).

2. Annual Operations and Maintenance costs (O+M) not shown. At this time, insufficient data exists for reasonable estimate. Data gaps include pumping rate and discharge method. O+M costs could be on the order of $100,000 per year, however, significant increase/decrease could occur due to either of the following:

a. Discharge to POTW would result in substantial decrease to O+M, total O+M cost range likely to be 50-100K per year with POTW discharge.

b. Discharge to Surface Water would result in substantial increase to O+M due to higher treatment standards/requirements, total O+M cost range likely to be 100-150K per year with Surface Water Discharge.

3. Packaged groundwater treatment system includes pH adjustment, chemical filtration, and carbon adsorption.


GW-04
Trichloroethene 4,700
Iron 2,090
Manganese 1,600
Selenium 96.8
Sodium 35,400
Cyanide 416
GW-05
Trichloroethene 2,700
Tetrachloroethene 90
Iron 1,660
Manganese 1,380
Selenium 88.4
Sodium 35,400
Cyanide 382
MW-04 (6'-8')
Aluminum 7,500
Beryllium 0.36
Iron 11,400
Lead 5.2
Magnesium 2,150
Sodium 115
Zinc 39.3
MW-04 (12'-14')
Aluminum 8,480
Arsenic 20.4
Barium 434
Beryllium 0.4
Calcium 5,110
Chromium 13.3
Iron 13,400
Magnesium 5,230
Potassium 3,190
Selenium 8.6
Sodium 548
Zinc 34.3
SB-6 (7'-10')
Aluminum 6,426.2
Arsenic 8.4
Chromium 36.2
Copper 1,309
Lead 5.3
Nickel 93.5
Mercury 0.12
Selenium 11.7
Sodium 135
Zinc 764
SB-5 (4.5'-6.5')
Copper 369
Nickel 38.9
Selenium 7.8
Sodium 98.7
Zinc 28.7
SB-4 (7'-8.5')
Aluminum 5,213.5
Arsenic 27.6
Chromium 48
Copper 249
Lead 6.7
Nickel 84.2
Selenium 2.2
Sodium 122
Zinc 617
GW-03
Trichloroethene 68
Antimony 5.1
Iron 1,420
Selenium 60.1
Sodium 39,900
Zinc 516
MW-03 (6'-8')
Arsenic 9.5
Copper 695
Nickel 28.4
Selenium 6.7
Zinc 37.7
SB-07 (3.5'-5.5')
Aluminum 21,295
Barium 721
Calcium 5,124.1
Copper 87.2
Iron 24,435
Lead 4.3
Magnesium 11,389
Nickel 15.5
Potassium 6,993.6
Sodium 481
Zinc 302
SB-07DUP (3.5'-5.5')
Aluminum 18,074
Barium 484
Calcium 4,792.8
Copper 71.2
Iron 18,931
Lead 5
Magnesium 8,583.6
Potassium 4,652.7
Sodium 485
Zinc 282
LP-AQ*
Vinyl chloride 2.2
cis-1,2-Dichloroethene 4.8
Trichloroethene 0.92
bis(2-Ethylhexyl)phthalate 2
Aluminum 162
Arsenic 88.8
Barium 23.8
Calcium 9,500
Copper 154
Iron 256
Magnesium 536
Manganese 28.8
Nickel 45.9
Potassium 704
Selenium 3.2
Sodium 5,750
Vanadium 1.4
Zinc 286
Cyanide 12.7
SB-03 (8'-9.5')
Aluminum 5,274.3
Arsenic 10
Chromium 48.7
Copper 83.8
Lead 12.9
Nickel 62.5
Sodium 209
Zinc 123
SB-02 (8'-9.5')
Aluminum 7,099
Arsenic 27.6
Chromium 13.8
Copper 52.2
Iron 11,697
Lead 4.3
Magnesium 2,201.2
Manganese 282
Nickel 108
Potassium 869
Sodium 152
Zinc 209
SP-AQ*
1,4-Dichlorobenzene 0.76
bis(2-Ethylhexyl)phthalate 2
Aluminum 4.8
Antimony 80.8
Arsenic 3.1
Barium 3.4
Calcium 22,000
Chromium 2
Cobalt 1.8
Copper 167
Iron 582
Magnesium 2,560
Manganese 72.5
Nickel 788
Potassium 2,900
Selenium 14.3
Sodium 4,500
Vanadium 1.1
Zinc 230
Cyanide 39.9
SP-SL*
2-Butanone 37
Toluene 14
Xylene(total) 30
Fluoranthene 1,200
Pyrene 300
Benzo(a)anthracene 230
Chrysene 280
bis(2-Ethylhexyl)phthalate 12,000
Di-n-octylphthalate 330
Benzo(b)fluoranthene 330
Benzo(k)fluoranthene 240
Benzo(a)pyrene 200
4,4'-DDE 11
Aroclor-1248 150
Aroclor-1260 72
Aluminum 16,100
Antimony 5.9
Arsenic 402
Barium 174
Chromium 6.4
Calcium 9,760
Cobalt 34
Copper 1,180
Iron 30,400
Lead 228
Magnesium 5,940
Manganese 815
Mercury 0.49
Nickel 10,400
Potassium 1,120
Selenium 200
Silver 0.97
Sodium 717
Vanadium 32.9
Zinc 9,660
Cyanide 2,420
SW-12
Iron 363
SS-03
Calcium 1,540
Potassium 587
Zinc 41.5
SW-07
Copper 3,960
Iron 34,100
Mercury 0.22
Zinc 2,090
Cyanide 858
SD-07
Benzo(a)anthracene 300
Chrysene 410
Benzo(b)fluoranthene 360
Benzo(k)fluoranthene 320
Benzo(a)pyrene 300
Indeno(1,2,3-cd)pyrene 290
Copper 2,080
Nickel 494
Zinc 1,890
SW-06
Copper 491
Iron 7,240
Cyanide 220
SD-06
Chrysene 150
Benzo(b)fluoranthene 130
Benzo(k)fluoranthene 120
Copper 2,330
Nickel 835
Zinc 938
SW-05
Iron 1,110
SD-05
Benzo(a)anthracene 180
Chrysene 300
Benzo(b)fluoranthene 260
Benzo(k)fluoranthene 210
Benzo(a)pyrene 180
Copper 690
Nickel 231
Zinc 441
SD-08
Benzo(a)anthracene 710
Chrysene 1,000
Benzo(b)fluoranthene 820
Benzo(k)fluoranthene 780
Benzo(a)pyrene 810
SW-10
Iron 346
SD-10
alpha-Chlordane 3.5
gamma-Chlordane 3.4
SW-09
Copper 95.4
Iron 24,000
SD-09
Vinyl Chloride 25
Benzo(a)anthracene 260
Chrysene 370
Benzo(b)fluoranthene 320
Benzo(k)fluoranthene 300
Benzo(a)pyrene 320
Indeno(1,2,3-cd)pyrene 150
Chromium 144
Copper 129
Nickel 264
SW-02
Iron 908
SD-02
Copper 162
Nickel 180
SW-01
Iron 658
SD-01
Benzo(a)anthracene 1,200
Chrysene 1,300
Benzo(b)fluoranthene 840
Benzo(k)fluoranthene 950
Benzo(a)pyrene 1,000
Indeno(1,2,3-cd)pyrene 110
Copper 374
Nickel 166
SW-01DUP
Iron 1,060
Cyanide 39.0 J
SD-01DUP
Benzo(a)pyrene 230
Copper 493
Nickel 284
SW-04
Iron 856
SD-04
Benzo(b)fluoranthene 150
Benzo(k)fluoranthene 150
Benzo(a)pyrene 120
Copper 603
Nickel 234
SW-03
Iron 1,510
SD-03
4-Chloro-3-methylphenol 160
Copper 398
Nickel 212
SS-01
Benzo(a)pyrene 97
Calcium 1,480
Copper 177
Potassium 703
Zinc 124
SS-01DUP
Calcium 1,430
Copper 51.7
Potassium 768
Zinc 94.9
SS-02
Calcium 1,280
Copper 39
Potassium 526
Zinc 68.7
MW-02 (6'-8')
Copper 45.9
Mercury 0.25
MW-02DUP (6'-8')
Copper 42.8
Mercury 0.17
MW-02 (12'-14')
Arsenic 18.5
Calcium 1,850
Chromium 61.1
Copper 114
Iron 10,800
Magnesium 5,480
Manganese 304
Mercury 0.2
Nickel 39
Sodium 196
Zinc 32.4
GW-02
Arsenic 54.5
Iron 2,270
Selenium 91.6
Sodium 54,600
SB-01 (4'-6')
Aluminum 14,471
Arsenic 30.8
Beryllium 0.43
Chromium 36.2
Copper 40.4
Iron 19,186
Lead 8
Magnesium 3,545.3
Nickel 46.9
Selenium 2.8
Sodium 124
Thallium 1.8
Zinc 77.4
GW-01
Sodium 27,700
SS-04
SS-03
SS-02
SS-01
SS-05
MW-04
MW-03
MW-02
MW-01
SB-07
SB-06
SB-05
SB-04
SB-03
SB-02
SB-01
PIT A
PIT B
PIT C
PIT D
PIT E
PIT F
PIT G
SW/SD-12
SW/SD-11
SW/SD-10
SW/SD-09
SW/SD-08
SW/SD-07
SW/SD-06
SW/SD-05
SW/SD-04
SW/SD-03
SW/SD-02
SW/SD-01
STREAM
STREAM
WETLAND AREA
POND
PROPERTY LINE
MACADAM PARKING AREA
GRAVEL AREA
1 & 2 STORY CONCRETE BLOCK BUILDING
1 STORY CONC BLOCK BLDG
1 STORY CONC BLDG BLOCK
GRAVEL DRIVE
FURNACE DOCK ROAD
ROSALIND DRIVE
CROSS ROAD AVE
DRAINAGE CULVERT
TRIBUTARY
340
350
360
380
320
300
LEGEND:
MW-01 MONITORING WELLS (LOCATION)
SS-01 SURFACE SOIL
SW/SD-01 SURFACE WATER AND SEDIMENT
SEPTIC TANK/LEACH PIT SOIL
SOIL BORING
NOTES
1. SURFACE WATER AND GROUNDWATER RESULTS PRESENTED IN ug/L (ppb), AND REVIEWED AGAINST NYSDEC WATER QUALITY STANDARDS/GUIDANCE VALUES (CLASS D FOR SURFACE WATER AND CLASS GA FOR GROUNDWATER), OCTOBER, 1993.
2. SURFACE AND SUBSURFACE SOIL RESULTS PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS, AND REVIEWED AGAINST NYSDEC RECOMMENDED SOIL CLEAN-UP OBJECTIVES, JANUARY, 1994.
3. SEDIMENT RESULTS PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS, AND REVIEWED AGAINST NYSDEC PROPOSED SEDIMENT CRITERIA, NOVEMBER, 1993.
*4. SLUDGE RESULTS ARE PRESENTED IN ug/kg (ppb) FOR ORGANICS AND mg/kg (ppm) FOR INORGANICS. WATER RESULTS ARE PRESENTED IN ug/L (ppb). NO CRITERIA AVAILABLE FOR COMPARISON; LISTING INCLUDES ALL OCCURRENCES.
5. ABBREVIATIONS:
GW - GROUNDWATER
LP - LEACH PIT
MW - SOIL FROM ASSOCIATED MONITORING WELL LOCATION
SB - SOIL BORING
SD - SEDIMENT
SP - SEPTIC TANK
SS - SURFACE SOIL
SW - SURFACE WATER
APPROXIMATE
200 150 100 50 0 200
SCALE IN FEET
6 TANKS/PITS LOCATED AS OF 3/28/91
SURFACE FEATURES FROM WESTCHESTER COUNTY, DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH, SPRING 1990
TOPOGRAPHIC INTERPRETATION FROM NYSDEC, 1983
THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY
ICS PROPERTIES
MAGNA METALS SITE CORTLANDT, N.Y.
FIGURE 4-1
CONSTITUENTS DETECTED AT CONCENTRATIONS EXCEEDING APPLICABLE CRITERIA LEVELS - 1998 RI SUMMARY
TETRA TECH EC, INC.

NYSDEC Site ID# 36003

Final
Supplemental Remedial Investigation/Feasibility Study
Work Plan Addendum

For the
Magna Metals Site
Lightron Corporation

Town of Cortlandt
Westchester County, New York

Prepared by:

Foster Wheeler Environmental Corporation

March 2003

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1.0 INTRODUCTION

The purpose of this supplemental RI/FS Work Plan Addendum is to present a scope of work to conduct Supplemental Phase 2 RI sampling, which will be implemented at the Magna Metals site located in the Town of Cortlandt, New York. The existing RI/FS Work Plan documents prepared by Foster Wheeler and approved by DEC will be used to execute field investigation activities. This additional phase of work addresses data gaps presented in the Draft RI/FS report, dated November 1998, and New York Department of Environmental Conservation (NYSDEC) comments. This revised Work Plan addendum is based on comments provided by NYSDEC (Attachment A) and additional historical documentation provided by NYSDEC (Attachment B).

2.0 ADDITIONAL PIT LOCATION SURVEY

A more comprehensive pit location survey will be performed, extending further west than previously performed, based on additional historical NYSDEC documentation.

The documentation, contained in NYSDEC files, shows two septic tanks and nine drainage structures, various drawings show pipes connecting some of those structures, and a potential refuse area. Figure 1 in Appendix A of the draft RI report (November 1998) shows possible pipe sections but not to the extent shown in NYSDEC documentation. The geophysical work performed in 1996 covered a smaller geographic area based on then existing available information. As a result, the 1996 survey may not have covered the area where other structures might be located.

A more complete effort to determine the location and condition of these underground structures, including piping at Magna Metals will be made during this second phase of the RI. Several pipes shown on the above-mentioned RI Report, Figure 1 extend west towards the hill above the creek. Also, documents in NYSDEC files show pipes extending northward. A final attempt to identify the location and terminuses of these pipes will be made. Clearing of trees and brush will be required prior to initiating this task.

The search for additional pits and potential refuse area shall extend further to the west than previously investigated and the approximate area for additional geophysical investigation is denoted on Figure 1 (oversize drawing). Based on the NYSDEC maps (Attachment B), the geophysical search will extend approximately 165 feet west of the building. According to NYSDEC figures, the furthest pit is approximately 155 feet from the building. The potential refuse area was shown to be 100 feet west of the building. The geophysical work and associated vegetative clearing will be done in two steps to potentially minimize the amount of trees and small vegetation to be removed. The two step process is shown on Figure 1. Following vegetation removal in Step 1, real time hand-held geophysics will be performed on the cleared area. If the pits and refuse areas are not visually identifiable or detectable using real time, hand-held geophysics, additional vegetative clearance will be performed in Step 2 to widen the investigation area.

Ground penetrating radar (GPR) data will be collected along lines parallel to the former Magna Metals building (roughly east-west) will be spaced 10 feet apart. Multiple GPR

lines will be collected over locations of subsurface pits shown on NYSDEC documents to identify the characteristic GPR signature of these features.

The technique of GPR provides an effective non-invasive method of detecting and mapping small-scale variations in the very high frequency (VHF) electromagnetic (EM) properties of subsurface materials, which are often associated with geologic boundaries and/or man-made artifacts.

The processed digital files will be analyzed for characteristic signatures that may be associated with potential subsurface tanks and appurtenant piping. A characteristic signature of a subsurface tank will be determined by collecting a number of scans over the known location of a subsurface tank and comparing this signature to subsequent data collected.

2.1 LEACH PIT AND REFUSE AREA SAMPLING

An attempt will be made to sample the bottom material in each of the pits (existing and any newly located pits). A manual hand auger device will be used from grade level. There will not be any worker entry into the pits. If there is a concrete/or solid bottom, no sampling will be conducted. If the pits do not have a bottom, a sample will be collected.

Should sampling not be possible, in order to address quantification of the Remedial Action costs the Feasibility Study (FS), the Final FS will be modified so that a high-end range of excavation could be included in the Feasibility Study. The depth of bedrock would bound the high-end depth of excavation estimate, information that was previously collected during the RI.

In the event that the potential refuse area is located, samples will be collected using either a hand auger/or drilling rig, depending upon the amount of any potential metallic debris identified. One location will be sampled, with samples from within the debris (if any) and below the debris (natural overburden).

The pit and refuse samples will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, TAL metals, cyanide and total organic carbon (TOC).

3.0 HOMEOWER SURVEY

The existence of private (domestic and production) wells and/or municipal wells will be researched. The evaluation will include a review of NYSDEC records to determine if any wells are present. In addition, state and local well records will be reviewed to obtain available information. Any existing well logs will be used in conjunction with site data to assist in planning of final bedrock well locations. Any domestic wells identified will be sampled to better delineate the plume. Sampling permission will be required from the owners for access. If there are any domestic wells, a door-to-door survey will also be conducted to evaluate access to these wells for sampling. Any wells identified will be sampled for TCL Volatile Organics, Cyanide, TAL Metals using procedures for Groundwater Sampling. It should be noted that during analysis of the data in preparation of the 1998 RI/FS Report, the Department of Health and local government were contacted via telephone. According to their records, nearby residences were on a municipal water supply and that there were no records of any private production wells.

4.0 GROUNDWATER CONTAMINATION DELINEATION

The groundwater contamination at the site has not been fully delineated in the overburden aquifer. In addition, the vertical extent of groundwater contamination has not been fully delineated to determine if the underlying bedrock aquifer has been impacted. The proposed additional activities outlined below will address the horizontal and vertical delineation of groundwater contamination at the site. Figure 1 shows the tentative locations of overburden and bedrock monitoring wells. Prior to final location selection, NYSDEC shall be included in the decision making.

4.1 OVERBURDEN AQUIFER MONITORING WELLS

Additional monitoring wells will be installed in the overburden aquifer to attempt to complete the horizontal delineation of the groundwater contamination. Overburden monitoring wells will be installed and sampled as outlined in the Remedial Investigation/Feasibility Study Work Plan (RI/FS Work Plan) and the Quality Assurance Project Plan (QAPP) previously submitted and approved by NYSDEC. Figure 1 illustrates the proposed location of the four (4) additional overburden monitoring wells.

Monitoring well MW-05 will be installed approximately 300 feet east of monitoring well MW-04. Monitoring well MW-05 is approximately 250 feet up-gradient of the Leach Pit area that is suspected to be the source of groundwater contamination. This monitoring well will be used to determine the background chemistry of the groundwater prior to flowing through the Leach Pit source area. Up to three subsurface soil samples will be collected at this location to supplement subsurface background soils collected during the Phase 1 RI. Monitoring well MW-06 will be installed approximately 100 feet north of monitoring well MW-04. This monitoring well will be used to assist in defining the northerly extent of the plume. Since the groundwater is moving in a westerly direction it is anticipated that there will be minimal contaminant movement in this direction.

Monitoring well MW-07 will be installed approximately 600 feet in the general downgradient direction of MW-04 along Rosalind Drive. This monitoring well will be used to assist in determining the downgradient edge of the plume. If there are elevated levels of TCE in this monitoring well, additional monitoring well(s) may be required further downgradient at a later date. This step-wise approach will minimize the number of monitoring wells needed to complete the horizontal delineation of the plume.

Monitoring well MW-08 will be installed approximately 700 feet in the general downgradient direction of MW4 along Cross Road Ave. These two downgradient monitoring wells, (MW-07 and MW-08) will assist in delineating the horizontal extent of contamination, and also, provide water level data to better define the local groundwater regime.

4.2 BEDROCK AQUIFER MONITORING WELLS

One bedrock monitoring well, MW-04D will be installed in the immediate area of MW-04. The bedrock monitoring well will be installed as outlined in Attachment C. The bedrock monitoring well will be installed and sampled to determine if the contamination in the overburden aquifer has migrated into the underlying bedrock aquifer. The bedrock

monitoring well will be installed next to monitoring well MW-04 because the highest levels of contamination in the overburden aquifer were found in this area.

4.3 GROUNDWATER SAMPLING AND ANALYTICAL REQUIREMENTS

The five newly installed monitoring wells and the four previously installed monitoring wells will be sampled in accordance with procedures outlined in the RI/FS Work Plan and the QAPP. The groundwater samples will be analyzed for TCL Volatile Organics, Cyanide and TAL metals. The samples will not be analyzed for SVOCs or Pesticides/Herbicides because these compounds were not detected at significant levels in the previous sampling events that warrant further investigation.

4.4 TOPOGRAPHIC WELL ELEVATION SURVEY

A land surveyor will obtain the horizontal and vertical locations of the existing and newly installed monitoring wells and up to 5 surface water locations in order to develop a site groundwater elevation contour map. Semi-permanent type surveying markers will be installed at surface water locations prior to surveying. Surface water level measurements will be collected at the time of topographic surveying, along with groundwater elevations in monitoring wells for a synoptic water level measurement event.

5.0 BUILDING INTERIOR SAMPLING

Elevated levels of contamination are present at the leach pits outside of the Former Magna Metals Building (see building denoted as such on Figure 1). Previous site visits had evaluated entrance to the building for building interior sampling. However, due to poor building conditions (it has not been maintained by the current owner for many years), significant Health and Safety concerns preclude any sampling.

In discussion with NYSDEC, there has been an understanding on the part of FWENC that the current owner is considering demolition of the building. If such an action occurs, building access restrictions will no longer prevent the collection of data below the slab. Assuming the building is demolished by the current owner, conditions below the building slab will be investigated for potential drains or some other low point, which could allow infiltration of waste into the subsurface. Should a potential drain or infiltration gallery be identified, soil samples will be collected at intervals below the slab until the water table, or until bedrock is encountered, whichever occurs first. Soil sampling will be conducted using a drill rig and will be consistent with subsurface soil sampling protocols presented in the RI/FS Work Plan. Soil samples will be analyzed for TCL Volatile Organics, Cyanide, and TAL Metals. Location SB-8 has been denoted on Figure 1, however, location within the building is approximate.

6.0 SURFACE SOIL SAMPLING

Surface soil samples will be collected on the slope and down slope from the former Magna Metals property, and also, adjacent to the building, to better delineate the extent of residual surface contamination that may persist from potential former operations which may pose a human health risk. All Surface Soil samples collected will be analyzed for TCL Volatile Organics, Cyanide, and TAL Metals.

Surface soil samples will be collected at seven locations (3 on slope, 2 at base of slope, 2 adjacent to the former Magna Metals building - locations SS-6 to SS-12) for TCL Volatile Organic, Cyanide, TAL Metals. Locations SS-13, SS-14, and SS-15 shall be collected to provide data on background surface soil conditions. Samples will be obtained at a 0-2" interval.

7.0 SURFACE WATER AND SEDIMENT SAMPLING

7.1 RI/FS FINDINGS

Results of the previous investigation conducted by Foster Wheeler indicated the following: (1) the presence of ecological receptors in the aquatic habitats adjacent to the Magna Metals property, (2) the presence of potential site related contaminants in these habitats, (3) complete exposure pathways for receptors to be exposed to the contaminants and (4) the observed concentrations of PAHs and metals exceed pertinent eco-screening level values. These findings indicate that a toxic effect based assessment (Step IIC of the FWIA) is warranted to collect site-specific data for assessing risk to ecological receptors.

Concentrations of metals and polycyclic aromatic hydrocarbons (PAHs) were found to exceed sediment-screening level benchmarks in the creek and pond basin areas downstream from the site. Surface water samples collected from three locations proximal to former leach pits exceed background levels and the NYSDEC water quality criterion for Class D waters. This exceedance suggests that survival of aquatic life may be impacted by local sources or discharges from the site.

As required by NYSDEC regulations, further investigations will be conducted to determine what effects are being manifested in these habitats. A site specific biological/chemical study will be performed to reduce inherent uncertainties applied in Step IIB (previously conducted at the site during the RI.) The Step IIC will include:

- Community Level Analysis using benthic macroinvertebrate surveys;
- Organism Level Analysis using surface water and sediment toxicity testing and;
- Supplemental sediment and surface water sampling.

This three-study method approach will be used in the Step II C to supplement the existing Step II A-B analysis (performed during the RI.) The data obtained will supply a site specific basis for identifying risks to fish and wildlife resources and will assist in the identification and selection of specific remedial action alternatives for the site and will be incorporated into the revised RI/FS (see section 7.0). Table 1 provides station identification and rationale for sampling for the Step II C field program.

7.2 BENTHIC MACROINVERTEBRATE SURVEY

Benthic macroinvertebrate surveys will be used as study methods for aquatic community level analyses (Bode et.al., 2002, 1990) in the two small streams receiving drainage from the Magna Metals site. Samples shall be collected from the two streams and two background locations (one from each stream, SW/SD- 13 and SW/SD-17 locations) for

Table 1

FWIA Step II C Sampling Station Identification and Rationale

Sampling Station Identification	**Sampling Rationale**
SW/SD 13, SW/SD17	Site specific background locations for Step II C chemical and biological assessments.
SW/SD 14, SW/SD15, SW/SD 16, SW/SD18, SW/SD 19, SW/SD20	Site specific sediment and surface water samples to be used to evaluate extent and nature of chemical distribution from Step II B analysis and in support of biological assessments in the adjacent streams.
SW 21, SW 22	Sampling locations having surface waters with high potential for biological effects (metals) as determined from Step II B.
SD21, SD22, SD23, SD24	Sediment sampling locations to determine extent and nature of potential site related contaminants and biological assessment in the pond.
SD25, SD26	Sediment sampling locations to evaluate extent and nature of potential site related contaminants below the pond.

community level analysis. Replicate samples of the benthic macroinvertebrate community will be collected at individual sampling locations (SW/SD-14, SW/SD-15, SW/SD-16, SW/SD-19, SW/SD-20) using a benthic kick net, surber sampler or benthic grab device with the final selection being based on field conditions encountered. Final selection of the sampling device will also be based upon universal application at each of the sampling stations and sampling methods will follow guidance from Bode et. al., (1990, 2002) and USEPA (1999).

Proposed sampling locations are identified on Figure 1.0. Collected samples shall be sieved via a 500 um sieve, the contents of which will be preserved with 70% ethanol for laboratory identification. A sample of sediments from the macroinvertebrate surveys conducted at each survey location will be collected for chemical analysis in support of the benthic community analysis. Analytical and invertebrate data will be used in conjunction with co-located surface water and sediment data to identify changes in benthic community structure and function with increasing distance from the site.

7.3 TOXICITY TESTING

Surface Water Toxicity Testing will be used as an organism level analysis for assessing if the elevated concentrations of metals (especially copper) observed in surface waters near the site have the potential to impact aquatic life. Bulk water samples will be collected for use in 96 hour, *Ceriodaphina* toxicity testing from five locations and a background station. Proposed sampling locations (SW/SD-14, SW/SD-15, SW/SD-17, SW/SD-19, SW-21, SW-22) are identified on Figure 1.0. Methods for conducting the tests shall follow EPA (2002) or similar methods. Results of the toxicity test shall be used in conjunction with co-located surface water samples to determine if existing metal concentrations in the stream near the site have the potential to impact aquatic life.

In addition to the proposed surface water toxicological evaluation, Whole Sediment Toxicity Testing shall be performed at each proposed benthic sampling station (SW/SD-13, SW/SD-14, SW/SD-15, SW/SD-17, SW/SD-19, SD21, and SD23). Test species shall include the amphipod *Hyalella azteca* and the midge, *Chironomus tentans*. Ten-day acute test methods shall follow guidance set forth in USEPA (1994) for EPA method 100.1 for *Hyalella azteca* and method 100.2 for *Chironomus tentans*. The primary endpoint for the tests shall be survival and the secondary endpoint shall be growth for both test species.

7.4 SUPPLEMENTAL SURFACE WATER AND SEDIMENT SAMPLING

A bimodal assessment approach will be employed for the surface water and sediment IIC assessment. Sediment samples will be collected at sample stations (SW/SD-13, SW/SD-14, SW/SD-15, SW/SD-16, SW/SD-17, SW/SD-18, SW/SD-19, SW/SD-20, SD21, SD22, SD23, SD24, and SD25) for the benthic macroinvertebrate community survey. Collected sediment samples will be analyzed for TAL metals, polycyclic aromatic hydrocarbons (PAHs), total organic carbon (TOC) and acid volatile sulfide and soluble extractable metals (AVS/SEM). Additional sediment samples will be collected in support of better defining the nature and extent of metals and PAHs in the streams and pond receiving runoff from the site.

Surface water samples (SW/SD-13, SW/SD14, SW/SD-15, SW/SD-16, SW/SD-17, SW/SD-18, SW/SD-19, SW/SD-20, SW21, SW22) collected shall be analyzed for TAL metals. Proposed sampling locations are identified on Figure 1.0. Surface water and sediment data shall be used to correlate trends in observed community structure and potential for acute toxicity to aquatic life.

Data generated from the above site specific investigations will be used to confirm or reject the findings of the Step IIB Criteria specific analysis and revisions to the RI/FS, as necessary will be made. A focused Step IIC findings section shall be incorporated into the revised RI/FS, which will describe the results of the biological and chemical testing and interpretation of the results to better define risks to ecological receptors.

8.0 RI/FS REPORT

Following collection, laboratory analysis, and validation, the data collected in the sections above will be analyzed and evaluated. The existing RI/FS Report previously submitted in November 1998 will incorporate the findings of the supplemental investigation and shall be submitted to NYSDEC for review and comment. The revised RI/FS report will incorporate NYSDEC comments, dated April 11, 2002, received on the November 1998 RI/FS report. The supplemental data will be used to refine previous conclusions, recommendations, and subsequent evaluation of remedial alternatives.

9.0 SUPPLEMENTAL RI/FS SCHEDULE

Task	Approximate Anticipated Maximum Duration	Approximate Schedule Dates
NYDEC Work Plan Approval	----	April 7, 2003
On Site/Off Site Access Agreements	*20 Days	*April 7, 2003 – May 5, 2003
Homeowner Well Survey	30 Days	April 7, 2003 – May 16, 2003
Subcontractor Procurement	30 Days	April 7, 2003 – May 16, 2003
Site Mobilization	10 Days	April 28, 2003 – May 9, 2003
Step 1 Vegetation Clearance	3 Days	May 12, 2003 – May 14, 2003
Step 1 Geophysical Data Collection	3 Days	May 14, 2003 – May 16, 2003
Step 1 Geophysical Data Interpretation	2 Days	May 15, 2003 – May 16, 2003
Step 2 Vegetative Clearance	3 Days	May 19, 2003 – May 21, 2003
Step 2 Geophysical Data Collection	2 Days	May 21, 2003 – May 23, 2003
Step 2 Geophysical Data Interpretation	2 Days	May 22, 2003 – May 23, 2003
Leach Pit/Refuse Area Sampling	10 Days	May 27, 2003 – June 6, 2003
Surface Soil Sampling	5 Days	June 9, 2003 – June 13, 2003
Building Interior Sampling	5 Days	June 9, 2003 – June 13, 2003
Overburden Monitoring Well Installation	10 Days	June 16, 2003 – June 27, 2003
Bedrock Monitoring Well Installation	5 Days	June 23, 2003 – June 27, 2003

Task	Approximate Anticipated Maximum Duration	Approximate Schedule Dates
Surface Water & Sediment Sampling	10 Days	June 30, 2003 – July 11, 2003
Groundwater Sampling	5 Days	July 14, 2003 – July 18, 2003
Benthic Survey	15 Days	June 30, 2003 – July 18, 2003
Laboratory Analysis	60 Days	May 28, 2003 – August 22, 2003
Data Validation	60 Days	June 30,2 003 – Sept. 19, 2003
Revised RI Report	45 Days	September 22, 2003 – November 21, 2003

*If access agreements cannot be negotiated the project schedule will be extended accordingly.

10.0 REFERENCES

Bode, R.W., M.A. Novak, L.E. Abele, D.L. Heitzman and A.J. Smith. 2002. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYSDEC Division of Water, Albany, N.Y.

Bode, R.W., M.A. Novak, and L.E. Abele. 1990. Biological Impairment Criteria for Flowing Waters in New York State. NYSDEC Division of Water, Albany, N.Y.

Foster Wheeler Environmental Corporation. November 1998. Remedial Investigation/Feasibility Study Report for the Magna Metals Site, Town of Cortlandt, Westchester County, New York.

Foster Wheeler Environmental Corporation. August 1995. Remedial Investigation/Feasibility Study Work Plan for the Magna Metals site, Town of Cortlandt, Westchester County, New York.

USEPA 1994. Methods for Measuring the Toxicity of Sediment Associated Contaminants with Freshwater Invertebrates. U.S. Environmental Protection Agency, Office of Research and Development, Duluth, MN. EPA 600/R-94/024

USEPA 1999. Rapid Bioassessment Protocols for Use in Wadable Streams and Rivers. United States Environmental Protection Agency. Office of Water, Washington, D.C. EPA 841-B-99-002.

USEPA 2002. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. United States Environmental Protection Agency. Office of Research and Development, 4th Edition, Washington, D.C. EPA 821-R-02-013.

NYSDEC 1994. Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA). New York State Department of Environmental Conservation. Division of Fish and Wildlife. Albany, N.Y.

ATTACHMENT A

NYSDEC Comments
and
Mutually Agreeable Responses

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, 11th Floor
625 Broadway, Albany, New York 12233-7015
Phone: (518) 402-9622 • **FAX:** (518) 402-9627
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

April 11, 2002

Mark Sielski
Project Manager
Foster Wheeler Environmental Corporation
1000 The American Road
Morris Plains, NJ 07950

RE: Magna Metals, Site No. 360003
Remedial Investigation/Feasibility Study Work Plan Addendum

Dear Mr. Sielski:

The Department has received and reviewed the abovementioned document and has the following comments:

1. A major issue of concern is our knowledge of the underground structures at the site. Several older documents contained in Department files refer to two septic tanks and nine drainage structures and various drawings show pipes connecting some of those structures. Figure 1 in Appendix A of the draft RI report (November 1998) shows possible pipe sections but is by no means complete. The geophysical work done in 1996 does not cover a very large area and may not cover the area where other structures could be.

   A more complete effort to determine the location and condition of all the underground structures, including piping, at Magna Metals must be made during the second phase of the RI. Several pipes shown on the abovementioned Figure 1 show pipes extending west towards the hill above the creek. Also, documents in Department files show pipes extending northward. The location and terminuses of these pipes must be located.

2. The work plan suggests the installation of three shallow wells and a deep well. Perhaps another tactic that could be used is to use a geoprobe to sample groundwater at various depths and locations prior to the installation of monitoring wells. The depth of bedrock could be determined, piezometers could be installed to determine the direction of groundwater flow, groundwater samples could be collected, and a small geoprobe unit may be more palatable to the neighbors. After this preliminary data has been collected, then monitoring wells could be installed.

3. Only two drainage structures were sampled during the remedial investigation. All of the pits should be sampled. The sludge material at the bottom (if any remains) should be sampled as well as the soil below the rings. The soil below the rings should be sampled at regular intervals until bedrock is encountered.

4. Although surface soil samples have been taken at the site, they have been focused on a small area near the pits. Surface soil samples have not been taken immediately adjacent to the building nor in other areas around the building. Surface soil samples should be taken around the entire building and should establish the boundaries of surface soil contamination.

5. Sediment toxicity testing should be conducted on stream and wetland sediments due to the existing high levels of contaminants. The proposed benthic community analysis is useful but difficult to interpret quantitatively and must be supplemented by toxicity tests. AVS/SEM analysis is also useful in predicting non-bioavailability of metals in sediments but is not a substitute for actual toxicity testing since in cannot predict toxicity or predict the level of toxicity.

   Toxicity testing should be conducted on sediments from locations SD-13 (reference location), SD-14, SD-15, SD-16, SD-18, SD-19, SD-20, and SD-25. Location SD-19 should be moved approximately 100 feet upstream. A sediment sample should be collected at location SW-22 and tested. In addition, sediments should be collected and tested from at least two pond locations in the main depositional area. These may not be the locations currently proposed as SD-21 through -24 which seem to be most distant from the pond inlet and outlet. SD-21 and SD-24 should be moved to the southern area of the pond to locations suitable for toxicity testing.

The work plan states that significant revisions to the November 1998 draft Remedial Investigation (RI) Report (Foster Wheeler) will not be required when the revised report is resubmitted to the Department. The Department does have several comments about the existing report that need to be addressed in the revised report:

6. Some of the values shown in Table C-3 (Semi-volatile Compounds in the Septic Tank/Leach Pit) of the 1998 report are not shown on Figure 4-1. For example, 1,2 dichlorobenzene is present in sludge sample SP-SL at 4,200 ppb but is not shown in the figure. 2-Methyl naphthalene is not shown at 1,500 ppb. Please correct.

7. Some of the dates in the tables in the 1998 RI report are incorrect. For example, some of the dates for the soil boring samples are listed as 1996 but the soil borings were done in 1997. Please correct.

8. The 1998 RI report contains data generated in the 1980s and 1990s which is very helpful (Tables 1-1 through 1-12). However it is not always clear where the samples were taken even though there is a written description of sample locations on most of the tables. It is

particularly difficult to determine which pits were sampled. Please include figures that show the exact locations of the previous sampling events in the revised RI.

9. The topographical lines on some of the figures in the 1998 RI report are incorrect. Please correct.

10. When revising the RI report for submittal, please include logs generated during sampling and other field events (e.g., well development) in an appendix.

11. The 1998 RI report doesn't contain any watertable information. In order to determine groundwater flow direction the wells/piezometers must be surveyed and water levels measured. In the revised RI report include monitoring well elevations, water table elevations, and drawings with water table contours.

12. The 1998 report did not include any QA/QC information. Attached is guidance on how to complete a data usability summary report (DUSR). This must be included in the revised RI.

13. Please include the geophysical report(s) in the revised RI report in its entirety.

14. Ultimately the complete and approved remedial investigation and feasibility study reports must be submitted in electronic format to the Department. In the interim however, please submit the complete analytical data to the Department in spreadsheet format (excel preferably).

Please revise the work plan and resubmit it to the Department by April 30, 2002. If you have any questions, please call me at 518-402-9622.

Sincerely,



Sally W.W. Dewes, P.E.
Environmental Engineer 2
Bureau of Eastern Remedial Action
Division of Environmental Remediation

cc: R. Cozzy/File
P. Carella
S. Melvin, NYSDOH

ec: C. Manfredi, Reg. 3

mm08.wpd/3

New York State Department of Environmental Conservation
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Erin M. Crotty
Commissioner

September 6, 2002

Mark Sielski
Senior Project Manager
Foster Wheeler Environmental Corporation
1000 The American Road
Morris Plains, NJ 07950

RE: Magna Metals, Site No. 360003

Dear Mr. Sielski:

As we discussed in our phone conversation today, attached are three hand drawn figures showing septic tanks and pits at the Magna Metals site. If you have any questions, please call me at 518-402-9622.

Sincerely,

Sally W.W. Dewes, P.E.
Environmental Engineer 2
Bureau of Eastern Remedial Action
Division of Environmental Remediation

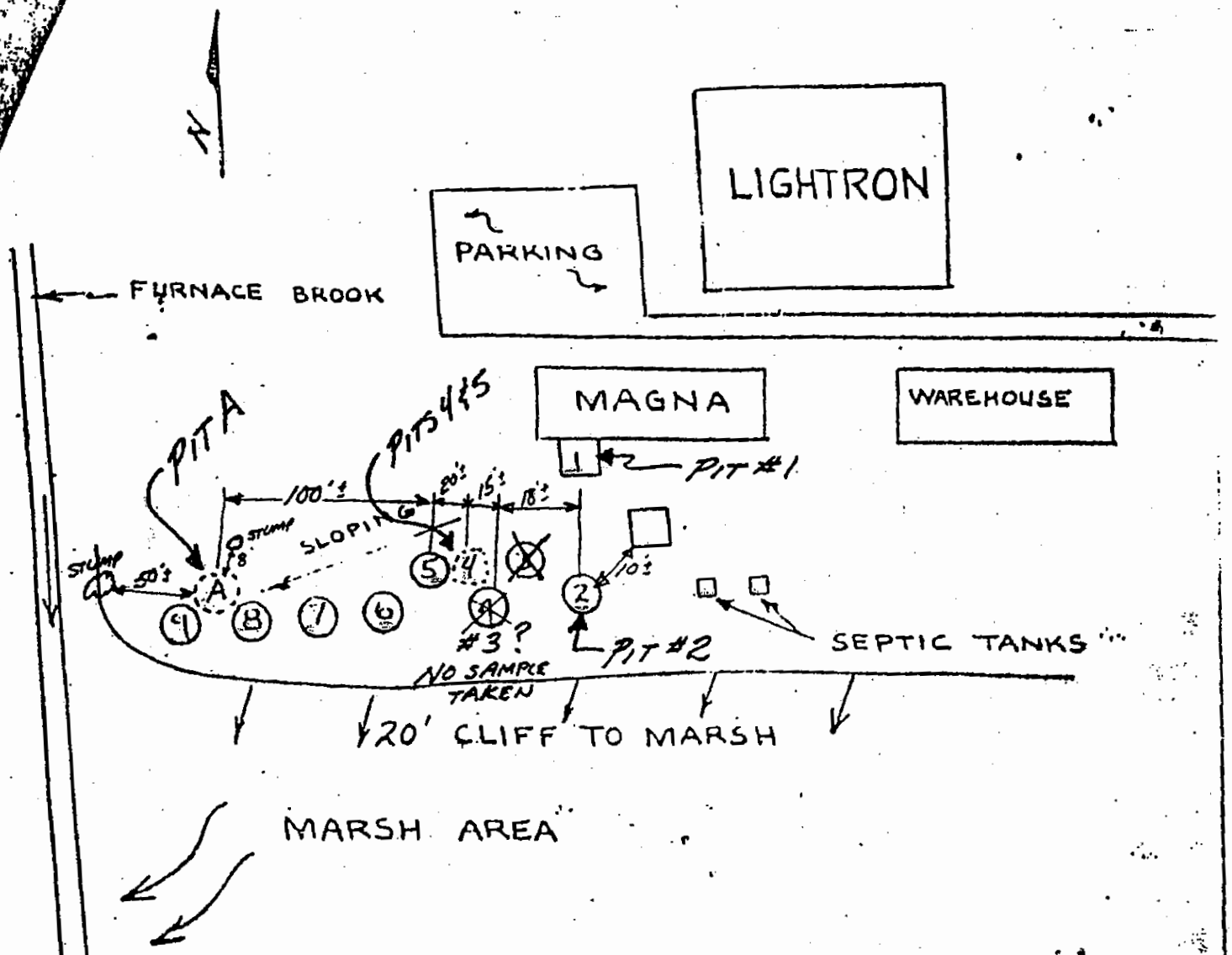
/File

mm09.wpd/1

APPENDIX "A"

from Sept. 23, 19
letter

EXHIBIT A - APPROXIMATE LOCATION FROM WHICH SAMPLES WERE TAKEN ON 8/19/82



MAGNA METALS. SITE SKETCH

WESTCHESTER CO., CORTLANDT, N.Y.

7-7-81, NO SCALE, R.E.T.

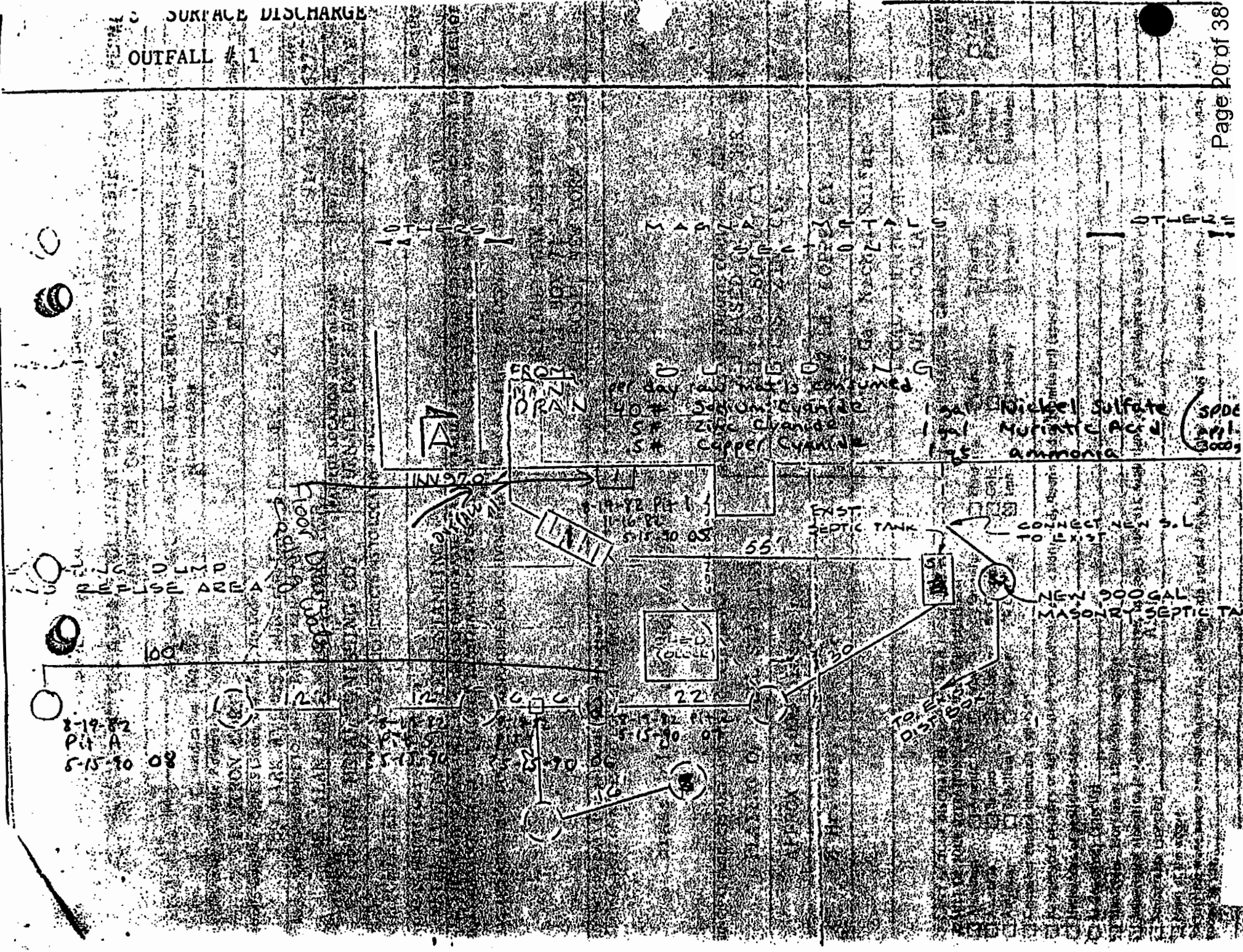
NEW YORK STATE

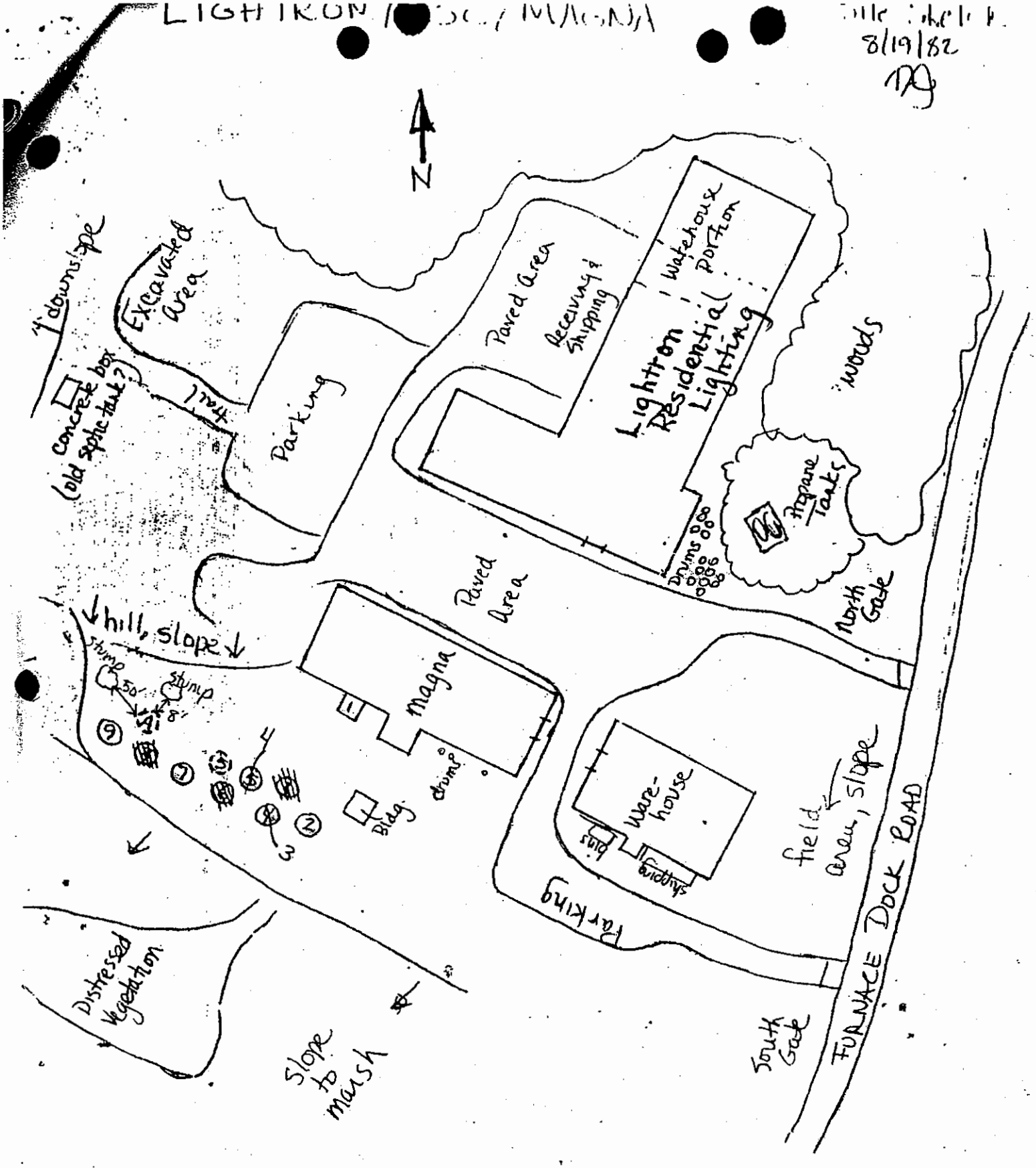
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE COMPLIANCE TEAM

SURFACE DISCHARGE

OUTFALL # 1





NOTE:
(5) revised location
pit not found
(4) 3 new number

Distances

A to 5	100'
5 to 4	20'
4 to 3	15'
3 to 2	18'
2 to Bldg	10'

O #
Erin M. Crotty Commissioner

New York State Department of Environmental Conservation
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Website: www.dec.state.ny.us

December 11, 2002

Mark Sielski
Project Manager
Foster Wheeler Environmental Corporation
1000 The American Road
Morris Plains, NJ 07950

RE: Magna Metals, Site No. 360003
Revised Remedial Investigation/Feasibility Study Work Plan Addendum dated November 1, 2002

Dear Mr. Sielski:

The Department has received and reviewed the above-mentioned document and has the following comments:

1. The area shown on Figure 1 depicting where geophysical work is to be done is not large enough. One of the figures contained in my letter to you dated September 6, 2002 shows a pit 155 feet to the west of the building. The area shown on Figure 1 does not extend that far. Another figure in the September letter shows a pit northwest of the building. These areas need to be investigated. The refuse area 100 feet west of the building shown in one of the figures in the September letter also needs to be investigated.

2. Page 1-3 states that if no TCE is found in the deep monitoring well MW-04D that is to be installed then no further investigation of bedrock will be necessary. Because of the tightness of the till, the groundwater contamination in MW-04 may flow laterally before sinking and not intersect MW-04D. Whether or not further investigation of bedrock is necessary will be based on the results of the entire investigation, not the analytical results for one compound in one well. Please remove that comment.

3. The location of MW-06 should be chosen after the geophysical work is done so that if any more pits are found that can be factored into the decision. The location will be selected after consultation with and approval of the Department.

4. It is not clear that the locations and depths of the monitoring wells placed on Rosalind Drive and Cross Road Avenue are chosen to our best advantage. A profile of the bedrock in that area would be very useful. Are there local well logs that could be examined to better understand the bedrock contours before choosing well locations and depths?

5. The proposed surface water toxicity testing and the proposed benthic community analysis essentially measure the same thing - surface water quality. Sediment toxicity testing is needed to assess potential impacts from contaminants in sediment. Given the size and nature of the site, it will not be necessary to conduct both acute and chronic testing, only the acute. Testing should follow the 10-day acute test for Hyallella which is EPA method 100.1, and the 10-day acute test for Chironomus which is EPA method 100.2. These methods can be found at the following EPA website: http://www.epa.gov/cgi-bin/claritgw?op-Display&document=clserv:ORD:0945;&rank=4&template=epa

6. The benthic community analysis should follow the NYSDEC guidance listed below. These can be obtained from the NYSDEC Division of Water Stream Biomonitoring Unit by calling Robert Bode at 518-402-8253.

   Bode, R.W, M.A. Novak, L.E. Abele, D.L. Heitzman and A.J. Smith. 2002. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYSDEC Division of Water, Albany, NY.

   Bode, R.W., M.A. Novak, and L.E. Abele. 1990. Biological Impairment Criteria for Flowing Waters in New York State. NYSDEC Division of Water. Albany, NY.

7. The methods for the proposed surface water testing have been updated and can be found at http://www.epa.gov/OST/WET/disk3/ctf.pdf

8. There are no figures in Attachment B. Please include.

9. Please include a schedule for the implementation of the additional field work and the completion of the RI/FS.

Please revise the addendum in accordance with the Department's comments and resubmit to the Department by January 10, 2003.

Below are two comments related to the draft RI/FS Report dated November 1998. Please address these comments when the revised RI is ultimately submitted.

10. With the exception of cadmium, hardness dependent ambient water quality criteria in

Table 4-2 of the RI/FS report are incorrectly calculated.

11. The classification for the tributary to Furnace Brook should be Class C. Using an average hardness of 155 mg/L, the Class C standards for hardness dependent metals are 3 for cadmium, 106 for chromium, 13 for copper, 6 for lead, 75.5 for nickel and 120 for zinc.

If you have any questions, please call me at 518-402-9622.

Sincerely,

/signed/

Sally W.W. Dewes, P.E.
Environmental Engineer 2
Bureau of Eastern Remedial Action
Division of Environmental Remediation

cc: S. Selmer, NYSDOH

ec: R. Cozzy/File
C. Dowd
C. Manfredi, Reg. 3

Sielski10.wpd/3

New York State Department of Environmental Conservation
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Erin M. Crotty
Commissioner

February 24, 2003

Mark Sielski
Project Manager
Foster Wheeler Environmental Corporation
1000 The American Road
Morris Plains, NJ 07950

Dear Mr. Sielski:

RE: Magna Metals, Site No. 360003
Supplemental Remedial Investigation /Feasibility Study Work Plan Addendum for the Magna Metal Site Lightron Corporation dated January 2003

The Department has received and reviewed the above-mentioned document and has the following comments:

1. The Department's April 2002 letter requests the testing of pond sediments. You have included the named sediment locations requested, but not the pond locations. Please add two pond locations or rather than adding locations, the Department suggests that you exchange two of the stream and tributary toxicity stations for two in the pond. You could eliminate sediment toxicity testing at SD-19 or SD-20 in the stream and at SD-15 or SD-16 in the tributary. Then, take sediments from two depositional areas in the pond for toxicity testing. All samples with toxicity testing should be analyzed for chemical constituents. Pond benthics won't be comparable to stream benthics so benthic sampling in the pond is not required.

2. Section 6.0. Surface soil samples must be collected from a depth of 0"-2" for the purpose of assessing potential exposures, as opposed to 0"-6" as stated in the work plan.

3. Locations SS-11 though SS-13 must be tested for the same parameters as SS-6 to SS-10. Also, the text is unclear whether these locations are being collected as representative of background conditions. They should not be used for this purpose

4. The background sampling is inadequate. The Department's draft technical guidance (Technical Guidance for Site Investigation and Remediation, December 2002) calls for five background samples at a site such as Magna Metals.

   a. A minimum of five background samples should be collected from unimpacted areas on the site or in the vicinity of the site. The sample should be collected from a depth which conforms to the same depths sampled during the soil investigation.
   b. Background samples should be collected at locations unaffected by current and historic site operations as documented by the records search including aerial photographs. Wherever possible, background samples should be collected from locations which are topographically upgradient and upwind of contaminant sources;

c. Background samples should **not** be collected from the following areas: (1) Parking lots, roads, or roadside areas; (2) Areas where materials or wastes were loaded, handled, or stored; (3) Waste disposal areas; (4) Areas near railroad tracks; (5) Areas of historic fill material; (6) Areas receiving runoff from areas described immediately above or adjacent sites; (7) Storm drains or ditches receiving runoff from the site or adjacent sites; (8) Depositional areas from point sources; or (9) Any other area of concern.

d. Background samples should be collected and analyzed using the same methods as were used for area of concern samples;

e. Background samples should be collected from soil types similar to the area of concern samples. Similar soil types should be identified using standard classification systems.

5. Please include original figures in color in all distributed copies of the work plan. The gray text is very difficult to read on the original copy and impossible to read on the photocopies.

Please revise the work plan in accordance with these comments and resubmit it to the Department by March 10, 2003. If you have any questions, please call me at 518-402-9622.

Sincerely,

Sally W.W. Dewes, P.E.
Environmental Engineer 2
Bureau of Eastern Remedial Action
Division of Environmental Remediation

cc: S. Selmer, NYSDOH

ec: R. Cozzy/File
C. Dowd
C. Manfredi, Reg. 3
R. Rusinko, Esq., Tarrytown

October 30, 2002
Responses

FOSTER WHEELER ENVIRONMENTAL CORPORATION

October 30, 2002

Ms. Sally Dewes, P.E.
Bureau of Eastern Remediation
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7015

RE: Magna Metals, Site No. 360003
Remedial Investigation/Feasibility Study Work Plan Addendum

Dear Ms. Dewes:

Thank you for providing the requested additional documentation in your letter dated September 6, 2002, which provided clarification to DEC's comment letter of April 11, 2002. Our review of this information was necessary to respond to comments, and accordingly, revise the Work Plan.

Below are the NYSDEC comments to the Work Plan addendum, provided in the April 11 submittal (in italics) followed by the responses:

1. *A major issue of concern is our knowledge of the underground structures at the site. Several older documents contained in Department files refer to two septic tanks and nine drainage structures and various drawings show pipes connecting some of those structures. Figure 1 in Appendix A of the draft RI report (November 1998) shows possible pipe sections but is by no means complete. The geophysical work done in 1996 does not cover a very large area and may not cover the area where other structures could be.*

   A more complete effort to determine the location and condition of all the underground structures, including piping, at Magna Metals must be made during the second phase of the RI. Several pipes shown on the abovementioned Figure 1 show pipes extending west towards the hill above the creek. Also, documents in Department files show pipes extending northward. The location and terminuses of these pipes must be located.

   Upon receipt and review of the documentation provided in the September 6, 2002 letter, taking an additional effort to fully define the source area is regarded as a reasonable technical approach. The search for additional pits shall extend further to the west than previously investigated. From the maps provided, it is estimated that the search will approximately extend an additional 75 feet to the west.

1000 THE AMERICAN ROAD, MORRIS PLAINS, NJ 07050
TEL: 973-630-8000 FAX: 973-630-8025

2. *The Work Plan suggests the installation of three shallow wells and a deep well. Perhaps another tactic that could be used is to use a geoprobe to sample groundwater at various depths and locations prior to the installation of monitoring wells. The depth of bedrock could be determined, piezometers could be installed to determine the direction of groundwater flow, groundwater samples could be collected, and a small geoprobe unit may be more palatable to the neighbors. After this preliminary data has been collected, then monitoring wells could be installed.*

   Use of the geoprobe, will also not address DEC's goal (in the comment) to determine groundwater flow at the site. Installation of monitoring wells (as proposed in the Work Plan addendum) are the most feasible way to meet this requirement. However, as discussed during telephone conversation, the Work Plan addendum will make an adjustment to the proposed monitoring well layout, by placing the monitoring wells in the town right of ways along Rosalind Drive and Cross Road Ave. These would address the issue of off site contaminant migration, as well as provide adequate number of well locations to determine the local groundwater flow regime. In addition, access to the individual properties would not have to occur.

3. *Only two drainage structures were sampled during the remedial investigation. All of the pits should be sampled. The sludge material at the bottom (if any remains) should be sampled as well as the soil below the rings. The soil below the rings should be sampled at regular intervals until bedrock is encountered.*

   Use of a hollow stem auger or other type of mechanical drilling device, may result in releasing or providing a potential vertical pathway for any residual contamination in the pits/immediately below the pits and allow further downward migration. Foster Wheeler does not recommend manual entry into the pits to obtain bottom material (confined space entry), nor does Foster Wheeler recommend that a drilling rig, be driven over the pits to "punch a sample" through. Foster Wheeler's concern is that construction of these pits may not provide a suitable subsurface structure, and as a result, there could be collapse of drilling equipment into the pit.

   However, as per our telephone discussions, the Work Plan addendum will be modified to use a manual hand auger device from grade level. There will not be any worker entry into the pits. If there is a concrete/or solid bottom, no sampling will be conducted. If the pits do not have a bottom, a sample will be collected.

   Should sampling not be possible, in order to address quantification of the Remedial Action costs in the Feasibility Study (FS), Foster Wheeler will modify the Final FS so that a high-end range of excavation could be included in the Feasibility Study. The high-end depth of excavation estimate would be bounded by the depth of bedrock, information that was previously collected during the RI.

4. *Although surface soil samples have been taken at the site, they have been focused on a small area near the pits. Surface soil samples have not been taken immediately adjacent to the building or in other areas around the building. Surface soil samples*

should be taken around the entire building and should establish the boundaries of surface soil contamination.

Upon receipt of this new information in DEC's September 6, 2002 letter, additional surface soil sampling is warranted. Additional soil samples will be collected in the area where drums were shown adjacent to the Magna Building and adjacent to any new pits discovered.

5. *Sediment toxicity testing should be conducted on stream and wetland sediments due to the existing high levels of contaminants. The proposed benthic community analysis is useful but difficult to interpret quantitatively and must be supplemented by toxicity tests. AVS/SEM analysis is also useful in predicting non-bioavailability of metals in sediments but is not a substitute for actual toxicity testing since in cannot predict toxicity or predict the level of toxicity.*

   Toxicity testing should be conducted on sediments from locations SD-13 (reference location), SD-14, SD-15, SD-16, SD-18, SD-19, SD-20, and SD-25. Location SD-19 should be moved approximately 100 feet upstream. A sediment sample should be collected at location SW-22 and tested. In addition, sediments should be collected and tested from at least two pond locations in the main depositional area. These may not be the locations currently proposed as SD-21 through -24 which seem to be most distant from the pond inlet and outlet. *SD-21 and SD-24 should be moved to the southern area of the pond to locations suitable for toxicity testing.*

   It is our understanding that DEC no longer requires the sampling discussed in the above comment. Toxicity testing proposed in 6.3 of the Work Plan addendum is sufficient at this phase of the project.

If you have any questions, or need further information, please do not hesitate to contact me at 973-630-8544.

Sincerely,

Mark Sielski, P.G.
Project Manager

cc: E. Wactlar, Esq. (Griffon/Lightron)
N. Ward-Willis (Keane and Beane)

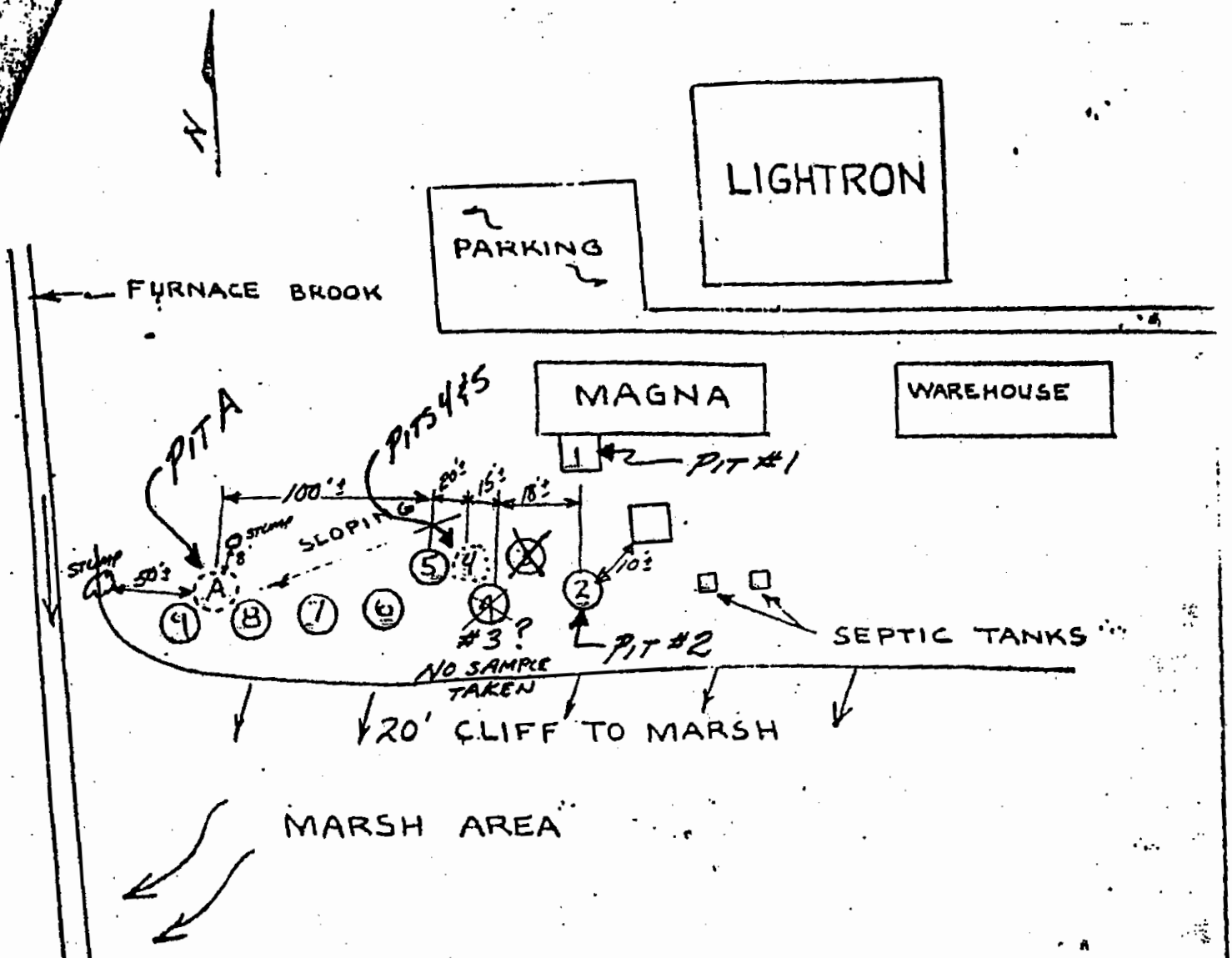
ATTACHMENT B

NYSDEC Additional Historical Documentation

APPENDIX "A"

from Sept. 23, 1 letter

EXHIBIT A - APPROXIMATE LOCATION FROM WHICH SAMPLES WERE TAKEN ON 8/19/82



MAGNA METALS. SITE SKETCH

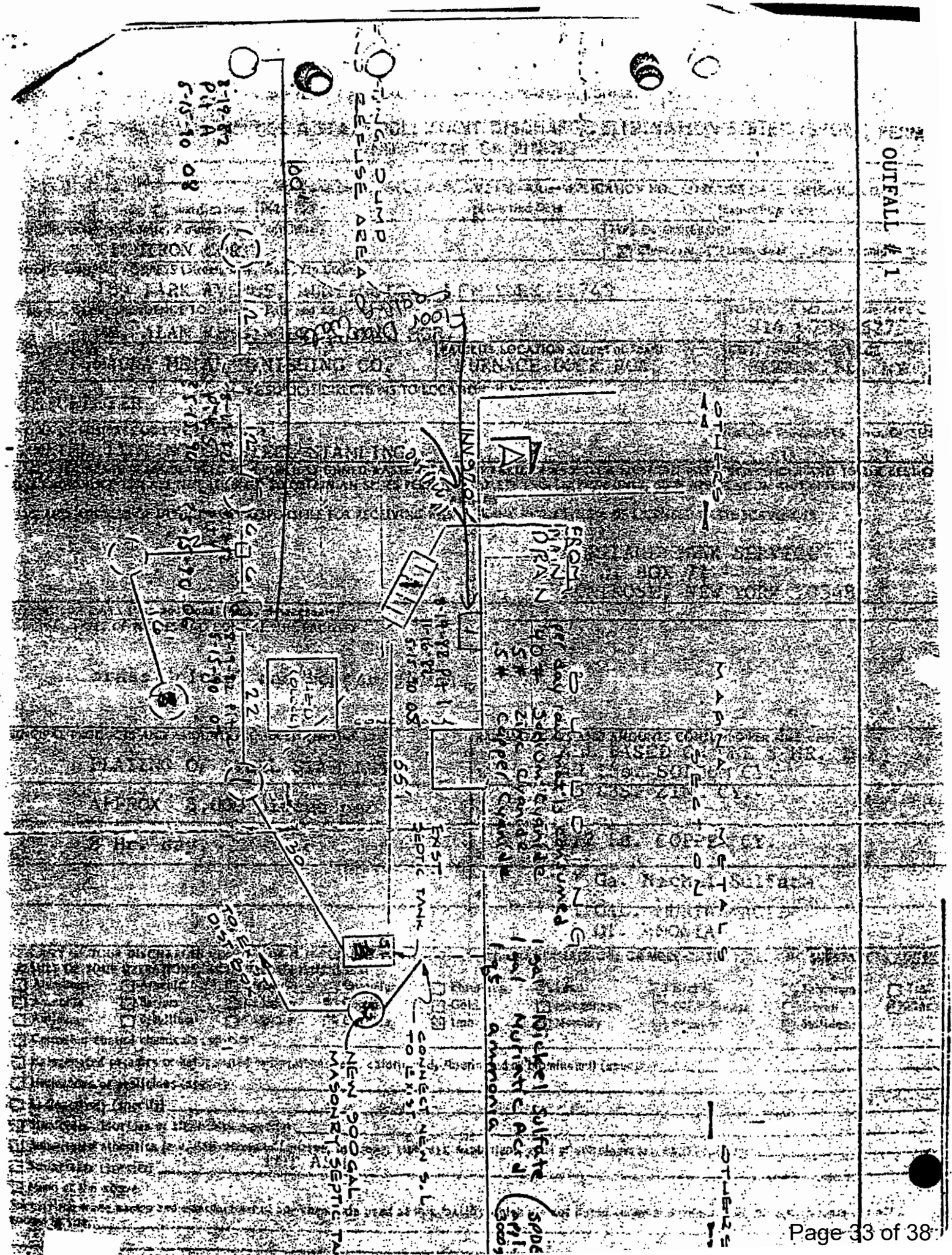
WESTCHESTER CO., CORTLANDT, N.Y.

7-7-81, NO SCALE, R.E.T.

NEW YORK STATE

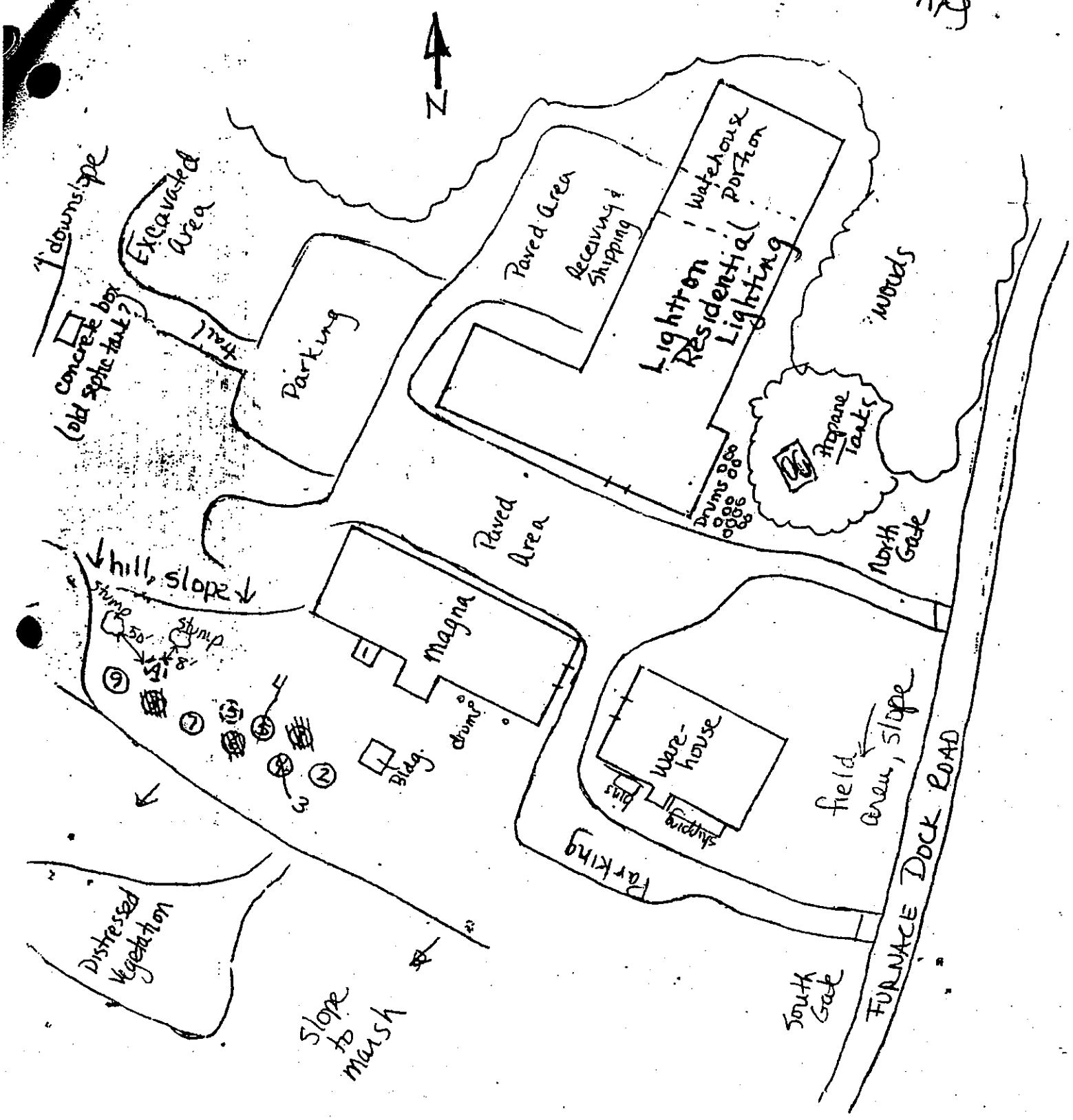
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE COMPLIANCE TEAM


OUTFALL # 1
REFUSE AREA
100'
FROM DRAIN
EXIST. SEPTIC TANK
CONNECT NEW S.L. TO EXIST.
NEW 900 GAL MASONRY SEPTIC TANK
Nickel Sulfate
Muriatic Acid
ammonia
OTHERS
MAGNA SECTION
METALS
Ga. Nickel Sulfate

LIGHTRON / SC / MAGNA

8/19/82



Brook (?)

NOTE:
(5) revised location
pit not found
(4) 3 new number

Distances

(A) to (5)	100'
(5) to (4)	20'
(4) to (3)	15'
(3) to (2)	18'
(2) to bldg	10'

ATTACHMENT C

Bedrock Drilling Specification

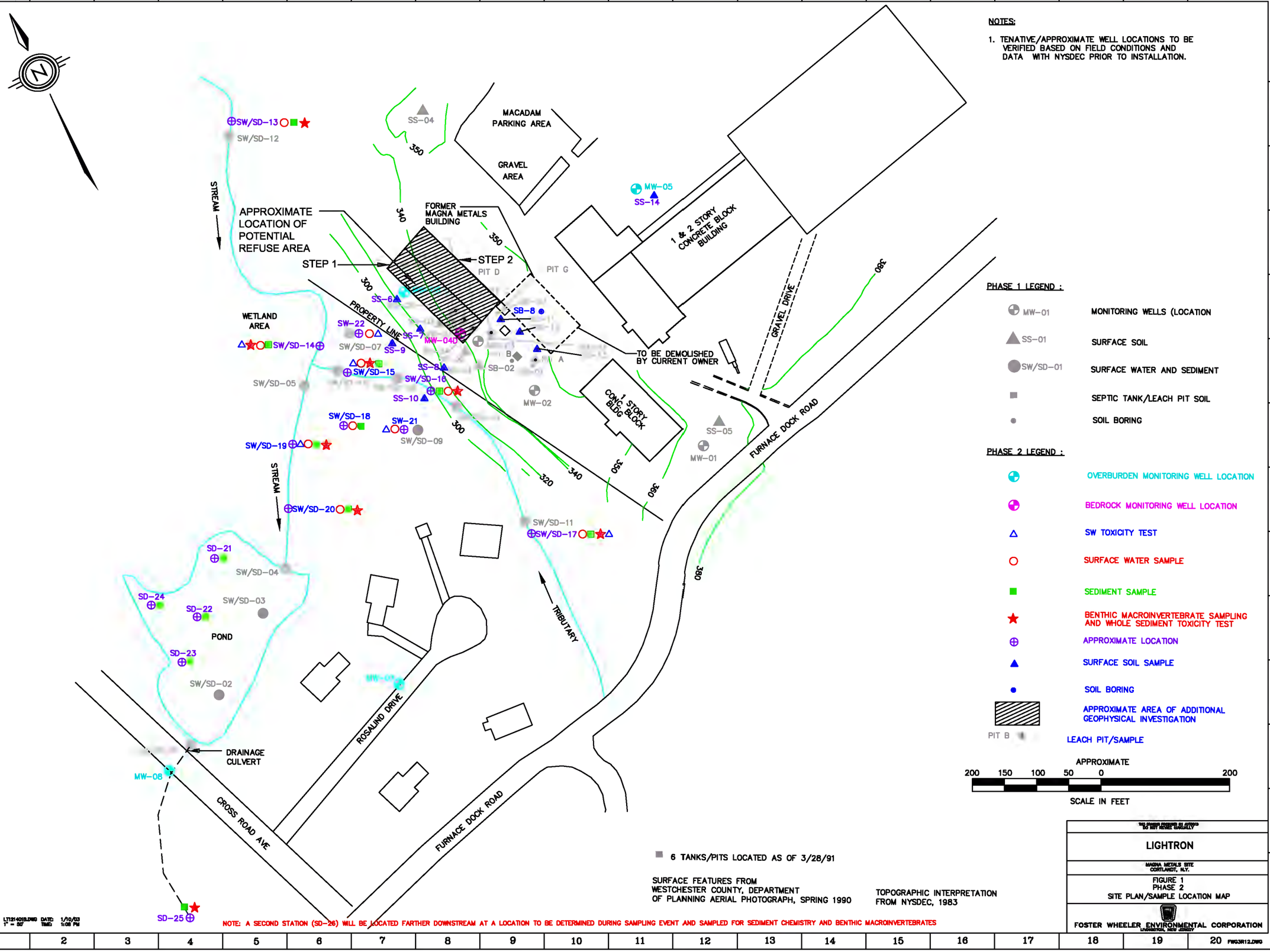
Bedrock Drilling Specification

Monitoring wells to be installed as open holes in bedrock will be installed according to the following specifications:

- Advance each boring to the top of the bedrock surface. Borehole advancement will be conducted using 6¼-inch inner diameter (ID) continuous flight hollow-stem augers in 2-foot intervals, to permit the continuous collection of subsurface soil samples with carbon steel split-spoon samplers. Confirmation of the bedrock surface depth will be based upon split-spoon refusal.
- Overbore the borehole to a 12-inch diameter borehole, in which to install a temporary 10-inch carbon steel overburden casing to bedrock, utilizing an appropriately sized tri-cone roller bit.
- Subsequent to temporary casing installation, continue borehole advancement into the bedrock to a depth of 5 feet below the bedrock surface with a 9-inch outer diameter (OD) tri-cone roller bit via the water rotary method.
- Set a permanent 6-inch carbon steel casing 5-feet into the competent bedrock by the spin casing method.
- Backfill the annular space around the well casing with bentonite/cement slurry to the surface. The ratio of cement to bentonite for grouting will be approximately 30 gallons of water to three 94 pound bags of cement to every 25 pounds of granular bentonite.
- Remove the 10-inch temporary casing during pressure grouting. Allow grout to cure for at least 24 hours.
- Continue coring and then drilling in the borehole to the maximum anticipated total depth (i.e. 10 feet below the point where groundwater was encountered) and/or the depth where fracture zones indicate sufficient yield, first using the rock coring method and then overboring utilizing the water rotary method and a 5-inch OD tri-cone roller bit.
- Complete the open hole monitoring well with a protective locking stick-up or flushmount box installed in a concrete pad.
- If the borehole extends to a depth greater than 25 feet below the bottom of the surface casing (due to depth and/or yield of groundwater), construct the monitoring well using 10 feet of 2-inch diameter Schedule 40 PVC or Schedule 5 stainless steel wire wound screen (0.010-inch slot or a slot size appropriate to the formation) and 2-inch diameter Schedule 40 PVC or Schedule 5 stainless steel riser pipe. For non-flushmounted wells, at least 2 to 3 feet of riser pipe must extend above the ground surface. Flushmounted wells will only be installed in high traffic areas, such as roadways, sidewalks, etc.
- Backfill the annular space to a minimum height of 2 feet above the top of screen with a sand pack. The sand pack shall be Morie #1 silica sand

(based on Site-specific geologic conditions and screen slot size). The remaining annular space will be filled with bentonite/cement grout up to the ground surface. The ratio of cement to bentonite for grouting will be approximately 30 gallons of water to three 94 pound bags of cement to every 25 pounds of granular bentonite.

- Complete the constructed monitoring well with a protective locking stickup or flushmount box installed in a concrete pad.


NOTES:
1. TENATIVE/APPROXIMATE WELL LOCATIONS TO BE VERIFIED BASED ON FIELD CONDITIONS AND DATA WITH NYSDEC PRIOR TO INSTALLATION.
APPROXIMATE LOCATION OF POTENTIAL REFUSE AREA
STEP 1
STEP 2
PIT D
PIT G
FORMER MAGNA METALS BUILDING
MACADAM PARKING AREA
GRAVEL AREA
1 & 2 STORY CONCRETE BLOCK BUILDING
1 STORY CONC. BLDG.
1 STORY BLOCK
TO BE DEMOLISHED BY CURRENT OWNER
GRAVEL DRIVE
FURNACE DOCK ROAD
PROPERTY LINE
WETLAND AREA
STREAM
TRIBUTARY
POND
ROSALIND DRIVE
CROSS ROAD AVE
DRAINAGE CULVERT
SW/SD-01
SW/SD-02
SW/SD-03
SW/SD-04
SW/SD-05
SW/SD-07
SW/SD-09
SW/SD-11
SW/SD-12
SW/SD-13
SW/SD-14
SW/SD-15
SW/SD-16
SW/SD-17
SW/SD-18
SW/SD-19
SW/SD-20
SW-21
SW-22
SD-21
SD-22
SD-23
SD-24
SD-25
SS-04
SS-05
SS-06
SS-07
SS-08
SS-09
SS-10
SS-14
MW-01
MW-02
MW-04D
MW-05
MW-08
SB-02
SB-8
PHASE 1 LEGEND :
MW-01 MONITORING WELLS (LOCATION
SS-01 SURFACE SOIL
SW/SD-01 SURFACE WATER AND SEDIMENT
SEPTIC TANK/LEACH PIT SOIL
SOIL BORING
PHASE 2 LEGEND :
OVERBURDEN MONITORING WELL LOCATION
BEDROCK MONITORING WELL LOCATION
SW TOXICITY TEST
SURFACE WATER SAMPLE
SEDIMENT SAMPLE
BENTHIC MACROINVERTEBRATE SAMPLING AND WHOLE SEDIMENT TOXICITY TEST
APPROXIMATE LOCATION
SURFACE SOIL SAMPLE
SOIL BORING
APPROXIMATE AREA OF ADDITIONAL GEOPHYSICAL INVESTIGATION
PIT B
LEACH PIT/SAMPLE
APPROXIMATE
200 150 100 50 0 200
SCALE IN FEET
6 TANKS/PITS LOCATED AS OF 3/28/91
SURFACE FEATURES FROM WESTCHESTER COUNTY, DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH, SPRING 1990
TOPOGRAPHIC INTERPRETATION FROM NYSDEC, 1983
NOTE: A SECOND STATION (SD-26) WILL BE LOCATED FARTHER DOWNSTREAM AT A LOCATION TO BE DETERMINED DURING SAMPLING EVENT AND SAMPLED FOR SEDIMENT CHEMISTRY AND BENTHIC MACROINVERTEBRATES
CAD FILE NAME: LT12140SLD.DWG PLOT SCALE: 1" = 50' DATE: 1/10/03 TIME: 1:08 PM
LIGHTRON
MAGNA METALS SITE CORTLANDT, N.Y.
FIGURE 1
PHASE 2
SITE PLAN/SAMPLE LOCATION MAP
FOSTER WHEELER ENVIRONMENTAL CORPORATION
FWG3R12.DWG

TETRA TECH EC, INC.

July 10, 2006

Ms. Sally Dewes
New York State Department of Environmental Conservation
Bureau of Remedial Action
625 Broadway
Albany, NY 12233-7016

Subject: **Data Findings From the Additional Data Collection Activities for the Former Magna Metals Site (NYSDEC Site No. 360003)**

Dear Ms. Dewes:

Please find enclosed the transmittal letter for the subject data findings. This is the version of the transmittal letter that has been approved by our client. The letter dated June 29, 2006 that previously transmitted the subject data findings was not approved by our client. Please note that there are **no** changes to the data that was previously submitted.

If you have any questions or comments, please call me at (973) 630-8544.

Sincerely,

Donald Campbell, PG

Enclosure
cc: Ian Ushe NYSDOH

JUL 13 2006

1000 The American Road, Morris Plains, NJ 07950
Tel 973.630.8000 Fax 973.630.8025
www.tteci.com

TETRA TECH EC, INC.

June 29, 2006

Ms. Sally Dewes
New York State Department of Environmental Conservation
Bureau of Remedial Action
625 Broadway
Albany, NY 12233-7016

Subject: **Data Findings From the Additional Data Collection Activities for the Former Magna Metals Site (NYSDEC Site No. 360003)**

Dear Ms. Dewes:

In accordance with the approved October 2005 Work Plan Addendum, Tetra Tech EC, Inc. is submitting the results from the additional data collection conducted at the Former Magna Metals Site in January and February 2006.

The field work was conducted in response to comments received from NYSDEC in letters dated April 20, 2005 and July 27, 2005. In these letters, NYSDEC indicated that soil vapor sampling and additional groundwater sampling were necessary to complete the Supplemental Remedial Investigation at the Former Magna Metals Site. Tetra Tech EC's professional judgment is that the newest results satisfy the needs of a complete RI data set, and as such, the RI Field Work is complete, and no further RI investigation is needed.

Specifically, the newest results confirm that sub slab vapor as are do not exceed the action levels. Also, the 2 new wells installed adjacent to the former Magna building due to NYSEC concerns on a potential source below the structure, did not indicate any contamination above NYSDEC standards. Furthermore, the data findings are consistent with the previous findings and the conclusions drawn in the Draft 1998 RI, that is, the leach pits are the source of soil and groundwater contamination. Our conclusion can be verified through review of the attached tables and figures.

As it has been some time, since our initial meeting that led the current data findings, I am presenting below the chronology of correspondences, meeting, and activities that occurred from August through November 2005 that led to the Final Additional Data Collection for the Supplemental Remedial Investigation/Feasibility Study Work Plan Addendum (October 2005).

Date	Correspondence/Meeting
August 31, 2005	Meeting at the Magna Metals Site between Tetra Tech EC, NYSDEC, NYSDOH, and Baker Properties to discuss locations of soil vapor sample locations. The following was agreed:

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	• Three additional monitoring wells would be installed and sampled. Two wells were to be installed adjacent to the former Magna Metals building to investigate it as a source of contamination, and one well was to be installed at the north end of the leach pits to delineate groundwater contamination; • Five soil vapor samples would be collected in the leach pit area; and • Three sub-slab soil vapor samples would be collected from the warehouse portion of the building east of the former Magna Metals Building. • It was agreed that NYSDEC/NYSDOH would evaluate the data results and determine if the Remedial Investigation Report could be finalized
September 1, 2005	Conference Call between to Tetra Tech EC, Inc., NYSDEC, and NYSDOH. The following was agreed: • Relocation of the three sub-slab vapor samples from building east of Former Magna Metals building. Instead three soil vapor samples would be collected beneath the roadway between the former Magna Metals building and the building to the east • One sub-slab soil vapor sample would be added beneath the warehouse south of the Magna Metals building.
September 15, 2005	Tetra Tech EC, Inc. submitted the Draft Additional Data Collection for the Supplemental RI/FS Work Plan Addendum (October 2005)
October 10, 2005	Comment letter from NYSDEC to Tetra Tech EC, Inc. on Draft Additional Data Collection for the Supplemental RI/FS Work Plan Addendum
October 18, 2005	Tetra Tech EC, Inc. resubmitted the Additional Data Collection for the Supplemental RI/FS Work Plan Addendum (October 2005)
November 10, 2005	NYSDEC approved the October 2005 Additional Data Collection for the Supplemental RI/FS Work Plan Addendum

January/February 2006. Field work commenced

March – June 2006 Removal of IDW, Lab Analysis, Data Validation, DUSRs, Data Summary

In closing, on behalf of the client, I am requesting that NYSDEC confirm that the data set is now complete and that the Draft Remedial Investigation Report, dated 1998, can be resubmitted as Final incorporating these newest results. Upon approval of the RI Report, the Feasibility Study will be prepared and submitted in accordance with the Order on Consent.

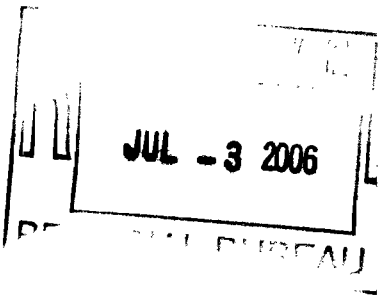
Sincerely,

Mark Sielski, PG
Project Manager

Enclosure
cc: N. Ward-Willis Keane & Beane w/o enc.
File

TETRA TECH EC, INC.

June 29, 2006



Ms. Sally Dewes
New York State Department of Environmental Conservation
Bureau of Remedial Action
625 Broadway
Albany, NY 12233-7016

Subject: **Additional Data Collection for the Supplemental Remedial Investigation/Feasibility Study Summary Letter Report for the Former Magna Metals Site (NYSDEC Site No. 360003)**

Dear Ms. Dewes:

Tetra Tech EC, Inc. is pleased to submit this Data Summary Letter Report for the additional data collection field work conducted at the Former Magna Metals Site in January and February 2006. The field work was conducted in response to comments received from NYSDEC in letters dated April 20, 2005 and July 27, 2005. In these letters, NYSDEC indicated that soil vapor sampling and additional groundwater sampling were necessary to complete the Supplemental Remedial Investigation at the Former Magna Metals Site. Below is a chronology of correspondences and meetings that occurred from August through November 2005 that led to the Final Additional Data Collection for the Supplemental Remedial Investigation/Feasibility Study Work Plan Addendum (October 2005).

Date	Correspondence/Meeting
August 31, 2005	Meeting at the Magna Metals Site between Tetra Tech EC, NYSDEC, NYSDOH, and Baker Properties to discuss locations of soil vapor sample locations. The following was agreed: • Three additional monitoring wells would be installed and sampled. Two wells were to be installed adjacent to the former Magna Metals building to investigate it as a source of contamination, and one well was to be installed at the north end of the leach pits to delineate groundwater contamination; • Five soil vapor samples would be collected in the leach pit area; and • Three sub-slab soil vapor samples would be collected from the warehouse portion of the building east of the former Magna Metals Building.
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Tel 973.630.8000 Fax 973.630.8025
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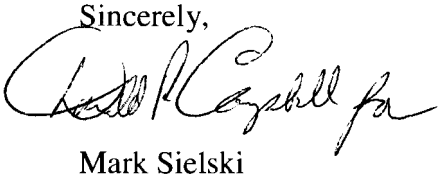
	• Relocation of the three sub-slab vapor samples from building east of Former Magna Metals building. Instead three soil vapor samples would be collected beneath the roadway between the former Magna Metals building and the building to the east • One sub-slab soil vapor sample would be added beneath the warehouse south of the Magna Metals building.
September 15, 2005	Tetra Tech EC, Inc. submitted the Draft Additional Data Collection for the Supplemental RI/FS Work Plan Addendum (October 2005)
October 10, 2005	Comment letter from NYSDEC to Tetra Tech EC, Inc. on Draft Additional Data Collection for the Supplemental RI/FS Work Plan Addendum
October 18, 2005	Tetra Tech EC, Inc. resubmitted the Additional Data Collection for the Supplemental RI/FS Work Plan Addendum (October 2005)
November 10, 2005	NYSDEC approved the October 2005 Additional Data Collection for the Supplemental RI/FS Work Plan Addendum

Following receipt of the November 10, 2005 NYSDEC letter, Tetra Tech EC, Inc. began mobilization. Field work commenced on January 4, 2006. Upon completion of field work, removal of IDW, and receipt of DUSRs, TtEC began preparing this Data Summary Letter Report.

In late May/early June 2006 Mr. Donald Campbell of Tetra Tech EC, Inc. and yourself exchanged several voicemail and email messages concerning submittal of the final Remedial Investigation Report. On June 14, 2006 you and Mr. Campbell were able to speak together via telephone and verbally agreed that the schedule presented in the October 2005 Additional Data Collection for the Supplemental RI/FS Work Plan Addendum only committed the submittal of this data summary report. It was further agreed that NYSDEC/NYSDOH would evaluate the data presented herein and determine if the Remedial Investigation Report could be finalized and, if so, that NYSDEC would send a letter to ISC Properties indicating that a final Remedial Investigation Report was to be submitted. The submittal date for the final Remedial Investigation Report will likely be dictated by conditions set forth in the ROD.

Sincerely,



Mark Sielski
Project Manager

Enclosure

cc: Ian Ushe NYSDOH w/enc.
N. Ward-Willis Keane & Beane w/ enc.
File

Table 1
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-01	SV-02	SV-03	SV-04	SV-05
Sample ID	MM-SV-01-010506	MM-SV-02-010506	MM-SV-03-010506	MM-SV-04-010506	MM-SV-05-010606
Sample Date	01/05/2006	01/05/2006	01/05/2006	01/05/2006	01/06/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT					
1,1,1-Trichloroethane	1.6	--	1.1	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	12	--	--
1,2,4-Trimethylbenzene	3.9	3.3	2	--	4.8
1,2-Dichloroethene	--	--	1.5	83	2.1
1,3,5-Trimethylbenzene	1.1	--	--	11	3.4
1,3-Butadiene	18 NJ	35 NJ	8.4	38 NJ	35
1,4-Dichlorobenzene	--	--	--	--	--
1,4-Dioxane	16	--	--	--	--
2,2,4-Trimethylpentane	--	17	--	32	1.5
2-Butanone	14	29	9.1	25	29
2-Hexanone	--	--	--	190	--
Acetone	69	110	36	--	97
Benzene	8	45	19	130	54
Carbon disulfide	25	110	4.7	18	28
Chloroform	2.4 NJ	--	--	--	--
Chloromethane	0.89	5.6	--	--	7.2
cis-1,2-Dichloroethene	--	--	1.5	44	2.1
Cyclohexane	6.5	21	0.96	83	2.8
Dichlorodifluoromethane	--	--	2.2	--	--
Ethylbenzene	2.3	6.9	4.3	650	10
Isopropyl alcohol	--	--	--	--	--
(m+p)xylene	6.1	11	6.1	1900	12
Methyl tert-butyl ether	--	--	--	--	--
n-Heptane	3.7	21	4.1	780	13
n-Hexane	7.4	32	6.3	150	17
o-Xylene	2.4	4.3	2.5	380	6.5
p-Ethyltoluene	3	3.3	2.3	22	4.7
Styrene	--	4	1.7	--	3.2
Tetrachloroethene	1.2	--	8.8	--	10

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 1
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-01	SV-02	SV-03	SV-04	SV-05
Sample ID	MM-SV-01-010506	MM-SV-02-010506	MM-SV-03-010506	MM-SV-04-010506	MM-SV-05-010606
Sample Date	01/05/2006	01/05/2006	01/05/2006	01/05/2006	01/06/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT					
Tetrahydrofuran	--	--	--	--	--
Toluene	9	26	14	210	38
trans-1,2-Dichloroethene	--	--	--	38	--
Trichloroethene	31	11	59	64	7
Trichlorofluoromethane	--	--	--	--	2
Vinyl chloride	--	1.2	--	22	0.92
Xylene (total)	8.3	16	8.3	2200	18

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 1
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-06	SV-07	SV-08	SV-09
Sample ID	MM-SV-06-010606	MM-SV-07-010606	MM-SV-08-010606	MM-SV-09-010506
Sample Date	01/06/2006	01/06/2006	01/06/2006	01/05/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT				
1,1,1-Trichloroethane	0.93	28	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	--	--	--	--
1,2,4-Trimethylbenzene	2.1	7.9	1.9	5.9
1,2-Dichloroethene	--	--	--	--
1,3,5-Trimethylbenzene	--	2.7	--	1.9
1,3-Butadiene	27	3.1 NJ	22 NJ	1.1 NJ
1,4-Dichlorobenzene	--	3	--	--
1,4-Dioxane	--	--	--	--
2,2,4-Trimethylpentane	--	3.2	--	2.2
2-Butanone	13	8	9.4	41
2-Hexanone	--	4.1	--	--
Acetone	59	29	38	52
Benzene	31	14	17	3.8
Carbon disulfide	5.3	3.1	5.3	3.7
Chloroform	1.3	--	--	--
Chloromethane	1.9	1.1	1	--
cis-1,2-Dichloroethene	--	--	--	--
Cyclohexane	1.5	9.3	1	1.4
Dichlorodifluoromethane	--	4	3.1	5.9
Ethylbenzene	4.3	7.4	2.6	3.9
Isopropyl alcohol	--	47	--	17
(m+p)xylene	7.4	23	4.8	12
Methyl tert-butyl ether	--	28	--	6.9
n-Heptane	4.5	9.8	3.9	3.8
n-Hexane	8.5	8.8	6.3	5.3
o-Xylene	2.5	7.8	1.6	--
p-Ethyltoluene	2	6.9	1.7	4.9
Styrene	1	2.1	0.85	--
Tetrachloroethene	130	4	8.1	--

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 1
Detected Volatile Organic Compounds for Soil Vapor Samples
January 2006
Magna Metals

Site ID	SV-06	SV-07	SV-08	SV-09
Sample ID	MM-SV-06-010606	MM-SV-07-010606	MM-SV-08-010606	MM-SV-09-010506
Sample Date	01/06/2006	01/06/2006	01/06/2006	01/05/2006
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3
CONSTITUENT				
Tetrahydrofuran	--	--	--	35
Toluene	25	22	12	15
trans-1,2-Dichloroethene	--	--	--	--
Trichloroethene	40	14	4.2	1.1
Trichlorofluoromethane	1.4	1.7	1.5	2.6
Vinyl chloride	--	--	--	--
Xylene (total)	9.6	30	6.1	11

Notes:
-- Non-detect
NJ - Tentative in identification and estimated in value
Currently, there are no soil vapor criteria in New York State to compare results against.

Table 2
Detected Volatile Organic Compounds for Groundwater Samples
February 2006
Magna Metals

	Site ID	MW-02	MW-03	MW-04	MW-04
	Sample ID	MM-GWMW02-022406	MM-GWMW03-022406	MM-GWMW04-022406	MM-GWMW94-022406
	Sample Date	02/24/2006	02/24/2006	02/24/2006	Duplicate of MM-GWMW04-022406
	Units	µg/L	µg/L	µg/L	
CONSTITUENT	**NY-GWQS**				
cis-1,2-Dichloroethene	5*	--	--	2.2 J	2.2 J
Tetrachloroethene	5	--	2.6 J	**7.5**	**8.2**
Trichloroethene	5	--	**17**	**270 D**	**260 D**

Notes:
Bold values exceed criteria.
*Criteria provided for 1,2-dichloroethene (total) are the most conservative values for the cis- and trans- isomers.
-- Non-detect
D - From a diluted sample
J - Estimated
NY-GWQS - New York Ambient Water Quality Standards

References:
NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

Table 2
Detected Volatile Organic Compounds for Groundwater Samples
February 2006
Magna Metals

	Site ID	MW-06	MW-09	MW-10	MW-11
	Sample ID	MM-GWMW06-022306	MM-GWMW09-022406	MM-GWMW10-022406	MM-GWMW11-022306
	Sample Date	02/23/2006	02/24/2006	02/24/2006	02/23/2006
	Units	µg/L	µg/L	µg/L	µg/L
CONSTITUENT	**NY-GWQS**				
cis-1,2-Dichloroethene	5*	**8.1**	--	--	1.3 J
Tetrachloroethene	5	2.6 J	--	--	2.2 J
Trichloroethene	5	**180 D**	--	4.5 J	**190**

Notes:
Bold values exceed criteria.
*Criteria provided for 1,2-dichloroethene (total) are the most conservative values for the cis- and trans- isomers.
-- - Non-detect
D - From a diluted sample
J - Estimated
NY-GWQS - New York Ambient Water Quality Standards

References:
NYSDEC Values are from Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998; Errata Sheet for the June 1998 TOGS 1.1.1, January 1999; and April 2000 Addendum to the June 1998 TOGS 1.1.1, April 2000.

LEGEND

SV-01 ▽ SUPPLEMENTAL SOIL VAPOR LOCATION

LP-02 ▽ LEACH PIT LOCATION

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. ALL CONCENTRATIONS ARE IN ug/m3.

3. NJ – TENTATIVE IN IDENTIFICATION AND ESTIMATED IN VALUE.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

N

0 50 100
FEET

SV-05 Constituent	MM–SV–05–010606 01/06/06
1,2,4–Trimethylbenzene	4.8
1,2–Dichloroethene	2.1
1,3,5–Trimethylbenzene	3.4
1,3–Butadiene	35
2,2,4–Trimethylpentane	1.5
2–Butanone	29
Acetone	97
Benzene	54
Carbon disulfide	28
Chloromethane	7.2
cis–1,2–Dichloroethene	2.1
Cyclohexane	2.8
Ethylbenzene	10
(m+p)xylene	12
n–Heptane	13
n–Hexane	17
o–Xylene	6.5
p–Ethyltoluene	4.7
Styrene	3.2
Tetrachloroethene	10
Toluene	38
Trichloroethene	7
Trichlorofluoromethane	2
Vinyl chloride	0.92

SV-06 Constituent	MM–SV–06–010606 01/06/06
1,1,1–Trichloroethane	0.93
1,2,4–Trimethylbenzene	2.1
1,3–Butadiene	27
2–Butanone	13
Acetone	59
Benzene	31
Carbon disulfide	5.3
Chloroform	1.3
Chloromethane	1.9
Cyclohexane	1.5
Ethylbenzene	4.3
(m+p)xylene	7.4
n–Heptane	4.5
n–Hexane	8.5
o–Xylene	2.5
p–Ethyltoluene	2
Styrene	1
Tetrachloroethene	130
Toluene	25
Trichloroethene	40
Trichlorofluoromethane	1.4

SV-04 Constituent	MM–SV–04–010506 01/05/06
1,2–Dichloroethene	83
1,3,5–Trimethylbenzene	11
1,3–Butadiene	38 NJ
2,2,4–Trimethylpentane	32
2–Butanone	25
2–Hexanone	190
Benzene	130
Carbon disulfide	18
cis–1,2–Dichloroethene	44
Cyclohexane	83
Ethylbenzene	650
(m+p)xylene	1900
n–Heptane	780
n–Hexane	150
o–Xylene	380
p–Ethyltoluene	22
Toluene	210
trans–1,2–Dichloroethene	38
Trichloroethene	64
Vinyl chloride	22

SV-01 Constituent	MM–SV–01–010506 01/05/06
1,1,1–Trichloroethane	1.6
1,2,4–Trimethylbenzene	3.9
1,3,5–Trimethylbenzene	1.1
1,3–Butadiene	18 NJ
1,4–Dioxane	16
2–Butanone	14
Acetone	69
Benzene	8
Carbon disulfide	25
Chloroform	2.4 NJ
Chloromethane	0.89
Cyclohexane	6.5
Ethylbenzene	2.3
(m+p)xylene	6.1
n–Heptane	3.7
n–Hexane	7.4
o–Xylene	2.4
p–Ethyltoluene	3
Tetrachloroethene	1.2
Toluene	9
Trichloroethene	31

SV-02 Constituent	MM–SV–02–010506 01/05/06
1,2,4–Trimethylbenzene	3.3
1,3–Butadiene	35 NJ
2,2,4–Trimethylpentane	17
2–Butanone	29
Acetone	110
Benzene	45
Carbon disulfide	110
Chloromethane	5.6
Cyclohexane	21
Ethylbenzene	6.9
(m+p)xylene	11
n–Heptane	21
n–Hexane	32
o–Xylene	4.3
p–Ethyltoluene	3.3
Styrene	4
Toluene	26
Trichloroethene	11
Vinyl chloride	1.2

SV-03 Constituent	MM–SV–03–010506 01/05/06
1,1,1–Trichloroethane	1.1
1,1,2–Trichloro–1,2,2–trifluoroethane	12
1,2,4–Trimethylbenzene	2
1,2–Dichloroethene	1.5
1,3–Butadiene	8.4
2–Butanone	9.1
Acetone	36
Benzene	19
Carbon disulfide	4.7
cis–1,2–Dichloroethene	1.5
Cyclohexane	0.96
Dichlorodifluoromethane	2.2
Ethylbenzene	4.3
(m+p)xylene	6.1
n–Heptane	4.1
n–Hexane	6.3
o–Xylene	2.5
p–Ethyltoluene	2.3
Styrene	1.7
Tetrachloroethene	8.8
Toluene	14
Trichloroethene	59

SV-08 Constituent	MM–SV–08–010606 01/06/06
1,2,4–Trimethylbenzene	1.9
1,3–Butadiene	22 NJ
2–Butanone	9.4
Acetone	38
Benzene	17
Carbon disulfide	5.3
Chloromethane	1
Cyclohexane	1
Dichlorodifluoromethane	3.1
Ethylbenzene	2.6
(m+p)xylene	4.8
n–Heptane	3.9
n–Hexane	6.3
o–Xylene	1.6
p–Ethyltoluene	1.7
Styrene	0.85
Tetrachloroethene	8.1
Toluene	12
Trichloroethene	4.2
Trichlorofluoromethane	1.5

SV-07 Constituent	MM–SV–07–010606 01/06/06
1,1,1–Trichloroethane	28
1,2,4–Trimethylbenzene	7.9
1,3,5–Trimethylbenzene	2.7
1,3–Butadiene	3.1 NJ
1,4–Dichlorobenzene	3
2,2,4–Trimethylpentane	3.2
2–Butanone	8
2–Hexanone	4.1
Acetone	29
Benzene	14
Carbon disulfide	3.1
Chloromethane	1.1
Cyclohexane	9.3
Dichlorodifluoromethane	4
Ethylbenzene	7.4
Isopropyl alcohol	47
(m+p)xylene	23
Methyl tert–butyl ether	28
n–Heptane	9.8
n–Hexane	8.8
o–Xylene	7.8
p–Ethyltoluene	6.9
Styrene	2.1
Tetrachloroethene	4
Toluene	22
Trichloroethene	14
Trichlorofluoromethane	1.7

SV-09 Constituent	MM–SV–09–010506 01/05/06
1,2,4–Trimethylbenzene	5.9
1,3,5–Trimethylbenzene	1.9
1,3–Butadiene	1.1 NJ
2,2,4–Trimethylpentane	2.2
2–Butanone	41
Acetone	52
Benzene	3.8
Carbon disulfide	3.7
Cyclohexane	1.4
Dichlorodifluoromethane	5.9
Ethylbenzene	3.9
Isopropyl alcohol	17
(m+p)xylene	12
Methyl tert–butyl ether	6.9
n–Heptane	3.8
n–Hexane	5.3
p–Ethyltoluene	4.9
Tetrahydrofuran	35
Toluene	15
Trichloroethene	1.1
Trichlorofluoromethane	2.6

FORMER MAGNA METALS BUILDING

1 A… BLC…

SHED

APPROXIMATE PROPERTY LI…

1 STORY CONCRETE BLOCK BUILDING

FURNACE DOCK ROAD

CROSS ROAD

DRAINAGE CULVERT

DRAINAGE CULVERT

360 320 360 380 400 540 520

SV-04 LP-09 LP-0A LP-08 SV-05 LP-07 LP-06 LP-06A LP-05 SV-06 LP-04 LP-03 LP-02 SV-07 LP-01 SV-01 SV-02 SV-03 ST-02 ST-01 SV-08 SV-09

LEGEND

MW-01 ◆ MONITORING WELL LOCATION

LP-02 ▽ LEACH PIT LOCATION

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

GROUNDWATER FLOW DIRECTION

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. [BRACKETS] INDICATE CONCENTRATION EQUALS OR EXCEEDS NY-GWQS.

3. NY-GWQS – NEW YORK GROUNDWATER QUALITY STANDARD.

4. ALL CONCENTRATIONS ARE IN µg/L.

5. ft bgs – FEET BELOW GROUND SURFACE

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

N

0 50 100
FEET

MW-11		MM-GWMW11-02230 15 ft bgs 02/23/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[190]

MW-06		MM-GWMW06-02230 17.5 ft bgs 02/23/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[180] D
cis-1,2-Dichloroethene	5	[8.1]

MW-03		MM-GWMW03-02240 0 ft bgs 02/24/06
Constituent	NY-GWQS	Primary
Trichloroethene	5	[17]

MW-04		MM-GWMW04-02240 16 ft bgs 02/24/06	MM-GWMW94-02240 16 ft bgs 02/24/06
Constituent	NY-GWQS	Primary	Duplicate
Tetrachloroethene	5	[7.5]	[8.2]
Trichloroethene	5	[270] D	[260] D

FURNACE BR

WETLAND AREA

POND

MACADAM PARKING AREA

FORMER MAGNA METALS BUILDING

1 AND 2 STORY CONCRETE BLOCK BUILDING

1 STORY CONCRETE BLOCK BUILDING

SHED

APPROXIMATE PRO

UNNAME

OCK ROAD

MW-01 MW-02 MW-03 MW-04 MW-04D MW-05 MW-06 MW-07 MW-09 MW-10 MW-11

LP-01 LP-02 LP-03 LP-04 LP-05 LP-06 LP-06A LP-07 LP-08 LP-09 LP-0A

ST-01 ST-02

340 360 380 400

TETRA TECH EC, INC.

TITLE:
Groundwater Exceedences – February 2006
Supplemental RI/FS – Additional Data Collection Summary Letter Report
Magna Metals, Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMB	CTS	1172.0003
CHKD:	APPD:	FIGURE NO.:
		2
DATE:	REV.:	
06/12/2006	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FIGURE 2 GW EXCEEDENCES 061206.DWG

ATTACHMENT 1

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name DONALD CAMPBELL + KELLY MILLET Date/Time Prepared 01/04/06 @0915

Preparer's Affiliation TETRA TECH EC Phone No. 973.630.8000

Purpose of Investigation MAGNA METALS (SITE # 360003) SOIL VAPOR SURVEY

1. OCCUPANT:

Interviewed: Y / (N)

COMPANY NAME
~~Last Name:~~ POLYMEDCO, INC. ~~First Name:~~ _____

Address: 510 FURNACE DOCK ROAD, CORTLANDT MANOR, NY

County: WESTCHESTER

~~Home Phone:~~ N/A Office Phone: (914) 739-5400

Number of Occupants/persons at this location 0 Age of Occupants N/A
– BUILDING IS CURRENTLY ONLY USED FOR STORAGE.

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: (Y) / N

COMPANY NAME
~~Last Name:~~ BAKERS PROPERTIES, LP ~~First Name:~~ REPRESENTATIVE INTERVIEWED: DOUG GRIMMER

Address: 485 WASHINGTON AVE, PLESANTVILLE, NY 10570

County: WESTCHESTER

Home Phone: N/A Office Phone: (914) 747-1550

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
(Industrial)	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) STORAGE OF POLYMEDCO EQUIPMENT

Does it include residences (i.e., multi-use)? Y / (N) If yes, how many? _____

Other characteristics:

Number of floors 1 Building age ~50 YEARS

Is the building insulated? (Y) / N ONLY ROOF INSULATED How air tight? Tight / (Average) / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

N/A

Airflow near source

N/A

Outdoor air infiltration

Outdoor air enters around roll-style garage doors & doorways & at windows (single pane glass).

Infiltration into air ducts

Air infiltrates at cold air return located along western wall - ajoining the furnace room.

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete blocks	stone	brick w/steel frame
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with paint (old)	
e. Concrete floor:	unsealed	sealed	sealed with partly w/ paint	
f. ~~Foundation~~ Building walls:	poured	block	stone	other _____
g. ~~Foundation~~ Building walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy N/A
i. The basement is:	finished	unfinished	partially finished	N/A
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: ____/____(feet) BUILDING IS AT GRADE.

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

WATER ENTERS BUILDING THROUGH FLOOR @ NW CORNER + ELECTRIC ENTERS AT CENTER OF EASTERN WALL.

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: N/A

Boiler/furnace located in: Basement Outdoors Main Floor Other IN ADDOINING STRUCTURE - SHARES PART OF WESTERN WALL.

Air conditioning: Central Air Window units Open Windows (None)

Are there air distribution ducts present? (Y) / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

Air ducts associated with the heating system run along the ceiling. Cold air return is along the western wall adjacent to the furnace room.

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)
Basement	N/A
1st Floor	Storage
2nd Floor	N/A
3rd Floor	N/A
4th Floor	N/A

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y (N)

b. Does the garage have a separate heating unit? Y / N / (NA)

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) / N / NA Please specify 3 generators are stored in the southern portion of the building.

d. Has the building ever had a fire? Y (N) When? _____

e. Is a kerosene or unvented gas space heater present? Y (N) Where? _____

f. Is there a workshop or hobby/craft area? Y (N) Where & Type? _____

g. Is there smoking in the building? Y (N) How frequently? _____

h. Have cleaning products been used recently? Y (N) When & Type? _____

i. Have cosmetic products been used recently? Y (N) When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / (N) Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / (N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? Y / (N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / (N) If yes, where vented? _____

o. Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? Y / (N)
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y (N) / (N/A)
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N (N/A)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

(N/A)

Is there a radon mitigation system for the building/structure? Y (N) Date of Installation: _____
Is the system active or passive? Active/Passive N/A

9. WATER AND SEWAGE

Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: Public Sewer (Septic Tank) Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: N/A

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

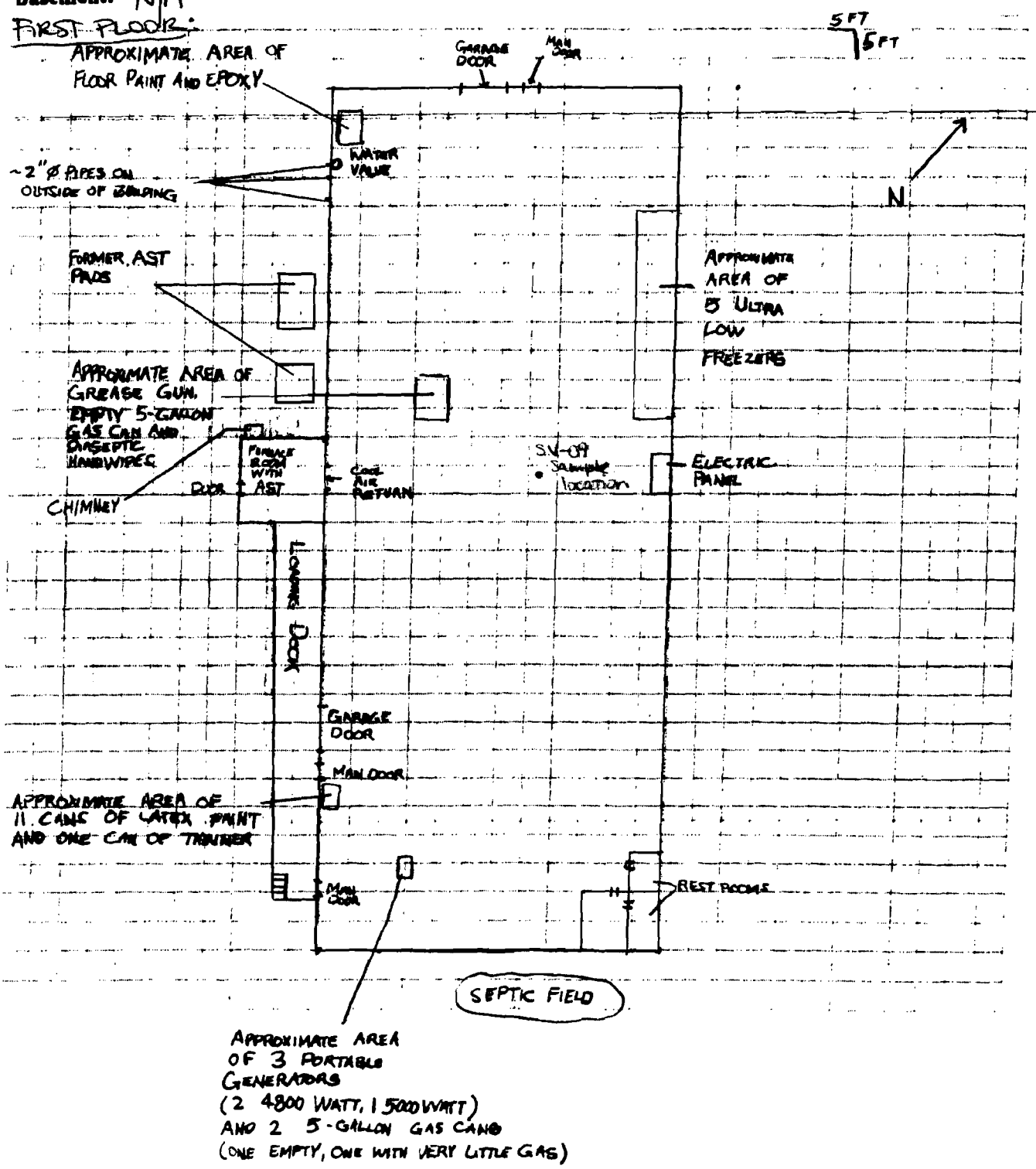
c. Responsibility for costs associated with reimbursement explained? Y / N (N/A)

d. Relocation package provided and explained to residents? Y / N (N/A)

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement: N/A



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

See attached figure (FIGURE 1).

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: MINI RAE 2000 PHOTOIONIZATION DETECTOR

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
Southern corner	portable generators (3)	3	U	gasoline	0.1	Y
Southern corner	5-gallon gas cans	2	U	gasoline	0.2	Y
Sw/along w/wall	1-gallon paint cans (Latex + Acrylic)	11	U	Acrylic polymer, 2(2methoxyethoxy)-ethanol,	0.0	Y
—	—	—	—	oxatridecyl acetate, carbon black, 2(2-Butoxyethoxy)-ethanol,	—	—
—	—	—	—	oxo-tridecyl Acetate, ethylene glycol.	—	—
Center/ northern portion	DisAseptic Handwipes	160 towelettes	U	Benzalkonium chloride, Isopropyl alcohol, Lauramine oxide,	0.0	Y
—	—	—	—	Octoxynol 9, Myristalkonium Chloride, Quaternium	—	—
Center/ northern portion	Grease Gun	~1L	U	no label	0.0	Y
northwest corner	1 - 1-gallon epoxy concrete paint 4 - 1-gallon epoxy coat hardener	—	UO	Ethylene Glycol	0.0	Y
↓	3 5gallon Buckets of epoxy coating	—	UO	none listed - see photos	0.0	Y
↓	1 5 gallon bucket of paint	—	U	none listed	0.0	Y
↓	1 5-gallon bucket of primer	—	U	none listed	0.0	Y

* Describe the condition of the product containers as **Unopened (UO), Used (U), or Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

ATTACHMENT 2

MW-02

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals
DATE: 2/24/06
WEATHER: Sunny High of 40°F
MONITORING WELL NO.: MW-02 WELL PERMIT NUMBER:

ENVIRONMENTAL CONSULTING FIRM: Tetra Tech EC
FIELD PERSONNEL: Kelly Millet & Shannon Hill
Sheet 1 of 1

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 ppm
OPEN WELL (Initial): 0.2 ppm
PUMP INTAKE DEPTH: 22 ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (Initial): 13.15 ft from TOC
PUMP START TIME: 8:44

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
9:44	X		4.90	NA	2.37	NA	249	NA	12.54	NA	42.7	NA	8.99	NA	NA	13.15
8:49	X		5.89	0.99	2.41	101.69	218	-31	7.74	61.72	8.4	19.67	9.73		500	13.24
8:54	X		6.[illegible]	0.14	2.40	99.59	201	-17	7.64	98.71	-2.0	23.81	10.64	1 gal	500	13.22
8:59	X		6.07	0.04	2.40	[illegible]	194	-7	7.71	100.90	-5.9		10.86	1.75 gal		13.21
9:04	X		6.09	0.02	2.43	101.25	188	-6	7.5[illegible]	97.15	-9.0		10.97	3 gal		13.24
9:09	X		6.10	0.01	2.44	100.41	184	-4	7.42	99.07	-9.9		11.03	4.5 gal	"	
9:10		X	Sample taken													

COMMENTS: MM-GWMW02-022406 collected at 9:10 total purged 4.5 gallons

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-03

Bailing
~~LOW FLOW RATE~~
PURGING AND SAMPLING DATA SHEET

SITE:	Magna Metals	ENVIRONMENTAL	Sheet 1 of 1
DATE:	2/24/06	CONSULTING FIRM:	Tetra Tech EC
WEATHER:	~~MW-03~~ Sunny 40°F	FIELD PERSONNEL:	Kelly Millet & Shannon Hill
MONITORING WELL NO.:	MW-03	WELL PERMIT NUMBER:	

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 ~~PUMP INTAKE DEPTH: ____ ft from top of casing (TOC)~~
OPEN WELL (initial): 0.0 WATER ELEVATION WITH PUMP IN PLACE (initial): 16.51 ft from TOC
PUMP START TIME: ____

	TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
Initial	11:30	X		6.12	NA	1.73	NA	218	NA	6.55	NA	199	NA	9.20	NA	NA	15.51
	11:40	X		5.76		1.58		230		8.00		334		9.32			Dry
				Well Dry at 11:40, ~~3~~ Aprx. 0.75 gallons bailed allow well to											3/4 gallon		
				recharge prior to bailing sample													15.53
	14:10		X	Sample MM-GW/MW03-022406													
	14:10	—		5.65		1.6		213		7.55		133		9.44			15.53

COMMENTS: Well Purged w/Bailer due to low water volume insufficient for low flow sampling; sample # MM-GW/MW03-022406 taken at 14:10
Water visually turbid w/ light brown silt

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-04

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals
DATE: 2/24/06
WEATHER: Sunny High of 48°F
MONITORING WELL NO.: MW-04 WELL PERMIT NUMBER:
ENVIRONMENTAL CONSULTING FIRM: Tetra Tech EC
FIELD PERSONNEL: Kelly Millet & Shannon Hill
Sheet 1 of 1

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 OPEN WELL (initial): 10.6
PUMP INTAKE DEPTH: 16 ft from top of casing (TOC)
WATER ELEVATION WITH PUMP IN PLACE (initial): 12.31 ft from TOC
PUMP START TIME: 9:47

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity % **	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
9:47	X		6.08	NA	0.505	NA	163	NA	2.53	NA	16.8	NA	8.43	NA	NA	12.31
9:50	X		6.08	-0.4	0.497	98.4	179	16	0.00	—	2.4	15.4%	8.60	1 gal	200	13.02
9:56	X		6.18	0.1	0.490	98.59	163	16	0.00	—	-8.5	-354.2%	10.19		200	13.04
10:00	X		6.16	-0.02	0.495	101.02	155	-8	0.00	—	-10	117.64	10.18		200	13.03
10:04	X		6.13	0.03	0.495	100	137	-18	0.00	—	-7	70%	10.28	1 gal	"	12.99
10:09	X		6.12	-0.01	0.501	101.21	142	5	0.00	—	-25	35.7%	11.41		"	13.19
10:12	X		6.13	0.01	0.497	99.2	147	5	0.00	—	3.5	-140	10.75		"	13.04
10:16	X		6.09	-0.05	0.493	99.2	137	10	0.00	—	6.9	197	11.16		"	13.02
10:18		X	Sample collected											2 gallons		

COMMENTS: 10:18 Sample MM-GW-MW04-022406 also collect Sample # MM-GW-MW94-022406 for Dup.
2 gallons total purged

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-06

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE:	Magna Metals	ENVIRONMENTAL CONSULTING FIRM:	Tetra Tech EC
DATE:	2/23/06	FIELD PERSONNEL:	Kelly Millet & Shannon Hill
WEATHER:	Overcast ~40°F		
MONITORING WELL NO.:	MW-06	WELL PERMIT NUMBER:	

Sheet 1 of 1

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 OPEN WELL (initial): 0.1

PUMP INTAKE DEPTH: 17.5 ft from top of casing (TOC)

WATER ELEVATION WITH PUMP IN PLACE (initial): 15.56 ft from TOC

PUMP START TIME: 13:48

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
13:48	X		6.50	NA	0.309	NA	117	NA	7.80	NA	65.3	NA	9.62	NA	NA	15.56
13:55	X		6.05	-0.45	0.305	98.71	117	0	3.14	40.26	32.1	49.16	11.22		300	15.82
14:00	X		5.98	-0.07	0.303	99.34	117	0	2.76	87.89	23.5	73.21	12.52	½ gal	250	15.90
14:05	X		5.97	-0.01	0.305	100.66	118	1	2.24	81.15	10.4	44.26	13.42	1.25 gal	"	15.97
14:10	X		5.94	-0.03	0.310	101.64	119	1	1.83	81.70	8.5	81.73	13.39	1.5 gal	200	15.98
14:14	X		5.95	0.01	.311	100.32	115	-4	1.84	100.55	7.3	85.88	12.98	1.75 gal		15.92
14:18	X		5.94	0.01	.306	98.39	106	-9	1.61	87.5	12.5	171.23	13.36		150	~~16.27~~ 15.[illegible]
14:22	X		5.92	-0.02	0.297	97.39	103	3	1.44	89.44	8.3	66.4	14.87	2 gal		15.87
14:26	X		5.93	0.01	0.303	101.68	102	1	1.47	102.08	15.2	143.13	14.60			15.83
14:30	X		5.96	0.03	0.298	97.36	104	2	1.44	97.96	411	2703.15	14.54			16.50
14:38	X		5.87	-0.09	0.302	102.37	99	-5	.57	39.58	307	74.40	16.65	3 gal		16.45
14:44	X		5.98	0.11	0.303	100.33	106	7	0.00	—	219	71.34	12.33			16.80
14:48	X		5.94	-0.04	0.297	98	108	2	0.00	—	405	194.93	13.39	4.5 gal		16.53
14:54	X		5.96	0.02	0.290	97.6	103	5	0.00	—	271	66.9	17.80	4.75 gal		16.41
15:00	X		5.94	-0.02	0.299		96	-7	0.00	—	294		17.61			16.18
15:05		X	Sample collected											5 gals		

→ water [illegible]

COMMENTS: All parameters stable except Turbidity contact office per DC collect sample MM-GW-MW-06-07

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-09

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals | ENVIRONMENTAL | Sheet 1 of 1
DATE: [redacted] 2/24/06 | CONSULTING FIRM: Tetra Tech EC
WEATHER: Sunny 40°F | FIELD PERSONNEL: Kelly Millet & Shannon Hill
MONITORING WELL NO.: MW-09 | WELL PERMIT NUMBER:
PID/FID READINGS (ppm): AMBIENT AIR: 0.0 | PUMP INTAKE DEPTH: 17.5 ft from top of casing (TOC)
OPEN WELL (initial): 1.0 | WATER ELEVATION WITH PUMP IN PLACE (initial): [redacted] ft from TOC
PUMP START TIME: 13:03 | 14.89

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
13:03	X		5.87	NA	2.27	NA	218	NA	9.30	NA	563	NA	8.80	NA	NA	14.89
13:08	X		5.75	-0.12	2.27	100	203	-15	7.71	83.66	799	141.9	9.37		250	15.34
13:13	X		5.76	0.01	2.30	101.32	191	-12	6.87	89.12	294	28.92	10.11	1gal	"	15.90
13:18	X		5.77	0.01	2.28	99	180	-11	6.74	98.1	37.1	13.01	11.86	1.5gal		16.97
13:24	X		5.77	—	2.28	100	175	-15	7.58	112.46	38.3	103	11.63		175	15.95
13:28	X		5.78	0.01	2.27	99.56	170	5	7.55	99.6	23.8	84.10	12.18	2gal	"	15.92
13:32	X		5.80	0.02	2.30	101.32	167	-3	7.79	103.18	13.4	56.3	11.60	2.5gal	11	15.94
13:36	X		5.80	—	2.28		169	0	7.89		9.7		11.74			15.90
13:40			Sample Time													

COMMENTS: mm-GWMW09-022406 taken @ 13:40, collect triple volume for MS/MSD
Gallons purge = ~2.5

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized
** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized
*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized
**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-10

Bailing

~~LOW FLOW RATE~~

PURGING AND SAMPLING DATA SHEET

SITE: Magna Metals — ENVIRONMENTAL — Sheet 1 of 1

DATE: 3/24/08 — CONSULTING FIRM: Tetra Tech EC

WEATHER: Sunny High of 40°F — FIELD PERSONNEL: Kelly Millet & Shannon Hill

MONITORING WELL NO.: MW-10 — WELL PERMIT NUMBER:

PID/FID READINGS (ppm): AMBIENT AIR: 0.0 — OPEN WELL (initial): 0.3

PUMP INTAKE DEPTH: N/A ft from top of casing (TOC)

WATER ELEVATION WITH PUMP IN PLACE (initial): _____ ft from TOC

PUMP START TIME: N/A

TDW 15.91

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity % **	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
Initial			5.73	NA	2.39	NA	308	NA	7.07	NA	136	NA	10.07	NA	NA	14.24
11:56			5.57		2.45		279		8.28		999		10.09			Dry
11:57			well dry Aprx 1 gallon bailed allow well to recharge prior to collection sample													
1																
14:25	—	—	5.79		2.52		258		7.86		442		9.75			
Sample																

COMMENTS: Sample # MW-GWMW10-032408 taken at 14:25 (taken with bailer)

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

MW-11

LOW FLOW RATE
PURGING AND SAMPLING DATA SHEET

SITE:	Magna Metals	ENVIRONMENTAL	Sheet 1 of 1
DATE:	2/23/06	CONSULTING FIRM:	Tetra Tech EC
WEATHER:	Overcast 40°F (High)	FIELD PERSONNEL:	Kelly Millet & Shannon Hill
MONITORING WELL NO.:	MW-11	WELL PERMIT NUMBER:	15.0 ft

PID/FID READINGS (ppm): AMBIENT AIR: ~~1.2~~ 0.0 PUMP INTAKE DEPTH: ~~[illegible]~~ ft from top of casing (TOC)

OPEN WELL (Initial): 1.2 WATER ELEVATION WITH PUMP IN PLACE (Initial): 13.33 ft from TOC

PUMP START TIME: ~~[illegible]~~ 11:10

TIME	Purging	Sampling	pH (pH units) Reading	pH Change*	Specific Conductivity (mS/cm) Reading	Specific Conductivity %**	Redox Potential (mv) Reading	Redox Potential Change***	Dissolved Oxygen (mg/L) Reading	Dissolved Oxygen %****	Turbidity (NTU) Reading	Turbidity %****	Temperature (degrees C)	Volume of Water Removed (ml)	Pumping Rate (ml/min)	Water Elevation (ft from TOC)
—	X		—	NA	—	NA	—	NA	—	NA	—	NA	—	NA	NA	—
11:10	X		5.55	NA	1.99	NA	189	NA	6.90	NA	228	NA	9.04			13.33
11:15	X		5.72	0.17	2.02	~~0.03~~ 98	172	-17	7.86	86.[illegible]	69.9	412%	8.91		200	14.16
11:20	X		5.79	0.07	2.04	100.99	147	-25	8.84	98	42.5	2740	8.36	1gal		13.99
11:25	X		5.81	0.02	1.97	96.56	136	-11	4.32	48.86	23.8		11.82			13.98
11:30	pump	stopped	11:32 re started													~~14.57~~
11:35	X		5.84	0.03	1.96	99.4	123	-13	6.85	158.5	172	4093.0	11.47	2.5gal	450	14.54
11:40	X		5.86	0.02	1.95	99.4	127	4	6.55	95.6	61.9	35.99	11.84	3gal	450	14.54
11:45	X		5.82	-0.04	2.00	102.56	119	-8	7.66	116.95	20	32.31	10.62	3 1/4gal		14.20
11:50	X		5.80	0.02	1.86	93	112	-7	8.74	114.62	31.5	157.5	14.43			14.52
11:54	X		5.81	0.01	1.95	104.8	122	10	9.20	104.78	15.0	47.62	11.73	4gal		14.55
~~11:58~~ 12:00	X		5.83	0.02	1.95	100	116	-6	7.02	76.3	29.1	194	11.74	4 1/2gal	350	14.55
12:04	X		5.85	0.02	1.95	100	108	8	6.81	97	17.4	59.79	12.16	4 3/4gal	"	14.38
12:08	X		5.85	0	1.95	"	95	-13	7.32	107	40	229.89	12.6		"	14.38
12:12	X		5.86	0.01	1.93	98.97	79	-16	6.56	89.86	106	265	18.95	5gal	"	14.32
12:16	X		5.88	0.02	1.95	101.04	103	24	6.16	93.9	56.3	54.66	14.94		500	14.71
12:20	X		5.97	0.09	1.94	99.48	113	10	6.77	109.9	144	255.77	11.07			
12:23	well dry - allow well to recharge															
12:35		X	Sam													14.42

COMMENTS: Collect sample MM-gWMW11-0223~~[illegible]~~06

* Calculate change by subtracting current reading from previous reading. When 3 consecutive readings are +/- 0.1, pH is considered stabilized

** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 97 and 103 percent, specific conductivity is considered stabilized

*** Calculate change by subtracting current reading from previous reading. When when 3 consecutive readings are +/- 10 mv, redox potential is considered stabilized

**** Calculate percent by dividing current reading by previous reading and multiplying by 100. When 3 consecutive readings are between 90 and 110 percent, these parameters are considered stabilized

well recharge 1[illegible]

H_2O got sediment turbid and flow increase

TETRA TECH EC, INC.

January 30, 2009

Ms. Sally Dewes, PE
New York State Department of Environmental Conservation
Bureau of Remedial Action
625 Broadway
Albany, NY 12233-7016

Subject: **Additional Data Collection**
Data Summary Report for Magna Metals Site

Dear Ms. Dewes:

Enclosed please find the above subject report revised per the January 2009 comment letter. If you have any questions please do not hesitate to call me at 973-630-8544.

Regards,

Mark Sielski, PG
Project Manager

cc: N. Ward-Willis Keane & Beane
File

SGS

1000 The American Road, Morris Plains, NJ 07950
Tel 973.630.8000 Fax 973.630.8025
www.tteci.com

ADDITIONAL DATA COLLECTION

FOR THE

FORMER MAGNA METALS SITE
(NYSDEC Site No. 360003)

TOWN OF CORTLANDT
WESTCHESTER COUNTER, NEW YORK

DATA SUMMARY REPORT

JANUARY 2009

PREPARED BY:

Tetra Tech EC, Inc.
1000 The American Road
Morris Plains, New Jersdy 07950



TETRA TECH EC, INC.

ADDITIONAL DATA COLLECTION

FOR THE

FORMER MAGNA METALS SITE
(NYSDEC Site No. 360003)
TOWN OF CORTLANDT
WESTCHESTER COUNTY, NEW YORK

DATA SUMMARY REPORT

JANUARY 2009

PREPARED BY:

Tetra Tech EC, Inc.
1000 The American Road
Morris Plains, New Jersey 07950



TETRA TECH EC, INC.

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6.0 DATA SUMMARY 2

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FIGURE 2 SEDIMENT AND SURFACE SOIL LOCATIONS

LIST OF ATTACHMENTS

1 BORING LOGS
2 DUSR REPORT
3 ANALYTICAL TABLES

1.0 INTRODUCTION

This report presents the data results from the additional work perfonned at the request of NYSDEC to collect supplemental data in two locations: 1) an area where drums were previously stored near an on-site building (as reported in historic NYSDEC documentation), and 2) an upgradient wetland area. The additional work was implemented based on NYSDEC comment letters dated November 9, 2007, March 13, 2008, and August 22, 2008, in regards to the Draft Final Rl Report submitted August 2007 and the December 2007 Draft Work Plan Addendum for Additional Data Collection. DEC approved the Draft Work Plan Addendum for Additional Data Collection September, 2008.

The field investigation activities discussed below were conducted in October 2008 in accordance with the NYSDEC-approved plans and tunder NYSDEC field oversight, Mr. Michael Haggerty. All sampling locations were approved by NYSDEC in thc field. The samp.ing locations wcrc surveyed with a global positioning system (GPS) in the field. The accuracy of these points is ±0.6 to 1.0 meters.

2.0 ADDITIONAL DIRECT PUSH SOIL SAMPLING SAMPLING

Additional direct push soil sampling was performed to determine if a former drum storage area (as reported in historic NYSDEC documentation) may have contributed to contamination under the building slab. Soil and groundwater samples were proposed to be collected and analyzed. However, due to the shallow depth to bedrock, hydropunch was not liable to be performed and no groundwater samples could be obtained.

Two (2) soil borings were sampled southeast of the building as presented in Figure 1. Surface soil samples were collected and analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL metals. Subsurface soil samples were collected and analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL metals. Boring depths werc 2 feet and 6 feet. Boring logs are included in Attachment 1.

3.0 ADDITIONAL SEDIMENT SAMPLING

Four surface sediment samples were collected from the upgradient wetland area (see Figure 2). The samples were collected from 0 to 6 inches below ground surface. One sediment sample was collected within the ponded area approximately 0 to 6 inches below water bottom. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL metals.

4.0 ADDITIONAL SURFACE SOIL SAMPLING

Three surface soil samples were collected from the northern side of the property between the buildings and the wetlands (see Figure 2). One of the samples was collected from the large "open area" north of the macadam parking area. The other two were collected from the vegetated areas east and west of the "open area." The samples were collected from 0

to 6 inches below ground surface. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL metals.

5.0 DATA VALIDATION

Upon receipt of soil gas and groundwater analytical results, the data was validated and Data Usability Summary Reports (DUSRs) were generated for each data package and are included as Attachment 2.

6.0 DATA SUMMARY REPORT

Analytical data tables for soil and sediment samples are included as Attachment 3. Data results for both the former drum storage area and upgradient wetlands were unremarkable. No VOCs or SVOC was detected above the NYSDEC Recommended Soil Criteria – Protection of Ecological Resources in the three surface soil samples. No PCBs were detected in the three surface soil samples. 4,4-DDE and 4,4-DDT were the only pesticides and silver was the only metal detected above the Protection of Ecological Resources criteria in the surface soil samples. No VOCs, SVOCs, pesticides, PCBs or metals were detected above NYSDEC Recommended Soil Criteria – Commercial Use in the samples collected from the two soil borings.

No VOCs, SVOCs, pesticides, or PCBs were detected above NYSDEC Sediment Criteria. Manganese was detected in one sample above its SEL and silver was detected in three samples and the duplicate above its SEL. At least one of eight metals was found in the each sediment sample at a concentration above its LEL.

No further sampling is required as delineation is complete. ISC Properties requests that the RI be accepted as complete.

FIGURE 1

LEGEND

SB-802 SOIL BORING

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE WETLAND AREA

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

2. SB-801 AND SB-802 REFER TO SOIL BORINGS (SB) SAMPLED IN 2008 (8) AND THE CORRESPONDING LOCATION NUMBERS (01 OR 02).

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

0 15 30
FEET

FORMER MAGNA METALS BUILDING

LP-01

SHED

SB-802

SB-801

APPROXIMATE PROPERTY LINE

1 STORY CONCRETE BLOCK BUILDING

320

340

360

380

FURNACE DOCK ROAD

TETRA TECH EC, INC.

TITLE:
Soil Boring/Hydropunch Locations
Supplemental RI
Magna Metals, Cortlandt, New York

DWN: CTS	DES.: CTS	PROJECT NO.: 106-1172
CHKD: MS	APPD: MS	FIGURE NO.: 1
DATE: 12/23/2008	REV.: 0	

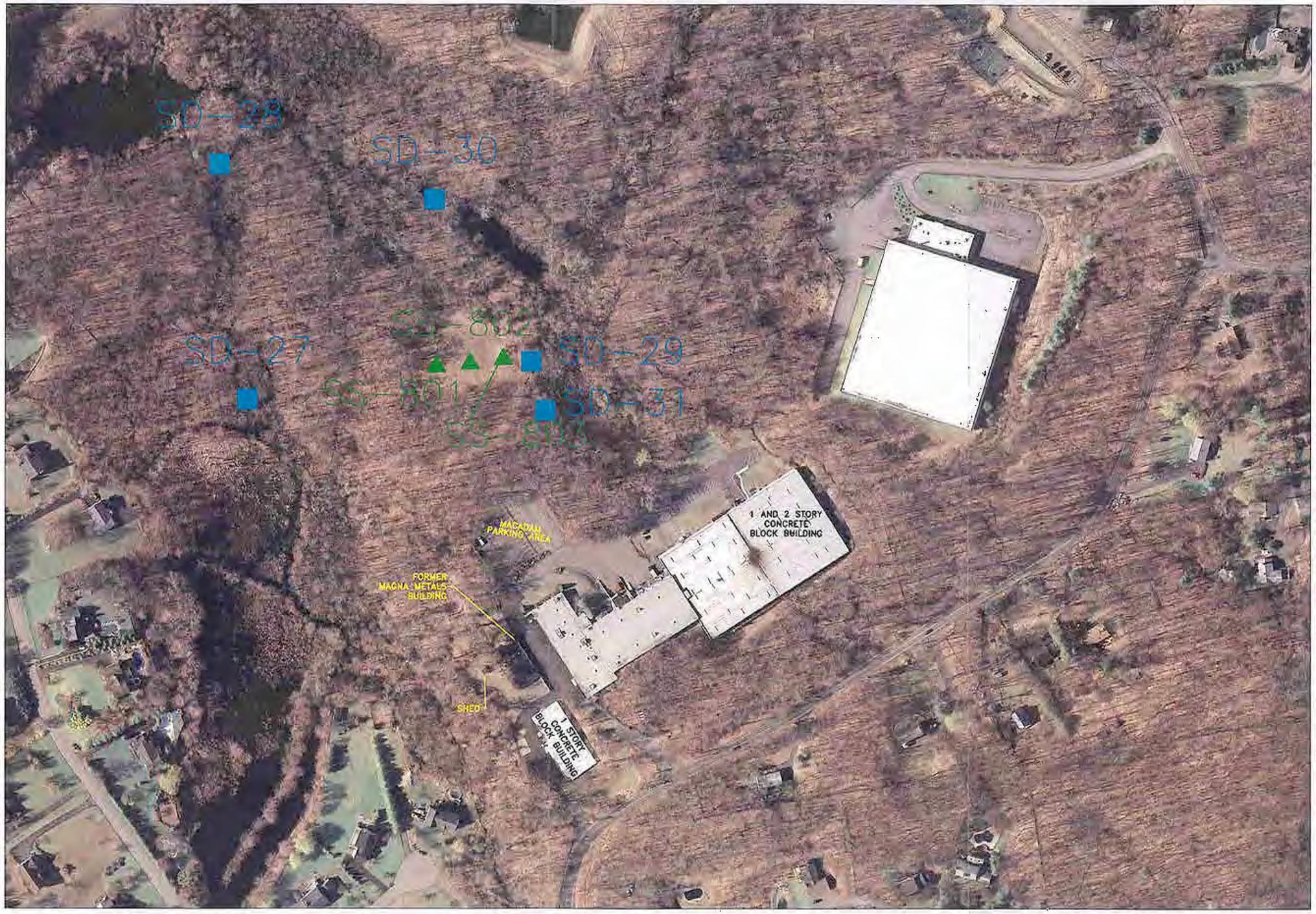
E:\GIS\DENEY\GSPROJ\MAGNA METALS\Figure 1 Soil Boring and Hydropunch Locations 122308.dwg

FIGURE 2

LEGEND

SD-27 SEDIMENT LOCATION

SS-801 APPROXIMATE SURFACE SOIL LOCATION



SOURCE:
AERIAL PHOTOGRAPH –
NYS GIS CLEARINGHOUSE, 2007.

0 50 100
FEET

TETRA TECH EC, INC.

TITLE:
Sediment and Surface Soil Locations
Supplemental RI
Magna Metals, Cortlandt, New York

DRN: CTS	DES.: CTS	PROJECT NO.: 106-1172
CHKD: MS	APP'D: MS	FIGURE NO.: 2
DATE: 01/23/2009	REV.: 1	

ATTACHMENT 1

Log of Borings

FIELD BORING LOG SHEET

BORING LOG SHEET

BORING NUMBER: SB801
PROJECT: Magna Metals
PROJECT NO.: 105-172.0004.00000
LOCATION (area) or BORING ID: SB801
TOTAL DEPTH (FT): 6
GEOLOGIST: C. De Carlo
DRILLER: Advanced
DRILLING/SAMPLING METHOD: <Blank> Direct Push
DATE STARTED: 10/5/05
DATE COMPLETED: 10/5/05
GROUNDWATER DEPTH (FT): not encountered
GROUND ELEVATION (FT):
X COORDINATE: —
Y COORDINATE:
DATUM:

TETRA TECH EC, INC.

Sample ID	Start Depth (feet)	End Depth (feet)	BLOWS per 6"	Recovery (ft)	Consolidated ? Y or N	USCS Soil Classification	Geologic Unit Code	Color	Description	TIME	DATE	Depth of PID/FID (ft)	FID (ppm)	PID (ppm)	Comments	Contact (A, H, U)
SB801 0-5	0	0.75'		—			—	—	Asphalt and bedding material					0.0	Hand Dug to 5'	
	0.75	1.25		—			SM	Dark Brown	Fine silty SAND w/ fine subangular gravel, moist					0.0	Sample collected from 0.75-1.25 @ 0950	
	0.75	4.5					SM	Lt Brown	silty f SAND, tr. f gravel, sl moist							
	4.5	5					SM	Lt Brown	silty f SAND, tr f gravel, moist							
SB801 5-8	5	5.8		2'			SM		SAA					0.0		

FIELD BORING LOG SHEET

BORING LOG SHEET

BORING NUMBER: SB 801

TETRA TECH EC, INC.

PROJECT:
PROJECT NO.:
LOCATION (well or boring ID):
TOTAL DEPTH (FT):
GEOLOGIST:
DRILLER:
DRILLING/ SAMPLING METHOD: <Blank>

DATE STARTED:
DATE COMPLETED:
GROUNDWATER DEPTH (FT):
GROUND ELEVATION (FT):
X COORDINATE:
Y COORDINATE:
DATUM:

Sample ID	Start Depth (feet)	End Depth (feet)	BLOWS per 6"	Recovery (ft)	Graphic Log	USCS Soil Classification or Material	Geologic Unit Code	Color	Description	TIME	DATE	Depth of PID/FID (ft)	FID (ppm)	PID (ppm)	Comments	Contact (A, H, U)
	5.5	5.75					ML	Lt Brown	fine sandy SILT, w/ some fine angular gravel, v moist					0.0		
	5.75	6					—	—	weathered, shattered rock						refusal @ 6' bgs	
									end of boring @ 6' bgs							

Proprietary Information - Copyright 2002

FIELD BORING LOG SHEET

BORING LOG SHEET

BORING NUMBER: SB 802

TETRATECH EC, INC.

PROJECT: Magna Metals
PROJECT NO.: 106-172.0001.0000
LOCATION (well or boring ID): SB-802
TOTAL DEPTH (FT): 2'
GEOLOGIST: C. De Carlo
DRILLER: Advanced
DRILLING/SAMPLING METHOD: <Blank>

DATE STARTED: 10/7/08
DATE COMPLETED: 10/7/08
GROUNDWATER DEPTH (FT): Not encountered
GROUND ELEVATION (FT):
X COORDINATE:
Y COORDINATE:
DATUM:

Sample ID	Start Depth (feet)	End Depth (feet)	BLOWS per 6"	Recovery (ft)	Consolidated ? Y or N	USCS Soil Classification or Material	Grain Size Unit Code	Color	Description	TIME	DATE	Depth of PID/FID (ft)	FID (ppm)	PID (ppm)	Comments	Contact (A, H, U)
SB802 0-2'	0	0.75		-			-	-	Asphalt and bedding material						Hand Dug	
	0.75	1.5		-		SM		Dark Brown	silty fine SAND tr. fine grave sl. moist					0.0		
						SM		Lt. Brown	silty fine SAND tr. fine gravel sl. moist					0.0		
									end of boring @ 2' bgs						Rock visible @ bottom of boring	

Boring Log Sheet (FF-3)
Tetra Tech EC, Inc.
Proprietary Information - Copyright 2002

ATTACHMENT 2

Data Usability Report

MEMORANDUM

TO: C. Snyder **DATE: December 18, 2008**

FROM: C. Minch

SUBJECT: Magna Metals

Laboratory	Project Number	Sample Identification
Chemtech	Z5047	SS-801, SS802, SS803

Three soil samples were collected on October 17, 2008 and shipped to Chemtech where the samples were analyzed for volatiles, semivolatiles, pesticides, PCBs, metals, and TOC. A screening review was performed by an EPA Region II certified validator utilizing applicable criteria specified in EPA Region II Standard Operating Procedures (SOP) HW-24, Rev. 2, October 2006, HW-22, Rev. 3, October 2006, HW-44, Rev. 1.0, October 2006, HW-45, Rev. 1.0, October 2006, HW-2, Rev. 13, September 2006, HWB-1/HWB-2, Rev. 0, March 1994, and best professional judgment. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Preservation and Holding Time
- Surrogate Recovery
- Blank Contamination
- Matrix Spike Recovery
- Laboratory Control Samples (LCS)
- Interference Check Sample
- Instrument Tune
- Calibrations
- Laboratory Duplicate
- Internal Standards
- Serial Dilution

Based upon this review, all data are considered acceptable and valid with the following qualifications.

The following observations are noted:

1. The following compounds were qualified as estimated (UJ) due to low recovery in the LCS analyses.
   trichloroethene, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 3,3'-dichlorobenzidine:
   SS-801, SS-802, SS-803

2. The following compounds were qualified as estimated (UJ) in the samples below for exceeding %D (20%) criteria in the associated continuing calibration standard.
   dichlorodifluoromethane, chloromethane, acetone, methyl-tert-butyl ether, methyl acetate, 1,1-dichloroethane, cyclohexane, 2-butanone, 1,1,2,2-tetrachloroethane:
   SS-801, SS-802, SS-803

3. The TIC at the retention time of 3.44 in the semivolatile analyses of samples SS-801 and SS-803 was qualified "R" because it is a common laboratory contaminant.

4. With the exception of heptachlor, DDE, and DDT, all compounds exhibited low or 0% recovery in the MS and/or MSD performed on SS-801 Consequently, all compounds except heptachlor, DDE, and DDT were estimated (UJ) in SS-801.

5. DDT was qualified as estimated (J/UJ) in samples SS-801, SS-802, and SS-803 for exceeding %RSD and %D criteria in the calibrations.

6. The positive results for alpha and gamma chlordane were qualified as estimated (J) in SS-802 because the %D between the values obtained on the two dissimilar analytical columns exceeded 25%.

7. Cadmium, lead and silver exceeded the CRQL when they were not present in the ICSA solution. In addition, iron was present in the samples at concentrations that exceeded the concentration in the ICS solutions. Consequently, cadmium, lead and silver were qualified as estimated (J) in SS-801, SS-802, and SS-803 due to positive interference.

8. Calcium, chromium, cobalt, copper, iron, manganese, nickel, and zinc were estimated (J) in SS-801, SS-802, and SS-803 because the serial dilution exceeded 10%.

10. TOC was estimated (J) in SS-801, SS-802, and SS-803 due to low recovery (57%) in the matrix spike performed on sample SS-803.

MEMORANDUM

TO: C. S yder **DATE:** Dece ber 18, 2008

FROM: C. Minch

SUBJECT: Magna Metals

Laboratory	Project Number	Sample Identification
Chemtech	Z4885	SD-27, SD-28, SD-29, SD-30, SD-31, SD-50, SB-801-0.75-1.25, SB-801-5-6, SB-802-0.75-1.25, SB-802-1.5-2

Ten soil samples were collected during this sampling event and shipped to Chemtech where the samples were analyzed for volatiles, semivolatiles, pesticides, PCBs, metals, and TOC. A screening review was performed by an EPA Region II certified validator utilizing applicable criteria specified in EPA Region II Standard Operating Procedures (SOP) HW-24, Rev. 2, October 2006, HW-22, Rev. 3, October 2006, HW-44, Rev. 1.0, October 2006, HW-45, Rev. 1.0, October 2006, HW-2, Rev. 13, September 2006, HWB-1/HWB-2, Rev. 0, March 1994, and best professional judgment. Data qualifier definitions are as follows:

U The analyte was analyzed for, but not detected above the reported sample quantitation limit.

R The sample results are rejected (unusable) due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Validation consisted of checking and verifying that the criteria listed below were within acceptable QC limits.

- Preservation and Holding Time
- Surrogate Recovery
- Blank Contamination
- Matrix Spike Recovery
- Laboratory Control Samples (LCS)
- Interference Check Sample
- Instrument Tune
- Calibrations
- Laboratory Duplicate
- Internal Standards
- Serial Dilution

Based upon this review, all data are considered acceptable and valid with the following qualifications.

The following observations are noted:

1. All analytes were qualified as estimated (J/UJ) in all parameters of samples SD-29 and SD-31 because the % moisture exceeded 50%.

2. The following compounds were qualified as indicated in the samples below due to low response of the associated internal standard:
   Qualified unusable (R); IS#4 < 25%:
   isopropylbenzene → 1,2,4-trichlorobenzene: SB-801-0.75-1.25RE

   Qualified as estimated (UJ); < 50%:
   all analytes: SB-802-0.75-1.25RE
   dichlorodifluoromethane → bromoform: SB-801-0.75-1.25RE
   isopropylbenzene → 1,2,4-trichlorobenzene: SB-801-0.75-1.25, SB-802-0.75-1.25, SB-802-1.5-2, SB-802-1.5-2RE

3. Methyl acetate was estimated (UJ) in samples SB-801-5-6, SB-802-0.75-1.25, SB-802-1.5-2, and SB-802-1.5-2RE for exceeding %D (20%) criteria in the associated continuing calibration standard.

4. The TICs at the retention time of 3.59 in the semivolatile analyses of samples SD-27, SD-28, SD-29, SD-30, SD-31, SD-50, and SB-801-5-6 were qualified "R" because it is a common laboratory contaminant.

5. The TICs at the retention time of 13.83 in the semivolatile analyses of samples SD-27, SD-28, SD-29, SD-30, and SD-31 were qualified "R" due to similar contamination in the method blank.

6. The positive results for aroclor 1260 were qualified as estimated (J) in SB-801-5-6, SB-802-0.75-1.25, and SB-802-1.5-2 because the %D between the values obtained on the two dissimilar analytical columns exceeded 25%.

7. Mercury was qualified as estimated (J/UJ) in samples SD-27, SD-28, SD-30, SD-50, SB-801-5-6, SB-802-0.75-1.25, and SB-802-1.5-2 due to low recovery in the CRQL standard.

8. Lead and silver exceeded the CRQL when they were not present in the ICSA solution. In addition, iron was present in several samples at concentrations that exceeded the concentration in the ICS solutions. Consequently, lead and silver were qualified as estimated (J) in samples SD-30, SD-50, SB-801-0.75-1.25, SB-801-5-6, SB-802-0.75-1.25, and SB-802-1.5-2 due to positive interference.

9. Potassium was estimated (J) in all samples except SD-29 and SD-31 because the serial dilution exceeded 10%.

10. TOC was estimated (J) in all samples except SD-29 and SD-31 due to high recovery in the MS/MSD performed on sample SD-30.

11. The following metals were qualified as indicated in the samples below for exceeding the limits of field precision.
qualified as unusable (R)
Ni: SD-30
qualified as estimated (J)
Mg: SD-30
Al, Ba, Cr, Cu, Fe, Mn, V, Zn: SD-30, SD-50

ATTACHMENT 3

Data Analytical Tables

Table 1
Volatile Organic Compounds in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC		SS801		SS802		SS803	
Lab Sample Number	Recommended		Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria		10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND								
Dichlorodifluoromethane	NC		0.011	U	0.011	U	0.011	U
Chloromethane	NC		0.0077	U	0.0076	U	0.0076	U
Vinyl Chloride	NC		0.008	U	0.0078	U	0.0079	U
Bromomethane	NC		0.012	U	0.012	U	0.012	U
Chloroethane	NC		0.011	U	0.011	U	0.011	U
Trichlorofluoromethane	NC		0.0089	U	0.0088	U	0.0088	U
1,1,2-Trichlorotrifluoroethane	NC		0.0096	U	0.0095	U	0.0097	U
1,1-Dichloroethene	NC		0.0058	U	0.0057	U	0.0057	U
Acetone	2.2		0.099	U	0.097	U	0.098	U
Carbon Disulfide	NC		0.0063	U	0.0061	U	0.0062	U
Methyl tert-butyl Ether	NC		0.0052	U	0.0051	U	0.0051	U
Methyl Acetate	NC		0.0098	U	0.0096	U	0.0097	U
Methylene Chloride	12		0.014	U	0.014	U	0.014	U
trans-1,2-Dichloroethene	NC		0.0072	U	0.007	U	0.0071	U
1,1-Dichloroethane	NC		0.0065	U	0.0064	U	0.0064	U
Cyclohexane	NC		0.0059	U	0.0058	U	0.0059	U
2-Butanone	NC		0.029	U	0.029	U	0.029	U
Carbon Tetrachloride	NC		0.0034	U	0.0034	U	0.0034	U
cis-1,2-Dichloroethene	NC		0.0075	U	0.0073	U	0.0074	U
Chloroform	12		0.0052	U	0.0051	U	0.0051	U
1,1,1-Trichloroethane	NC		0.0055	U	0.0054	U	0.0055	U
Methylcyclohexane	NC		0.0048	U	0.0047	U	0.0048	U
Benzene	70		0.0042	U	0.0041	U	0.0041	U
1,2-Dichloroethane	10		0.0048	U	0.0047	U	0.0047	U
Trichloroethene	2		0.0042	U	0.0041	U	0.0042	U

Table 1
Volatile Organic Compounds in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC		SS601		SS602		SS603	
Lab Sample Number	Recommended		Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria		10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND								
1,2-Dichloropropane	NC		0.0055	U	0.0053	U	0.0054	U
Bromodichloromethane	NC		0.0041	U	0.004	U	0.004	U
4-Methyl-2-Pentanone	NC		0.022	U	0.022	U	0.022	U
Toluene	36		0.0051	U	0.005	U	0.0051	U
t-1,3-Dichloropropene	NC		0.0049	U	0.0048	U	0.0048	U
cis-1,3-Dichloropropene	NC		0.0039	U	0.0038	U	0.0039	U
1,1,2-Trichloroethane	NC		0.0035	U	0.0035	U	0.0035	U
2-Hexanone	NC		0.025	U	0.025	U	0.025	U
Dibromochloromethane	NC		0.0038	U	0.0038	U	0.0038	U
1,2-Dibromoethane	NC		0.0048	U	0.0047	U	0.0047	U
Tetrachloroethene	2		0.0072	U	0.007	U	0.0071	U
Chlorobenzene	40		0.0044	U	0.0043	U	0.0044	U
Ethyl Benzene	NC		0.0047	U	0.0045	U	0.0046	U
m/p-Xylenes	0.26		0.011	U	0.011	U	0.011	U
o-Xylene	0.26		0.0044	U	0.0043	U	0.0044	U
Styrene	NC		0.0036	U	0.0035	U	0.0036	U
Bromoform	NC		0.0047	U	0.0046	U	0.0047	U
Isopropylbenzene	NC		0.0048	U	0.0047	U	0.0047	U
1,1,2,2-Tetrachloroethane	NC		0.0052	U	0.0051	U	0.0051	U
1,3-Dichlorobenzene	NC		0.0038	U	0.0038	U	0.0039	U
1,4-Dichlorobenzene	NC		0.0045	U	0.0044	U	0.0044	U
1,2-Dichlorobenzene	NC		0.005	U	0.0049	U	0.0049	U
1,2-Dibromo-3-Chloropropane	NC		0.0059	U	0.0058	U	0.0059	U
1,2,4-Trichlorobenzene	NC		0.0038	U	0.0038	U	0.0038	U
Total Confident Conc			0		0		0	
Total TICs			0		0		0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 2
Semi-volatile Organic Compounds in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC	SS801		SS802		SS803	
Lab Sample Number	Recommended	Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria	10/17/2006		10/17/2006		10/17/2006	
Matrix	Ecological Use	SOIL		SOIL		SOIL	
Dilution Factor		10		20		20	
Units	mg/kg	mg/kg		mg/kg		mg/kg	
COMPOUND							
Benzaldehyde	NC	0.13	U	0.25	U	0.25	U
Phenol	30	0.11	U	0.21	U	0.21	U
bis(2-Chloroethyl)ether	NC	0.05	U	0.098	U	0.098	U
2-Chlorophenol	NC	0.1	U	0.2	U	0.21	U
2-Methylphenol	NC	0.1	U	0.2	U	0.2	U
2,2-oxybis(1-Chloropropane)	NC	0.16	U	0.31	U	0.31	U
Acetophenone	NC	0.11	U	0.22	U	0.23	U
3+4-Methylphenols	NC	0.12	U	0.23	U	0.23	U
N-Nitroso-di-n-propylamine	NC	0.14	U	0.27	U	0.27	U
Hexachloroethane	NC	0.13	U	0.25	U	0.25	U
Nitrobenzene	NC	0.09	U	0.18	U	0.18	U
Isophorone	NC	0.13	U	0.25	U	0.25	U
2-Nitrophenol	NC	0.14	U	0.27	U	0.28	U
2,4-Dimethylphenol	NC	0.11	U	0.22	U	0.23	U
bis(2-Chloroethoxy)methane	NC	0.088	U	0.17	U	0.17	U
2,4-Dichlorophenol	NC	0.091	U	0.18	U	0.18	U
Naphthalene	NC	0.092	U	0.18	U	0.18	U
4-Chloroaniline	NC	0.25	U	0.49	U	0.5	U
Hexachlorobutadiene	NC	0.16	U	0.3	U	0.31	U
Caprolactam	NC	0.46	U	0.9	U	0.91	U
4-Chloro-3-methylphenol	NC	0.11	U	0.22	U	0.22	U
2-Methylnaphthalene	NC	0.11	U	0.21	U	0.21	U
Hexachlorocyclopentadiene	NC	0.2	U	0.38	U	0.39	U
2,4,6-Trichlorophenol	NC	0.089	U	0.17	U	0.18	U
2,4,5-Trichlorophenol	NC	0.11	U	0.22	U	0.22	U
1,1-Biphenyl	NC	0.11	U	3.3	J	0.22	U
2-Chloronaphthalene	NC	0.093	U	0.18	U	0.18	U
2-Nitroaniline	NC	0.18	U	0.35	U	0.36	U
Dimethylphthalate	NC	0.11	U	0.22	U	0.22	U
Acenaphthylene	NC	0.056	U	0.11	U	0.11	U

Table 2
Semi-volatile Organic Compounds in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC	SS801		SS802		SS803	
Lab Sample Number	Recommended	Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria	10/17/2006		10/17/2006		10/17/2006	
Matrix	Ecological Use	SOIL		SOIL		SOIL	
Dilution Factor		10		20		20	
Units	mg/kg	mg/kg		mg/kg		mg/kg	
COMPOUND							
2,6-Dinitrotoluene	NC	0.14	U	0.27	U	0.27	U
3-Nitroaniline	NC	0.25	U	0.5	U	0.5	U
Acenaphthene	20	0.083	U	0.16	U	0.16	U
2,4-Dinitrophenol	NC	0.2	U	0.4	U	0.4	U
4-Nitrophenol	NC	0.22	U	0.44	U	0.45	U
Dibenzofuran	NC	0.12	U	0.23	U	0.23	U
2,4-Dinitrotoluene	NC	0.12	U	0.25	U	0.25	U
Diethylphthalate	NC	0.13	U	0.26	U	0.26	U
4-Chlorophenyl-phenylether	NC	0.15	U	0.29	U	0.29	U
Fluorene	30	0.1	U	0.2	U	0.2	U
4-Nitroaniline	NC	0.3	U	0.59	U	0.6	U
4,6-Dinitro-2-methylphenol	NC	0.5	U	1	U	1	U
N-Nitrosodiphenylamine	NC	0.29	U	0.58	U	0.57	U
4-Bromophenyl-phenylether	NC	0.17	U	0.34	U	0.35	U
Hexachlorobenzene	NC	0.12	U	0.23	U	0.23	U
Atrazine	NC	0.27	U	0.53	U	0.54	U
Pentachlorophenol	0.8	0.43	U	0.85	U	0.86	U
Phenanthrene	NC	0.12	U	0.23	U	1.6	J
Anthracene	NC	0.13	U	0.25	U	0.26	U
Carbazole	NC	0.29	U	0.57	U	0.58	U
Di-n-butylphthalate	NC	0.18	U	0.35	U	0.36	U
Fluoranthene	NC	0.093	U	1.2	J	2.9	J
Pyrene	NC	0.084	U	1.7	J	2.3	J
Butylbenzylphthalate	NC	0.24	U	0.47	U	0.48	U
3,3-Dichlorobenzidine	NC	0.29	U	0.57	U	0.57	U
Benzo(a)anthracene	NC	0.092	U	1.3	J	1.1	J
Chrysene	NC	0.071	U	1.7	J	1.4	J
bis(2-Ethylhexyl)phthalate	NC	0.15	U	0.29	U	0.29	U
Di-n-octyl phthalate	NC	0.13	U	0.26	U	0.27	U

Table 2
Semi-volatile Organic Compounds in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC	SS801		SS802		SS803	
Lab Sample Number	Recommended	Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria	10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use	SOIL		SOIL		SOIL	
Dilution Factor		10		20		20	
Units	mg/kg	mg/kg		mg/kg		mg/kg	
COMPOUND							
Benzo(b)fluoranthene	NC	0.28	U	2.5	J	1.6	J
Benzo(k)fluoranthene	NC	0.18	U	1.3	J	0.35	U
Benzo(a)pyrene	2.6	0.11	U	1.6	J	1.1	J
Indeno(1,2,3-cd)pyrene	NC	0.097	U	1.1	J	0.19	U
Dibenz(a,h)anthracene	NC	0.28	U	0.56	U	0.56	U
Benzo(g,h,i)perylene	NC	0.28	U	1.2	J	0.85	J
Total Confident Conc.		0		16.9		12.65	
Total TICs		0		450		790	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria

Table 3
Pesticides In Surface Soil Samples
Magna Metals

Sample ID	NYSDEC	SS801		SS802		SS803	
Lab Sample Number	Recommended	Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria	10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use	SOIL		SOIL		SOIL	
Dilution Factor		1		10		1	
Units	mg/kg	mg/kg		mg/kg		mg/kg	
COMPOUND							
alpha-BHC	0.04	0.00016	U	0.0016	U	0.00016	U
beta-BHC	0.6	0.00021	U	0.002	U	0.00021	U
delta-BHC	0.04	0.00021	U	0.002	U	0.00021	U
gamma-BHC	NC	0.00019	U	0.0018	U	0.00018	U
Heptachlor	0.14	0.00017	U	0.0017	U	0.00017	U
Aldrin	0.14	0.00019	U	0.0018	U	0.00018	U
Heptachlor epoxide	NC	0.00022	U	0.0022	U	0.00022	U
Endosulfan I	NC	0.00022	U	0.0022	U	0.00022	U
Dieldrin	0.006	0.00022	U	0.0022	U	0.00022	U
4,4-DDE	0.0033	0.0076		0.0022	U	0.00022	U
Endrin	0.014	0.00066	U	0.0065	U	0.00065	U
Endosulfan II	NC	0.00023	U	0.0023	U	0.00023	U
4,4-DDD	0.0033	0.00031	U	0.0031	U	0.00031	U
Endosulfan Sulfate	NC	0.00027	U	0.0026	U	0.00026	U
4,4-DDT	0.0033	0.0082		0.0018	U	0.0021	
Methoxychlor	NC	0.00024	U	0.0024	U	0.00024	U
Endrin ketone	NC	0.00055	U	0.0053	U	0.00054	U
Endrin aldehyde	NC	0.00023	U	0.0023	U	0.00023	U
alpha-Chlordane	1.3	0.00022	U	0.021	P	0.00022	U
gamma-Chlordane	NC	0.00021	U	0.015	JP	0.00021	U
Toxaphene	NC	0.0042	U	0.041	U	0.0041	U
Total Confident Conc.		0.0158		0.036		0.0021	
Total TICs		0		0		0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 4
Polychlorinated Biphenyls (PCBs) In Surface Soil Samples
Magna Metals

Sample ID	NYSDEC		SS801		SS802		SS803	
Lab Sample Number	Recommended		Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria		10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND								
Aroclor-1016	1	*	0.0043	U	0.0042	U	0.0043	U
Aroclor-1221	1	*	0.0053	U	0.0052	U	0.0052	U
Aroclor-1232	1	*	0.0056	U	0.0054	U	0.0055	U
Aroclor-1242	1	*	0.0024	U	0.0024	U	0.0024	U
Aroclor-1248	1	*	0.0053	U	0.0052	U	0.0053	U
Aroclor-1254	1	*	0.0054	U	0.0053	U	0.0054	U
Aroclor-1260	1	*	0.0043	U	0.0042	U	0.0043	U
Total Confident Conc.			0		0		0	
Total TICs			0		0		0	

Qualifiers
* = Sum of all PCBs
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 6
Metals in Surface Soil Samples
Magna Metals

Sample ID	NYSDEC	SS801		SS802		SS803	
Lab Sample Number	Recommended	Z5047-01		Z5047-02		Z5047-03	
Sampling Date	Soil Criteria	10/17/2008		10/17/2008		10/17/2008	
Matrix	Ecological Use	SOIL		SOIL		SOIL	
Dilution Factor		1		1		1	
Units	mg/kg	mg/kg		mg/kg		mg/kg	
COMPOUND							
Aluminum	NC	13900		11400		12200	
Antimony	NC	0.45	U	0.441	U	0.444	U
Arsenic	13	1.48		1.4		0.693	J
Barium	433	69.1		88.5		84.3	
Beryllium	10	0.355		0.279		0.241	
Cadmium	4	1.81		1.97		2.07	
Calcium	NC	10200		19600		5550	
Chromium	NC	14.3		23.1		85.2	
Cobalt	NC	7.12		7.78		9.88	
Copper	50	16		19.7		21	
Iron	NC	16100		18900		18500	
Lead	63	14.6		31.9		24.5	
Magnesium	NC	7440		12400		5490	
Manganese	1600	249		280		407	
Mercury	0.18	0.033		0.062		0.028	
Nickel	30	19.8		16.4		22.7	
Potassium	NC	1120		1550		1200	
Selenium	3.9	0.636	U	0.623	U	0.628	U
Silver	2	2.87		3.04		3.34	
Sodium	NC	141		225		383	
Thallium	NC	0.767	U	0.753	U	0.758	U
Vanadium	NC	27.5		30.3		36.9	
Zinc	109	49.9		63		56.5	
Total Confident Conc.		NA		NA		NA	
Total TICs		0		0		0	

Qualifiers
U - Non-detect
J - Estimated

Table 6
Volatile Organic Compounds in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC		SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended		Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria		10/7/2008		10/7/2008		10/7/2008		10/7/2008	
Matrix	Commercial Use		SOIL		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND										
Dichlorodifluoromethane	NC		0.011	U	0.01	U	0.01	U	0.01	U
Chloromethane	NC		0.0073	U	0.007	U	0.007	U	0.0069	U
Vinyl Chloride	13		0.0076	U	0.0073	U	0.0073	U	0.0072	U
Bromomethane	NC		0.011	U	0.011	U	0.011	U	0.011	U
Chloroethane	NC		0.01	U	0.0098	U	0.0097	U	0.0096	U
Trichlorofluoromethane	NC		0.0065	U	0.0063	U	0.0063	U	0.0062	U
1,1,2-Trichlorotrifluoroethane	NC		0.0092	U	0.0089	U	0.0088	U	0.0086	U
1,1-Dichloroethene	500		0.0055	U	0.0053	U	0.0053	U	0.0052	U
Acetone	500		0.093	U	0.09	U	0.09	U	0.089	U
Carbon Disulfide	NC		0.0059	U	0.0057	U	0.0057	U	0.0056	U
Methyl tert-butyl Ether	500		0.0049	U	0.0047	U	0.0047	U	0.0046	U
Methyl Acetate	NC		0.0093	U	0.0089	U	0.0089	U	0.0086	U
Methylene Chloride	500		0.013	U	0.013	U	0.013	U	0.013	U
trans-1,2-Dichloroethene	500		0.0068	U	0.0065	U	0.0065	U	0.0064	U
1,1-Dichloroethane	240		0.0062	U	0.0059	U	0.0059	U	0.0058	U
Cyclohexane	NC		0.0056	U	0.0054	U	0.0054	U	0.0053	U
2-Butanone	NC		0.028	U	0.026	U	0.026	U	0.026	U
Carbon Tetrachloride	22		0.0032	U	0.0031	U	0.0031	U	0.0031	U
cis-1,2-Dichloroethene	500		0.0071	U	0.0068	U	0.0068	U	0.0067	U
Chloroform	350		0.0049	U	0.0047	U	0.0047	U	0.0046	U
1,1,1-Trichloroethane	500		0.0052	U	0.005	U	0.005	U	0.005	U
Methylcyclohexane	NC		0.0046	U	0.0044	U	0.0044	U	0.0043	U
Benzene	44		0.004	U	0.0038	U	0.0038	U	0.0038	U
1,2-Dichloroethane	30		0.0045	U	0.0043	U	0.0043	U	0.0043	U
Trichloroethene	200		0.004	U	0.0038	U	0.0038	U	0.0038	U

Table 6
Volatile Organic Compounds in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC		SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended		Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria		10/7/2008		10/7/2008		10/7/2008		10/7/2008	
Matrix	Commercial Use		SOIL		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND										
1,2-Dichloropropane	NC		0.0052	U	0.005	U	0.005	U	0.0049	U
Bromodichloromethane	NC		0.0038	U	0.0037	U	0.0037	U	0.0037	U
4-Methyl-2-Pentanone	NC		0.021	U	0.02	U	0.02	U	0.02	U
Toluene	500		0.0048	U	0.0046	U	0.0046	U	0.0046	U
t-1,3-Dichloropropene	NC		0.0046	U	0.0044	U	0.0044	U	0.0044	U
cis-1,3-Dichloropropene	NC		0.0037	U	0.0035	U	0.0035	U	0.0035	U
1,1,2-Trichloroethane	NC		0.0034	U	0.0032	U	0.0032	U	0.0032	U
2-Hexanone	NC		0.024	U	0.023	U	0.023	U	0.023	U
Dibromochloromethane	NC		0.0036	U	0.0035	U	0.0035	U	0.0034	U
1,2-Dibromoethane	NC		0.0045	U	0.0043	U	0.0043	U	0.0043	U
Tetrachloroethene	150		0.0068	U	0.0065	U	0.0065	U	0.0065	U
Chlorobenzene	500		0.0042	U	0.004	U	0.004	U	0.004	U
Ethyl Benzene	390		0.0044	U	0.0042	U	0.0042	U	0.0042	U
m/p-Xylenes	500		0.01	U	0.0098	U	0.0098	U	0.0097	U
o-Xylene	500		0.0042	U	0.004	U	0.004	U	0.004	U
Styrene	NC		0.0034	U	0.0033	U	0.0033	U	0.0032	U
Bromoform	NC		0.0045	U	0.0043	U	0.0043	U	0.0042	U
Isopropylbenzene	NC		0.0045	U	0.0043	U	0.0043	U	0.0043	U
1,1,2,2-Tetrachloroethane	NC		0.0049	U	0.0047	U	0.0047	U	0.0046	U
1,3-Dichlorobenzene	280		0.0037	U	0.0035	U	0.0035	U	0.0035	U
1,4-Dichlorobenzene	130		0.0042	U	0.0041	U	0.0041	U	0.004	U
1,2-Dichlorobenzene	500		0.0047	U	0.0045	U	0.0045	U	0.0045	U
1,2-Dibromo-3-Chloropropane	NC		0.0056	U	0.0054	U	0.0054	U	0.0053	U
1,2,4-Trichlorobenzene	NC		0.0036	U	0.0035	U	0.0035	U	0.0034	U
Total Confident Conc.			0		0		0		0	
Total TICs			0		0		0		0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 7
Semi-volatile Organic Compounds in Samples from Soil Borings
Wagner Metals

Sample ID	NYSDEC	SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended	Z4685-10		Z4685-11		Z4685-12		Z4685-13	
Sampling Date	Soil Criteria	10/7/2006		10/7/2006		10/7/2006		10/7/2006	
Matrix	Commercial Use	SOIL		SOIL		SOIL		SOIL	
Dilution Factor		40		6		40		20	
Units	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND									
Benzaldehyde	NC	0.49	U	0.059	U	0.47	U	0.23	U
Phenol	500	0.4	U	0.049	U	0.39	U	0.2	U
bis(2-Chloroethyl)ether	NC	0.19	U	0.023	U	0.18	U	0.092	U
2-Chlorophenol	NC	0.39	U	0.048	U	0.38	U	0.19	U
2-Methylphenol	NC	0.39	U	0.047	U	0.37	U	0.19	U
2,2-oxybis(1-Chloropropane)	NC	0.6	U	0.073	U	0.58	U	0.29	U
Acetophenone	NC	0.43	U	0.053	U	0.42	U	0.21	U
3+4-Methylphenols	NC	0.44	U	0.054	U	0.43	U	0.21	U
N-Nitroso-di-n-propylamine	NC	0.53	U	0.064	U	0.51	U	0.25	U
Hexachloroethane	NC	0.47	U	0.058	U	0.46	U	0.23	U
Nitrobenzene	NC	0.34	U	0.042	U	0.33	U	0.16	U
Isophorone	NC	0.48	U	0.058	U	0.46	U	0.23	U
2-Nitrophenol	NC	0.53	U	0.065	U	0.51	U	0.26	U
2,4-Dimethylphenol	NC	0.43	U	0.053	U	0.42	U	0.21	U
bis(2-Chloroethoxy)methane	NC	0.33	U	0.041	U	0.32	U	0.16	U
2,4-Dichlorophenol	NC	0.34	U	0.042	U	0.33	U	0.17	U
Naphthalene	500	0.35	U	0.043	U	0.34	U	0.17	U
4-Chloroaniline	NC	0.95	U	0.12	U	0.92	U	0.46	U
Hexachlorobutadiene	NC	0.59	U	0.072	U	0.57	U	0.28	U
Caprolactam	NC	1.7	U	0.21	U	1.7	U	0.84	U
4-Chloro-3-methylphenol	NC	0.43	U	0.052	U	0.41	U	0.21	U
2-Methylnaphthalene	NC	0.41	U	0.05	U	0.4	U	0.2	U
Hexachlorocyclopentadiene	NC	0.74	U	0.091	U	0.72	U	0.36	U
2,4,6-Trichlorophenol	NC	0.34	U	0.041	U	0.33	U	0.16	U
2,4,5-Trichlorophenol	NC	0.43	U	0.053	U	0.42	U	0.21	U
1,1-Biphenyl	NC	0.43	U	0.053	U	0.42	U	0.21	U
2-Chloronaphthalene	NC	0.35	U	0.043	U	0.34	U	0.17	U
2-Nitroaniline	NC	0.68	U	0.083	U	0.66	U	0.33	U
Dimethylphthalate	NC	0.42	U	0.052	U	0.41	U	0.2	U
Acenaphthylene	500	0.21	U	0.026	U	0.21	U	0.1	U
2,6-Dinitrotoluene	NC	0.52	U	0.063	U	0.5	U	0.25	U
3-Nitroaniline	NC	0.96	U	0.12	U	0.93	U	0.47	U
Acenaphthene	500	0.31	U	0.038	U	0.3	U	0.15	U
2,4-Dinitrophenol	NC	0.77	U	0.095	U	0.75	U	0.37	U
4-Nitrophenol	NC	0.86	U	0.11	U	0.83	U	0.42	U
Dibenzofuran	NC	0.45	U	0.055	U	0.43	U	0.22	U
2,4-Dinitrotoluene	NC	0.48	U	0.059	U	0.47	U	0.23	U
Diethylphthalate	NC	0.49	U	0.061	U	0.46	U	0.24	U
4-Chlorophenyl-phenylether	NC	0.55	U	0.068	U	0.54	U	0.27	U
Fluorene	500	0.38	U	0.048	U	0.38	U	0.19	U

Table 7
Semi-volatile Organic Compounds in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC	SB-501-0.75-1.25		SB-501-5-6		SB-502-0.75-1.5		SB-502-1.5-2	
Lab Sample Number	Recommended	Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria	10/7/2006		10/7/2006		10/7/2006		10/7/2006	
Matrix	Commercial Use	SOIL		SOIL		SOIL		SOIL	
Dilution Factor		40		5		40		20	
Units	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND									
4-Nitroaniline	NC	1.1	U	0.14	U	1.1	U	0.55	U
4,6-Dinitro-2-methylphenol	NC	2	U	0.24	U	1.9	U	0.95	U
N-Nitrosodiphenylamine	NC	1.1	U	0.13	U	1.1	U	0.53	U
4-Bromophenyl-phenylether	NC	0.66	U	0.081	U	0.64	U	0.32	U
Hexachlorobenzene	NC	0.44	U	0.054	U	0.42	U	0.21	U
Atrazine	NC	1	U	0.13	U	0.99	U	0.5	U
Pentachlorophenol	6.7	1.6	U	0.2	U	1.6	U	0.8	U
Phenanthrene	500	0.45	U	0.055	U	0.44	U	0.22	U
Anthracene	500	0.49	U	0.06	U	0.47	U	0.24	U
Carbazole	NC	1.1	U	0.14	U	1.1	U	0.54	U
Di-n-butylphthalate	NC	0.68	U	0.083	U	0.66	U	0.33	U
Fluoranthene	500	0.35	U	0.043	U	0.34	U	0.17	U
Pyrene	500	0.32	U	0.039	U	0.31	U	0.15	U
Butylbenzylphthalate	NC	0.92	U	0.11	U	0.89	U	0.44	U
3,3-Dichlorobenzidine	NC	1.1	U	0.13	U	1.1	U	0.53	U
Benzo(a)anthracene	5.6	0.35	U	0.043	U	0.34	U	0.17	U
Chrysene	56	0.27	U	0.033	U	0.26	U	0.13	U
bis(2-Ethylhexyl)phthalate	NC	0.56	U	0.068	U	0.54	U	0.27	U
Di-n-octyl phthalate	NC	0.51	U	0.062	U	0.49	U	0.25	U
Benzo(b)fluoranthene	5.6	1	U	0.13	U	1	U	0.51	U
Benzo(k)fluoranthene	56	0.67	U	0.081	U	0.64	U	0.32	U
Benzo(a)pyrene	1	0.43	U	0.052	U	0.41	U	0.21	U
Indeno(1,2,3-cd)pyrene	5.6	0.37	U	0.045	U	0.36	U	0.18	U
Dibenz(a,h)anthracene	0.56	1.1	U	0.13	U	1	U	0.52	U
Benzo(g,h,i)perylene	500	1.1	U	0.13	U	1	U	0.51	U
Total Confident Conc.		0		0		0		0	
Total TICs		0		0		0		0	

Qualifiers
U - Non-detect
J - Estimated
NC - No Criteria

Table 8
Pesticides in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC	SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended	Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria	10/7/2008		10/7/2008		10/7/2008		10/7/2008	
Matrix	Commercial Use	SOIL		SOIL		SOIL		SOIL	
Dilution Factor		10		10		10		10	
Units	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND									
alpha-BHC	3.4	0.0015	U	0.0015	U	0.0019	U	0.0019	U
beta-BHC	3	0.002	U	0.0019	U	0.0019	U	0.0019	U
delta-BHC	500	0.002	U	0.0019	U	0.0017	U	0.0017	U
gamma-BHC	NC	0.0018	U	0.0017	U	0.0016	U	0.0016	U
Heptachlor	15	0.0016	U	0.0016	U	0.0017	U	0.0017	U
Aldrin	0.68	0.0018	U	0.0017	U	0.002	U	0.002	U
Heptachlor epoxide	NC	0.0021	U	0.002	U	0.002	U	0.002	U
Endosulfan I	200	0.0021	U	0.002	U	0.002	U	0.002	U
Dieldrin	1.4	0.0021	U	0.002	U	0.002	U	0.002	U
4,4-DDE	62	0.0021	U	0.002	U	0.006	U	0.0061	U
Endrin	89	0.0063	U	0.0061	U	0.0021	U	0.0021	U
Endosulfan II	200	0.0022	U	0.0021	U	0.0029	U	0.0029	U
4,4-DDD	92	0.003	U	0.0029	U	0.0024	U	0.0024	U
Endosulfan Sulfate	NC	0.0025	U	0.0025	U	0.0017	U	0.0017	U
4,4-DDT	47	0.0018	U	0.0017	U	0.0022	U	0.0022	U
Methoxychlor	NC	0.0023	U	0.0022	U	0.005	U	0.005	U
Endrin ketone	NC	0.0052	U	0.005	U	0.0021	U	0.0021	U
Endrin aldehyde	NC	0.0022	U	0.0021	U	0.002	U	0.002	U
alpha-Chlordane	24	0.0021	U	0.002	U	0.0019	U	0.0019	U
gamma-Chlordane	NC	0.002	U	0.0019	U	0.038	U	0.038	U
Toxaphene	NC	0.039	U	0.038	U	0		0	
Total Confident Conc.		0		0					
Total TICs		0		0		0		0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria

Table 9
Polychlorinated Biphenyls (PCBs) in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC		SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended		Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria		10/7/2008		10/7/2008		10/7/2008		10/7/2008	
Matrix	Commercial Use		SOIL		SOIL		SOIL		SOIL	
Dilution Factor			1		1		1		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND										
Aroclor-1016	1	*	0.0041	U	0.004	U	0.004	U	0.004	U
Aroclor-1221	1	*	0.005	U	0.0049	U	0.0049	U	0.0049	U
Aroclor-1232	1	*	0.0053	U	0.0051	U	0.0051	U	0.0051	U
Aroclor-1242	1	*	0.0023	U	0.0022	U	0.0022	U	0.0022	U
Aroclor-1248	1	*	0.0051	U	0.0049	U	0.0049	U	0.0049	U
Aroclor-1254	1	*	0.0051	U	0.005	U	0.005	U	0.005	U
Aroclor-1260	1	*	0.036		0.004	U	0.004	U	0.004	U
Total Confident Conc.			0.036		0		0		0	
Total TICs			0		0		0		0	

Qualifiers
* = Sum of all PCBs
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 10
Metals in Samples from Soil Borings
Magna Metals

Sample ID	NYSDEC	SB-801-0.75-1.25		SB-801-5-6		SB-802-0.75-1.5		SB-802-1.5-2	
Lab Sample Number	Recommended	Z4885-10		Z4885-11		Z4885-12		Z4885-13	
Sampling Date	Soil Criteria	10/7/2008		10/7/2008		10/7/2008		10/7/2008	
Matrix	Commercial Use	SOIL		SOIL		SOIL		SOIL	
Dilution Factor		1		1		1		1	
Units	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND									
Aluminum	NC	12600		5850		8560		9140	
Antimony	NC	0.427	U	0.415	U	0.407	U	0.412	U
Arsenic	16	2.06	J	0.624	J	1.54	J	0.506	J
Barium	400	186		83.4		166		113	
Beryllium	590	0.224	J	0.139	J	0.158	J	0.114	J
Cadmium	9.3	0.952	J	0.335	J	0.673	J	0.594	J
Calcium	NC	11700		944		12600		2040	
Chromium	NC	31.5		16.8		15.7		21.9	
Cobalt	NC	16.3		7.19	J	13.8		14.3	
Copper	270	194		18.1		100		35.3	
Iron	NC	16500		9050		12300		13200	
Lead	1000	30.5		3.33	J	16.2		4.74	
Magnesium	NC	11700		1820		12700		6890	
Manganese	10000	147		88.1		101		126	
Mercury	2.8	0.031	J	0.008	U	0.008	J	0.007	U
Nickel	310	44		18.3		20		25	
Potassium	NC	2320		622	J	1760		1960	
Selenium	1500	0.603	U	0.586	U	0.575	U	0.583	U
Silver	1500	3	J	1.8	J	2.23	J	2.39	J
Sodium	NC	186	J	64.2	J	148	J	147	J
Thallium	NC	0.728	U	0.708	U	0.694	U	0.704	U
Vanadium	NC	62.8		15.4		47.1		43.8	
Zinc	10000	260		16.8		203		37.8	
Total Confident Conc.		NA		NA		NA		NA	
Total TICs		0		0		0		0	

Qualifiers
U - Non-detect.
J - Estimated.

Table 11
TOC in Soil
Magna Metals

Sample ID	SS801	SS802	SS803	SB-801-0.75-1.25	SB-801-5-6	SB-802-0.75-1.5	SB-802-1.5-2
Lab Sample Number	Z5047-01	Z5047-02	Z5047-03	Z4885-10	Z4885-11	Z4885-12	Z4885-13
Sampling Date	10/17/2008	10/17/2008	10/17/2008	10/7/2008	10/7/2008	10/7/2008	10/7/2008
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Dilution Factor	1	1	1	1	1	1	1
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
COMPOUND							
TOC	6700	7800	4900	8600	980	7000	5800

Qualifiers
U - Non-detect.
J - Estimated.

Table 12
Volatile Organic Compounds in Sediment
Magna Metals

Sample ID	NYSDEC	Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment	Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=6600 mg/kg	SOIL	
Dilution Factor			1			1			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Dichlorodifluoromethane	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
Chloromethane	NC	NC	0.0082	U	NC	0.0086	U	NC	0.014	U
Vinyl Chloride	NC	NC	0.0085	U	NC	0.0092	U	NC	0.015	U
Bromomethane	NC	NC	0.013	U	NC	0.013	U	NC	0.022	U
Chloroethane	NC	NC	0.011	U	NC	0.012	U	NC	0.02	U
Trichlorofluoromethane	NC	NC	0.0073	U	NC	0.0079	U	NC	0.013	U
1,1,2-Trichlorotrifluoroethane	NC	NC	0.01	U	NC	0.011	U	NC	0.018	U
1,1-Dichloroethene	NC	NC	0.0062	U	NC	0.0066	U	NC	0.011	U
Acetone	NC	NC	0.1	U	NC	0.11	U	NC	0.18	U
Carbon Disulfide	NC	NC	0.0067	U	NC	0.0072	U	NC	0.012	U
Methyl tert-butyl Ether	NC	NC	0.0055	U	NC	0.0059	U	NC	0.0097	U
Methyl Acetate	NC	NC	0.01	U	NC	0.011	U	NC	0.018	U
Methylene Chloride	NC	NC	0.015	U	NC	0.016	U	NC	0.026	U
trans-1,2-Dichloroethene	NC	NC	0.0076	U	NC	0.0082	U	NC	0.013	U
1,1-Dichloroethane	NC	NC	0.0069	U	NC	0.0074	U	NC	0.012	U
Cyclohexane	NC	NC	0.0063	U	NC	0.0068	U	NC	0.011	U
2-Butanone	NC	NC	0.031	U	NC	0.033	U	NC	0.055	U
Carbon Tetrachloride	NC	NC	0.0036	U	NC	0.0039	U	NC	0.0064	U
cis-1,2-Dichloroethene	NC	NC	0.008	U	NC	0.0086	U	NC	0.014	U
Chloroform	NC	NC	0.0055	U	NC	0.0059	U	NC	0.0097	U
1,1,1-Trichloroethane	NC	NC	0.0059	U	NC	0.0063	U	NC	0.01	U
Methylcyclohexane	NC	NC	0.0051	U	NC	0.0055	U	NC	0.009	U
Benzene	NC	NC	0.0044	U	NC	0.0048	U	NC	0.0078	U
1,2-Dichloroethane	NC	NC	0.0051	U	NC	0.0054	U	NC	0.0089	U
Trichloroethene	NC	NC	0.0045	U	NC	0.0049	U	NC	0.0079	U
1,2-Dichloropropane	NC	NC	0.0058	U	NC	0.0062	U	NC	0.01	U
Bromodichloromethane	NC	NC	0.0043	U	NC	0.0047	U	NC	0.0076	U
4-Methyl-2-Pentanone	NC	NC	0.024	U	NC	0.025	U	NC	0.042	U

Table 12
Volatile Organic Compounds in Sediment
Magna Metals

Sample ID	NYSDEC	Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment	Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=5600 mg/kg	SOIL	
Dilution Factor			1			1			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Toluene	235	0.3995	0.0054	U	0.5875	0.0058	U	1.551	0.0096	U
c-1,3-Dichloropropene	NC	NC	0.0052	U	NC	0.0056	U	NC	0.0091	U
cis-1,3-Dichloropropene	NC	NC	0.0041	U	NC	0.0045	U	NC	0.0073	U
1,1,2-Trichloroethane	NC	NC	0.0038	U	NC	0.0041	U	NC	0.0066	U
2-Hexanone	NC	NC	0.027	U	NC	0.029	U	NC	0.048	U
Dibromochloromethane	NC	NC	0.0041	U	NC	0.0044	U	NC	0.0072	U
1,2-Dibromoethane	NC	NC	0.0051	U	NC	0.0054	U	NC	0.0089	U
Tetrachloroethene	NC	NC	0.0077	U	NC	0.0082	U	NC	0.013	U
Chlorobenzene	NC	NC	0.0047	U	NC	0.0051	U	NC	0.0083	U
Ethyl Benzene	312	0.3894	0.0049	U	0.53	0.0053	U	1.3992	0.0087	U
m/p-Xylenes	833	1.4161	0.011	U	2.0825	0.012	U	5.4978	0.02	U
o-Xylene	833	1.4161	0.0047	U	2.0825	0.0051	U	5.4975	0.0083	U
Styrene	NC	NC	0.0036	U	NC	0.0041	U	NC	0.0067	U
Bromoform	NC	NC	0.005	U	NC	0.0054	U	NC	0.0088	U
Isopropylbenzene	105	0.1786	0.0051	U	0.2625	0.0054	U	0.693	0.0089	U
1,1,2,2-Tetrachloroethane	NC	NC	0.0055	U	NC	0.0059	U	NC	0.0097	U
1,3-Dichlorobenzene	NC	NC	0.0041	U	NC	0.0045	U	NC	0.0073	U
1,4-Dichlorobenzene	NC	NC	0.0048	U	NC	0.0051	U	NC	0.0084	U
1,2-Dichlorobenzene	NC	NC	0.0053	U	NC	0.0057	U	NC	0.0093	U
1,2-Dibromo-3-Chloropropane	NC	NC	0.0063	U	NC	0.0068	U	NC	0.011	U
1,2,4-Trichlorobenzene	NC	NC	0.0041	U	NC	0.0044	U	NC	0.0072	U
Total Confident Conc.						0			0	
Total TICs			0			0			0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 12
Volatile Organic Compounds in Sediment
Rogers Metals

Sample ID	NYSDEC	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Sediment	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4885-05	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14000 mg/kg	SOIL	
Dilution Factor			1			SD-30			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Dichlorodifluoromethane	NC	NC	0.012	U	NC	0.015	U	NC	0.045	U
Chloromethane	NC	NC	0.0086	U	NC	0.01	U	NC	0.031	U
Vinyl Chloride	NC	NC	0.0089	U	NC	0.011	U	NC	0.032	U
Bromomethane	NC	NC	0.013	U	NC	0.016	U	NC	0.047	U
Chloroethane	NC	NC	0.012	U	NC	0.015	U	NC	0.043	U
Trichlorofluoromethane	NC	NC	0.0077	U	NC	0.0094	U	NC	0.028	U
1,1,2-Trichlorotrifluoroethane	NC	NC	0.011	U	NC	0.013	U	NC	0.039	U
1,1-Dichloroethene	NC	NC	0.0065	U	NC	0.0079	U	NC	0.023	U
Acetone	NC	NC	0.11	U	NC	0.13	U	NC	0.53	J
Carbon Disulfide	NC	NC	0.007	U	NC	0.0085	U	NC	0.025	U
Methyl tert-butyl Ether	NC	NC	0.0058	U	NC	0.007	U	NC	0.021	U
Methyl Acetate	NC	NC	0.011	U	NC	0.013	U	NC	0.039	U
Methylene Chloride	NC	NC	0.016	U	NC	0.019	U	NC	0.057	U
trans-1,2-Dichloroethene	NC	NC	0.008	U	NC	0.0097	U	NC	0.029	U
1,1-Dichloroethane	NC	NC	0.0072	U	NC	0.0088	U	NC	0.026	U
Cyclohexane	NC	NC	0.0066	U	NC	0.008	U	NC	0.024	U
2-Butanone	NC	NC	0.032	U	NC	0.039	U	NC	0.12	U
Carbon Tetrachloride	NC	NC	0.0036	U	NC	0.0046	U	NC	0.014	U
cis-1,2-Dichloroethene	NC	NC	0.0083	U	NC	0.01	U	NC	0.03	U
Chloroform	NC	NC	0.0058	U	NC	0.007	U	NC	0.021	U
1,1,1-Trichloroethane	NC	NC	0.0061	U	NC	0.0075	U	NC	0.022	U
Methylcyclohexane	NC	NC	0.0054	U	NC	0.0065	U	NC	0.019	U
Benzene	NC	NC	0.0047	U	NC	0.0057	U	NC	0.017	U
1,2-Dichloroethane	NC	NC	0.0053	U	NC	0.0064	U	NC	0.019	U
Trichloroethene	NC	NC	0.0047	U	NC	0.0057	U	NC	0.017	U
1,2-Dichloropropane	NC	NC	0.0061	U	NC	0.0074	U	NC	0.022	U
Bromodichloromethane	NC	NC	0.0045	U	NC	0.0056	U	NC	0.016	U
4-Methyl-2-Pentanone	NC	NC	0.025	U	NC	0.03	U	NC	0.089	U

Table 12
Volatile Organic Compounds in Sediment
Stages Metals

Sample ID	NYSDEC	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Sediment	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4885-05	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14000 mg/kg	SOIL	
Dilution Factor			1			SD-30			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Toluene	235	1.081	0.0057	U	1.081	0.0069	U	3.29	0.021	U
t-1,3-Dichloropropene	NC	NC	0.0054	U	NC	0.0066	U	NC	0.02	U
cis-1,3-Dichloropropene	NC	NC	0.0043	U	NC	0.0053	U	NC	0.016	U
1,1,2-Trichloroethane	NC	NC	0.0039	U	NC	0.0048	U	NC	0.014	U
2-Hexanone	NC	NC	0.028	U	NC	0.034	U	NC	0.1	U
Dibromochloromethane	NC	NC	0.0043	U	NC	0.0052	U	NC	0.015	U
1,2-Dibromoethane	NC	NC	0.0053	U	NC	0.0064	U	NC	0.019	U
Tetrachloroethene	NC	NC	0.008	U	NC	0.0097	U	NC	0.029	U
Chlorobenzene	NC	NC	0.0049	U	NC	0.006	U	NC	0.018	U
Ethyl Benzene	212	0.9752	0.0052	U	0.9752	0.0063	U	2.988	0.019	U
m/p-Xylenes	833	3.8318	0.012	U	3.8318	0.015	U	11.662	0.043	U
o-Xylene	833	3.8318	0.0049	U	3.8318	0.006	U	11.662	0.018	U
Styrene	NC	NC	0.004	U	NC	0.0049	U	NC	0.014	U
Bromoform	NC	NC	0.0052	U	NC	0.0064	U	NC	0.019	U
Isopropylbenzene	105	0.483	0.0053	U	0.483	0.0064	U	1.47	0.019	U
1,1,2,2-Tetrachloroethane	NC	NC	0.0058	U	NC	0.007	U	NC	0.021	U
1,3-Dichlorobenzene	NC	NC	0.0043	U	NC	0.0053	U	NC	0.016	U
1,4-Dichlorobenzene	NC	NC	0.005	U	NC	0.0061	U	NC	0.018	U
1,2-Dichlorobenzene	NC	NC	0.0056	U	NC	0.0068	U	NC	0.02	U
1,2-Dibromo-3-Chloropropane	NC	NC	0.0066	U	NC	0.008	U	NC	0.024	U
1,2,4-Trichlorobenzene	NC	NC	0.0043	U	NC	0.0052	U	NC	0.015	U
Total Confident Conc.			0			0			0.53	
Total TICs			0			0			0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 13
Semivolatile Organic Compounds in Sediment
Degree Gabala

Sample ID	NYSDEC	Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment	Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=8600 mg/kg	SOIL	
Dilution Factor			1			1			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Benzaldehyde	NC	NC	0.014	U	NC	0.015	U	NC	0.024	U
Phenol	NC	NC	0.011	U	NC	0.012	U	NC	0.02	U
bis(2-Chloroethyl)ether	NC	NC	0.0053	U	NC	0.0057	U	NC	0.0094	U
2-Chlorophenol	NC	NC	0.011	U	NC	0.012	U	NC	0.019	U
2-Methylphenol	NC	NC	0.011	U	NC	0.012	U	NC	0.019	U
2,2-oxybis(1-Chloropropane)	NC	NC	0.017	U	NC	0.018	U	NC	0.03	U
Acetophenone	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
3+4-Methylphenols	NC	NC	0.012	U	NC	0.013	U	NC	0.022	U
N-Nitroso-di-n-propylamine	NC	NC	0.015	U	NC	0.016	U	NC	0.026	U
Hexachloroethane	12.6	0.02142	0.013	U	0.0315	0.014	U	0.08316	0.023	U
Nitrobenzene	NC	NC	0.0096	U	NC	0.01	U	NC	0.017	U
Isophorone	NC	NC	0.013	U	NC	0.014	U	NC	0.023	U
2-Nitrophenol	NC	NC	0.015	U	NC	0.016	U	NC	0.026	U
2,4-Dimethylphenol	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
bis(2-Chloroethoxy)methane	NC	NC	0.0094	U	NC	0.01	U	NC	0.016	U
2,4-Dichlorophenol	NC	NC	0.0097	U	NC	0.01	U	NC	0.017	U
Naphthalene	256	0.4386	0.0098	U	0.646	0.01	U	1.7028	0.017	U
4-Chloroaniline	NC	NC	0.027	U	NC	0.029	U	NC	0.047	U
Hexachlorobutadiene	55	0.0935	0.017	U	0.1375	0.018	U	0.363	0.029	U
Caprolactam	NC	NC	0.049	U	NC	0.052	U	NC	0.088	U
4-Chloro-3-methylphenol	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
2-Methylnaphthalene	NC	NC	0.011	U	NC	0.012	U	NC	0.02	U
Hexachlorocyclopentadiene	44	0.0748	0.021	U	0.11	0.022	U	0.2904	0.037	U
2,4,6-Trichlorophenol	NC	NC	0.0095	U	NC	0.01	U	NC	0.017	U
2,4,5-Trichlorophenol	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
1,1-Biphenyl	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
2-Chloronaphthalene	NC	NC	0.0099	U	NC	0.011	U	NC	0.017	U
2-Nitroaniline	NC	NC	0.019	U	NC	0.02	U	NC	0.034	U
Dimethylphthalate	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
Acenaphthylene	NC	NC	0.006	U	NC	0.0064	U	NC	0.01	U
2,6-Dinitrotoluene	NC	NC	0.015	U	NC	0.015	U	NC	0.026	U
3-Nitroaniline	NC	NC	0.027	U	NC	0.029	U	NC	0.048	U

Table 13
Semivolatile Organic Compounds in Sediment
Magna Metals

Sample ID	NYSDEC	Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment	Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=6500 mg/kg	SOIL	
Dilution Factor			1			1			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
Acenaphthene	NC	NC	0.0088	U	NC	0.0094	U	NC	0.015	U
2,4-Dinitrophenol	NC	NC	0.022	U	NC	0.023	U	NC	0.038	U
4-Nitrophenol	NC	NC	0.024	U	NC	0.026	U	NC	0.042	U
Dibenzofuran	NC	NC	0.013	U	NC	0.013	U	NC	0.022	U
2,4-Dinitrotoluene	NC	NC	0.013	U	NC	0.014	U	NC	0.024	U
Diethylphthalate	NC	NC	0.014	U	NC	0.015	U	NC	0.024	U
4-Chlorophenyl-phenylether	NC	NC	0.016	U	NC	0.017	U	NC	0.027	U
Fluorene	NC	NC	0.011	U	NC	0.012	U	NC	0.019	U
4-Nitroaniline	NC	NC	0.032	U	NC	0.034	U	NC	0.058	U
4,6-Dinitro-2-methylphenol	NC	NC	0.055	U	NC	0.059	U	NC	0.097	U
N-Nitrosodiphenylamine	NC	NC	0.031	U	NC	0.033	U	NC	0.054	U
4-Bromophenyl-phenylether	NC	NC	0.019	U	NC	0.02	U	NC	0.033	U
Hexachlorobenzene	9081	15.4377	0.012	U	22.7025	0.013	U	59.9346	0.022	U
Atrazine	NC	NC	0.029	U	NC	0.031	U	NC	0.051	U
Pentachlorophenol	100	0.17	0.046	U	0.25	0.049	U	0.65	0.081	U
Phenanthrene	NC	NC	0.013	U	NC	0.014	U	NC	0.022	U
Anthracene	NC	NC	0.014	U	NC	0.015	U	NC	0.024	U
Carbazole	NC	NC	0.031	U	NC	0.033	U	NC	0.055	U
Di-n-butylphthalate	NC	NC	0.019	U	NC	0.02	U	NC	0.034	U
Fluoranthene	NC	NC	0.0099	U	NC	0.011	U	NC	0.017	U
Pyrene	8775	14.9175	0.0089	U	21.9375	0.0095	U	57.915	0.016	U
Butylbenzylphthalate	NC	NC	0.026	U	NC	0.027	U	NC	0.045	U
3,3-Dichlorobenzidine	NC	NC	0.031	U	NC	0.033	U	NC	0.054	U
Benzo(a)anthracene	NC	NC	0.0096	U	NC	0.01	U	NC	0.017	U
Chrysene	NC	NC	0.0076	U	NC	0.0081	U	NC	0.013	U
bis(2-Ethylhexyl)phthalate	NC	NC	0.016	U	NC	0.017	U	NC	0.027	U
Di-n-octyl phthalate	NC	NC	0.014	U	NC	0.015	U	NC	0.025	U
Benzo(b)fluoranthene	NC	NC	0.029	U	NC	0.031	U	NC	0.052	U
Benzo(k)fluoranthene	NC	NC	0.019	U	NC	0.02	U	NC	0.033	U
Benzo(a)pyrene	NC	NC	0.012	U	NC	0.013	U	NC	0.021	U
Indeno(1,2,3-cd)pyrene	NC	NC	0.01	U	NC	0.011	U	NC	0.018	U
Dibenz(a,h)anthracene	NC	NC	0.03	U	NC	0.032	U	NC	0.053	U
Benzo(g,h,i)perylene	NC	NC	0.03	U	NC	0.031	U	NC	0.052	U
Total Confident Conc.			0			0			0	
Total TICs			0			450			790	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 13
Semivolatile Organic Compounds in Sediment
Magna Metals

Sample ID	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4886-05	
Sampling Date	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix	TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14000 mg/kg	SOIL	
Dilution Factor		1			SD-30			1	
Units		mg/kg			mg/kg			mg/kg	
COMPOUND									
Benzaldehyde	NC	0.015	U	NC	0.018	U	NC	0.053	U
Phenol	NC	0.012	U	NC	0.015	U	NC	0.044	U
bis(2-Chloroethyl)ether	NC	0.0057	U	NC	0.0068	U	NC	0.021	U
2-Chlorophenol	NC	0.012	U	NC	0.014	U	NC	0.043	U
2-Methylphenol	NC	0.012	U	NC	0.014	U	NC	0.043	U
2,2-oxybis(1-Chloropropane)	NC	0.018	U	NC	0.022	U	NC	0.065	U
Acetophenone	NC	0.013	U	NC	0.016	U	NC	0.047	U
3+4-Methylphenols	NC	0.013	U	NC	0.016	U	NC	0.046	U
N-Nitroso-di-n-propylamine	NC	0.016	U	NC	0.019	U	NC	0.057	U
Hexachloroethane	0.05796	0.014	U	0.05796	0.017	U	0.1764	0.051	U
Nitrobenzene	NC	0.01	U	NC	0.012	U	NC	0.037	U
Isophorone	NC	0.014	U	NC	0.017	U	NC	0.051	U
2-Nitrophenol	NC	0.016	U	NC	0.019	U	NC	0.058	U
2,4-Dimethylphenol	NC	0.013	U	NC	0.016	U	NC	0.047	U
bis(2-Chloroethoxy)methane	NC	0.01	U	NC	0.012	U	NC	0.036	U
2,4-Dichlorophenol	NC	0.01	U	NC	0.012	U	NC	0.037	U
Naphthalene	1.1868	0.011	U	1.1868	0.013	U	3.612	0.038	U
4-Chloroaniline	NC	0.029	U	NC	0.034	U	NC	0.1	U
Hexachlorobutadiene	0.253	0.018	U	0.253	0.021	U	0.77	0.064	U
Caprolactam	NC	0.053	U	NC	0.063	U	NC	0.19	U
4-Chloro-3-methylphenol	NC	0.013	U	NC	0.016	U	NC	0.046	U
2-Methylnaphthalene	NC	0.012	U	NC	0.015	U	NC	0.044	U
Hexachlorocyclopentadiene	0.2024	0.023	U	0.2024	0.027	U	0.616	0.081	U
2,4,6-Trichlorophenol	NC	0.01	U	NC	0.012	U	NC	0.037	U
2,4,5-Trichlorophenol	NC	0.013	U	NC	0.016	U	NC	0.047	U
1,1-Biphenyl	NC	0.013	U	NC	0.016	U	NC	0.046	U
2-Chloronaphthalene	NC	0.011	U	NC	0.013	U	NC	0.038	U
2-Nitroaniline	NC	0.021	U	NC	0.025	U	NC	0.074	U
Dimethylphthalate	NC	0.013	U	NC	0.015	U	NC	0.046	U
Acenaphthylene	NC	0.0064	U	NC	0.0077	U	NC	0.023	U
2,6-Dinitrotoluene	NC	0.016	U	NC	0.019	U	NC	0.056	U
3-Nitroaniline	NC	0.029	U	NC	0.035	U	NC	0.1	U

Table 13
Semivolatile Organic Compounds in Sediment
Magna Metals

Sample ID	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4885-05	
Sampling Date	Criteria	10/6/2006		Criteria	10/6/2006		Criteria	10/6/2006	
Matrix	TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14000 mg/kg	SOIL	
Dilution Factor		1			SD-30			1	
Units		mg/kg			mg/kg			mg/kg	
COMPOUND									
Acenaphthene	NC	0.0095	U	NC	0.011	U	NC	0.034	U
2,4-Dinitrophenol	NC	0.023	U	NC	0.028	U	NC	0.084	U
4-Nitrophenol	NC	0.026	U	NC	0.031	U	NC	0.093	U
Dibenzofuran	NC	0.014	U	NC	0.016	U	NC	0.049	U
2,4-Dinitrotoluene	NC	0.015	U	NC	0.017	U	NC	0.052	U
Diethylphthalate	NC	0.015	U	NC	0.018	U	NC	0.054	U
4-Chlorophenyl-phenylether	NC	0.017	U	NC	0.02	U	NC	0.06	U
Fluorene	NC	0.012	U	NC	0.014	U	NC	0.042	U
4-Nitroaniline	NC	0.035	U	NC	0.041	U	NC	0.12	U
4,6-Dinitro-2-methylphenol	NC	0.059	U	NC	0.071	U	NC	0.21	U
N-Nitrosodiphenylamine	NC	0.033	U	NC	0.039	U	NC	0.12	U
4-Bromophenyl-phenylether	NC	0.02	U	NC	0.024	U	NC	0.072	U
Hexachlorobenzene	41.7726	0.013	U	41.7726	0.016	U	127.134	0.047	U
Atrazine	NC	0.031	U	NC	0.037	U	NC	0.11	U
Pentachlorophenol	0.46	0.05	U	0.46	0.059	U	0.46	0.18	U
Phenanthrene	NC	0.014	U	NC	0.016	U	NC	0.049	U
Anthracene	NC	0.015	U	NC	0.018	U	NC	0.053	U
Carbazole	NC	0.034	U	NC	0.04	U	NC	0.12	U
Di-n-butylphthalate	NC	0.021	U	NC	0.025	U	NC	0.074	U
Fluoranthene	NC	0.011	U	NC	0.013	U	NC	0.038	U
Pyrene	40.365	0.0096	U	40.365	0.011	U	122.85	0.034	U
Butylbenzylphthalate	NC	0.028	U	NC	0.033	U	NC	0.099	U
3,3-Dichlorobenzidine	NC	0.033	U	NC	0.04	U	NC	0.12	U
Benzo(a)anthracene	NC	0.011	U	NC	0.013	U	NC	0.038	U
Chrysene	NC	0.0082	U	NC	0.0097	U	NC	0.029	U
bis(2-Ethylhexyl)phthalate	NC	0.017	U	NC	0.02	U	NC	0.06	U
Di-n-octyl phthalate	NC	0.015	U	NC	0.018	U	NC	0.055	U
Benzo(b)fluoranthene	NC	0.032	U	NC	0.038	U	NC	0.11	U
Benzo(k)fluoranthene	NC	0.02	U	NC	0.024	U	NC	0.072	U
Benzo(a)pyrene	NC	0.013	U	NC	0.016	U	NC	0.046	U
Indeno(1,2,3-cd)pyrene	NC	0.011	U	NC	0.013	U	NC	0.04	U
Dibenz(a,h)anthracene	NC	0.032	U	NC	0.039	U	NC	0.12	U
Benzo(g,h,i)perylene	NC	0.032	U	NC	0.038	U	NC	0.11	U
Total Confident Conc.		0			0			0	
Total TICs		180			0			27270	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 14
Pesticides in Sediment
Stage Metals

Sample ID	NYSDEC	Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment	Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix		TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=6600 mg/kg	SOIL	
Dilution Factor			1			1			1	
Units	mg/kg		mg/kg			mg/kg			mg/kg	
COMPOUND										
alpha-BHC	NC	NC	0.00017	U	NC	0.00018	U	NC	0.0003	U
beta-BHC	NC	NC	0.00022	U	NC	0.00024	U	NC	0.00039	U
delta-BHC	NC	NC	0.00022	U	NC	0.00024	U	NC	0.00039	U
gamma-BHC	NC	NC	0.0002	U	NC	0.00021	U	NC	0.00035	U
Heptachlor	13.1	0.02227	0.00018	U	0.03275	0.0002	U	0.08646	0.00032	U
Aldrin	NC	NC	0.0002	U	NC	0.00021	U	NC	0.00035	U
Heptachlor epoxide	13.1	0.02227	0.00023	U	0.03275	0.00025	U	0.08646	0.00041	U
Endosulfan I	0.78	0.001326	0.00023	U	0.00195	0.00025	U	0.005148	0.00041	U
Dieldrin	NC	NC	0.00023	U	NC	0.00025	U	NC	0.00041	U
4,4-DDE	NC	NC	0.00023	U	NC	0.00025	U	NC	0.00041	U
Endrin	NC	NC	0.0007	U	NC	0.00075	U	NC	0.0012	U
Endosulfan II	0.78	0.001326	0.00025	U	0.00195	0.00026	U	0.005148	0.00043	U
4,4-DDD	NC	NC	0.00033	U	NC	0.00035	U	NC	0.00056	U
Endosulfan Sulfate	NC	NC	0.00028	U	NC	0.0003	U	NC	0.0005	U
4,4-DDT	NC	NC	0.0002	U	NC	0.00021	U	NC	0.00035	U
Methoxychlor	NC	NC	0.00026	U	NC	0.00028	U	NC	0.00045	U
Endrin ketone	NC	NC	0.00058	U	NC	0.00062	U	NC	0.001	U
Endrin aldehyde	NC	NC	0.00025	U	NC	0.00026	U	NC	0.00043	U
alpha-Chlordane	NC	NC	0.00023	U	NC	0.00025	U	NC	0.00041	U
gamma-Chlordane	NC	NC	0.00022	U	NC	0.00024	U	NC	0.00039	U
Toxaphene	3.2	0.00544	0.0044	U	0.008	0.0047	U	0.02112	0.0076	U
Total Confident Conc.			0			0			0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 14
Pesticides in Sediment
Magra Metals

Sample ID	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4885-05	
Sampling Date	Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix	TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14000 mg/kg	SOIL	
Dilution Factor		1			SD-30			1	
Units		mg/kg			mg/kg			mg/kg	
COMPOUND									
alpha-BHC	NC	0.00019	U	NC	0.00022	U	NC	0.00067	U
beta-BHC	NC	0.00024	U	NC	0.00028	U	NC	0.00086	U
delta-BHC	NC	0.00024	U	NC	0.00028	U	NC	0.00086	U
gamma-BHC	NC	0.00021	U	NC	0.00025	U	NC	0.00076	U
Heptachlor	0.06026	0.0002	U	0.06026	0.00024	U	0.1834	0.00071	U
Aldrin	NC	0.00021	U	NC	0.00025	U	NC	0.00076	U
Heptachlor epoxide	0.06026	0.00025	U	0.06026	0.0003	U	0.1834	0.0009	U
Endosulfan I	0.003588	0.00025	U	0.003588	0.0003	U	0.01092	0.0009	U
Dieldrin	NC	0.00025	U	NC	0.0003	U	NC	0.0009	U
4,4-DDE	NC	0.00025	U	NC	0.0003	U	NC	0.0009	U
Endrin	NC	0.00076	U	NC	0.0009	U	NC	0.0027	U
Endosulfan II	0.003588	0.00027	U	0.003588	0.00032	U	0.01092	0.00095	U
4,4-DDD	NC	0.00036	U	NC	0.00043	U	NC	0.0013	U
Endosulfan Sulfate	NC	0.00031	U	NC	0.00036	U	NC	0.0011	U
4,4-DDT	NC	0.00021	U	NC	0.00025	U	NC	0.00076	U
Methoxychlor	NC	0.00028	U	NC	0.00033	U	NC	0.001	U
Endrin ketone	NC	0.00063	U	NC	0.00074	U	NC	0.0022	U
Endrin aldehyde	NC	0.00027	U	NC	0.00032	U	NC	0.00095	U
alpha-Chlordane	NC	0.00025	U	NC	0.0003	U	NC	0.0009	U
gamma-Chlordane	NC	0.00024	U	NC	0.00028	U	NC	0.00086	U
Toxaphene	0.01472	0.0048	U	0.01472	0.0057	U	0.0448	0.017	U
Total Confident Conc.		0			0			0	

Qualifiers
U - Non-detect.
J - Estimated.
NC - No Criteria.

Table 15
Polychlorinated Biphenyls (PCBs) in Sediment
Magna Metals

Sample ID	NYSDEC		Sample	SD-27		Sample	SD-28		Sample	SD-29	
Lab Sample Number	Sediment		Specific	Z4885-01		Specific	Z4885-02		Specific	Z4885-03	
Sampling Date	Criteria		Criteria	10/6/2008		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix			TOC=1700 mg/kg	SOIL		TOC=2500 mg/kg	SOIL		TOC=6600 mg/kg	SOIL	
Dilution Factor				1			1			1	
Units	mg/kg			mg/kg			mg/kg			mg/kg	
COMPOUND											
Aroclor-1016	2760.8	*	4.69336	0.0046	U	6.902	0.0049	U	18.22128	0.0081	U
Aroclor-1221	2760.8	*	4.69336	0.0056	U	6.902	0.006	U	18.22128	0.0099	U
Aroclor-1232	2760.8	*	4.69336	0.0059	U	6.902	0.0063	U	18.22128	0.01	U
Aroclor-1242	2760.8	*	4.69336	0.0026	U	6.902	0.0028	U	18.22128	0.0045	U
Aroclor-1248	2760.8	*	4.69336	0.0057	U	6.902	0.0061	U	18.22128	0.01	U
Aroclor-1254	2760.8	*	4.69336	0.0058	U	6.902	0.0061	U	18.22128	0.01	U
Aroclor-1260	2760.8	*	4.69336	0.0046	U	6.902	0.0049	U	18.22128	0.0081	U
Total Confident Conc.				0			0			0	

Qualifiers
* = Sum of all PCBs
U - None detected.

Table 15
Polychlorinated Biphenyls (PCBs) in Sediment
Magna Metals

Sample ID	Sample	SD-30		Sample	SD-50		Sample	SD-31	
Lab Sample Number	Specific	Z4885-04		Specific	Z4885-06		Specific	Z4885-05	
Sampling Date	Criteria	10/6/20		Criteria	10/6/2008		Criteria	10/6/2008	
Matrix	TOC=4600 mg/kg	SOIL		TOC=4600 mg/kg	Duplicate of		TOC=14 0 mg/kg	SOIL	
Dilution Factor		1			SD-30			1	
Units		mg/kg			mg/kg			mg/kg	
COMPOUND									
Aroclor-1016	12.69968	0.005	U	12.69968	0.0059	U	38.6512	0.018	U
Aroclor-1221	12.69968	0.0061	U	12.69968	0.0072	U	38.6512	0.022	U
Aroclor-1232	12.69968	0.0064	U	12.69968	0.0076	U	38.6512	0.023	U
Aroclor-1 42	12.69968	0.0028	U	12.69968	0.0033	U	38.6512	0.01	U
Aroclor-1248	12.69968	0.0061	U	12.69968	0.0073	U	38.6512	0.022	U
Aroclor-1254	12.69968	0.0062	U	12.69968	0.0074	U	38.6512	0.022	U
Aroclor-1260	12.69968	0.005	U	12.69968	0.0059	U	38.6512	0.018	U
Total Confident Conc.		0			0			0	

Qualifiers
* = Sum of all PCBs
U - None detected.

Table 16
Metals in Sediment
Magna Metals

Sample ID	NYSDEC		SD-27		SD-28		SD-29		SD-30		SD-50		SD-31	
Lab Sample Number	Sediment		Z4885-01		Z4885-02		Z4885-03		Z4885-04		Z4885-06		Z4885-05	
Sampling Date	Criteria		10/6/2008		10/6/2008		10/6/2008		10/6/2008		10/6/2008		10/6/2008	
Matrix			SOIL		SOIL		SOIL		SOIL		Duplicate of		SOIL	
Dilution Factor			1		1		1		1		SD-30		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND	SEL	LEL												
Aluminum	NC	NC	1390		4020		14900	J	5760	J	10500	J	10500	J
Antimony	25	2	0.48	U	0.511	U	0.831	U	0.51	U	0.617	U	1.85	U
Arsenic	33	6	0.149	U	0.159	U	2.88	J	1.52	J	2.7	J	3.17	J
Barium	NC	NC	21.4	J	47.9		295	J	98	J	191	J	166	J
Beryllium	NC	NC	0.039	J	0.14	J	0.446	J	0.201	J	0.363	J	0.275	J
Cadmium	9	0.6	0.164	J	0.198	J	1.09	J	0.551	J	1.12	J	0.537	J
Calcium	NC	NC	503	J	1060		3610	J	1370		1870		7300	J
Chromium	110	26	12.2		14.7		16.4	J	8.08	J	13.6	J	12.2	J
Cobalt	NC	NC	5.27	J	5.8	J	12.8	J	5.68	J	10.2	J	5.06	J
Copper	110	16	3.62	J	4.46	J	25.1	J	11.1	J	19.9	J	24.1	J
Iron	40000	20000	5890		5540		22800	J	11500	J	20000	J	10800	J
Lead	110	31	1.56	J	4.59	J	23	J	14.2	J	23	J	81.4	J
Magnesium	NC	NC	4140		2600		4150	J	1800	J	3120		2620	J
Manganese	1,100	460	101		61.5		4770	J	432	J	895	J	122	J
Mercury	1.3	0.15	0.009	UJ	0.011	J	0.057	J	0.024	J	0.028	J	0.141	J
Nickel	50	16	21.9		32		23.2	J		R	33.1		10.5	J
Potassium	NC	NC	158	J	251	J	1200	J	532	J	855	J	379	J
Selenium	NC	NC	0.679	U	0.722	U	1.18	U	0.721	U	0.872	U	2.62	U
Silver	2	1	1.02	J	0.955	J	4.13	J	2.07	J	3.57	J	2.09	J
Sodium	NC	NC	64.8	U	68.9	U	330	J	90.5	J	151	J	1190	J
Thallium	NC	NC	0.82	U	0.872	U	1.42	U	0.871	U	1.05	U	3.16	U
Vanadium	NC	NC	3.86	J	8.58	J	37.8	J	14.1	J	24.8	J	39.2	J
Zinc	270	120	12.8	J	20.2		116	J	75.5	J	148	J	44.2	J

Qualifiers
U - Non-detect.
J - Estimated.
R - Rejected.
NC - No Criteria.
BOLD indicates exceedance of SEL criteria.
Shading indicates exceedance of LEL criteria.

Table 17
TOC in Sediment
Magna Metals

Sample ID	SD-27		SD-28		SD-29		SD-30		SD-50		SD-31	
Lab Sample Number	Z4885-01		Z4885-02		Z4885-03		Z4885-04		Z4885-06		Z4885-05	
Sampling Date	10/6/2008		10/6/2008		10/6/2008		10/6/2008		10/6/2008		10/6/2008	
Matrix	SOIL		SOIL		SOIL		SOIL		Duplicate of		SOIL	
Dilution Factor	1		1		1		1		SD-30		1	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
COMPOUND												
TOC	1700	J	2500	J	6600	J	4600	J	4600	J	14000	J

Qualifiers
J - Estimated.

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B
625 Broadway, Albany, New York 12233-7016
Phone: (518) 402-9768 • **FAX:** (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

April 3, 2009

Mark Sielski
Tetra Tech EC., Inc.
2000 The American Road
Morris Plains, NJ 07950

Re: Magna Metals Site (Site No. 360003)
Remedial Investigation Report dated August 2007 and Additional Data Collection Data Summary Report dated January 30, 2009

Dear Mr. Sielski:

The Departments of Environmental Conservation and Health have reviewed the above-mentioned reports and find them acceptable. The 2009 data summary report, in conjunction with the August 2007 RI report, provide enough data to move forward with a Feasibility Study. Please submit these two documents in final format, both hard copy and electronic format within 30 days. This RI report approval does not include the indoor air study being completed by AKRF. That study and any associated reports will be completed and approved separately.

As stated in the consent decree, within 90 days of receipt of this approval of the RI report, ISC shall submit a Feasability Study evaluating on-site and off-site remedial alternatives, consistent with the approved RI/FS work plan and CERCLA.

Sincerely,

Sally Dewes

Sally Dewes, P.E.
Project Manager

ec: R. Cozzy/File
R.Rusinko, OGC
C. Grosier, DFWMR
N. Walz, NYSDOH

FEASIBILITY STUDY REPORT

FOR THE

FORMER MAGNA METALS SITE

(NYSDEC Site No. 360003)

TOWN OF CORTLANDT

WESTCHESTER COUNTY, NEW YORK

NOVEMBER 2010

PREPARED BY:



TETRA TECH ENGINEERING CORPORATION PC

1000 The American Road
Morris Plains, New Jersey 07950

CERTIFICATION STATEMENT

To the best of my knowledge, I certify that this Feasibility Study was prepared in accordance with all applicable statutes and regulations and in substantial conformance with New York State Department of Environmental Conservation guidance and that all activities were performed in full accordance with the New York State Department of Environmental Conservation-approved Work Plan and any New York State Department of Environmental Conservation modifications.

TETRA TECH ENGINEERING CORPORATION PC

_____ _____

Type/Printed Name Signature

_____

Date

_____

NY State PE Stamp and Seal #/Expiration Date

It is a violation of Education Law Article 145, Professional Engineering and Land Surveying, Section 7209, for any person, unless he is acting under the direction of a licensed professional engineer or land surveyor, to alter this item in any way. If an item bearing the seal of a professional engineer or land surveyor is altered, the altering engineer or land surveyor shall affix to this item his seal and the notation "altered by" followed by his signature and the date of such alteration, and a specific description of the alteration.

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EXECUTIVE SUMMARY

This report presents the results of a Feasibility Study (FS) performed by Tetra Tech EC, Inc. (TtEC) on behalf of ISC Properties (ISCP) for the Magna Metals Site (the Site) in the Town of Cortlandt, New York. The FS satisfies requirements specified in the 1996 Order-On-Consent between ISCP and the NYSDEC. This report was completed in substantial conformance with the New York State Department of Environmental Conservation (NYSDEC) "Draft DER-10 Technical Guidance for Site Investigation and Remediation" (2002).

The purpose of this FS is to identify and evaluate remedial alternatives to address contaminated on-site soil, groundwater, soil vapor, and off-site sediments. The FS process includes:

Establishment of Remedial Action Objectives (RAOs);
Identification of General Response Actions (GRAs) to address the RAOs;
Identification and screening of technologies applicable to each GRA;
Selection of process options for retained technologies;
Combination of selected process options to form remedial alternatives;
Detailed evaluation of remedial alternatives;
Proposal of the remedial alternative; and
Documentation of the FS process in this report.

The Magna Metals Site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. Nearby towns include Peekskill and Croton-on-Hudson. The Site is part of a larger commercial property owned by Baker Properties, who acquired the property from ISCP in 1982, and has leased it to various commercial tenants. The identity of these commercial tenants and their use of the property have varied over time. Residential areas are located around the facility. A wetland area, stream, and pond are located near the Site.

Extensive remedial investigation (RI) activities have been performed at the former Magna Metals Site. In April 2009, NYSDEC determined the RI (TtEC, 2007) to be final.

Soil Investigation Summary

The strata underlying the Site are as follows in sequence from upper to lower:

1. Sandy to silty sand overburden unit (various depths across site, ranging from 2 to 18 feet in thickness).

2. Bedrock-Hornblende granite, hard rock with limited permeability.

Inorganic contaminants (i.e., metals) were found at elevated levels in subsurface soil at the Site; the highest concentrations of these compounds were detected in the vicinity of the leach pits and septic tanks near the former Magna Metals building. Elevated levels of inorganics in subsurface soil present a future potential for exposures based on exceedances of NYSDEC SCOs for Protection of Human Health. There are no current exposure routes that could impact human health or the environment due to subsurface soil existing on-site.

Groundwater Investigation Summary

Overburden groundwater exists in the form of a very shallow water-bearing unit of limited hydraulic significance (i.e., typically less than five feet in thickness). Periodically, monitoring wells are dry at the site, especially during periods of reduced precipitation. When overburden groundwater is present, the observed flow direction is to the west toward the unnamed tributary, the wetland area, and the confluence of the unnamed tributary and Furnace Brook.

Volatile organic compounds were detected at elevated levels in groundwater, with the highest concentrations of these compounds detected in the vicinity of the source areas (leach pits and septic tanks) near the Former Magna Metals building. Soil vapors were detected beneath the Polymedco building slab. Elevated levels may present a potential for future exposure for groundwater ingestion or contact based on exceedances of Class GA groundwater standards. Sub slab vapors may present a future inhalation exposure. Groundwater is not currently used at the Site or in the nearby vicinity based on County records.

Sediment Investigation Summary

A Habitat Based Assessment was performed to assess the impacts of elevated levels of inorganics and PAHs in sediments of the unnamed tributary, Furnace Brook, the unnamed pond, and the wetlands. The results of the Habitat Based Assessment determined nickel and copper as potential contaminants of concern for sediments associated with each area (i.e., Furnace Brook, the unnamed tributary, the unnamed pond, and the wetlands). Elevated levels may cause exposures to ecological receptors (based on NYSDEC SCO for Protection of Ecological Receptors standard).

Surface Water Investigation Summary

The Habitat Based Assessment identified elevated levels of inorganics in the unnamed tributary and the wetlands east of Furnace Brook. Due to location, frequency, and reappearance of inorganics in other media (*e.g.*, sediments) exceeding NYSDEC Criteria, remedial goals for surface water were not developed; the remediation of sediments will mitigate the surface water contamination.

Soil Vapor Investigation Summary

Three soil vapor sampling events were performed during the 2007, 2008, and 2009 heating seasons. Sampling included both sub-slab soil vapor and ambient indoor air. The highest sub-slab VOC concentrations were detected beneath the Polymedco office area, and to a much lesser extent, Motion Labs. TCE was the primary contaminant detected in sub-slab samples, and to a lesser extent, PCE, TCA, DCE, and toluene. Minor detections in indoor air of other contaminants such as toluene and n-heptane were noted during the 3 sampling events. These contaminants are more likely to be associated with VOC sources within the buildings rather than VOC migration through the building sub-slab. Due to elevated concentrations of VOCs in sub-slab soil vapor, this Feasibility Study addresses their mitigation.

Remedial Action Objectives

The RAOs, based on NYSDEC DER-10, are as follows for each impacted media.

Soil

- Prevent ingestion/direct contact with contaminated soil
- Prevent migration of contaminants that would result in groundwater or surface water contamination
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain
- Remove the source of soil contamination, to the extent practicable

Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater
- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable
- Prevent the discharge of contaminants to surface water
- Remove the source of groundwater contamination

Sediments

- Prevent direct contact with contaminated sediments
- Prevent surface water contamination which may result in fish advisories
- Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of ambient water quality criteria
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain
- Remove the source of sediment contamination

Development of Alternatives

Following development of RAOs, identification of General Response Actions (GRAs) and screening of remedial technologies and process options, the following remedial alternatives were developed for detailed evaluation:

Soil Alternatives

S-1: No Action
S-2: Limited Action
S-3: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Restricted Use SCOs and Building Demolition
S-4: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Unrestricted Use SCOs and Building Demolition

Groundwater Alternatives

GW-1: No Action
GW-2: Groundwater Monitoring and Sub-Slab Vapor Mitigation
GW-3: *In Situ* Treatment and Sub-Slab Vapor Mitigation
GW-4: Limited Permanganate Treatment, Groundwater Monitoring, and Sub Slab Vapor Mitigation

Sediment Alternatives

SD-1: No Action
SD-2: Limited Action
SD-3: Removal of Metals-Impacted Sediments
- SD-3A: Off-Site Removal of Metals – Impacted Sediments above Habitat Assessment Based PRGs
- SD-3B: Off-Site Removal of Metals – Impacted Sediments above Pre-Release Conditions
- SD-3C: Off-Site Removal of Metals – Impacted Sediments above NYSDEC LELs

Evaluation of Alternatives

The media-specific remedial alternatives identified above were first evaluated individually, and then on a comparative basis using the following seven evaluation criteria:

1. Compliance with Standards, Criteria and Guidance (SCGs);
2. Overall Protection of Human Health and the Environment;
3. Short-Term Impact and Effectiveness;
4. Long-Term Effectiveness and Permanence;
5. Reduction of Toxicity, Mobility, and/or Volume;
6. Implementability; and
7. Cost.

Comparative Analysis of Soil Alternatives

Compliance with SCGs

Alternatives S-3 would achieve chemical-specific Restricted Use (i.e., Protection of Human Health (Commercial), Protection of Groundwater and Protection of Ecological Resources) SCOs and S-4 would achieve Unrestricted Use SCOs for COCs by removal of soil exhibiting concentrations in excess of NYSDEC SCOs from the Site. The value added benefit of alternatives S-3 and S-4 is that impacted groundwater is remediated in areas of soil removal. Alternatives S-1 and S-2 do not remove contamination from the Site.

Overall Protection of Human Health and the Environment

Alternatives S-3 and S-4 are the most protective of health and the environment, since they remove material above NYSDEC SCOs from the Site and significantly reduce or eliminate exposure to COCs in soil. Alternative S-3 provides protection through removal of soil exhibiting

concentrations above Restricted Use (i.e., Protection of Human Health (Commercial), Protection of Groundwater and Protection of Ecological Resources) SCOs and through implementation of Institutional Controls, while Alternative S-4 provides protection through removal of soil exhibiting concentrations in excess of Unrestricted Use SCOs. Alternative S-2 mitigates exposure, but does not provide any removal or treatment that significantly reduces migration of contaminants or expedites the cleanup of the Site to regulatory standards. Alternative S-1 is the least protective, since it does not remove or treat contaminants nor mitigate the potential for exposure.

Short-Term Impact and Effectiveness

Alternatives S-1 and S-2 would have the lowest short-term impact. Alternatives S-3 and S-4 would produce disturbance of site contaminants as a result of construction activities. Alternatives S-3 and S-4 would have higher short-term impacts since any excavated or removed materials would need to be transported through off-site areas for off-site disposal. These impacts would be minimized through proper construction and transportation procedures and engineering controls.

Long-Term Effectiveness and Permanence

Alternatives S-3 is effective at contaminant reduction and reducing potential future exposure. Source materials would be removed and contaminated soil would be removed. Based on the known extent of COCs in excess of NYSDEC SCOs, Alternative S-3 achieves a similar reduction of COCs as Alternative S-4. Alternative S-2 is less effective, since all existing contamination, including sources of contamination, would remain on-site. Alternative S-1 would not be effective, since it would not reduce potential exposures. Long-term monitoring would be required.

Reduction of Mobility, Toxicity, and/ or Volume

Alternatives S-3 and S-4 offer significant reductions in mobility and volume of contaminated soil, since soil excavation occurs in a large area. Excluding contingency soil removals, alternatives S-3 and S-4 would remove approximately 7,000 and 36,000 CY of soil, respectively. Alternatives S-2 and S-1 offer no reduction in mobility, toxicity, or volume since no active remediation would be performed.

Implementability

Alternative S-1 is the easiest to implement, since no remedial activities are employed in this alternative. Alternative S-2 is also easy to implement, involving only institutional controls. Alternatives S-3 and S-4 would be more difficult to implement, as they involve building demolition and subsurface soil removal and installation of shoring and/or bracing.

Services, equipment, and materials are available for all alternatives. Alternatives S-1 and S-2 require no materials and limited services. Alternatives S-3 and S-4 require building demolition, excavation services, and backfill materials. Some on-site soil may be suitable for reuse to offset the quantity.

All of the alternatives evaluated are administratively feasible. Alternatives S-1 and S-2 would be the easiest to implement (short-term) since no remedial activity would be performed. The remaining alternatives involve construction activities and associated administrative activities. Alternatives S-3 and S-4 would have some additional coordination requirements for demolition and off-site transportation, which the other alternatives would not entail. Due to the larger volume of soil removal in Alternative S-4, the coordination effort would be greater than in S-3. Long-term institutional management (*e.g.*, monitoring, reporting, public coordination) would be associated with all of the alternatives except for S-4. Alternatives S-2, S-3 and S-4 have the potential to require remedial activities and/or implementation of institutional controls on off-site properties if contamination from the leach pits extends beyond the property line. Performance of remedial activities and/or implementation of institutional controls for off-site properties would be contingent upon success negotiation of access agreements with the property owners.

Cost

Alternative S-1 has no capital costs and minimal O&M costs for periodic reviews. Alternative S-2 has the next lowest capital cost and minimal O&M costs for periodic reviews. Alternative S-3 has the second highest capital costs, and minimal O&M costs for reviews. Alternative S-4 has the highest capital costs, but no O&M costs. Alternative S-3 will result in comparable level of exposure reduction as S-4, but at a significantly lower overall cost. Overall, the ranking of the alternatives based on net present value from lowest to highest is: S-1, S-2, S-3, S-4.

Comparative Analysis of Groundwater Alternatives

Compliance with SCGs

Alternatives GW-1, GW-2, GW-3, and GW-4 would be performed in accordance with action- and location-specific SCGs. Alternative GW-1 would not trigger action or location specific SCGs. Alternatives GW-1 and GW-2 may eventually achieve chemical-specific SCGs for VOCs over an extended period of time by natural processes. Implementation of Alternative S-3 or S-4 achieves SCGs of groundwater in the overburden within the alternative's excavation boundaries. Alternative GW-3 could achieve SCGs without the implementation of active soil remedial activities. Alternative GW-4 is designed to be implemented in conjunction with Soil Alternatives S-3 or S-4.

Overall Protection of Human Health and the Environment

Alternative GW-1 is the least protective, as it is a No Action alternative. Alternative GW-2 provides monitoring, institutional controls, and a sub-slab vapor mitigation system. Alternative GW-2 also involves hydraulic modeling and the construction of an expanded monitoring well network following soil removal. Monitoring of contaminants in groundwater would be implemented and groundwater use restrictions would be maintained. Alternative GW-3 involves active treatment of contaminated groundwater and would be more effective than GW-2. Alternative GW-4 involves a one-time limited application of permanganate to the top of bedrock, in conjunction with the soil excavation activities, to provide enhanced restoration of groundwater.

Short-Term Impact and Effectiveness

Alternative GW-1 would have the lowest short-term impact. The short-term impact of Alternatives GW-2 and GW-4 would be slightly greater, since on-site construction of monitoring wells and a sub slab vapor system will be required. The short-term impact of Alternative GW-3 would include more intrusive activities at the Site.

Long-Term Effectiveness and Permanence

Alternatives GW-1, GW-2, GW-3, and GW-4 would all require an extended period of time for groundwater to reach acceptable levels. GW-1 and GW-2 require the greatest amount of time, while GW-3 and GW-4 would require less time. Monitoring would provide additional assurance that there aren't off-site exposures. Alternative GW-3 would achieve protection of health over a shorter time period than GW-2 because it involves actively treating the contamination in groundwater. Alternative GW-4 would provide additional protection of groundwater beyond GW-2 because it involves limited application of chemical reagents.

Reduction of Mobility, Toxicity, and/or Volume

Alternative GW-1 offers no reduction in mobility, toxicity, or volume, since no active remediation would be performed. Alternative GW-2 offers no reduction by itself. However, significant reduction can be achieved in GW-1, GW-2, and GW-4 by implementation of soil Alternatives S-3 or S-4. Alternative GW-3 would provide reduction of contaminant mobility, toxicity, and/or volume via active treatment.

Implementability

All of the alternatives evaluated are technically feasible. Alternative GW-1 is easiest to implement. Alternative GW-2 is somewhat more difficult to implement, requiring hydraulic modeling to determine locations of monitoring wells and confirmatory sampling. Alternative GW-3 would be the most difficult to implement because it involves active remediation. Alternative GW-4 is similar in difficulty to GW-2.

Alternative GW-1 requires no services, equipment, or materials. Services, equipment and materials are readily available for Alternatives GW-2 and GW-3. Alternative GW-2 requires consulting services for monitoring and data evaluation, construction services for monitoring network installation, and construction of a soil vapor system and O&M of the system, all of which are readily available. Alternative GW-3 would require consulting services and services for treatment implementation as well as O&M. Treatment services and equipment for this alternative are available. Alternative GW-4 would require consulting services and services for treatment implementation as well as monitoring services.

Cost

Alternative GW-1 has no capital costs and minimal O&M costs for periodic reviews. Alternative GW-2 has higher capital and O&M costs for implementation of monitoring activities, installation of a sub slab vapor system, and subsequent O&M. Alternative GW-3 has the highest capital

costs. Sub-slab vapor system will have O&M costs in GW-2, GW-3, and GW-4. Alternative GW-4 has lower costs than GW-3.

Comparative Analysis of Sediment Alternatives

Compliance with SCGs

Alternatives SD-3A, SD-3B, and SD-3C remove contaminated sediments from the Site to achieve cleanup objectives. Alternatives SD-1 and SD-2 do not remove contaminated materials from the Site.

Overall Protection of Human Health and the Environment

Alternative SD-3C is the most protective of health and the environment because it would remove contaminated materials to NYSDEC LELs. Alternative SD-3B would re-establish sediment conditions similar to background (pre-release). Alternative SD-3A provides protection of resources by removing contaminated materials to habitat assessment-based PRGs. Alternative SD-2 prevents exposure through use restrictions, but does not provide any removal or containment that significantly reduces contaminant migration and/or ecological exposure. Alternative SD-1 is the least protective, since it does not remove or treat contaminants nor reduce the risk of exposure.

Short-Term Impact and Effectiveness

Alternatives SD-1 and SD-2 would have the lowest short-term impact. There would be no potential exposures to workers or the public during implementation of these alternatives, since no active remediation would be performed. Alternative SD-3A would have a high short-term impact because it involves excavation of contaminated sediment. Alternatives SD-3B and -3C would have the greatest short-term impacts, since they require extensive excavations of contaminated material. Alternative SD-3A, -3B, -3C could potentially increase risk of exposure to workers and the public. Off-site disposal is also required for Alternatives SD-3A, -3B, -3C. These impacts would be minimized through proper construction and transportation procedures and engineering controls.

Long-Term Effectiveness and Permanence

Alternatives SD-3B and -3C are the most effective at reducing potential exposures to health and the environment. Alternative SD-3A is effective at reducing habitat assessment-based risks to ecological resources. Implementation of Institutional Controls in Alternative SD-2 is less effective since existing contamination, including sources of contamination, would remain. Alternative SD-1 would not be effective, since it would not reduce potential health or ecological risks. Long-term monitoring would be required.

Reduction of Mobility, Toxicity, and/ or Volume

Alternatives SD-3B and -3C offer the most significant reduction in mobility and volume of contaminated soil, since sediments with contaminated material exceeding the most stringent remedial goals or criteria would be removed. Alternative SD-3A offers a significant reduction in

mobility and volume. Alternatives SD-1 and SD-2 offer no reduction in mobility, toxicity, or volume.

Implementability

All of the sediment alternatives evaluated are technically feasible. However, SD-3B and SD-3C are the most challenging. Alternative SD-1 is the easiest to implement, since no remedial activities are employed in this alternative. Alternative SD-2 may be easy to implement, involving only institutional controls, however, the sediments are off-site and are on private property, which may make use restrictions difficult to implement. Alternatives SD-3A, -3B and -3C would be difficult to implement, as they involve removal of sediments in areas of surface water and wetlands. Control of water and stream flow would be required during implementation of SD-3A, -3B, and -3C. SD-3B and -3C are more difficult to implement because of the acreage involved, remoteness of some locations, and extensive mature wooded wetland system.

Services, equipment, and materials are available for all alternatives. Alternative SD-1 requires no materials or services. Alternative SD-2 requires limited services. Alternatives SD-3A, -3B and -3C require excavation, re-routing of streams and/or dewatering as well as restoration with appropriate material. The quantities of appropriate backfill are substantial; the quantity of backfill material under Alternatives SD-3B and -3C are the largest.

All of the alternatives evaluated are administratively feasible. Alternatives SD-1 and SD-2 would be the easiest to implement (short-term) since no or very limited activity would be performed. The remaining alternatives involve construction activities and associated administrative activities (*e.g.*, permitting, public participation and coordination, etc.). Alternative SD-3A, -3B, and -3C would have some additional coordination requirements for off-site transportation, which Alternatives SD-1 and SD-2 would not entail. Alternatives SD-3B and -3C may be very difficult to implement due to the property access issues, disturbances to third party property, and restoration requirements. Long-term institutional management (*e.g.*, monitoring, reporting, public coordination) would be associated with all of the alternatives except SD-1. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for remediation activities and/or implementation of institutional controls associated with Alternatives SD-2, SD-3A, SD-3B and SD-3C. Multiple third party owners are likely to be involved.

Cost

Alternative SD-1 has no capital costs and minimal O&M costs for periodic reviews. Alternative SD-2 has the next lowest capital and O&M costs for implementation of institutional controls. Removal alternatives have the highest capital and O&M costs (ranging in cost based on standards and criteria). Overall, the ranking of the alternatives based on net present value (capital and O&M) from lowest to highest is: SD-1, SD-2, SD-3A, SD-3B, and SD-3C.

Proposed Plan for Site Remediation

The proposed plan for the site remediation incorporates Alternatives S-3, GW-4, and SD-3A. Implementation of Alternative S-3 will remove COCs to meet chemical-specific SCGs. An added benefit of S-3 is that the impacted groundwater is also remediated via removal of

overburden soils in excavation areas. Because the most significant groundwater impacted areas are addressed during S-3, the recommendation of Alternative GW-4 can be made and any potential future risk of exposure to groundwater can be controlled by institutional controls that prevent the installation of wells or usage of groundwater for potable supply at the Site. In addition, permanganate would be applied to the top of the bedrock surface and over time would enter any existing bedrock fractures to treat groundwater. Groundwater would be monitored by a monitoring well system subject to periodic reviews. Operation of the sub slab vapor mitigation system will also provide positive benefit. Implementation of Alternative SD-3A will remove contaminated sediments which will mitigate potential current and future risks.

The overall net present value based on a 30-year period of performance for implementation of the selected remedy (i.e., S-3, GW-4, and SD-3A) is $6,621,000.

1.0 INTRODUCTION

1.1 Purpose of the Report

This report presents the results of the Feasibility Study (FS) prepared for ISC Properties (ISCP) for the Former Magna Metals Site (the Site) in Cortlandt, New York. The FS is based on the Remedial Investigation (RI) Report which was approved by NYSDEC on April 3, 2009.

The purpose of the FS is to identify and evaluate media-specific remedial alternatives for contaminated soil (including soil vapor) sediments, and groundwater at the Site.

The FS satisfies requirements specified in the 1996 Order-On-Consent between ISCP and the NYSDEC. This report was completed in compliance with the New York State Department of Environmental Conservation (NYSDEC) "Draft DER-10 Technical Guidance for Site Investigation and Remediation" (2002).

The following additional guidance and criteria documents were considered in the development of this FS: the U.S. Environmental Protection Agency (USEPA) National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (USEPA, 1994), the USEPA Interim Final guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (USEPA, 1988), the New York State Department of Environmental Conservation (NYSDEC) guidance document entitled "Guidelines for Remedial Investigation/Feasibility Studies" (NYSDEC, 1989), and the NYSDEC guidance entitled "Selection Of Remedial Actions At Inactive Hazardous Waste Sites" (NYSDEC, 1990).

1.2 Organization of the Report

This FS Report consists of seven sections whose contents are set forth below:

Section 2.0 Remedial Action Objectives – This section provides the applicable chemical-specific, action-specific, and location-specific standards, criteria and guidance (SCGs), the remedial action objectives (RAOs), and the general response actions (GRAs).

Section 3.0 Identification and Screening of Technologies and Selection of Process Options – This section describes the methodology and the results of the technology identification and screening, selection of process options, and development of alternatives that was performed as part of the FS.

Section 4.0 Detailed Analysis of Remedial Alternatives – This section provides a description of the seven criteria that were used for analysis of the remedial alternatives, and provides the detailed analysis of soil, sediment, and groundwater alternatives.

Section 5.0 Comparative Analysis – This section provides the comparative analysis of the soil, sediment and groundwater alternatives, using the seven criteria that were utilized for the Section 4.0 Detailed Analysis.

Section 6.0 Proposed Remedial Alternatives – This section provides the results of the evaluation process and identifies the proposed remedy for the Site.

Section 7.0 References – This section cites the references that were relied upon for information and guidance during the performance of the FS and preparation of this FS Report.

1.3 Nature and Extent of Contamination Summary

Previous remedial investigations and reports were performed and submitted to the DEC. Figures 1-1 and 1-2 presents the nature and extent of soil contamination for inorganics and organics, respectively. Figure 1-3 shows the nature and extent of soil vapor contamination. Tables 1-1 through 1-3 summarize the exceedance frequencies in the investigations.

Table 1-1 - Groundwater Frequency Exceedance			
Detected Constituents	**Concentration Range Detected (ppb)**	**SCG[a] (ppb)**	**Frequency Exceeding SCG**
Volatile Organic Compounds			
cis-1,2-Dichloroethene	1.3 J to 8.1	5	3/7
Tetrachloroethene	2.2 J to 14	5	5/8
Trichloroethene	4.5 J to 910 D	5	9/10
Inorganics			
Aluminum	52.0 J to 46,900	NC	NA
Arsenic	4.8 J to 133	25	1/4
Barium	68.9 J to 1,140	1,000	1/8
Beryllium	0.10 J to 5.6	3	1/5
Calcium	20,400 to 127,000	NC	NA
Chromium	2.5 J to 139	50	1/7
Cobalt	1.1 J to 40.8 J	NC	NA
Copper	8.4 J to 240	200	1/5
Cyanide	27 J to 560	200	1/3
Iron	33.2 J to 37,200	300	7/8
Lead	3.1 to 13.2	25	0/5
Magnesium	14,600 to 74,700	35,000	6/8
Manganese	29.4 to 9,500	300	4/8
Mercury	0.26	0.7	0/1
Nickel	8.2 J to 108	100	1/8
Potassium	2,230 J to 17,100 J	NC	NA
Selenium	1.6 J to 131	10	5/6
Sodium	12,700 J to 264,000 J	20,000	7/8
Thallium	8.3 J to 14.4	0.5	4/4
Vanadium	1.8 J to 72.2	NC	NA
Zinc	4.3 J to 150 J	2,000	0/7

[a] SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), and 6 NYCRR Part 703, Surface Water and
D - From a diluted sample
J - Estimated
NA - Not applicable
NC - No criteria

Table 1-2 - Soil Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**Unrestricted SCG[a] (ppm)**	**Frequency Exceeding Unrestricted SCG**	**Restricted Commercial SCG[b] (ppm)**	**Frequency Exceeding Restricted Commercial SCG**
Volatile Organic Compounds					
1,1,2,2-Tetrachloroethane	0.003 J	NC	NA	NC	NA
2-Butanone	0.004 J	0.12	0/1	0.12	0/1
2-Hexanone	0.005 J	NC	NA	NC	NA
4-Methyl-2-pentanone	0.004 J	NC	NA	NC	NA
Acetone	0.005 JB - 0.040	0.05	0/11	0.05	0/11
Benzene	0.0085 J	0.06	0/1	0.06	0/1
cis-1,2-Dichloroethene	0.0072 J to 0.023 J	0.25	0/2	0.25	0/2
Ethyl benzene	0.160 J	1	0/1	1	0/1
m/p-xylene	0.0055 J to 1.6 JD	0.26	1/3	0.26	1/3
Methylene chloride	0.004 JB to 0.033 J	0.05	0/12	0.05	0/12
o-Xylene	0.73 JD	0.26	1/1	0.26	1/1
Toluene	0.0031 J to 0.12 J	0.7	0/3	0.07	0/3
Trichloroethene	0.0017 J to 0.018	0.47	0/10	0.47	0/10
Semi-Volatile Organic Compounds					
1,1-Biphenyl	3.3 J	NC	NA	NC	NA
2-Methylphenol	0.004 J to 0.039 J	NC	NA	NC	NA
Acenaphthylene	0.15 J	20	0/1	20	0/1
Anthracene	0.004 J to 0.061 J	100	0/3	500	0/3
Benzo(a)anthracene	0.013 J to 1.3 J	1	2/15	1	2/15
Benzo(a)pyrene	0.018 J to 1.9 J	1	3/12	1	3/12
Benzo(b)fluoranthene	0.021 J to 2.5 J	1	3/13	1.7	2/13
Benzo(g,h,i)perylene	0.046 J to 1.2 J	100	0/7	500	0/7
Benzo(k)fluoranthene	0.026 J to 1.3 J	0.8	1/6	1.7	0/6
Bis(2-ethylhexyl)phthalate	0.012 J to 13 JD	NC	NA	NC	NA
Butylbenzylphthalate	0.013 J to 0.36 J	NC	NA	NC	NA
Chrysene	0.019 J to 1.7 J	1	2/11	1	2/11
Dibenz(a,h)anthracene	0.089 J to 0.35 J	0.33	1/2	0.56	0/2

Table 1-2 - Soil Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**Unrestricted SCG[a] (ppm)**	**Frequency Exceeding Unrestricted SCG**	**Restricted Commercial SCG[b] (ppm)**	**Frequency Exceeding Restricted Commercial SCG**
Sodium	50 B to 11,900 J	NC	NA	NC	NA
Thallium	1.8 J to 38.8	NC	NA	NC	NA
Vanadium	2.8 J to 69	NC	NA	NC	NA
Zinc	10.3 to 37,300 J	109	37/61	109	37/61
Pesticides					
4,4'-DDD	0.00098 JP to 0.01	0.0033	4/5	17	0/5
4,4'-DDE	0.0071 JPN to 0.008	0.0033	3/3	47	0/3
4,4'-DDT	0.00092 JP to 0.0089	0.0033	7/9	14	0/9
alpha-BHC	0.00005 JP	0.02	0/1	0.02	0/1
alpha-Chlordane	0.00027 JP to 0.021 P	0.094	0/3	1.3	0/3
Dieldrin	0.00028 JP	0.005	0/1	0.006	0/1
Endosulfan I	0.00032 JP	2.4	0/1	102	0/1
Endosulfan II	0.00015 JP	2.4	0/1	102	0/1
gamma-Chlordane	0.015 JP	NC	NA	NC	NA
Heptachlor	0.00019 JP	0.042	0/1	0.14	0/1
Polychlorinated Biphenyls (PCBs)					
Aroclor 1254	0.024 JP to 1.5 JD	0.1	5/10	1	1/10
Aroclor 1260	0.0072 J to 0.08	0.1	0/6	1	0/6
Total Organic Carbon (TOC)					
Total Organic Carbon	806 to 8,600 J	NC	NA	NC	NA

[a] SCG: Standard Criteria or Guidance - Part 375-6.8(a), Unrestricted Soil Cleanup Objectives

[b] SCG: Standard Criteria or Guidance - Part 375-6.8(b) - Restricted Commercial (Protection of Public Health - Commercial, Protection of Ecological Resources, and Protection of Groundwater) Soil Cleanup Objectives

B (organic) - Present in associated blank sample

B (inorganic) - Concentration above method detection limit but below reporting limit

D - From a diluted sample

J - Estimated

N - Presumptively present

NA - Not applicable

NC - No criteria

P - Compound had >25% difference for the detected concentration values between two gas chromatograph columns

Table 1-2 - Soil Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**Unrestricted SCG[a] (ppm)**	**Frequency Exceeding Unrestricted SCG**	**Restricted Commercial SCG[b] (ppm)**	**Frequency Exceeding Restricted Commercial SCG**
Diethylphthalate	0.013 J to 0.051 J	NC	NA	NC	NA
Di-n-butylphthalate	0.012 JB to 0.66 B	NC	NA	NC	NA
Di-n-octyl phthalate	0.013 J	NC	NA	NC	NA
Fluoranthene	0.008 J to 2.9 J	100	0/21	500	0/21
Indeno(1,2,3-cd)pyrene	0.022 J to 1.1 J	0.5	2/7	5.6	0/7
Phenanthrene	0.006 J to 1.6 J	100	0/18	500	0/18
Pyrene	0.008 J to 2.3 J	100	0/22	500	0/22
Inorganics					
Aluminum	2,260 to 21,295	NC	NA	NC	NA
Antimony	0.34 J to 22 J	NC	NA	NC	NA
Arsenic	0.506 J to 1,190 J	13	24/60	13	24/60
Barium	20.1 J to 721	350	5/61	400	5/61
Beryllium	0.114 J to 0.85	7.2	0/56	10	0/56
Cadmium	0.16 J to 19.2 J	2.5	6/29	4	6/29
Calcium	664 B to 18,200 J	NC	NA	NC	NA
Chromium	2.2 B to 5050	30	22/52	41	19/52
Cobalt	2.3 B to 86.6 J	NC	NA	NC	NA
Copper	12.8 to 34,700 JD	50	40/61	50	40/61
Cyanide	0.577 to 25,000 J	27	21/42	27	21/42
Iron	4,350 to 39,900	NC	NA	NC	NA
Lead	1.1 to 1,030 J	63	19/61	63	19/61
Magnesium	970 B to 12,700	NC	NA	NC	NA
Manganese	83 J to 864 J	1,600	0/61	1,600	0/61
Mercury	0.008 J to 1.1 J	0.18	10/33	0.18	10/33
Nickel	6.7 B to 63,700 JD	30	36/61	30	36/61
Potassium	267 B to 6,994 J	NC	NA	NC	NA
Selenium	0.63 J to 1,410 J	3.9	24/45	3.9	24/45
Silver	0.87 J to 9	2	12/19	2	12/19

Table 1-3 - Sediment (Organics) Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**SCG[a] (ppm)**	**Frequency Exceeding SCG**	**Site-Derived Value[b] (ppm)**	**Frequency Exceeding Site-Derived Value**
Semi-Volatile Organic Compounds					
Anthracene	0.2 J	NC	NA	NC	NA
Benzo(a)anthracene	0.1 J to 0.47	1.3[c]	0/6	110.97[c]	0/6
Benzo(a)pyrene	0.12 J to 0.66 J	1.3[c]	0/6	110.97[c]	0/6
Benzo(b)fluoranthene	0.076 J to 1.2 J	1.3[c]	0/7	110.97[c]	0/7
Benzo(g,h,i)perylene	0.15 J to 0.22 J	NC	NA	NC	NA
Benzo(k)fluoranthene	0.085 J to 0.6 J	1.3[c]	0/5	110.97[c]	0/5
Chrysene	0.071 J to 0.65 J	1.3[c]	0/7	110.97[c]	0/7
Fluoranthene	0.16 J to 1.4 J	1,020[d]	0/9	87,069.24[d]	0/9
Fluorene	0.07 J	NC	NA	NC	NA
Indeno(1,2,3-cd)pyrene	0.048 J	1.3[c]	0/1	110.97[c]	0/1
Phenanthrene	0.08 J to 0.9	120[d]	0/7	10,243.44[d]	0/7
Pyrene	0.12 J to 1.3 J	NC	NA	NC	NA
Total Organic Carbon (TOC)					
Total Organic Carbon	1,700 J to 140,000 J	NC	NA	NC	NA

[a]SCG - Standard Criteria or Guidance: New York State Department of Environmental Conservation's "Technical Guidance for Screening Contaminanted Sediments"

[b]SCG normalized using site-specific TOC values.

[c]Value for Human Health Bioaccumulation

[d]Value for Benthic Aquatic Life Chronic Toxicity

J - Estimated

NA - Not applicable

NC - No criteria

Table 1-4 - Sediment (Inorganics) Frequency Exceedance					
Detected Constituents	**Concentration Range Detected (ppm)**	**Lowest Effect Level SCG[a] (ppm)**	**Frequency Exceeding Lowest Effect Level SCG**	**Severe Effect Level SCG (ppm)**	**Frequency Exceeding Severe Effect Level SCG**
Inorganics					
Aluminum	2,920 to 19,800 J	NC	NA	NC	NA
Arsenic	1.1 B to 19.3 J	6	10/22	33	0/22
Barium	32.6 J to 604 J	NC	NA	NC	NA
Beryllium	0.17 J to 1.6 J	NC	NA	NC	NA
Cadmium	0.31 J to 1.4 J	0.6	10/12	9	0/12
Calcium	882 B to 16,400	NC	NA	NC	NA
Chromium	11.4 J to 166 J	26	19/22	110	22/28
Cobalt	4.6 B to 58.8 J	NC	NA	NC	NA
Copper	4.4 J to 2,330 J	16	26/28	110	22/28
Iron	2,130 to 23,400 J	20,000 (2%)	11/28	40,000 (4%)	0/28
Lead	3 to 112 J	31	14/28	110	1/28
Magnesium	2,130 to 23,400 J	NC	NA	NC	NA
Manganese	87 to 958 J	460	8/21	1100	0/21
Mercury	0.01 J to 0.25 J	0.15	7/15	1.3	0/15
Nickel	17 to 835 J	16	28/28	50	23/28
Potassium	207 B to 1,970 J	NC	NA	NC	NA
Selenium	0.61 B to 68.2 J	NC	NA	NC	NA
Silver	0.19 J to 1.4 JB	1	2/8	2.2	0/8
Sodium	59.8 J to 770 J	NC	NA	NC	NA
Thallium	3.4 J	NC	NA	NC	NA
Vanadium	5.8 B to 61 J	NC	NA	NC	NA
Zinc	29.3 J to 1,890 J	120	20/28	270	6/28

[a]SCG - Standard Criteria or Guidance: New York State Department of Environmental Conservation's "Technical Guidance for Screening Contaminated Sediments"

J - Estimated NA - Not applicable NC - No criteria

2.0 REMEDIAL ACTION OBJECTIVES

This section discusses the development of Remedial Action Objectives (RAOs) based on Standards, Criteria, and Guidance (SCGs). General Response Actions to address the RAOs are then identified.

2.1 Standards, Criteria, and Guidance (SCGs)

The Magna Metals Site is categorized as a Class II Inactive Hazardous Waste site by the NYSDEC. Activities at the Site are being performed under an Order on Consent. In accordance with 6 NYCRR 375-1, NYSDEC-issued permits are not required for environmental remediation activities conducted at this Site. Rather, the activities are evaluated and implemented based on the substantive elements of the applicable and relevant and appropriate state environmental laws and regulations. Federal applicable, relevant and appropriate requirements (ARARs) must be complied with fully, including the requirements to obtain permits if necessary. These federal and state environmental laws and regulations and other guidance To Be Considered (TBCs) are collectively referred to as SCGs.

The SCGs that may guide the remedial activities at the site are addressed in this section. This includes both New York State SCGs, as well as federal standards that are more stringent than State SCGs. New York State SCGs are standards or requirements that implement the New York State Environmental Conservation Law. Remedial actions conducted in New York State are required to attain SCGs to the extent practicable as per NYSDEC Subpart 375: Environmental Remediation Programs (December 2006).

SCGs are categorized as chemical-, action, or location-specific:

Chemical-specific SCGs set health or risk-based concentration limits or ranges in various environmental media for specific hazardous substances, pollutants or contaminants.

Action-specific SCGs set controls or restrictions on particular kinds of activities that may be selected to accomplish a remedy. These SCGs may specify particular performance levels, actions or technologies to be used to manage hazardous substances, pollutants or contaminants.

Location-specific SCGs set restrictions on activities within specific locations, such as wetlands and floodplains, and depend on the characteristics of a site and its immediate environs.

2.1.1 Chemical-Specific SCGs

Chemical-specific SCGs are health or risk-based concentrations for specific hazardous substances, pollutants, or contaminants in various environmental media. Chemical-specific SCGs include remediation goals for chemicals of concern (COCs) in designated media (i.e., soil, sediments, and groundwater). Statutes, regulations, and guidelines to be used in the identification of chemical-specific SCGs are listed in Table 2-1.

TABLE 2-1 (Sheet 1 of 2)
CHEMICAL-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
FEDERAL				
Ecological Risk Assessments	Process for Designing and Conducting Ecological Risk Assessments, June 1997	EPA 540-R-97-006	Guidance document developed by USEPA for conducting ecological risk assessments.	Guidance to be considered for identifying ecological exposure pathways that remediation of sediments may address.
Sediment Quality Screening	Guidelines for Deriving Site-Specific Sediment Quality Criteria for the Protection of Benthic Organisms, 1993	EPA 822-R-93-017	Guidance document developed by USEPA for developing sediment quality criteria for organic chemicals that are reflective of local conditions.	Guidance to be referenced in establishing sediment quality standards.
STATE				
Inactive Hazardous Waste Sites	Program for designating and managing inactive hazardous waste sites	Article 27, Title 13	Establishes general cleanup goals for environmental media to levels that will eliminate a significant threat to the environment. This allows NYSDEC to designate inactive hazardous waste disposal sites.	Sites are listed based on evidence of a significant threat posed by hazardous waste disposed of at the site. A significant adverse impact on the environment and/or a significantly increased risk to human health would constitute a significant threat. The Magna Metals site is classified as an Inactive Hazardous Waste Site.
Soil Cleanup Goals	NYSDEC Soil Cleanup Objectives	NYSDEC Subpart 375	Establishes soil cleanup objectives based on commercial land use and protection of groundwater quality	Specified clean-up goals may be referenced in determining site specific soil treatment levels.

TABLE 2-1 (Sheet 2 of 2)
CHEMICAL-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
Sediment Cleanup Goals	NYSDEC Technical Guidance for Screening Contaminated Sediments	NYSDEC Technical Guidance for Screening Contaminated Sediments	Screening Criteria for purposes of identifying areas of sediment contamination and developing a preliminary assessment of risk to human health and the environment.	Guidance to be referenced in establishing sediment quality standards specific to the remediation of the streams and pond.
Surface Water Cleanup Goals	NYSDEC Ambient Water Quality Standards and Guidance Values – Class GA Standards	TOGS	Establishes toxicity based surface water quality criteria for protection of aquatic organisms and human health.	Ambient water quality criteria may be referenced in establishing surface water quality standards specific to the remediation of the streams and pond.
Groundwater Cleanup Goals	Groundwater and Surface Water Quality Standards	6 NYCRR 703	Establishes groundwater quality and surface water quality standards and provides maximum concentrations for specific parameters.	Contamination in excess of groundwater quality standards and surface water quality standards may require corrective actions.

2.1.2 Action-Specific SCGs

Action-specific SCGs are technology or activity-based requirements or limitations. These SCGs are triggered by, and apply to, the implementation of particular remedial activities. Federal and state statutes, regulations, and guidelines used to identify action-specific SCGs for the site are listed in Table 2-2.

Of primary consideration are the Resource Conservation and Recovery Act (RCRA) hazardous waste management regulations (and the NYSDEC equivalents). The Land Disposal Restriction (LDRs) requirements of the RCRA regulations (40 CFR 268) apply to the placement of hazardous waste in land disposal units. The RCRA LDRs are potential SCGs for the excavation and disposal of impacted soils. Specifically, excavated soils that are characterized as hazardous waste must meet stringent treatment standards prior to final land disposal.

Pursuant to the Phase IV amendments to the LDR regulations, soils contaminated with hazardous wastes may be treated to meet LDRs or an alternate treatment standard. Under this Alternate Treatment Standards rule revision, hazardous waste constituents in soils can be reduced by 90 percent capped at 10 times the applicable LDR Universal Treatment Standard. Prior approval for use of Alternative Treatment Standards for hazardous waste soils is not required.

Other Action-Specific SCGs that may apply to the remedial activities at the site include the NYSDEC solid and hazardous waste handling, transportation and disposal regulations and ambient air quality standards and emission limitations.

2.1.3 Location-Specific SCGs

Location-specific SCGs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in specific locations. Statutes, regulations, and guidelines used in the identification of location-specific SCGs are listed in Table 2-3.

2.2 Remedial Action Objectives

The RAOs for the site are developed based on the contaminants of concern, potential exposure routes, receptors, and acceptable concentrations for each exposure route in order to protect health and the environment.

2.2.1 Contaminants of Concern

A number of COCs were identified based on information obtained during the Remedial Investigation. COCs were identified for each environmental medium (soil, sediments, and groundwater), based on historical information, concentrations relative to NYSDEC Criteria,

TABLE 2-2 (Sheet 1 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
FEDERAL				
Generation, Management, and Treatment of Hazardous Waste	Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste Management	40 U S C Section 6901 et seq.		
	Identification and Listing of Hazardous Wastes	40 CFR Part 261	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 40 CFR Parts 260-266	These regulations do not set clean-up standards, but would apply to the classification of all impacted soils and residual waste streams generated during remedial activities.
	Hazardous Waste Determinations	40 CFR Part 262.11	Generators must characterize their wastes to determine if the waste is hazardous by listing (40 CFR 261, Subpart D) by characteristic (40 CFR 261, Subpart C) or excluded from regulation (40 CFR 261.4)	Excavated soils may be classified as characteristic or listed hazardous wastes. By-products or residues from the treatment of contaminated soils, sediments, and groundwater must also be characterized.
	Manifesting	40 CFR 262, Subpart B	Generators must prepare a Hazardous Waste Manifest (EPA form 8700-22) for all off-site shipments of hazardous waste to disposal or treatment facilities	Will apply to all off-site shipments of RCRA/NYSDEC hazardous wastes.
	Recordkeeping	40 CFR 262.40	Generators must retain copies of all hazardous waste manifests used for off-site disposal	Generator must retain copies of waste manifests for a minimum period of three years after shipment date.

TABLE 2-2 (Sheet 2 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
Generation, Management, and Treatment of Hazardous Waste (cont'd)	Labeling and Marking	40 CFR 262, Subpart C	Species EPA marking, labeling and container requirements for off-site disposal of hazardous waste	Pre-transportation requirements for off-site shipments of hazardous wastes.
	Accumulation Limitations	40 CFR Part 262.34	Allows generators of hazardous waste to store and treat hazardous waste at the generation site for up to 90 days in tanks, containers, and containment buildings without having to obtain a RCRA hazardous waste permit.	Hazardous wastes may be stored for up to 90 days on-site without the need for a storage permit unless NYSDEC waives the 90-day limit as an administrative requirement.
	Standards for Owners/Operators of Hazardous Waste Treatment, Storage, Disposal (TSD) Facilities General Facility Standards	40 CFR Part 264/265 Subpart B	General requirements for owners/operators of TSD facilities including general waste analysis and compatibility, notices and inspection requirements, location and construction standards, and security	These subpart standards would be applicable to the on-site management of hazardous waste soils and sediments in tanks, containers or containment buildings.
	Closure and Post-Closure	Subpart G	Established closure and post-closure requirements for hazardous waste treatment and storage units	

TABLE 2-2 (Sheet 3 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
	Container Management	Subpart I	Hazardous waste stored in containers must comply with management requirements, including types of containers used, waste compatibility and inspection requirements.	Applicable to storage and/or treatment of hazardous wastes in containers on-site.
	Tank Systems	Subpart J	Tank systems for the treatment or storage of hazardous wastes are to be designed and operated in a manner to prevent releases to the environment	Applicable for the tank treatment and/or storage of all site generated wastes classified as a hazardous waste.
	Containment Buildings	Subpart DD	Containment buildings must be designed, constructed, and operated to meet regulatory performance standards	Standards applicable to the construction of containment buildings used to treat and/or store hazardous waste. .
Capping of Hazardous Waste	RCRA Subtitle C Standards for Capping Surface Impoundments Waste Piles Landfills	40 U S C Section 6901 et seq. 40 CFR Part 264/265 Subpart K Subpart L Subpart N	Regulations governing placement of caps or similar barriers over hazardous waste. Requirements for installation, permeability, maintenance of cover, elimination of free liquids or solidification, run-on/run-off damage control, and post-closure use of property	Requirements potentially applicable to the upland disposal of hazardous waste excavated material.
Capping of Non-Hazardous Waste	RCRA Subtitle D Criteria for Classification of Solid Waste Disposal Facilities	42 U S C Section 6901 et seq. 40 CFR Part 257	Minimum criteria for siting, construction, operation, and closure of solid waste disposal facilities. Each State is to develop, permit, and enforce a solid waste management program based on USEPA requirements	Requirements potentially applicable to the on-site disposal of contaminated soils and the upland disposal of and associated residual waste streams.

TABLE 2-2 (Sheet 4 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
Water Quality Impacts	Clean Water Act	33 U S C Section 1251-1376		
	Ambient Water Quality Criteria Guidelines	40 CFR Part 131	Establishes toxicity-based surface water quality criteria for protection of aquatic organisms and human health.	Ambient water quality criteria would be potentially applicable in establishing cleanup standards and establishing discharge standards for treated groundwater.
	Wastewater Discharge Permits, Effluent Guidelines, Best Available Technology (BAT) and BMPPT	40 CFR Parts 122, 125, 401	Permit requirements for point source discharges to waters of the United States, establishes effluent standards and requirements for preventing toxic releases	Potentially applicable for remedial activities involving a direct wastewater discharge to nearby surface water and/or diversions/disruptions of the surface water flows of the streams and pond that would impact water quality.
Air Emissions from a Point Source	Clean Air Act (CAA)	40 U S C Section 7401-7642		
	National Ambient Air Quality Standards (NAAQS)	40 CFR Part 50	Establishes ambient air quality standards for protection of public health	NAAQS may be applicable in evaluating whether there are air impacts at the site during remedial activities.
	New Source Review (NSR) and Prevention of Significant Deterioration (PSD) Requirements	40 CFR Part 52	New Sources or modifications which emit greater than the defined threshold for listed pollutants must perform ambient impact analysis and install controls which meet best available control technology (BACT)	These regulations are potentially applicable and would require a comparison of potential emissions from the remedial activity to the emission thresholds for NSR.
	National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR Part 61 40 CFR Part 63	Source-specific regulations which establish emissions standards for hazardous air pollutants (HAPs)	NESHAPs may be applicable if emissions from remediation activities exceed the thresholds for compliance.

TABLE 2-2 (Sheet 5 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
	New Source Performance Standards (NSPS)	40 CFR Part 6	Source-specific regulations which establish testing, control monitoring and reporting requirements for new emission sources	NSPS could be relevant and appropriate if steam-generating equipment, thermal desorption units, or other regulated new sources were to be used onsite.
Land Disposal of Hazardous Waste	RCRA Subtitle C Land Disposal Restrictions (LDRs)	40 U S C Section 6901 et seq. 40 CFR Part 268	Restricts land disposal of hazardous wastes that exceed specific criteria. Establishes Universal Treatment Standards (UTSs) to which hazardous wastes must be treated to prior to land disposal. Phase IV rule revision establishes Alternate Treatment Standards for Soils containing hazardous wastes.	Wastes exhibiting a hazardous characteristic would need to be treated to meet UTS for all hazardous constituents present in the residuals prior to any upland disposal. Characteristically hazardous soils can be treated to meet the UTS standards or to meet the alternative treatment standards for RCRA hazardous soils.

TABLE 2-2 (Sheet 6 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
STATE				
Generation, Management, and Treatment of Hazardous Waste	Siting of Industrial Hazardous Waste Facilities	6 NYCRR Part 361	Establishes procedures for selecting appropriate sites for hazardous waste facilities	These regulations are potentially applicable for remediation activities which would involve the construction of upland hazardous waste management facilities
	NYSDEC Division of Hazardous Substances Regulation Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 6 NYCRR Parts 372-376	These regulations do not set clean-up standards, but would apply during the on-site management of excavated hazardous waste soils and the upland management of and residual waste streams generated during remediation activities.
	New York State Hazardous Waste Management Facility Regulations	6 NYCRR Part 370.373.372	Establishes New York State's USEPA equivalent hazardous waste management program. Includes regulations for hazardous waste facility construction, operation, and closure, and standards for hazardous waste generation, manifesting, and transport	[See RCRA Hazardous Waste Management Regulations. 40 CFR Parts 263 and 264/265 under Federal SCGs listed in this table]

TABLE 2-2 (Sheet 7 of 7)
ACTION-SPECIFIC SCGs

ACTION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
Capping of Non-Hazardous Waste	New York State Solid Waste Management Facility Regulations	6 NYCRR Part 360, 364	Establishes New York State's USEPA equivalent solid waste management program. Includes regulations governing construction, operation, and closure of solid waste disposal facilities	These regulations are potentially applicable to remediation activities involving the upland management and disposal of non-hazardous wastes.
Water Treatment Discharge	New York State Regulations on the State Pollution Discharge Elimination System (SPDES)	6 NYCRR Parts 750-758	State Pollution Discharge Elimination System (SPDES) Permitting Requirements	May be applicable to discharge of treated groundwater.
	New York State Water Classifications and Quality Standards	6 NYCRR Parts 701, 702, 704	Defines surface water classifications and ambient water quality standards that are the basis for establishing effluent limitations under the SPDES program.	Furnace Brook is classified as a Class C stream.
	NYSDEC Ambient Water Quality Standards and Guidance Values	Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1	Provides a compilation of ambient water quality standards and guidance values for toxic and non-conventional pollutants for use in NYSDEC programs, including the SPDES permit program.	These standards and guidance values are applicable in establishing discharge limitations to surface waters.
Air Emissions	New York State Air Pollution Control Regulations	6 NYCRR Parts 120, 200-203, 207, 211, 211, 212, 219 Air Guide-1	Establishes emissions standards for new sources of air pollutants and specific contaminants.	Requirements would be applicable to remediation alternatives that result in emissions of air contaminants, including particulate matter.
	New York State Ambient Air Quality Standards	6 NYCRR Part 257	Establishes state ambient air quality standards and guidelines for protection of public health.	May be applicable in evaluating air impacts during remediation activities. Establishes short-term action limits for occupational exposure.

TABLE 2-3 (Sheet 1 of 1)
LOCATION-SPECIFIC SCGs

LOCATION	REQUIREMENTS	CITATION	DESCRIPTION	COMMENT
FEDERAL				
Floodplains	Executive Order 11988 - Floodplain Management	40 CFR 6, Subpart A; 40 CFR 6.302	Activities taking place within floodplains must be done to avoid adverse impacts and preserve beneficial values in floodplains.	Activities may occur within the floodplain of the Hudson River.
Wetlands/Waters of the U.S.	Dredge and Fill in Wetlands	33 CFR Parts 320-330/40 CFR Part 230	Dredge or fill material into wetlands must be evaluated based on specific criteria.	Would be applicable to remediation activities impacting jurisdictional wetlands.
	Executive Order 11990 - Protection of Wetlands	40 CFR Part 6 Subpart A	Activities taking place within wetlands must be done to avoid adverse impacts.	Would be applicable to remediation activities conducted in jurisdictional wetlands.
Historic/Cultural Resources	National Historic Preservation act	16 USC 470	Establishes requirements for the identification and preservation of historic and cultural resources	Would be applicable to the management of historic or archeological artifacts identified on the site.
Critical Habitat	Endangered Species Act and Fish and Wildlife Coordination Act	16 USC 661 and 16 U.S.C. 1531	Actions must be taken to conserve critical habitat in areas where there are endangered or threatened species.	Requirements would be applicable if endangered or threatened species are identified on or adjacent to the site.
Considering Wetlands at CERCLA Sites	Wetlands Protection at CERCLA sites	OSWER 9280.0-03	Guidance document to be used to evaluate impacts to wetlands at Superfund sites	Requirements should be considered when evaluating impacts to jurisdictional wetlands.
STATE				
Water Resources	Protection of Waters	6 NYCRR 608	Regulates removal or placement of fill materials within state waters.	Placement of fill materials and/or excavation of sediment within with pond and streams.
Floodplains	Floodplain Management Regulations	6 NYCRR Part 500	Establishes floodplain management requirements including limitations on projects, including placement of fill, which may result in an increase in flood levels or water surface elevations during a base flood discharge.	Remediation activities may occur within the floodplain of Furnace Brook.
Floodplain	TSD Facility Permitting Requirements	6 NYCRR Subpart 373-1	Facility must be designed and operated to avoid washout.	Requirements are potentially applicable to any upland treatment, storage or disposal of hazardous wastes within the floodplain of Furnace Brook.
Wetlands	Alteration of Freshwater Wetlands	6 NYCRR Subpart 663	Establishes requirements for activities taking place in freshwater wetlands, including dredging, draining, fill or placement of structures.	Would be applicable to work conducted in wetlands or greater than 12.4 acres or in adjacent areas.

natural (background) levels and/or toxicological characteristics. The media-specific COCs are listed in Table 2-4.

Figures 2-1 through 2-3 depict COCs in soil and groundwater that exceed applicable regulatory benchmarks. Figures 2-4 through 2-8 depict conceptual illustrations of inorganic COCs in sediments, which form the basis of sediment remedial action alternatives, as they depict areas having contaminants that were detected above PRGs (preliminary remediation goals) and therefore, are areas considered for remedial actions.

2.2.2 PRGs

Preliminary remedial goals for soil are based on the NYSDEC Subpart 375 values for Protection of Groundwater, Protection of Ecological Resources, and Protection of Human Health. Protection of Human Health Commercial SCOs were considered for on-site soils, and Protection of Human Health Residential SCOs were considered for off-site soils. Table 2-5 summarizes the potential PRGs for soil.

PRGs for groundwater are based on the TOGS 1.1.1 Class GA Groundwater Criteria. Table 2-6 summarizes the potential SCG-based PRGs for groundwater.

Ecological PRGs for inorganics in sediments were based on the results of the Habitat Assessment in the Final RI Report. Site-specific Maximum No Observed Effect Concentration PRGs are listed in Table 2-7 for the two Habitat Assessment sediment areas developed during the RI where exceedances occurred (*i.e.*, Furnace Brook/Unnamed Pond and Unnamed tributary). Two additional remedial goals requested by NYSDEC (during finalization of the RI Report) for each inorganic contaminant of concern in sediments are also listed in Table 2-7. The additional NYSDEC required remedial goals are based on pre-release conditions (background sample results) and NYSDEC Lowest Effect Levels (LELs). The pre-release and LEL remedial goals have been applied to the same areas for which the Ecological PRGs were developed (*i.e.*, Furnace Brook/Unnamed Pond and Unnamed Tributary).

PRGs for organics in sediments were not developed for the Site since the organic COCs for sediment (primarily benzo(a)pyrene) were linked to sources unrelated to historical operations at the Site (*e.g.*, runoff from Furnace Dock Road).

Ecological PRGs for off-site surface soil locations SS-6 through SS-10 associated with sediment/wetland areas are also listed in Table 2-7. Surface soils in these locations will be included with the sediment remedial alternatives. The remaining off-site surface soil locations (SS-04 and SS-13 through 15) are considered background samples.

As discussed in the Final RI, surface water concentrations were compared to ecological screening criteria to determine if potential risks to aquatic life were present. Due to location, frequency, and reappearance in other media (*e.g.*, sediments) of COCs in surface water exceeding NYSDEC Criteria, PRGs for surface water were not developed. The remediation of sediments will facilitate recovery of surface water.

TABLE 2-4
CHEMICAL CONTAMINANTS OF CONCERN BY MEDIA

SOIL	***GROUNDWATER***
<u>Inorganics</u> Arsenic Chromium Copper Cyanide Lead Mercury Nickel Selenium Zinc <u>Semivolatiles</u> Benzo(b)fluoranthene Benzo(a)pyrene	<u>Volatiles</u> PCE TCE cis-1,2-DCE <u>Inorganics</u> Arsenic Chromium Copper Cyanide Nickel Selenium

SURFACE WATER	***SEDIMENTS***
<u>Inorganics</u> Copper Zinc	<u>Inorganics</u> Nickel Copper Zinc <u>Semivolatiles</u> Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(d)fluoranthene Benzo(a)pyrene

TABLE 2-5

POTENTIAL SCG-BASED PRGs FOR SOIL

Site-Related Contaminant	SCO-Based PRGs Residential Use (mg/kg)	SCO-Based PRGs Commercial Use (mg/kg)	SCO-Based PRGs Protection of GW (mg/kg)	SCO-Based PRGs Protection of Ecological Resources (mg/kg)
Inorganics				
Copper	270	270	1,720	50
Cyanide	27	27	40	NC
Nickel	140	310	130	30
Arsenic	16	16	16	13
Chromium	36	1,500	NC	41
Selenium	36	1,500	4	3.9
Lead	400	1,000	450	63
Zinc	2,200	10,000	2,480	109
Mercury	0.81	2.8	0.73	0.18
Semivolatiles				
Benzo(b)fluoranthene	1	5.6	1.7	NC
Benzo(a)pyrene	1	1	22	2.6

Notes – Based on NYSDEC SCOs Subpart 375-6
NC – No criteria specified
Chromium criteria listed is for trivalent chromium

TABLE 2-6
POTENTIAL SCG-BASED PRGs FOR GROUNDWATER

Site-Related Contaminant	TOGS 1.1.1 Class GA-Based Groundwater SCG-Based PRGs (ug/L)
Inorganics	
Arsenic	25
Chromium	50
Copper	200
Nickel	100
Selenium	10
Cyanide	200
Volatiles	
Tetrachloroethene	5*
Trichloroethene	5*
cis-1,2-Dichloroethene	5*
* The principal organic contaminant standard for groundwater of 5 ug/L applies to this substance	

TABLE 2-7
POTENTIAL SCG-BASED PRGs FOR INORGANICS IN SEDIMENTS

FURNACE BROOK/UNNAMED POND				
Inorganic COCs	**Site Specific Maximum No Observed Effect Concentration* PRGs**		**NYSDEC Lowest Effect Level (LEL) PRGs**	**Background Concentration[2] PRGs**
	(mg/Kg)	**SEM/AVS[1]**	**(mg/Kg)**	**(mg/Kg)**
Nickel	200.0	<1.0	16.0	24.1
Copper	415.0	<1.0	16.0	13.7
Zinc	NA[3]	NA[3]	120	54.1
UNNAMED TRIBUTARY				
Inorganic COCs	**Site Specific Maximum No Observed Effect Concentration* PRGs**		**NYSDEC Lowest Effect Level (LEL) PRGs**	**Background Concentration[1] PRGs**
	(mg/Kg)	**SEM/AVS[1]**	**(mg/Kg)**	**(mg/Kg)**
Nickel	143.0	<1.0	16.0	24.1
Copper	107.0	<1.0	16.0	13.7
Zinc	NA[3]	NA[3]	120	54.1

*No observed impairment in survival or growth in *Hyalella azteca* and *Chironomus tentans* relative to the background location.

[1] Ratio of soluble extractable metals to acid volatile sulfide

[2] Average background concentration from five upgradient sediment samples (SD-27 through SD-31) used to determine preliminary remedial goals.

[3] Zinc was not identified as a contaminant of potential concern for the Furnace Brook/Unnamed Pond or the Unnamed Tributary areas during the RI; therefore, habitat assessment-based PRGs for zinc were not developed.

2.2.3 Remedial Action Objectives

In this section, RAOs for the Site are identified based on the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation (last revised December 2002). The media-specific RAOs for the Site are listed below:

Soil

- Prevent ingestion/direct contact with contaminated soil
- Prevent migration of contaminants that would result in groundwater or surface water contamination
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain
- Remove the source of soil contamination, to the extent practicable

Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater
- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable
- Prevent the discharge of contaminants to surface water
- Remove the source of groundwater contamination

Sediments

- Prevent direct contact with contaminated sediments
- Prevent surface water contamination which may result in fish advisories
- Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of ambient water quality criteria
- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain
- Remove the source of sediment contamination

2.3 General Response Actions

To attain the RAOs developed for the site, the following GRAs for soil, groundwater, and sediments have been identified:

1. No Action
2. Limited Action
    a. Institutional Controls (*e.g.*, environmental easements)
    b. Engineering Controls (*e.g.*, access restrictions)
3. Containment
4. Treatment/Disposal
    a. *In situ* Treatment

b. Removal/Treatment/Disposal

No Action involves no institutional controls, containment, or treatment, but would include reviews for periodic reevaluation of site conditions. Limited Action involves measures that restrict access to contaminated areas through physical and/or administrative measures, and typically include long-term monitoring.

Containment actions include technologies that involve little or no treatment, but provide protection of health and the environment by reducing mobility of contaminants and/or eliminating pathways of exposure.

Treatment/Disposal actions include technologies that act to reduce the volume, toxicity and/or mobility of contaminants. These technologies include *in situ* treatment or removal and *ex situ* treatment (e.g., physical, chemical, thermal, biological). Disposal actions include both on-site and off-site disposal technologies.

3.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES AND SELECTION OF PROCESS OPTIONS

The screening of remedial technologies is performed in two steps: (1) the identification and screening of technology types and process options for each general response action, and (2) the evaluation and selection of representative process options. The following sections discuss the results of these steps.

3.1 Identification and Screening of Technologies

Remedial technology types associated with each of the GRAs are discussed in this section. Most of these remedial technology types contain several different process options that could be applicable to the remediation of contaminated soil, groundwater, and sediment. These potentially applicable technologies and process options are initially screened based on technical feasibility, considering site-specific conditions, contaminant types, and concentrations, to select representative technologies and process options for development of remedial alternatives.

3.1.1 Soil

In this section, potential technologies for remediation of contaminated soil exceeding PRGs are discussed and summarized with the results of the initial screening. For those technologies that were not retained for further evaluation, the rationale for their elimination is included. Table 3-1 summarizes the results of the preliminary screening of soil technologies and process options discussed below.

3.1.1.1 No Action

Description: No Action is a response that does not include any remedial measures. No Action allows for periodic reviews of the site and reevaluation of the need for remedial action at periodic intervals.

Initial Screening: No active remediation or institutional controls are implemented under this option. Any reduction in the toxicity, mobility or volume of contaminants would be the result of natural attenuation, since no treatment would be implemented. The No Action alternative is retained for further evaluation as a baseline for comparison of other alternatives.

3.1.1.2 Limited Action

Limited Action consists of technologies that are generally passive, including monitoring, access restrictions (e.g., engineering controls such as fencing and warning signs) and institutional controls (e.g., environmental easements, health and safety plans, Site Management Plans, etc.).

TABLE 3-1
SCREENING OF SOIL TECHNOLOGIES AND PROCESS OPTIONS

General Response Actions	Remedial Technology Types	Process Options	Technical Feasibility
No Action	No Action	Site Reviews	Retained
Limited Action	Access Restrictions	Access Restrictions	Retained
	Institutional Controls	Environmental Easements	Retained
		Health and Safety Plan and Site Management Plan	Retained
	Monitoring	Monitoring and Site Reviews	Retained
Containment	Capping	Permeable Soil	Retained
		Clay	Retained
		Asphalt	Retained
		Multi-Media	Retained
	Barrier Walls	Sheet Piling	Not Retained
		Slurry Walls	Not Retained
		Grouting	Not Retained
Removal/Treatment/ Disposal	Removal	Excavation	Retained
	In Situ Treatment	Soil Vapor Extraction	Not Retained
		Soil Flushing/Washing	Not Retained
		Stabilization/ Solidification	Retained
		Steam stripping (DUS)	Not Retained
		Biodegradation	Not Retained
		Oxidation	Not Retained
	Ex Situ Treatment	Reuse/Recycling	Retained
		Stabilization/ Solidification	Retained
		Thermal Desorption	Not Retained
		Incineration	Not Retained
		Biodegradation	Not Retained
		Soil Washing	Not Retained
		Soil Vapor Extraction	Not Retained
		Chemical Oxidation	Not Retained
	Disposal	On-site Landfill	Not Retained
		Off-site Disposal	Retained

3.1.1.2.1 Access Restrictions

Description: Access to contaminated areas would be restricted by providing a security fence and affixing signs (as appropriate).

Initial Screening: Fencing around the impacted soil areas would effectively prevent exposure to the impacted materials. This process option is retained for further evaluation.

3.1.1.2.2 Environmental Easements

Description: This process option includes the use of environmental easements to ensure the performance of operation, maintenance, and/or monitoring requirements and the potential restriction of future uses on properties that have residual contamination above unrestricted use criteria, or which have engineering controls that must be maintained or protected.

Initial Screening: Environmental easements are required for sites with residual contamination above unrestricted use criteria and for sites with engineering controls that provide protection of human health and/or the environment and must be maintained and/or monitored. Although difficulties may occur with third party owners, this process option is retained.

3.1.1.2.3 Health and Safety and Site Management Plans

Description: This process option includes the preparation, implementation and maintenance of plans for the property to manage future activities at the Site. The plans, which could include a Health and Safety Plan and/or a Site Management Plan, would require monitoring and use of personal protective equipment during construction activities at the site.

Initial Screening: Plans would be required as the final step in the development of remedial alternatives that do not remediate the site to unrestricted use conditions. Plans are retained as a process option.

3.1.1.2.4 Monitoring and Site Reviews

Description: This process option includes periodic data collection (e.g., quarterly, annual, etc.) and review of the data to assess the current conditions at the site. These data would be used to determine if implemented remedial activities have achieved the RAOs or are continuing to be protective of health and the environment as conditions improve towards achieving the RAOs. Should site reviews indicate conditions are worsening or the current conditions pose an unacceptable risk to health or the environment, additional activities could be implemented.

Initial Screening: Periodic monitoring and site reviews are necessary to assess the progress of remedial activities and the protectiveness of implemented actions until RAOs are achieved. They are a necessary component of nearly all remedial actions, the exception being those that immediately achieve RAOs, and are therefore retained as a process option.

3.1.1.3 Containment

Containment provides isolation of contaminated soil from potential receptors and/or uncontaminated media. Capping technologies and/or vertical barriers can be used to contain contaminated soil, minimize exposure to contaminated soil, control migration of contaminants, and reduce leaching of contaminants from the soil to groundwater. Capping of contaminated soil could be achieved by using permeable soil caps, clay caps, asphalt caps, and multiple layer caps. Vertical barriers, including sheet piling, slurry walls and grout curtains, were not retained due to the potential pathway to underlying bedrock. However, sheet piling may be used in conjunction with deep excavation activities.

3.1.1.3.1 Permeable Soil Cap

Description: A permeable soil cap can be installed over contaminated soil to mitigate direct contact with contaminants. A permeable soil cap would have a high permeability relative to clay, and would allow percolation of surface water, runoff, etc.

Initial Screening: A permeable soil cap would be effective in mitigating direct contact with contaminated surface soils; however, soil caps do not reduce contaminant migration to groundwater. Permeable soil caps are susceptible to erosion from climatic and storm forces; this can be mitigated with a properly maintained vegetative cover. Permeable soil caps are also susceptible to settling, ponding of liquids, and invasion by burrowing animals and deep rooted vegetation if not properly maintained. This option is retained for contaminated surface and subsurface soils.

3.1.1.3.2 Clay Cap

Description: Clay caps are commonly used for soil that contains hazardous or non-hazardous waste. Bentonite, a natural clay with high swelling properties, is often mixed with on-site soil and water to produce a low permeability layer. A low permeability clay cap would not only physically isolate the source, but also reduce the potential for leaching of contaminants to groundwater by creating a low permeability barrier.

Initial Screening: A clay cap would be effective in mitigating direct contact with contaminated soils and would also mitigate contaminant migration by reducing surface infiltration; however, clay caps do not mitigate contaminant migration beneath the water table. Clay, which consists of fine material, is susceptible to erosion from climatic and storm forces; this can be mitigated with a properly maintained vegetative cover. Proper particle distribution is essential to create a low permeability cap. Clay caps are also susceptible to cracking, settling, ponding of liquids and invasion by burrowing animals and deep rooted vegetation if not properly maintained. This option is retained for the contaminated surface and subsurface soils.

3.1.1.3.3 Asphalt Cap

Description: An asphalt cap would consist of graded soil and a gravel sub-base, with asphalt paving as a final cover. The cap minimizes wind and rain erosion, preserves slope stability, and provides protection from the elements for layers below it.

Initial Screening: Asphalt caps provide a low permeability cover to mitigate direct contact with contaminated soils and reduce infiltration; however, asphalt caps do not mitigate contaminant migration beneath the water table. They are less susceptible to erosion from climatic and storm forces than a soil or clay cap. An asphalt cap is subject to cracking and settling if not properly maintained. However, it would be effective in achieving remedial action objectives for soil including mitigating direct contact with contaminated soils. Therefore, this option is retained.

3.1.1.3.4 Multi-Media Cap

Description: A multi-media cap is a combination of two or more of the single layer capping technologies. A disadvantage of one is compensated for by an advantage of another. Most caps recommended for hazardous waste projects are multi-layer caps. A multi-media cap would typically consist of 2 feet of clay, a synthetic liner, filter fabric, 1 foot of sand, 2 feet of top soil, and vegetation at the top.

Initial Screening: The performance of a properly installed, multi-layered cap is generally excellent. There is still a need for periodic monitoring and maintenance of the cap but to a lesser extent than a single media cap. This type of cap would require more restrictions on future use of the site and would be less practical to install around buildings and on small areas while offering little increased benefit. However, this type of cap has the advantage of reducing infiltration, in addition to minimizing exposure. Therefore, this option is retained.

3.1.1.3.5 Sheet Piling

Description: This technique could be used as a vertical barrier whereby the soil within the enclosure is dewatered and soil remedial activities could proceed in a "dry" state. Steel or heavy gauge PVC sheet piling cutoffs require very little maintenance. Recent advances in jointing technology have made sheet piling relatively resistance to leakage.

Initial Screening: Sheet piling is not feasible for source control due to the potential vertical migration pathway to underlying bedrock. However, sheet piling may be used in conjunction with soil excavation for dewatering purposes.

3.1.1.3.6 Slurry Walls

Description: Slurry walls are a common subsurface barrier because they are a relatively inexpensive means of reducing groundwater flow through contaminated source materials. Slurry walls are constructed in a vertical trench excavated under a slurry. This slurry, usually a mixture of bentonite and water, acts essentially like a drilling fluid. It hydraulically shores the trench to prevent collapse, and at the same time, forms a filter cake on the trench walls to prevent high fluid losses into the surrounding ground. In some cases, soil or cement are added to the bentonite slurry to form a soil-bentonite or cement-bentonite slurry wall. Slurry wall installation typically requires the handling of potentially contaminated excess spoils.

Initial Screening: Slurry walls are typically used when they can be "keyed" into a confining layer. This option is not retained due to the potential vertical migration pathway to underlying bedrock.

3.1.1.3.7 Grouting

Grouting is typically accomplished by drilling a grout tool down to a given depth and then raising up the tool while injecting grout through the jet. The actual grouting injection locations may be at plan intervals close enough to ensure overlap of the known radius of a jet tool, or may be further apart based on the ability of the grout to penetrate undisturbed soils that are beyond the tool radius. This technique can be used to construct a full or partial vertical barrier.

Initial Screening: This process typically results in an excess spoils volume, and this material has to be managed and in most cases disposed of. This process is not retained due to the potential vertical migration pathway to the underlying bedrock layer.

3.1.1.4 Removal

Removal technologies involve physical removal of contaminated soil, usually with the intention of subsequent treatment and/or disposal. This category includes excavation and is a preliminary or support technology as part of *ex situ* treatment options which first require removal of the contaminated media.

3.1.1.4.1 Excavation

Description: Excavation refers to the use of construction equipment such as backhoes, bulldozers, front end loaders, and clamshells that are typically used on land to excavate and handle contaminated soil. Excavation could also be used to access contamination source areas (*e.g.*, leach pits) to provide a means for physical removal of contaminated subsurface soil.

Initial Screening: Excavation would be required as the initial material handling step in numerous remedial alternatives. The excavation areas would be restored with clean backfill which may serve as a physical barrier to subsurface contamination that may not be excavated. Excavation is retained for the source areas and the contaminated soils.

3.1.1.5 In Situ Treatment

Treatment technologies are used to change the physical or chemical state of a contaminant or to destroy the contaminant completely to reduce volume, toxicity and/or mobility of the contaminant. *In situ* treatment is a technology category in which contaminated soil is treated "in place", without removal of the soil media. The technologies evaluated in this category are soil vapor extraction, soil flushing/washing, stabilization/solidification, steam stripping, biodegradation, and chemical oxidation.

3.1.1.5.1 Soil Vapor Extraction

Description: Vapor extraction wells are installed throughout the impacted material down to the water table. Through a network of piping, a vacuum is applied to the wells to draw off the constituents as a vapor. Some variations utilize injected air into wells within the water table combined with vacuum extraction to liberate contaminants within the groundwater along with vadose zone contamination. The removed vapor sometimes requires further treatment via thermal oxidation or carbon adsorption prior to release to the atmosphere.

Initial Screening: Soil vapor extraction is not effective at removing inorganics in soils and is therefore not retained as a potential technology. However, a Sub Slab Depressurization System is included with groundwater alternatives due to the presence of VOCs in sub slab vapor.

3.1.1.5.2 In Situ Soil Flushing/Washing

Description: Inorganics can be washed from contaminated soils by means of an extraction process termed "soil washing." An aqueous solution (e.g., surfactant) is injected into the area of impacted material. As the aqueous solution flows through the impacted media, sorbed contaminants are mobilized into solution by reason of solubility, formation of an emulsion, or by chemical reaction with the flushing solution. The solution, combined with the removed constituents, is then extracted from the subsurface utilizing wells and multi-phase extraction methods. Additional processes can be used to enhance the removal of insoluble contaminants. Additional treatment of the extracted aqueous waste is necessary prior to disposal.

Initial Screening: *In situ* soil washing relies on the hydraulic conductivity and homogeneity of the subsurface medium for proper transmission of the washing reagent throughout the saturated zone and contact with contaminants of concern. The site geology includes fine grained soils (*i.e.*, clays and silts) which could negatively impact the ability of the washing reagent to reach the contaminants of concern and could also negatively impact ease of extraction. The low solubility of the heavier inorganics in the impacted areas could prevent effective soil washing even in areas with less fine grained soils. Additionally, when used over a wide area, this process could also generate a substantial quantity of wastewater that would require treatment and disposal. In addition, close to the streams and unnamed pond, there is a potential to mobilize contamination and therefore a potential to discharge contaminated water to the various water bodies. Therefore, this technology is not retained.

3.1.1.5.3 In Situ Stabilization/Solidification

Description: *In situ* stabilization is a process whereby contaminated soils are converted in-place into a stable cement type matrix in which contaminants are bound or trapped and become immobile. Silicates can stabilize contaminants such as metals. It has been demonstrated that chemical fixation products of certain silicate-based mixtures do not leach metals and most organics. Large augers are used to inject the stabilizing reagents and mix the impacted material. Treatment may be achieved in both the saturated and unsaturated zones with this technology.

Initial Screening: For the site contaminants and physical conditions present, this process option could effectively reduce the risks associated with soils at the Site. Treatability studies would be required prior to design of an *in situ* stabilization remedy for the site. This technology is retained for further evaluation.

3.1.1.5.4 In Situ Steam Stripping (Dynamic Underground Stripping (DUS))

Description: *In situ* steam stripping is a physical separation treatment process that utilizes steam introduced into the impacted material to strip off organic constituents. Steam is injected into the periphery of the contaminated areas to vaporize and mobilize contaminants, which are then extracted at centrally located vapor and liquid extraction points. In combination, electrical

heating may be used to vaporize contaminants in less permeable zones or lenses. Vapor and liquid collection and treatment systems would be required to process the extracted liquid and vapor prior to disposal. Treatment is achieved in both the saturated and unsaturated zones.

Initial Screening: For the site contaminants and physical conditions present, this process would not effectively reduce the risks associated with soils at the Site. Inorganics, the predominant contaminants of concern in soils, would not be effectively treated by *in situ* steam stripping. Therefore, this technology is not retained for further evaluation

3.1.1.5.5 In Situ Biodegradation

Description: Biological treatment involves the use of native microbes or selectively adapted bacteria to degrade a variety of organic compounds. The biological processes usually involve the addition of microbes, nutrients, and oxygen. To enhance the performance of microbial activity in the subsurface, oxygen is added to the saturated zone via either an oxygen releasing compound or controlled direct injection of air or oxygen itself. Treatment is generally only accomplished in the saturated zone.

Initial Screening: This process option is not effective for inorganics in soils. Therefore, this technology is not retained for further evaluation.

3.1.1.5.6 In Situ Chemical Oxidation

Description: This technology involves the use of a chemical reagent that is injected into the soil via constructed wells or driven wellpoints to break down organic constituents into carbon dioxide and water. Generally, a hydrogen peroxide based mixture is used, with additives and catalysts to enhance the reaction characteristics. The amount of reagent needed, spacing of injection points, and the frequency of addition to achieve cleanup goals are dependent upon organic concentrations and soil characteristics.

Initial Screening: This technology is not well established for inorganics in soils. Therefore, this process option is not retained for further evaluation.

3.1.1.6 Ex Situ Treatment

Treatment technologies may be implemented *ex situ*, i.e., after excavation of contaminated soil. The process options for *ex situ* treatment technologies that were evaluated included: reuse/recycling, stabilization/solidification, thermal desorption, incineration, biodegradation, soil washing and soil vapor extraction.

3.1.1.6.1 Reuse/Recycling

Description: This category of process options includes the processing of impacted material from the Site that as part of a process to produce a useable end product. Process options include: cold batch asphalt (on or off-site), hot mix asphalt batching, brick manufacturing, cement manufacturing, and co-burning in an industrial boiler. In addition, it is sometimes practical to use lime to amend soils for moisture and to re-use slightly impacted soils at sites, thereby reducing

the amount of imported backfill that is needed, and reducing the amount of off-site disposal that is required to remediate a site.

Initial Screening: Excavation of soils from source areas may not result in reusable soils. This option may be applicable for the reuse of slightly or non-impacted soils located outside of the source areas, and is retained.

3.1.1.6.2 Solidification/Stabilization

Description: Stabilization is a process whereby contaminated soils are converted into a stable cement type matrix in which contaminants are bound or trapped and become immobile. Generally, cementing additives are used, with other reagents as necessary to stabilize the organic constituents present in the site soil. A pug mill is used to thoroughly mix the impacted material with the additives.

Initial Screening: This process would be effective for the impacted material. This technology would immobilize contaminants in the soil matrix and would require long-term monitoring at the point of disposal. Bench-scale testing would be required to identify the appropriate additives and dosage rates. This technology can be used for effective immobilization of constituents present at the site and therefore is retained as a process option.

3.1.1.6.3 Thermal Desorption

Description: The thermal desorption technology is a thermal stripping process. Prepared soils are introduced into the enclosed heated chamber using a heated screw or belt conveyor. Direct or indirect heating methods are used to volatilize organics from the soil. The off-gas containing the thermally stripped compounds is then combusted in an afterburner, adsorbed in a carbon adsorption unit or treated by catalytic oxidation designed to ensure removal of these compounds to acceptable levels. Typical operating temperatures for thermal stripping of organics are 400°F to 900°F; however, higher temperatures are achievable. Operating temperatures are selected based on the hydrocarbons present in the soil.

Initial Screening: This process would not be effective for inorganics, the predominant constituents of concern in soils at the Site. Therefore, this technology is not retained for further evaluation.

3.1.1.6.4 Incineration

Description: Incineration is a thermal destruction method which can be used to destroy combustible waste materials including organic contaminants in soils. Incineration systems such as multiple hearth, rotary kiln, infrared and fluidized bed can treat highly-contaminated soils at high temperatures (1200°F to 1800°F in the primary chamber and at 1400°F to 2400°F in the secondary chamber). Infrared incineration systems are used primarily for solids or sludges.

Initial Screening: High temperature incineration is not suitable for removal of inorganics in contaminated soils. Therefore, incineration is not retained as an option.

3.1.1.6.5 Biodegradation

Description: Biological treatment involves the use of native microbes or selectively adapted bacteria to degrade a variety of organic compounds. The biological processes usually involve the addition of microbes, nutrients, oxygen and moisture. The microbial action serves to effectively degrade the organic constituents. Several options for implementing this approach on-site for excavated materials exist, including: constructing a biopile, landfarming, or composting. The option that would be most appropriate for this site is the construction of an engineered biopile. In order to minimize odors from this process, the pile would be covered with a heavy polyethylene sheeting.

Initial Screening: Aerobic biodegradation has not been demonstrated to be effective on inorganic constituents. Therefore, on-site *ex situ* biodegradation is not retained.

3.1.1.6.6 Soil Washing

Description: Soil washing of excavated soil involves processing the impacted material in a reactor vessel, or other treatment unit in conjunction with a reagent solution designed to remove the organic constituents from the native soil. The optimum reagent and reaction time would require the performance of bench and pilot studies to optimize the process.

Initial Screening: *Ex situ* soil washing overcomes heterogeneity concerns associated with *in situ* soil washing. Large volumes of aqueous wastes would also be generated and would require further treatment and disposal. Furthermore, significant feedstock preparation is required for this process option. Therefore, this process option is not retained.

3.1.1.6.7 Soil Vapor Extraction

Description: This process option involves the construction of engineered stockpiles of impacted soil after excavation. Slotted pipes are installed within the stockpiles and a vacuum is applied to draw off the volatile organic constituents. An emissions control system is required to treat extracted vapor prior to release to the environment.

Initial Screening: This process is not effective for the treatment of inorganics, therefore, this option is not retained for further evaluation.

3.1.1.6.8 Chemical Oxidation

Description: This technology involves the use of a chemical reagent that is injected into stockpiled soil to chemically convert hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. Oxidation reactions involve the transfer of electrons from one compound to another. The oxidizing agents most commonly used for treatment of hazardous contaminants are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide. Chemical oxidation is a short- to medium-term technology. Generally, a hydrogen peroxide based mixture is used, with additives and catalysts to enhance the reaction characteristics. The amount of reagent needed, spacing of injection points, and the frequency of addition to achieve cleanup goals are dependent upon organic concentrations and soil characteristics.

Initial Screening: The target contaminant group for chemical oxidation is organics. Therefore, this process option is not retained for further evaluation.

3.1.1.7 Disposal

This category of remedial process options refers to disposal of impacted soil on or off-site, with or without prior treatment. The remedial technologies are on-site landfill (with or without treatment) and off-site disposal (with or without treatment).

3.1.1.7.1 On-Site Landfill

Description: Impacted soil would be excavated and then disposed of in an on-site landfill. A regulated landfill would have to be constructed on-site, including liner system, leachate collection and treatment, and multi-layer cap.

Initial Screening: An onsite landfill would have to meet rigorous regulatory requirements. The depth to groundwater is not sufficient to allow for the construction of an efficient landfill, and there is not sufficient space available on-site for this option; therefore, this option is not retained.

3.1.1.7.2 Off-Site Disposal

Description: Hazardous impacted material (if any) would be transported to a regulated facility and properly disposed of following treatment to meet LDRs if necessary. Non-hazardous soil can be directly disposed of off-site in a non-hazardous landfill or potentially reused (e.g., as landfill cover) after treatment (if appropriate) in accordance with NYSDEC rules.

Initial Screening: Offsite disposal to a landfill either directly or after treatment is a viable option. Both hazardous and non-hazardous materials may be encountered during remedial operations. Both materials would have to be managed and therefore this option is retained.

3.1.2 Groundwater

In the following sections, potential groundwater remedial technologies are briefly described and summarized with the results of the screening. Technologies capable of addressing VOC and inorganics impacts to groundwater are identified as such. For those technologies that were not retained, the rationale for their elimination is included. Table 3-2 summarizes the results of the preliminary screening of groundwater technologies and process options discussed below.

3.1.2.1 No Action

Description: No Action provides no institutional controls of active remediation, but includes periodic reviews to assess the need for future remedial actions.

Initial Screening: No action would not provide any remedial action. Although the No Action alternative would not meet remedial objectives, it is retained throughout the detailed evaluation as a baseline for comparison of other alternatives.

3.1.2.2 Limited Action

Limited Action is a category of institutional controls that includes use restrictions, planning, long-term monitoring and periodic site reviews to assess migration of contaminants.

3.1.2.2.1 Institutional Controls

Description: Institutional controls as applied to groundwater include public notification measures and use restrictions to control exposure to site conditions.

Some actions included in this category could be restrictions placed on the property to restrict use of the site groundwater, and actions initiated by the local government or the state to restrict or regulate the installation of new wells. Other actions could include implementation of a health and safety plan that would establish guidelines for groundwater management and use in the area.

Initial Screening: Currently, groundwater is not used at the former ISCP property; however, to prevent future use, restrictions and other institutional controls would ensure that the currently incomplete groundwater exposure pathway remains incomplete as long as groundwater contaminant concentrations exceed Class GA standards. Institutional controls are retained.

3.1.2.2.2 Monitored Natural Attenuation

Description: Monitored Natural Attenuation (MNA) relies on natural processes to achieve RAOs within a reasonable timeframe. Implementation of MNA includes a comprehensive monitoring program to verify MNA is occurring, detect any changes in the environment that may reduce the effectiveness of MNA, identify any toxic or mobile transformation products, verify the plume is not expanding, and verify no negative impacts on downgradient receptors. Monitoring would continue for some period of time after Class GA standards are achieved to ensure that contaminant levels do not rebound.

Initial Screening: An MNA analysis would be required. If source control measures are implemented (*e.g.*, removal of source areas), an MNA analysis would be completed to show the effect on VOCs in site groundwater. The results of various groundwater sampling events between 1997 and 2006 have shown reductions in concentrations of contaminants of concern in groundwater (see RI data) and have also shown the possibility of a natural PCE dechlorination process occurring on the Site due to the development of PCE daughter products *(i.e.,* TCE and DCE). Therefore, this approach will be retained for consideration in conjunction with source reduction measures.

TABLE 3-2
SCREENING OF GROUNDWATER TECHNOLOGIES AND PROCESS OPTIONS

General Response Actions	Remedial Technology Types	Process Options	Technical Feasibility
No Action	No Action	Site Reviews	Retained
Limited Action	Institutional Controls	Use Restrictions	Retained
		Health and Safety Plan	Retained
		Monitored Natural Attenuation	Retained
Containment	Barrier Walls	Sheet Piling	Not Retained
		Slurry Walls	Not Retained
		Grouting	Not Retained
		Hydraulic Containment	Not Retained
Removal/Treatment/ Disposal	Removal	Extraction Wells	Not Retained
	In Situ Treatment	PRB	Not Retained
		Biodegradation	Retained
		Chemical Oxidation/Ozonation	Retained
		Carbon Adsorption	Not Retained
		Air Sparging	Retained
	Ex Situ Treatment	Air Stripping	Not Retained*
		Carbon Adsorption	Not Retained*
		Filtration	Not Retained*
		UV-Oxidation	Not Retained*
		Ion Exchange	Not Retained*
		Reverse Osmosis	Not Retained*
		Biological Treatment	Not Retained*
	Disposal	Discharge to Groundwater	Not Retained*
		Discharge to Surface Water	Not Retained*
		Discharge to POTW	Not Retained*

* *Ex Situ* treatment technologies and process options were not considered feasible due to site hydraulic conditions.

3.1.2.3 Containment

Containment is a remedial technology capable of providing isolation of contaminated groundwater from uncontaminated groundwater and preventing groundwater discharge to surface water bodies. Containment technologies include vertical barriers such as sheet piling and slurry walls in order to form a barrier to contaminant migration. It may be necessary to provide groundwater removal behind the barrier to prevent excess mounding and the potential spread of impacted groundwater around the barrier.

3.1.2.3.1 Sheet Piling

Description: Sheet piling driven into the soil can be used as a barrier to limit the migration of contaminants via groundwater if the sheet piling can be "keyed" into an underlying layer of low permeability. This technique could also be used during soil excavation whereby the soil within the enclosure is dewatered and soil remedial activities could proceed in a "dry" state. Steel or heavy gauge PVC sheet piling cutoffs require very little maintenance. Recent advances in jointing technology have made sheet piling relatively resistance to leakage.

Initial Screening: Sheet piling can be used in any hydraulic condition (such as low or high groundwater movements). However, the potential of contaminant migration to the underlying bedrock layer would reduce the effectiveness of sheet piling as a barrier to migration. Therefore, the use of sheet piling as a vertical barrier is not retained.

3.1.2.3.2 Slurry Walls

Description: Slurry walls are a common subsurface barrier because they are a relatively inexpensive means of reducing groundwater flow in unconsolidated earth materials. Slurry walls are constructed in a vertical trench that is excavated under a slurry. This slurry, usually a mixture of bentonite and water, acts essentially like a drilling fluid. It hydraulically shores the trench to prevent collapse, and at the same time, forms a filter cake on the trench walls to prevent high fluid losses into the surrounding ground. In some cases, soil or cement are added to the bentonite slurry to form a soil-bentonite or cement-bentonite slurry wall.

Initial Screening: Slurry walls are typically used when they can be "keyed" into a confining layer and the groundwater does not move rapidly. The potential of contaminant migration to the underlying bedrock layer would reduce the effectiveness of a slurry wall as a vertical barrier. Additionally, slurry wall installation generates significant spoils that must be managed and is also difficult to implement adjacent to a wetland/stream system without migration concern. This process option is not retained.

3.1.2.3.3 Grouting

Grouting is typically accomplished by drilling a grout tool down to a given depth and then raising up the tool while injecting grout through the jet. The actual grouting injection locations may be at plan intervals close enough to ensure overlap of the known radius of a jet tool, or may be further apart based on the ability of the grout to penetrate undisturbed soils that are beyond the tool radius. This technique can be used to construct a full or partial vertical barrier.

Initial Screening: The process typically results in an excess volume of soils that has to be managed and in most cases disposed of. Also, this process may not be effective in controlling groundwater contaminant migration due to the possibility of contaminant migration to the underlying bedrock layer. Jet grouting is not retained as an option for groundwater.

3.1.2.3.4 Hydraulic Containment

Description: In order to prevent contaminated groundwater from migrating, hydraulic control via the removal of groundwater may be utilized. This technique involves the use of a line of extraction wells or other means (*e.g.*, trench) to pump out site groundwater as it flows toward the site boundary, thus preventing flow off-site. This water would need to be treated and discharged.

Initial Screening: Hydraulic containment relies upon the creation of overlapping capture zones by the pumping of extraction wells to prevent flow past the wells. Poor hydraulic conditions were noted at the Site during the RI; therefore extraction technologies are not considered feasible for site groundwater. Therefore, this process option is not retained.

3.1.2.4 Removal

Groundwater removal technologies involve extraction of contaminated groundwater combined with treatment and disposal. The design of a groundwater extraction system depends upon the depth of contamination and hydrogeologic factors of the aquifer.

3.1.2.4.1 Extraction Wells

Description: Groundwater extraction wells screened within the aquifer utilize a submersible pump set within the screened interval to withdraw contaminated groundwater. Extraction wells are effective when the aquifer characteristics are favorable for a constant recharge of groundwater into the well. They are an efficient way of delivering groundwater to a treatment system, can be utilized for aquifer remediation and can be used for removal in support of a vertical barrier system.

Initial Screening: Poor hydraulic conditions were noted at the Site during the RI such as slow monitoring well recharge effects, and the shallow thickness of the overburden water bearing unit (less than five feet). Extraction technologies are not considered feasible for site groundwater. Therefore, this process option is not retained.

3.1.2.5 In Situ Treatment

3.1.2.5.1 In Situ Permeable Reactive Barrier (PRB)

Description: PRB technology has been proven effective in treating chlorinated contaminants in groundwater. A permeable reactive wall is installed across the flow path of a contaminant plume, allowing the groundwater of the plume to passively move through the wall. These barriers allow the passage of water while prohibiting the movement of contaminants by employing such agents as zero-valent metals, chelators (ligands selected for their specificity for a given metal), sorbents, microbes, and others. The contaminants will either be degraded or

retained in a concentrated form by the barrier material. Target contaminant groups for passive treatment walls are VOCs, SVOCs, and inorganics.

Initial Screening: The overburden groundwater unit at the Site is relatively shallow in thickness, and a PRB would not likely be effective for this hydrogeologic unit. Although this technology can effectively treat VOCs and inorganics in groundwater, this process option is not retained due to poor site hydraulic conditions.

3.1.2.5.2 In Situ Biodegradation

Description: Biological treatment involves the use of native microbes to degrade a variety of organic compounds. *In situ* biodegradation promotes and accelerates natural processes in the undisturbed subsurface via the addition of appropriate reagents. The applicability of a bioremediation approach is determined by the biodegradability of the organic constituents, and environmental factors affecting microbial activity.

Initial Screening: *In situ* biodegradation is a viable technology for application to impacted groundwater and is effective for remediation of organic constituents. With this process, organic contaminant concentrations in the overburden and bedrock groundwater could be reduced. Therefore, this process option is retained.

3.1.2.5.3 In Situ Chemical Oxidation/Ozonation

Description: This technology involves the use of a chemical reagent that is injected into the groundwater via use of constructed wells or driven wellpoints. The reagent breaks down the organic constituents into carbon dioxide and water. The amount of reagent needed, spacing of injection points, and the frequency of addition to achieve cleanup goals are dependent upon organic constituent concentrations and groundwater flow. Chemical reagents can also be placed within the excavation areas to achieve a limited one-time treatment.

Initial Screening: This treatment technology can be applied to groundwater impacted with organic constituents. Field pilot studies would be necessary to further refine the operational conditions of this technology. This treatment could be applied to both the overburden and bedrock hydrogeologic units. This process option is retained for the contaminated groundwater at the Site.

3.1.2.5.4 In Situ Air Sparging

Description: *In situ* air sparging is a process where air is sparged through well screens into an aquifer by supplying compressed air into the wellhead under controlled conditions. The sparged air enters the aquifer in the form of small bubbles after being broken up while passing through the well screen and into the porous media. The bubbles then rise up through the groundwater and perform diffused air stripping in the aquifer. This process removes VOCs from the groundwater and transfers them into the vapor zone. The vapors must be captured via soil vapor extraction methods in the vadose zone and treated before being discharge to the atmosphere. Pilot testing is required when using this technology. This technology can be utilized at significant depths below the ground surface, is well established, and is effective as long as non-

aqueous phase liquids are not present. A support infrastructure must be established and includes utility trenches, air sparging equipment (compressor and controls), soil vapor extraction equipment, and vapor phase treatment equipment, and O&M during operation.

Initial Screening: This technology is effective for VOCs; however, it may not be as effective under the site hydraulic conditions, where overburden groundwater is sometimes absent. However, this process option will be retained for further evaluation.

3.1.2.5.5 In Situ Carbon Adsorption

Description: *In situ* carbon adsorption would involve the installation of granulated activated carbon (GAC) in a trench or cell in a manner so as to intercept groundwater flow. Activated carbon selectively adsorbs constituents in hazardous wastes by a surface attraction phenomenon in which the organic molecules are attracted to the internal pores of the carbon granules. GAC can be used for the adsorption of volatile organics, semivolatile organics, pesticides, and herbicides in groundwater. Adsorption efficiency is chemical specific, depending upon the strength of the molecular attraction between adsorbent and adsorbate, molecular weight, electrokinetic charge, pH, and surface area. Once the micropore surfaces are saturated with organics, the carbon is "spent" and must be replaced with fresh carbon or regenerated. This would be accomplished from the ground surface via manholes.

Initial Screening: Although this technology is effective for VOCs, it would be technically impracticable to implement this technology in the bedrock hydrogeologic unit. Therefore, this technology is not retained as a process option.

3.1.2.6 Ex Situ Treatment

This class of remedial technologies would be applied to groundwater that has been removed from the aquifer (e.g., via extraction wells). Underlying the Site, overburden groundwater is found at shallow depths above bedrock (less than five feet in hydraulic thickness). Slow monitoring well recharge effects seen in the field, seasonally dry monitoring wells and the shallow thickness of the overburden water bearing unit (less than five feet) are signs of low-flow conditions at the Site. Extraction and *ex situ* treatment technologies are not considered feasible for the treatment of contaminated groundwater. Therefore, *ex situ* treatment technologies and process options were not evaluated in this FS.

3.1.3 Sediment

Technologies for the *ex situ* remediation of soil are generally applicable to sediments (after removal). Therefore, the descriptions and initial screening of technologies presented in Section 3.1.1 for soils are also generally valid for sediments. A brief summary of each technology category identifying deviations from the soil screening is provided below, and Table 3-3 summarizes the technology screening for sediments.

3.1.3.1 No Action

The initial screening of No Action for sediment is identical to soil. No Action is retained for comparison of other alternatives.

3.1.3.2 Limited Action

The initial screening of the process options for Limited Action is nearly identical to soil. Physical barriers to restrict access may be more difficult to implement, since access to sediment areas from the water (*i.e.*, off-site) may be possible and also since impacted sediments are located on third-party owned properties; however, these process options were retained for further evaluation.

3.1.3.3 Containment

The initial screening of the process options for containment varies from soil in that capping is not feasible, since it would prevent the maintenance or re-establishment of a healthy ecosystem. Similarly, vertical containment barriers are not considered feasible for containment of contaminated sediment, since they would interfere with the natural sediment ecosystem. However, vertical containment barriers such as sheet piling are retained for sediment excavation purposes. Sheet piling may be used for construction of cofferdams during sediment removal in areas of impacted sediment (*e.g.*, in the unnamed pond).

3.1.3.4 Removal

The initial screening of conventional excavation as discussed in the soil technology screening is applicable for sediments in shallow water or in areas where surface water can be eliminated before removal of sediment (*e.g.*, by diversion or dewatering). For deeper sediment removal, dredging could be implemented; however, due to the shallow nature of the on-site water bodies, it is anticipated that conventional excavation techniques can be utilized to remove sediment, and dredging is therefore not evaluated.

3.1.3.5 In Situ Treatment

The initial screening of *in situ* treatment for sediments varies from soil in that *in situ* treatment is considered not technically feasible in sediment areas due to the difficulty in system installation (e.g., wells), operation (*e.g.*, off-gas collection), and monitoring. Therefore, no *in situ* treatment technologies were retained for sediment alternative development.

3.1.3.6 Ex Situ Treatment

The initial screening of *ex situ* treatment for soil are generally applicable to sediment. The *ex situ* soil treatment technologies described in Section 3.1.1 are applicable to sediments at the Magna Metals Site.

3.1.3.7 Disposal

The initial screening of disposal technologies for sediments is identical to soil.

TABLE 3-3
SCREENING OF SEDIMENT TECHNOLOGIES AND PROCESS OPTIONS

General Response Actions	Remedial Technology Types	Process Options	Technical Feasibility
No Action	No Action	Monitoring and Site Reviews	Retained
Limited Action	Access Restrictions	Access Restrictions	Retained
	Institutional Controls	Environmental Easements	Retained
		Health and Safety Plan and Soil Management Plan	Retained
	Monitoring	Monitoring and Site Reviews	Retained
Containment	Capping	Permeable Soil	Not Retained
		Clay	Not Retained
		Asphalt	Not Retained
		Multi-Media	Not Retained
	Barrier Walls	Sheet Piling	Not Retained
		Slurry Walls	Not Retained
		Grouting	Not Retained
Removal/Treatment/ Disposal	Removal	Excavation	Retained
	In Situ Treatment	Soil Vapor Extraction	Not Retained
		Soil Flushing/Washing	Not Retained
		Stabilization/ Solidification	Not Retained
		Steam stripping (DUS)	Not Retained[1]
		Biodegradation	Not Retained[1]
		Oxidation	Not Retained[1]
	Ex Situ Treatment	Reuse/Recycling	Retained
		Stabilization/ Solidification	Retained
		Thermal Desorption	Not Retained
		Incineration	Not Retained
		Biodegradation	Not Retained
		Soil Flushing/ Washing	Not Retained
		Soil Vapor Extraction	Not Retained
		Chemical Oxidation	Not Retained
	Disposal	On-site Landfill	Not Retained
		Off-site Disposal	Retained

Notes (variations from soil screening):
[1]*In situ* technologies are not considered applicable for sediment.

3.2 Selection of Process Options

Process options are evaluated on the basis of overall remedial effectiveness, technical implementability, and cost relative to site-specific conditions, contaminant types, and contaminant concentrations.

Process option effectiveness focuses on: 1) ability to process the estimated quantities of material and to meet contaminant reduction goals; 2) effectiveness of protecting health and the environment during the construction and implementation phases; and 3) reliability of the technology with respect to contaminants and site conditions.

Implementability refers to how easy it will be to employ the process option based on site and contaminant characteristics.

The cost evaluation is preliminary and relies upon engineering judgment and vendor-provided information to generate a relative cost of process options within a technology type.

The initially screened and accepted soil, groundwater, and sediment process options are evaluated qualitatively based on effectiveness, implementability, and cost as described above. Comparisons are made within each technology type by assessing the effectiveness, implementability and cost of each process option as low, moderate, or high relative to other process options within the technology type. When significant variations between process options within a technology type do not exist, a moderate rating was assigned. Based on this evaluation, specific process options were selected for development of media-specific remedial alternatives. The results of the process option evaluation and selection are summarized in Tables 3-4, 3-5, and 3-6 for soil, groundwater, and sediment respectively.

TABLE 3-4 (Sheet 1 of 2)
SELECTION OF SOIL PROCESS OPTIONS

Process Option	Effectiveness	Implementability	Cost
***No Action**	Does not meet RAOs	Easily implemented	Very low cost
Limited Action			
*Environmental Easements	Prevents exposure to site subsurface contaminants	Easily implemented	Low cost
Access Restrictions	Prevents exposure to site contaminants	Easily implemented	Low cost
*Health and Safety Plan and Site Management Plan	Protects workers during future activities and manages soil	Easily implemented	Low cost
*Monitoring and Site Reviews	Monitors site conditions	Easily implemented	Low cost
Containment			
Permeable Soil Capping	Prevents exposure to site contaminants	Implementable	Low cost
Clay Capping	Prevents exposure to site contaminants and reduces contaminant migration	Implementable	Low cost
Asphalt Capping	Prevents exposure to site contaminants and reduces contaminant migration	Implementable	Moderate cost
Multi-Media Capping	Prevents exposure to site contaminants and reduces contaminant migration	Implementable	Moderate to High cost
Sheet Piling	Does not effectively inhibit migration when pathway to underlying bedrock exists; may be used for dewatering purposes	Implementable	Moderate cost
Removal			
*Excavation	Effective for contaminant removal for subsequent treatment and disposal	Implementable at shallow depths; more complex for deeper contamination	Moderate to High cost, depending on required depth

TABLE 3-4 (Sheet 2 of 2)
SELECTION OF SOIL PROCESS OPTIONS

***In Situ* Treatment**			
In situ stabilization/ solidification	Effective for inorganic constituents	Moderate to difficult to implement, and is equipment intensive	Moderate to high cost
***Ex Situ* Treatment**			
Recycling/Reuse	Effective for the reuse of slightly impacted site soils and other materials	Easily implemented; several options available	Low to moderate cost
Stabilization/ Solidification	Moderately effective for immobilization of free water, site contaminants; no destruction	Easy to implement; must identify disposal location for stabilized contaminants	Moderate cost
Disposal			
*Off-site landfill	Effective for final disposal of treated soil	Easy to implement; requires transportation coordination	Moderate to High cost
*Process options that have been selected for development of remedial alternatives.			

TABLE 3-5 (Sheet 1 of 1)
SELECTION OF GROUNDWATER PROCESS OPTIONS

Process Options	Effectiveness	Implementability	Cost
*No Action	Does not meet RAOs	Easily implemented	Very low cost
Limited Action			
*Use restrictions	Prevents exposure to contaminants	Easily implemented	Low cost
*Health and Safety Plan	Protects workers during future activities	Easily implemented	Low cost
*Monitored Natural Attenuation	Monitors natural attenuation of groundwater contaminants	Easily implemented	Low to Moderate cost
***In Situ* Treatment**			
In Situ Biodegradation	Destructive treatment for GW contaminants; slow to achieve cleanup goals	Moderately implementable	Moderate cost
**In Situ* Chemical Oxidation	Destructive treatment for GW contaminants; rapidly achieves cleanup goals	Moderately implementable	Moderate cost
*Limited Permanganate Application	Beneficial to enhance restoration of groundwater	Easily implemented (one-time application in conjunction with soil removal)	Low to moderate cost
In Situ Air Sparging	Effective for removal of organic contaminants from groundwater	Moderately implementable	Moderate cost
*Process options selected for development of remedial alternatives.			

TABLE 3-6 (Sheet 1 of 1)
SELECTION OF SEDIMENT PROCESS OPTIONS

Process Option	Effectiveness	Implementability	Cost
***No Action**	Does not meet RAOs	Easily implemented	Very low cost
Limited Action			
*Environmental Easements	Prevents exposure to site contaminants	Easily implemented	Low cost
Access Restrictions	Prevents exposure to site contaminants	Easily implemented	Low cost
*Health and Safety Plan and Site Management Plan	Protects workers during future activities and manages soil	Easily implemented	Low cost
*Monitoring and Site Reviews	Monitors site conditions	Easily implemented	Low cost
Containment			
Sheet Piling	Not effective for containment of contaminants; may be used for cofferdam/removal purposes	Implementable	Moderate cost
Grouting	Not effective for contaminent of contaminants; may be used for coffer dam/removal purposes	Implementable	Moderate to High cost
Removal			
*Excavation	Effective for contaminant removal for subsequent treatment and disposal	Easily implemented	Moderate to High cost, depending on required depth and location
***Ex Situ* Treatment**			
Recycling/Reuse	Effective for the reuse of slightly impacted site sediments	Easily implemented; several options available	Low to moderate cost
Stabilization/ Solidification	Moderately effective for immobilization of free water, site contaminants; no destruction	Easy to implement; must identify disposal location for stabilized contaminants	Moderate cost
Disposal			
*Off-site landfill	Effective for final disposal of treated sediments	Easy to implement; requires transportation coordination	Moderate to high cost

*Process options that have been selected for development of remedial alternatives.

3.3 Development of Alternatives

Based on the evaluations discussed in the preceding sections, the following media-specific remedial alternatives were developed for the Magna Metals site:

3.3.1 Soil Alternatives

Inorganics are the primary contaminants to be addressed within the soil media. Therefore, the following alternatives were developed:

- S-1: No Action

S-2: Limited Action
S-3: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Restricted Use SCOs and Building Demolition
S-4: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Unrestricted Use SCOs and Building Demolition

3.3.2 Groundwater Alternatives

VOCs and inorganics are the contaminants of concern in groundwater. In addition, sub slab vapor is impacted with VOCs; therefore, mitigation of potential vapor intrusion is also incorporated into the Groundwater Remedial Alternatives. An active remediation alternative for groundwater and passive remediation alternatives (in combination with source removal and including overburden excavation to top of underlying bedrock) have been developed.

GW-1: No Action
GW-2: Groundwater Monitoring and Sub Slab Vapor Mitigation
GW-3: *In Situ* Treatment and Sub Slab Vapor Mitigation
GW-4: Limited Permanganate Application, Groundwater Monitoring, and Sub Slab Vapor Mitigation

3.3.3 Sediment Alternatives

Inorganics are the predominant contaminants of concern in sediments.

SD-1: No Action
SD-2: Limited Action
SD-3: Removal of Metals-Impacted Sediments
- SD-3A: Off-Site Removal of Metals – Impacted Sediments above Habitat Assessment Based PRGs
- SD-3B: Off-Site Removal of Metals – Impacted Sediments above Pre-Release Conditions
- SD-3C: Off-Site Removal of Metals – Impacted Sediments above NYSDEC LELs

3.4 Preliminary Screening of Alternatives

The next stage in the feasibility evaluation typically consists of a preliminary screening of potential remedial alternatives based on the general criteria of effectiveness, implementability,

and cost. The purpose of the screening step is to reduce the number of alternatives requiring further analysis by identifying those alternatives having sufficient merit to undergo detailed evaluation. As a result of the relatively small number of feasible alternatives developed for each media at the site, preliminary screening was not performed; the alternatives identified in the previous section were carried forward for detailed analysis in Section 4.0.

4.0 DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

This section presents a detailed description and evaluation of the remedial alternatives identified in Section 3.0. Section 4.1 discusses the evaluation criteria against which the remedial actions are analyzed. Section 4.2 presents detailed descriptions of each of the alternatives and the results of the analysis of each alternative with respect to each of the criteria.

4.1 Description of Analysis Criteria

The remedial alternatives developed in Section 4.1 were evaluated using the following seven criteria:

1. Compliance with Standards, Criteria, and Guidance (SCGs);
2. Overall Protection of Human Health and the Environment;
3. Short-Term Impacts and Effectiveness;
4. Long-Term Effectiveness and Permanence;
5. Reduction of Toxicity, Mobility, and/or Volume;
6. Implementability; and
7. Cost.

The seven criteria are described in the following sections.

4.1.1 Compliance with SCGs (as set forth in Section 2.0 of this report)

This criterion is used to determine how each remedial alternative complies with Standards, Criteria and Guidance (SCGs). Each alternative is evaluated in detail for:

Compliance with chemical-specific SCGs (e.g., Class GA standards);
Compliance with action-specific SCGs (e.g., RCRA minimum technology standards);
Compliance with location-specific SCGs (e.g., floodplains); and

4.1.2 Overall Protection of Human Health and the Environment

This criterion provides an overall assessment of protection based on a composite of factors such as long-term and short-term effectiveness and compliance with SCGs. Evaluations of the overall protectiveness address:

How well a specific site remedial action achieves protection over time;
How well site risks are reduced; and
How well each source of contamination is eliminated, reduced, or controlled for each remedial alternative.

4.1.3 Short-Term Impacts and Effectiveness

This criterion addresses the impacts of the action during the construction and implementation phase until the remedial action objectives have been met. Factors evaluated include protection of the community during the remedial actions; protection of workers during the remedial actions;

environmental impacts resulting from the implementation of the remedial actions; and the time required to achieve protection.

4.1.4 Long-Term Effectiveness and Permanence

This criterion addresses the results of the remedial action in terms of the potential risk remaining at the site after the remedial action objectives have been met. The components of this criterion include the magnitude of the residual risks; the adequacy and suitability of controls used to manage treatment residuals or untreated wastes; and the long-term reliability of management controls for providing continued protection from residuals (i.e., the assessment of potential failure of the technical components).

4.1.5 Reduction of Toxicity, Mobility and/or Volume

This criterion addresses the statutory preference that treatment is used to result in the reduction of the total mass of toxic contaminants, the irreversible reduction in contaminant mobility, or the reduction of the total volume of contaminated media. Factors to be evaluated in this criterion include the treatment process employed; the amount of hazardous material destroyed or treated; the degree of reduction in toxicity, mobility or volume expected; and the type and quantity of treatment residuals.

4.1.6 Implementability

This criterion addresses the technical and administrative feasibility of implementing a remedial action and the availability of various services and materials required during its implementation. *Technical feasibility* factors include construction and operation difficulties; reliability of technology; ease of undertaking additional remedial actions; and the ability to monitor the effectiveness of the remedy. *Administrative feasibility* includes the ability and time required for permit approval and for activities needed to coordinate with other agencies. Factors employed in evaluating the availability of services and materials include availability of treatment, storage, and disposal services with required capacities; availability of equipment and specialists; and availability of prospective technologies for competitive bid.

4.1.7 Cost

The types of costs that would be addressed include: capital costs, operation and maintenance (O&M) costs, costs of periodic reviews (where required), present value of capital and O&M costs, and potential future remedial action costs. Capital costs consist of direct and indirect costs. Direct costs include expenditures for the equipment, labor, and materials necessary to install remedial actions. Indirect costs include expenditures for engineering, administrative, and other services required to complete the implementation of remedial alternatives. Annual O&M costs include auxiliary materials and energy, disposal of residuals, purchased services, administrative costs, insurance, taxes, license costs, maintenance reserve and contingency funds, rehabilitation costs, and costs for long-term monitoring.

This assessment evaluates the costs of the remedial actions on the basis of present worth. Present worth analysis allows remedial actions to be compared on the basis of a single cost representing an amount that, if invested in the base year and disbursed as needed, would be sufficient to cover

all costs associated with the remedial action over its planned life. A required operating performance period and a discount rate are assumed to calculate present worth cost. A discount rate of five percent is assumed for a base calculation. The discount rate represents the anticipated difference between the rate of investment return and inflation. The estimated costs provided for the remedial actions have an accuracy of -30 to +50 percent as suggested in TAGM 4030.

4.2 Detailed Analysis of Alternatives

The following sections present descriptions of each of the remedial alternatives and the results of the evaluation of the alternatives against the seven criteria defined above.

4.2.1 Detailed Analysis of Soil Remedial Alternatives

This section presents the evaluation of remedial alternatives for soil. As indicated previously, the alternatives incorporate various technologies to address contamination at the Magna Metals Site.

4.2.1.1 Alternative S-1: No Action

The No Action alternative includes no active remediation at the site. Contaminated soils would be left in place with no treatment or controls to prevent future exposure to contaminated media. Periodic reviews would be performed to assess any changes in the risk to health and the environment posed by the site. This alternative is developed as a basis of comparison for other alternatives.

4.2.1.1.1 Compliance with SCGs

The No Action alternative does not comply with chemical-specific SCGs since no action would be taken to address NYSDEC SCO exceedances. Action- and location-specific SCGs are not triggered, since no on-site remedial activities would be performed.

4.2.1.1.2 Overall Protection of Human Health and the Environment

The No Action alternative would not remove, contain, or treat the contaminated soil at the site. Therefore, potential risks to health and the environment resulting from contaminated soil above cleanup levels would remain unchanged. In addition, there is the continued potential for migration of contaminants and potential vapor intrusion into occupied buildings.

4.2.1.1.3 Short-Term Impacts and Effectiveness

Under the No Action alternative, there would be no short-term impacts to workers or the surrounding community. No construction would be required for implementation of this alternative. This alternative would not result in any short-term improvement over current conditions. As no design or construction activities are required for this alternative, it would take no time to implement.

4.2.1.1.4 Long-Term Effectiveness and Permanence

The No Action alternative would have low long-term effectiveness and/or permanence. The potential for future exposure to contaminated soil. (e.g., during intrusive construction activities) would not be mitigated. No institutional or engineering controls would be implemented to mitigate potential exposure to the contaminated material.

4.2.1.1.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative would not involve any containment, removal, treatment, or disposal of the contaminated soil or impacted subslab vapor. Therefore, this alternative would not provide any reduction in the toxicity, mobility, and/or volume of contaminants.

4.2.1.1.6 Implementability

There are no technical feasibility concerns with the No Action alternative. The effectiveness of the remedy would be evaluated in periodic reviews and implementation of this alternative would not preclude further remedial action in the future. There are no administrative feasibility concerns with this alternative. As this alternative involves no construction activities, availability of resources and use of proven technologies is not applicable. Consulting services are readily available for periodic reviews. Coordination with regulatory agencies would be required for making decisions regarding any future remedial alternatives.

4.2.1.1.7 Cost

There is no capital cost for the No Action alternative. The net present cost of the alternative, based on periodic (i.e., 5-year) reviews for a 30-year period of performance and a 5% discount rate is $56,000. See Appendix A for details.

4.2.1.2 Alternative S-2: Limited Action

The Limited Action alternative includes no active remediation at the site. Contaminated soils would be left in place with no treatment and limited controls to prevent potential future exposure to contaminated media. Under this alternative, environmental easements (on the ISCP property) would be implemented to restrict future use of the site to commercial activities. A HASP and Site Management Plan would be developed and implemented to describe (for example) adequate control measures and PPE/monitoring to be implemented during intrusive activities. Periodic (i.e., 5-year) reviews would also be performed to assess changes in the potential risks posed by the Site.

4.2.1.2.1 Compliance with SCGs

The Limited Action alternative does not comply with chemical-specific SCGs since no action would be taken to address NYSDEC SCO exceedances. Action- and location-specific SCGs are not triggered, since no on-site remedial activities would be performed.

4.2.1.2.2 Overall Protection of Human Health and the Environment

The Limited Action alternative would not remove, contain, or treat the contaminated soil. Potential risks from exposure to on-site contaminated subsurface soil above cleanup levels would be mitigated by institutional controls; environmental easements. Proper implementation of the HASP and Site Management Plan would help mitigate potential future exposure to contaminated soil. However, there is the continued potential for migration of contaminants.

4.2.1.2.3 Short-Term Impacts and Effectiveness

Under the Limited Action alternative, there would be no short-term impacts to workers or the surrounding community. No construction would be required for implementation of this alternative. Through development and implementation of a HASP, direct contact risks would be minimized. The Site Management Plan would help to mitigate risks. The time required to implement this alternative would be approximately six months.

4.2.1.2.4 Long-Term Effectiveness and Permanence

Potential for future exposure at the Site would be mitigated by institutional controls following implementation of this alternative. Limited controls would be implemented to manage the remaining contaminated material such as restricting future use to commercial/industrial, and controlling intrusive activities at the Site. These controls would be effective at mitigating risks on site, though there is the potential for violation of these controls. Risks at the Site would be re-evaluated periodically.

4.2.1.2.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative would not involve any containment, removal, treatment, or disposal of the contaminated soil. Therefore, this alternative would not provide any reduction in the toxicity, mobility, and/or volume of contaminants.

4.2.1.2.6 Implementability

There are no technical feasibility concerns with the Limited Action alternative for soil. The effectiveness of the remedy would be evaluated in periodic reviews. As this alternative involves no construction activities, availability of resources and use of proven technologies is not a concern. Consulting services are readily available for negotiation and implementation of environmental easements and preparation of a HASP and Site Management Plan. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for implementation of institutional controls. Multiple third party owners are likely to be included. Services are also available for conducting periodic reviews.

4.2.1.2.7 Cost

The capital cost associated with negotiation and implementation of the required institutional controls is $39,000. The net present cost of the alternative, based on a 30-year period of

performance and a 5% discount rate is $95,000, including periodic (5-year) reviews. See Appendix A for details.

4.2.1.3 Alternative S-3: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Restricted Use SCOs and Building Demolition

Alternative S-3 would include the removal of COCs in overburden soils to NYSDEC Protection of Human Health (Commercial), Protection of Groundwater and Protection of Ecological Resources SCOs, and demolition of the former Magna Metals building. The applicable SCOs for the site-related contaminants are:

Contaminant	Protection of Human Health (Commercial)	Protection of Groundwater	Protection of Ecological Resources
Arsenic	16	16	13
Chromium (hex)	400	19	1
Chromium (tri)	1,500	NS	41
Copper	270	1,720	50
Cyanide	27	40	NS
Lead	1,000	450	63
Mercury	2.8	0.73	0.18
Nickel	310	130	30
Selenium	1,500	4	3.9
Zinc	10,000	2,480	109
Benzo(b)fluoranthene	5.6	1.7	NS
Benzo(a)pyrene	1	22	2.6

The footprint and vertical extent of overburden soil removal would be defined by occurrences of COC concentrations in excess of the NYSDEC Restricted Use SCOs as determined during a pre-design investigation, as well as from post-excavation sampling during implementation of remedial activities. Figure 4-1 shows the approximate extent of soil removal based on comparisons of RI and Supplemental RI soil analytical data to the relevant SCOs. Vertically, overburden soil removal would extend to approximately 10 to 15 feet bgs (the approximate depth to bedrock). An estimated volume of 7,000 cubic yards (cy) of soil would be removed.

If the pre-design (i.e., design stage) sampling investigation and/or remedial activities identify additional contamination associated with the leach pits extending off-site, the excavation will be extended as necessary to address highly contaminated subsurface soils. This alternative does not include removal of COCs in excess of NYSDEC SCOs in off-site soils that are considered background samples (SS-04 and SS-13 through 15).

The building proposed to be demolished is also shown on Figure 4-1. Due to the weakened structural nature of the former Magna Metals building, ISCP's consultant was unable to obtain sample data directly below the floor. Therefore, as part of this alternative, NYSDEC has requested that building demolition and post-demolition sampling of subsurface conditions is included. This alternative includes a contingency for the potential removal of hot spots (contaminated soils above NYSDEC Restricted Use SCOs) below the building floor to an extent

of approximately 10 to 15 feet bgs. The maximum volume of soil to be removed from beneath the former Magna Metals building is approximately 3,900 cy. This option is contingent upon hot spot soils being present below the building slab.

An added benefit of soil excavation is that contaminated groundwater within the excavation boundaries is removed. Shoring and/or sheet piling may be needed for this alternative for slope stability and safety, as well as for dewatering purposes since the excavation proceeds below the water table; however, as discussed previously, significant quantities of groundwater are not anticipated due to site hydraulic conditions. Dewatering and removal of the contaminated overburden soil material will have the added benefit of locally addressing groundwater contamination.

Prior to backfilling the excavation area, an application of permanganate, which is considered to be part of groundwater alternative GW-4, could be performed at the bottom of the excavation area for the purpose of treating residual contamination located within underlying bedrock fractures (see Alternative GW-4). Following the one-time application of the permanganate in implementation of GW-4, the excavation area would be backfilled.

Excavated soils may be reused as backfill if all compounds are below regulatory criteria. For the purposes of this FS, it is assumed that clean backfill will replace all areas where soil is removed. Post-remediation confirmatory sampling is included as part of this alternative in areas where soil will be removed. Post-remediation sampling will be performed to ensure that remedial action objectives have been met.

Options for treatment and disposal of excavated soil could include reuse/recycling, on- or off-site stabilization/solidification, or on- or off-site chemical reduction/oxidation. For the purposes of this FS, off-site landfill disposal at an appropriate facility was considered. During remedial design, market conditions will be re-evaluated to assess the cost-effectiveness of alternative treatment options, facilities, or technologies.

Environmental easements would be implemented to restrict future use of the Site. A HASP and Site Management Plan would be developed and implemented to describe (for example) adequate control measures and PPE/monitoring to be implemented during on-site intrusive activities. Periodic reviews would also be performed to assess changes in the potential for human exposure and impacts to the environment posed by the Site.

4.2.1.3.1 Compliance with SCGs

Restricted Use SCOs would be achieved for COCs through excavation. Construction activities would be conducted in accordance with action- and location-specific SCGs. Wastes generated would be managed, transported, and treated in accordance with applicable local, State, and Federal requirements.

4.2.1.3.2 Overall Protection of Human Health and the Environment

Removal of contaminated overburden soil to Restricted Use SCOs in conjunction with restricting future use of the Site would be protective of human health and the environment. By removing

the sources of contamination, the potential for continued contaminant migration to groundwater would be reduced to the maximum extent practicable. Furthermore, removal of saturated overburden soils would remove impacted groundwater.

4.2.1.3.3 Short-Term Impacts and Effectiveness

This alternative would involve extensive on-site remedial activities to remove contaminated soils and the former Magna Metals building. There would be risks typically associated with construction activities, including movement of heavy equipment across an active facility. A HASP would be developed and implemented to provide protection for on-site workers. In addition, appropriate engineering controls (*i.e.*, water sprays, excavation in an enclosed structure, etc.) may be necessary to mitigate the possibility of fugitive dust, etc. Off-site transportation would be performed in strict accordance with transportation plans to minimize impacts to neighborhoods through which contaminated soil will be transported. Development of a Site Management Plan would help to mitigate potential exposures. The timeframe required for implementation of this alternative is approximately 6 to 12 months.

4.2.1.3.4 Long-Term Effectiveness and Permanence

This alternative would be effective and permanent over the long-term. Limited controls would be implemented to manage remaining contamination above NYSDEC Unrestricted Use SCOs, consisting of restricting future use to commercial activities. The site remedy would be evaluated periodically.

4.2.1.3.5 Reduction of Mobility, Toxicity, and/or Volume

Removal of COCs in overburden soil and source areas would significantly reduce the potential for exposure and migration of contaminants. Treatment at the off-site disposal facility would substantially reduce the toxicity and/or volume of contaminated soil. Copper and nickel were selected for mass reduction analysis, as these two contaminants are frequently detected. Based on the average concentration of metals in soil samples within the excavation area (excluding leach pit samples), it is estimated that approximately 6,000 lbs of copper contamination and 1,000 lbs of nickel contamination will be removed by excavation activities associated with this alternative.

4.2.1.3.6 Implementability

Technical Feasibility: There are no major technical feasibility concerns with this alternative. Demolition, excavation, transportation, and disposal are conventional technologies that are typically easy to implement. Excavation is not anticipated to extend below approximately 15 feet bgs; therefore, significant technical challenges are not anticipated and conventional equipment can be used. Subsurface structures (*i.e.*, leach pits, septic tanks, and PVC piping) would be removed prior to soil excavation. Based on historic information, subsurface utilities are not present within the excavation area; however, a utility mark-out is required before any intrusive activities. Dewatering using well points outside the excavation area may be required. Any water encountered during excavation would be treated for discharge or off-site disposal, depending on quantity to be managed.

Administrative Feasibility: Administratively, this alternative would be relatively easy to implement. An acceptable transportation plan for the large quantities of soil that would need to be transported to an appropriate disposal facility would be established. Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material to the site. Coordination with regulatory agencies would also be required for periodic reviews. However, there are no concerns with the ability or time required to interact with local and regulatory agencies.

It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for remediation activities and implementation of institutional controls. Multiple third party owners are likely to be included. Also significant disturbance to private properties could occur.

Availability of Services and Materials: Equipment, labor, and materials are readily available for all components of this alternative. Consulting services are readily available for implementation of the HASP. Services are also available for conducting periodic reviews.

4.2.1.3.7 Cost

The estimated capital cost associated with this alternative is $3,696,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $3,752,000, including periodic (5-year) reviews.

4.2.1.4 Alternative S-4: Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Unrestricted Use SCOs and Building Demolition

Alternative S-4 would remove COCs in site soils to meet NYSDEC Unrestricted Use SCOs, and would include demolition of the former Magna Metals building. Evaluation of this alternative is a requirement as per NYSDEC's DER-10. This alternative would not include removal of off-site soils associated with background samples (SS-04 and SS-13 through 15), nor would it include removal of surface soils associated with wetland/sediment areas (these areas are addressed in the sediment alternatives).

The footprint and vertical extent of soil removal would be defined during a pre-design investigation, as well as from post-excavation sampling during implementation of remedial activities. Based on the known footprint depicted in Figure 4-2, and a vertical extent of COC concentrations in excess of NYSDEC Unrestricted Use SCOs (approximately 14 feet), an estimated volume of 36,000 cy of soil would be removed. If the pre-design (i.e., design stage) sampling investigation and/or remedial activities identify additional contamination extending off-site, the excavation will be extended accordingly to address contaminated subsurface soils.

The building proposed to be demolished is also shown on Figure 4-2. Due to the weakened structural nature of the former Magna Metals building, ISCP's consultant was unable to obtain sample data directly below the floor. Therefore, as part of this alternative, NYSDEC has requested that building demolition and post-demolition sampling of subsurface conditions is included. This alternative includes a contingency for the potential removal of hot spots (contaminated soils above NYSDEC Unrestricted Use SCOs) below the building floor to an

extent of approximately 10 to 15 feet bgs. The maximum volume of soil to be removed from beneath the former Magna Metals building is approximately 3,900 cy. This option is contingent upon hot spot soils being present below the building slab.

The depth of the water table is approximately 10 feet bgs in the vicinity of the remedial area. Shoring and/or sheet piling may be needed for this alternative for slope stability and safety, as well as for dewatering purposes since the excavation proceeds below the water table; however, as discussed previously, significant quantities of groundwater are not anticipated to be encountered due to site conditions. Dewatering and removal of the contaminated overburden soil material will have the added benefit of addressing groundwater contamination.

Excavated soils may be reused as backfill if below regulatory criteria. For the purposes of this FS, it is assumed that clean backfill will replace all areas where soil is removed. Post-remediation confirmatory sampling is included as part of this alternative in areas where soil will be removed. Post-remediation sampling will be performed to ensure that remedial design objectives have been met.

This alternative could be implemented in conjunction with groundwater alternative GW-4, a one-time application of permanganate to the top of the bedrock surface (see Alternative GW-4), while the excavation is open, and prior to backfilling.

Options for treatment and disposal of excavated soil could include reuse/recycling, on- or off-site stabilization/solidification, or on- or off-site chemical reduction/oxidation. For the purposes of this FS, off-site landfill disposal at an appropriate facility was considered. During remedial design, market conditions will be re-evaluated to assess the cost-effectiveness of alternative treatment options, facilities, or technologies.

4.2.1.4.1 Compliance with SCGs

This alternative would be implemented in accordance with chemical-, action-, and location-specific SCGs. This alternative would achieve Unrestricted Use SCOs for COCs. Wastes generated would be managed, transported, and treated in accordance with applicable local, State, and Federal requirements.

4.2.1.4.2 Overall Protection of Human Health and the Environment

This alternative would remove contaminated media and source areas to the maximum extent practicable, providing the maximum protection for human health and the environment.

4.2.1.4.3 Short-Term Impacts and Effectiveness

This alternative would involve extensive on-site remedial activities to remove COCs exceeding Unrestricted Use SCOs and demolition of former Magna Metals building. There would be risks typically associated with construction activities, including movement of heavy equipment through areas adjacent to roads and residential properties. A HASP would be developed and implemented to provide protection for on-site workers. The timeframe required for implementation of this alternative is approximately 6 to 12 months.

4.2.1.4.4 Long-Term Effectiveness and Permanence

This alternative would be effective and permanent over the long-term, as the maximum removal of contaminated materials is performed under this alternative.

4.2.1.4.5 Reduction of Mobility, Toxicity, and/or Volume

Removal of COCs exceeding Unrestricted Use SCOs from the Site would eliminate the potential for exposure and migration of site-related impacts. Treatment at the off-site disposal facility could potentially reduce the mobility, toxicity and/or volume of impacted soil. Copper and nickel were selected for mass reduction analysis as these two contaminants were frequently detected. Based on the average concentration of metals in soil samples within the excavation area (excluding leach pit samples), it is estimated that approximately 21,800 lbs of copper contamination and 3,800 lbs of nickel contamination will be removed by excavation activities associated with this alternative.

4.2.1.4.6 Implementability

Technical Feasibility: Demolition, excavation, transportation, and disposal are conventional technologies that are typically easy to implement. For technical practicability reasons, excavation would not extend below bedrock (maximum depth of approximately 15 feet bgs); therefore, technical challenges are not anticipated and conventional equipment can be used. Subsurface structures (*i.e.*, leach pits and septic tanks) would be removed prior to soil excavation. Based on historic information, subsurface utilities are not present within the excavation area; however, a utility mark-out is required before any intrusive activities. Dewatering using well points outside the excavation area may be required. Any water encountered during excavation would be treated for discharge or off-site disposal, depending on quantity to be managed.

Administrative Feasibility: Administratively, this alternative would be relatively easy to implement. An acceptable transportation plan for the large quantities of soil that would need to be transported to an appropriate disposal facility would be established. Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material to the site. However, there are no concerns with the ability or time required to interact with local and regulatory agencies.

Due to the larger volume of soil excavated, coordination efforts would be more difficult. It may be difficult to obtain access agreements to off-site impacted areas on private properties which

would be required for remediation activities and implementation of institutional controls. Multiple third party owners are likely to be included. Also significant disturbance to private properties could occur.

Availability of Services and Materials: Equipment, labor, and materials are readily available for all components of this alternative. Consulting services are readily available for implementation of the HASP.

4.2.1.4.7 Cost

The estimated capital cost associated with this alternative is $11,819,000. There is no annual O&M cost associated with this alternative. See Appendix A for details.

4.2.2 Detailed Analysis of Groundwater Remedial Alternatives

This section presents the evaluation of remedial alternatives for groundwater contamination present at the Site.

4.2.2.1 Alternative GW-1: No Action

The No Action alternative includes no active remediation at the site. Contaminated groundwater would be left in place with no treatment or controls to prevent future exposure to contaminated media or further contaminant migration. No mitigation of sub slab VOC impacts would be implemented. However, periodic reviews would be performed to assess changes in the risks posed by the Site.

4.2.2.1.1 Compliance with SCGs

The No Action alternative for groundwater does not comply with SCGs or address sub slab VOC impacts. Groundwater currently exceeds Class GA standards on-site. Groundwater would continue to exceed these criteria for an extended period of time. Natural processes could potentially reduce the contaminant levels to below relevant criteria. Sub slab VOCs would not be actively mitigated. Location- and action-specific SCGs would not be triggered, since no remedial activities would be performed.

4.2.2.1.2 Overall Protection of Human Health and the Environment

This alternative would not include removal, on-site containment, or treatment of contaminated groundwater or address sub slab VOC impacts. Currently, groundwater is not used at the property, so there are no current exposures to contaminated groundwater. However, there are no current restrictions on groundwater usage at the property.

4.2.2.1.3 Short-Term Impacts and Effectiveness

Under the No Action alternative, there would be no short-term impacts to workers or the surrounding community. No construction would be required for implementation of this alternative.

4.2.2.1.4 Long-Term Effectiveness and Permanence

Although naturally occurring processes may provide reduction in risks (based on results from remedial investigations) in the long-term, an indefinite timeframe would be required for contaminated groundwater to reach acceptable levels. No controls would be implemented to mitigate potential future exposure to contaminated groundwater.

4.2.2.1.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative would not involve any containment, removal, treatment, or disposal of the contaminated groundwater. Therefore, this alternative would not result in any immediate reduction in the toxicity, mobility, or volume of contaminants. Over time, contaminant concentrations in the groundwater may eventually decline to be in compliance with Class GA standards resulting in a reduction in toxicity of the contaminated groundwater and/or a reduction in the dissolved phase plume volume.

4.2.2.1.6 Implementability

There are no technical feasibility concerns with the No Action alternative. The effectiveness of the remedy would be evaluated in periodic reviews and implementation of this alternative would not preclude further remedial action in the future.

4.2.2.1.7 Cost

There is no capital cost for the No Action alternative. The net present cost of the alternative, based on periodic (i.e., 5-year) reviews for a 30-year period of performance and a 5% discount rate is $56,000. See Appendix A for details.

4.2.2.2 Alternative GW-2: Groundwater Monitoring and Sub Slab Vapor Mitigation

This alternative includes monitoring of groundwater, institutional controls to mitigate potential future exposure pathways at the Site, in conjunction with the removal of contaminated soil (overburden aquifer material) during implementation of either Alternatives S-3 or S-4, and installation of a sub slab vapor depressurization system. Groundwater use restrictions would be implemented to prohibit use of groundwater. Figure 4-3 summarizes Alternative GW-2.

Sample data from 1998, 2004, and 2006 reports consistently showed that the source of the groundwater contamination was the former leach pits. Although there are currently exceedances of NYSDEC Class GA Levels, this alternative is being considered since addressing the sources of contamination will likely mitigate the zone of where contaminated groundwater is present through direct removal of the overburden material that constitutes the water bearing zone at the Site. Furthermore, the results of various groundwater sampling events between 1997 and 2006 have shown reductions in concentrations of VOCs in groundwater and have also shown the possibility of a natural dechlorination process occurring at the Site. Evidence of dechlorination, in addition to removal of the overburden soil material, supports selection of the monitoring alternative for groundwater.

This alternative would include institutional controls to prohibit the use of groundwater for potable purposes on-site or in the adjacent community.

A Site Management Plan (SMP) would be developed and implemented under this alternative to describe adequate control measures and PPE/monitoring to be implemented following remediation activities. The SMP would also include a monitoring program to verify ongoing reduction of remaining groundwater contamination. Both new and existing monitoring wells would be incorporated within the monitoring network.

Sub Slab Vapor

Elevated levels of VOCs were primarily detected in sub-slab samples from below the Polymedco Office/Laboratory during the RI phase. In order to reduce the potential for soil vapor intrusion, a Sub Slab Depressurization System (SSD) is included in Alternative GW-2.

An SSD system will be installed beneath approximately 18,000 square feet of floor slab of the Polymedco Office/Laboratory, as shown on Figure 4-3. The proposed system will consist of one or more fans or blowers, which draw air from the soil beneath the building, and a series of collection and discharge pipes. As part of the proposed SSD system, the floor slab of the Polymedco Office/Laboratory will need to be sealed off from the system (i.e., no cracks, gaps, etc. in the slab). After system start-up, if pressure testing indicates a negative pressure field has not been established, the SSD system will be expanded.

For purposes of FS costing and analysis, it is anticipated that one of the following SSD units will be required:

- Low Pressure/High Flow – used where permeable soils exist sub slab - the unit typically consists of an in-line centrifugal fan and 4-inch diameter PVC piping.
- High Pressure/Low Flow – used where lower permeability soils exist sub slab - the unit typically consists of a regenerative blower and 1.5 to 2-inch diameter PVC piping.

Structures such as underground piping or footings beneath the Polymedco building may impede air flow, and therefore, will be carefully considered. Additionally, depth to bedrock may be in close proximity to the building sub slab. The specific details and selection of the system will be identified during remedial design.

In addition, a HASP would be developed and implemented at the former ISCP property to ensure use of adequate control measures and PPE during intrusive activities. Periodic reviews would also be performed to assess changes in the risk to human health and the environment posed by the Site.

4.2.2.2.1 Compliance with SCGs

Implementation of Alternative GW-2 would be performed in compliance with action- and location-specific SCGs and monitors chemical-specific SCGs. Implementation of S-3 and S-4 will significantly reduce impacts to groundwater on their own.

4.2.2.2.2 Overall Protection of Human Health and the Environment

Alternative GW-2 by itself would not fully remove, contain, or treat the contaminated groundwater. Risks associated with the potential for ingestion of contaminated groundwater and/or dermal contact with contaminated groundwater would be greatly reduced by implementation of use restrictions. Inhalation of vapor would be mitigated by the sub slab vapor system. Selection of Soil Alternative S-3 or S-4 would remove contaminated groundwater within the excavation boundaries during dewatering activities.

4.2.2.2.3 Short-Term Impacts and Effectiveness

Limited construction would be involved in this alternative. Additional monitoring wells may need to be installed to complete the monitoring network. Any contaminants existing outside the soil removal areas would persist at the Site. It is estimated that this alternative could be implemented in less than 6 to 12 months.

4.2.2.2.4 Long-Term Effectiveness and Permanence

It is anticipated that natural processes will at some time in the future achieve target cleanup levels (NYSDEC WQ Values) for organic COCs in groundwater. Maintenance of groundwater use restrictions will mitigate potential exposures.

4.2.2.2.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative by itself would not involve any containment, removal, treatment, or disposal of the contaminated groundwater. Therefore, this alternative would not result in any immediate reduction in the toxicity, mobility, or volume of contaminants in groundwater. Over time, organic contaminant concentrations in the groundwater may eventually decline to be in compliance with Class GA standards resulting in a reduction in toxicity of the contaminated groundwater and/or a reduction in the dissolved phase plume volume. Furthermore, implementation of soil Alternative S-3 or S-4 would have a significant reduction of mobility, toxicity, and/or volume of both organic and inorganic contamination in groundwater; therefore, making GW-2 a viable alternative.

4.2.2.2.6 Implementability

There are no technical feasibility concerns with Alternative GW-2 for groundwater. The effectiveness of the remedy would be evaluated in periodic reviews.

As this alternative involves limited construction activities, resources and proven technologies are readily available. Consulting services are also readily available for negotiation and implementation of use restrictions, monitoring, and O&M of the sub slab system. Services are

also available for conducting periodic reviews. Coordination with regulatory agencies would be required for review of groundwater data and periodic reviews as well as making decisions regarding any future remedial alternatives.

4.2.2.2.7 Cost

A capital cost of $250,000 is estimated for implementation of the monitoring network, sub slab vapor mitigation, and groundwater use restrictions. Annual O&M cost is estimated to be $40,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $927,000, including costs for periodic (5-year) reviews.

4.2.2.3 Alternative GW-3: In Situ Treatment and Sub Slab Vapor Mitigation

4.2.2.3.1 Description

This alternative provides for *in situ* treatment of contaminated groundwater to significantly reduce or eliminate residual contaminants in groundwater, and installation of a sub slab vapor depressurization system. For development of this alternative, several *in situ* treatments are carried through, such as *in situ* chemical oxidation, *in situ* biodegradation, and *in situ* air sparging. Remedial design activities may potentially use one of these process options or a combination for incorporation into the remedial design.

In situ chemical oxidation would be performed by injection of a chemical reagent (e.g., fenton's reagent) into the subsurface through injection points located on-site. *In situ* chemical oxidation could be effective for organic contaminants in groundwater. The amount of reagent needed, spacing of injection points, injection point requirements, and the frequency of addition to achieve cleanup goals would be determined during pre-design investigation activities.

In situ biodegradation would be effective for organic contaminants in groundwater and would include the addition of oxygen to the saturated zone to enhance the performance of microbial activity in the subsurface. Oxygen may be added via either an oxygen releasing compound or controlled direct injection of air or oxygen itself. *In situ* biodegradation may require a longer implementation schedule than *in situ* chemical oxidation due to the possible need for multiple rounds of injections. Details, such as the numbers of injection points and schedule for biodegradation activities would be addressed during pre-design investigation activities.

In situ air sparging would include injecting air below the contaminated area to partition the dissolved, sorbed, or any free-phase VOCs (if present) into the vapor phase. The vapors would be captured via soil vapor extraction methods in the vadose zone and treated before being discharge to the atmosphere. Extreme care will be exercised so that contaminants are removed efficiently and without adverse effects, such as the spread of residual VOCs to clean areas. *In situ* air sparging may require a longer implementation schedule than *in situ* chemical oxidation due to the continuous nature of the process. Details, such as the numbers of injection points and schedule for sparging activities would be addressed during pre-design investigation activities.

Monitoring wells, located downgradient of the injection locations, would be used to monitor the treated groundwater. The location and requirements of downgradient monitoring wells would be determined during design activities.

Sub Slab Vapor

The Sub Slab Depressurization System described in Alternative GW-2 would also be included in Alternative GW-3.

4.2.2.3.2 Compliance with SCGs

This alternative would reduce or eliminate concentrations of contaminants in groundwater to comply with Class GA standards. Depending on the type of treatment process selected, residual concentrations of inorganics in groundwater are possible. Activities associated with this alternative would be performed in accordance with applicable location and action-specific SCGs.

4.2.2.3.3 Overall Protection of Human Health and the Environment

In situ treatment would break down contaminants in the groundwater to achieve the Class GA standards. Ultimately, the breakdown of contaminants in groundwater would be protective of human health and the environment. However, there are significant uncertainties with respect to time to remediate. Conservatively, ultimate restoration would be in terms of decades, not years. Since there are currently exceedances of Class GA standards, well use restrictions would be maintained. Potential for inhalation of vapor would be mitigated by the sub slab vapor system.

4.2.2.3.4 Short-Term Effectiveness

The installation of the injection wells would cause minimal disturbance. These activities will be performed in accordance with safe construction practices and a HASP to ensure that workers and the public are not impacted by subsurface contamination disturbed during these activities. The installation of the *in situ* groundwater treatment system is anticipated to require approximately 3 months. Operation depends on the selected treatment process and may be for a period of 1 to 2 years after completion of the source remedies. In the event of extended dry periods, treatment duration may require a longer period of time.

4.2.2.3.5 Long-Term Effectiveness and Permanence

This alternative, in conjunction with a remedy for source soils, may ultimately achieve Class GA standards. Until the standards are achieved, water use restrictions will remain in place to ensure protection of human health. Upon reaching the groundwater standards, the groundwater remedy would be permanent to the extent that source remedies are permanent (or maintained) to prevent recontamination of groundwater leaving the Site.

4.2.2.3.6 Reduction of Mobility, Toxicity, or Volume

This alternative would involve *in situ* treatment of contaminated groundwater. The toxicity of groundwater would be reduced by the treatment or removal of contaminants. In addition, the system has the effect of minimizing mobility by treating groundwater before it leaves the Site.

4.2.2.3.7 Implementability

Technical Feasibility: The installation of injection points and operation of an *in situ* treatment system can be readily implemented using conventional technologies. However, due to the limited aquifer depth and availability of water and limited hydraulic conductivities, any active *in situ* treatment will be extremely difficult, and leaves the duration to achieve Class GA standards in doubt.

Administrative Feasibility: Environmental easements would have to be implemented and maintained.

Availability of Services and Materials: Materials and services for installation and operation of the *in situ* chemical oxidation system and O&M of the sub slab system are readily available.

4.2.2.3.8 Cost

The capital cost for this alternative is estimated at $1,490,000. Annual O&M cost is estimated to be $40,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $2,167,000. See Appendix A for more information.

4.2.2.4 Alternative GW-4: Limited Permanganate Treatment, Groundwater Monitoring, and Sub Slab Vapor Mitigation

4.2.2.4.1 Description

This alternative provides for a single, one-time application of permanganate within the soil excavation area in conjunction with alternatives S-3 or S-4. This alternative also includes groundwater monitoring and installation of a sub slab vapor depressurization system.

Prior to backfilling the excavation, permanganate would be applied at the bottom of the excavation area for the purpose of oxidizing residual groundwater contamination located within underlying bedrock. The concentration and volume of permanganate would be determined during pre-design investigation activities. Permanganate would enter the bedrock through any existing cracks or fissures such as fractures. For the purposes of this FS, it is assumed that approximately 1,000 gallons of permanganate would be added. Following the one-time application of the permanganate, the excavation area would be backfilled.

Monitoring wells, located downgradient of the treatment area, would be used to monitor the treated groundwater. The location and requirements of downgradient monitoring wells would be determined during design activities.

Sub Slab Vapor

The Sub Slab Depressurization System described in Alternative GW-2 would also be included Alternative GW-4.

4.2.2.4.2 Compliance with SCGs

Combined with the selected soil excavation alternative, this alternative would reduce or eliminate residual concentrations of contaminants in groundwater. Residual concentrations of inorganics in groundwater are possible. Activities associated with this alternative would be performed in accordance with applicable location and action-specific SCGs.

4.2.2.4.3 Overall Protection of Human Health and the Environment

The application of permanganate would oxidize organic contaminants in the groundwater to enhance restoration to Class GA standards. Ultimately, the breakdown of contaminants in groundwater would be protective of human health and the environment. However, there are significant uncertainties with respect to time to remediate. Conservatively, ultimate restoration would be in terms of decades, not years. Well use restrictions would be maintained. Potential for inhalation of vapor would be mitigated by the sub slab vapor system.

4.2.2.4.4 Short-Term Effectiveness

The application of permanganate would cause little or no disturbance beyond the disturbance created by the excavation activities. Activities will be performed in accordance with safe construction practices and a HASP to ensure that workers and the public are not impacted during these activities. The application of permanganate would take place immediately following excavation activities and prior to backfilling.

4.2.2.4.5 Long-Term Effectiveness and Permanence

This alternative, in conjunction with a soil excavation, may ultimately achieve Class GA standards. Until the standards are achieved, water use restrictions will remain in place to ensure protection of human health. Upon reaching the groundwater standards, the groundwater remedy would be permanent.

4.2.2.4.6 Reduction of Mobility, Toxicity, or Volume

This alternative would involve oxidation of contaminated groundwater largely in bedrock in combination with the selected soil alternative. The toxicity of groundwater would be reduced by the oxidation. In addition, the volume of contaminated groundwater (specifically overburden) will be reduced as a result of the removal of contaminants in groundwater during dewatering activities associated with soil removal.

4.2.2.4.7 Implementability

Technical Feasibility: The application of permanganate, groundwater monitoring, and a sub slab vapor system can be readily implemented using conventional technologies.

Administrative Feasibility: Environmental easements would have to be implemented and maintained.

Availability of Services and Materials: Materials and services for addition of permanganate, groundwater monitoring, and O&M of the sub slab system are readily available.

4.2.2.4.8 Cost

The capital cost for this alternative is estimated at $377,000. Annual O&M cost is estimated to be $40,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $1,054,000. See Appendix A for more information.

4.2.3 Detailed Analysis of Sediment Remedial Alternatives

This section presents the evaluation of remedial alternatives for sediment. The alternatives incorporate various technologies to address impacted sediment on the Magna Metals Site.

4.2.3.1 Alternative SD-1: No Action

The No Action alternative includes no active remediation at the site. Contaminated sediments would be left in place with no treatment or controls to prevent future exposure to contaminated media. Periodic reviews would be performed to assess any changes in the risk to the environment posed by the site. This alternative is developed as a basis of comparison for other alternatives.

4.2.3.1.1 Compliance with SCGs

The No Action alternative does not comply with chemical-specific SCGs since no action would be taken to address contaminated sediment. Action- and location-specific SCGs are not triggered, since no on-site remedial activities would be performed.

4.2.3.1.2 Overall Protection of Human Health and the Environment

The No Action alternative would not remove, contain, or treat the contaminated sediment. Therefore, potential ecological risks resulting from contaminated sediment above cleanup levels would remain unchanged. Risks associated with the potential for direct contact with contaminated sediment would persist. In addition, there is the continued potential for migration of contaminants.

4.2.3.1.3 Short-Term Impacts and Effectiveness

Under the No Action alternative, there would be no short-term impacts to workers or the surrounding community. No construction would be required for implementation of this

alternative. This alternative would not result in any short-term improvement over current conditions. As no design or construction activities are required for this alternative, it would take no time to implement.

4.2.3.1.4 Long-Term Effectiveness and Permanence

The No Action alternative would have no long-term effectiveness and/or permanence. The magnitude of risks would be the same following implementation of this alternative. No institutional controls would be implemented to manage the contaminated sediments.

4.2.3.1.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative would not involve any containment, removal, treatment, or disposal of the contaminated sediments. Therefore, this alternative would not provide any reduction in the toxicity, mobility, and/or volume of contaminants.

4.2.3.1.6 Implementability

There are no technical feasibility concerns with the No Action alternative. The effectiveness of the remedy would be evaluated during periodic reviews and implementation of this alternative would not preclude further remedial action in the future.

There are no administrative feasibility concerns with this alternative. As this alternative involves no construction activities, availability of resources and use of proven technologies is not applicable. Consulting services are readily available for periodic reviews. Coordination with regulatory agencies would be required for making decisions regarding any future remedial alternatives.

4.2.3.1.7 Cost

There is no capital cost for the No Action alternative. The net present cost of the alternative, based on periodic (i.e., 5-year) reviews for a 30-year period of performance and a 5% discount rate is $56,000. See Appendix A for details.

4.2.3.2 Alternative SD-2: Limited Action

The Limited Action alternative includes no active remediation at the site. Contaminated sediments would be left in place with no treatment and limited controls to prevent future exposure to contaminated media. Under this alternative, a HASP and Site Management Plan would be developed and implemented to describe (for example) adequate control measures and PPE/monitoring to be implemented during intrusive activities. Periodic reviews would also be performed to assess changes in the potential risk to human health and the environment posed by the Site.

4.2.3.2.1 Compliance with SCGs

The Limited Action alternative does not comply with chemical-specific SCGs since no action would be taken to address contaminated sediment. Action- and location-specific SCGs are not triggered, since no on-site remedial activities would be performed.

4.2.3.2.2 Overall Protection of Human Health and the Environment

The Limited Action alternative would not remove, contain, or treat the contaminated sediment. Risks resulting from contaminated sediment above cleanup levels would be somewhat mitigated by institutional controls (e.g., proper implementation of the HASP and Site Management Plan). However, ecological risks would not be mitigated, and there is the continued potential for exposure.

4.2.3.2.3 Short-Term Impacts and Effectiveness

Under the Limited Action alternative, there would be no short-term impacts to workers or the surrounding community. No construction would be required for implementation of this alternative. Development and implementation of a HASP and Site Management Plan would help to mitigate risks. The time required to implement this alternative would be approximately six months.

4.2.3.2.4 Long-Term Effectiveness and Permanence

Potential risks would be mitigated by institutional controls. These controls would be effective at mitigating risks to human health, though there is the potential for violation of these controls. Risks at the Site would be re-evaluated periodically. Risks to ecological resources would not be mitigated under this alternative.

4.2.3.2.5 Reduction of Mobility, Toxicity, and/or Volume

This alternative would not involve any containment, removal, treatment, or disposal of the contaminated sediment. Therefore, this alternative would not provide any reduction in the toxicity, mobility, and/or volume of contaminants.

4.2.3.2.6 Implementability

There are no technical feasibility concerns with the Limited Action alternative for sediment. The effectiveness of the remedy would be evaluated in periodic reviews. As this alternative involves no construction activities, availability of resources and use of proven technologies is not a concern. Institutional controls may be difficult to implement since the affected area is off-site, on private property and would require negotiation of agreements with the property owners for implementation of the HASP and SMP. Consulting services are readily available for negotiation and implementation of access restrictions and HASP and Site Management Plan. Services are also available for conducting periodic reviews.

4.2.3.2.7 Cost

The capital cost associated with negotiation and implementation of the required institutional controls is $39,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $95,000, including periodic (5-year) reviews. See Appendix A for details.

4.2.3.6 Alternative SD-3A: Removal of Metals-Impacted Sediments Above Habitat-Assessment Based PRGs

Alternative SD-3A would include the removal of sediments with contaminant concentrations above the PRGs developed during the Habitat assessment (as part of the RI). For the purposes of this FS, sediments have been grouped into two separate areas (referred to as "sediment systems") based on location and the areas of concern established in the Habitat Assessment. The first is the Furnace Brook/Unnamed Pond sediment system; the second is the Unnamed Tributary System. The locations of Furnace Brook, the Unnamed Pond, and the Unnamed Tributary can be seen on sediment figures in Section 2.0 of this report.

This alternative would involve removal of sediments from the Furnace Brook/Unnamed Pond sediment system with concentrations of nickel and copper above 200 mg/kg and 415 mg/kg, respectively (PRGs established during the RI), and sediments from the Unnamed Tributary sediment system with concentrations of nickel and copper above 143 mg/kg and 107 mg/kg, respectively (PRGs). In the Habitat Assessment, no toxicity was observed attributable to zinc in sediments, and therefore, a PRG was not developed for zinc for this alternative.

In addition, COCs in excess of NYSDEC Ecological SCOs will be removed from off-site surface soils in the locations of SS-06 through 10. Surface soils in these wetland locations are included with this sediment alternative. The approximate areas of sediments and surface soils to be removed under this alternative can be seen in Figure 4-4A.

During pre-design activities, additional investigation will be performed to determine the vertical extent of contamination. In addition, post excavation sampling will be performed following remediation. For FS estimating purposes, materials will be removed to a depth of approximately two (2) feet bgs and replaced with comparable materials to pre-existing grade to re-establish the sediment ecosystem. Excavation beyond 2 feet bgs to meet PRGs for this alternative is not proposed, as ecological exposures to deeper contamination is not considered a significant exposure pathway. As discussed previously, if subsurface impacts associated with the leach pits are observed extending off-site, these impacts will be addressed with the soil remedial alternatives to the applicable cleanup criteria for those alternatives.

The quantity of off-site sediment and surface soil to be removed and replaced under this alternative is approximately 3,840 CY. Excavated wetland substrate will be restored with similar clean material, matching the organic content to existing. In the submerged aquatic excavation areas, clean sand or similar will be used. All excavation areas will be revegetated in kind through replanting and reseeding, Wetlands and aquatic environments will be restored to original contours, ensuring little to no change in drainage patterns and ensuring re-establishment of vegetation.

Options for treatment and disposal of excavated sediment could include reuse/recycling, on- or off-site stabilization/solidification, or on- or off-site chemical or thermal treatment. Treatment and disposal of excavated sediments/soils will correspond with treatment and disposals of excavated soils. For the purposes of this FS, off-site landfill disposal at an appropriate facility was considered. During remedial design, market conditions will be re-evaluated to assess the cost-effectiveness of alternative treatment options, facilities, or technologies.

Since this alternative includes the removal of off-site surface soils to ecological SCOs, this may not result in remediation of all soils, specifically subsurface soils, to unrestricted use criteria. Therefore, this alternative includes institutional controls, consisting of use restrictions (i.e., environmental easement), and development and implementation of a HASP and Site Management Plan. Periodic reviews would also be performed to assess any changes in the risk to health and the environment posed by the Site.

This alternative also includes post-remedial monitoring of surface water to monitor the effectiveness of sediment remediation on surface water. Furnace Brook, the unnamed pond, and the unnamed tributary would be sampled biannually and compared to regulatory criteria. Surface water data would be included in periodic site reviews.

4.2.3.6.1 Compliance with SCGs

This alternative will comply with chemical-specific SCGs as determined by the habitat assessment-based PRGs. Removal and restoration activities would be performed in accordance with all applicable action- and location-specific SCGs. Mitigation of wetlands would also be performed as required based on the disturbed wetlands within the sediment system areas.

4.2.3.6.2 Overall Protection of Human Health and the Environment

This alternative would provide protection through the removal of contaminated sediment. Residual contamination above unrestricted use criteria may remain after implementation of this alternative. Potential exposure to residual contamination will be mitigated by institutional controls.

4.2.3.6.3 Short-Term Impacts and Effectiveness

This alternative would involve off-site construction to remove contaminated sediment and surface soils. There would be risk of exposure to contaminants that are mobilized during these activities. There would also be risks typically associated with construction activities, including movement of heavy equipment. These risks would be addressed by developing and implementing a HASP to provide protection for workers. In addition, appropriate engineering controls (*i.e.*, controlling access, controlling transport of contaminants to surface water bodies, etc.) would be needed. The timeframe required for implementation of this alternative is approximately 6 to 12 months.

4.2.3.6.4 Long-Term Effectiveness and Permanence

This alternative would potentially result in attainment of target cleanup levels upon completion of the remedial activities. This alternative removes contaminated sediment and surface soils to reduce exposure risks. Residual risks, if any, would be mitigated by institutional controls. Otherwise, no institutional controls are anticipated.

4.2.3.6.5 Reduction of Mobility, Toxicity, and/or Volume

Removal of off-site contaminated sediments and surface soils would significantly reduce the potential for migration of contaminants and potential for exposure. Treatment at the off-site disposal facility could potentially reduce the mobility, toxicity and/or volume of contaminated sediment.

4.2.3.6.6 Implementability

Technical Feasibility: There are no major technical feasibility concerns with this alternative. Excavation, transportation, and disposal are conventional remedial technologies that are typically easy to implement. Since sediments are the result of on-site erosion and off-site deposition events, excavation is unlikely to extend below two feet bgs. Therefore, technical challenges are not anticipated and conventional equipment can be used. Restoration can also be easily implemented at the Site.

Administrative Feasibility: Administratively, this alternative could be moderately difficult to implement. Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material from the site to an appropriate disposal facility. Wetland mitigation would also be required. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for access for remediation activities and implementation of institutional controls. Multiple third party owners are likely to be involved.

Availability of Services and Materials: Equipment, labor, and materials are readily available for all constructional components of this alternative. Materials and services for restoration are generally available; however, custom sediment material may need to be developed and manufactured to replace the sediment material removed.

4.2.3.6.7 Cost

The estimated capital cost associated with this alternative and implementation of the institutional controls, if required, is $1,427,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $1,815,000, including periodic (5-year) reviews. See Appendix A for details.

4.2.3.7 Alternative SD-3B: Removal of Metals-Impacted Sediments to Pre-Release (Background) Conditions

Alternative SD-3B would include the removal of sediments with analytical concentrations above pre-release (background) PRGs as requested by NYSDEC. The average concentrations of nickel, copper, and zinc from background sediment sample locations SD-27 through SD-31 were used as pre-release PRGs. The average background concentrations of nickel, copper, and zinc

from these locations are 24.1, 13.7, and 54.1 mg/kg respectively. Sediment will be removed from off-site areas in locations exceeding these conditions,

In addition, COCs in excess of NYSDEC ecological SCOs will be removed from off-site surface soils in the locations of SS-06 through 10. Surface soils in these wetland locations are included with this alternative. The approximate areas of sediments and surface soils to be removed under this alternative can be seen in Figure 4-4B.

During pre-design activities, additional investigation will be performed to determine the vertical extent of contamination. In addition, post excavation sampling will be performed following remediation. For FS estimating purposes, materials will be removed to a depth of approximately two (2) feet bgs and replaced with comparable materials to pre-existing grade to re-establish the sediment ecosystem. Excavation beyond 2 feet bgs to meet PRGs for this alternative is not proposed, as ecological exposures to deeper contamination is not considered a significant exposure pathway. As discussed previously, if subsurface impacts associated with the leach pits are observed extending off-site, these impacts will be addressed with the soil remedial alternatives to the applicable cleanup criteria for those alternatives.

The quantity to be removed and replaced under this alternative is approximately 16,000 CY. Excavated wetland substrate will be restored with similar clean material, matching the organic content to existing. In the submerged aquatic excavation areas, clean sand or similar will be used. All excavation areas will be revegetated in kind through replanting and reseeding, Wetlands and aquatic environments will be restored to original contours, ensuring little to no change in drainage patterns and ensuring re-establishment of vegetation.

Options for treatment and disposal of excavated sediment could include reuse/recycling, on- or off-site stabilization/solidification, or on- or off-site chemical or thermal treatment. Treatment and disposal of excavated sediments/soils will correspond with treatment and disposals of excavated soils. For the purposes of this FS, off-site landfill disposal at an appropriate facility was considered. During remedial design, market conditions will be re-evaluated to assess the cost-effectiveness of alternative treatment options, facilities, or technologies.

This alternative also includes post-remedial monitoring of surface water as described in Alternative SD-3A.

Since this alternative includes the removal of off-site surface soils to ecological SCOs, this may not result in remediation of all soils, specifically subsurface soils, to unrestricted use criteria. Therefore, this alternative includes institutional controls, consisting of use restrictions (i.e., environmental easement), and development and implementation of a HASP and Site Management Plan. Periodic reviews would also be performed to assess any changes in the risk to health and the environment posed by the Site.

4.2.3.7.1 Compliance with SCGs

This alternative will comply with chemical-specific SCGs. Removal and restoration activities would be performed in accordance with applicable action- and location-specific SCGs.

Mitigation of wetlands would also be performed as required based on the disturbed wetlands within the sediment system areas.

4.2.3.7.2 Overall Protection of Human Health and the Environment

This alternative would provide protection predominantly through the removal of contaminated sediment and surface soils. Residual contamination in subsurface soil, if any, would be mitigated by institutional controls.

4.2.3.7.3 Short-Term Impacts and Effectiveness

This alternative would involve an on-site construction effort to remove contaminated sediment and surface soils. There would be risk of exposure to contaminants that are mobilized during these activities. There would also be risks typically associated with construction activities, including movement of heavy equipment. These risks would be addressed by developing and implementing a HASP to provide protection for workers. In addition, appropriate engineering controls (*i.e.*, controlling access, controlling transport of contaminants to surface water bodies, etc.) would be needed. The timeframe required for implementation of this alternative is approximately 12 to 18 months.

4.2.3.7.4 Long-Term Effectiveness and Permanence

This alternative would potentially result in attainment of target cleanup levels upon completion of the remedial activities. This alternative is protective of human health and the environment in that it removes contaminated sediment and surface soil to reduce exposure risks.

4.2.3.7.5 Reduction of Mobility, Toxicity, and/or Volume

Removal and disposal of contaminated sediments and surface soils would significantly reduce the potential for migration of contaminants. Treatment at the off-site disposal facility could potentially reduce the mobility, toxicity and/or volume of contaminated sediment.

4.2.3.7.6 Implementability

Technical Feasibility: There are technical feasibility concerns with this alternative. Excavation, transportation, and disposal are conventional remedial technologies that are typically easy to implement. Excavation is not likely to extend below two feet bgs; therefore, technical challenges are not anticipated and conventional equipment can be used. However, significant degradation of the existing wooded wetland system is likely to occur, resulting from the expansive excavation footprint created by attaining Pre-Release levels. Trees would have to be worked around and/or removed. Native habitats would be destroyed. Extensive wetland restoration would be required.

Administrative Feasibility: Administratively, this alternative could be very difficult to implement. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for remediation activities and implementation of institutional controls. Multiple third party owners are likely to be involved. Also significant disturbance to

private properties could occur. Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material from the site to an appropriate disposal facility.

Availability of Services and Materials: Equipment, labor, and materials are readily available for all constructional components of this alternative. Materials and services for restoration are generally available; however, custom sediment material may need to be developed and manufactured to replace the sediment material removed.

4.2.3.7.7 Cost

The estimated capital cost associated with this alternative and implementation of the required institutional controls is $5,079,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $5,467,000, including periodic (5-year) reviews. See Appendix A for details.

4.2.3.8 Alternative SD-3C: Removal of Metals-Impacted Sediments to NYSDEC Lowest Effect Levels (LELs)

As requested by NYSDEC, Alternative SD-3C includes the removal of sediments with analytical results above NYSDEC Lowest Effect Levels (LELs) for inorganic COCs in sediment. NYSDEC Sediment Cleanup Criteria Lowest Effect Level (LEL) for both nickel and copper is 16 mg/kg. The NYSDEC LEL for zinc is 120 mg/kg. Sediment locations with analytical results of nickel, copper, and zinc exceeding LEL criteria will be removed from the off-site areas as part of this alternative.

In addition, COCs in excess of NYSDEC Ecological SCOs will be removed from off-site surface soils in the locations of SS-06 through 10. Surface soils in these locations are associated with wetlands/sediments and are therefore included with this alternative. The approximate areas of sediments and surface soils to be removed under this alternative can be seen in Figure 4-4C.

During pre-design activities, additional investigation will be performed to determine the vertical extent of contamination. In addition, post excavation sampling will be performed following remediation. For FS estimating purposes, materials will be removed to a depth of approximately two (2) feet bgs and replaced with comparable materials to pre-existing grade to re-establish the sediment ecosystem. Excavation beyond 2 feet bgs to meet PRGs for this alternative is not proposed, as ecological exposures to deeper contamination is not considered a significant exposure pathway. As discussed previously, if subsurface impacts associated with the leach pits are observed extending off-site, these impacts will be addressed with the soil remedial alternatives to the applicable cleanup criteria for those alternatives.

The quantity of sediment to be removed and replaced under this alternative is approximately 15,900 CY. Excavated wetland substrate will be restored with similar clean material, matching the organic content to existing. In the submerged aquatic excavation areas, clean sand or similar will be used. All excavation areas will be revegetated in kind through replanting and reseeding, Wetlands and aquatic environments will be restored to original contours, ensuring little to no

change in drainage patterns and ensuring re-establishment of vegetation. Actual depths will be confirmed during remediation through sampling.

Options for treatment and disposal of excavated sediment could include reuse/recycling, on- or off-site stabilization/solidification, or on- or off-site chemical or thermal treatment. Treatment and disposal of excavated sediments/soils will correspond with treatment and disposals of excavated soils. For the purposes of this FS, off-site landfill disposal at an appropriate facility was considered. During remedial design, market conditions will be re-evaluated to assess the cost-effectiveness of alternative treatment options, facilities, or technologies.

Since this alternative includes the removal of off-site surface soils to ecological SCOs, this may not result in remediation of all soils, specifically subsurface soils, to unrestricted use criteria. Therefore, this alternative includes institutional controls, consisting of use restrictions (i.e., environmental easement), and development and implementation of a HASP and Site Management Plan. Periodic reviews would also be performed to assess any changes in the risk to health and the environment posed by the Site.

This alternative also includes post-remedial monitoring of surface water as described in Alternative SD-3A.

4.2.3.8.1 Compliance with SCGs

This alternative will comply with chemical-specific SCGs. Removal and restoration activities would be performed in accordance with applicable action- and location-specific SCGs. Mitigation of wetlands would also be performed as required based on the disturbed wetlands within the sediment system areas.

4.2.3.8.2 Overall Protection of Human Health and the Environment

This alternative would provide protection through the removal of contaminated materials to prevent contact and migration. Residual contamination in subsurface soil, if any, would be mitigated by institutional controls.

4.2.3.8.3 Short-Term Impacts and Effectiveness

This alternative would involve a significant construction effort to remove contaminated materials. There would be risk of exposure to contaminants that are mobilized during these activities. There would also be risks typically associated with construction activities, including movement of heavy equipment. These risks would be addressed by developing and implementing a HASP to provide protection for workers. In addition, appropriate engineering controls (*i.e.*, controlling access, controlling transport of contaminants to surface water bodies, etc.) would be needed. The timeframe required for implementation of this alternative is approximately 12 to 18 months.

4.2.3.8.4 Long-Term Effectiveness and Permanence

This alternative would potentially result in attainment of target cleanup levels upon completion of the remedial activities. This alternative is protective in that it removes contaminated sediment and surface soil to reduce exposure risks.

4.2.3.8.5 Reduction of Mobility, Toxicity, and/or Volume

Removal and disposal of contaminated materials would significantly reduce the potential for migration of contaminants and potential for exposure. Treatment at the off-site disposal facility could potentially reduce the mobility, toxicity and/or volume of contaminated sediment.

4.2.3.8.6 Implementability

Technical Feasibility: There are no major technical feasibility concerns with this alternative. Excavation, transportation, and disposal are conventional remedial technologies that are typically easy to implement. Excavation is unlikely to extend below two feet bgs; therefore, technical challenges are not anticipated and conventional equipment can be used. Wetland mitigation would also be required due to the major removal impact imposed on the existing wetland system. Extensive degradation of the native flora and fauna would occur. Extensive numbers of trees would have to be worked around or removed. Native habitats would be destroyed over an extensive area.

Administrative Feasibility: Administratively, this alternative could be very difficult to implement. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for remediation activities and implementation of institutional controls. Multiple third party owners are likely to be involved. Also significant disturbance to private properties could occur. Coordination with local authorities would be required to establish an acceptable transportation plan for transportation of material from the site to an appropriate disposal facility.

Availability of Services and Materials: Equipment, labor, and materials are readily available for all constructional components of this alternative. Materials and services for restoration are generally available; however, custom sediment material may need to be developed and manufactured to replace the sediment material removed.

4.2.3.8.7 Cost

The estimated capital cost associated with this alternative and implementation of the required institutional controls is $5,048,000. The net present cost of the alternative, based on a 30-year period of performance and a 5% discount rate is $5,436,000, including periodic (5-yeaer) reviews. See Appendix A for details.

5.0 COMPARATIVE ANALYSIS

The following section compares the relative performance of each remedial alternative using the specific evaluation criteria presented in Section 4.1. Comparisons are presented in a qualitative manner, and identify substantive differences between the alternatives. As with the detailed evaluation, the following criteria are used for the comparative analysis.

Compliance with SCGs;
Overall Protection of Human Health and the Environment;
Short-Term Impact and Effectiveness;
Long-Term Effectiveness and Permanence;
Reduction of Toxicity, Mobility, and/or Volume;
Implementability; and
Cost

5.1 Comparative Analysis of Soil Alternatives

5.1.1 Compliance with SCGs

Alternatives S-3 would achieve chemical-specific Restricted Use SCGs and S-4 would achieve Unrestricted Use SCGs for COCs by removal of soil exhibiting concentrations in excess of NYSDEC SCOs from the Site. The value added benefit of alternatives S-3 and S-4 is that impacted groundwater is remediated during soil removal. Alternatives S-1 and S-2 do not remove contamination from the Site.

5.1.2 Overall Protection of Human Health and the Environment

Alternatives S-3 and S-4 are the most protective of health and the environment, since they remove material above NYSDEC SCOs from the Site and significantly reduce or eliminate exposure to COCs in soil. Alternative S-2 mitigates exposure, but does not provide any removal or treatment that significantly reduces migration of contaminants or expedites the cleanup of the Site to regulatory standards. Alternative S-1 is the least protective, since it does not remove or treat contaminants nor mitigate the potential for exposure.

5.1.3 Short-Term Impact and Effectiveness

Alternatives S-1 and S-2 would have the lowest short-term impact. There would be no potential risks to workers or the public during implementation of these alternatives, since no active remediation would be performed. Alternatives S-3 and S-4 would produce disturbance of site contaminants as a result of construction activities. Exposures to workers and the public would be minimal and would be mitigated through appropriate health and safety procedures and engineering controls, as necessary. Alternatives S-3 and S-4 would have higher short-term impacts since any excavated or removed materials would need to be transported through off-site areas for off-site disposal. These impacts would be minimized through proper construction and transportation procedures and engineering controls.

5.1.4 Long-Term Effectiveness and Permanence

Alternatives S-3 is effective at contaminant reduction and reducing potential future exposure. Source materials would be removed and hot spot contaminated soil in the subsurface would be removed. During soil removal, impacted groundwater would be remediated within the excavation areas and there would no longer be the potential for source material to impact groundwater in the future. Based on the known extent of COCs in excess of NYSDEC SCOs, Alternative S-3 achieves a similar reduction of COCs as Alternative S-4. Alternative S-2 is less effective, since all existing contamination, including sources of contamination, would remain on-site. Exposures would be mitigated through institutional controls. Long-term O&M and land use restrictions would be required to ensure the effectiveness of this alternative. Alternative S-1 would not be effective, since it would not reduce potential exposures. Long-term monitoring would be required.

5.1.5 Reduction of Mobility, Toxicity, and/ or Volume

Alternatives S-3 and S-4 offer significant reductions in mobility and volume of contaminated soil, since soil excavation occurs in a large area. Both S-3 and S-4 also remove impacted groundwater during remediation activities such as dewatering. Alternative S-3 offers the same reduction in mobility and almost the same volume as Alternative S-4. Excluding contingency soil removals, alternatives S-3 and S-4 would remove approximately 7,000 and 36,000 CY of soil, respectively. Alternatives S-2 and S-1 offer no reduction in mobility, toxicity, or volume since no active remediation would be performed.

5.1.6 Implementability

All of the alternatives evaluated are technically feasible. Alternative S-1 is the easiest to implement, since no remedial activities are employed in this alternative. Alternative S-2 is also easy to implement, involving only institutional controls. Alternatives S-3 and S-4 would be more difficult to implement, as they involve building demolition and subsurface soil removal and installation of shoring and/or bracing.

Services, equipment, and materials are available for all alternatives. Alternatives S-1 and S-2 require no materials and limited services. Alternatives S-3 and S-4 require building demolition and excavation services in addition to backfill materials. Due to the larger volume of soil removal in Alternative S-4, the coordination effort would be greater than in S-3. However, some on-site soil may be suitable for reuse to offset the quantity.

All of the alternatives evaluated are administratively feasible. Alternatives S-1 and S-2 would be the easiest to implement (short-term) since no remedial activity would be performed. The remaining alternatives all involve construction activities and associated administrative activities (*e.g.*, permitting, public participation and coordination, etc.). Alternatives S-3 and S-4 would have some additional coordination requirements for demolition and off-site transportation, which the other alternatives would not entail. Long-term institutional management (*e.g.*, monitoring, reporting, public coordination) would be associated with all of the alternatives except for S-4. Alternatives S-2, S-3 and S-4 have the potential to require remedial activities and/or implementation of institutional controls on off-site properties if contamination from the leach

pits extends beyond the property line. Performance of remedial activities and/or implementation of institutional controls for off-site properties would be contingent upon success negotiation of access agreements with the property owners.

5.1.7 Cost

Alternative S-1 has no capital costs and minimal O&M costs associated with periodic reviews. Alternative S-2 has the next lowest capital cost and minimal O&M costs for periodic reviews. Alternative S-3 has the second highest capital costs, and minimal O&M costs for reviews. Alternative S-4 has the highest capital costs and no O&M costs. Alternative S-3 will result in comparable level of exposure reduction as S-4, but at a significantly lower cost. Overall, the ranking of the alternatives based on net present value from lowest to highest is: S-1, S-2, S-3, S-4.

5.2 Comparative Analysis of Groundwater Alternatives

5.2.1 Compliance with SCGs

Alternative GW-1 would not trigger action- or location- specific SCGs. Alternatives GW-2, GW-3, and GW-4 would be performed in accordance with action- and location-specific SCGs. Alternatives GW-1 and GW-2 may eventually achieve chemical-specific SCGs for VOCs over an extended period of time by natural processes. Implementation of Alternative S-3 or S-4 achieves SCGs within the alternative's excavation boundaries. Alternative GW-3 could potentially achieve SCGs without the implementation of active soil remedial activities.

5.2.2 Overall Protection of Human Health and the Environment

Alternative GW-1 is the least protective, as it is a No Action alternative. Alternative GW-2 provides monitoring, institutional controls, and a sub-slab vapor mitigation system. Alternative GW-2 also involves hydraulic modeling and the construction of an expanded monitoring well network following soil removal. Monitoring of contaminants in groundwater would be implemented and groundwater use restrictions would be maintained. Alternative GW-3 involves active treatment of contaminated groundwater and would be more effective than GW-2. Alternative GW-4 involves all the technical components of GW-2 and also provides some beneficial enhancement to restoration of groundwater.

5.2.3 Short-Term Impact and Effectiveness

Alternative GW-1 would have the lowest short-term impact. There would be no potential exposure to workers or the public during implementation of the alternative, since no on-site activities or construction would be performed. The short-term impact of Alternative GW-2 would be slightly greater, since on-site construction of monitoring wells and a sub slab vapor system will be required. The short-term impact of Alternative GW-3 would include more intrusive activities at the Site. Short-term impacts of GW-4 would be similar to GW-2.

5.2.4 Long-Term Effectiveness and Permanence

Alternatives GW-1, GW-2, GW-3, and GW-4 would all require an extended period of time for groundwater to reach acceptable levels. GW-1, GW-2, and GW-4 require the greatest amount of time and GW-3 would require less time. Monitoring would provide additional assurance that there aren't off-site exposures under Alternatives GW-2 and GW-4. Alternative GW-3, by itself, not in conjunction with a soil alternative, would achieve protection of health over a shorter time period because it involves actively treating the contamination in groundwater.

5.2.5 Reduction of Mobility, Toxicity, and/or Volume

Alternative GW-1 offers no reduction in mobility, toxicity, or volume, since no active remediation would be performed. Alternative GW-2 offers no reduction by itself. However, significant reduction can be achieved in GW-1, GW-2, and GW-4 by implementation of soil Alternatives S-3 or S-4. Monitoring will verify reduction of mobility, toxicity, and volume. Alternative GW-3 would provide reduction of contaminant mobility, toxicity, and/or volume via active treatment without implementation of soil alternatives S-3 or S-4.

5.2.6 Implementability

All of the alternatives evaluated are technically feasible. Alternative GW-1 is easiest to implement. Alternative GW-2 and GW-4 are somewhat more difficult to implement, requiring hydraulic modeling to determine locations of monitoring wells and confirmatory sampling, possibly over an extended time period. Alternative GW-3 would be the most difficult to implement because it involves active remediation.

Alternative GW-1 requires no services, equipment, or materials. Services, equipment and materials are readily available for Alternatives GW-2, GW-3, and GW-4. Alternatives GW-2 and GW-4 require consulting services for monitoring and data evaluation, construction services for monitoring network installation, and construction of a soil vapor system and O&M of the system, all of which are readily available. Alternative GW-4 also involves application of permanganate to the top of the bedrock surface in conjunction with soil alternatives S-3 or S-4. Alternative GW-3 would require consulting services and services for treatment implementation as well as O&M. Treatment services and equipment for this alternative are available.

5.2.7 Cost

Alternative GW-1 has no capital costs and no O&M costs. Alternatives GW-2 and GW-4 have higher capital and O&M costs for implementation of monitoring activities, installation of a sub slab vapor system, and subsequent O&M. Alternative GW-3 has the highest capital costs, but lower O&M costs due to the shorter timeframe to achieve the class GA standards (assuming that no soil remediation is performed). Sub slab depressurization will have O&M costs in GW-2, GW-3, and GW-4.

5.3 Comparative Analysis of Sediment Alternatives

5.3.1 Compliance with SCGs

Alternatives SD-3A, SD-3B, and SD-3C remove contaminated sediments from the Site to achieve cleanup objectives. Alternatives SD-1 and SD-2 do not remove contaminated materials from the Site.

5.3.2 Overall Protection of Human Health and the Environment

Alternative SD-3C is the most protective of health and the environment because it would remove contaminated materials to NYSDEC LELs. Alternative SD-3B would re-establish sediment conditions similar to background (pre-release). Alternative SD-3A provides protection of resources by removing contaminated materials to habitat assessment-based PRGs. Alternative SD-2 prevents human exposure through use restrictions, but does not provide any removal or containment that significantly reduces contaminant migration and/or ecological exposure. Alternative SD-1 is the least protective, since it does not remove or treat contaminants nor reduce the risk of exposure.

5.3.3 Short-Term Impact and Effectiveness

Alternatives SD-1 and SD-2 would have the lowest short-term impact. There would be no potential exposures to workers or the public during implementation of these alternatives, since no active remediation would be performed. Alternative SD-3A would have a high short-term impact because it involves excavation of contaminated sediment. Alternatives SD-3B and -3C would have the greatest short-term impacts, since they require extensive excavations of contaminated material. Alternative SD-3A, -3B, -3C could potentially increase risk of exposure to workers and the public. Off-site disposal is also required for Alternatives SD-3A, -3B, -3C. These impacts would be minimized through proper construction and transportation procedures and engineering controls.

5.3.4 Long-Term Effectiveness and Permanence

Alternatives SD-3B and -3C are the most effective at reducing potential exposures to health and the environment. Alternative SD-3A is effective at reducing habitat assessment-based risks to ecological resources. Alternative SD-2 is less effective, since existing contamination, including sources of contamination, would remain. Exposure would be minimized through institutional controls. However, this alternative would not be effective in minimizing ecological risks since ecological exposure would remain. Alternative SD-1 would not be effective, since it would not reduce potential health or ecological risks. Long-term monitoring would be required.

5.3.5 Reduction of Mobility, Toxicity, and/ or Volume

Alternatives SD-3B and -3C offer the most significant reduction in mobility and volume of contaminated soil, since sediments with contaminated material exceeding the most stringent remedial goals or criteria would be removed. Alternative SD-3A offers a significant reduction in mobility and volume. Alternatives SD-1 and SD-2 offer no reduction in mobility, toxicity, or volume.

5.3.6 Implementability

All of the sediment alternatives evaluated are technically feasible. However, SD-3B and SD-3C are the most challenging. Alternative SD-1 is the easiest to implement, since no remedial activities are employed in this alternative. Alternative SD-2 may be easy to implement, involving only institutional controls, however, the sediments are off-site, on private property, which may make use restrictions difficult to implement. Alternatives SD-3A, -3B and -3C would be difficult to implement, as they involve removal of sediments in areas of surface water and wetlands. Control of water and stream flow would be required during implementation of SD-3A, -3B, and -3C. SD-3B and -3C are more difficult to implement because of the acreage involved, remoteness of some locations, and extensive mature wooded wetland system.

Services, equipment, and materials are available for all alternatives. Alternative SD-1 requires no materials or services. Alternative SD-2 requires limited services. Alternatives SD-3A, -3B and -3C require excavation, re-routing of streams and/or dewatering as well as restoration with appropriate material. The quantities of appropriate backfill are substantial; the quantity of backfill material under Alternatives SD-3B and -3C are the largest.

All of the alternatives evaluated are administratively feasible. Alternatives SD-1 and SD-2 would be the easiest to implement (short-term) since no or very limited activity would be performed. The remaining alternatives involve construction activities and associated administrative activities (*e.g.*, permitting, public participation and coordination, etc.). Alternative SD-3A, -3B, and -3C would have some additional coordination requirements for off-site transportation, which the other alternatives would not entail. Alternatives SD-3B and -3C may be very difficult to implement due to the property access issues, disturbances to third party property, and restoration requirements. Long-term institutional management (*e.g.*, monitoring, reporting, public coordination) would be associated with all of the alternatives except SD-1. It may be difficult to obtain access agreements to off-site impacted areas on private properties which would be required for remediation activities and/or implementation of institutional controls associated with Alternatives SD-2, SD-3A, SD-3B and SD-3C. Multiple third party owners are likely to be involved.

5.3.7 Cost

Alternative SD-1 has no capital costs and minimal O&M costs associated with periodic reviews. Alternative SD-2 has the next lowest capital and O&M costs for implementation of institutional controls. Removal alternatives have the highest capital and O&M costs (ranging in cost based on standards and criteria). Overall, the ranking of the alternatives based on net present value (capital and O&M) from lowest to highest is: SD-1, SD-2, SD-3A, SD-3B, and SD-3C.

6.0 PROPOSED REMEDIAL ALTERNATIVE

This section presents the proposed alternative for each media based on the evaluations presented in the previous sections. As noted in these evaluations, there are inter-relationships between the media-specific alternatives. Therefore, the media-specific alternative proposals are followed by a description of the overall proposed plan for site remediation that describes these inter-relationships and how the proposed alternatives result in the most effective overall remediation plan for the Site.

6.1 Media-specific Alternative Proposal

The following sections describe the proposed remedial alternatives for each media.

6.1.1 Soil Remedial Alternative

Based on the evaluation of soil alternatives, S-3 (Removal of COCs in Soil Exhibiting Concentrations in Excess of NYSDEC Restricted Use SCOs and Building Demolition) is proposed.

Removal of the sources of COCs in soil in excess of NYSDEC Restricted Use SCOs would be protective of human health and the environment and would provide protection against further migration and transfer into other media. As a result of the soil removal, the impacted groundwater will also be mitigated. Removed soils will be replaced with clean fill or site backfill (if below SCOs).

6.1.2 Groundwater Remedial Alternative

The proposed alternative for groundwater is Alternative GW-4 (Limited Permanganate Application, Groundwater Monitoring, and Sub Slab Vapor Mitigation). Environmental easements will be implemented to protect against potable water wells being drilled and installed on-site. Based on data collected during the RI, there are no potable groundwater wells on-site or in the near vicinity that pose an exposure. Implementation of S-3 will immediately mitigate the impacted contaminated groundwater and bring groundwater into compliance with Class GA standards within the excavation area. In conjunction with S-3, GW-4 will also include a one-time permanganate application to the top of the bedrock surface which will be beneficial to enhancing restoration of groundwater.

Installation of a sub slab depressurization system to address elevated VOC concentrations is also included in this alternative, to mitigate the potential for sub slab vapor intrusion.

6.1.3 Sediment Remedial Alternative

Based on the evaluation of sediment alternatives, SD-3A (Removal of Metals-Impacted Sediments above PRGs) is the proposed remedy.

Removal of impacted sediments to the habitat assessment-based PRGs will provide protection against further sediment system impacts.

6.2 Proposed Plan for Site Remediation

The proposed plan for the site remediation incorporates Alternatives S-3, GW-4, and SD-3A. Implementation of Alternative S-3 will remove COCs to meet chemical-specific SCGs. An added benefit of S-3 is that the impacted groundwater is also remediated in excavation areas via removal of overburden soils. Because the most significant groundwater impacted areas are addressed during S-3, the recommendation of Alternative GW-4 can be made and any potential future risk of exposure to groundwater can be controlled by institutional controls that prevent the installation of wells or usage of groundwater for potable supply at the Site. Furthermore, permanganate would be added to the bedrock surface, which will enhance restoration of groundwater. Groundwater would be monitored by a monitoring well system subject to periodic reviews. Operation of the sub slab vapor mitigation system will also provide positive benefit. Implementation of Alternative SD-3A will remove contaminated sediments which will mitigate potential current and future risks based upon the RI Habitat Assessment.

The overall net present value based on a 30-year period of performance for implementation of the selected remedy (i.e., S-3, GW-4, and SD-3A) is $6,621,000.

7.0 REFERENCES

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LEGEND

Location has contamination concentration in excess of restricted commercial, protection of public health, protection of ecological resources, and/or protection of groundwater soil cleanup objectives

Location has no contamination concentrations in excess of comparison criteria

SS-15 (Background)
SS-801
SS-802
SS-803
SS-13 (Background)
SS-14 (Background)
SS-04 (Background)
FURNACE BROOK
MACADAM PARKING AREA
FORMER MAGNA METALS BUILDING
1 AND 2 STORY CONCRETE BLOCK BUILDING
LP-09
LP-0A
RA
LP-08
LP-07
LP-06
LP-06A
LP-05
LP-04
LP-03
LP-02
SS-06
SB-06
SS-09
SS-07
SB-05
MW-04
SB-07
SS-03
SB-04
SS-11
MW-03
SB-03
SS-02
SS-12
SS-01
ST-02
MW-02
SB-02
ST-01
SB-01
SS-08
SS-10
SB-801
SB-802
SHED
1 STORY CONCRETE BLOCK BUILDING
APPROXIMATE PROPERTY LINE
SS-05
MW-01
WETLAND AREA
POND
360
320
N
0 50 100
FEET

TETRA TECH EC, INC.

TITLE:
Exceedances of Comparison Criteria in Soil (Inorganics)
Magna Metals
Cortlandt, New York

DWN.:	DATE:	PROJECT NO.:
LMC	12/09/10	106-1172
CHKD:	REV.:	FIGURE NO.:
RC	0	1-1
DES.:	APPD:	
LMC	RC	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 1-1 N&E OF SOIL INORGANICS 120910.DWG

LEGEND

Location has contamination concentrations in excess of Unrestricted Soil Cleanup Objectives only

Location has contamination concentration in excess of restricted commercial, protection of public health, protection of ecological resources, and/or protection of groudnwater soil cleanup objectives

Location has no contamination concentrations in excess of comparison criteria

SS-15 (Background)
SS-801
SS-802
SS-803
SS-13 (Background)
SS-14 (Background)
SS-04 (Background)
FURNACE BROOK
MACADAM PARKING AREA
FORMER MAGNA METALS BUILDING
1 AND 2 STORY CONCRETE BLOCK BUILDING
LP-09
LP-0A
RA
LP-08
LP-07
LP-06
LP-06A
LP-05
LP-04
LP-03
LP-02
SS-06
SB-06
SS-09
SS-07
SB-05
MW-04
SB-07
SS-03
SB-04
SS-11
MW-03
SB-03
SS-02
SS-12
SS-01
ST-02
MW-02
SB-02
ST-01
SB-01
SS-08
SS-10
SB-801 SB-802
SHED
APPROXIMATE PROPERTY LINE
1 STORY CONCRETE BLOCK BUILDING
SS-05
MW-01
WETLAND AREA
POND
360
320
N
0 50 100
FEET

TETRA TECH EC, INC.

TITLE:
Exceedances of Comparison Criteria in Soil (Organics)
Magna Metals
Cortlandt, New York

DWN.: LMC	DATE: 12/09/10	PROJECT NO.: 106-1172	
CHKD: RC	REV.: 0	FIGURE NO.: 1-2	
DES.: LMC	APPD: RC		

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 1-2 N&E OF SOIL ORGANICS 120910.DWG

LEGEND

Location has contamination concentrations in excess of 2002 OSWER Draft Guidance – Target Shallow Soil Gas Concentration Screening Levels (Risk = 1E–4) for 1,3–Butadiene.

Location has contamination concentrations in excess of 2002 OSWER Draft Guidance – Target Shallow Soil Gas Concentration Screening Levels (Risk = 1E–4) for Trichloroethene

Location has contamination concentrations in excess of 2002 OSWER Draft Guidance – Target Shallow Soil Gas Concentration Screening Levels (Risk = 1E–4) for 1,3–Butadiene AND Trichloroethene

Location has no contamination concentrations in excess of 2002 OSWER Draft Guidance – Target Shallow Soil Gas Concentration Screening Levels (Risk = 1E–4)

N

0 25 50
FEET

FORMER
MAGNA METALS
BUILDING

SV–04
SV–05
SV–06
SV–07
SV–08
SV–01
SV–02
SV–03
SV–09

SHED

APPROXIMATE PRO

1 STORY
CONCRETE
BLOCK BU

TETRA TECH EC, INC.

TITLE:
Exceedances of Comparison Criteria in Soil Vapor
Magna Metals
Cortlandt, New York

DWN.: LMC	DATE: 12/09/10	PROJECT NO.: 106–1172	
CHKD: RC	REV.: 1	FIGURE NO.: 1–3	
DES.: LMC	APPD: RC		

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 1–3 N&E OF SOIL VAPOR 120910.DWG

LEGEND

SB–01 ● SOIL BORING LOCATION

LP–02 ▽ LEACH PIT LOCATION

MW–01 ◆ MONITORING WELL LOCATION

SS–08 ■ SURFACE SOIL SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SURFACE SOIL LOCATIONS SS–01 TO SS–05 AND ALL SOIL BORING LOCATIONS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

3. SURFACE SOIL LOCATIONS SS–06 TO SS–15 ARE BASED ON GPS COORDINATES.

FT BGS – FEET BELOW GROUND SURFACE
MG/KG – MILLIGRAM PER KILOGRAM
UG/KG – MICROGRAM PER KILOGRAM
COC – CONTAMINANT OF CONCERN
NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

QUALIFIERS:
D – FROM A DILUTED SAMPLE
J – ESTIMATED
N – PRESUMPTIVELY PRESENT
P – COMPOUND HAD A GREATER THAN 25% DIFFERENCE FOR THE DETECTED CONCENTRATION BETWEEN THE TWO GAS CHROMATOGRAPH COLUMNS.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

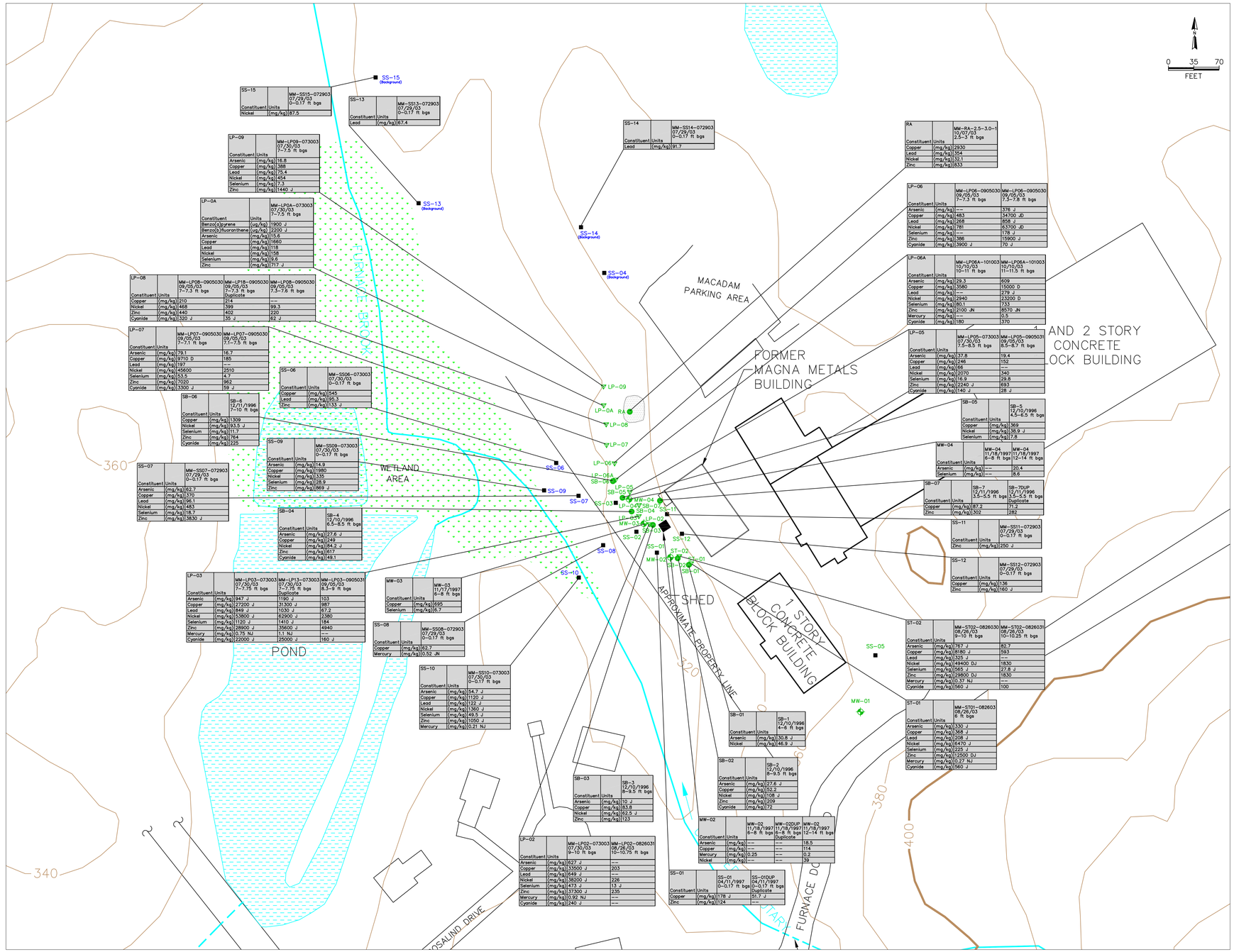
5. TOPOGRAPHIC LINES ARE APPROXIMATE.

COMPARISION CRITERIA FOR SAMPLE LOCATIONS IN GREEN (ON–SITE)

Constituent	Units	Protection of Ecological Resources	Protection of Groundwater	Protection of Public Health - Commercial
Benzo(a)pyrene	(ug/kg)	2600	22000	1000
Benzo(b)fluoranthene	(ug/kg)	NC	1700	5600
Arsenic	(mg/kg)	13	16	16
Chromium	(mg/kg)	41	NC	1500
Copper	(mg/kg)	50	1720	270
Lead	(mg/kg)	63	450	1000
Mercury	(mg/kg)	0.18	0.73	2.8
Nickel	(mg/kg)	30	130	310
Selenium	(mg/kg)	3.9	4	1500
Zinc	(mg/kg)	109	2480	10000
Cyanide	(mg/kg)	NC	40	27

COMPARISION CRITERIA FOR SAMPLE LOCATIONS IN BLUE (OFF–SITE)

Constituent	Units	Protection of Ecological Resources	Protection of Groundwater	Protection of Public Health - Residential
Arsenic	(mg/kg)	13	16	16
Chromium	(mg/kg)	41	NC	36
Copper	(mg/kg)	50	1720	270
Lead	(mg/kg)	63	450	400
Mercury	(mg/kg)	0.18	0.73	0.81
Nickel	(mg/kg)	30	130	140
Selenium	(mg/kg)	3.9	4	36
Zinc	(mg/kg)	109	2480	2200



SS-15		MM–SS15–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Nickel	(mg/kg)	87.5

SS-13		MM–SS13–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Lead	(mg/kg)	67.4

SS-14		MM–SS14–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Lead	(mg/kg)	91.7

LP–09		MM–LP09–073003 07/30/03 7–7.5 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	16.8
Copper	(mg/kg)	388
Lead	(mg/kg)	75.4
Nickel	(mg/kg)	454
Selenium	(mg/kg)	7.3
Zinc	(mg/kg)	1440 J

LP–0A		MM–LP0A–073003 07/30/03 7–7.5 ft bgs
Constituent	Units	
Benzo(a)pyrene	(ug/kg)	1900 J
Benzo(b)fluoranthene	(ug/kg)	2200 J
Arsenic	(mg/kg)	15.6
Copper	(mg/kg)	1660
Lead	(mg/kg)	118
Nickel	(mg/kg)	158
Selenium	(mg/kg)	9.6
Zinc	(mg/kg)	717 J

RA		MM–RA–2.5–3.0–1 10/07/03 2.5–3 ft bgs
Constituent	Units	
Copper	(mg/kg)	2930
Lead	(mg/kg)	354
Nickel	(mg/kg)	32.1
Zinc	(mg/kg)	833

LP–06		MM–LP06–0905030 09/05/03 7–7.3 ft bgs	MM–LP06–0905030 09/05/03 7.5–7.8 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	---	376 J
Copper	(mg/kg)	483	34700 JD
Lead	(mg/kg)	268	858 J
Nickel	(mg/kg)	781	63700 JD
Selenium	(mg/kg)	---	178 J
Zinc	(mg/kg)	386	15900 J
Cyanide	(mg/kg)	3900 J	70 J

LP–06A		MM–LP06A–101003 10/10/03 10–11 ft bgs	MM–LP06A–101003 10/10/03 11–11.5 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	29.3	609
Copper	(mg/kg)	3580	15000 D
Lead	(mg/kg)	---	279 J
Nickel	(mg/kg)	2940	23200 D
Selenium	(mg/kg)	80.1	733
Zinc	(mg/kg)	2100 JN	8570 JN
Mercury	(mg/kg)	---	0.5
Cyanide	(mg/kg)	180	370

LP–08		MM–LP08–0905030 09/05/03 7–7.3 ft bgs	MM–LP18–0905030 09/05/03 7–7.3 ft bgs Duplicate	MM–LP08–0905030 09/05/03 7.3–7.6 ft bgs
Constituent	Units			
Copper	(mg/kg)	210	214	---
Nickel	(mg/kg)	468	399	99.3
Zinc	(mg/kg)	460	402	220
Cyanide	(mg/kg)	320 J	35 J	62 J

LP–07		MM–LP07–0905030 09/05/03 7–7.1 ft bgs	MM–LP07–0905030 09/05/03 7.1–7.5 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	79.1	16.7
Copper	(mg/kg)	9710 D	185
Lead	(mg/kg)	197	---
Nickel	(mg/kg)	45600	2510
Selenium	(mg/kg)	53.5	4.7
Zinc	(mg/kg)	7020	962
Cyanide	(mg/kg)	3300 J	59 J

SS–06		MM–SS06–073003 07/30/03 0–0.17 ft bgs
Constituent	Units	
Copper	(mg/kg)	545
Lead	(mg/kg)	95.3
Zinc	(mg/kg)	133 J

SB–06		SB–6 12/10/1996 7–10 ft bgs
Constituent	Units	
Copper	(mg/kg)	1309
Nickel	(mg/kg)	93.5 J
Selenium	(mg/kg)	11.7
Zinc	(mg/kg)	764
Cyanide	(mg/kg)	225

SS–09		MM–SS09–073003 07/30/03 0–0.17 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	14.9
Copper	(mg/kg)	1980
Nickel	(mg/kg)	335
Selenium	(mg/kg)	28.9
Zinc	(mg/kg)	869 J

SS–07		MM–SS07–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	62.7
Copper	(mg/kg)	370
Lead	(mg/kg)	96.1
Nickel	(mg/kg)	483
Selenium	(mg/kg)	18.7
Zinc	(mg/kg)	3830 J

SB–04		SB–4 12/10/1996 6.5–8.5 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	27.6 J
Copper	(mg/kg)	249
Nickel	(mg/kg)	84.2 J
Zinc	(mg/kg)	617
Cyanide	(mg/kg)	49.1

LP–03		MM–LP03–073003 07/30/03 7–7.75 ft bgs	MM–LP13–073003 07/30/03 7–7.75 ft bgs Duplicate	MM–LP03–0905031 09/05/03 8.3–9 ft bgs
Constituent	Units			
Arsenic	(mg/kg)	947 J	1190 J	103
Copper	(mg/kg)	27200 J	31300 J	987
Lead	(mg/kg)	849 J	1030 J	67.2
Nickel	(mg/kg)	53800 J	62900 J	2380
Selenium	(mg/kg)	1120 J	1410 J	184
Zinc	(mg/kg)	28900 J	35600 J	4940
Mercury	(mg/kg)	0.75 NJ	1.1 NJ	---
Cyanide	(mg/kg)	22000 J	25000 J	160 J

MW–03		MW–03 11/17/1997 6–8 ft bgs
Constituent	Units	
Copper	(mg/kg)	695
Selenium	(mg/kg)	6.7

SS–08		MM–SS08–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Copper	(mg/kg)	62.7
Mercury	(mg/kg)	0.52 JN

SS–10		MM–SS10–073003 07/30/03 0–0.17 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	54.7 J
Copper	(mg/kg)	1120 J
Lead	(mg/kg)	122 J
Nickel	(mg/kg)	1360 J
Selenium	(mg/kg)	49.5 J
Zinc	(mg/kg)	1050 J
Mercury	(mg/kg)	0.21 NJ

SB–03		SB–3 12/10/1996 8–9.5 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	10 J
Copper	(mg/kg)	83.8
Nickel	(mg/kg)	62.5 J
Zinc	(mg/kg)	123

LP–02		MM–LP02–073003 07/30/03 9–10 ft bgs	MM–LP02–082603 08/26/03 10–10.75 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	627 J	---
Copper	(mg/kg)	33500 J	203
Lead	(mg/kg)	649 J	---
Nickel	(mg/kg)	38200 J	226
Selenium	(mg/kg)	473 J	13 J
Zinc	(mg/kg)	37300 J	235
Mercury	(mg/kg)	10.92 NJ	---
Cyanide	(mg/kg)	240 J	---

SB–01		SB–1 12/10/1996 4–6 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	30.8 J
Nickel	(mg/kg)	46.9 J

SB–02		SB–2 12/10/1996 8–9.5 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	27.6 J
Copper	(mg/kg)	52.2
Nickel	(mg/kg)	108 J
Zinc	(mg/kg)	209
Cyanide	(mg/kg)	72

MW–02		MW–02 11/18/1997 6–8 ft bgs	MW–02DUP 11/18/1997 6–8 ft bgs Duplicate	MW–02 11/18/1997 12–14 ft bgs
Constituent	Units			
Arsenic	(mg/kg)	---	---	18.5
Copper	(mg/kg)	---	---	114
Mercury	(mg/kg)	0.25	---	0.2
Nickel	(mg/kg)	---	---	39

SS–01		SS–01 04/11/1997 0–0.17 ft bgs	SS–01DUP 04/11/1997 0–0.17 ft bgs Duplicate
Constituent	Units		
Copper	(mg/kg)	178 J	51.7 J
Zinc	(mg/kg)	124	---

SB–05		SB–5 12/10/1996 4.5–6.5 ft bgs
Constituent	Units	
Copper	(mg/kg)	369
Nickel	(mg/kg)	38.9 J
Selenium	(mg/kg)	7.8

MW–04		MW–04 11/18/1997 6–8 ft bgs	MW–04 11/18/1997 12–14 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	---	20.4
Selenium	(mg/kg)	---	8.6

SB–07		SB–7 12/10/1996 3.5–5.5 ft bgs	SB–70UP 12/11/1996 3.5–5.5 ft bgs Duplicate
Constituent	Units		
Copper	(mg/kg)	87.2	71.2
Zinc	(mg/kg)	302	282

SS–11		MM–SS11–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Zinc	(mg/kg)	250 J

SS–12		MM–SS12–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Copper	(mg/kg)	136
Zinc	(mg/kg)	160 J

ST–02		MM–ST02–0826030 08/26/03 9–10 ft bgs	MM–ST02–0826031 08/26/03 10–10.25 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	767 J	82.7
Copper	(mg/kg)	8180 J	593
Lead	(mg/kg)	325 J	---
Nickel	(mg/kg)	48400 DJ	1830
Selenium	(mg/kg)	565 J	27.8 J
Zinc	(mg/kg)	29800 DJ	1830
Mercury	(mg/kg)	0.37 NJ	---
Cyanide	(mg/kg)	560 J	100

ST–01		MM–ST01–082603 08/26/03 6 ft bgs
Constituent	Units	
Arsenic	(mg/kg)	330 J
Copper	(mg/kg)	368 J
Lead	(mg/kg)	208 J
Nickel	(mg/kg)	6470 J
Selenium	(mg/kg)	225 J
Zinc	(mg/kg)	12500 DJ
Mercury	(mg/kg)	0.27 NJ
Cyanide	(mg/kg)	560 J

SS–05		MM–SS05–072903 07/29/03 0–0.17 ft bgs
Constituent	Units	
Copper	(mg/kg)	1180 J
Lead	(mg/kg)	1020 J
Nickel	(mg/kg)	1130 J
Zinc	(mg/kg)	1020 J

LP–05		MM–LP05–073003 07/30/03 7.5–8.5 ft bgs	MM–LP05–090503 09/05/03 8.5–8.7 ft bgs
Constituent	Units		
Arsenic	(mg/kg)	37.8	19.4
Copper	(mg/kg)	246	152
Lead	(mg/kg)	66	---
Nickel	(mg/kg)	2070	340
Selenium	(mg/kg)	16.9	29.8
Zinc	(mg/kg)	2240 J	693
Cyanide	(mg/kg)	140 J	28 J

TETRA TECH EC, INC.

TITLE:
COCs in Excess of NYSDEC Residential (Off–Site) and Restricted Commercial (On–Site) Soil Cleanup Objectives in Soil
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	LMC	106–1172
CHKD:	APPD:	FIGURE NO.:
EAG	MS	2–1
DATE:	REV.:	
12/09/10	1	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 2–1 SOIL EXCEEDANCES 120910.DWG

LEGEND

SB-01 ● SOIL BORING LOCATION
LP-02 ▽ LEACH PIT LOCATION
MW-01 ⊕ MONITORING WELL LOCATION
SS-08 ■ SURFACE SOIL SAMPLE LOCATION
320 CONTOUR LINE (20 FT INTERVAL)
APPROXIMATE REFUSE AREA
APPROXIMATE WETLAND AREA

NOTES:
1. SURFACE SOIL LOCATIONS SS-01 TO SS-05 AND ALL SOIL BORING LOCATIONS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

3. SURFACE SOIL LOCATIONS SS-06 TO SS-15 ARE BASED ON GPS COORDINATES.

FT BGS – FEET BELOW GROUND SURFACE
MG/KG – MILLIGRAM PER KILOGRAM
UG/KG – MICROGRAM PER KILOGRAM
COC – CONTAMINANT OF CONCERN
NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

QUALIFIERS:
D – FROM A DILUTED SAMPLE
J – ESTIMATED
N – PRESUMPTIVELY PRESENT
P – COMPOUND HAD A GREATER THAN 25% DIFFERENCE FOR THE DETECTED CONCENTRATION BETWEEN THE TWO GAS CHROMATOGRAPH COLUMNS.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

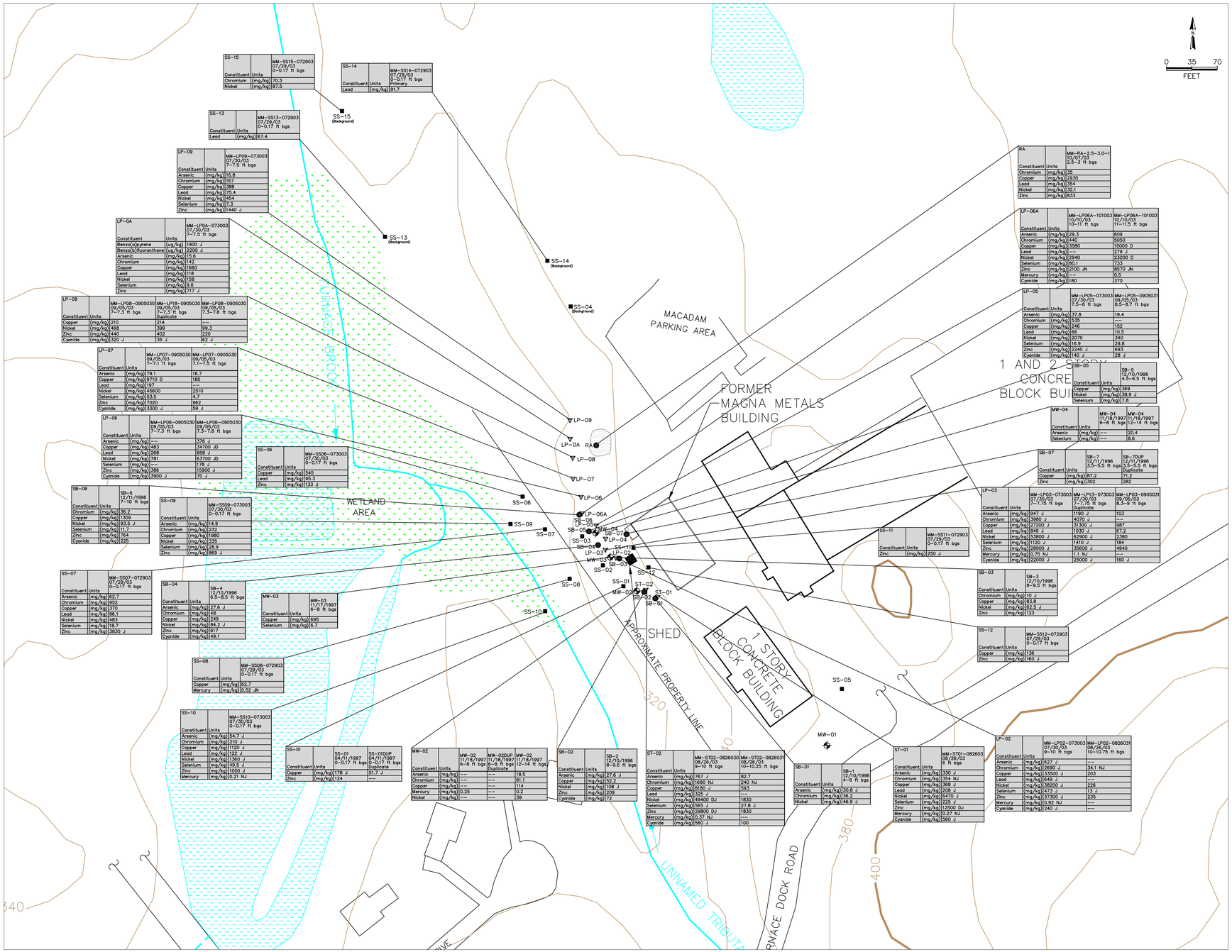
3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

COMPARISION CRITERIA FOR ALL SAMPLE LOCATIONS

Constituent	Units	Unrestricted Use Soil Cleanup Objective
Benzo(a)pyrene	(ug/kg)	1000
Benzo(b)fluoranthene	(ug/kg)	1000
Arsenic	(mg/kg)	13
Chromium	(mg/kg)	30
Copper	(mg/kg)	50
Lead	(mg/kg)	63
Mercury	(mg/kg)	0.18
Nickel	(mg/kg)	30
Selenium	(mg/kg)	3.9
Zinc	(mg/kg)	109
Cyanide	(mg/kg)	27



TETRA TECH EC, INC.	TITLE: COCs in Excess of Unrestricted-Use NYSDEC Soil Cleanup Objectives in Soil Magna Metals Cortlandt, New York	DWN: LMC	DES.: LMC	PROJECT NO.: 106-1172
		CHKD: EAG	APPD: MS	FIGURE NO.: 2-2
		DATE: 12/10/09	REV.: 0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-2 SOIL EXCEEDANCES (UNRESTRICTED) 121009.DWG

LEGEND

MW–02 ⊕ GROUNDWATER SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:

1. ALL UNITS IN UG/L.
2. D – FROM A DILUTED SAMPLE.
3. ONLY THE MOST RECENT SAMPLING ROUND FOR EACH PARAMETER IS SHOWN.
4. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

Constituent	New York Groundwater Quality Standard
Tetrachloroethene	5
Trichloroethene	5
cis-1,2-Dichloroethene	5
Arsenic	25
Chromium	50
Copper	200
Nickel	100
Selenium	10
Cyanide	200

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.
2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.
3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.
4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.
5. TOPOGRAPHIC LINES ARE APPROXIMATE.

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FEET

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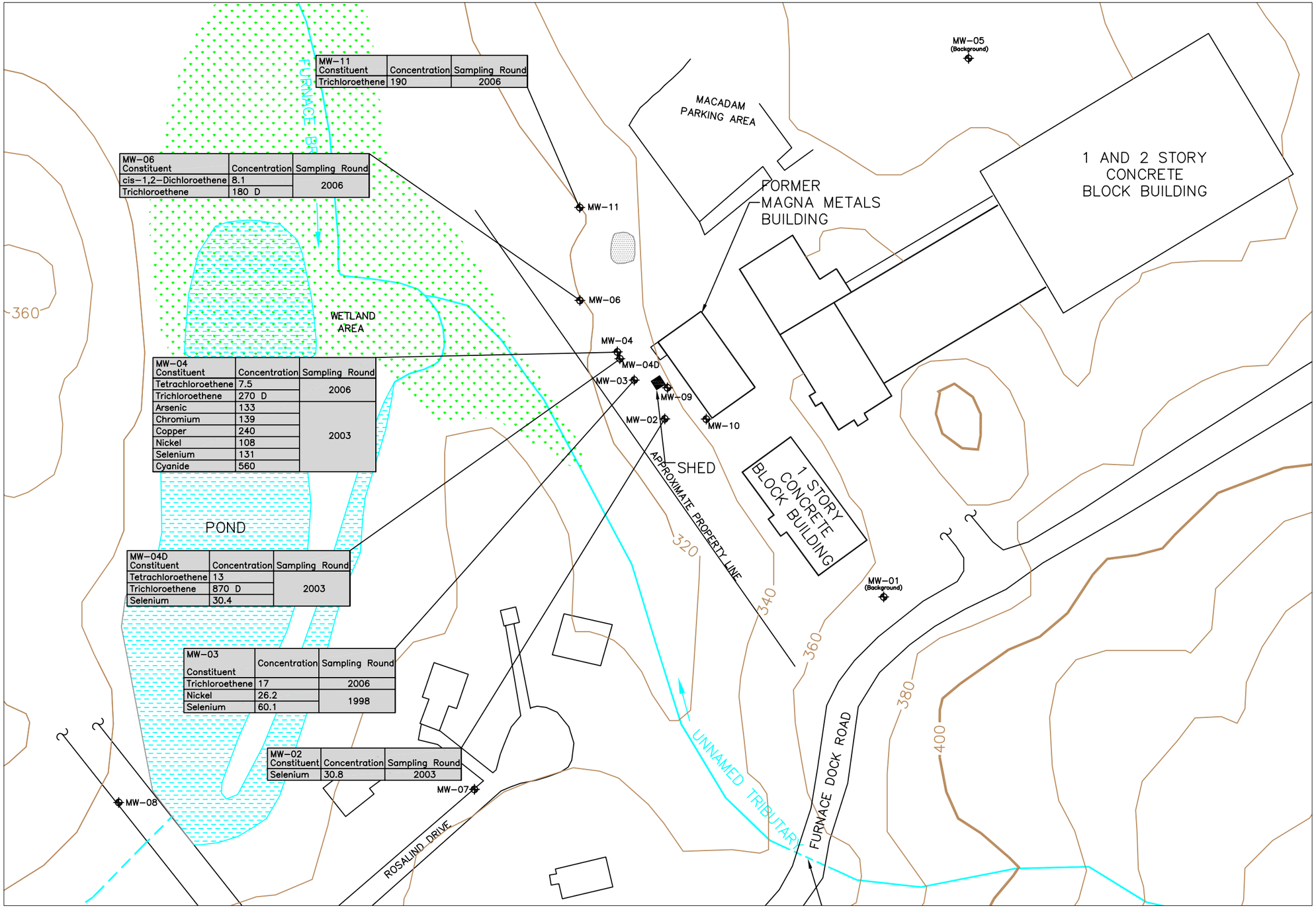


TETRA TECH EC, INC.

TITLE:
Contaminants of Concern in Excess of Class GA Groundwater Quality Criteria
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106–1172
CHKD:	APPD:	FIGURE NO.:
DATE: 12/10/09	REV.: 0	2–3

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2–3 GW 121009.DWG

LEGEND

SD-18 220 ◆ SEDIMENT SAMPLE LOCATION (FURNACE/POND) COPPER CONCENTRATION IN MG/KG

SD-10 60 ◆ SEDIMENT SAMPLE LOCATION (UNNAMED TRIB) COPPER CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

NOTE: ONE COLOR REPRESENTS TWO DIFFERENT HABITAT ASSESSMENT-BASED CRITERIA FOR THE TWO SEPARATE AREAS FOR THE PURPOSES OF DEVELOPING REMEDIAL ALTERNATIVES.

FURNACE BROOK/UNNAMED POND SYSTEM NOTE:

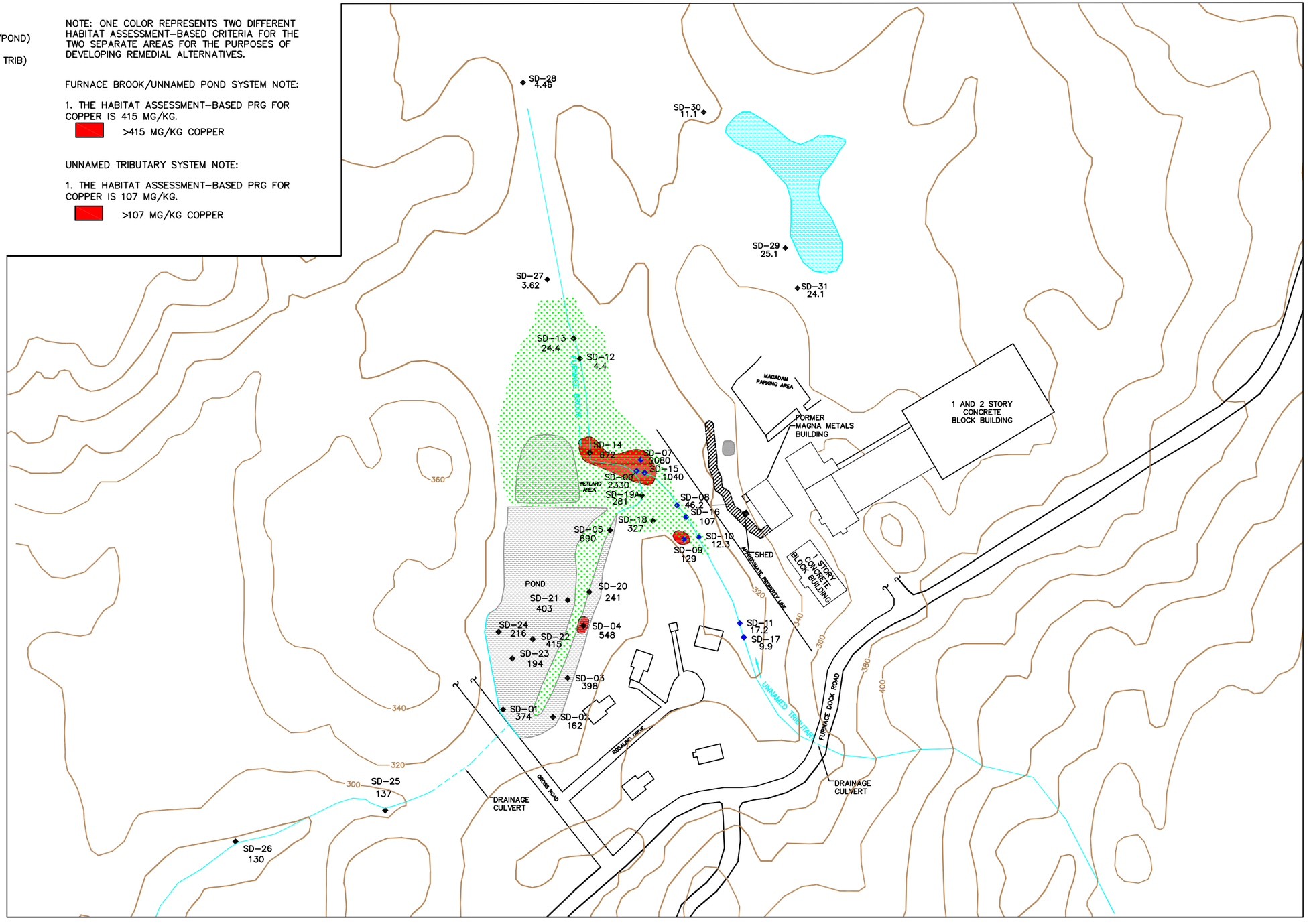
1. THE HABITAT ASSESSMENT-BASED PRG FOR COPPER IS 415 MG/KG.

>415 MG/KG COPPER

UNNAMED TRIBUTARY SYSTEM NOTE:

1. THE HABITAT ASSESSMENT-BASED PRG FOR COPPER IS 107 MG/KG.

>107 MG/KG COPPER



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FEET

N

TETRA TECH EC, INC.

TITLE:
Copper in Off-Site Sediment Above Habitat Assessment-Based PRGs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		2-4
DATE:	REV.:	
12/10/09	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-4 COPPER IN OFF-SITE SED 121009.DWG

LEGEND

SD-18 220 ◆ SEDIMENT SAMPLE LOCATION (FURNACE/POND) NICKEL CONCENTRATION IN MG/KG

SD-10 60 ◆ SEDIMENT SAMPLE LOCATION (UNNAMED TRIB) NICKEL CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTE: ONE COLOR REPRESENTS TWO DIFFERENT HABITAT ASSESSMENT-BASED CRITERIA FOR THE TWO SEPARATE AREAS FOR THE PURPOSES OF DEVELOPING REMEDIAL ALTERNATIVES.

FURNACE BROOK/UNNAMED POND SYSTEM NOTES

1. THE HABITAT ASSESSMENT-BASED PRG FOR NICKEL IS 200 MG/KG.

>200 MG/KG NICKEL

UNNAMED TRIBUTARY SYSTEM NOTE:

1. THE HABITAT ASSESSMENT-BASED PRG FOR NICKEL IS 143 MG/KG.

>143 MG/KG NICKEL

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

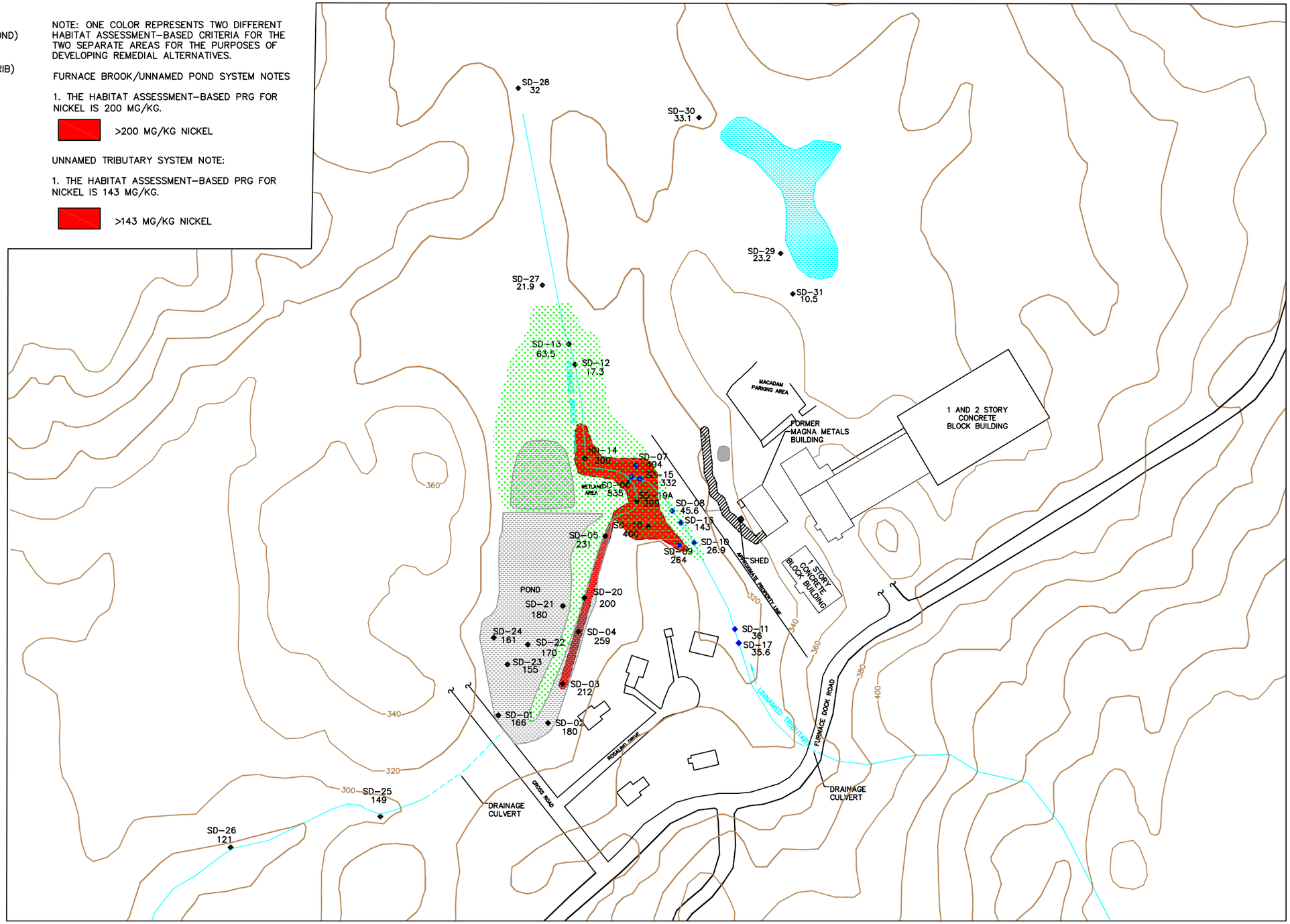
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



0 125 250
FEET

N

TETRA TECH EC, INC.

TITLE:
Nickel in Off-Site Sediment Above Habitat Assessment-Based PRGs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 12/10/09	REV.: 0	2-5

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-5 NICKEL IN OFF-SITE SED 121009.DWG

LEGEND

SD-18 ◆ 220 SEDIMENT SAMPLE LOCATION COPPER CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

1. THE PRE-RELEASE REMEDIAL GOAL FOR COPPER IS 13.7 MG/KG.

2. THE NYSDEC LEL FOR COPPER IS 16 MG/KG.

3. CONCENTRATIONS FROM UPGRADIENT SAMPLES SD-12, SD-13, AND SD-29 THROUGH SD-31 ARE EXCLUDED IN CONCEPTUAL ILLUSTRATIONS.

4. EXCEEDANCES OF THE PRE-RELEASE REMEDIAL GOAL FOR COPPER ARE CO-LOCATED WITHIN THE AREA OF THE NYSDEC LEL EXCEEDANCES.

13.7-16 MG/KG COPPER

> 16 MG/KG COPPER

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

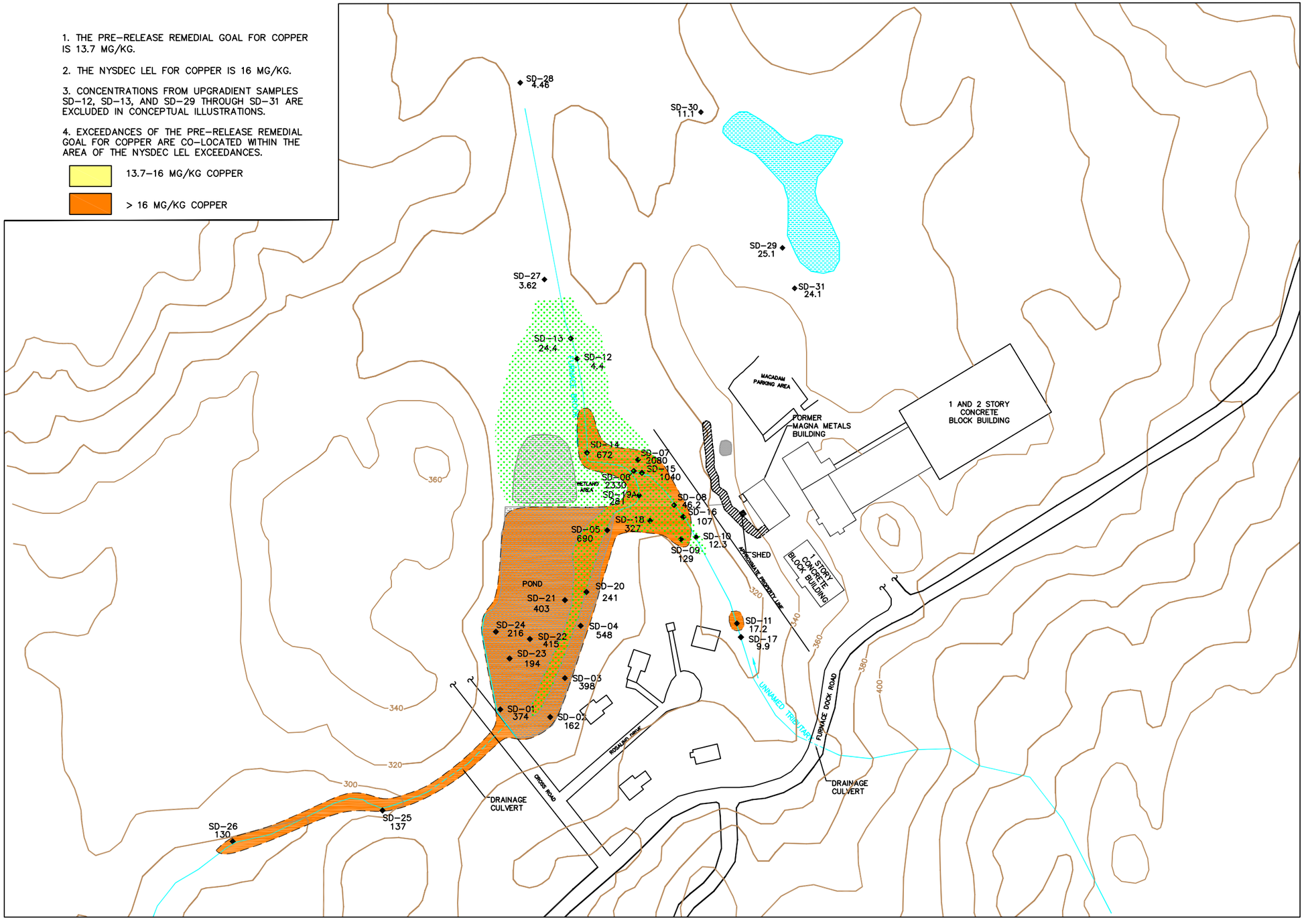
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



0 125 250
FEET

N

TETRA TECH EC, INC.

TITLE:
Copper in Off-Site Sediment Above Pre-Release Conditions and LELs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 12/10/09	REV.: 0	2-6

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-6 COPPER SED PRE-RELEASE AND LEL 121009.DWG

LEGEND

SD-18 ◆ 220 SEDIMENT SAMPLE LOCATION NICKEL CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

1. THE PRE-RELEASE REMEDIAL GOAL FOR NICKEL IS 24.1 MG/KG.

2. THE NYSDEC LEL FOR NICKEL IS 16 MG/KG.

3. CONCENTRATIONS FROM UPGRADIENT SAMPLES SD-12, SD-13, AND SD-29 THROUGH SD-21 ARE EXCLUDED IN CONCEPTUAL ILLUSTRATIONS.

4. EXCEEDANCES OF THE NYSDEC LEL FOR NICKEL ARE CO-LOCATED WITHIN THE AREA OF THE PRE-RELEASE EXCEEDANCES.

16-24.1 MG/KG NICKEL

> 24.1 MG/KG NICKEL

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

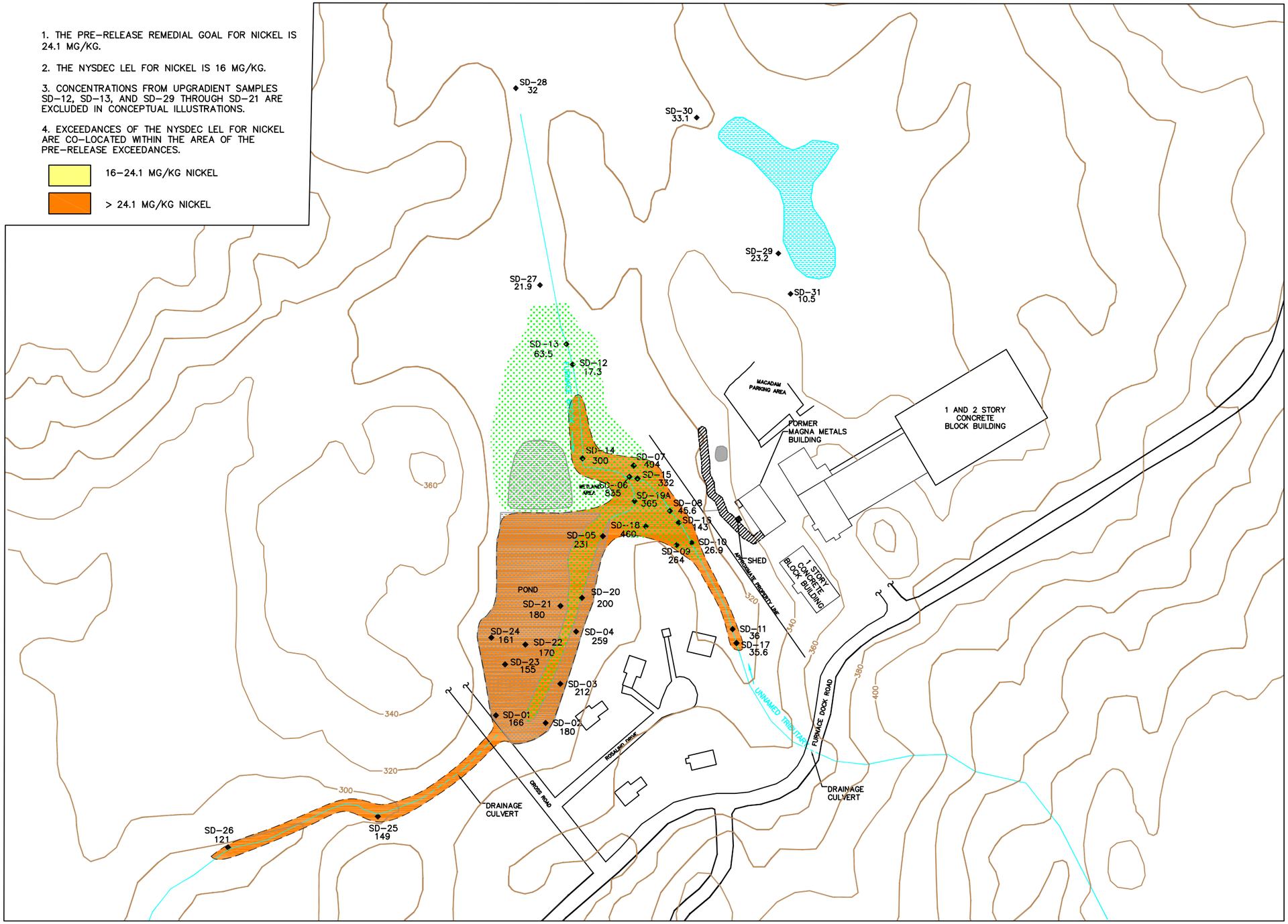
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



0 125 250
FEET

N

TETRA TECH EC, INC.

TITLE:
Nickel in Off-Site Sediment Above Pre-Release Conditions and LELs
Magna Metals
Cortlandt, New York

DWN: LMC	DES.: EAG	PROJECT NO.: 106-1172	
CHKD:	APPD:	FIGURE NO.: 2-7	
DATE: 12/10/09	REV.: 0		

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-7 NICKEL SED PRE-RELEASE AND LEL 121009.DWG

LEGEND

SD-18 ◆ 290 SEDIMENT SAMPLE LOCATION ZINC CONCENTRATION IN MG/KG

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

1. THE PRE-RELEASE REMEDIAL GOAL FOR ZINC IS 54.1 MG/KG.

2. THE NYSDEC LEL FOR ZINC IS 120 MG/KG.

3. CONCENTRATIONS FROM UPGRADIENT SAMPLES SD-12, SD-13, AND SD-29 THROUGH SD-21 ARE EXCLUDED IN CONCEPTUAL ILLUSTRATIONS.

54.1-120 MG/KG ZINC

> 120 MG/KG ZINC

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. SD-27 THROUGH SD-31 ARE BACKGROUND SAMPLE LOCATIONS.

3. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

4. THE EXTENT OF THE CONTAMINATED AREA IS APPROXIMATE.

5. SAMPLE LOCATIONS FOR SD-13 TO SD-26 ARE BASED ON GPS COORDINATES.

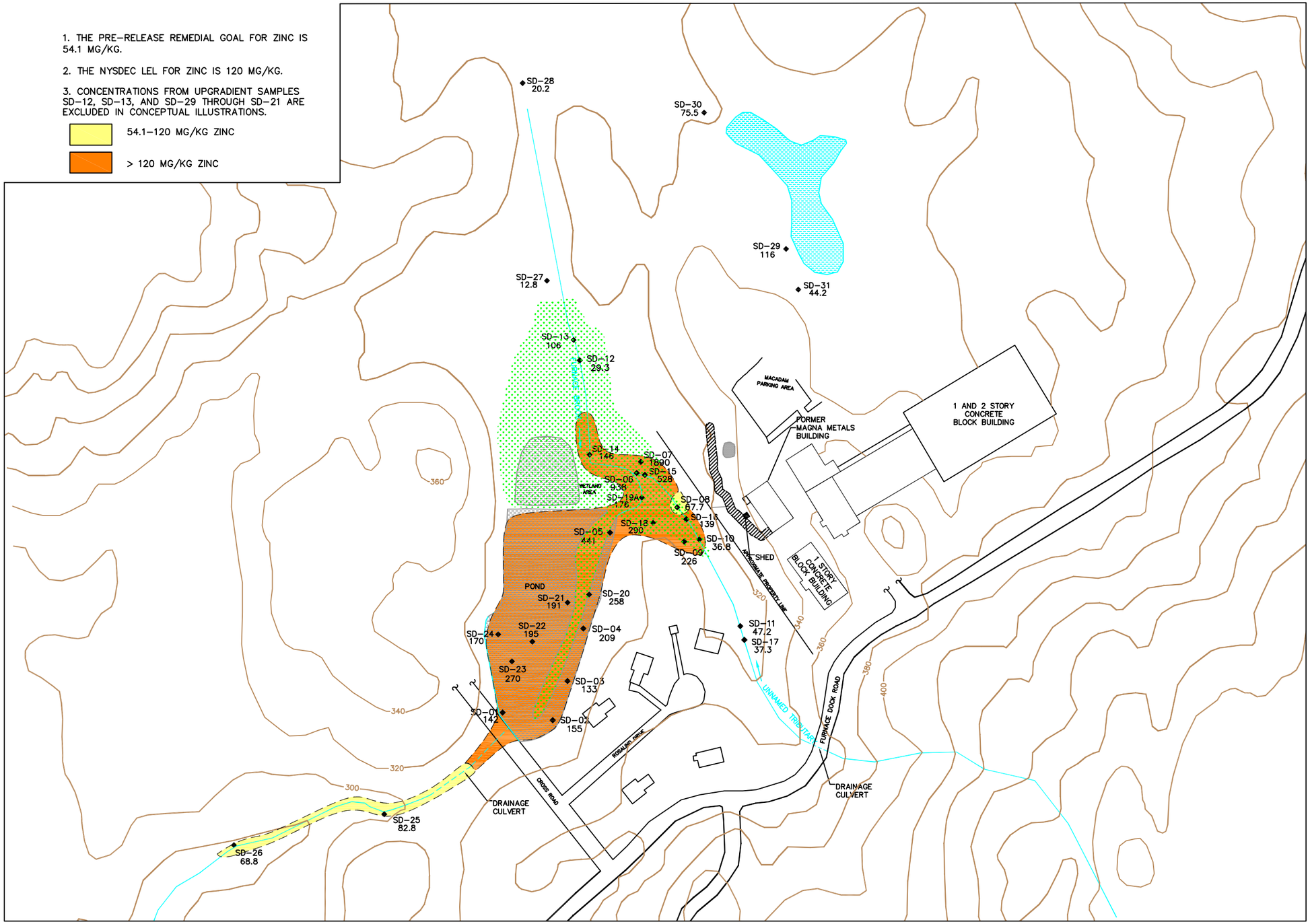
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



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FEET

N

TETRA TECH EC, INC.

TITLE:
Zinc in Off-Site Sediment Above Pre-Release Conditions and LELs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
		2-8
DATE:	REV.:	
12/10/09	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 2-8 ZINC SED PRE-RELEASE AND LEL 121009.DWG

LEGEND

SB–07 ● SUBSURFACE SOIL BORING SAMPLE LOCATION
SS–15 ■ SURFACE SOIL BORING SAMPLE LOCATION
LP–03 ▽ LEACH PIT LOCATION
MW–02 ⊕ MONITORING WELL LOCATION
ST–01 ▽ SEPTIC TANK LOCATION

APPROXIMATE EXCAVATION AREA

SUBSURFACE SOIL AREA TO BE EXCAVATED (CONTINGENT UPON ANALYTICAL DATA OBTAINED FOLLOWING THE FORMER MAGNA METALS BUILDING DEMOLITION)

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS AND PIT/TANK LOCATIONS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

3. EXCAVATION AREAS TO BE DETERMINED IN THE FIELD BASED ON CONFIRMATORY SAMPLE RESULTS.

4. EXCAVATED SOILS TO BE REPLACED WITH CLEAN FILL, TOPSOIL, AND SEEDING.

5. COC – CONTAMINANT OF CONCERN

6. SCO – SOIL CLEANUP OBJECTIVE

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

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FEET

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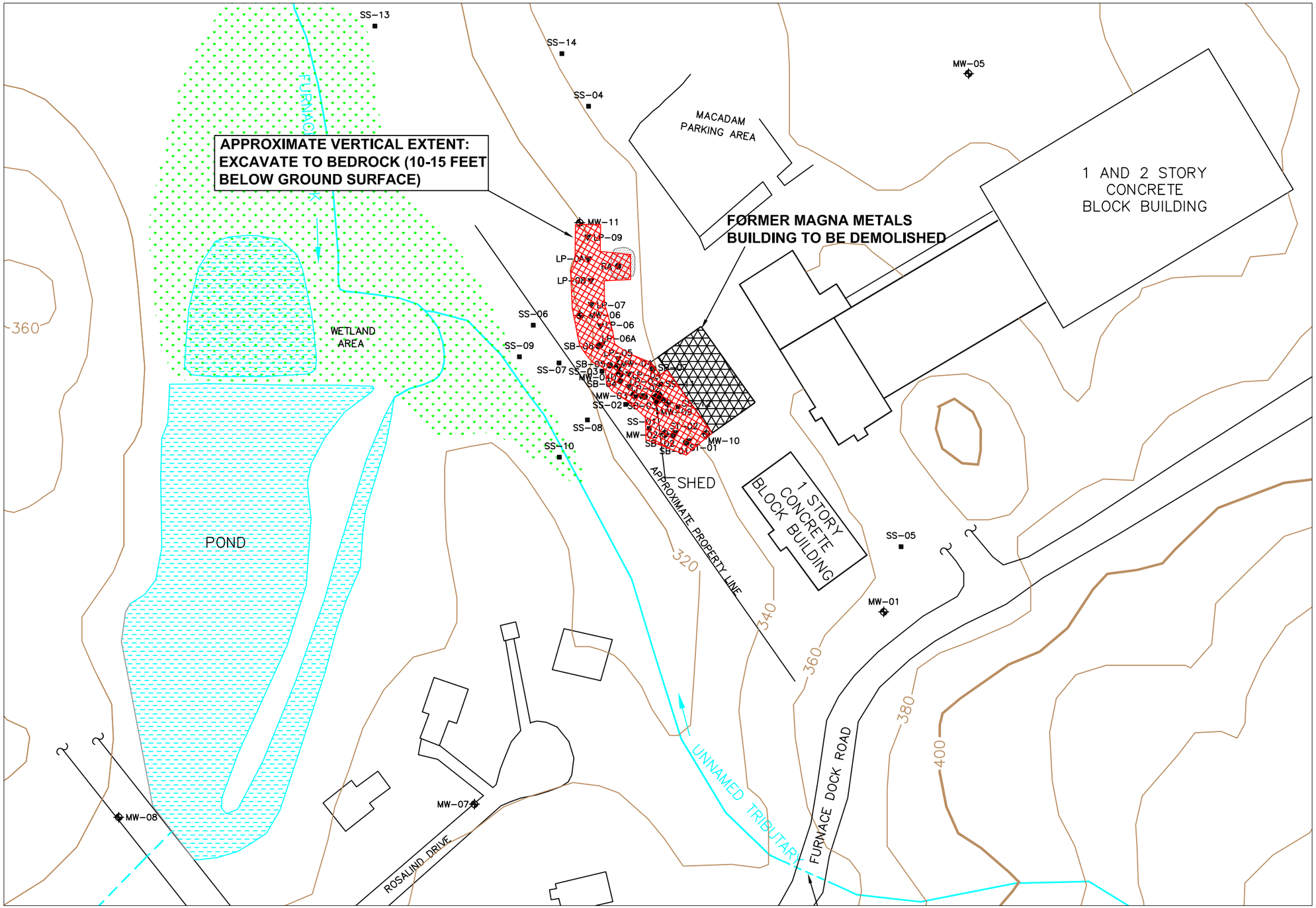

TETRA TECH EC, INC.

TITLE:
Alternative S–3: Removal of COCs in Soil Exhibiting Concentration in Excess of NYSDEC Restricted Use Commercial SCOs and Building Demolition
Magna Metals
Cortlandt, New York

DWN: LMC	DES.: EAG	PROJECT NO.: 106–1172
CHKD:	APPD:	FIGURE NO.: 4–1
DATE: 12/09/10	REV.: 1	

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LEGEND

SB–07 ● SUBSURFACE SOIL BORING SAMPLE LOCATION
SS–15 ■ SURFACE SOIL BORING SAMPLE LOCATION
LP–03 ▼ LEACH PIT LOCATION
MW–02 ⊕ MONITORING WELL LOCATION
ST–01 ▼ SEPTIC TANK LOCATION

APPROXIMATE EXCAVATION AREA

SUBSURFACE SOIL AREA TO BE EXCAVATED (CONTINGENT UPON ANALYTICAL DATA OBTAINED FOLLOWING THE FORMER MAGNA METALS BUILDING DEMOLITION)

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS AND PIT/TANK LOCATIONS ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

3. EXCAVATION AREAS TO BE DETERMINED IN THE FIELD BASED ON CONFIRMATORY SAMPLE RESULTS.

4. EXCAVATED SOILS TO BE REPLACED WITH CLEAN FILL, TOPSOIL, AND SEEDING.

5. COC – CONTAMINANT OF CONCERN

6. SCO – SOIL CLEANUP OBJECTIVE

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

0 60 120
FEET

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APPROXIMATE DEPTH: EXCAVATE TO EXTENT OF COCs > UNRESTRICTED USE SCOs

FORMER MAGNA METALS BUILDING TO BE DEMOLISHED

1 AND 2 STORY CONCRETE BLOCK BUILDING

1 STORY CONCRETE BLOCK BUILDING

SHED

MACADAM PARKING AREA

FURNACE BROOK

WETLAND AREA

POND

UNNAMED TRIBUTARY

FURNACE DOCK ROAD

ROSALIND DRIVE

APPROXIMATE PROPERTY LINE

SS–13, SS–14, SS–04, SS–05, SS–06, SS–07, SS–08, SS–09, SS–10, SS–11, SS–12

MW–01, MW–02, MW–03, MW–04, MW–05, MW–06, MW–07, MW–08, MW–09, MW–10, MW–11

LP–01, LP–02, LP–03, LP–04, LP–05, LP–06, LP–07, LP–08, LP–09

SB–01, SB–02, SB–03, SB–04, SB–05, SB–06, SB–07

ST–01, ST–02

320, 340, 360, 380, 400

TETRA TECH EC, INC.

TITLE:
Alternative S–4: Removal of COCs in Soil Exhibiting Concentration in Excess of NYSDEC Unrestricted Use SCOs and Building Demolition
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106–1172
CHKD:	APPD:	FIGURE NO.:
		4–2
DATE:	REV.:	
11/18/10	1	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\NOV 2010 FIGURES\FIGURE 4–2 ALTERNATIVE S–4 111810.DWG

LEGEND

MW-02 GROUNDWATER SAMPLE LOCATION

MW-12 POSSIBLE NEW MONITORING WELL LOCATION (TO BE VERIFIED DURING REMEDIAL DESIGN)

ALTERNATIVE S-3 AND S-4 REMOVALS

POTENTIAL AREA OF CONTAMINANTS OF CONCERN IN GROUNDWATER ABOVE NYSDEC CLASS GA LEVELS

320 CONTOUR LINE (20 FT INTERVAL)

APPROXIMATE SOURCE AREA

SUB-SLAB DEPRESSURIZATION SYSTEM LOCATION

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTE:
LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.

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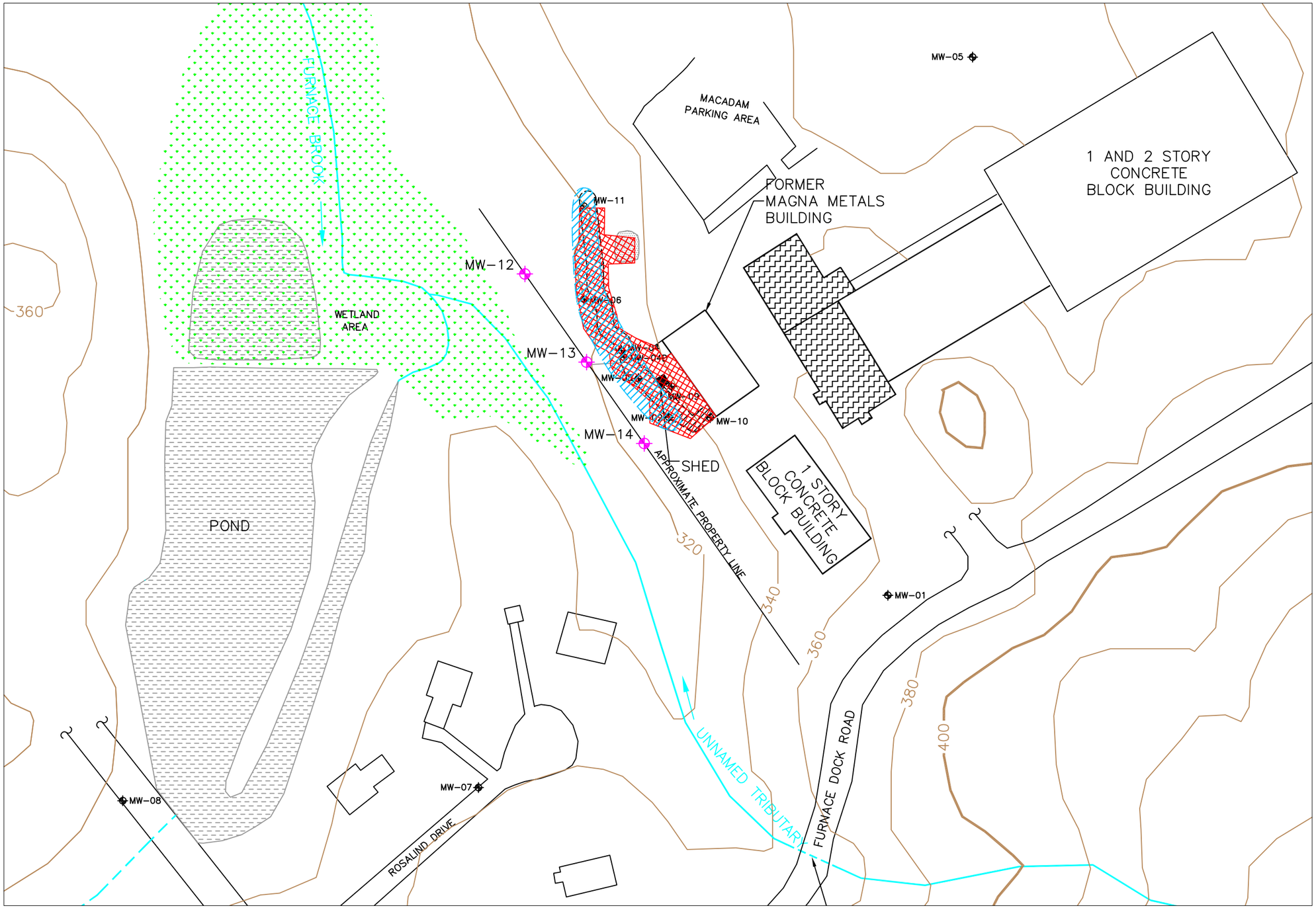


TETRA TECH EC, INC.

TITLE:
ALTERNATIVE GW-2: GROUNDWATER MONITORING AND SUB-SLAB VAPOR MITIGATION
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
EAG		4-3
DATE:	REV.:	
11/18/09	0	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 4-3 ALTERNATIVE GW-2 111809.DWG

LEGEND

SD-18 ◆ SEDIMENT SAMPLE LOCATION

SS-06 ◆ SURFACE SOIL SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

POND

APPROXIMATE AREA OF SEDIMENT TO BE REMOVED

APPROXIMATE AREA OF OFF-SITE SOILS TO BE REMOVED

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

3. SAMPLE LOCATION FOR SD-13 IS BASED ON GPS COORDINATES.

4. SEDIMENTS AND SURFACE SOILS TO BE REMOVED TO APPROXIMATELY 2 FT. BGS AND FILLED WITH LIKE MATERIAL.

5. PRG - PRELIMINARY REMEDIATION GOAL.

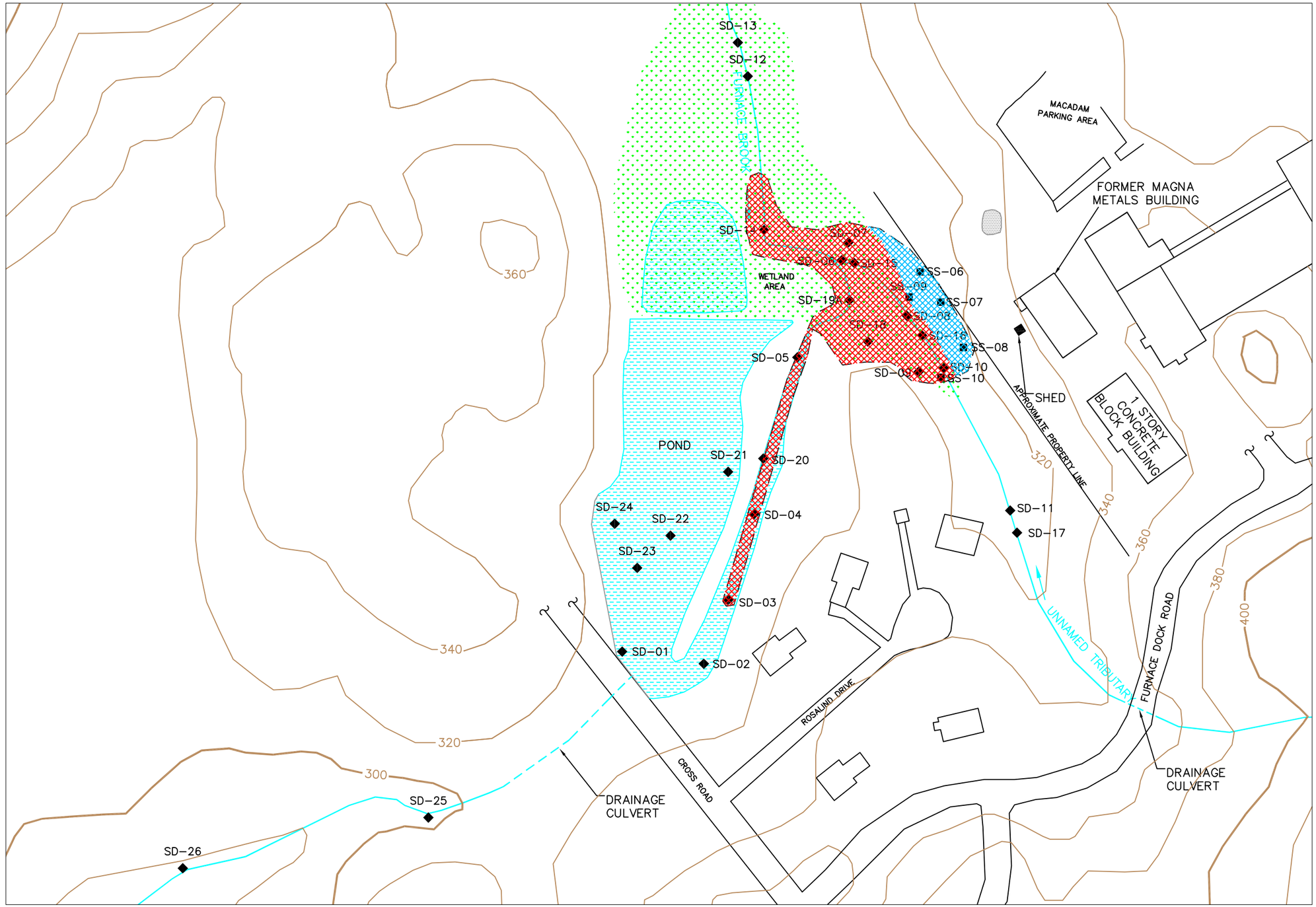
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



TETRA TECH EC, INC.

TITLE:
Alternative SD-3A: Off-Site Removal of Metals - Impacted Sediments Above Habitat Assessment-Based PRGs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 05/20/10	REV.: 1	4-4A

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LEGEND

SD-18 ◆ SEDIMENT SAMPLE LOCATION

SS-06 ◆ SURFACE SOIL SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

POND

APPROXIMATE AREA OF SEDIMENT TO BE REMOVED

APPROXIMATE AREA OF OFF-SITE SOILS TO BE REMOVED

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS FOR SD-01 TO SD-12 ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

3. SAMPLE LOCATION FOR SD-13 IS BASED ON GPS COORDINATES.

4. SEDIMENTS AND SURFACE SOILS TO BE REMOVED TO APPROXIMATELY 2 FT. BGS AND FILLED WITH LIKE MATERIAL.

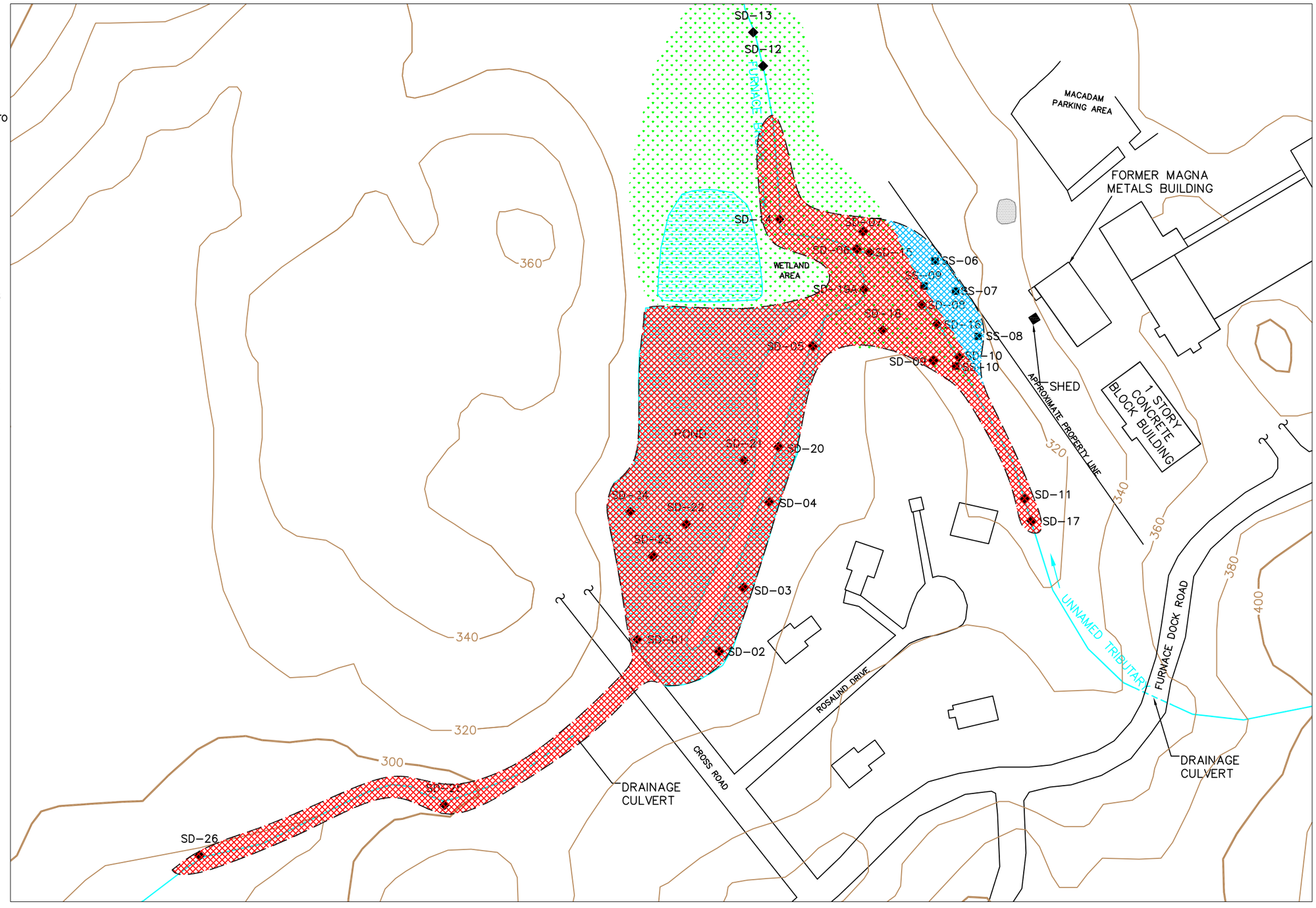
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



TETRA TECH EC, INC.

TITLE:
Alternative SD-3B: Off-Site Removal of Metals – Impacted Sediments Above Pre-Release Conditions
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106-1172
CHKD:	APPD:	FIGURE NO.:
DATE: 05/20/10	REV.: 1	4-4B

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LEGEND

SD–18 ◆ SEDIMENT SAMPLE LOCATION

SS–06 ◆ SURFACE SOIL SAMPLE LOCATION

320 CONTOUR LINE (20 FT INTERVAL)

POND

APPROXIMATE AREA OF SEDIMENT TO BE REMOVED

APPROXIMATE AREA OF OFF–SITE SOILS TO BE REMOVED

APPROXIMATE REFUSE AREA

APPROXIMATE WETLAND AREA

NOTES:
1. SAMPLE LOCATIONS FOR SD–01 TO SD–12 ARE APPROXIMATE.

2. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, AND GEOPHYSICAL SURVEY AREA ARE BASED ON SURVEY DATA.

3. SAMPLE LOCATION FOR SD–13 IS BASED ON GPS COORDINATES.

4. SEDIMENTS AND SURFACE SOILS TO BE REMOVED TO APPROXIMATELY 2 FT. BGS AND FILLED WITH LIKE MATERIAL.

5. NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.

6. LEL – LOWEST EFFECT LEVEL.

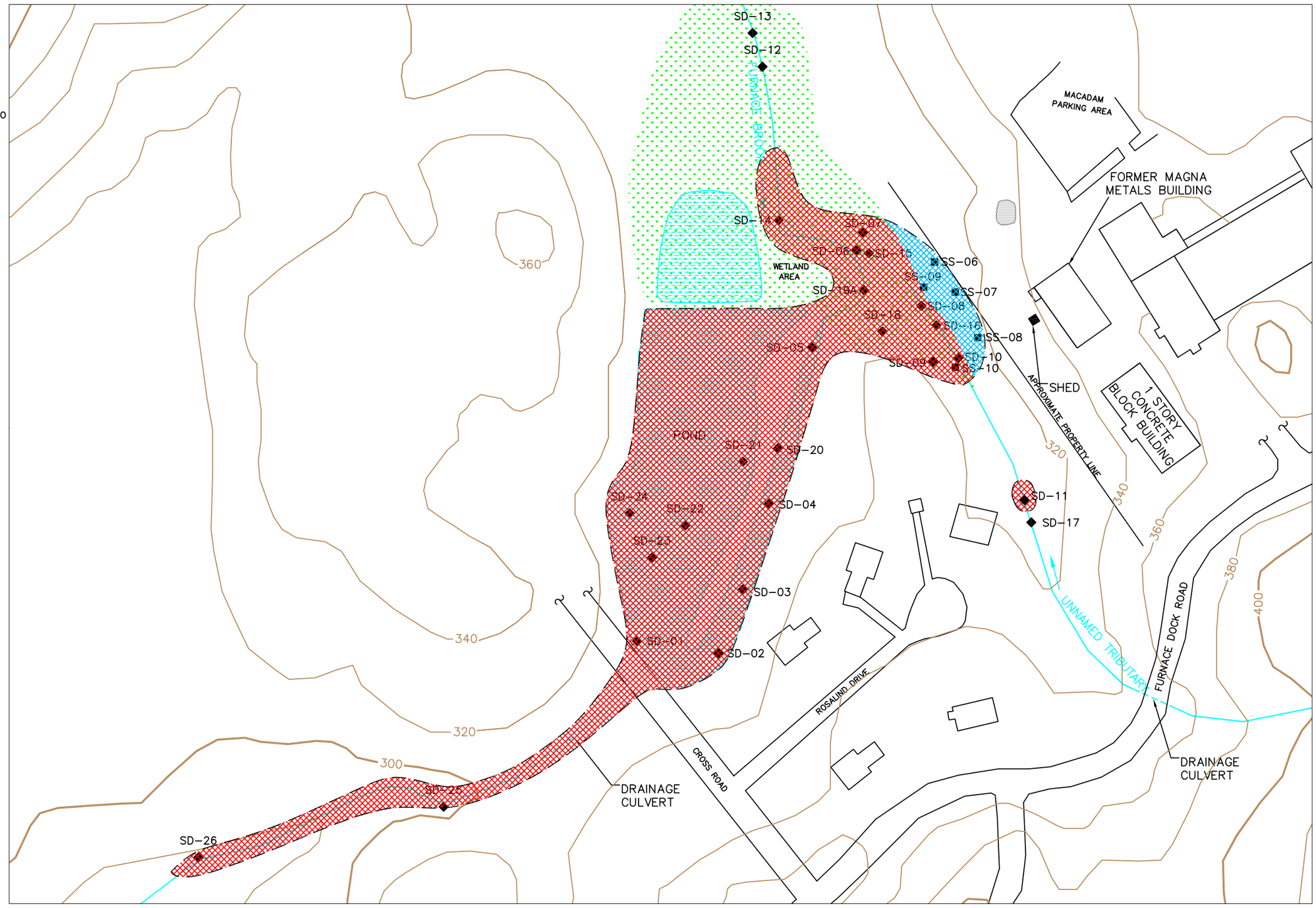
SOURCES:
1. CONTOUR LINES, FURNACE DOCK ROAD, AND FURNACE BROOK BELOW POND BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5–MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

2. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

3. APPROXIMATE REFUSE AREA BASED ON NYSDEC DRAWING.

4. APPROXIMATE WETLAND AREA BASED ON FIELD OBSERVATIONS.

5. TOPOGRAPHIC LINES ARE APPROXIMATE.



0 75 150
FEET

N

TETRA TECH EC, INC.

TITLE:
Alternative SD–3C: Off–Site Removal of Metals – Impacted Sediments Above NYSDEC LELs
Magna Metals
Cortlandt, New York

DWN:	DES.:	PROJECT NO.:
LMC	EAG	106–1172
CHKD:	APPD:	FIGURE NO.:
		4–4C
DATE:	REV.:	
05/20/10	1	

N:\GIS\GISKEY\GISPROJ31\MAGNA METALS\FS FIGURES\FIGURE 4–4C SEDS ABOVE LELS 052010.DWG

APPENDIX A

REMEDIAL ALTERNATIVE COST ESTIMATES

TABLE A-1
ALTERNATIVE COST ESTIMATE SUMMARY

Alternative	Capital	O&M (Annual)	Annual O&M NPV	Reviews NPV	Total O&M NPV	Total NPV
Soil Alternatives						
S-1 (No Action)	0	0	0	56,000	56,000	56,000
S-2 (Limited Action)	39,000	0	0	56,000	56,000	95,000
S-3 (Removal of COCs in Soil Above NYSDEC Restricted Use SCOs and Building Demolition)	3,696,000	0	0	56,000	56,000	3,752,000
S-4 (Removal of COCs in Soil Above NYSDEC Unrestricted Use SCOs and Building Demolition)	11,819,000	0	0	0	0	11,819,000
Groundwater Alternatives						
GW-1 (No Action)	0	0	0	56,000	56,000	56,000
GW-2 (Groundwater Monitoring and Sub Slab Vapor Mitigation)	250,000	40,000	621,000	56,000	677,000	927,000
GW-3 (*In Situ* Treatment and Sub Slab Vapor Mitigation)	1,490,000	40,000	621,000	56,000	677,000	2,167,000
GW-4 (Limited Permanganate Addition, Groundwater Monitoring, Sub Slab Vapor Mitigation)	377,000	40,000	621,000	56,000	677,000	1,054,000
Sediment Alternatives						
SD-1 (No Action)	0	0	0	56,000	56,000	56,000
SD-2 (Limited Action)	39,000	0	0	56,000	56,000	95,000
SD-3a (Removal > Habitat Based PRGs)	1,427,000	22,000	332,000	56,000	388,000	1,815,000
SD-3b (Removal > Background)	5,079,000	22,000	332,000	56,000	388,000	5,467,000
SD-3c (Removal > LELs)	5,048,000	22,000	332,000	56,000	388,000	5,436,000
Preferred Remedy						
S-3, GW-4, SD-3A	5,500,000	62,000	953,000	168,000	1,121,000	6,621,000

TABLE A-2
ALTERNATIVE S-2 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000

Subtotal	$	30,000
Contingency (20%)	$	6,000
Engineering (N/A)	$	-
Legal and Administrative (10%)	$	3,000
Grand Total	**$**	**39,000**

TABLE A-3
ALTERNATIVE S-3 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	SITE PREPARATION				
	Clearing and grading	2000	SY	1.00	2,000
	SUPPORT FACILITIES				
	Office trailers	1	LS	7,500	7,500
	Decon trailer	1	LS	5,250	5,250
	EROSION & SEDIMENT CONTROL				
	Silt Fence & Installation	1000	LF	10	10,000
	BUILDING DEMOLITION				
	Demolition of Former Magna Metals Building	1	LS	200,000	200,000
	EXCAVATION				
	Leach pits and septic tank removal	13	EA	2,500	32,500
	Monitoring well removal	6	EA	500	3,000
	Soil Excavation (above water table)	5580	CY	20	111,600
	Soil Excavation (below water table)	1400	CY	40	56,000
	Contingency Soil Excavation (above water table)	2600	CY	20	52,000
	Contingency Soil Excavation (below water table)	1300	CY	40	52,000
	Material Handling	10880	CY	4	43,520
	Sheet Piling	1000	LF	60	60,000
	POST EXCAVATION SAMPLING				
	Post-excavation sampling	60	EA	450	27,000
	OFF-SITE TREATMENT & DISPOSAL				
	Tanks/Piping/Debris	39	Ton	75	2,925
	Non-hazardous soil	16320	Ton	100	1,632,000
	Hazardous soil	0	Ton	280	-
	Dewatering water treatment	285,000	Gal	0.20	57,000
	SITE RESTORATION/CAP				
	Clean fill	10480	CY	25	262,000
	Top soil	400	CY	30	12,000
	Restoration of Wetlands	0	Acres	8,000	-
	Seeding	0.5	Acres	1,875	938
	MISCELLANEOUS				
	Misc. Disposal	1	LS	3,750	3,750
	Health and Safety Oversight	6	MO	7,500	45,000
				Subtotal	$ 2,737,983
				Contingency (20%)	$ 547,600
				Engineering (10%)	$ 273,800
				Legal and Administrative (5%)	$ 136,900
				Grand Total	**$ 3,696,283**

Notes and Assumptions:
1. Clearing and grading assumes entire area needs to be cleared
2. Six wells within the excavation area to be removed
3. Silt fence installed around excavation area for erosion and sediment control
4. Leach pits/septic tank removal assumes 13 total pits/tanks removed (2007 RI Report)
5. Depth of water table: 10 feet bgs
6. Depth of subsurface soil excavations: 12.5 feet
7. Sheet piling needed for all subsurface soil excavation areas
8. Post excavation sampling - 1 sample per 30 LF sidewall, 1 sample per 900 sf excavation bottom
9. Tanks/piping/debris tonnage based on estimated volume of 1.5 cy per tank/pit (including piping), 2.0 tons/cy unit weight
10. All soil non-hazardous for disposal purposes
11. Unit weight of excavated soil: 1.5 tons/cy
12. Top 6 inches restored with topsoil/seeding for all areas
13. Wetland restoration area less than 0.1 acres, assumed no wetland restoration necessary
14. Soil excavation below building contingent on verification of contamination
15. Contingency soil excavations beneath building upon verification of visual contamination
16. Demolition cost includes abatement

TABLE A-4
ALTERNATIVE S-4 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	SITE PREPARATION				
	Clearing and grading	8000	SY	1.00	8,000
	SUPPORT FACILITIES				
	Office trailers	1	LS	7,500	7,500
	Decon trailer	1	LS	5,250	5,250
	EROSION & SEDIMENT CONTROL				
	Silt Fence & Installation	1300	LF	10	13,000
	BUILDING DEMOLITION				
	Demolition of Former Magna Metals Building	1	LS	200,000	200,000
	EXCAVATION				
	Leach pits and septic tank removal	13	EA	2,500	32,500
	Monitoring well removal	6	EA	500	3,000
	Soil Excavation (above water table)	25,600	CY	20	512,000
	Soil Excavation (below water table)	10,250	CY	40	410,000
	Contingency Soil Excavation (above water table)	2600	CY	20	52,000
	Contingency Soil Excavation (below water table)	1300	CY	40	52,000
	Material Handling	39,750	CY	4	159,000
	Sheet Piling	1300	LF	60	78,000
	POST EXCAVATION SAMPLING				
	Post-excavation sampling	121	EA	450	54,450
	OFF-SITE TREATMENT & DISPOSAL				
	Tanks/Piping/Debris	39	Ton	75	2,925
	Non-hazardous soil	59625	Ton	100	5,962,500
	Hazardous soil	0	Ton	280	-
	Dewatering water treatment	600,000	Gal	0.20	120,000
	SITE RESTORATION				
	Clean fill	38550	CY	25	963,750
	Top soil	1200	CY	30	36,000
	Restoration of Wetlands	0	Acres	8,000	-
	Seeding	1.5	Acres	1,875	2,813
	MISCELLANEOUS				
	Misc. Disposal	1	LS	5,000	5,000
	Health and Safety Oversight	6	MO	7,500	45,000
				Subtotal	$ 8,754,688
				Contingency (20%)	$ 1,750,900
				Engineering (10%)	$ 875,500
				Legal and Administrative (5%)	$ 437,700
				Grand Total	**$ 11,818,788**

Notes and Assumptions:
1. Clearing and grading assumes entire area needs to be cleared
2. Six wells within the excavation area to be removed.
3. Silt fence installed around excavation area for erosion and sediment control
4. Leach pits/septic tank removal assumes 13 total pits/tanks removed (2007 RI Report)
5. Depth of water table: 10 feet bgs
6. Depth of subsurface soil excavations: 14 feet
7. Sheet piling needed for all subsurface soil excavation areas
8. Post excavation sampling - 1 sample per 30 LF sidewall, 1 sample per 900 sf excavation bottom
9. Tanks/piping/debris tonnage based on estimated volume of 1.5 cy per tank/pit (including piping), 2.0 tons/cy unit weight
10. All soil non-hazardous for disposal purposes
11. Unit weight of excavated soil: 1.5 tons/cy
12. Top 6 inches restored with topsoil/seeding for all areas
13. Wetland restoration area less than 0.1 acres, assumed no wetland restoration necessary
14. Soil excavation below building contingent on verification of contamination
15. Contingency soil excavations beneath building upon verification of visual contamination
16. Demolition cost includes abatement.

TABLE A-5
ALTERNATIVE GW-2 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	Decontamination Pad		LS	750	750
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	GW MONITORING				
	System Design	1	EA	7,500	7,500
	GW MONITORING WELL INSTALLATION				
	Well installation	3	EA	1,000	3,000
	SUB-SLAB DEPRESSURIZATION				
	Sub-Slab Depressurization System	1	LS	125,000	125,000
	CONSTRUCTION				
	Health and safety	1	LS	4,000	4,000
				Subtotal	$ 200,250
				Contingency (20%)	$ 40,100
				Engineering (N/A)	$ -
				Legal and Administrative (5%)	$ 10,000
				Grand Total	**$ 250,350**

Notes and Assumptions:
1. Health and safety costs are estimated for H&S oversight during approximately a 1 week construction period
2. Three new overburden monitoring wells added to monitoring network (may change based on system design)

TABLE A-6
ALTERNATIVE GW-3 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	SUPPORT FACILITIES				
	Decontamination Area	1	LS	4,000	4,000
	CHEMICAL OXIDATION				
	Bench/Pilot study	1	EA	25,000	25,000
	Injection	750	EA	1,000	750,000
	SUB-SLAB DEPRESSURIZATION				
	Sub-Slab Depressurization System	1	LS	125,000	125,000
	MISCELLANEOUS				
	Misc. disposal	1	LS	4,000	5,000
	Health and safety oversight	18	MO	7,500	135,000
				Subtotal	$ 1,104,000
				Contingency (20%)	$ 220,800
				Engineering (10%)	$ 110,400
				Legal and Administrative (5%)	$ 55,200
				Grand Total	**$ 1,490,400**

Notes and Assumptions:
1. *In Situ* Chemical Oxidation used as treatment process.
2. Unit cost of injection based on ISOTEC quote and includes cost of chemicals

TABLE A-7
ALTERNATIVE GW-4 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	BEDROCK PERMANGANATE TREATMENT				
	Permanganate Addition	1	LS	70,000	70,000
	SUB-SLAB DEPRESSURIZATION				
	Sub-Slab Depressurization System	1	LS	125,000	125,000
	MISCELLANEOUS				
	Misc. disposal	1	LS	4,000	5,000
				Subtotal	$ 260,000
				Contingency (20%)	$ 52,000
				Engineering (20%)	$ 52,000
				Legal and Administrative (5%)	$ 13,000
				Grand Total	**$ 377,000**

Notes and Assumptions:
1. This alternative can only be implemented in conjunction with Soil Alternatives S-3 or S-4.

TABLE A-8
ALTERNATIVE SD-2 CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000

Subtotal	$	30,000
Contingency (20%)	$	6,000
Engineering (N/A)	$	-
Legal and Administrative (10%)	$	3,000
Grand Total	**$**	**39,000**

TABLE A-9
ALTERNATIVE SD-3a CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	SITE PREPARATION				
	Clearing and grading	5000	SY	1	5,000
	SUPPORT FACILITIES				
	Office trailers	1	LS	7,500	7,500
	Decon trailer	1	LS	5,250	5,250
	EXCAVATION				
	Sediment and Surface Soil Excavation	3840	CY	20	76,800
	Material Handling	3840	CY	4	15,360
	POST EXCAVATION SAMPLING				
	Post-excavation sampling	58	EA	450	26,100
	OFF-SITE TREATMEANT & DISOSAL				
	Non-hazardous soil	5760	Ton	100	576,000
	Hazardous soil	0	Ton	280	-
	SITE RESTORATION				
	Clean fill	0	CY	25	-
	Top soil (suitable sediment)	3840	CY	40	153,600
	Restoration of Wetlands	1.2	Acres	8,000	9,600
	Seeding	0	Acres	1,875	-
	MISCELLANEOUS				
	Misc. Disposal	1	LS	3,750	3,750
	Health and Safety Oversight	6	MO	7,500	45,000
				Subtotal	$ 983,960
				Contingency (20%)	$ 196,800
				Engineering (20%)	$ 196,800
				Legal and Administrative (5%)	$ 49,200
				Grand Total	**$ 1,426,760**

Notes and Assumptions:
1. Clearing and grading assumes entire area needs to be cleared
2. Top 2 feet of sediment removed, streams/tributaries will be diverted with pipes.
3. Removed sediment replaced with sediment-like material
4. Post excavation sampling - 1 sample per 900 sf excavation bottom
5. All sediments non-hazardous for disposal purposes
6. Unit weight of excavated sediment: 1.5 tons/cy
7. Entire area of removed sediments are wetlands

TABLE A-10
ALTERNATIVE SD-3b CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	SITE PREPARATION				
	Clearing and grading	24000	SY	1	24,000
	SUPPORT FACILITIES				
	Office trailers	1	LS	7,500	7,500
	Decon trailer	1	LS	5,250	5,250
	EXCAVATION				
	Sediment and Surface Soil Excavation	16000	CY	20	320,000
	Material Handling	16000	CY	4	64,000
	POST EXCAVATION SAMPLING				
	Post-excavation sampling	240	EA	450	108,000
	OFF-SITE TREATMEANT & DISOSAL				
	Non-hazardous soil	24000	Ton	100	2,400,000
	Hazardous soil	0	Ton	280	-
	SITE RESTORATION				
	Clean fill	0	CY	25	-
	Top soil (suitable sediment)	16000	CY	40	640,000
	Restoration of Wetlands	5.0	Acres	8,000	40,000
	Seeding	0	Acres	1,875	-
	MISCELLANEOUS				
	Misc. Disposal	1	LS	3,750	3,750
	Health and Safety Oversight	12	MO	7,500	90,000
				Subtotal	$ 3,762,500
				Contingency (20%)	$ 752,500
				Engineering (10%)	$ 376,300
				Legal and Administrative (5%)	$ 188,100
				Grand Total	**$ 5,079,400**

Notes and Assumptions:
1. Clearing and grading assumes entire area needs to be cleared
2. Top 2 feet of sediment removed, streams/tributaries will be diverted with pipes.
3. Removed sediment replaced with sediment-like material
4. Post excavation sampling - 1 sample per 900 sf excavation bottom
5. All sediments non-hazardous for disposal purposes
6. Unit weight of excavated sediment: 1.5 tons/cy
7. Entire area of removed sediments are wetlands

TABLE A-11
ALTERNATIVE SD-3c CAPITAL COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Cost
	MOBILIZATION/DEMOBILIZATION				
	Mobilization	1	LS	30,000	30,000
	ADMINISTRATIVE ACTIONS				
	Institutional Controls	1	LS	10,000	10,000
	Health and Safety Plan	1	LS	10,000	10,000
	Site Management Plan	1	LS	10,000	10,000
	SITE PREPARATION				
	Clearing and grading	23800	SY	1	23,800
	SUPPORT FACILITIES				
	Office trailers	1	LS	7,500	7,500
	Decon trailer	1	LS	5,250	5,250
	EXCAVATION				
	Sediment and Surface Soil Excavation	15900	CY	20	318,000
	Material Handling	15900	CY	4	63,600
	POST EXCAVATION SAMPLING				
	Post-excavation sampling	238	EA	450	107,100
	OFF-SITE TREATMEANT & DISOSAL				
	Non-hazardous soil	23850	Ton	100	2,385,000
	Hazardous soil	0	Ton	280	-
	SITE RESTORATION				
	Clean fill	0	CY	25	-
	Top soil (suitable sediment)	15900	CY	40	636,000
	Restoration of Wetlands	4.9	Acres	8,000	39,440
	Seeding	0	Acres	1,875	-
	MISCELLANEOUS				
	Misc. Disposal	1	LS	3,750	3,750
	Health and Safety Oversight	12	MO	7,500	90,000
				Subtotal	$ 3,739,440
				Contingency (20%)	$ 747,900
				Engineering (10%)	$ 373,900
				Legal and Administrative (5%)	$ 187,000
				Grand Total	**$ 5,048,240**

Notes and Assumptions:
1. Clearing and grading assumes entire area needs to be cleared
2. Top 2 feet of sediment removed, streams/tributaries will be diverted with pipes.
3. Removed sediment replaced with sediment-like material
4. Post excavation sampling - 1 sample per 900 sf excavation bottom
5. All sediments non-hazardous for disposal purposes
6. Unit weight of excavated sediment: 1.5 tons/cy
7. Entire area of removed sediments are wetlands

TABLE A-12
ALTERNATIVE S-1 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	8	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-13
ALTERNATIVE S-2 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	8	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-14
ALTERNATIVE S-3 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	8	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-15
ALTERNATIVE GW-1 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	15	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-16
ALTERNATIVE GW-2 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	Operation, Maintenance & Monitoring	15	% of Capital	125,000	18,800
	MONITORING				
	Groundwater sampling (labor)	20	hr/yr	80	1,600
	Groundwater analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	40,400
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	621,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**676,600**

Notes and Assumptions:
1. Maintenance cost is based on 15% of capital cost for only those components requiring long-term maintenance (i.e., SSDS)
2. 10 wells would be monitored biannually for a period of 5 years
3. Two 10-hr days to complete monitoring (biannually) of 10 wells

TABLE A-17
ALTERNATIVE GW-3 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	Operation, Maintenance & Monitoring	15	% of Capital	125,000	18,800
	MONITORING				
	Groundwater sampling (labor)	20	hr/yr	80	1,600
	Groundwater analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	40,400
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	621,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**676,600**

Notes and Assumptions:
1. Maintenance cost is based on 15% of capital cost for only those components requiring long-term maintenance (i.e., SSDS)
2. Monitoring and sampling of GW would be performed until clean-up levels are achieved-assumed to be long-term for cost estimate purposes
3. 10 wells would be monitored biannually for a period of 5 years
4. Two 10-hr days to complete monitoring (biannually) of 10 wells

TABLE A-18
ALTERNATIVE GW-4 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	Operation, Maintenance & Monitoring	15	% of Capital	125,000	18,800
	MONITORING				
	Groundwater sampling (labor)	20	hr/yr	80	1,600
	Groundwater analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	40,400
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	621,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**676,600**

Notes and Assumptions:
1. Maintenance cost is based on 15% of capital cost for only those components requiring long-term maintenance (i.e., SSDS)
2. Monitoring and sampling of GW would be performed until clean-up levels are achieved-assumed to be long-term for cost estimate purposes
3. 10 wells would be monitored biannually for a period of 5 years
4. Two 10-hr days to complete monitoring (biannually) of 10 wells

TABLE A-19
ALTERNATIVE SD1 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	8	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-20
ALTERNATIVE SD2 O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	MISCELLANEOUS				
	Maintenance	8	% of Capital	-	-
	Contingency	10	% of O&M	-	-
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	-
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	-
NPV Reviews	$	55,600
Total NPV O&M	**$**	**55,600**

TABLE A-21
ALTERNATIVE SD-3a O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	SURFACE WATER SAMPLING				
	Surface water sampling (labor)	20	hr/yr	80	1,600
	Surface water analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	21,600
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	332,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**387,600**

Notes and Assumptions:
1. Surface water would be monitored biannually for a period of 5 years
2. Two 10-hr days to complete monitoring (biannually)

TABLE A-22
ALTERNATIVE SD-3b O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	SURFACE WATER SAMPLING				
	Surface water sampling (labor)	20	hr/yr	80	1,600
	Surface water analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	21,600
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	332,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**387,600**

Notes and Assumptions:
1. Surface water would be monitored biannually for a period of 5 years
2. Two 10-hr days to complete monitoring (biannually)

TABLE A-23
ALTERNATIVE SD-3c O&M COST ESTIMATE

Item #	Description	Estimated Quantity	Unit of Measure	Unit Cost (material and labor)	Estimated Annual Cost
	SURFACE WATER SAMPLING				
	Surface water sampling (labor)	20	hr/yr	80	1,600
	Surface water analysis	10	EA	1,000	10,000
	Data Analysis/Reporting	1	LS	10,000	10,000
	MISCELLANEOUS				
	5-year reviews	6	EA	20,000	N/A

Annual O&M (excl. 5-yr reviews)	$	21,600
Project duration (years)		30
Interest rate		5%
NPV Annual O&M	$	332,000
NPV Reviews	$	55,600
Total NPV O&M	**$**	**387,600**

Notes and Assumptions:
1. Surface water would be monitored biannually for a period of 5 years
2. Two 10-hr days to complete monitoring (biannually)

APPENDIX B

MASS REDUCTION ANALYSIS

Table B-1
Calculation of Mass Removal
Former Magna Metals Site
Cortlandt, New York

Location	MW-02	MW-02	MW-02	MW-03	MW-04	MW-04	SB-1	SB-2	SB-3	SB-4
Sample ID	MW-02	Duplicate	MW-02	MW-03	MW-04	MW-04	SB-1	SB-2	SB-3	SB-4
Sample Date	11/18/97	of MW-02	11/18/97	11/17/97	11/18/97	11/18/97	12/10/1996	12/10/1996	12/10/1996	12/10/1996
Sample Depth (feet bgs)	6-8	6-8	12-14	6-8	6-8	12-14	4-6	8-9.5	8-9.5	6.5-8.5
Copper	45.9	42.8	114	695	23.2	19.4	40.4	52.2	83.8	249
Nickel	10.4	10.5	39	28.4	11.3	7.4	46.9	108	62.5	84.2

Location	SB-5	SB-6	SB-7	SB-7	SS-01	SS-01	SS-02	SS-03	SS-11	SS-12
Sample ID	SB-5	SB-6	SB-7	Duplicate of	SS-01	Duplicate of	SS-02	SS-03	MM-SS11-072903	MM-SS12-072903
Sample Date	12/10/1996	12/11/1996	12/11/1996	SB-7	04/11/97	SS-01	04/11/97	04/11/97	7/29/2003	7/29/2003
Sample Depth (feet bgs)	4.5-6.5	7-10	3.5-5.5	3.5-5.5	0-0.17	0-0.17	0-0.17	0-0.17	0-0.17	0-0.17
Copper	369	1309	87.2	71.2	177	51.7	39	18	30.2	136
Nickel	38.9	93.5	15.5	11.9	15	13.9	11.4	10.2	11.6	11.1

	Average Concentration (mg/kg)	S-3 Excavation (tons)	S-3 Removal (lbs of constituent)	S-4 Excavation (tons)	S-4 Removal (lbs of constituent)
Copper	182.7	16320	5963.328	59625	21786.975
Nickel	32.08	16320	1047.0912	59625	3825.54

Pre-Design Investigation Work Plan

Magna Metals State Superfund Site
Town of Cortlandt,
Westchester County, New York

NYSDEC Site Number: 360003

NYSDEC STANDBY ENGINEERING CONTRACT D007625
Work Assignment No. 5

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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February 2013

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Appendix A Site Specific Health and Safety Plan

1.0 INTRODUCTION

Henningson, Durham, & Richardson Architecture and Engineering, P.C. (HDR) has prepared this Pre-Design Investigation (PDI) Work Plan as part of the remedial design (RD) for the Magna Metals State Superfund Site No. 360003 under Superfund Standby Engineer Contract No. D007625, Work Assignment #5.

1.1 Purpose

The purpose of the pre-design investigation is to define the limits of the impacted soil in-situ (i.e. pre-excavation) to facilitate design and construction of the remedial action specified in the Record of Decision (ROD) issued in June 2011. Specific objectives of the PDI include:

- Delineating the extent of impacted soils under the former Magna Metals building;
- Delineating the horizontal and vertical extent of impacted soils on-site;
- Delineating the horizontal and vertical extent of impacted soils and sediments off-site; and,
- Delineating the extent of impacted sediments in Furnace Brook.

1.2 Site Background

The Site is a 26 acre parcel located at 510 Furnace Dock Road in the Town of Cortlandt, New York. The property is currently owned by Baker Capital Limited Partnership and has three buildings on-site. Two buildings are currently used as offices, a laboratory and warehouse. The third building is the former Magna Metals building, which is vacant. From 1955 to 1979, the Site was used for metal plating, polishing, and lacquering operations. During operations, liquid waste containing metal and VOC contamination was discharged to a series of leach pits located behind the former Magna Metals building resulting in contamination of on-site and off-site soils and sediments.

The southwestern property line borders a freshwater wetland area regulated by the New York State Department of Environmental Conservation (NYSDEC) and an off-site pond. Furnace Brook traverses the Site, approximately 300 feet (ft) west of the former Magna Metals building, flowing south into the wetland area and pond. An unnamed tributary flows southwest along the southern property line from the direction of Furnace Dock Road, and discharges to Furnace Brook in the vicinity of the wetland area and off-site pond. Figure 1 shows the location of the Site in relation to the off-site pond, wetland, unnamed tributary, and Furnace Brook.

Topography across the Site ranges from approximately 355 ft above mean sea level (amsl) along the former Magna Metals Building, to 312 ft amsl along the southwestern property line within the wetland area. The former Magna Metals building and leach pit area reside on a hill which slopes steeply down to the wetland area. The height of the slope varies from 12 to 19 ft with an

approximate gradient of 2 horizontal feet to 1 vertical foot (2H:1V). Stormwater drainage follows site topography and drains west into the unnamed tributary to Furnace Brook and the wetland area.

1.3 Site Geology and Hydrogeology

The subsurface soils at the Site and surrounding area consists of a sand to silty sand overburden unit approximately 2 to 18 ft thick, overlying bedrock (Hornblende). Overburden material in the leach pit area is presumed to be fill material placed during the installation of the leach pits. The inferred thickness of the fill material in this area is approximately 7 to 10 ft.

The site has overburden and bedrock groundwater units. The overburden groundwater unit is approximately 6 to 16 ft below the ground surface (bgs) and flows to the west toward Furnace Brook. The bedrock groundwater flows in a similar direction.

1.4 Nature and Extent of Contamination

A final Remedial Investigation (RI) Report was completed in August 2007 followed by a final Feasibility Study (FS) in November 2010, both prepared by Tetra Tech EC, Inc. The RI as well as previous investigations identified one source area and several impacted media including groundwater, surface water, soil, sediment, and indoor air. Contaminants of concern (COCs) identified during the RI include metals, Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs) analytes including the following:

arsenic	silver
barium	zinc
cadmium	1,1,2,2-tetrachloroethane
chromium	dichloroethene (DCE)
copper	tetrachloroethylene (PCE)
cyanides (soluble cyanide salts)	trichloroethene (TCE)
lead	xylene (mixed)
mercury	benzo(a)pyrene
nickel	benzo(k)fluoranthene
selenium	chrysene

As per the ROD, silver, barium, cadmium, and polycyclic aromatic hydrocarbons (PAHs) are co-located with the other metals and will be removed as a result of removing soil impacted with metals above the Site Specific Soil Cleanup Objectives (SCOs) identified in the ROD. ROD also identified impacted sediments as those sediments with analytical concentrations above Site Specific Sediment Criteria which was defined as the greater of pre-release/background conditions or New York State Lowest Effect Levels (LELs) for metals.

To facilitate investigation, the Site and off-site areas were divided into seven areas of concern (AOCs). All AOCs are shown in Figure 2 and defined as follows:

AOC-1 – Leach Pit Area – The leach pit (LP) area is located west of the former Magna Metals building and is the source area of contamination found at the Site. The leach pit area encompasses approximately 0.7 acres and includes the area directly behind the former Magna Metals building extending approximately 180 ft northwest of the building. Eleven leach pits and two septic tanks (ST) are located within the leach pit area. Five (LP-06 through LP-09 and LP-0A) of the eleven leach pits are constructed of pre-fabricated concrete and the remaining pits (LP-02 through LP-06 and LP-06A) are constructed of cinderblocks. Both the cinderblock and prefabricated leach pits have soil or gravel bottoms except for LP-01 which has a concrete/solid bottom.

Pipes connecting the leach pits are constructed of perforated plastic pipe. Based on previous investigations, fluid appears to enter ST-01 from the building and flow progressively to ST-02 through LP-02 to LP-06A. LP-01 located adjacent to the build may have received flow from the building and discharged into LP-02 although no interconnecting pipe was found. LP-06 to LP-09 appear to have been installed at a later date. Flow was then routed from LP-05 progressively through LP-09. LP-06A and the pipe leading to LP-06A were abandoned in place. No outlet pipe was found for LP-09, and appears to be the terminus of the leach pit system.

This area is entirely on-site and Site Specific SCOs will be used to develop the RD for this AOC. Metals were detected at concentrations greater than the NYSDEC Commercial Use SCOs in eleven soil samples from the leach pit/septic tanks, 6 of 7 soil borings, and 3 of 4 soil samples at monitoring well locations collected from the leach pit area. Soil samples were collected at depths ranging from 3.5 to 11.5 ft bgs. One of 6 surface soil samples collected from the leach pit area exhibited metal concentrations greater than the Commercial Use SCOs. The greatest concentration of copper and nickel detected in soil samples (LP-06) was 34,700 milligram per kilogram (mg/kg) and 63,700 mg/kg, respectively. The greatest concentration of arsenic (LP-06A) and cyanide (LP-03) detected in soil samples was 609 and 22,000 mg/kg, respectively.

AOC-2 – Upland Area – The area between the leach pit area and the wetland area has been identified the upland area. The topography decrease (from 332 amsl to 312 amsl) is fairly steep in the upland area. Stormwater drainage flows from the leach pit area through the upland area towards the west/southwest and discharges into the off-site pond through the wetland area.

This area is entirely on-site and the Site Specific SCOs will be used to develop the RD for this AOC. Four surface soil (SS) samples (SS-06 through SS-09) were collected directly down gradient of the wastewater overflow. With the exception of SS-08, a southern most surface soil sample, three surface soil sample exhibited copper concentrations greater than the Commercial Use SCO of 270 mg/kg. Three surface soil samples exhibited concentrations of copper from 545 mg/kg to 1,980 mg/kg, nickel from 335 mg/kg to 483 mg/kg, barium from 69.4 to 407 mg/kg, arsenic from 4.4 mg/kg to 63.7 mg/kg, and selenium from 1.3 mg/kg to 18.7 mg/kg.

AOC-3 – Refuse Area – A refuse area near sample RA was identified approximately 100 ft northwest of the former Magna Metals building. During the RI one sample (RA) was collected from 2.5 to 3.0 bgs in this area and analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, TCL pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, cyanide and Total Organic Carbon (TOC). The sample results indicated elevated levels of copper and lead concentrations (2930 mg/kg and 354 mg/kg). The horizontal and vertical extents of metal contamination in the reuse are is unknown. This area is entirely on-site and the Site Specific SCOs will be used to develop the RD for this AOC.

AOC-4 – Former Magna Metals Building – This AOC consists of an area beneath the former Magna Metals building. Sampling underneath the building was not conducted during the RI due to the dilapidated condition of the building. The horizontal and vertical extents of contamination underneath the building are unknown. This area is entirely on-site and the Site Specific SCOs will be used to develop the RD in this AOC.

AOC-5 – Freshwater Wetland and Unnamed Tributary – This AOC consists of the freshwater wetland and unnamed tributary that borders the southwestern property line. Storm water drainage flows along the unnamed tributary through the wetland area and discharges into Furnace Brook. The RI identified impacts in the unnamed tributary and surrounding wetland area. The estimated impacted area is approximately 2.5 acres, which does not include Furnace Brook or the off site pond.

This area is located both on and off-site but entirely within the limits of the wetlands, therefore the Site Specific Sediment Criteria will be used to develop the RD in this AOC. Ten sediment samples and one surface sample were collected in the wetland and unnamed tributary area during the previous investigations. The sample results indicated elevated levels of metal concentrations above the NYSDEC sediment criteria. Copper was detected as high as 2,080 mg/kg and 2,330 mg/kg at locations SD-07 and SD-06 respectively.

AOC-6 – Off Site Pond – This AOC consists of the off-site pond, located approximately 400 ft west of the former Magna Metals Building. The pond is approximately 2.5 acres in size and is located within the NYSDEC regulated wetland boundary. Furnace Brook enters the pond area from the north and flows around the eastern edge of the pond prior to discharging into the pond near the southern edge adjacent to Cross Road. A thin elongated island extends between the pond and Furnace Brook which may have been created from the placement of dredged material from the Furnace Brook channel. Based on the survey, there appears to be a second channel connection between the pond and Furnace Brook near the northern edge of the pond.

This area is located off-site, therefore the Site Specific Sediment Criteria will be used to develop the RD in this AOC. Four sediment (SD) samples were collected in the off-site pond area during the previous investigations. The sample results indicated elevated levels of metal concentrations

above the NYSDEC sediment criteria. Copper was detected as high as 415 mg/kg and 403 mg/kg at locations SD-22 and SD-21, respectively.

AOC-7 – Furnace Brook – This AOC consists of the Furnace Brook as it enters the wetland area along the channel east of the pond, through the 36 inch diameter culvert beneath Cross Road to a location approximately 900 ft downstream of discharge point of the culvert located underneath Sunlit Trail. Eight sediment samples collected in this area exhibited copper concentrations greater than 100 mg/kg. This area is located off-site, therefore the Site Specific Sediment Criteria will be used to develop the RD in this AOC.

1.5 Selected Remedy

A ROD was issued in June 2011 and identified the selected remedy as excavation and off-site disposal for both on-site and off-site areas. Areas excavated to bedrock in the vicinity of the leach pits will be applied with an application of permanganate (or other oxidizer) to treat VOC contamination located within the underlying bedrock fractures. The ROD identified impacted soils and sediments for the AOCs as follows:

AOC-1 through AOC-4 – Impacted soils are defined as soils exceeding the Site Specific SCOs which includes the Commercial Use SCOs for lead, mercury, and zinc or the lower of Commercial Use SCOs or protection of groundwater SCOs for VOC COCs and arsenic, chromium, copper, cyanide, nickel and selenium. The ROD states that silver, barium, cadmium, and polycyclic aromatic hydrocarbons (PAHs) are co-located with the other metals and will be removed as a result of removing soil impacted with metals above the listed criteria. Contaminants found with no specific SCOs listed in the ROD will be compared with the Commercial Use SCOs.

AOC-5 through AOC 7 – Impacted sediments are defined as those sediments with analytical concentrations above the Site Specific Sediment Criteria which includes greater of pre-release/background conditions or New York State Lowest Effect Levels (LELs) for metals. The average concentrations of nickel, copper, and zinc from background sediment sample locations are to be used as pre-release levels.

2.0 SAMPLING PLAN

A sampling program was developed to define the limits of the impacted soil and sediments to facilitate remedial design. This sampling plan focuses on impacted soil/sediments located within AOCs 1- 4, and off-site sediments located within AOCs 5 - 7. Specific objectives of the PDI sampling include:

- AOC 1: Delineate impacted soils in the vicinity of the leach pits horizontally (it is assumed that soil impacts extend vertically to bedrock) to the Site Specific SCOs.
- AOC 2: Delineate horizontal and vertical extent of impacted soils in the upland area to the Site Specific SCOs.
- AOC 3: Delineate the horizontal and vertical extent of soil contamination in the reuse area to the Site Specific SCOs.
- AOC 4: Investigation of soils beneath the former Magna Metals building for potential contamination to the Site Specific SCOs.
- AOC 5 to 7: Delineate the horizontal and vertical extent of impacted sediments in AOCs 5 - 7 to the Site Specific Sediment Criteria.

2.1 Sample Location and Frequency

New York State Technical Guidance (DER-10) stipulates a post excavation/confirmatory sample frequency of 1 sample for every 30 linear feet of excavation side wall and 1 sample for every 900 square feet of excavation bottom area. The sample frequency may be reduced for larger areas/excavations greater than 30 by 30 ft which is the case with the Magna Metals Site. The sampling frequency for each AOC was developed based on the approximate size of the AOC and the relative contamination detected in the AOC.

2.1.1 AOC-1 – Leach Pit Area

The estimated excavation area for the leach pit area is shown in the ROD. Per the ROD, this area will be excavated to bedrock. Thirteen soil borings are proposed around the perimeter of the excavation area to horizontally delineate the soil impacts. The proposed soil boring locations are shown on Figure 3.

Soil samples are proposed at the surface (0.5 to 1 foot bgs), 9 to 9.5 ft bgs and 14 to 14.5 ft bgs. The 9 to 9.5 foot bgs sample interval is approximately 1 to 2 foot beneath the bottom of the leach pits. The deep interval (14 to 14.5 ft bgs) is approximately 2 ft above the top of bedrock. Soil samples will be analyzed for VOCs and metals. Boring locations and/or sample depth intervals may be adjusted based on field screening (visual observations, bedrock depth).

A total 39 samples will be collected from 13 soil borings. A summary of the proposed sampling locations, depth intervals, sample rational and analytical methods are provided in Table 1.

2.1.2 AOC-2 – Upland Area

Eight soil borings are proposed in the Upland Area to delineate soil impacts horizontally and vertically. The proposed locations represent and approximate frequency of one sample every 75 linear feet of side wall and 3,600 square feet of bottom area. The proposed soil boring locations are shown on Figure 3. The borings will be advanced to a maximum depth of 5 feet (or bedrock). Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. The proposed sample intervals are shown on Figure 3 and additional sampling details are provided in Table 1.

2.1.3 AOC-3 – Refuse Area

Five soil borings are proposed in the Refuse Area to delineate soil impacts horizontally and vertically. The proposed soil boring locations are shown on Figure 3. The borings will be advanced to a maximum depth of 5 feet (or bedrock). Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. The proposed sample intervals are shown on Figure 3 and additional sampling details are provided in Table 1.

2.1.4 AOC-4 – Former Magna Metals Building

Six soil borings are proposed within the former Magna Metals Building to investigate potential soil impacts beneath the building. The proposed locations represent and approximate frequency of one sample every 30 linear feet of side wall and 1,200 square feet of bottom area. The proposed soil boring locations are shown on Figure 3. The boring will be advanced to bedrock along the southern edge of the building and a maximum depth of 5 feet bgs in other portions of the building. Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. The proposed sample intervals are shown on Figure 3 and additional sampling details are provided in Table 1.

2.1.5 AOC-5 – Freshwater Wetland and Unnamed Tributary

Twenty-five sediment locations are proposed in the wetland area to delineate sediment impacts horizontally and vertically. The proposed locations represent and approximate frequency of one sample every 60 linear feet of side wall and 3,000 square feet of bottom area. The proposed soil boring locations are shown on Figure 3. The borings will be advanced to a maximum depth of 5 feet (or bedrock). Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. A total of 54 sediment samples will be collected from the 25 locations. The proposed sample intervals are shown on Figure 3 and additional sampling details are provided in Table 1.

2.1.6 AOC-6 – Off-Site Pond

Twenty-three sediment locations are proposed in the Off-Site Pond area to delineate sediment impacts horizontally and vertically. The proposed locations represent and approximate frequency of one sample every 100 linear feet of side wall and 10,000 square feet of bottom area. The proposed soil boring locations are shown on Figure 3. The borings will be advanced to a maximum depth of 5 feet bgs or bedrock. Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. A total 62 sediment samples will be collected from the 23 locations. The proposed sample intervals are shown on Figure 3 and additional sampling details are provided in Table 1.

2.1.7 AOC-7 – Furnace Brook

Fifty-nine sediment locations are proposed in Furnace Brook to delineate sediment impacts horizontally and vertically. The proposed locations are located in transects spaced approximately every 75 feet upstream of the culvert and every 100 feet down stream of the culvert. Each transect consists of two sidewall samples and one bottom sample. The proposed soil boring locations are shown on Figure 3 and Figure 4. The borings will be advanced to a maximum depth of 5 feet bgs upstream of the culvert and 2 feet bgs downstream of the culvert. Soil samples will be collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. A total of 115 sediment samples will be collected from the 59 locations. The proposed sample intervals are shown on Figures 3 and 4, and additional sampling details are provided in Table 1.

2.2 Background Samples

Ten sediment background sample locations are proposed in the wetland, unnamed tributary and Furnace Brook, up gradient of the impacted area of the Site. Background sediment samples will be evaluated to establish the average background concentrations of sediment nickel, copper, and zinc concentrations.

3.0 FIELD ACTIVITIES

3.1 Access Agreements

A total of seventeen properties will be affected by the PDI field sampling activities. In October and November of 2012, NYSDEC mailed out letters notifying affected property owners about future activities and requesting authorization to enter onto their properties to complete the work. As of December 2012, seven access agreements have not been obtained. Properties with remaining access agreements include:

- U.S. Privacy Act redaction
-
-
-
-
-
-

Access agreements for these properties will be required before proceeding with sampling work proposed for the wetland and unnamed tributary area, and the downstream section of Furnace Brook area.

3.2 Field Sampling Activities

Field sampling activities will be completed in accordance with HDR's Program Field Activities Plan (FAP). Site specific field activities include surface soil sampling, subsurface soil sampling, and sediment sampling.

3.2.1 Surface Soil Samples

Surface soil samples will be collected at all soil boring locations not covered by structures. Soil samples slated for VOC analysis will be collected a minimum of 6 inches bgs. Samples will be collected in the same manner as described below for subsurface soil samples.

3.2.2 Subsurface Soil Samples

3.2.2.1 Hollow Stem Auger

Subsurface soil samples collected in the leach pit and building areas will be collected using hollow stem auger drilling technique. Borings will be advanced using a truck mounted probe rig in 4-foot runs using a 4.25 inch inside diameter. Samples will be collected at the specified depths using a split spoon sampler with an outer diameter of 3 inches and length of 18 inches. All borings will be advanced to bedrock unless otherwise specified in the Work Plan. Soil samples will be continuously logged for soil description/stratigraphy, moisture content, color, and evidence of contamination (odor/sheen) on a soil probe log.

Soil chemical samples shall be collected at the targeted one foot depth intervals as specified in Section 2.0 for each AOC. The top several inches of material in the spoon will be discarded prior to collecting the sample. For VOC samples, soil shall be transferred directly from the split spoon to the appropriate sample jars utilizing the proper sampling techniques (Purge-and-Trap Soil Sampler or EnCore™ Sampler). Soil collected for all other analysis shall first be homogenized in a cleaned stainless steel bowl before transferring to sample jars supplied by the laboratory.

Samples will be submitted to a certified contract laboratory, under chain of custody via overnight delivery for sample analysis.

3.2.2.2 Direct Push/Probe

Subsurface soil samples will be collected using direct push/probe drilling technique in the upland on-site area, wetland area and Furnace Brook area if the samples cannot be collected by hand. Borings will be advanced using a track mounted probe rig in 4-foot lengths using a 1.5 inch inside diameter macro core soil sampler. All borings will be advanced to maximum of 5 ft or bedrock unless otherwise specified to an alternate depth in the Work Plan. Samples will be collected in dedicated acetate liners inside the macro-core tube. Acetate liners shall be provided by the driller. Soil samples will be continuously logged for soil description/stratigraphy, moisture content, color, and evidence of contamination (odor/sheen) on a soil probe log.

Soil samples will be collected at the targeted one foot depth intervals specified in Section 2.0 for each AOC. For VOC samples, soil shall be transferred directly from the acetate liner to the appropriate sample jars using a disposable stainless steel Scoopula. Soil collected for all other analysis shall first be homogenized in a cleaned stainless steel bowl before transferring to sample jars supplied by the laboratory.

Samples will be submitted to a certified contract laboratory, under chain of custody via overnight delivery for sample analysis.

3.2.3 Sediment Samples

Sediment samples will be collected to a depth specified in Section 2.0. The maximum depth shall be 4 ft bgs. Samples near the shore shall be collected in a manner to avoid entering the water. Samples located in areas that will not be accessible from the shore shall be collected by either wading into the water or by boat. Sediment samples shall be collected using a laboratory cleaned, dedicated stainless steel sediment corer or hand auger unless the area is accessible by the geo-probe. Alternate sediment samplers will be used if the physical characteristics of the sediment are not amenable to the equipment listed above.

Sediments collected at the targeted depth intervals specified in Section 2.0 will be transferred to appropriate sample jars and sent to the contract laboratory via overnight delivery under chain of custody protocol.

3.3 Site Survey

Sample locations shall be marked and surveyed after the sample collection is completed. Sample locations will be field located using GPS prior to sample collection. Sample locations that cannot be survey will be recorded using GPS by HDR field staff.

3.4 Equipment Decontamination

All re-useable sampling equipment shall be decontaminated between each sample location to prevent cross contamination. Re-useable equipment includes but is not limited to bowls, Scoopulas, geo-probe rods, macro-core sampler, augers, and spoons. Small equipment shall be decontaminated in buckets at a designated area covered with plastic sheeting, located a minimum of 100 ft from the wetland, Furnace Brook or unnamed tributary. Larger equipment shall be washed at a designated decontamination station capable of collecting water in a collection sump. Decontamination water shall consist of potable water and a phosphate free detergent. Once washed, equipment shall be rinsed with de-ionized water. Steam cleaning equipment is also acceptable.

3.5 Field Documentation

Daily activities will be documented in bound notebooks and submitted to the NYSDEC with the final PDI report. Documentation will include:

- visitors/staff/equipment on site;
- weather conditions;
- daily progress;
- issues encountered;
- corrective actions taken;
- photo documentation of sample collection;
- air monitoring results; and
- instrument/equipment calibration documentation

3.6 Health and Safety

Field activities for the PDI will be completed in conformance with the safety procedures and practices identified in HDR's Program Health and Safety Plan (HASP) and the site specific HASP included as Appendix A. HDR field staff will review and sign the site specific HASP and understand and use the personal protective equipment required by the HASP. All onsite staff will be 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) trained and will be current on the 8-hour HAZWOPER refresher.

3.7 Waste Handling and Disposal

HDR will be responsible for the proper storage, handling, and disposal of investigation-derived waste. Anticipated waste streams include personal protective equipment, solids and liquids

generated during decontamination. Specific waste handling and disposal procedures will be as follows:

- Liquids generated as a result of decontamination activities will be collected in 55 gallon drums for off-site disposal. Two drum staging areas for liquids shall be designated on the Site. One staging area for liquids exhibiting visual staining, sheen, or odors and one for those liquids that don't exhibit visual staining, sheen, or odors. To characterize the liquid for off-site disposal, one sample shall be collected from one drum at each staging area. Samples shall be biased to drums observed or suspected of being the most contaminated. Drums will be clearly labeled as to their contents and origin. A waste subcontractor will be contracted to remove the drums to an off-site location for waste disposal.
- Soil cuttings from borings completed on-site that are outside the wetland, off-site pond, and Furnace Brook areas shall be returned to the holes. Other soils taken from the wetland, off-site pond, and Furnace Brook areas that are not collected for sample analysis will be disposed of in drums staged in a designated area for off-site disposal. Drums shall be segregated based on soils exhibiting visual staining, sheen or odors and soils with no indication of contamination. To characterize the soils for off site disposal, one sample shall be collected from one drum at each staging area. Samples shall be biased to drums observed or suspected of being the most contaminated. Drums shall be clearly labeled as to their contents and origin. A waste subcontractor will be contracted to remove the drums to an off-site location for disposal.

3.8 Quality Assurance/Quality Control

The overall Quality Assurance/Quality Control (QA/QC) objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analyses, and reporting to ensure data is collected in a uniform manner, and that data is of consistently high quality. In order to collect and record data in a uniform manner, the Program Quality Assurance Project Plan (controlling document) was prepared which describes and specifies QA/QC procedures for the PDI field work.

4.0 REFERENCES

HDR, April 2011. Program Field Activity Plan, NYSDEC Standby Engineering Contract #D007625.

HDR, April 2011. Program Health and Safety Plan, NYSDEC Standby Engineering Contract #D007625.

HDR, April 2011. Program Quality Assurance Project Plan, NYSDEC Standby Engineering Contract #D007625.

NYSDEC, 1999. Technical Guidance for Screening Contaminated Sediments. NYSDEC Division of Fish, Wildlife and Marine Resources.

NYSDEC, 2004. Part 703 Surface Water and Groundwater Quality Standards and Ground water Effluent Limitations. www.dec.state.ny.us/website/regs/703.htm.

NYSDEC, 2010. DER 10: Technical Guidance for Site Investigation and Remediation.

NYSDEC, 2011. Record of Decision, Magna Metals State Superfund Project, Cortlandt, Westchester County, Site No. 360003.

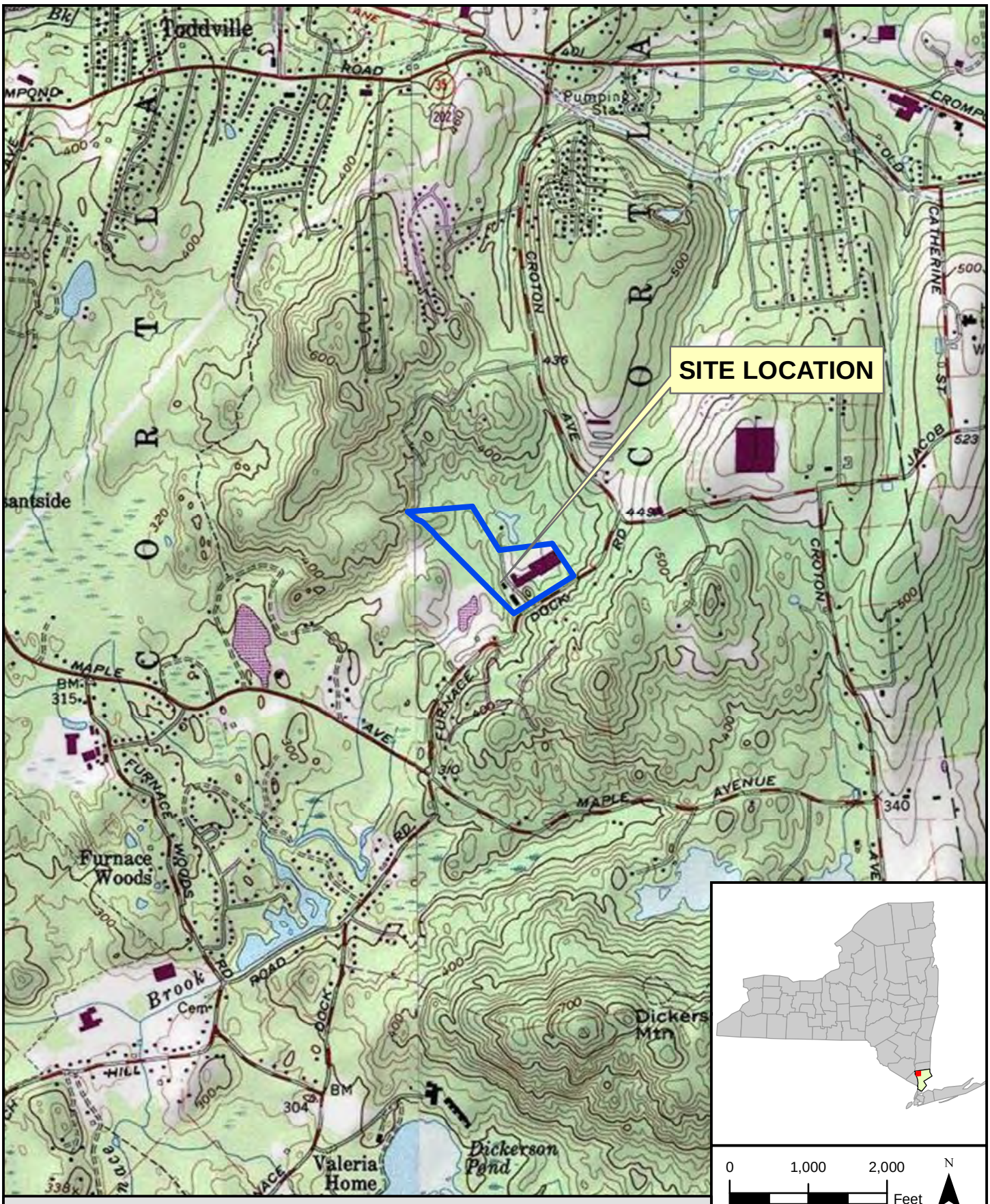
Tetra Tech Engineering Corporation, August 2007. Final Remedial Investigation for the Former Magna Metals Site, Volumes 1 and 2.

Tetra Tech Engineering Corporation, November 2010. Feasibility Study Report for the Former Magna Metals Site.

5.0 LIST OF ACRONYMS AND ABBREVIATIONS

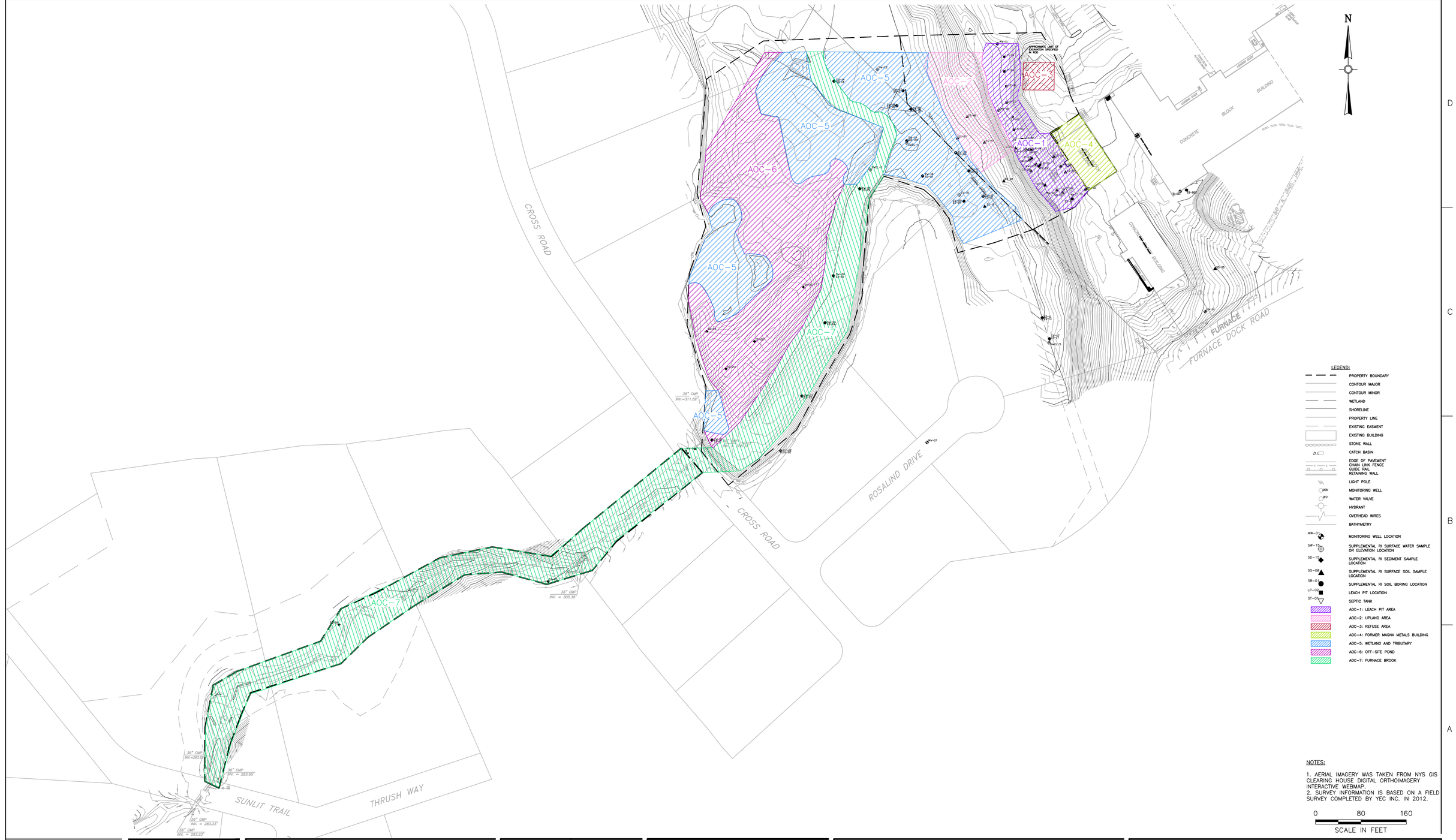
amsl	above mean sea level
AOC	Area of Concern
bgs	below ground surface
COC	Contaminant of Concern
FAP	Field Activities Plan
ft	Feet/Foot
FS	Feasibility Study
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDR	Henningson, Durham & Richardson Architecture and Engineering, P.C. in association with HDR Engineering, Inc.
LELs	Lowest Effect Levels
LP	Leach Pit
mg/kg	milligrams per kilogram
NYSDEC	New York State Department of Environmental Conservation
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PDI	Pre-Design Investigation
QA/QC	Quality Assurance/ Quality Control
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SCO	Soil Cleanup Objective
SD	Sediment
SS	Surface Soil
ST	Septic Tank
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TOC	Total Organic Carbon
VOC	volatile organic compound

FIGURES



Source: United States Geological Survey Topographic Map

HDR	**Magna Metals State Superfund Site (NYSDEC Site # 360003)** **510 Furnace Dock Road** **Westchester County, Cortlandt, New York**	**Figure 1** **Site Location Map** **February 2013**



HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	10/2012	PRE-INVESTIGATION WORK PLAN

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

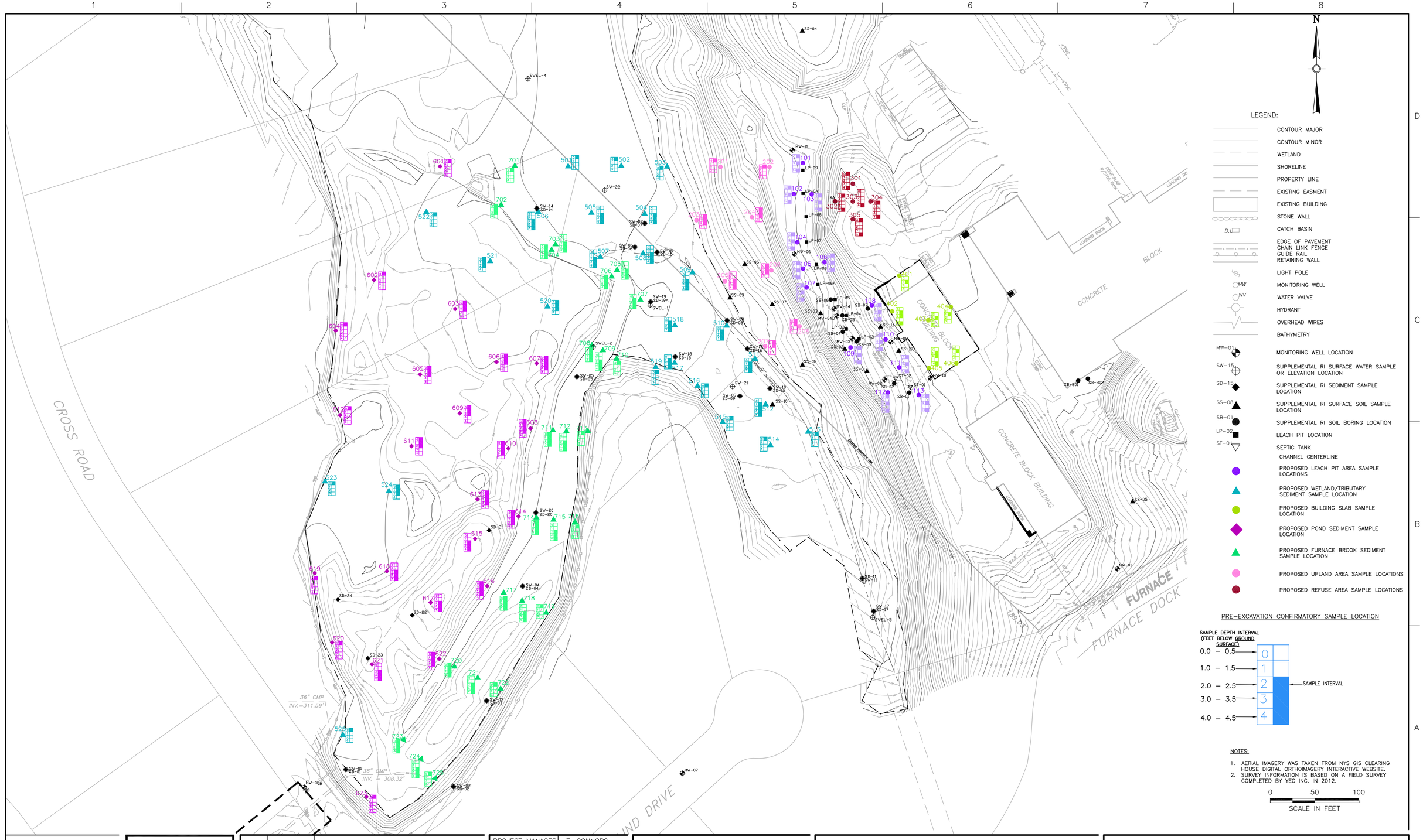
PRE-DESIGN INVESTIGATION WORK PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

SITE MAP

0

FILENAME	
SCALE	1" = 80'

SHEET
FIGURE 2


CROSS ROAD
CONCRETE BLOCK BUILDING
CONCRETE
FURNACE
FURNACE DOCK
LOADING DOCK
CONCRETE BLOCK BUILDING
BLOCK
36" CMP
INV.=311.59'
36" CMP
INV. = 308.32'
SWEL-4
SW-22
SW-14
SD-14
SW-07
SD-07
SW-06
SD-06
SW-19
SD-19A
SWEL-1
SW-18
SD-18
SW-05
SD-05
SW-21
SW-10
SD-10
SW-09
SD-09
SW-20
SD-20
SD-21
SD-24
SD-22
SD-23
SW-04
SD-04
SW-03
SD-03
SW-01
SD-01
SW-02
SD-02
SWEL-2
SS-04
SS-06
SS-09
SS-07
SS-08
SS-10
SS-05
SW-16
SD-16
SW-17
SD-17
SWEL-5
SD-11
SW-11
MW-11
MW-06
MW-04
MW-03
MW-02
MW-01
MW-08B
MW-07
SB-801
SB-802
SB-01
SB-02
SB-03
SB-04
SB-05
SB-06
SB-07
SB-08
SB-09
SB-10
SB-11
LP-09
LP-08
LP-07
LP-06
LP-06A
LP-05
LP-04
LP-03
LP-02
LP-01
ST-01
ST-02
RA
SHORE CHANNEL
SEWER FORCE MAIN
GAS LINE
CONC-24"RC
W/SHORE PARK
CONC-24"RC
CONC-10"RC
CONC-12"RC
CONC-15"RC
CONC-18"RC
CONC-24"RC
CONC-30"RC
CONC-36"RC
CONC-42"RC
CONC-48"RC
CONC-60"RC
CONC-72"RC
CONC-84"RC
CONC-96"RC
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CONC-396"RC
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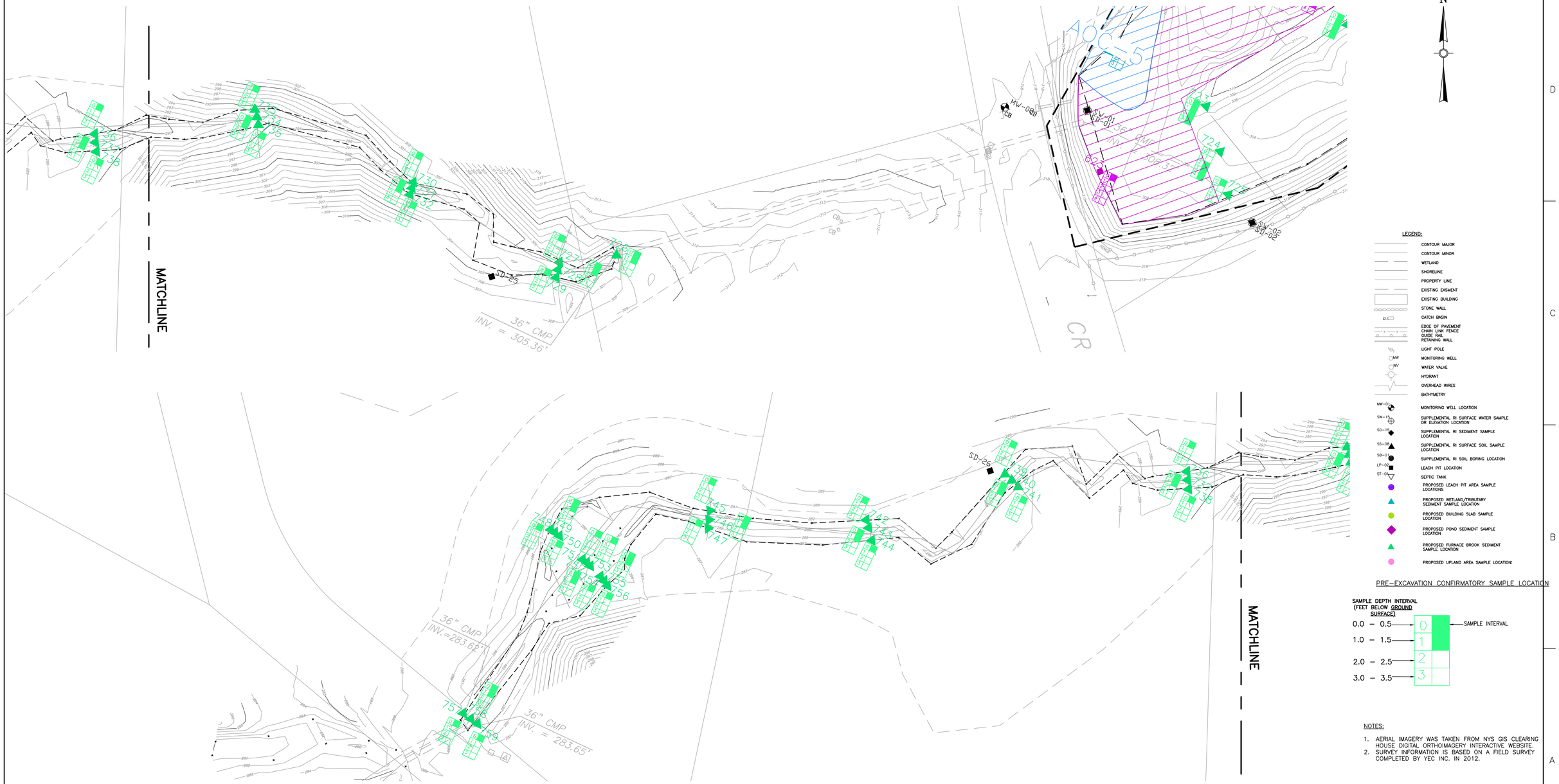
CONC-504"RC
CONC-516"RC



HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	10/2012	PRE-INVESTIGATION WORK PLAN

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

DRAFT

PRE-DESIGN INVESTIGATION WORK PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

PROPOSED BROOK SAMPLE LOCATIONS

0

FILENAME	
SCALE	1"=30'

SHEET
FIGURE 4

TABLES

Table 1
Summary of Proposed Soil Boring and Sampling Plan
Magna Metals Superfund Site
Cortlandt, New York.

Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
AOC-1 – Leach Pit Area					
101	LPSB101	0-0.5	LPSB101-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
101	LPSB101	9-9.5	LPSB101-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
101	LPSB101	14-14.5	LPSB101-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
102	LPSB102	0-0.5	LPSB102-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
102	LPSB102	9-9.5	LPSB102-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
102	LPSB102	14-14.5	LPSB102-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
103	LPSB103	0-0.5	LPSB103-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
103	LPSB103	9-9.5	LPSB103-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
103	LPSB103	14-14.5	LPSB103-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
104	LPSB104	0-0.5	LPSB104-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
104	LPSB104	9-9.5	LPSB104-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
104	LPSB104	14-14.5	LPSB104-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
105	LPSB105	0-0.5	LPSB105-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
105	LPSB105	9-9.5	LPSB105-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
105	LPSB105	14-14.5	LPSB105-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
106	LPSB106	0-0.5	LPSB106-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
106	LPSB106	9-9.5	LPSB106-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
106	LPSB106	14-14.5	LPSB106-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
107	LPSB107	0-0.5	LPSB107-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
107	LPSB107	9-9.5	LPSB107-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
107	LPSB107	14-14.5	LPSB107-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
108	LPSB108	0-0.5	LPSB108-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
108	LPSB108	9-9.5	LPSB108-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
108	LPSB108	14-14.5	LPSB108-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
109	LPSB109	0-0.5	LPSB109-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
109	LPSB109	9-9.5	LPSB109-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit

Table 1
Summary of Proposed Soil Boring and Sampling Plan
Magna Metals Superfund Site
Cortlandt, New York.

Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
109	LPSB109	14-14.5	LPSB109-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
110	LPSB110	0-0.5	LPSB110-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
110	LPSB110	9-9.5	LPSB110-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
110	LPSB110	14-14.5	LPSB110-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
111	LPSB111	0-0.5	LPSB111-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
111	LPSB111	9-9.5	LPSB111-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
111	LPSB111	14-14.5	LPSB111-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
112	LPSB112	0-0.5	LPSB112-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
112	LPSB112	9-9.5	LPSB112-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
112	LPSB112	14-14.5	LPSB112-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
113	LPSB113	0-0.5	LPSB113-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
113	LPSB113	9-9.5	LPSB113-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
113	LPSB113	14-14.5	LPSB113-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
AOC-2 – Upland Area					
201	UASB201	0-0.5	UASB201-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
202	UASB202	0-0.5	UASB202-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
203	UASB203	0-0.5	UASB203-0-0.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
203	UASB203	1-1.5	UASB203-1-1.5	VOCs,Metals	First sample at approximately one foot below ground surface to determine vertical extent of contamination
203	UASB203	2-2.5	UASB203-2-2.5	VOCs,Metals	Second sample at approximately two feet below ground surface to determine vertical extent of contamination
204	UASB204	0-0.5	UASB204-0-0.5	VOCs,Metals	Surface sample to determine soil concentration is less than Commercial Use SCOs
204	UASB204	1-1.5	UASB204-1-1.5	VOCs,Metals	First sample at approximately one foot below ground surface to determine vertical extent of contamination
204	UASB204	2-2.5	UASB204-2-2.5	VOCs,Metals	Second sample at approximately two feet below ground surface to determine vertical extent of contamination
205	UASB205	2-2.5	UASB205-2-2.5	VOCs,Metals	Bottom Sample to delineate vertical extent of contamination
205	UASB205	3-3.5	UASB205-3-3.5	VOCs,Metals	First sample at approximately three feet below ground surface to determine vertical extent of contamination
205	UASB205	4-4.5	UASB205-4-4.5	VOCs,Metals	Second sample at approximately four feet below ground surface to determine vertical extent of contamination
206	UASB206	0-0.5	UASB206-0-0.5	VOCs,Metals	Surface sample to determine soil concentration is less than Commercial Use SCOs
206	UASB206	1-1.5	UASB206-1-1.5	VOCs,Metals	First sample at approximately one foot below ground surface to determine vertical extent of contamination

Table 1
Summary of Proposed Soil Boring and Sampling Plan
Magna Metals Superfund Site
Cortlandt, New York.

Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
206	UASB206	2-2.5	UASB206-2-2.5	VOCs,Metals	Second sample at approximately two feet below ground surface to determine vertical extent of contamination
207	UASB207	0-0.5	UASB207-0-0.5	VOCs,Metals	Surface sample to determine soil concentration is less than Commercial Use SCOs
207	UASB207	1-1.5	UASB207-1-1.5	VOCs,Metals	First sample at approximately one foot below ground surface to determine vertical extent of contamination
208	UASB208	0-0.5	UASB208-0-0.5	VOCs,Metals	Surface sample to determine soil concentration is less than Commercial Use SCOs
208	UASB208	1-1.5	UASB208-1-1.5	VOCs,Metals	First sample at approximately one foot below ground surface to determine vertical extent of contamination
AOC-3 – Refuse Area					
301	RASB301	0-0.5	RASB301-0-0.5	Metals	Surface sample
301	RASB301	4-4.5	RASB301-4-4.5	Metals	Bottom sample for excavation
302	RASB302	0-0.5	RASB302-0-0.5	Metals	Surface sample
302	RASB302	4-4.5	RASB302-4-4.5	Metals	Bottom sample for excavation
303	RASB303	4-4.5	RASB303-4-4.5	Metals	Bottom sample for excavation
304	RASB304	0-0.5	RASB304-0-0.5	Metals	Surface sample
304	RASB304	4-4.5	RASB304-4-4.5	Metals	Bottom sample for excavation
305	RASB305	0-0.5	RASB305-0-0.5	Metals	Surface sample
305	RASB305	4-4.5	RASB305-4-4.5	Metals	Bottom sample for excavation
AOC-4 – Former Magna Metals Building					
401	BDSB401	1-1.5	BDSB401-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
402	BDSB402	1-1.5	BDSB402-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
402	BDSB402	9-9.5	BDSB402-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
402	BDSB402	14-14.5	BDSB402-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
403	BDSB403	1-1.5	BDSB403-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
404	BDSB404	1-1.5	BDSB404-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
405	BDSB405	1-1.5	BDSB405-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
405	BDSB405	9-9.5	BDSB405-9-9.5	VOCs,Metals	First sidewall sample at approximately two feet below the bottom of the leach pits to determine vertical extent of contamination below the bottom of leach pit
405	BDSB405	14-14.5	BDSB405-14-14.5	VOCs,Metals	Second sidewall sample at two feet above bedrock and also to assist in estimating the volume required for excavation and off-site disposal
406	BDSB406	1-1.5	BDSB406-1-1.5	VOCs,Metals	Surface sample to determine soil impacts compare to Commercial Use SCOs
AOC-5 – Freshwater Wetland and Unnamed Tributary					
501	WTSD501	0-0.5	WTSD501-0-0.5	Metals	Surface sample
502	WTSD502	0-0.5	WTSD502-0-0.5	Metals	Surface sample
503	WTSD503	0-0.5	WTSD503-0-0.5	Metals	Surface sample
504	WTSD504	2-2.5	WTSD504-2-2.5	Metals	Bottom sample for 2' excavation
504	WTSD504	3-3.5	WTSD504-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
504	WTSD504	4-4.5	WTSD504-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
505	WTSD505	2-2.5	WTSD505-2-2.5	Metals	Bottom sample for 2' excavation
505	WTSD505	3-3.5	WTSD505-3-3.5	Metals	First vertical delineation sample to determine extent of contamination

Table 1
Summary of Proposed Soil Boring and Sampling Plan
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Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
505	WTSD505	4-4.5	WTSD505-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
506	WTSD506	2-2.5	WTSD506-2-2.5	Metals	Bottom sample for 2' excavation
506	WTSD506	3-3.5	WTSD506-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
506	WTSD506	4-4.5	WTSD506-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
507	WTSD507	2-2.5	WTSD507-2-2.5	Metals	Bottom sample for 2' excavation
507	WTSD507	3-3.5	WTSD507-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
507	WTSD507	4-4.5	WTSD507-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
508	WTSD508	2-2.5	WTSD508-2-2.5	Metals	Bottom sample for 2' excavation
508	WTSD508	3-3.5	WTSD508-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
508	WTSD508	4-4.5	WTSD508-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
509	WTSD509	2-2.5	WTSD509-2-2.5	Metals	Bottom sample for 2' excavation
509	WTSD509	3-3.5	WTSD509-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
509	WTSD509	4-4.5	WTSD509-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
510	WTSD510	1-1.5	WTSD510-1-1.5	Metals	Bottom sample for 1' excavation
510	WTSD510	2-2.5	WTSD510-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
510	WTSD510	3-3.5	WTSD510-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
511	WTSD511	1-1.5	WTSD511-1-1.5	Metals	Bottom sample for 1' excavation
511	WTSD511	2-2.5	WTSD511-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
511	WTSD511	3-3.5	WTSD511-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
512	WTSD512	1-1.5	WTSD512-1-1.5	Metals	Bottom sample for 1' excavation
512	WTSD512	2-2.5	WTSD512-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
512	WTSD512	3-3.5	WTSD512-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
512	WTSD512	4-4.5	WTSD512-4-4.5	Metals	Third vertical delineation sample
513	WTSD513	0-0.5	WTSD513-0-0.5	Metals	Surface sample
514	WTSD514	0-0.5	WTSD514-0-0.5	Metals	Surface sample
515	WTSD515	0-0.5	WTSD515-0-0.5	Metals	Surface sample
516	WTSD516	0-0.5	WTSD516-0-0.5	Metals	Surface sample
517	WTSD517	1-1.5	WTSD517-1-1.5	Metals	Bottom sample for 1' excavation
517	WTSD517	2-2.5	WTSD517-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
517	WTSD517	3-3.5	WTSD517-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
518	WTSD518	1-1.5	WTSD518-1-1.5	Metals	Bottom sample for 1' excavation
518	WTSD518	2-2.5	WTSD518-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
518	WTSD518	3-3.5	WTSD518-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
519	WTSD519	0-0.5	WTSD519-0-0.5	Metals	Surface sample
520	WTSD520	0-0.5	WTSD520-0-0.5	Metals	Surface sample
520	WTSD520	1-1.5	WTSD520-1-1.5	Metals	Bottom sample for 1' excavation
520	WTSD520	2-2.5	WTSD520-2-2.5	Metals	Vertical delineation sample of 1'
521	WTSD521	0-0.5	WTSD521-0-0.5	Metals	Surface sample
521	WTSD521	1-1.5	WTSD521-1-1.5	Metals	Bottom sample for 1' excavation
521	WTSD521	2-2.5	WTSD521-2-2.5	Metals	Vertical delineation sample of 1'
522	WTSD522	0-0.5	WTSD522-0-0.5	Metals	Surface sample
523	WTSD523	0-0.5	WTSD523-0-0.5	Metals	Surface sample
524	WTSD524	0-0.5	WTSD524-0-0.5	Metals	Surface sample

Table 1
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Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
524	WTSD524	1-1.5	WTSD524-1-1.5	Metals	Bottom sample for 1' excavation
524	WTSD524	2-2.5	WTSD524-2-2.5	Metals	Vertical delineation sample of 1'
525	WTSD525	0-0.5	WTSD525-0-0.5	Metals	Surface sample
AOC-6 – Off Site Pond					
601	PASD601	0-0.5	PASD601-0-0.5	Metals	Surface sample
602	PASD602	0-0.5	PASD602-0-0.5	Metals	Surface sample
603	PASD603	0-0.5	PASD603-0-0.5	Metals	Surface sample
603	PASD603	1-1.5	PASD603-1-1.5	Metals	Bottom sample for 1' excavation
603	PASD603	2-2.5	PASD603-2-2.5	Metals	Vertical delineation sample at 1'
604	PASD604	0-0.5	PASD604-0-0.5	Metals	Surface sample
605	PASD605	0-0.5	PASD605-0-0.5	Metals	Surface sample
605	PASD605	1-1.5	PASD605-1-1.5	Metals	Bottom sample for 1' excavation
605	PASD605	2-2.5	PASD605-2-2.5	Metals	Vertical delineation sample of 1'
606	PASD606	0-0.5	PASD606-0-0.5	Metals	Surface sample
606	PASD606	1-1.5	PASD606-1-1.5	Metals	Bottom sample for 1' excavation
606	PASD606	2-2.5	PASD606-2-2.5	Metals	Vertical delineation sample of 1'
607	PASD607	0-0.5	PASD607-0-0.5	Metals	Surface sample
607	PASD607	1-1.5	PASD607-1-1.5	Metals	Bottom sample for 1' excavation
607	PASD607	2-2.5	PASD607-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
607	PASD607	3-3.5	PASD607-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
608	PASD608	0-0.5	PASD608-0-0.5	Metals	Surface sample
608	PASD608	1-1.5	PASD608-1-1.5	Metals	Bottom sample for 1' excavation
608	PASD608	2-2.5	PASD608-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
608	PASD608	3-3.5	PASD608-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
609	PASD609	0-0.5	PASD609-0-0.5	Metals	Surface sample
609	PASD609	1-1.5	PASD609-1-1.5	Metals	Bottom sample for 1' excavation
609	PASD609	2-2.5	PASD609-2-2.5	Metals	Vertical delineation sample of 1'
610	PASD610	0-0.5	PASD610-0-0.5	Metals	Surface sample
610	PASD610	1-1.5	PASD610-1-1.5	Metals	Bottom sample for 1' excavation
610	PASD610	2-2.5	PASD610-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
610	PASD610	3-3.5	PASD610-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
611	PASD611	0-0.5	PASD611-0-0.5	Metals	Surface sample
611	PASD611	1-1.5	PASD611-1-1.5	Metals	Bottom sample for 1' excavation
611	PASD611	2-2.5	PASD611-2-2.5	Metals	Vertical delineation sample of 1'
612	PASD612	0-0.5	PASD612-0-0.5	Metals	Surface sample
613	PASD613	0-0.5	PASD613-0-0.5	Metals	Surface sample
613	PASD613	1-1.5	PASD613-1-1.5	Metals	Bottom sample for 1' excavation
613	PASD613	2-2.5	PASD613-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
613	PASD613	3-3.5	PASD613-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
614	PASD614	0-0.5	PASD614-0-0.5	Metals	Surface sample
614	PASD614	1-1.5	PASD614-0-0.5	Metals	Bottom sample for 1' excavation
614	PASD614	2-2.5	PASD614-1-1.5	Metals	First vertical delineation sample to determine extent of contamination

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614	PASD614	3-3.5	PASD614-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
615	PASD615	2-2.5	PASD615-3-3.5	Metals	Bottom sample for 2' excavation
615	PASD615	3-3.5	PASD615-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
615	PASD615	4-4.5	PASD615-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
616	PASD616	0-0.5	PASD616-0-0.5	Metals	Surface sample
616	PASD616	1-1.5	PASD616-1-1.5	Metals	Bottom sample for 1' excavation
616	PASD616	2-2.5	PASD616-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
616	PASD616	3-3.5	PASD616-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
617	PASD617	2-2.5	PASD617-2-2.5	Metals	Bottom sample for 2' excavation
617	PASD617	3-3.5	PASD617-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
617	PASD617	4-4.5	PASD617-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
618	PASD618	2-2.5	PASD618-2-2.5	Metals	Bottom sample for 2' excavation
618	PASD618	3-3.5	PASD618-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
618	PASD618	4-4.5	PASD618-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
619	PASD619	0-0.5	PASD619-0-0.5	Metals	Surface sample
620	PASD620	0-0.5	PASD620-0-0.5	Metals	Surface sample
621	PASD621	2-2.5	PASD621-2-2.5	Metals	Bottom sample for 2' excavation
621	PASD621	3-3.5	PASD621-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
621	PASD621	4-4.5	PASD621-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
622	PASD622	0-0.5	PASD622-0-0.5	Metals	Surface sample
622	PASD622	1-1.5	PASD622-1-1.5	Metals	Bottom sample for 1' excavation
622	PASD622	2-2.5	PASD622-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
622	PASD622	3-3.5	PASD622-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
623	PASD623	0-0.5	PASD623-0-0.5	Metals	Surface sample
AOC-7 – Furnace Brook					
701	BRSD701	0-0.5	BRSD701-0-0.5	Metals	Surface sample
702	BRSD702	0-0.5	BRSD702-0-0.5	Metals	Surface sample
702	BRSD702	1-1.5	BRSD702-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
702	BRSD702	2-2.5	BRSD702-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
703	BRSD703	2-2.5	BRSD703-2-2.5	Metals	Bottom sample for 2' excavation
703	BRSD703	3-3.5	BRSD703-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
703	BRSD703	4-4.5	BRSD703-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
704	BRSD704	0-0.5	BRSD704-0-0.5	Metals	Surface sample
704	BRSD704	1-1.5	BRSD704-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
704	BRSD704	2-2.5	BRSD704-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
704	BRSD704	3-3.5	BRSD704-3-3.5	Metals	Third vertical delineation sample to determine extent of contamination
705	BRSD705	2-2.5	BRSD705-2-2.5	Metals	Bottom sample for 2' excavation
705	BRSD705	3-3.5	BRSD705-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
705	BRSD705	4-4.5	BRSD705-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
706	BRSD706	0-0.5	BRSD706-0-0.5	Metals	Surface sample
706	BRSD706	1-1.5	BRSD706-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
706	BRSD706	2-2.5	BRSD706-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination

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706	BRSD706	3-3.5	BRSD706-3-3.5	Metals	Third vertical delineation sample to determine extent of contamination
707	BRSD707	1-1.5	BRSD707-1-1.5	Metals	Bottom sample for 1' excavation
707	BRSD707	2-2.5	BRSD707-2-2.5	Metals	First vertical delineation sample to determine extent of contamination
707	BRSD707	3-3.5	BRSD707-3-3.5	Metals	Second vertical delineation sample to determine extent of contamination
708	BRSD708	0-0.5	BRSD708-0-0.5	Metals	Surface sample
708	BRSD708	1-1.5	BRSD708-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
708	BRSD708	2-2.5	BRSD708-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
708	BRSD708	3-3.5	BRSD708-3-3.5	Metals	Third vertical delineation sample
709	BRSD709	2-2.5	BRSD709-2-2.5	Metals	Bottom sample for 2' excavation
709	BRSD709	3-3.5	BRSD709-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
709	BRSD709	4-.45	BRSD709-4-.45	Metals	Second vertical delineation sample to determine extent of contamination
710	BRSD710	0-0.5	BRSD710-0-0.5	Metals	Surface sample
711	BRSD711	0-0.5	BRSD711-0-0.5	Metals	Surface sample
711	BRSD711	1-1.5	BRSD711-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
711	BRSD711	2-2.5	BRSD711-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
711	BRSD711	3-3.5	BRSD711-3-3.5	Metals	Third vertical delineation sample
712	BRSD712	2-2.5	BRSD712-2-2.5	Metals	Bottom sample for 2' excavation
712	BRSD712	3-3.5	BRSD712-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
712	BRSD712	4-.45	BRSD712-4-.45	Metals	Second vertical delineation sample to determine extent of contamination
713	BRSD713	0-0.5	BRSD713-0-0.5	Metals	Surface sample
714	BRSD714	0-0.5	BRSD714-0-0.5	Metals	Surface sample
714	BRSD714	1-1.5	BRSD714-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
714	BRSD714	2-2.5	BRSD714-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
714	BRSD714	3-3.5	BRSD714-3-3.5	Metals	Third vertical delineation sample
715	BRSD715	2-2.5	BRSD715-2-2.5	Metals	Bottom sample for 2' excavation
715	BRSD715	3-3.5	BRSD715-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
715	BRSD715	4-4.5	BRSD715-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
716	BRSD716	0-0.5	BRSD716-0-0.5	Metals	Surface sample
717	BRSD717	0-0.5	BRSD717-0-0.5	Metals	Surface sample
717	BRSD717	1-1.5	BRSD717-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
717	BRSD717	2-2.5	BRSD717-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
717	BRSD717	3-3.5	BRSD717-3-3.5	Metals	Third vertical delineation sample
718	BRSD718	2-2.5	BRSD718-2-2.5	Metals	Bottom sample for 2' excavation
718	BRSD718	3-3.5	BRSD718-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
718	BRSD718	4-4.5	BRSD718-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
719	BRSD719	0-0.5	BRSD719-0-0.5	Metals	Surface sample
720	BRSD720	0-0.5	BRSD720-0-0.5	Metals	Surface sample
720	BRSD720	1-1.5	BRSD720-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
720	BRSD720	2-2.5	BRSD720-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
720	BRSD720	3-3.5	BRSD720-3-3.5	Metals	Third vertical delineation sample
721	BRSD721	2-2.5	BRSD721-2-2.5	Metals	Bottom sample for 2' excavation
721	BRSD721	3-3.5	BRSD721-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
721	BRSD721	4-4.5	BRSD721-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination

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722	BRSD722	0-0.5	BRSD722-0-0.5	Metals	Surface sample
723	BRSD723	0-0.5	BRSD723-0-0.5	Metals	Surface sample
723	BRSD723	1-1.5	BRSD723-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
723	BRSD723	2-2.5	BRSD723-2-2.5	Metals	Second vertical delineation sample to determine extent of contamination
723	BRSD723	3-3.5	BRSD723-3-3.5	Metals	Third vertical delineation sample
724	BRSD724	2-2.5	BRSD724-2-2.5	Metals	Bottom sample for 2' excavation
724	BRSD724	3-3.5	BRSD724-3-3.5	Metals	First vertical delineation sample to determine extent of contamination
724	BRSD724	4-4.5	BRSD724-4-4.5	Metals	Second vertical delineation sample to determine extent of contamination
725	BRSD725	0-0.5	BRSD725-0-0.5	Metals	Surface sample
726	BRSD726	0-0.5	BRSD726-0-0.5	Metals	Surface sample
726	BRSD726	1-1.5	BRSD726-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
727	BRSD727	0-0.5	BRSD727-0-0.5	Metals	Surface sample
728	BRSD728	0-0.5	BRSD728-0-0.5	Metals	Surface sample
728	BRSD728	1-1.5	BRSD728-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
729	BRSD729	0-0.5	BRSD729-0-0.5	Metals	Surface sample
730	BRSD730	0-0.5	BRSD730-0-0.5	Metals	Surface sample
731	BRSD731	0-0.5	BRSD731-0-0.5	Metals	Surface sample
731	BRSD731	1-1.5	BRSD731-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
732	BRSD732	0-0.5	BRSD732-0-0.5	Metals	Surface sample
733	BRSD733	0-0.5	BRSD733-0-0.5	Metals	Surface sample
734	BRSD734	0-0.5	BRSD734-0-0.5	Metals	Surface sample
734	BRSD734	1-1.5	BRSD734-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
735	BRSD735	0-0.5	BRSD735-0-0.5	Metals	Surface sample
736	BRSD736	0-0.5	BRSD736-0-0.5	Metals	Surface sample
737	BRSD737	0-0.5	BRSD737-0-0.5	Metals	Surface sample
737	BRSD737	1-1.5	BRSD737-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
738	BRSD738	0-0.5	BRSD738-0-0.5	Metals	Surface sample
739	BRSD739	0-0.5	BRSD739-0-0.5	Metals	Surface sample
740	BRSD740	0-0.5	BRSD740-0-0.5	Metals	Surface sample
740	BRSD740	1-1.5	BRSD740-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
741	BRSD741	0-0.5	BRSD741-0-0.5	Metals	Surface sample
742	BRSD742	0-0.5	BRSD742-0-0.5	Metals	Surface sample
743	BRSD743	0-0.5	BRSD743-0-0.5	Metals	Surface sample
743	BRSD743	1-1.5	BRSD743-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
744	BRSD744	0-0.5	BRSD744-0-0.5	Metals	Surface sample
745	BRSD745	0-0.5	BRSD745-0-0.5	Metals	Surface sample
746	BRSD746	0-0.5	BRSD746-0-0.5	Metals	Surface sample
746	BRSD746	1-1.5	BRSD746-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
747	BRSD747	0-0.5	BRSD747-0-0.5	Metals	Surface sample
748	BRSD748	0-0.5	BRSD748-0-0.5	Metals	Surface sample
749	BRSD749	0-0.5	BRSD749-0-0.5	Metals	Surface sample
749	BRSD749	1-1.5	BRSD749-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
750	BRSD750	0-0.5	BRSD750-0-0.5	Metals	Surface sample

Table 1
Summary of Proposed Soil Boring and Sampling Plan
Magna Metals Superfund Site
Cortlandt, New York.

Soil Boring Location Number	Soil Boring Location ID	Sample Depth (ft bgs)	Sample ID (Area ID-Soil Boring ID-Start Depth-End Depth)	Sample Analysis	Sample Rational
751	BRSD751	0-0.5	BRSD751-0-0.5	Metals	Surface sample
752	BRSD752	0-0.5	BRSD752-0-0.5	Metals	Surface sample
752	BRSD752	1-1.5	BRSD752-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
753	BRSD753	0-0.5	BRSD753-0-0.5	Metals	Surface sample
754	BRSD754	0-0.5	BRSD754-0-0.5	Metals	Surface sample
755	BRSD755	0-0.5	BRSD755-0-0.5	Metals	Surface sample
755	BRSD755	1-1.5	BRSD755-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
756	BRSD756	0-0.5	BRSD756-0-0.5	Metals	Surface sample
757	BRSD757	0-0.5	BRSD757-0-0.5	Metals	Surface sample
758	BRSD758	0-0.5	BRSD758-0-0.5	Metals	Surface sample
758	BRSD758	1-1.5	BRSD758-1-1.5	Metals	First vertical delineation sample to determine extent of contamination
759	BRSD759	0-0.5	BRSD759-0-0.5	Metals	Surface sample
Background Samples					
801	BSSB801	0-0.5	BSSB801-0-0.5	Metals	Surface sample
802	BSSB802	0-0.5	BSSB802-0-0.5	Metals	Surface sample
803	BSSB803	0-0.5	BSSB803-0-0.5	Metals	Surface sample
804	BSSB804	0-0.5	BSSB804-0-0.5	Metals	Surface sample
805	BSSB805	0-0.5	BSSB805-0-0.5	Metals	Surface sample
806	BSSB806	0-0.5	BSSB806-0-0.5	Metals	Surface sample
807	BSSB807	0-0.5	BSSB807-0-0.5	Metals	Surface sample
808	BSSB808	0-0.5	BSSB808-0-0.5	Metals	Surface sample
809	BSSB809	0-0.5	BSSB809-0-0.5	Metals	Surface sample
810	BSSB810	0-0.5	BSSB810-0-0.5	Metals	Surface sample

Notes:
LP = Leach Pit Area
UA = Upland Area
RA = Refuse Area
BD = Former Magna Metals Building
WT = Wetland and Tributary Area
PA = Off-Site Pond Area
BR = Furnace Brook Area
BG = Background Samples
ft bgs = Feet Below Ground Surface

APPENDICIES

PROJECT SPECIFIC HEALTH AND SAFETY PLAN

For

Magna Metals State Superfund Site
Town of Cortlandt,
Westchester County, New York

NYSDEC Site Number: 360003

NYSDEC STANDBY ENGINEERING CONTRACT D006129-01
Work Assignment No. 5

February 2013

Prepared by:

HDR Engineering, Inc.
One Blue Hill Plaza, Floor 12
Pearl River, New York 10965

Under the Direction of:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 BROADWAY
ALBANY, NEW YORK 12233

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Signature Sheet

Project Specific Health And Safety Plan

Magna Metals State Superfund Site
Town of Cortlandt,
Westchester County, New York

Contract No. D006129-01; Work Assignment No. 5

Prepared by: _____ Date: 10/8/12
John Guzewich
Office Safety Coordinator
(845) 735-8300 x252

Approved by: _____ Date: 10/8/12
Beth Regan, CIH
H&S Regional Manager
(763) 591-5477

Approved by: _____ Date: 10/8/12
Thomas Connors, PE
(845) 735-8300 x269

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SITE SPECIFIC HEALTH & SAFETY PLAN:
TITLE PAGE
HDR Engineering

PROJECT NAME: Magna Metals	PROJECT CLIENT: NYSDEC
JOB SITE ADDRESS: 510 Furnace Dock Road, Cortlandt Manor, NY	JOB NUMBER:
PROJECT MANAGER: Thomas Connors, HDR	PHONE NO.: (845) 735-8300
SITE CONTACT: Jiss Philip	PHONE NO.: (845) 735-8300

( ) AMENDMENT NO. 0

OBJECTIVES OF FIELD WORK:
Perform a Supplemental Site Investigation at the site.
Field Activities Include:

1. Site Visits (including but not limited to wetlands, threatened & endangered species, and floodplain assessments);
2. Soil Borings/Sampling;
3. Test Pit Observation/Sampling;

SITE TYPE: *Check as many as applicable*

( ) Active
(**X**) Inactive
(**X**) Secure
( ) Unsecured
( ) Enclosed space
( ) Landfill
( ) Uncontrolled
(**X**) Industrial
(**X**) Residential
( ) Well Field
( ) Natural
( ) Military
( ) Other specify**:**

DESCRIPTION AND FEATURES: *Summarize below. Include principal operations and unusual features (containers, buildings, dikes, power lines, hills, slopes, rivers)*

Location: Magna Metals is located at 510 Furnace Dock Road in the Town of Cortlandt in Westchester County near the intersection of Furnace Dock Road and Maple Avenue. Nearby towns include Peekskill and Croton–on-Hudson. The Hudson River is located three miles west of the site.

Site Features: The Site is a 26 acre parcel located at 510 Furnace Dock Road in the Town of Cortlandt, New York. The property is currently owned by Baker Capital Limited Partnership and has three buildings on-site. Two buildings are currently used as offices, a laboratory and warehouse. The third building is the former Magna Metals building, which is vacant. From 1955 to 1979, the Site was used for metal plating, polishing, and lacquering operations. During operations, liquid waste containing metal and VOC contamination was discharged to a series of leach pits located behind the former Magna Metals building resulting in contamination of on-site and off-site soils and sediments. The southwestern property line borders a freshwater wetland area regulated by the New York State Department of Environmental Conservation (NYSDEC) and an off-site pond. Furnace Brook traverses the Site, approximately 300 feet (ft) west of the former Magna Metals building, flowing south into the wetland area and pond. An unnamed tributary flows southwest along the southern property line from the direction of Furnace Dock Road, and discharges to Furnace Brook in the vicinity of the wetland area and off-site pond. Figure 1 shows the location of the Site in relation to the off-site pond, wetland, unnamed tributary, and Furnace Brook. Topography across the Site ranges from approximately 355 ft above mean sea level (amsl) along the former Magna Metals Building, to 312 ft amsl along the southwestern property line within the wetland area. The former Magna Metals building and leach pit area reside on a hill which slopes steeply down to the wetland area. The height of the slope varies from 12 to 19 ft with an approximate gradient of 2 horizontal feet to 1 vertical foot (2H:1V). Stormwater drainage follows site topography and drains west into the unnamed tributary to Furnace Brook and the wetland area.

Current Zoning/Use: The site is zoned MD industrial and is surrounded by residentially zoned property.

Historic Use: Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operations, iron, lead, copper, nickel, zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethene (TCE) was allegedly discharged to the septic system. Previous investigations and actions were performed by the Department and the Westchester County Health Department starting in 1978.

SITE SPECIFIC HEALTH & SAFETY PLAN:
TITLE PAGE
HDR Engineering

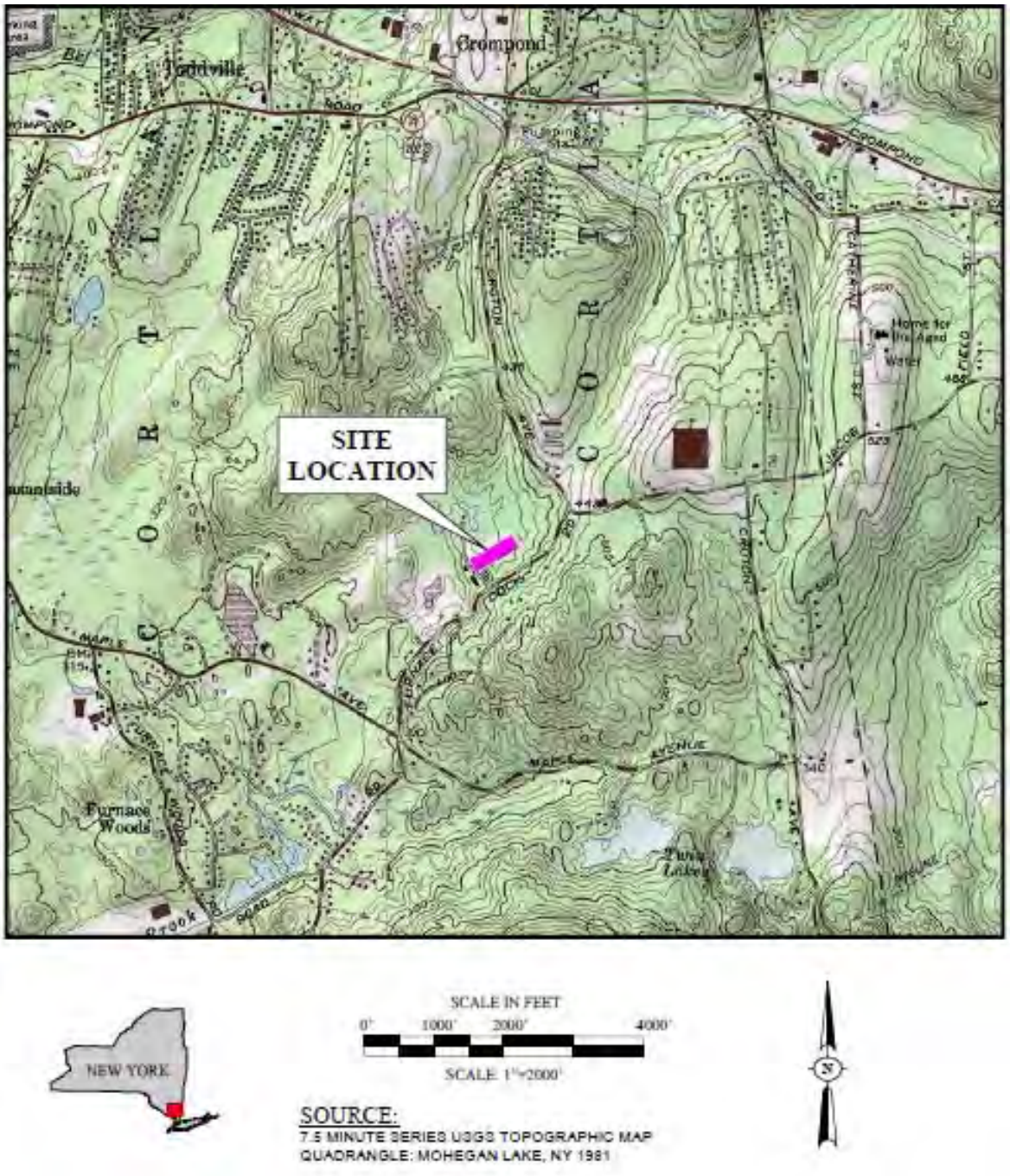
Site Geology and Hydrogeology: The primary characteristics of the subsurface at the site and surrounding area consist of a sandy to silty sand overburden unit, approximately 2 to 18 feet thick, overlying Hornblende bedrock. In the leach pit area it is presumed that much of the overburden material is fill resulting from the installation of the leach pits. The inferred depth is approximately 7 to 10 feet thick. Metal and lamp parts were found buried in this area. Overburden groundwater exists in the form of a very shallow water-bearing unit (typically less than five feet thick). Overburden groundwater flow direction is to the west toward the unnamed tributary, the wetland area, and the confluence of the unnamed tributary and Furnace Brook. Bedrock groundwater flows in a similar direction and some may discharge into the overburden water units.

Investigation Activities: This investigation phase of work at the site is being conducted to fill in data gaps form previous investigations at the site and provide soil delineation data to determine the limits of the fill and also provide data required to design an engineered cap for the impacted areas of the site. A Direct-Push Technology (DPT) rig will be used to collect soil samples to provide chemical data as to the quality of the existing material on site and provide a delineation of the horizontal and vertical limits of the fill materials on site. Test pits will be conducted to define the edge of the fill material along the boundaries in certain areas for the cap design requirements.

SURROUNDING POPULATION: **(X) Residential** ( ) Industrial **(X) Rural** ( ) Urban **(X) Commercial** ( ) Other:

SITE SPECIFIC HEALTH & SAFETY PLAN
SITE LOCATION PLAN/SITE SKETCH
Henningson, Durham & Richardson Architecture & Engineering, P.C.

The overall site plan.



SITE SPECIFIC HEALTH & SAFETY PLAN
EMERGENCY CONTACTS AND APPROVAL PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

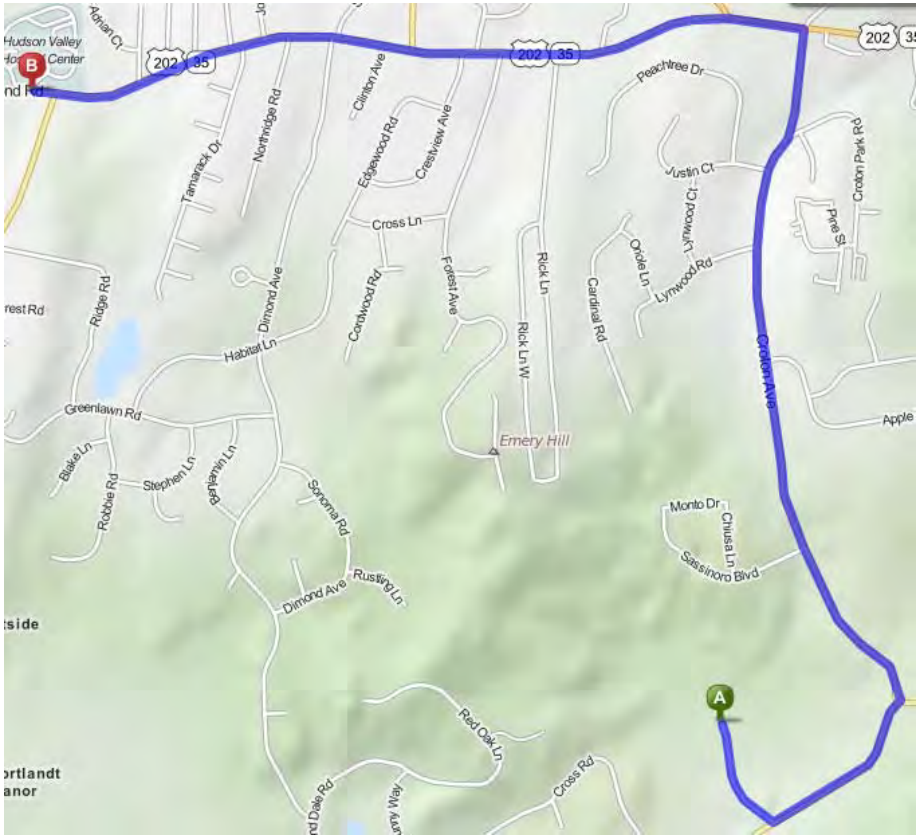
EMERGENCY CONTACTS			**EMERGENCY CONTACTS**	**NAME**	**PHONE**
EPA Region 2		(800) 223-0425	Project Manager	Thomas Connors	(845) 735-8300
NYDEC Region 3 Office		(845) 256-3000	Office Safety Coordinator (OSC)	John Guzewich	(845) 735-8300 x252
Site Telephone		TBD	QA/QC Coordinator	Amita Patel	(845) 735-8300
Poison Control Center	National	(800)-962-1253			(845) 735-8300
WorkCare, Inc.	Sheila Nghe	(800) 455-6155 x423	Site Safety Officer	Jiss Philip	(845) 735 8300 ext 295
National Response Center		(800)-424-8802			
NY State Spill Hotline		(800)-457-7362	Fire Department		911
1. Evacuation Routes will be specified by the HSO and communicated to all personnel on site. 2. Personnel will evacuate under conditions specified by air monitoring or as directed by the HSO. 3. An INCIDENT REPORT form will be completed for all accidents (see Appendix A).			Police Department		911
QA REVIEW: _____ Date: HDR Corporate Safety Department			**Nearest Hospital Emergency Room Number:**	Hudson Valley Hospital	(914) 737-9000
HEALTH AND SAFETY PLAN APPROVALS			**Number of 24-Hour Ambulance:**		911
Project Manager: _____ Date Site Health and Safety Officer _____ Date:			The route to the hospital is described on the following page and includes a map.		

SITE SPECIFIC HEALTH & SAFETY PLAN
HOSPITAL MAP ROUTE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

Hudson Valley Hospital
Directions: See below
Address: 1980 Crompond Road, Cortlandt Manor, NY 10567
(914) 737-9000

Start out going southeast on Furnace Dock Rd.	0.2 mi
Turn left to stay on Furnace Dock Rd.	0.3 mi.
Turn left onto Croton Ave.	1.2 mi.
Turn left onto Crompond Rd / US-202 / RT-35.	1.3 mi
1980 CROMPOND RD is on the right	
(~3.01 miles; 7 minutes)	

Hudson Valley Hospital
1980 Crompond Road, Cortlandt Manor, NY 10567
(914) 737-9000



SITE SPECIFIC HEALTH & SAFETY PLAN
HISTORY AND WASTE CHARACTERIZATION PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

HISTORY: Summarize site specific information below or attach information behind this page.

WASTE TYPES: (X) Liquid (X) Solid (X) Sludge ( ) Gas (X) Unknown ( ) Other specify:

WASTE CHARACTERISTICS: Check as many as applicable.

( ) Corrosive ( ) Flammable ( ) Radioactive

(**X**) Toxic (**X**) Volatile ( ) Reactive

( ) Inert Gas (**X**) Unknown ( ) Other specify:

WORK ZONES: Work zones have been described on the "WORK ZONE MAP PAGE."

1. The exclusion zone will consist of a 25-foot radius around the drilling and sampling locations.

HAZARDS OF CONCERN: Check as many as applicable.

(**X**) Heat Stress
See HDR H&S Pro #28

(**X**) Noise
See HDR H&S Pro #26

(**X**) Cold Stress attach guidelines
See HDR H&S Pro #29

(**X**) Inorganic Chemicals

( ) Explosive/Flammable (X) Organic Chemicals See MSDS (Attached)

( ) Oxygen Deficient

(**X**) Motorized Traffic

( ) Radiological

(**X**) Heavy Machinery
See HDR H&S Pro #37

(**X**) Biological
See HDR H&S Pro #34

(**X**) Slips, Trips & Falls
See HDR H&S Pro #3

(**X**) Trenching/Test Pits
See HDR H&S Pro #5

(**X**) Other specify: Water Boating Safety
See HDR H&S Pro #18

CONFINED SPACES WILL NOT BE ENTERED.
(If confined spaces are to be entered a specific confined space entry plan will be developed)

PRINCIPAL DISPOSAL METHODS AND PRACTICES: Summarize Site Specific Conditions Procedures Below:

Investigative Derived Wastes (IDW) generated during field activities will be returned to the sample location unless it appears to be heavily contaminated or contains product based on field observations. Types of IDW that may be generated include:

Decontamination fluids from small tool and large equipment decontamination activities;

- Soil from the installation of hand or power auger borings, well installation borings, and test pits/trenches.

All decontamination fluids and purged groundwater will be discharged to the ground surface away from the sample locations unless there is product present with the water.

All IDW soils generated during the investigation will be returned to the excavation or boring location or spread out on the ground nearby unless it appears to be heavily contaminated (product present) based on field observations.

If IDW is required to be drummed, it will be labeled properly and staged in a designated location on site prior to proper disposal.

All field refuse including PPE, paper towels, plastic bags, and other general refuse will be containerized and disposed of as solid waste.

SITE SPECIFIC HEALTH & SAFETY PLAN
HAZARDOUS MATERIAL SUMMARY PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

HAZARDOUS MATERIAL SUMMARY: **Underline and bold waste type** and estimate amounts by category (if possible)

CHEMICALS Amounts/Units:	SOLIDS Amounts/Units:	SLUDGES Amounts/Units:	SOLVENTS Amounts/Units:	OILS Amounts/Units:	OTHER Amounts/Units:
Acids	Flyash	**Paint**	**Halogenated (chloro, bromo) Solvents**	**Oily Wastes**	Laboratory
Pickling Liquors	**Asbestos**	Pigments	**Hydrocarbons**	Gasoline	Pharmaceutical
Caustics	Milling/Mine Tailings	**Metal Sludges**	Alcohols	Diesel Oil	Hospital
Pesticides	Ferrous Smelter	POTW Sludge	Ketones	Lubricants	Radiological
Dyes/Inks	Non-ferrous Smelter	**Aluminum**	Esters	**PCBs**	Municipal
Cyanides	**Metals – Lead, Chromium, Zinc, etc.**	Distillation Bottoms	Ethers	**Polynuclear Aromatics**	**Construction**
Phenols	**Other**	Other	Other	Other	Munitions
Halogens	Specify: Landfill related	Specify**:**	Specify:	Specify:	Other :
Dioxins					Specify:

OVERALL HAZARD EVALUATION: ( ) High ( ) Medium **(X) Low** ( ) Unknown (Where tasks have different hazards, evaluate each)
Attach additional sheets if necessary)

JUSTIFICATION: Soil sampling will be conducted using a drill rig, shovel, and/or hand auger and test pits will be advanced with a backhoe. HDR personnel will not enter any trenches greater than 5 ft unless properly protected by benching or shoring or shielding. The backhoe operator will be instructed to use techniques to minimize potential release of dust when the material is removed from the test pits and placed in the spoils pile(s). Where possible test pit observations will be conducted from the upwind side of the test pits. VOC and dust monitoring will be conducted during intrusive sub-surface investigation activities. Engineering controls for dust suppression will be utilized in order to minimize the generation of dust, if required. Site visits and walk thru are intermittent and for short durations.

FIRE/EXPLOSION POTENTIAL: ( ) High ( ) Medium **(X) Low** ( ) Unknown

BACKGROUND REVIEW: **(X) COMPLETE** ( ) INCOMPLETE

SITE SPECIFIC HEALTH & SAFETY PLAN
CHEMICAL HAZARD TABLE PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

POTENTIAL CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION (specify units and media)	Exposure Limits Ppm (TWA) or mg/m^3 (TWA) **(specify)**	IDLH ppm or mg/m^3 **(specify)**	SYMPTOMS/EFFECTS OF ACUTE EXPOSURE	
Arsenic	402 mg/kg SL	TLV: 1 ppm PEL: 5 ppm	5 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Barium (as Ba)	721 mg/kg S	TLV: 0.5 mg/m^3 PEL: 0.5 mg/m^3	50 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Benzo(a)pyrene	1000 1 ugmg/kg SD	TLV: 0.2 mg/m^3 PEL: 0.2 mg/m^3	700 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Benzo(k)fluoranthene	950 0.95 ugmg/kg SD	Not Listed	Not Listed	SEE APPENDIX D Material Safety Data Sheet	
Cadmium	6.4 mg/kg SL	TLV: 0.2 mg/m^3 PEL: 0.05 mg/m^3	9 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Chromium	144 mg/kg SD	TLV: 0.5 mg/m^3 PEL: 1 mg/m^3	250 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Chrysene	1300 1.4 ugmg/kg SD	TLV: 0.2 mg/m^3 PEL: 0.2 mg/m^3	100 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Copper	2330 mg/kg SD	TLV: 1 mg/m^3 PEL: 0.1 mg/m^3	100 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Cyanides	2420 mg/kg SL	TLV: 5 mg/m^3 PEL: 5 mg/m^3	25 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Lead (Pb)	228 mg/kg SL	TLV: 0.05 mg/m^3 PEL: 0.05 mg/m^3	100 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Mercury	0.49 mg/kg SL	TLV: 0.025 mg/m^3 PEL: 0.1 mg/m^3	10 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	

SITE SPECIFIC HEALTH & SAFETY PLAN
CHEMICAL HAZARD TABLE PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

Nickel	10400 mg/kg SL	TLV: 0.1 mg/m^3 PEL: 1 mg/m^3	10 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Selenium	200 mg/kg SL	TLV: 0.2 mg/m^3 PEL: 0.2 mg/m^3	1 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Silver	1.4 mg/kg SD	TLV: 0.1 mg/m^3 PEL: 0.01 mg/m^3	10 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	
Tetrachloroethylene (PCE)	90 ug/L GW	TLV: 100 ppm PEL: 25 ppm	150 ppm	SEE APPENDIX D Material Safety Data Sheet	
Trichloroethene (TCE)	4700 ug/L GW	TLV: 50 ppm PEL: 50 ppm	1000 ppm	SEE APPENDIX D Material Safety Data Sheet	
Xylene	30 mg/kg SL	TLV: 100 ppm PEL: 100 ppm	900 ppm	SEE APPENDIX D Material Safety Data Sheet	
Zinc	9660 mg/kg SL	TLV: 5 mg/m^3 PEL: 10 mg/m^3	50 mg/m^3	SEE APPENDIX D Material Safety Data Sheet	

NA = Not Available
S = Soil
A = Air
NE = None Established
SW = Surface Water
GW = Groundwater
U = Unknown
T = Tailings
SL = Sludge
W = Waste
D = Drums
SD = Sediment
OFF = Offsite
TWA = Time weighted average

HAZARD COMMUNICATIONS STANDARD

A notebook containing this Site Specific Health and Safety Plan will be taken to the field with the crew and kept in the vehicle. A current inventory of chemicals to be brought on-site and appropriate MSDSs will accompany these chemicals in the vehicle. All visitors entering the site are required to read the Health and Safety Plan and are required to sign the visitor's log, provided in Appendix C.

SITE SPECIFIC HEALTH & SAFETY PLAN
TASK DESCRIPTION PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

FIELD ACTIVITIES COVERED UNDER THIS PLAN - **ATTACH ACTIVITY HAZARD ANALYSIS FOR EACH TASK**				HAZARD		
TASK DESCRIPTION/SPECIFIC TECHNIQUE-STANDARD OPERATING PROCEDURES/SITE LOCATION(Attach additional sheets as necessary)	Type	Primary	Contingency	SCHEDULE		
1 Site Visit (including but not limited to wetlands, species, and floodplain assessments);	Intrusive	A B C **D**	A B C D	Hi	Med	Low
	Non-intrusive	Modified D	**Exit Area**			X
2 Soil Boring; Test Pit Observation / Sampling	**Intrusive**	A B C **D**	A B C D	Hi	Med	Low
	Non-intrusive	Modified D	**Exit Area**			X
3 Sediment Sampling;	**Intrusive**	A B C **D**	A B C D	Hi	Med	Low
	Non-intrusive	Modified D	**Exit Area**			X
4 Mobilization / Demobilization	Intrusive	A B C **D**	A B C D	Hi	Med	Low
	Non-intrusive	Modified D	**Exit Area**			X

PERSONNEL AND RESPONSIBILITIES (Include subcontractors) Responsibilities and the reporting organizational structure are described on the following page.

NAME	PHONE	DATE OF LAST 8-HOUR REFRESHER	DATE OF HEALTH CLEARANCE	RESPONSIBILITIES	ON-SITE? List task numbers
Thomas Connor	(845) 735-8300	November 2012		Project Manager	Yes(1)
Jiss Philip	(845) 735-8300	December 2012	December 2011	Junior Engineer; Site Safety And Health Officer	Yes (1,2,3,4)
Amita Patel	(845) 735-8300	December 2012	December 2011	Engineer	Yes (1, 2, 3)
John Guzewich	(845) 735-8300	January 2013	February 2011	Office Safety And Health Officer	Yes (1, 2, 3, 4)
Dana Lindsay	(845) 735-8300	April 2012	April 2012	Junior Engineer	Yes (1, 2,3,4)
Colin Mills	(845) 735-8300	January 2013	December 2012	Environmental Scientist; Site Safety And Health Officer	Yes (1, 2, 3, 4)
Ed Brandt	(845) 735-8300	January 2013	April 2012	Environmental Scientist; Site Safety And Health Officer	Yes (1, 2, 3, 4)

Notes: EM 385-1-1 (latest version) requires at least two First Aid/CPR trained personnel on-site.

Per EM 385-1-1, a minimum of two personnel on-site (including subcontractors) will be First Aid/CPR trained. The Site SHO will provide a First Aid kit for all site activities.

SITE SPECIFIC HEALTH & SAFETY PLAN
PPE BY TASK PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

PROTECTIVE EQUIPMENT: Specify by task. Indicate type and/or material as necessary. Use copies of this sheet if needed.

TASKS: **1** – 2 – 3 - **4** **(Site Visits – Mob / Demob)** (**X**) Primary
LEVEL: A - B - C - **D** – Modified ( ) Contingency

Respiratory: (**X**) Not Needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not Needed
(**X**) Safety Glasses:
( ) Face Shield:
( ) Goggles:
(**X**) Hard Hat:
( ) Other:

Boots: ( ) Not Needed
(**X**) Boots - Safety-Toed
( ) Over boots:
( ) Rubber:

Protective Clothing: ( ) Not Needed
( ) Encapsulated Suit:
( ) Splash Suit:
( ) Apron
(X) Disposable Coverall: OPTIONAL (if contacting impacted soils)
( ) Saranex Coverall:
( ) Cloth Coverall:
( ) Other:

Gloves: ( ) Not Needed
( ) Under gloves:
(**X**) Gloves: Disposable Nitrile Gloves when handling soils, sediments, sludges
( ) Over gloves:

( ) Other - specify below:

TASKS: 1 - **2** - **3** - 4 **(Soil Borings/ Sampling - Test Pits)** (**X**) Primary
LEVEL: A - B - C - **D** - Modified ( ) Contingency

Respiratory: (**X**) Not Needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not Needed
(**X**) Safety Glasses:
( ) Face Shield:
( ) Goggles:
(X) Hard Hat:
( ) Other:

Boots: ( ) Not Needed
(X) Boots - Safety-Toed
( ) Over boots:
( ) Rubber:

Protective Clothing: ( ) Not Needed
( ) Encapsulated Suit:
( ) Splash Suit:
( ) Apron
(**X**) Disposable Coverall: OPTIONAL (if contacting impacted soils, sediments, sludges, or liquids)*
( ) Saranex Coverall:
( ) Cloth Coverall:
( ) Other:

Gloves: ( ) Not Needed
( ) Under gloves: Latex
(**X**) Gloves: Disposable Nitrile Gloves when handling soils, sediments, sludges
(**X**) Work Gloves: May be needed over nitrile gloves when excavating shallow soils manually

(**X**) Other - specify below:
Ear plugs (if noise excessive from drill rig or backhoe exists)

Notes:
* Disposable coverall and/or aprons will be available on site. It is not believed that the disposable coverall and/or aprons will be needed for dermal protection; however, they will be available in the event site conditions warrant the use of them or if preferred.

SITE SPECIFIC HEALTH & SAFETY PLAN
AIR MONITORING BY TASK
HDR

MONITORING EQUIPMENT: Specify by task. Indicate type as necessary. Attach additional sheets as necessary.

INSTRUMENT	TASK	ACTION GUIDELINES	COMMENTS (Includes schedules of use)
Portable Gas Monitor (Breathing Zone)	1 - **2** - **3** – 4 (Soil Borings & Test Pits)	**0-10% LEL** **No explosion hazard** **10-25% LEL** **Potential explosion hazard; notify SHO.** **>25% LEL** **Potential Explosion hazard; interrupt task/evacuate** **21.0% 02** **<20.5% 02** **Oxygen normal** **<19.5% 02** **Oxygen deficient; notify SHO. Interrupt task/evacuate**	( ) Not Needed If % LEL concentration elevated over or at top of borehole or excavation, let vent and monitor before continuing boring or test pits
Radiation Survey Meter	1 - 2 - 3 - 4	3X Background Notify SHSC >2mR/hr Interrupt task/evacuate	**(X) Not Needed**
Photo ionization Detector ( ) 11.7 ev **(X) 10.6 ev** ( ) 9.8 ev ( ) ___ ev	1 - **2** - **3** – 4 (Soil Borings & Test Pits)	**Specify: If TOTAL VOC's ≥ 5 PPM above background in the breathing zone, sustained for 5 or more minutes, all personnel shall evacuate the site. Contact Project HSO and the site shall be reevaluated after 30 minutes. The HSO will re-enter the site upwind and monitor with the PID. Once the volatile levels are below 1 PPM, work can continue.**	( ) Not Needed
Flame Ionization Detector	1 - 2 - 3 - 4		**(X) Not Needed**
Dust Monitor	1 - **2** - **3** – 4 (Soil Borings & Test Pits)	**Specify: Particulates will be monitored within the work area during intrusive activities. Prior to beginning intrusive work, a background ambient measurement will be collected. If during the work, particulate levels in the work area are 150 ug/m^3 above the background level for a period of fifteen (15) minutes, then downwind perimeter measurements will be collected. If measurements remain 150 ug/m^3 above the background then dust suppression techniques will be employed.**	( ) Not Needed
Other: Specify	1 - 2 - 3 - 4	Specify:	**(X) Not Needed**

Notes:

SITE SPECIFIC HEALTH & SAFETY PLAN
DECONTAMINATION PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

DECONTAMINATION PROCEDURES

ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO

Personalized Decontamination Summarize below and/or attach diagram; discuss use of work zones. On-Site crews will wear disposable gloves when contacting excavated soils, sediments, sludges, or liquids. Disposable coveralls will be available if required.	Sampling Equipment Decontamination Summarize below and/or attach diagram; discuss use of work zones. For equipment such as spoons, knives, bowls, trowels, hand augers, balers, direct-push samplers and surface water sampling devices (dippers), the following procedures will be used: (1) Initial wash with potable water/alconox soap mixture. Scrub brushes will be used to remove all residual dirt or other debris. (2) Potable water wash to remove all soap residue. (3) Rinse with distilled/deionized water. (4) Wrap decontaminated equipment in plastic or aluminum foil to prevent recontamination. For sampling in areas where elevated metal concentrations are a concern, the following additional step may be added between steps 2 and 3 above: 2a) Rinse with diluted (10%) nitric acid (HNO_3).	Heavy Equipment Decontamination Summarize below and/or attach diagram; discuss use of work zones. For equipment such as drill rigs, augers, drill rods, etc. the following procedures will be used: (1) Remove solids with brush and/or water. (2) Stubborn soil or residue may be washed with a potable water/alconox soap mixture. Scrub brushes will be used to remove all residual dirt or other debris. (3) If possible, place decontaminated equipment in a secure location, or wrap in plastic to prevent potential recontamination.
Containment and Disposal Method Disposable PPE will be secured in plastic bags and disposed of as municipal waste.	Containment and Disposal Method See principal disposal methods and practices.	Containment and Disposal Method See principal disposal methods and practices.

SITE SPECIFIC HEALTH & SAFETY PLAN
WORK ZONE PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

The designated exclusion zone will surround the specific work areas. The exclusion zone will consist of a 25-foot radius around each drilling location, or test pit location. A formal contamination reduction zone will not be required based on the contaminants known to be present. An on-site HDR vehicle will be used as the site command post. If necessary, personnel evacuation will be towards the command post. Re-assembly will also be at the command post. Should the command post not be at a safe location, personnel shall assemble at the main entrance of the site in the northeast portion of the property.

At the end of each day, site personnel will remove disposable coveralls (if worn) and gloves and wash hands and face with soap and water or waterless cleanser prior to leaving the site.

SITE SPECIFIC HEALTH & SAFETY PLAN
SIGNATURE PAGE
Henningson, Durham & Richardson Architecture and Engineering, P.C.

The following personnel have read and fully understand the contents of this Site Health and Safety Plan and referenced HDR H&S procedures and further agree to all requirements contained herein. Furthermore, the individuals are fully trained and have required clearances in accordance with HDR H&S Procedure #20. Attach copies of current HTRW and first aid training, medical clearance, and respiratory fit test records.

Name	Affiliation	Date	Signature

Appendix A
Incident Report Form

All accidents, injuries and illnesses which occur from performing project activities in this HASP require that the injured person and the Site Health and Safety Officer complete an INCIDENT REPORT and forward it to the Corporate Director of Safety, Mr. Jim Woolcott, in Omaha, Nebraska.

Appendix B
Deviations and Additions Form

Deviations from and additions to this HASP are permitted and sometimes required based on additional information obtained after the preparation date of the HASP. The DEVIATIONS AND ADDITIONS form will be used to authorize and record all deviations and additions that occur after any one individual has signed this document. The NJDEP and USEPA should be notified of any deviations from the HASP. Changes in this HASP are only permitted with the following:

1. Written documentation of what the deviation or addition is and reference to the appropriate section from this HASP;
2. Written justification for the change;
3. Verbal communication of the change to all personnel who are directly affected and answering all questions regarding the change to the satisfaction of those same individuals; and
4. Signatures from all personnel who are affected by the change prior to commencing project activities on site with an approval signature from the Site Health and Safety Officer.

Health and Safety Plan
Deviations and Additions

HDR Engineering, Inc.
8404 Indian Hills Drive
Omaha, NE 68114-4049
(402) 399-1000

Change 1: Section:

Description of Change:

Justification:

Safety Impact:

Signatures of Acknowledgement:

Resident Field Representative	Date		Date
	Date		Date
	Date		Date

Change 2: Section:

Description of Change:

Justification:

Safety Impact:

Signatures of Acknowledgement:

Resident Field Representative	Date		Date
	Date		Date
	Date		Date

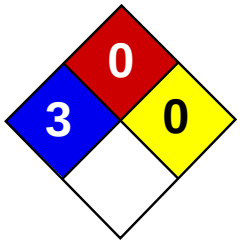
Appendix C
Visitors Log

Visitors to the site may be permitted entrance into the exclusion and contamination reduction zones based upon approval of the Site Coordinator. Otherwise, they must remain in the support zone. The Site Coordinator will be responsible for documenting the name and identity of all visitors in the VISITORS LOG.

VISITORS LOG

Name	Company or Agency	Purpose of Visit	Area(s) to be entered	Date and Time on Site	Checked in by:

Appendix D
Material Safety Data Sheets





Material Safety Data Sheet
Sodium Cyanide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium Cyanide

Catalog Codes: SLS2314, SLS3736

CAS#: 143-33-9

RTECS: VZ7525000

TSCA: TSCA 8(b) inventory: Sodium Cyanide

CI#: Not available.

Synonym:

Chemical Name: Sodium Cyanide

Chemical Formula: NaCN

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium Cyanide	143-33-9	100

Toxicological Data on Ingredients: Sodium Cyanide: ORAL (LD50): Acute: 6.44 mg/kg [Rat]. DERMAL (LD50): Acute: 10.4 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator). Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of acids, of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Dangerous on contact with acids, acid fumes, water or stream. It will produce toxic and flammable vapors of CN-H and sodium oxide. Contact with acids and acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas. When heated to decomposition it emits toxic fumes hydgrogen cyanide and oxides of nitrogen

Special Remarks on Explosion Hazards: Fusion mixtures of metal cyanides with metal chlorates, perchlorated or nitrates causes a violent explosion

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Corrosive solid. Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
STEL: 5 (mg/m3) from ACGIH (TLV) [United States] SKIN CEIL: 4.7 from NIOSH CEIL: 5 (mg/m3) from NIOSHConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Granular solid. Flakes solid.)

Odor:
Faint almond-like odor. Odorless when perfectly dry. Emits odor of hydrogen cyanide when damp.

Taste: Not available.

Molecular Weight: 49.01 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 1496°C (2724.8°F)

Melting Point: 563°C (1045.4°F)

Critical Temperature: Not available.

Specific Gravity: 1.595 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Vapor Density of Hydrogen Cyanide gas: 0.941

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Soluble in cold water. Slightly soluble in Ethanol

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, moisture, incompatibles.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity:
Corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Violent reaction with fluorine gas, magnesium, nitrates, nitric acid. Dangerous on contact with acids, acid fumes, water or stream. It wil produce toxic and flammable vapors of CN-H and sodium oxide. Cyanide may react with CO2 in ordinary air to form toxic hydrogen cyanide gas. Strong oxidizers such as acids, acid salts, chlorates, and nitrates. Contact with acids and acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas.

Special Remarks on Corrosivity: Corrosive to aluminum

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 6.44 mg/kg [Rat]. Acute dermal toxicity (LD50): 10.4 mg/kg [Rabbit].

Chronic Effects on Humans: May cause damage to the following organs: skin, eyes, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects (maternal and paternal fertility) based on animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health effects: Skin: May cause itching and irritation. May be fatal if absorbed through injured skin with symtpoms similar to those noted for inhalation and ingestion. Eyes: May cause eye irritation and eye damage. Inhalation: May cause respiratory tract irritation. May be fatal if inhaled. The substance inhibits cellular respiration causing metabolic asphyxiation. May cause headache, weakness, dizziness, labored breathing, nausea, vomiting. May be followed by cardiovascular effects, unconciousness, convulsions, coma, and death Ingestion: May be fatal if swallowed. May cause

gastrointestinal tract irritation with nausea, vomiting. May affect behavior and nervous systems(seizures, convulsions, change in motor activity, headache, dizziness, confusion, weakness stupor, aniexity, agitation, tremors), cardiovascular system, respiration (hyperventilation, pulmonary edema, breathing difficulty, respiratory failure), cardiovascular system (palpitations, rapid heart beat, hypertension, hypotension). Massive doses by produce sudden loss of conciousness and prompt death from respiratory arrest. Smaller but still lethal doses on the breath or vomitus. Chronic Potential Health Effects: Central Nervous system effects (headaches, vertigo, insomnia, memory loss, tremors, fatigue), fatigue, metabolic effects (poor appetite), cardiovascular effects (chest discomfort, palpitations), nerve damage to the eyes, or dermatitis, respiratory tract irritation, eye irritation, or death can occur. may prolong the illness for 1 or more hours. A bitter almond odor may be noted

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Sodium cyanide UNNA: 1689 PG: I

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut carcinogen reporting list.: Sodium Cyanide Illinois chemical safety act: Sodium Cyanide New York release reporting list: Sodium Cyanide Rhode Island RTK hazardous substances: Sodium Cyanide Pennsylvania RTK: Sodium Cyanide Minnesota: Sodium Cyanide Massachusetts RTK: Sodium Cyanide Massachusetts spill list: Sodium Cyanide New Jersey: Sodium Cyanide New Jersey spill list: Sodium Cyanide Louisiana RTK reporting list: Sodium Cyanide Louisiana spill reporting: Sodium Cyanide California Director's List of Hazardous Substances: Sodium Cyanide TSCA 8(b) inventory: Sodium Cyanide TSCA 4(a) final test rules: Sodium Cyanide TSCA 8(a) PAIR: Sodium Cyanide TSCA 8(d) H and S data reporting: Sodium Cyanide TSCA 12(b) one time export: Sodium Cyanide SARA 302/304/311/312 extremely hazardous substances: Sodium Cyanide CERCLA: Hazardous substances.: Sodium Cyanide: 10 lbs. (4.536 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-6: Reactive and very flammable material. CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive solid.

DSCL (EEC):
R27/28- Very toxic in contact with skin and if swallowed. R41- Risk of serious damage to eyes. S1/2- Keep locked up and out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28- After contact with skin, wash immediately with plenty of water S36/37- Wear suitable protective clothing and gloves. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

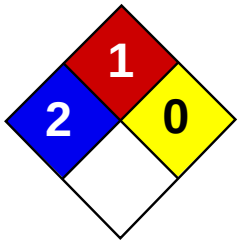
References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 01:58 PM

Last Updated: 06/09/2012 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.





Material Safety Data Sheet
Silver MSDS

Section 1: Chemical Product and Company Identification

Product Name: Silver

Catalog Codes: SLS4222, SLS2005, SLS3427, SLS1210, SLS2632, SLS4054, SLS1837

CAS#: 7440-22-4

RTECS: VW3500000

TSCA: TSCA 8(b) inventory: Silver

CI#: Not applicable.

Synonym:

Chemical Formula: Ag

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Silver	7440-22-4	100

Toxicological Data on Ingredients: Silver: ORAL (LD50): Acute: 100 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact: No known effect on skin contact, rinse with water for a few minutes.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Splash goggles. Lab coat.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (mg/m3) from OSHA (PEL) TWA: 0.01 (mg/m3) from OSHA NIOSH Australia: TWA: 0.1 (mg/m3)Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Solid metallic powder. Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 107.87 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2212°C (4013.6°F)

Melting Point: 961°C (1761.8°F)

Critical Temperature: Not available.

Specific Gravity: 10.4 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Is not dispersed in cold water, hot water.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 100 mg/kg [Mouse].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Very hazardous in case of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:

Identification:

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Rhode Island RTK hazardous substances: Silver Pennsylvania RTK: Silver Minnesota: Silver Massachusetts RTK: Silver New Jersey: Silver TSCA 8(b) inventory: Silver TSCA 8(a) PAIR: Silver TSCA 8(d) H and S data reporting: Silver SARA 313 toxic chemical notification and release reporting: Silver: 1% CERCLA: Hazardous substances.: Silver: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC): R41- Risk of serious damage to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Not applicable. Lab coat. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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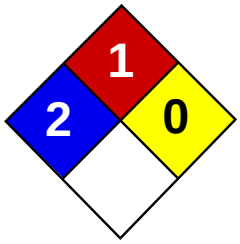



Material Safety Data Sheet
Selenium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Selenium

Catalog Codes: SLS2629

CAS#: 7782-49-2

RTECS: VS7700000

TSCA: TSCA 8(b) inventory: Selenium

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Se

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Selenium	7782-49-2	100

Toxicological Data on Ingredients: Selenium: ORAL (LD50): Acute: 6700 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Material in powder form, capable of creating a dust explosion.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.2 (mg/m3) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Solid metallic powder.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 78.96 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 684.9°C (1264.8°F)

Melting Point: 217°C (422.6°F)

Critical Temperature: Not available.

Specific Gravity: 4.81 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 6700 mg/kg [Rat].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in animal. Excreted in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Selenium powder : UN2658 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Selenium Massachusetts RTK: Selenium TSCA 8(b) inventory: Selenium SARA 313 toxic chemical notification and release reporting: Selenium CERCLA: Hazardous substances.: Selenium

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).

DSCL (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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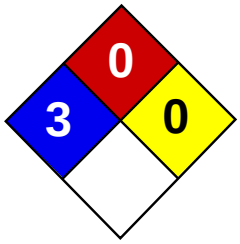



Material Safety Data Sheet
Potassium cyanide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Potassium cyanide

Catalog Codes: SLP3853, SLP1036

CAS#: 151-50-8

RTECS: TS8750000

TSCA: TSCA 8(b) inventory: Potassium cyanide

CI#: Not available.

Synonym:

Chemical Name: Potassium Cyanide

Chemical Formula: KCN

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

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1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Potassium cyanide	151-50-8	100

Toxicological Data on Ingredients: Potassium cyanide: ORAL (LD50): Acute: 5 mg/kg [Rabbit]. 8.5 mg/kg [Mouse]. 5 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (permeator), of ingestion, of inhalation. Hazardous in case of skin contact (irritant), of eye contact (irritant). Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, liver. The substance may be toxic to cardiovascular system, upper respiratory tract, Urinary system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion:
Notes to Physcian: Exposure should be treated as cyanide poisoning. Antidote: Always have a cyanide antidote kit on hand when working with cyanide compounds. Get medical advice to use.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Contact with acids or acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas.

Special Remarks on Explosion Hazards:
Chlorates + potassium cyanide explode when heated. Potassium cyanide + nitrites may cause explosion. Nitrogen trichloride explodes on contact with potassium cyanide. Potassium cyanide + hydrogen cyanide is a frictioin and impact-sensitive explosive and may initiate detonation of liquid hydrogen cyanide. Mercuric nitrate + potassium cyanide explodes when heated and contained in narrow iignition tubes. Perchloryl fluoride + potassium cyanide causes an explosive reaction at 100-300 C. Potassium cyanide + ammoniacal silver, following heating, shock or standing can cause an explosion. Heating of potassium cyanide & chromium tetraoxide can cause an explosion. Mixtures of metal cyanides with metal chlorates, perchlorates, or nitrates causes a violent explosion.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:
Corrosive solid. Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Moisture Sensitive. Light Sensitive. Protect from light. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
STEL: 5 (mg/m3) from ACGIH (TLV) [United States] CEIL: 0.7 from NIOSH [United States] CEIL: 5 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance:
Solid. (Crystalline or Granular solid. Deliquescent solid.)

Odor:
Almond-like. Like bitter almonds. Odor of hydrogen cyanide (Slight.)

Taste: Not available.

Molecular Weight: 65.11 g/mole

Color: White.

pH (1% soln/water): 11 [Basic.]

Boiling Point: 1625°C (2957°F)

Melting Point: 634.5°C (1174.1°F)

Critical Temperature: Not available.

Specific Gravity: 1.553 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol.

Solubility:
Easily soluble in hot water. Soluble in cold water. Partially soluble in methanol. Very slightly soluble in ethanol (0.57 g/100 g @ 19.5 deg. C)) Solubility in hydroxylamine 41 g/100 g @ 7.5 deg. C. Solublility in formamide: 146 g/l @ 25 deg. C Solubility in Water: Soluble in 2 parts of cold, 1 part boiling water. Soluble in 2 parts of glycerol. Soluble in 25 parts of methanol (4.91 g/100 g methanol @ 19.5 deg. C) Solubility in liquid sulflur dioxide: 0.017 g/100 g @ 0 deg. C. Solubility in dimethylformamide: 0.22 g/100 g @ 25 deg. C. Solubility in anhydrous liquid ammonia: 4.55 g/100 g @ -33.9 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water, moisture, light,air

Incompatibility with various substances:
Highly reactive with oxidizing agents. Reactive with acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Moisture sensitive. Air Sensitive. Deliquescent. Protect from light. Reacts with water or any acid releasing hydrogen cyanide. Toxic gases and vapors (such as hydrogen cyanide and carbon monoxide) may be released when potassium cyanide decomposes. Incompatible with acids, acid syrups, alkaloids, chloral hydrate, iodine, metallic salts, permanganates, chlorates, peroxides. Potassium cyanide may react with carbon dioxide in ordinary air to form toxic hydrogen cyanide gas. Potasssium cyanide is readily oxidized by heating to potassium cyanate in presence of oxygen or easily reduced oxides.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 5 mg/kg [Rat].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Causes damage to the following organs: blood, liver. May cause damage to the following organs: cardiovascular system, upper respiratory tract, Urinary system, central nervous system (CNS).

Other Toxic Effects on Humans: Very hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (female fertility and fetotoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May be fatal if absorbed through skin. Causes skin irritation and possible burns especially if the skin is wet or moist. May be absorbed through skin and cause symptoms similar to those described for ingestion. Eyes: Causes eye irritation and possible eye burns. Inhalation: May be fatal if inhaled. Causes respiratory tract and mucous membrane irritation. Inhalation of high concentrations may cause central nervous system effects similar to those described for ingestion. Ingestion: May be fatal if swallowed. Causes severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause tissue anoxia. May affect behavior/Central Nervous system, Metabolism, cardiovascular system, respiratory system, blood, respiration. Symptoms of cyanide poisoning may include flushing, nausea, vomiting, palpitations, tachycardia, hypotension, hypertension, increased pulse rate, arrhythmias, heart conduction defects, hypernea, headache, dizziness, confusion, anxiety, agitation, tremors, weakness, hyperventilation, dyspnea, apnea, severe hypoxic signs in absence of cyanosis (cyanosis is generally late finding), convulsions, seizures, memory loss, insomnia, metabolic acidosis, poor appetite. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contract may cause dermatitis. Ingestion: Prolonged or repeated exposure from ingestion may affect the urinary system, brain, liver and thyroid (goiter) as well have the same effects as acute overexposure.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Potassium cyanide UNNA: 1680 PG: I

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Potassium cyanide Illinois chemical safety act: Potassium cyanide New York acutely hazardous substances: Potassium cyanide Rhode Island RTK hazardous substances: Potassium cyanide Pennsylvania RTK: Potassium cyanide Minnesota: Potassium cyanide Massachusetts RTK: Potassium cyanide Massachusetts spill list: Potassium cyanide New Jersey: Potassium cyanide

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive solid. WHMIS Class B-6: Reactive and very flammable material.

DSCL (EEC):
R16- Explosive when mixed with oxidizing substances. R28- Very toxic if swallowed. R38- Irritating to skin. R40- Possible risks of irreversible effects. R41- Risk of serious damage to eyes. S1/2- Keep locked up and out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28- After contact with skin, wash immediately with plenty of [***] S36/37- Wear suitable protective clothing and gloves. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 01:51 PM

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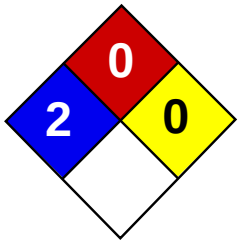



Material Safety Data Sheet
Nickel metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nickel metal

Catalog Codes: SLN2296, SLN1342, SLN1954

CAS#: 7440-02-0

RTECS: QR5950000

TSCA: TSCA 8(b) inventory: Nickel metal

CI#: Not applicable.

Synonym: Nickel Metal shot; Nickel metal foil.

Chemical Name: Nickel

Chemical Formula: Ni

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Nickel metal	7440-02-0	100

Toxicological Data on Ingredients: Nickel metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to skin. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Material in powder form, capable of creating a dust explosion. This material is flammable in powder form only.

Special Remarks on Explosion Hazards:
Material in powder form, capable of creating a dust explosion. Mixtures containing Potassium Perchlorate with Nickel & Titanium powders & infusorial earth can explode. Adding 2 or 3 drops of approximately 90% peroxyformic acid to powdered nickel will result in explosion. Powdered nickel reacts explosively upon contact with fused ammonium nitrate at temperatures below 200 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, combustible materials, metals, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH (TLV) [United States] Inhalation Respirable. TWA: 0.5 (mg/m3) [United Kingdom (UK)] TWA: 1 (mg/m3) from OSHA (PEL) [United States] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid. Lustrous solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 58.71 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 2730°C (4946°F)

Melting Point: 1455°C (2651°F)

Critical Temperature: Not available.

Specific Gravity: Density: 8.908 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:

Insoluble in cold water, hot water. Insoluble in Ammonia. Soluble in dilute Nitric Acid. Slightly soluble in Hydrochloric Acid, Sulfuric Acid.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, combustible materials, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong acids, selenium, sulfur, wood and other combustibles, nickel nitrate, aluminum, aluminum trichloride, ethylene, p-dioxan, hydrogen, methanol, non-metals, oxidants, sulfur compounds, aniline, hydrogen sulfide, flammable solvents, hydrazine, and metal powders (especially zinc, aluminum, and magnesium), ammonium nitrate, nitryl fluoride, bromine pentafluoride, potassium perchlorate + titanium powder + indusorial earth.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP. Causes damage to the following organs: skin. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose/Conc: LDL [Rat] - Route: Oral; Dose: 5000 mg/kg LDL [Guinea Pig] - Route: Oral; Dose: 5000 mg/kg

Special Remarks on Chronic Effects on Humans: May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Nickel dust and fume can irritate skin. Eyes: Nickel dust and fume can irritate eyes. Inhalation: Inhalation of dust or fume may cause respiratory tract irritation with non-productive cough, hoarseness, sore throat, headache, vertigo, weakness, chest pain, followed by delayed effects, including tachypnea, dyspnea, and ARDS. Death due to ARDS has been reported following inhalation of high concentrations of respirable metallic nickel dust. Later effects may include pulmonary edema and fibrosis. Ingestion: Metallic nickel is generally considered not to be acutely toxic if ingested. Ingestion may cause nausea, vomiting, abdominal , and diarrhea. Nickel may damage the kidneys(proteinuria), and may affect liver function. It may also affect behavior (somnolence), and cardiovascular system (increased cornary artery resistance, decreased myocardial contractility, myocardial damage, regional or general arteriolar or venus dilation). Chronic Potential Health Effects: Skin: May cause skin allergy. Nickel and nickel compounds are among the most common sensitizers inducing allergic contact dermatitis. Inhalation: Chronic inhalation nickel dust or fume can cause chronic hypertrophic rhinitis, sinusitis, nasal polyps, perforation of the nasal septum, chronic pulmonary irritation, fibrosis, pulmonary edema, pulmonary eosinophilia, Pneumoconiosis, allergies (asthma-like allergy), and cancer of the nasal sinus cavities, lungs, and possibly other organs. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough, and/or chest tightness. Chronic inhalation of nickel dust or fume may also affect the liver (impaired liver function tests), and blood (changes in red blood cell count). Ingestion: Prolonged or repeated ingestion of nickel can be a source chronic urticaria and other signs of allergy.

Chronic ingestion of NIckel may also affect respiration and cause pneumoconiosis or fibrosis. Note: In the general population, sensitization occurs from exposure to nickel-containing coins, jewelry, watches,

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel metal California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel metal Connecticut hazardous material survey.: Nickel metal Illinois toxic substances disclosure to employee act: Nickel metal Illinois chemical safety act: Nickel metal New York release reporting list: Nickel metal Rhode Island RTK hazardous substances: Nickel metal Pennsylvania RTK: Nickel metal Michigan critical material: Nickel metal Massachusetts RTK: Nickel metal Massachusetts spill list: Nickel metal New Jersey: Nickel metal New Jersey spill list: Nickel metal Louisiana spill reporting: Nickel metal California Director's List of Hazardous Substances: Nickel metal TSCA 8(b) inventory: Nickel metal

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R43- May cause sensitization by skin contact. S22- Do not breathe dust. S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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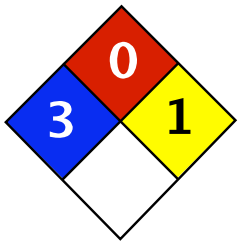

Health	3
Fire	0
Reactivity	2
Personal Protection	J

Material Safety Data Sheet
Sodium hydroxide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium hydroxide

Catalog Codes: SLS3298, SLS1081, SLS2503, SLS3925, SLS1705

CAS#: 1310-73-2

RTECS: WB4900000

TSCA: TSCA 8(b) inventory: Sodium hydroxide

CI#: Not available.

Synonym: Caustic Soda

Chemical Name: Sodium Hydroxide

Chemical Formula: NaOH

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium hydroxide	1310-73-2	100

Toxicological Data on Ingredients: Sodium hydroxide LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.

The substance may be toxic to mucous membranes, upper respiratory tract, skin, eyes.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: metals

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive in presence of heat.

Fire Fighting Media and Instructions: Not available

Special Remarks on Fire Hazards:
sodium hydroxide + zinc metal dust causes ignition of the latter.

Under proper conditions of temperature, pressure and state of division, it can ignite or react violently with acetaldehyde, ally alcohol, allyl chloride, benzene-1,4-diol, chlorine trifluoride, 1,2 dichlorethylene, nitroethane, nitromethane, nitroparaffins, nitropropane, cinnamaldehyde, 2,2-dichloro-3,3-dimethylbutane.
Sodium hydroxide in contact with water may generate enough heat to ignite adjacent combustible materials.
Phosphorous boiled with NaOH yields mixed phosphines which may ignite spontanously in air.
sodium hydroxide and cinnamaldehyde + heat may cause ignition.
Reaction with certain metals releases flammable and explosive hydrogen gas.

Special Remarks on Explosion Hazards:
Sodium hydroxide reacts to form explosive products with ammonia + silver nitrate.
Benzene extract of allyl benzenesulfonate prepared from allyl alcohol, and benzene sulfonyl chloride in presence of aquesous sodium hydroxide, under vacuum distillation, residue darkened and exploded.
Sodium Hydroxde + impure tetrahydrofuran, which can contain peroxides, can cause serious explosions.
Dry mixtures of sodium hydroxide and sodium tetrahydroborate liberate hydrogen explosively at 230-270 deg. C.
Sodium Hydroxide reacts with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat to cause an explosion.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:
Corrosive solid.
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep container dry. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic. Deliquescent.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
STEL: 2 (mg/m3) from ACGIH (TLV) [United States]

TWA: 2 CEIL: 2 (mg/m3) from OSHA (PEL) [United States]
CEIL: 2 (mg/m3) from NIOSHConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Deliquescent solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 40 g/mole

Color: White.

pH (1% soln/water): 13.5 [Basic.]

Boiling Point: 1388°C (2530.4°F)

Melting Point: 323°C (613.4°F)

Critical Temperature: Not available.

Specific Gravity: 2.13 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, moisture, moist air

Incompatibility with various substances:
Highly reactive with metals.
Reactive with oxidizing agents, reducing agents, acids, alkalis, moisture.

Corrosivity: Not available.

Special Remarks on Reactivity:
Hygroscopic. Much heat is evolved when solid material is dissolved in water. Therefore cold water and caution must be used for this process.
Sodium hydroxide solution and octanol + diborane during a work-up of a reaction mixture of oxime and diborane in tetrahyrofuran is very exothermic, a mild explosion being noted on one occassion.

Reactive with water, acids (mineral, non-oxidizing, e.g. hydrochloric, hydrofluoric acid, muriatic acid, phosphoric), acids (mineral, oxidizing e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, foraldehyde), carbamates (e.g. carbanolate, carbofuran), esters (e.g. butyl acetate, ethyl acetate, propyl formate), halogenated organics (dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), isocyanates (e.g. methyl isocyanate), ketones (acetone, acetophenone, MEK, MIBK), acid chlorides, strong bases, strong oxidizing agents, strong reducing agents, flammable liquids, powdered metals and metals (i.e aluminum, tin, zinc, hafnium, raney nickel), metals (alkali and alkaline e.g. cesium, potassium, sodium), metal compounds (toxic e.g. berylium, lead acetate, nickel carbonyl, tetraethyl lead), mitrides (e.g. potassium nitride, sodium nitride), nitriles (e.g. acetonitrile, methyl cyanide), nitro compounds (organic e.g. nitrobenzene, nitromethane), acetic anhydride, chlorohydrin, chlorosulfonic acid, ethylene cyanohydrin, glyoxal, hydrosulfuric acid, oleum, propiolactone, acylonitrile, phorosous pentoxide, chloroethanol, chloroform-methanol, tetrahydroborate, cyanogen azide, 1,2,4,5 tetrachlorobenzene, cinnamaldehyde.
Reacts with formaldehyde hydroxide to yield formic acid, and hydrogen.

Special Remarks on Corrosivity: Very caustic to aluminum and other metals in presence of moisture.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells.
May cause damage to the following organs: mucous membranes, upper respiratory tract, skin, eyes.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive).
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose:
LDL [Rabbit] - Route: Oral; Dose: 500 mg/kg

Special Remarks on Chronic Effects on Humans: May affect genetic material. Investigation as a mutagen (cytogenetic analysis)

Special Remarks on other Toxic Effects on Humans:

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sodium hydroxide, solid UNNA: 1823 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sodium hydroxide
Illinois chemical safety act: Sodium hydroxide
New York release reporting list: Sodium hydroxide
Rhode Island RTK hazardous substances: Sodium hydroxide
Pennsylvania RTK: Sodium hydroxide
Minnesota: Sodium hydroxide
Massachusetts RTK: Sodium hydroxide
New Jersey: Sodium hydroxide
Louisiana spill reporting: Sodium hydroxide
California Director's List of Hazardous Substances: Sodium hydroxide
TSCA 8(b) inventory: Sodium hydroxide
CERCLA: Hazardous substances.: Sodium hydroxide: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):
R35- Causes severe burns.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves.
Synthetic apron.
Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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REVISION DATE: 5th February 2009

NITIC ACID MSDS
Nitric Acid >/=70%

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT NAME: Nitric Acid >/=70%

SUPPLIER:
Abbey Chemicals
27-30 North River Road
Great Yarmouth
Norfolk
NR30 1SH
Tel: +44 1493 850303
Fax: +44 1493 330909
www.abbey-chemicals.co.uk

Emergency Contact Number (Office Hours): +44 1493 850303

SDS No.: N023

2 HAZARDS IDENTIFICATION

Contact with combustible material may cause fire. Causes severe burns.

CLASSIFICATION: C;R35. O;R8.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Classification	Content
NITRIC ACID ...%	231-714-2	7697-37-2	O;R8 C;R35	70-100 %

The Full Text for all R-Phrases are Displayed in Section 16

EC No. 231-714-2

CAS-No. 7697-37-2

4 FIRST-AID MEASURES

INHALATION

Move the exposed person to fresh air at once. Rinse nose and mouth with water. Keep the affected person warm and at rest. Get prompt medical attention.

INGESTION

Remove victim immediately from source of exposure. Immediately rinse mouth and drink plenty of water. Call an ambulance and take these instructions. Do not induce vomiting.

SKIN CONTACT

Remove contaminated clothing. Important to remove the substance from the skin immediately. Rinse the skin immediately with lots of water. Get medical attention.

EYE CONTACT

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Continue to rinse for at least 15 minutes and get medical attention.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Fire can be extinguished using: Water spray. Powder.

REVISION DATE: 5th February 2009

Nitric Acid >/=70%

UNUSUAL FIRE & EXPLOSION HAZARDS

OXIDISING! May ignite other combustible materials.

SPECIFIC HAZARDS

Nitric acid (HNO3). Oxides of: Nitrogen.

PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Follow precautions for safe handling described in this safety data sheet. Avoid inhalation of vapours and contact with skin and eyes.

ENVIRONMENTAL PRECAUTIONS

Do not discharge into drains, water courses or onto the ground.

SPILL CLEAN UP METHODS

Bund material with inert material, carefully dilute with water spray to minimize fume emmision ahd heat generation. Carefully neutralize using excess of slaked lime or soda ash to form a slury. take up slurry into plastic containers and hold for disposal.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS

Avoid spilling, skin and eye contact. Mechanical ventilation or local exhaust ventilation is required. Eye wash facilities and emergency shower must be available when handling this product.

STORAGE PRECAUTIONS

Store in tightly closed original container in a dry, cool and well-ventilated place. Suitable containers Stainless steel.

STORAGE CLASS

Corrosive storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	Std	TWA - 8 hrs		STEL - 15 min		Notes
NITRIC ACID ...%				1 ppm	2.6 mg/m3	

mg/m3

PROTECTIVE EQUIPMENT



RESPIRATORY EQUIPMENT

No specific recommendation made, but respiratory protection must be used if the general level exceeds the Recommended Workplace Exposure Limit. Chemical respirator with specific cartridge providing protection against the compound of concern.

HAND PROTECTION

Wear protective gloves.

EYE PROTECTION

Goggles/face shield are recommended.

OTHER PROTECTION

Wear rubber apron. Wear rubber footwear. Provide eyewash station and safety shower.

REVISION DATE: 5th February 2009

Nitric Acid >/=70%

HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash promptly if skin becomes contaminated. Wash hands after handling. When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid		
COLOUR	Colourless to Yellowish		
ODOUR	Pungent Fuming		
SOLUBILITY	Soluble in water The product reacts with water and will generate heat.		
BOILING POINT (°C)	89	MELTING POINT (°C)	<-49
RELATIVE DENSITY	1.42 - 1.502	VAPOUR PRESSURE	51 mm Hg 20°C
pH-VALUE, CONC. SOLUTION	<1		

10 STABILITY AND REACTIVITY

STABILITY

Avoid: Contact with combustibles.

CONDITIONS TO AVOID

Avoid excessive heat for prolonged periods of time.

MATERIALS TO AVOID

Strong alkalis. Strong reducing agents. Powdered metal.

HAZARDOUS DECOMPOSITION PRODUCTS

Nitric acid (HNO3). Oxides of: Nitrogen.

11 TOXICOLOGICAL INFORMATION

INHALATION

Irritating to respiratory system. Vapours may irritate the respiratory system and cause coughing, asthmatic breathing and breathlessness.

INGESTION

Causes severe burns. Swallowing concentrated chemical may cause severe internal injury. Ingestion may cause severe irritation of the mouth, the oesophagus and the gastrointestinal tract.

SKIN CONTACT

Causes severe burns. Corrosive. Prolonged contact causes serious tissue damage.

EYE CONTACT

Causes severe burns. Contact with concentrated chemical may very rapidly cause severe eye damage, possibly loss of sight.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Dangerous for the environment if discharged into watercourses. The product contains a substance which is harmful to aquatic organisms.

MOBILITY

The product is soluble in water. Mobile.

BIOACCUMULATION

The product does not contain any substances expected to be bioaccumulating.

DEGRADABILITY

The product is expected to be slowly biodegradable.

13 DISPOSAL CONSIDERATIONS

REVISION DATE: 5th February 2009

Nitric Acid >/=70%

GENERAL INFORMATION

When handling waste, consideration should be made to the safety precautions applying to handling of the product. Do not puncture or incinerate even when empty.

DISPOSAL METHODS

Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION





UK ROAD CLASS	8		
PROPER SHIPPING NAME	NITRIC ACID		
UN NO. ROAD	2031	UK ROAD PACK GR.	I
ADR CLASS NO.	8	ADR CLASS	Class 8: Corrosive substances.
ADR PACK GROUP	I	HAZARD No. (ADR)	885
ADR LABEL NO.	8 & 5.1	HAZCHEM CODE	2PE
CEFIC TEC(R) NO.	80GCO1-I	RID CLASS NO.	8
RID PACK GROUP	I	UN NO. SEA	2031
IMDG CLASS	8	IMDG PACK GR.	I
EMS	F-A, S-Q	MFAG	See Guide
MARINE POLLUTANT	No.	UN NO. AIR	2031
AIR CLASS	8	AIR SUB CLASS	5.1
AIR PACK GR.	I		

15 REGULATORY INFORMATION

LABELLING



Corrosive



Oxidising

CONTAINS NITRIC ACID 71%

RISK PHRASES

R8	Contact with combustible material may cause fire.
R35	Causes severe burns.

SAFETY PHRASES

S17	Keep away from combustible material.
S24/25	Avoid contact with skin and eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
S60	This material and its container must be disposed of as hazardous waste.

REVISION DATE: 5th February 2009

Nitric Acid >/=70%

STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations.

APPROVED CODE OF PRACTICE

Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply.

GUIDANCE NOTES

CHIP for everyone HSG(108). Workplace Exposure Limits EH40.

16 OTHER INFORMATION

REVISION DATE	5th February 2009
REV. NO./REPL. SDS GENERATED	04
SDS NO.	N023

SAFETY DATA SHEET STATUS

Approved.

DATE	31st January 2008
SIGNATURE	Thomas Tailford

RISK PHRASES IN FULL

R35	Causes severe burns.
R8	Contact with combustible material may cause fire.

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades **MSDS No. 9950**

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732)750-6000
MSDS Internet Website www.hess.com/about/environ.html

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS * (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION (rev. Dec-97)

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES (rev. Dec-97)

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES (rev. Dec-97)

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Dec-97)

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

EXPOSURE LIMITS

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	50	--	A4 (skin)
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

SOLUBILITY (H_2O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY (rev. Dec-94)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION (rev. Jan-04)

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:



15. REGULATORY INFORMATION (rev. Jan-04)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION (rev. Jan-04)

NFPA® HAZARD RATING	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
	* CHRONIC		

SUPERSEDES MSDS DATED: 12/30/97

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212)642-4900
API	American Petroleum Institute (202)682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MSA Sanitizer

MINE SAFETY APPLIANCES CO -- 34337 CLEANER-SANITIZER II

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MSDS Safety Information

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FSC: 6840
NIIN: 00-570-5299
MSDS Date: 02/03/1992
MSDS Num: BQQFT
Product ID: 34337 CLEANER-SANITIZER II
MFN: 03
Responsible Party
Cage: 55799
Name: MINE SAFETY APPLIANCES CO
Address: 3880 MEADOWBROOK RD
City: MURRYSVILLE PA 15668-1753
Info Phone Number: 412-325-1313
Emergency Phone Number: 412-325-1313
Review Ind: Y
Published: Y

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Contractor Summary

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Cage: 40912
Name: MINE SAFETY APPLIANCE (REPLACED BY CAGE 55799)
Address: 201 N BRADDOCK AVENUE
Box: 426
City: PITTSBURGH PA 15230
Phone: 412-967-3000
Cage: 55799
Name: MINE SAFETY APPLIANCES CO DBA MSA
Address: 3880 MEADOWBROOK RD
City: MURRYSVILLE PA 15668-1753
Phone: 724-733-9272

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Item Description Information

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Item Manager: S9G
Item Name: SANITIZER-DETERGENT,GENERAL PURPOSE
Specification Number: NONE
Type/Grade/Class: NONE
Unit of Issue: BX
Quantitative Expression: 000000000240Z
UI Container Qty: 0
Type of Container: BOX OF 12 PKT

==========

Ingredients

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Cas: 68424-85-1
Name: ALKYL DIMETHYL BENZYL AMMONIYUM CHLORIDE
% Wt: 2.5
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 497-19-8
RTECS #: VZ4050000
Name: SODIUM CARBONATE

% Wt: 25-50
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 144-55-8
RTECS #: VZ0950000
Name: SODIUM BICARBONATE
% Wt: 10-25
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 7758-29-4
RTECS #: YK4570000
Name: SODIUM PHOSPHATE, TRIBASIC (SARA III)
% Wt: 10-25
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 7732-18-5
RTECS #: ZC0110000
Name: WATER
% Wt: 5-10
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 7601-54-9
RTECS #: TC9490000
Name: SODIUM PHOSPHATE, TRIBASIC (SARA III)
% Wt: 1-10
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 127087-87-0
Name: NONOXYNOL-10
% Wt: 1-5
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 64-17-5
RTECS #: KQ6300000
Name: ETHYL ALCOHOL (ETHANOL)
% Wt: <1
Other REC Limits: NONE RECOMMENDED
OSHA PEL: 1000 PPM
ACGIH TLV: 1000 PPM; 9293
==========
Health Hazards Data

==========
LD50 LC50 Mixture: ORAL RAT LD50 IS UNKNOWN
Route Of Entry Inds - Inhalation: NO
Skin: NO
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: ACUTE: INHALATION OF DUST MAY CAUSE IRRITATION OF
RESPIRATORY TRACT. CONTACT MAY CAUSE SKIN AND EYE IRRITATION OR BURNS.
INGESTION MAY CAUSE BURNS TO MOUTH, THROAT, ABDOMEN, SWELLING OF LARYNX,
MUSCLE PARALYSIS, AND CONVULSIONS. CHRONIC: NONE SPECIFIED BY
MANUFACTURER.
Explanation Of Carcinogenicity: THE PRODUCT CONTAINS NO INGREDIENT THAT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Signs And Symptions Of Overexposure: INHALED: COUGHING, SHORTNESS OF
BREATH,
WHEEZING, SNEEZING. EYES: CORNEAL BURNS, PAIN, TEARING, REDNESS, BLURRED
VISION. SKIN: BURNS, PAIN, REDNESS. INGESTED: BURNS TO MOUTH, THROAT,
ABDOMEN, SEVERE S WELLING OF LARYNX, MUSCLE PARALYSIS, CONVULSIONS.
Medical Cond Aggravated By Exposure: NO INFORMATION
First Aid: INHALED: MOVE TO FRESH AIR. IF SYMPTOMS DEVELOP, SEE DOCTOR.
EYES:
FLUSH WITH LOTS OF WATER FOR 15 MINUTES, HOLD LIDS OPEN. SEE DOCTOR.
SKIN:
REMOVE CONTAMINATED CLOTHES. WASH WITH SOAP AND WATER. SEE DOCTOR IF
BURNED.
INGESTED: IF CONSCIOUS, DRINK MILK, RAW EGG WHITE, OR GELATIN SOLUTION
AND
LARGE QUANTITIES OF WATER. AVOID ALCOHOL. GET IMMEDIATE MEDICAL
ATTENTION!
==========
Handling and Disposal
==========
Spill Release Procedures: SWEEP UP AND PLACE IN CONTAINER FOR DISPOSAL.
AVOID
CREATING DUST.
Neutralizing Agent: NONE GIVEN BY MANUFACTURER.
Waste Disposal Methods: DISPOSE IN ACCORDANCE WITH ALL FEDERAL, STATE AND
LOCAL
REGULATIONS.
Handling And Storage Precautions: STORE IN A COOL, DRY PLACE.
Other Precautions: READ MANUFACTURER'S INSTRUCTIONS AND THEN FOLLOW THEM!
==========
Fire and Explosion Hazard Information
==========
Flash Point Text: UNKNOWN
Lower Limits: UNKNOWN
Upper Limits: UNKNOWN
Extinguishing Media: USE WATER SPRAY OR FOG, CARBON DIOXIDE, FOAM, OR DRY
CHEMICAL.
Fire Fighting Procedures: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A
FULL
FACED SELF CONTAINED BREATHING APPARATUS.
Unusual Fire/Explosion Hazard: PRODUCT IS NON-REACTIVE AND DOES NOT
READILY
SUPPORT COMBUSTION.

==========
Control Measures
==========
Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: NORMAL ROOM VENTILATION.
Protective Gloves: RUBBER
Eye Protection: SAFETY GLASSES
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER. : EYE WASH STATION.
Work Hygienic Practices: WASH HANDS AFTER USE AND BEFORE EATING, DRINKING, OR
SMOKING. LAUNDER CONTAMINATED CLOTHES BEFORE REUSE.
==========
Physical/Chemical Properties
==========
HCC: V7
B.P. Text: UNKNOWN
M.P/F.P Text: UNKNOWN
Decomp Text: UNKNOWN
Vapor Pres: UNKNOWN
Vapor Density: UNKNOWN
Spec Gravity: POWDER
Evaporation Rate & Reference: UNKNOWN
Solubility in Water: APPRECIABLE
Appearance and Odor: WHITE POWDER, FRAGRANT, PLEASING ODOR PH 1% SOL'N = 9.5-10.5
Corrosion Rate: UNKNOWN
==========
Reactivity Data
==========
Stability Indicator: YES
Stability Condition To Avoid: NONE
Materials To Avoid: OXIDIZING AGENTS NOTE SOAP & DETERGENTS DEACTIVATE THE GERMICIDE IN THE PRODUCT.
Hazardous Decomposition Products: NONE GIVEN BY MANUFACTURER (SUPPLIER).
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT RELEVANT
==========
Toxicological Information
==========
==========
Ecological Information
==========
==========
MSDS Transport Information
==========
==========
Regulatory Information
==========
==========
Other Information
==========
==========
Transportation Information
==========
Responsible Party Cage: 55799
Trans ID NO: 77126

Product ID: 34337 CLEANER-SANITIZER II
MSDS Prepared Date: 02/03/1992
Review Date: 05/10/1993
MFN: 3
Net Unit Weight: 24 OZ
Multiple KIT Number: 0
Review IND: Y
Unit Of Issue: BX
Container QTY: 0
Type Of Container: BOX OF 12 PKT
==========
Detail DOT Information
==========
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
Detail IMO Information
==========
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
==========
Detail IATA Information
==========
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
Detail AFI Information
==========
AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
==========
HAZCOM Label
==========
Product ID: LABEL COVERED UNDER EPA REGS - HAZCOM LABEL NOT AUTHORIZED
==========
Disclaimer (provided with this information by the compiling agencies): This
information is formulated for use by elements of the Department of Defense.
The United States of America in no manner whatsoever expressly or implied
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of Defense or other government situation.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas: Oxygen,
0.0015-23.5%; Methane, 0.0005-2.5%; Carbon Monoxide, 0.0005-1.0%; Hydrogen
Sulfide, 0.001-0.025%

SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable
Document Number: 50018

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This
MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on
Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE: Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME: AIR LIQUIDE AMERICA CORPORATION
ADDRESS: 821 Chesapeake Drive
Cambridge, MD 21613
EMERGENCY PHONE: CHEMTREC: 1-800-424-9300
BUSINESS PHONE: 1-410-228-6400
General MSDS Information 1-713/868-0440
Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL
NAME
CAS # mole % EXPOSURE LIMITS IN AIR
ACGIH OSHA
TLV STEL PEL STEL IDLH OTHER
ppm ppm ppm ppm ppm ppm
Oxygen 7782-44-7 0.0015 -
23.5%
There are no specific exposure limits for Oxygen. Oxygen levels should be maintained
above 19.5%.
Methane 74-82-8 0.0005 -
2.5%
There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA).
Oxygen levels should be maintained above 19.5%.
Hydrogen Sulfide 7783-06-4 0.001-
0.025 %
10 15 20 C
10
(Vacated
1989 PEL)

50 ppm
(10 minute
maximum
peak)
15 (Vacated
1989 PEL)
100 NIOSH REL: 10
ppm C (10
minutes)
DFG-MAK: 15
ppm
NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

CHEMICAL
NAME
CAS # mole % EXPOSURE LIMITS IN AIR
ACGIH OSHA
TLV STEL PEL STEL IDLH OTHER
ppm ppm Ppm ppm ppm ppm
Carbon Monoxide 630-08-0 0.0005 -
1.0%
25 NE 50
35
(Vacated
1989 PEL)
200 C
(Vacated
1989 PEL)
1200 NIOSH REL: 35
(TWA); 200 C
DFG MAK: 30
Nitrogen 7727-37-9 Balance There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.
NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless gas which has a rotten-egg odor (due to the presence
of Hydrogen Sulfide). The odor cannot be relied on as an adequate warning of the presence of this product,
because olfactory fatigue occurs after over-exposure to Hydrogen Sulfide. Hydrogen Sulfide and Carbon
Monoxide (another component of this gas mixture) are toxic to humans in relatively low concentrations. Overexposure
to this gas mixture can cause skin or eye irritation, nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Additionally, releases of this product may produce oxygen-deficient
atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such
atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF
EXPOSURE: The most significant route of over-exposure for this
product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of

this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A potential health hazard associated with this product is the potential of inhalation of Hydrogen Sulfide, a component of this gas mixture. Such over-exposures may occur if this product is used in a confined space or other poorly-ventilated area. Overexposures to Hydrogen Sulfide can cause dizziness, headache, and nausea. Over-exposure to this gas could result in respiratory arrest, coma, or unconsciousness, due to the presence of Hydrogen Sulfide. Continuous inhalation of low concentrations of Hydrogen Sulfide may cause olfactory fatigue, so that the odor is no longer an effective warning of the presence of this gas. A summary of exposure concentrations and observed effects are as follows:

CONCENTRATION OF
HYDROGEN SULFIDE OBSERVED EFFECT

0.3-30 ppm Odor is unpleasant.
50 ppm Eye irritation. Dryness and irritation of nose, throat.
Slightly higher than 50 ppm Irritation of the respiratory system.
100-150 ppm Temporary loss of smell.
200-250 ppm Headache, vomiting nausea. Prolonged exposure may lead to lung damage. Exposures of 4-8 hours can be fatal.
300-500 Swifter onset of symptoms. Death occurs in 1-4 hours.
500 ppm Headache, excitement, staggering, and stomach ache after brief exposure. Death occurs within 0.5 - 1 hour of exposure.
> 600 ppm Rapid onset of unconsciousness, coma, death.
> 1000 ppm Immediate respiratory arrest.
NOTE: This product contains a maximum of 250 ppm Hydrogen Sulfide. The higher concentration values here are presented to delineate the complete health effects which have been observed for humans after exposure to Hydrogen Sulfide.

HEALTH
FLAMMABILITY
REACTIVITY
PROTECTIVE EQUIPMENT
3
0
0
EYES RESPIRATORY HANDS BODY
(BLUE)
(RED)
(YELLOW)
For routine industrial applications
HAZARDOUS MATERIAL INFORMATION SYSTEM
B
See Section 8

3. HAZARD IDENTIFICATION (Continued)

Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide
(25 ppm), another component of this gas mixture, can result in serious health consequences. Carbon Monoxide
is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood
and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and
asphyxiation occurs.
Since the affinity of Carbon Monoxide for hemoglobin is about 200-300 times that of oxygen, only a small
amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50
ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this product is released in a
small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the
following:

CONCENTRATION OF
CARBON MONOXIDE OBSERVED EFFECT

All exposure levels: Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red.
200 ppm: Slight symptoms (i.e. headache) after several hours of exposure.
400 ppm: Headache and discomfort experienced within 2-3 hours of exposure.
1,000 -2000 ppm: Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger.
200-2500 ppm: Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes.
>2500 ppm: Potential for collapse and death before warning symptoms.
Additionally, if mixtures of this product contain less than 19.5% Oxygen and are released in a small, poorly
ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals
breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness,
drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of
over-exposure, death may occur. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN OBSERVED EFFECT

12-16% Oxygen: Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen: Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen: Nausea, vomiting, collapse, or loss of consciousness.
Below 6%: Convulsive movements, possible respiratory collapse, and death.

SKIN and EYE CONTACT: Hydrogen Sulfide, a component of this gas mixture, may be irritating to the skin.
Inflammation and irritation of the eyes can occur at very low airborne concentration of Hydrogen Sulfide (less
than 10 ppm). Exposure over several hours may result in “gas eyes” or “sore eyes” with symptoms of

scratchiness, irritation, tearing and burning. Above 50 ppm of Hydrogen Sulfide, there is an intense tearing,
blurring of vision, and pain when looking at light. Over-exposed individuals may see rings around bright lights.
Most symptoms disappear when exposure ceases. However, in serious cases, the eye can be permanently
damaged.
HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas
mixture may cause the following health effects:
ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure
to the product are anticipated under routine circumstances of use. However, Hydrogen Sulfide and Carbon
Monoxide (components of this gas mixture) are toxic to humans. Over-exposure to this gas mixture can cause
nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Due to the presence of Hydrogen
Sulfide, over-exposures to this gas mixture can also irritate the skin and eyes; severe eye contamination can
result in blindness.
CHRONIC: Severe over-exposures to Hydrogen Sulfide, a component of this gas mixture, which do not result in
death, may cause long-term symptoms such as memory loss, paralysis of facial muscles, or nerve tissue
damage. In serious cases of over-exposure, the eyes can be permanently damaged. Skin disorders and
respiratory conditions may be aggravated by repeated over-exposures to this gas product. Refer to Section 11
(Toxicology Information) for additional information on the components of this product.
TARGET ORGANS: Respiratory system, blood system, central nervous system effects, cardiovascular system,
reproductive system, skin, eyes.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-
Contained Breathing Apparatus must be worn.
No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any
adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as
possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation
if necessary.
SKIN EXPOSURE: If irritation of the skin develops after exposure to this gas mixture, immediately begin

decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated
clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.
EYE EXPOSURE: If irritation of the eye develops after exposure to this gas mixture, open victim's eyes while
under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for
15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.
Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical
attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS
to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT, (method): Not applicable.
AUTOIGNITION TEMPERATURE: Not applicable.
FLAMMABLE LIMITS (in air by volume, %):
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.
FIRE EXTINGUISHING MATERIALS: Non-flammable gas
mixture. Use extinguishing media appropriate for surrounding fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture
contains toxic gases, Hydrogen Sulfide and Carbon Monoxide,
and presents an health hazard to firefighters. This gas mixture is
not flammable; however, containers, when involved in fire, may
rupture or burst in the heat of the fire.
Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive.
SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing
Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product
presents significantly less risk of over-exposure to Hydrogen Sulfide and Carbon Monoxide, the toxic
components of this product, and other safety hazards related to the remaining components of this product, than a
similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used
during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in
which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to
by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a
leak, clear the affected area, protect people, and respond with trained personnel.
For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated

area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original
area of the release) for Hydrogen Sulfide, Carbon Monoxide, and Oxygen. Hydrogen Sulfide and Carbon
Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients)
and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.
If leaking incidentally from the cylinder, contact your supplier.

4
0
0 **HEALTH**
FLAMMABILITY
REACTIVITY
OTHER

NFPA RATING

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if
work is done in a poorly ventilated area; exposures to fatal concentrations of this product could occur without any
significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Do not attempt to repair, adjust, or
in any other way modify cylinders containing a gas mixture with Hydrogen Sulfide or Carbon Monoxide. If there
is a malfunction or another type of operational problem, contact nearest distributor immediately. Eye wash
stations/safety showers should be near areas where this product is used or stored. All work operations should be
monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All
work practices should minimize releases of Hydrogen Sulfide and Carbon Monoxide-containing gas mixtures.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being
knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature
(approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat,
ignition, and direct sunlight. Protect cylinders against physical damage.
Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full
containers from being stored for long periods of time. These cylinders are not refillable.

WARNING! Do not
refill DOT 39 cylinders. To do so may cause personal injury or property damage.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present
significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all
lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices
indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and
tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are
needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If
this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of
Oxygen, Hydrogen Sulfide, and Carbon Monoxide.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of
use. Use supplied air respiratory protection if Carbon Monoxide levels exceed the exposure levels given in
Section 2 (Composition and Information on Ingredients) or if oxygen levels are below 19.5%, or if either level is
unknown during emergency response to a release of this product. If respiratory protection is required for
emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection
Standard (29 CFR 1910.134) or equivalent State standards. The following NIOSH respiratory protection
recommendations for Hydrogen Sulfide and Carbon Monoxide are provided for further information.

NIOSH/OSHA RECOMMENDATIONS FOR HYDROGEN SULFIDE CONCENTRATIONS IN AIR:

UP TO 100 ppm: Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide;
gas mask with canister to protect against hydrogen sulfide; or SAR; or full-facepiece SCBA.
Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece
SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape: Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA
NOTE: The IDLH concentration for Hydrogen Sulfide is 100 ppm.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON MONOXIDE CONCENTRATIONS IN AIR:

UP TO 350 ppm Supplied Air Respirator (SAR)
UP TO 875 ppm Supplied Air Respirator (SAR) operated in a continuous flow mode.
UP TO 1200 ppm Gas mask with canister to protect against carbon monoxide; or full-facepiece SCBA; or
full-facepiece Supplied Air Respirator (SAR).
Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece
SCBA; or positive pressure, full-facepiece Supplied Air Respirator (SAR) with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister to protect against carbon monoxide; or escape-type SCBA.
NOTE: End of Service Life Indicator (ESLI) required for gas masks.
NOTE: The IDLH concentration for Carbon Monoxide is 1200 ppm.
EYE PROTECTION: Safety glasses.
HAND PROTECTION: No special protection is needed under normal circumstances of use.
BODY PROTECTION: No special protection is needed under normal circumstances of use.
NON-FLAMMABLE GAS MIXTURE MSDS - 50018 EFFECTIVE DATE: MARCH 10, 2000 PAGE 6 OF 10

9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: .072 lbs/ ft_3 (1.153 kg/m_3)
BOILING POINT: -320.4°F (-195.8°C)
FREEZING/MELTING POINT @ 10 psig: -345.8°F (-210°C)
SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906 **pH**: Not applicable.
SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023 **MOLECULAR WEIGHT:** 28.01
EVAPORATION RATE (nBuAc = 1): Not applicable. **EXPANSION RATIO:** Not applicable.
ODOR THRESHOLD: 0.13 ppm (Hydrogen Sulfide) **SPECIFIC VOLUME (ft_3/lb)**: 13.8
VAPOR PRESSURE @ 70°F (21.1°C) (psig): Not applicable.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
APPEARANCE AND COLOR: This product is a colorless gas which has an rotten egg-like odor, due to the presence of Hydrogen Sulfide.
HOW TO DETECT THIS SUBSTANCE (warning properties): Continuous inhalation of low concentrations of Hydrogen Sulfide (a component of this gas mixture) may cause olfactory fatigue, so that there are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation. Wet lead acetate paper can be used for leak detection.
The paper turns black in the presence of Hydrogen Sulfide. Cadmium chloride solutions can also be used.
Cadmium solutions will turn yellow upon contact with Hydrogen Sulfide.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.
DECOMPOSITION PRODUCTS: The thermal decomposition products of Methane include carbon oxides. The decomposition products of Hydrogen Sulfide include water and sulfur oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this product (Hydrogen Sulfide, Methane) are also incompatible with strong oxidizers (i.e. chlorine, bromine

pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel
and iron (especially at high temperatures and pressures). Hydrogen Sulfide is corrosive to most metals, because
it reacts with these substances to form metal sulfides.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or
direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:
NITROGEN: There are no specific toxicology data for Nitrogen.
Nitrogen is a simple asphyxiant, which acts to displace oxygen in the
environment.
METHANE: There are no specific toxicology data for Methane.
Methane is a simple asphyxiant, which acts to displace oxygen in the
environment.
HYDROGEN SULFIDE:
LCLo (inhalation, human) = 600 ppm/30 minutes
LDLO (inhalation, man) = 5.7 mg/kg; central nervous system,
pulmonary effects
LCLo (inhalation, human) = 800 ppm/5 minutes
LC_{50} (inhalation, rat) = 444 ppm
LC_{50} (inhalation, mouse) = 673 ppm/1 hour
LCLo (inhalation, mammal) = 800 ppm/5 minutes
CARBON MONOXIDE:
TCLo (inhalation, mouse) = 65 ppm/24 hours (7-18 preg): rep. effects
TCLo (inhalation, mouse) = 8 pph/1 hour (female 8D post): ter. effects
TCLo (inhalation, human) = 600 mg/m_3/10 minutes
LCLo (inhalation, man) = 4000 ppm/30 minutes
TCLo (inhalation, man) = 650 ppm/45 minutes: central nervous system
and blood system effects.
LCLo (inhalation, human) = 5000 ppm/5 minutes
LCLo (inhalation, dog) = 4000 ppm/46 minutes
LCLo (inhalation, rabbit) = 4000 ppm
LC_{50} (inhalation, rat) = 1811 ppm/4 hours
LC_{50} (inhalation, guinea pig) = 2450 ppm/4 hours
LC_{50} (inhalation, guinea pig) = 5718 ppm/4 hours
LCLo (inhalation, mammal) = 5000 ppm/5 minutes
LD_{50} (inhalation, wild bird) = 1334 ppm

11. TOXICOLOGICAL INFORMATION (Continued)

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists:
FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to
be, cancer-causing agents by these agencies.
IRRITANCY OF PRODUCT: Hydrogen Sulfide, a component of this gas mixture, is irritating to the eyes, and
may be irritating to the skin.
SENSITIZATION OF PRODUCT: The components of this gas mixture are not known to be skin or respiratory
sensitizers.
REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas
mixture on the human reproductive system.

Mutagenicity: This gas mixture is not expected to cause mutagenic effects in humans.
Embryotoxicity: This gas mixture contains components that may cause embryotoxic effects in humans; however,
due to the small total amount of the components, embryotoxic effects are not expected to occur.
Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder
size and small total amount of all components. Carbon Monoxide, a component of this gas mixture which
exists up to 1%, can cause teratogenic effects in humans. Severe exposure to Carbon Monoxide during
pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an
indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the
fetus.
Reproductive Toxicity: This gas mixture is not expected to cause adverse reproductive effects in humans.
*A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will
propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e.
within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A
teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across
generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.*
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be
aggravated by over-exposure to this product. Carbon Monoxide, a component of this gas mixture, can aggravate
some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris. Because of
the presence of Hydrogen Sulfide, eye disorders or skin problems may be aggravated by over-exposure to this
product.
RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure. Hyperbaric oxygen is
the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask,
or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering
stimulant drugs. Be observant for initial signs of pulmonary edema in the event of severe inhalation overexposures.
BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) are applicable for this product,
as follows:
BIOLOGICAL EXPOSURE INDICES (BEIs) for components of this product are as follows:
CHEMICAL DETERMINANT SAMPLING TIME BEI
CARBON MONOXIDE
• Carboxyhemoglobin in blood
• Carbon monoxide in end-exhaled air

• End of shift
• End of shift
• 3.5% of hemoglobin
• 20 ppm

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following
environmental data are applicable to the components of this product.
HYDROGEN SULFIDE: Water Solubility = 1 g/242 mL at 20☜C.
CARBON MONOXIDE: Water solubility = 3.3 ml/100 cc at 0 ☜C, 2.3 ml at 20°C.
NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C; 1.6 volumes Nitrogen/100 volumes water at 20°C.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects
on plant and animal life. Hydrogen Sulfide and Carbon Monoxide, components of this product, can be deadly to
exposed animal life, producing symptoms similar to those experienced by humans. This gas mixture may also
be harmful to plant life.

12. ECOLOGICAL INFORMATION (Continued)

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on
aquatic life. The presence of more than a trace of Carbon Monoxide (a component of this product) is a hazard to
fish. The following aquatic toxicity data are available for Hydrogen Sulfide (another component of this gas
mixture):
TLm (Asellussp) = 0.111 mg/L/96 hour
TLm (Cranfgonyx sp) =1.07 mg/L/96 hour
TLm (Gammarrus) = 0.84 mg/L/96 hour
LC_{50} (fly inhalation) = 380 mg/m_3/960 minutes
LC_{50} (fly inhalation) = 1500 mg/m_3/7 minutes
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0478 mg/L/96 hour
TLm (Lepomis macrochirus, bluegill sunfish) = 0.0448 mg/L/96 hour at 21-22 °C
TLm (Pimephlaes promelas, fathead minnow) = 0.0071-0.55 mg/L/96 hour
TLm (Salvenilis foninalis, brook trout) = 0.0216-0.038 mg/L/96 hour at 8-12.5 °C

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in
accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may
be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other
Information).

14. TRANSPORTATION INFORMATION

**THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF
TRANSPORTATION.**
PROPER SHIPPING NAME: Compressed gases, n.o.s. (Nitrogen, Hydrogen Sulfide)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER: UN 1956
PACKING GROUP: Not applicable.
DOT LABEL(S) REQUIRED: Non-Flammable Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126
MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants
(as defined by 49 CFR 172.101, Appendix B).
SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated
vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present
serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to
extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle
should be well-ventilated during transportation.
Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the
outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.
TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS
CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian
Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product is subject to the reporting requirements of Sections 302,
304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Methane	NO	NO	NO
Carbon Monoxide	NO	NO	NO
Nitrogen	NO	NO	NO
Hydrogen Sulfide	YES	YES	YES

SARA THRESHOLD PLANNING QUANTITY: Hydrogen Sulfide = 500 lbs.
TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
CERCLA REPORTABLE QUANTITY (RQ): Hydrogen Sulfide = 100 lbs.
OTHER U.S. FEDERAL REGULATIONS:
• Hydrogen Sulfide and Carbon Monoxide are subject to the reporting requirements of CFR 29 1910.1000.
NON-FLAMMABLE GAS MIXTURE MSDS - 50018 EFFECTIVE DATE: MARCH 10, 2000 PAGE 9 OF 10
• Hydrogen Sulfide and Methane are subject to the reporting requirements of Section 112(r) of the Clean Air
Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be
affected by the regulation.

15. REGULATORY INFORMATION (Continued)

OTHER U.S. FEDERAL REGULATIONS (Continued):
• Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety
Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Hydrogen Sulfide is
listed in Appendix A of this regulation. The Threshold Quantity for Hydrogen Sulfide under this regulation
is 1500 lbs (and so one cylinder of this product will not be affected by this regulation).
• This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
• Nitrogen and Oxygen are not listed Regulated Substances, per 40 CFR, Part 68, of the Risk Management for
Chemical Releases. Hydrogen Sulfide is listed under this regulation in Table 1 as a Regulated Substance
(Toxic Substance), in quantities of 10,000 lbs (4,553 kg) or greater. Carbon Monoxide and Methane are
listed under this regulation in Table 3, as Regulated Substances (Flammable), in quantities of 10,000 lbs
(4,553 kg) or greater, and so this mixture will not be affected by the regulation.
OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Classes
A and D2A, as per the Controlled Product Regulations.
STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following
specific State regulations:
Alaska - Designated Toxic and Hazardous Substances: Carbon Monoxide, Hydrogen Sulfide, Methane.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Hydrogen Sulfide, Methane.
Florida - Substance List: Oxygen, Carbon Monoxide, Hydrogen Sulfide
Illinois - Toxic Substance List: Carbon Monoxide, Methane, Hydrogen Sulfide.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Oxygen, Carbon Monoxide, Hydrogen Sulfide, Methane.
Minnesota - List of Hazardous Substances: Carbon Monoxide, Hydrogen Sulfide, Methane.
Missouri - Employer Information/Toxic Substance List t: Hydrogen Sulfide, Methane.
New Jersey - Right to Know Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: Hydrogen Sulfide.
Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Hydrogen Sulfide, Methane.
Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide,

Nitrogen, Hydrogen Sulfide, Methane.
Texas - Hazardous Substance List: Hydrogen Sulfide.
West Virginia - Hazardous Substance List: Hydrogen Sulfide.
Wisconsin - Toxic and Hazardous Substances: Hydrogen Sulfide
.
CALIFORNIA PROPOSITION 65: Carbon Monoxide (a component of this product) is on the California
Proposition 65 lists as a chemical known to the State of California to cause birth defects or other reproductive
harm.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

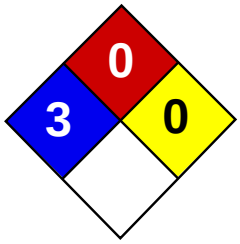
DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty)
they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue
because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are
Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are
flammable or oxidizing gas mixtures.
For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their
disposal is no different than that employed with other DOT containers such as spray paint cans, household
aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended
recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return
cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival.
Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this
operation as a service to valued customers who want to participate.

16. OTHER INFORMATION (Continued)

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to
create additional, unexpected hazards. Obtain and evaluate the safety information for each component before
you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety
evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or
death.
Further information about the handling of compressed gases can be found in the following pamphlets published

by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-
4102. Telephone: (703) 412-0900.
P-1 "Safe Handling of Compressed Gases in Containers"
AV-1 "Safe Handling and Storage of Compressed Gases"
"Handbook of Compressed Gases"
PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302
Fax on Demand: 1-800/231-1366

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.





Material Safety Data Sheet
Mercury MSDS

Section 1: Chemical Product and Company Identification

Product Name: Mercury

Catalog Codes: SLM3505, SLM1363

CAS#: 7439-97-6

RTECS: OV4550000

TSCA: TSCA 8(b) inventory: Mercury

CI#: Not applicable.

Synonym: Quick Silver; Colloidal Mercury; Metallic Mercury; Liquid Silver; Hydragyrum

Chemical Name: Mercury

Chemical Formula: Hg

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Mercury	7439-97-6	100

Toxicological Data on Ingredients: Mercury LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.

Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
When thrown into mercury vapor, boron phosphodiiodide ignites at once. Flame forms with chlorine jet over mercury surface at 200 deg to 300 deg C. Mercury undergoes hazardous reactions in the presence of heat and sparks or ignition.

Special Remarks on Explosion Hazards:
A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. CHLORINE DIOXIDE & LIQUID HG, WHEN MIXED, EXPLODE VIOLENTLY. Mercury and Ammonia can produce an

explosive compound. A mixture of the dry carbonyl and oxygen will explode on vigorous shaking with mercury. Methyl azide in the presence of mercury was shown to be potentially explosive.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.025 from ACGIH (TLV) [United States] SKIN TWA: 0.05 CEIL: 0.1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 0.025 (mg/m3) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Heavy liquid)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 200.59 g/mole

Color: Silver-white

pH (1% soln/water): Not available.

Boiling Point: 356.73°C (674.1°F)

Melting Point: -38.87°C (-38°F)

Critical Temperature: 1462°C (2663.6°F)

Specific Gravity: 13.55 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 6.93 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Ground mixtures of sodium carbide and mercury, aluminum, lead, or iron can react vigorously. A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. Incompatible with boron diiodophosphide; ethylene oxide; metal oxides, metals(aluminum, potassium, lithium, sodium, rubidium); methyl azide; methylsilane, oxygen; oxidants(bromine, peroxyformic acid, chlorine dioxide, nitric acid, tetracarbonynickel, nitromethane, silver perchlorate, chlorates, sulfuric acid, nitrates,); tetracarbonylnickel, oxygen, acetylinic compounds, ammonia, ethylene oxide, methylsiliane, calcium,

Special Remarks on Corrosivity:
The high mobility and tendency to dispersion exhibited by mercury, and the ease with which it forms alloys (amalga) with many laboratory and electrical contact metals, can cause severe corrosion problems in laboratories. Special precautions: Mercury can attack copper and copper alloy materials.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

May affect genetic material. May cause cancer based on animal data. Passes through the placental barrier in animal. May cause adverse reproductive effects(paternal effects- spermatogenesis; effects on fertility - fetotoxicity, post-implantation mortality), and birth defects.

Special Remarks on other Toxic Effects on Humans:

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Mercury UNNA: 2809 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Mercury California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Mercury Connecticut hazardous material survey.: Mercury Illinois toxic substances disclosure to employee act: Mercury Illinois chemical safety act: Mercury New York acutely hazardous substances: Mercury Rhode Island RTK hazardous substances: Mercury Pennsylvania RTK: Mercury Minnesota: Mercury Massachusetts RTK: Mercury New Jersey: Mercury New Jersey spill list: Mercury Louisiana spill reporting: Mercury California Director's List of Hazardous Substances.: Mercury TSCA 8(b) inventory: Mercury SARA 313 toxic chemical notification and release reporting: Mercury CERCLA: Hazardous substances.: Mercury: 1 lbs. (0.4536 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R23- Toxic by inhalation. R33- Danger of cumulative effects. R38- Irritating to skin. R41- Risk of serious damage to eyes. R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S2- Keep out of the

reach of children. S7- Keep container tightly closed. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label. S60- This material and its container must be disposed of as hazardous waste. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:22 PM

Last Updated: 06/09/2012 12:00 PM

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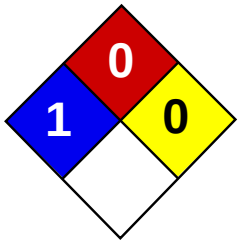



Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m3) from OSHA (PEL) [United States] TWA: 0.03 (mg/m3) from NIOSH [United States] TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: HYDROGEN CYANIDE, ANHYDROUS, STABILIZED

TRADE NAMES/SYNONYMS:
MTG MSDS 119; HYDROCYANIC ACID; PRUSSIC ACID; FORMONITRILE; CARBON HYDRIDE NITRIDE; HYDROCYANIC ACID, LIQUEFIED; HYDROGEN CYANIDE; RCRA P063; UN 1051; CHN; MAT11160; RTECS MW6825000

CHEMICAL FAMILY: inorganic, gas

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: HYDROGEN CYANIDE, ANHYDROUS, STABILIZED
CAS NUMBER: 74-90-8
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=4 REACTIVITY=2



EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: liquid
ODOR: almond odor
MAJOR HEALTH HAZARDS: potentially fatal if inhaled or swallowed, respiratory tract irritation, eye irritation
PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire. May polymerize. Containers may rupture or explode. May react on contact with air, heat, light or water.

POTENTIAL HEALTH EFFECTS:

INHALATION:
SHORT TERM EXPOSURE: irritation, rash, nausea, chest pain, irregular heartbeat, headache, blindness, bluish skin color, suffocation, lung congestion, paralysis, convulsions, coma, death
LONG TERM EXPOSURE: vomiting, digestive disorders, dizziness
SKIN CONTACT:
SHORT TERM EXPOSURE: suffocation
LONG TERM EXPOSURE: same as effects reported in long term inhalation, rash, itching
EYE CONTACT:
SHORT TERM EXPOSURE: irritation, suffocation, death
LONG TERM EXPOSURE: same as effects reported in short term exposure
INGESTION:
SHORT TERM EXPOSURE: suffocation, death
LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: When safe to enter area, remove from exposure. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention immediately.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

ANTIDOTE: amyl nitrite, inhalation; sodium nitrite, intravenous; sodium thiosulfate, infusion; oxygen.

NOTE TO PHYSICIAN: Consider amyl nitrite inhalation, 1 ampoule (0.2 mL) every 5 minutes, and oxygen. For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Containers may rupture or explode if exposed to heat. Vapor/air mixtures are explosive. Gas or vapor is lighter than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Cool containers with water spray until well after the fire is out. Keep unnecessary people away, isolate hazard area and deny entry. For tank, rail car or tank truck, evacuation radius: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FLASH POINT: 0 F (-18 C) (CC)
LOWER FLAMMABLE LIMIT: 5.6%
UPPER FLAMMABLE LIMIT: 40%
AUTOIGNITION: 1000 F (538 C)
FLAMMABILITY CLASS (OSHA): IA

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Do not touch spilled material. Stop leak if possible without personal risk. Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Reduce vapors with water spray. Do not get water directly on material. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. For tank, rail car or tank truck: 800 meters (1/2 mile). Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Avoid heat, flames, sparks and other sources of ignition. Shelf life is 90 days. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
HYDROGEN CYANIDE, ANHYDROUS, STABILIZED:
HYDROGEN CYANIDE:
10 ppm (11 mg/m3) OSHA TWA (skin)

4.7 ppm (5 mg/m3) OSHA STEL (skin) (vacated by 58 FR 35338, June 30, 1993)
4.7 ppm(CN) ACGIH ceiling (skin)
4.7 ppm (5 mg/m3) NIOSH recommended STEL (skin)

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
47 ppm
Any supplied-air respirator.
50 ppm
Any supplied-air respirator operated in a continuous-flow mode.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless
ODOR: almond odor
MOLECULAR WEIGHT: 27.03
MOLECULAR FORMULA: H-C-N
BOILING POINT: 79 F (26 C)
FREEZING POINT: 7 F (-14 C)
VAPOR PRESSURE: 620 mmHg @ 20 C
VAPOR DENSITY (air=1): 0.941
SPECIFIC GRAVITY (water=1): 0.699 @ 22 C
WATER SOLUBILITY: soluble

PH: weakly acidic
VOLATILITY: Not available
ODOR THRESHOLD: 2-5 ppm
EVAPORATION RATE: Not available
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol
Slightly Soluble: ether

10. STABILITY AND REACTIVITY

REACTIVITY: May react with evolution of heat on contact with water.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: combustible materials, bases, amines, oxidizing materials, acids

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: cyanides

POLYMERIZATION: Polymerizes with evolution of heat. Avoid contact with air, light, water, incompatible material or storage and use above room temperature.

11. TOXICOLOGICAL INFORMATION

HYDROGEN CYANIDE, ANHYDROUS, STABILIZED:
TOXICITY DATA: 150 ppm/30 minute(s) inhalation-rat LC50; 3700 ug/kg oral-mouse LD50
LOCAL EFFECTS:
Irritant: inhalation, eye
ACUTE TOXICITY LEVEL:
Highly Toxic: inhalation, ingestion
TARGET ORGANS: blood
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: blood system disorders, heart or cardiovascular disorders, nervous system disorders

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 5 ug/L 12 week(s) (Physiological) Atlantic salmon (Salmo salar)

INVERTEBRATE TOXICITY: 21 ug/L 83 hour(s) NOEC (Reproduction) Scud (Gammarus pseudolimnaeus)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): P063.

14. TRANSPORT INFORMATION



U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Hydrogen cyanide, stabilized
ID NUMBER: UN1051
HAZARD CLASS OR DIVISION: 6.1
PACKING GROUP: I
LABELING REQUIREMENTS: 6.1; 3
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden
MARINE POLLUTANT: HYDROGEN CYANIDE, ANHYDROUS, STABILIZED

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Hydrogen cyanide, stabilized
UN NUMBER: UN1051
CLASS: 6.1; 3
PACKING GROUP/CATEGORY: I

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
HYDROGEN CYANIDE: 10 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):
HYDROGEN CYANIDE: 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):
HYDROGEN CYANIDE: 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):

ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
HYDROGEN CYANIDE

OSHA PROCESS SAFETY (29 CFR 1910.119):
HYDROGEN CYANIDE: 1000 LBS TQ

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ABD1F

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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HCL/
MURIATIC ACID

==========
MSDS Safety Information
==========
FSC: 6810
NIIN: 00-045-8918
MSDS Date: 03/28/1997
MSDS Num: CHVMT
Product ID: HCL (MURIATIC ACID), CPE298002
MFN: 02
Responsible Party
Cage: 99530
Name: OLIN CORPORATION
Address: 501 MERRITT 7
Box: 4500
City: NORWALK CT 06856-4500
Info Phone Number: 203-356-3449
Emergency Phone Number: 800-OLIN-911(1-800-654-6911)
Published: Y
==========
Contractor Summary
==========
Cage: 99530
Name: OLIN CORPORATION
Address: 501 MERRITT 7
Box: 4500
City: NORWALK CT 06856-4500
Phone: 203-750-3000/800-511-MSDS
==========
Item Description Information
==========
==========
Ingredients
==========
Cas: 7647-01-0
RTECS #: MW4025000
Name: HYDROCHLORIC ACID (SARA 302/313) (CERCLA)
% Wt: 8-38
OSHA PEL: C 5 PPM
ACGIH TLV: C 5 PPM
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 7732-18-5
Name: WATER
% Wt: 62-93
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Name: SUP DAT: OCCUR TO ENTIRE GI TRACT, INCL STOM & INTESTINES,
CHARACTERIZED BY NAUS, VOMIT, DIARR, ABDOM PAIN,

Name: ING 3: BLEEDING, &/TISS ULCERATION. INGEST CAUSES SEVERE DAMAGE TO GI
TRACT W/POTENTIAL TO CAUSE PERFORATION.

Name: ING 4: CHRONIC: INHAL: RPTD/PRLNG EXPOS TO CONCS >ACCEPTED OCCUP LIMS
  MAY CAUSE DENTAL DISCOLORATION & EROSION

Name: ING 5: OF TEETH. SKIN: RPTD CONT W/MIST HAS BEEN REPORTED TO CAUSE CONT
  DERM (SKIN RASH). PRLNG/RPT EXPOS W/LIQ

Name: ING 6: MAY CAUSE PERM DMG. INGEST: INGEST OF SIGNIFICANT AMTS IS UNLIKELY
  BECAUSE OF ITS ACUTE CORR ACTION.

Name: FIRST AID PROC: INHAL: IF PERS EXPERIENCES NAUS, HDCH/DIZZ, PERS SHOULD
  STOP WORK IMMED & MOVE TO FRESH AIR

Name: ING 8: UNTIL THESE SYMPS DISAPPEAR. IF BRTHG IS DFCLT, ADMIN OXYGEN, KEEP
  PERS WARM & AT REST. CALL MD. IN THE

Name: ING 9: EVENT THAT INDIVIDUAL INHALES ENOUGH VAP TO LOSE CONSCIOUSNESS,
  PERS SHOULD BE MOVED TO FRESH AIR AT ONCE

Name: ING 10: & MD SHOULD BE CALLED IMMED. IF BRTHG HAS STOPPED, ARTF RESP
  SHOULD BE GIVEN IMMED. IN ALL CASES, ENSURE

Name: ING 11: ADEQUATE VENTILATION AND PROVIDE RESPIRATORY PROTECTION BEFORE
  THE PERSON RETURNS TO WORK.

Name: SPILL PROC: REQS. HAZ CONCS IN AIR MAY BE FOUND IN LOC SPILL AREA &
  IMMED DOWNWIND. AIR RELEASE. VAPS MAY BE

Name: ING 13: SUPPRESSED BY USE OF WATER FOG/VAP SUPPRESSANT FOAM. DIKE &
  CONTAIN ALL RUN-OFF WATER FOR TREATMENT AS

Name: ING 14: HAZ WASTE. WATER RELEASE: THIS MATL IS HVR/AIR & SOL IN
  WATER. CONTAIN CONTAM WATER BY BLDG A DIKE OF

Name: ING 15: COMPATIBLE ABSORBS. VACUUM/PUMP MATL TO NEUT CONTR & TREAT.
  LAND SPILL: COMPATIBLE ABSORBS: SAND, CLAY

Name: ING 16: SOIL & COMMERCIAL ABSORBS. SPILL RESIDUERS: DISP OF PER
  GUIDELINES UNDER WASTE DISP. THIS MATL MAY BE

Name: ING 17: NEUT FOR DISP; YOU ARE REQUESTED TO CONT OCEAN AT 800-OLIN-911
  BEFORE BEGINNNING ANY SUCH OPERATION.
==========
Health Hazards Data
==========
LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry Inds - Inhalation: YES

Skin: YES
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: ACUTE: INHAL: MIST/VAP/HYDROGEN CHLORINE GAS MAY CAUSE
IRRIT OF MUC MEMB & RESP TRACT W/SYMPS OF BURNING, CHOKING * COUGHING. AT
EXPOS CONCS >TLV, DMG MAY OCCUR TO MUC MEMB (ULCERATIONS OF NOSE & THRO AT) & RESP TRACT. AT THESE HIGH CONCS, SEV BRTHG DFCLTYS MAY OCCUR WHICH MAY BE DELAYED IN ONSET & MAY (EFTS OF OVEREXP)
Explanation Of Carcinogenicity: NOT RELEVANT.
Signs And Symptions Of Overexposure: HLTH HAZ: BE DUE TO PULM EDEMA (FLUID IN
LUNG) /LARYNGEAL EDEMA/SPASM. SKIN: HYDROFLUORIC ACID MIST MAY RAPIDLY CAUSE
SKIN INFLAMM & BURNS. DIRECT CONT OF LIQ WILL BE CORR TO SKIN & CAN CAUSE SEV IRRI T &/BURNS CHARACTERIZED BY REDNESS, SWELL & SCAB FORM. POTENTIAL FOR SCARRING & ULCERATION OF CONTACTED TISS (SUP DAT)
Medical Cond Aggravated By Exposure: RESPIRATORY AND CARDIOVASCULAR DISEASE.
First Aid: EYES: IMMED FLUSH W/LGE AMTS OF WATER FOR AT LEAST 15 MIN, OCCAS
LIFTING UPPER & LOWER EYELIDS. CALL MD AT ONCE. SKIN: IMMED FLUSH W/WATER
FOR AT LEAST 15 MIN. CALL MD. IF CLTHG COMES IN CONT W/PROD, IT SHOULD BE
REMOVED IMMED & LAUNDERED BEFORE REUSE. INGEST: IMMED DRINK LGE QTYS OF WATER. DO NOT INDUCE VOMIT. CALL MD AT ONCE. DO NOT GIVE ANYTHING BY MOUTH IF
PERS IS UNCON/HAVING CONVLS.

==========
Handling and Disposal
==========
Spill Release Procedures: FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT
800-424-9300. REPORTABLE QUANTITY: THIS PROD IS SUBJECT TO REPORTABLE QTY
W/RESPECT TO HYDROFLUORIC ACID. RQ'S ARE SUBJECT TO CHANGE & REFERENCE SHOU LD BE MADE TO 40 CFR 302.4 FOR CURRENT
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Methods: CARE MUST BE TAKEN TO PVNT ENVIRON CONTAM FROM USE OF
MATL. THE USER HAS THE RESPONSIBILITY TO DISP OF UNUSED MATL, RESIDUES & CONTRS IN COMPLIANCE W/ALL RELEVANT LOC, STATE & FED LAWS & REGS REGARDIN G TREATMENT, STOR & DISP FOR HAZ & NON HAZ WASTES
Handling And Storage Precautions: DO NOT TAKE INTERNALLY. AVOID CONT W/SKIN,
EYES & CLTHG. AVOID BRTHG MIST/VAP. STORE IN COOL, CLEAN, WELL-VENTED AREA. DO NOT STORE >100F (>38C).

Other Precautions: DO NOT EXPOSE TO DIRECT LIGHT. SHELF LIFE LIMITATIONS: 1
YEAR. GLASS/POLYETHYLENE CONTRS REC. WHEN SHIPPED W/OXIDIZERS, MUST BE SEPARATED BY 18 INCHES, W/WOOD PALLETS & ABSORB MATL IN BETWEEN.

==========

Fire and Explosion Hazard Information

==========

Extinguishing Media: ON SMALL FIRES, USE DRY CHEMICAL OR CARBON DIOXIDE. ON
LARGE FIRE, USE WATER.
Fire Fighting Procedures: WEAR NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). USE WATER TO COOL CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard: NOT COMBUSTIBLE BUT CONTACT WITH COMMON METALS
PRODUCES FLAMMABLE HYDROGEN GAS. MAY ALSO RELEASE CHLORINE GAS BY REACTION
WITH OXIDIZING AGENTS.

==========

Control Measures

==========

Respiratory Protection: NONE SPECIFIED BY MANUFACTURER.ALLY REQUIRED. IF VAPORS, MISTS, OR AEROSOLS ARE GENERATED, WEAR A NIOSH APPROVED FULL FACEPIECE, EQUIPPED WITH CHEMICAL CARTRIDGES APPROVED FOR HYDROGEN CHLORIDE.
Ventilation: N/R EXHST VENT IS REC IF VAPS, MIST/AEROSOLS ARE GENERATED.OTHERWISE, USE GOOD GENERAL ROOM VENTILATION.
Protective Gloves: NEOPRENE GLOVES.
Eye Protection: ANSI APRV CHEM SFTY GOGGS&FFACE SHLD(FPN
Other Protective Equipment: ANSI APPRVD EMER EYEWASH & DELUGE SHOWER (FP N).
BOOTS, APRON.FULL IMPERMEABLE SUIT REC IF EXPOS TO LGE PORTION OF BODY.
Work Hygienic Practices: UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.
Supplemental Safety and Health: MATLS TO AVOID: METALLIC OXIDES, MAGNESIUM,
OLEUM, PERCHLORIC ACID, ZINC. EFTS OF OVEREXP: ALSO EXISTS. EYE: EXPOS TO
MIST MAY RSLT IN IRRIT &/SEV BURNS W/PERM DMG & POSS LOSS OF SIGHT.
DIRECT CONT W/ LIQ WILL BE CORR TO EYE W/RSLTG SEV BURNS, POTENTIAL VISUAL
IMPAIRMENT/LOSS OF SIGHT. INGEST: IRRIT &/BURNS CAN

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Physical/Chemical Properties

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B.P. Text: >212F,100C
M.P/F.P Text: -101F,-74C
Vapor Pres: <210 @ 20C
Vapor Density: 1.3
Spec Gravity: 1.035-1.188
PH: <1
Evaporation Rate & Reference: APPROX 1 (WATER=1)
Solubility in Water: COMPLETE
Appearance and Odor: CLEAR, COLORLESS LIQUID; PUNGENT, SUFFOCATING ODOR
Percent Volatiles by Volume: 100

==========
Reactivity Data
==========
Stability Indicator: YES
Stability Condition To Avoid: HEAT, EXPOSURE TO SUNLIGHT.
Materials To Avoid: ALKALINE MATLS, ALUMINUM, AMINES, CARBONATES, IRON,
SULFURIC ACID, HYDROXIDES, LEATHER & OTHER FABRICS, (SUP DAT)
Hazardous Decomposition Products: FLAMM HYDROGEN GAS BY REACTION W/MANY METALS
(E.G. ALUMINUM). CHLORINE GAS IS RELEASED BY REACTION W/OXIDIZING AGENTS.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT RELEVANT.
==========
Toxicological Information
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==========
Ecological Information
==========
==========
MSDS Transport Information
==========
==========
Regulatory Information
==========
==========
Other Information
==========
==========
HAZCOM Label
==========
Product ID: HCL (MURIATIC ACID), CPE298002
Cage: 99530
Company Name: OLIN CORPORATION
Street: 501 MERRITT 7
PO Box: 4500
City: NORWALK CT
Zipcode: 06856-4500
Health Emergency Phone: 800-OLIN-911; (1-800-654-6911)
Label Required IND: Y
Date Of Label Review: 06/23/1998
Status Code: C
Label Date: 06/23/1998
Origination
Chronic Hazard IND: Y
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: DANGER
Respiratory Protection IND: YES
Health Hazard: Slight
Contact Hazard: Severe
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: ACUTE: INHAL: MIST/VAP/HCL GAS MAY CAUSE IRRIT OF MUCOUS MEMB & RESP TRACT W/BURN SYMPS, CHOKE & COUGH. AT EXPOS >TLV, MAY DMG MUC MEMB & RESP TRACT. AT HIGH CONC, SEV BRTHG DFCLTYS WHICH MAY BE DELAY ED IN ONSET & BE DUE TO PULM EDEMA, LARYNGEAL

EDEMA/SPASM. SKIN: HCL ACID MIST MAY CAUSE INFLAM & BURNS. DIRECT CONT OF
LIQ IS CORR CAUSING SEV IRRIT &/BURNS & ULCER OF CONTACTED TISS. EYE:
EXPOS TO M IST MAY CAUSE IRRIT &/SEV BURNS W/PERM DMG & POSS SIGHT
LOSS. INGEST: IRRIT &/BURNS CAN OCCUR TO GI TRACT. CHRONIC: RPTD/PRLNG
EXPOS TO HI CONC MAY CAUSE DENTAL DISCOLOR & EROSION. SKIN: DERM. PERM DM
G. INGEST: INLIKELY BECAUSE OR ACUTE CORR ACTION.

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information is formulated for use by elements of the Department of Defense.
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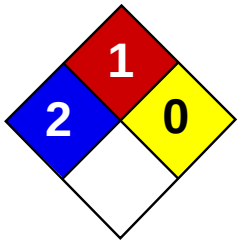
United States of America should seek competent professional advice to verify
and assume responsibility for the suitability of this information to their
particular situation regardless of similarity to a corresponding Department
of Defense or other government situation.





Material Safety Data Sheet
Copper MSDS

Section 1: Chemical Product and Company Identification

Product Name: Copper

Catalog Codes: SLC4939, SLC2152, SLC3943, SLC1150, SLC2941, SLC4729, SLC1936, SLC3727, SLC5515

CAS#: 7440-50-8

RTECS: GL5325000

TSCA: TSCA 8(b) inventory: Copper

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Cu

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Copper	7440-50-8	100

Toxicological Data on Ingredients: Copper LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH [1990] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 63.54 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2595°C (4703°F)

Melting Point: 1083°C (1981.4°F)

Critical Temperature: Not available.

Specific Gravity: 8.94 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Copper Massachusetts RTK: Copper TSCA 8(b) inventory: Copper CERCLA: Hazardous substances.: Copper

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 04:58 PM

Last Updated: 06/09/2012 12:00 PM

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Material Safety Data Sheet

Version 3.1
Revision Date 01/19/2012
Print Date 09/13/2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	cis-Dichloroethylene
Product Number	:	48597
Brand	:	Supelco
Supplier	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone # (For both supplier and manufacturer)	:	(314) 776-6555
Preparation Information	:	Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid

Target Organs

Central nervous system, Liver, Kidney

GHS Classification
Flammable liquids (Category 2)
Acute toxicity, Inhalation (Category 4)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

HMIS Classification

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical hazards:	1

NFPA Rating

Health hazard:	2
Fire:	3

Reactivity Hazard: 0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C2H2Cl2
Molecular Weight : 96.94 g/mol

Component		Concentration
cis-Dichloroethylene		
CAS-No.	156-59-2	-
EC-No.	205-859-7	
Index-No.	602-026-00-3	

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature: 2 - 8 °C

Handle and store under inert gas. Air and moisture sensitive. Light sensitive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
cis-Dichloroethylene	156-59-2	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Central Nervous System impairment Eye irritation			

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	light yellow

Safety data

pH	no data available

Melting point/freezing point	-80.0 °C (-112.0 °F)
Boiling point	60.0 - 61.0 °C (140.0 - 141.8 °F)
Flash point	6.0 °C (42.8 °F) - closed cup
Ignition temperature	no data available
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	1.28 g/cm3
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions

Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
Inhalation LC50
LC50 Inhalation - rat - 13700 ppm
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Fatty liver degeneration.

Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
no data available

Additional Information
RTECS: KV9420000

12. ECOLOGICAL INFORMATION

Toxicity

no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE
Marine pollutant: No

IATA
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Material Safety Data Sheet
Chrysene, 98%

MSDS# 95251

Section 1 - Chemical Product and Company Identification

MSDS Name:	Chrysene, 98%
Catalog Numbers:	AC224140000, AC224140010, AC224140050, AC224145000
Synonyms:	1,2-Benzophenanthrene; Benzo(a)phenanthrene; 1,2,5,6-Dibenzonaphthalene.
Company Identification:	Acros Organics BVBA Janssen Pharmaceuticalaan 3a 2440 Geel, Belgium
Company Identification: (USA)	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	800-ACROS-01
For information in Europe, call:	+32 14 57 52 11
Emergency Number, Europe:	+32 14 57 52 99
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300
CHEMTREC Phone Number, Europe:	703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#:	218-01-9
Chemical Name:	Chrysene
%:	98
EINECS#:	205-923-4

Hazard Symbols: T



Risk Phrases: 45 50/53

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Caution! May cause respiratory tract irritation. May cause eye and skin irritation. May cause cancer in humans. Target Organs: Liver, skin.

Potential Health Effects

Eye:	May cause eye irritation.
Skin:	May cause skin irritation.
Ingestion:	May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation:	May cause respiratory tract irritation.
Chronic:	May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Autoignition Temperature: Not available.

Flash Point: Not applicable.

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: health: ; flammability: 1; instability: ;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chrysene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA	0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Chrysene: 0.2 mg/m3 TWA (benzene soluble fraction) (listed under Coal tar pitches)

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Solid
Color:	very light beige
Odor:	Not available
pH:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
Evaporation Rate:	Not available
Viscosity:	Not available
Boiling Point:	448 deg C @ 760 mm Hg (838.40°F)
Freezing/Melting Point:	250-255 deg C
Decomposition Temperature:	Not available
Solubility in water:	insoluble
Specific Gravity/Density:	
Molecular Formula:	C18H12
Molecular Weight:	228.29

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	Dust generation.
Incompatibilities with Other Materials	Not available
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide.
Hazardous Polymerization	Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 218-01-9: GC0700000

LD50/LC50: RTECS: Not available.

Carcinogenicity: Chrysene - ACGIH: A1 - Confirmed Human Carcinogen (Coal tar pitches). California: carcinogen, initial date 1/1/90 NTP: Known carcinogen (Coal tar pitches). IARC: Group 1 carcinogen (Coal tar pitches).

Other: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: Please contact Fisher Scientific for shipping information
Hazard Class:
UN Number:
Packing Group:
Canada TDG
Shipping Name: Not available
Hazard Class:
UN Number:
Packing Group:

USA RQ: CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: Not available

Canada

CAS# 218-01-9 is listed on Canada's DSL List

Canadian WHMIS Classifications: D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 218-01-9 is listed on Canada's Ingredient Disclosure List

US Federal

TSCA

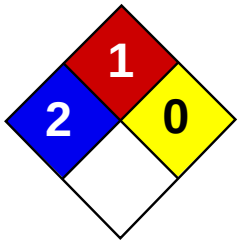
CAS# 218-01-9 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 6/30/1999

Revision #6 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.





Material Safety Data Sheet
Chromium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Chromium

Catalog Codes: SLC4711, SLC3709

CAS#: 7440-47-3

RTECS: GB4200000

TSCA: TSCA 8(b) inventory: Chromium

CI#: Not applicable.

Synonym: Chromium metal; Chrome; Chromium Metal Chips 2" and finer

Chemical Name: Chromium

Chemical Formula: Cr

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Chromium	7440-47-3	100

Toxicological Data on Ingredients: Chromium LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 580°C (1076°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Moderate fire hazard when it is in the form of a dust (powder) and burns rapidly when heated in flame. Chromium is attacked vigorously by fused potassium chlorate producing vivid incandescence. Pyrophoric chromium unites with nitric oxide with incandescence. Incandescent reaction with nitrogen oxide or sulfur dioxide.

Special Remarks on Explosion Hazards:
Powdered Chromium metal +fused ammonium nitrate may react violently or explosively. Powdered Chromium will explode spontaneously in air.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.5 (mg/m3) from ACGIH (TLV) [United States] TWA: 1 (mg/m3) from OSHA (PEL) [United States] TWA: 0.5 (mg/m3) from NIOSH [United States] TWA: 0.5 (mg/m3) [United Kingdom (UK)] TWA: 0.5 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 52 g/mole

Color: Silver-white to Grey.

pH (1% soln/water): Not applicable.

Boiling Point: 2642°C (4787.6°F)

Melting Point: 1900°C (3452°F) +/- !0 deg. C

Critical Temperature: Not available.

Specific Gravity: 7.14 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Soluble in acids (except Nitric), and strong alkalies.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids, alkalis.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with molten Lithium at 180 deg. C, hydrogen peroxide, hydrochloric acid, sulfuric acid, most caustic alkalies and alkali carbonates, potassium chlorate, sulfur dioxide, nitrogen oxide, bromine pentafluoride. It may react violently or ignite with bromine pentafluoride. Chromium is rapidly attacked by fused sodium hydroxide + potassium nitrate. Potentially hazardous incompatibility with strong oxidizers.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause cancer based on animal data. There is no evidence that exposure to trivalent chromium causes cancer in man.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: May cause skin irritation. Eyes: May cause mechanical eye irritation. Inhalation: May cause irritation of the respiratory tract and mucous membranes of the respiratory tract. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea. Chronic Potential Health Effects: Inhalation: The effects of chronic exposure include irritation , sneezing, reddness of the throat, bronchospasm, asthma, cough, polyps, chronic inflammation, emphysema, chronic bronchitis, pharyngitis, bronchopneumonia, pneumoconoisis. Effects on the nose from chronic chromium exposure include irritation, ulceration, and perforation of the nasal septum. Inflammation and ulceration of the larynx may also occur. Ingestion or Inhalation: Chronic exposure may cause liver and kidney damage.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Chromium Illinois toxic substances disclosure to employee act: Chromium Illinois chemical safety act: Chromium New York release reporting list: Chromium Rhode Island RTK hazardous substances: Chromium Pennsylvania RTK: Chromium Minnesota: Chromium Michigan critical material: Chromium Massachusetts RTK: Chromium Massachusetts spill list: Chromium New Jersey: Chromium New Jersey spill list: Chromium Louisiana spill reporting: Chromium California Director's List of Hazardous Substances: Chromium TSCA 8(b) inventory: Chromium SARA 313 toxic chemical notification and release reporting: Chromium CERCLA: Hazardous substances.: Chromium: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R40- Limited evidence of carcinogenic effect S36/37/39- Wear suitable protective clothing, gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:16 PM

Last Updated: 06/09/2012 12:00 PM

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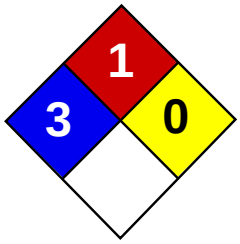



Material Safety Data Sheet
Cadmium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Cadmium

Catalog Codes: SLC3484, SLC5272, SLC2482

CAS#: 7440-43-9

RTECS: EU9800000

TSCA: TSCA 8(b) inventory: Cadmium

CI#: Not applicable.

Synonym:

Chemical Name: Cadmium

Chemical Formula: Cd

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Cadmium	7440-43-9	100

Toxicological Data on Ingredients: Cadmium: ORAL (LD50): Acute: 2330 mg/kg [Rat.]. 890 mg/kg [Mouse]. DUST (LC50): Acute: 50 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, lungs, liver. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 570°C (1058°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Non-flammable in presence of open flames and sparks, of heat, of oxidizing materials, of reducing materials, of combustible materials, of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (ppm) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 112.4 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 765°C (1409°F)

Melting Point: 320.9°C (609.6°F)

Critical Temperature: Not available.

Specific Gravity: 8.64 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity: Reacts violently with potassium.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 890 mg/kg [Mouse]. Acute toxicity of the dust (LC50): 229.9 mg/m3 4 hour(s) [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP. The substance is toxic to kidneys, lungs, liver.

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: An allergen. 0047 Animal: embryotoxic, passes through the placental barrier.

Special Remarks on other Toxic Effects on Humans: May cause allergic reactions, exzema and/or dehydration of the skin.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:

Identification:

Special Provisions for Transport:

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Cadmium California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Cadmium Pennsylvania RTK: Cadmium Massachusetts RTK: Cadmium TSCA 8(b) inventory: Cadmium SARA 313 toxic chemical notification and release reporting: Cadmium CERCLA: Hazardous substances.: Cadmium

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R26- Very toxic by inhalation. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

Created: 10/09/2005 04:29 PM

Last Updated: 06/09/2012 12:00 PM

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Buffer Solution (Phosphate), pH 7

1. Product Identification

Synonyms: None
CAS No.: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: 5608

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Potassium Phosphate Monobasic	7778-77-0	< 1%	No
Sodium Phosphate, Dibasic	7558-79-4	< 1%	No
Water	7732-18-5	> 99%	No

3. Hazards Identification

Emergency Overview

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

Potential Health Effects

Inhalation:
No adverse health effects via inhalation.
Ingestion:
Not expected to be a health hazard via ingestion. Large oral doses may cause irritation to the gastrointestinal tract.
Skin Contact:
Not expected to be a health hazard from skin exposure.
Eye Contact:
No adverse effects expected.

Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Not expected to require first aid measures.
Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
If large amounts were swallowed, give water to drink and get medical advice.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Wash thoroughly with running water. Get medical advice if irritation develops.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
Personal Respirators (NIOSH Approved):
Not expected to require personal respirator usage.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Odorless.
Solubility:
Complete (100%)
Specific Gravity:
No information found.
pH:
7
% Volatiles by volume @ 21C (70F):
ca. 99
Boiling Point:
No information found.
Melting Point:
No information found.
Vapor Density (Air=1):
Not applicable.
Vapor Pressure (mm Hg):
Not applicable.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
No information found.
Hazardous Polymerization:

Will not occur.
Incompatibilities:
No information found.
Conditions to Avoid:
Heat.

---

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Potassium Phosphate Monobasic (7778-77-0)	No	No	None
Sodium Phosphate, Dibasic (7558-79-4)	No	No	None
Water (7732-18-5)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

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13. Disposal Considerations

Dilute with water and flush to sewer if local ordinances allow, otherwise, whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Potassium Phosphate Monobasic (7778-77-0)	Yes	Yes	Yes	Yes
Sodium Phosphate, Dibasic (7558-79-4)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Potassium Phosphate Monobasic (7778-77-0)	Yes	Yes	No	Yes
Sodium Phosphate, Dibasic (7558-79-4)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313- List	Chemical Catg.
Potassium Phosphate Monobasic (7778-77-0)	No	No	No	No
Sodium Phosphate, Dibasic (7558-79-4)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Potassium Phosphate Monobasic (7778-77-0)	No	No	No
Sodium Phosphate, Dibasic (7558-79-4)	5000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **0** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

Label Precautions:

None.

Label First Aid:

Not applicable.

Product Use:

Laboratory Reagent.

Material Safety Data Sheet
Benzo[k]fluoranthene, 99+% (tlc)

MSDS# 54641

Section 1 - Chemical Product and Company Identification

MSDS Name:	Benzo[k]fluoranthene, 99+% (tlc)
Catalog Numbers:	AC279730000, AC279732500
Synonyms:	8,9-Benzofluoranthane.
Company Identification:	Acros Organics BVBA Janssen Pharmaceuticalaan 3a 2440 Geel, Belgium
Company Identification: (USA)	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	800-ACROS-01
For information in Europe, call:	+32 14 57 52 11
Emergency Number, Europe:	+32 14 57 52 99
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300
CHEMTREC Phone Number, Europe:	703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#:	207-08-9
Chemical Name:	Benzo[k]fluoranthene, 99+% (TLC)
%:	99%
EINECS#:	205-916-6

Hazard Symbols: T



Risk Phrases: 45

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Danger! May be fatal if swallowed. May be fatal if absorbed through the skin. Toxic. Carcinogen. May cause lung damage. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Cancer hazard. May be fatal if inhaled. Target Organs: Lungs, respiratory system.

Potential Health Effects

Eye:	Causes eye irritation.
Skin:	Causes skin irritation. May be fatal if absorbed through the skin.
Ingestion:	May be fatal if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation:	May be fatal if inhaled. Causes respiratory tract irritation.
Chronic:	May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower

eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician:

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Autoignition Temperature: Not available

Flash Point: Not available

Explosion Limits: Lower: Not available

Explosion Limits: Upper: Not available

NFPA Rating: Not published

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not breathe dust, mist, or vapor. Do not get on skin or in eyes. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Benzo[k]fluoranthene, 99+% (TLC)	none listed	none listed	none listed

OSHA Vacated PELs: Benzo[k]fluoranthene, 99+% (TLC): None listed

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Solid
Color:	yellow
Odor:	Not available
pH:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
Evaporation Rate:	Not available
Viscosity:	Not available
Boiling Point:	480 deg C @ 760.00mm Hg (896.00°F)
Freezing/Melting Point:	216 - 218 deg C
Decomposition Temperature:	Not available
Solubility in water:	Not available
Specific Gravity/Density:	
Molecular Formula:	C20H12
Molecular Weight:	252.32

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	Incompatible materials, dust generation.
Incompatibilities with Other Materials	Not available
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide.
Hazardous Polymerization	Has not been reported.

Section 11 - Toxicological Information

RTECS#:	CAS# 207-08-9: DF6350000
LD50/LC50:	RTECS: Not available.
Carcinogenicity:	Benzo[k]fluoranthene, 99+% (TLC) - California: carcinogen, initial date 7/1/87 NTP: Suspect carcinogen IARC: Group 2B carcinogen
Other:	See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: Not regulated as a hazardous material
Hazard Class:
UN Number:
Packing Group:
Canada TDG
Shipping Name: Not available
Hazard Class:
UN Number:
Packing Group:

USA RQ: CAS# 207-08-9: 5000 lb final RQ; 2270 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 45 May cause cancer.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 207-08-9: Not available

Canada

Canadian WHMIS Classifications: Not available

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 207-08-9 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

CAS# 207-08-9 is not listed on the TSCA Inventory. It is for research and development use only.

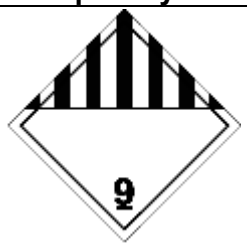
Section 16 - Other Information

MSDS Creation Date: 9/02/1997

Revision #6 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

Material Safety Data Sheet

NFPA	WHMIS	PPE	Transport Symbol
			

Preparation Date No data available **Revision Date** 16-Apr-2007 **Revision Number** 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Black-Knight™ CTP
Product Code 8344
UN-No UN3077
Contact Manufacturer

The Garland Company, Inc.
3800 East 91st. Street
Cleveland, Ohio 44105-2197
Ph: (800) 762-8225 Fax: (216) 641-0633

Garland Canda, Inc.
1296 Martin Grove Rd.
Toronto, Ontario M9W 4X3
Ph: (416)747-7995 Fax: (416)747-1980

Emergency Telephone Number 1-800-762-8225 (24 Hrs.)

2. HAZARDS IDENTIFICATION

Emergency Overview

Harmful by inhalation, in contact with skin and if swallowed
Harmful in contact with skin
Harmful if swallowed
Harmful by inhalation
Irritating to respiratory system
Irritating to skin
May be harmful if swallowed
May cause irritation of respiratory tract

Appearance Black. **Physical State** Solid. Liquid. **Odor** Aromatic.

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Mexico - Grade Serious risk, Grade 3

Potential Health Effects

Principle Routes of Exposure Skin contact, Inhalation, Ingestion.

Acute Effects

Eyes Avoid contact with eyes. Irritating to eyes.

Skin Avoid contact with skin. Irritating to skin. May cause sensitization by skin contact.

Inhalation Avoid breathing vapors or mists. Irritating to mucous membranes. Inhalation of vapours in high concentration may cause irritation of respiratory system.

Ingestion May be harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Chronic Effects Prolonged exposure may cause chronic effects.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions Skin disorders. Central nervous system.

Interactions with Other Chemicals Not available

Potential Environmental Effects See Section 12 for additional Ecological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Components

Chemical Name	CAS-No	Weight %	North American Hazard Indicator
High Temperature Coal Tar Pitch	65996-93-2	60 - 100	1
Fluoranthene	206-44-0	1 - 5	1
Phenanthrene	85-01-8	1 - 5	1
Pyrene	129-00-0	1 - 5	1
1,2-Benzanthracene	56-55-3	1 - 5	1
1,2-Benzphenanthrene	218-01-9	1 - 5	1
Benzo(a)pyrene	50-32-8	1 - 5	1
Benzo(G,H,I)Perylene	191-24-2	1 - 5	1
Indeno(1,2,3-CD)Pyrene	193-39-5	0.1 - 1	1
Benzo(B)fluoranthene	205-99-2	0.1 - 1	1
Dibenzo(A,H)pyrene	189-64-0	0.1 - 1	1
Benzo(J)fluoranthene	205-82-3	0.1 - 1	1
Benzo(K)fluoranthene	207-08-9	0.1 - 1	1
Dibenzo(A,E)pyrene	192-65-4	0.1 - 1	1
Dibenzo(A,I)pyrene	189-55-9	0.1 - 1	1
Dibenz(A,H)anthracene	53-70-3	0.1 - 1	1
Naphthalene	91-20-3	0.1 - 1	1
5-Methylchrysene	3697-24-3	0.1 - 1	1

4. FIRST AID MEASURES

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin Contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If skin irritation persists, call a physician. Remove and wash contaminated clothing before re-use.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician immediately.

Ingestion Never give anything by mouth to an unconscious person. Drink 1 or 2 glasses of water. Do not induce vomiting. Call a physician or Poison Control Centre immediately.

Notes to Physician Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Carbon dioxide (CO2). Foam. Dry powder. Dry chemical.

Unsuitable Extinguishing Media Do not use a solid water stream as it may scatter and spread fire.

Hazardous Combustion Products Carbon monoxide, Carbon dioxide (CO2), Hydrocarbons.

Explosion Data

Sensitivity to mechanical impact No
Sensitivity to static discharge Yes

Specific Hazards Arising from the Chemical
Combustible material. Thermal decomposition can lead to release of irritating gases and vapours.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA **Health** 3 **Flammability** 1 **Instability** 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions Avoid contact with skin, eyes and clothing. Evacuate personnel to safe areas. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Ensure adequate ventilation.

Environmental Precautions Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Keep out of waterways.

Methods for Containment Dam up

Methods for Cleaning Up Soak up with inert absorbent material. Pick up and transfer to properly labelled containers. Keep in suitable and closed containers for disposal.

Other Information Not applicable

7. HANDLING AND STORAGE

Handling Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Ensure adequate ventilation.

Storage Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep at temperatures below 100°C.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	Ontario TWAEV	Mexico
High Temperature Coal Tar Pitch	TWA: 0.2 mg/m^3	TWA: 0.2 mg/m^3	TWA: 0.2 mg/m^3	STEL: 0.03 mg/m^3 STEL: 0.015 ppm TWA: 0.02 mg/m^3 TWA: 0.002 mg/m^3
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 50 mg/m^3 TWA: 10 ppm	STEL: 78 mg/m^3 STEL: 15 ppm TWA: 10 ppm TWA: 52 mg/m^3	STEL: 75 mg/m^3 STEL: 15 ppm TWA: 50 mg/m^3 TWA: 10 ppm

Chemical Name	NIOSH IDLH
High Temperature Coal Tar Pitch	80 mg/m^3
Naphthalene	250 ppm

Engineering Measures Ensure adequate ventilation, especially in confined areas. Do not allow ventilation equipment to draw material odors indoors..

Personal Protective Equipment

Eye/face Protection Tightly fitting safety goggles.

Skin Protection Long sleeved clothing. Boots. Lightweight protective clothing.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hygiene Measures

When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Black
Odor Aromatic
Physical State Solid Liquid
pH Not available
Flash Point > 374°F / > 190°C
Method Tag closed cup
Autoignition Temperature 750°F / 399°C
Boiling Point/Range >464°F / 240°C
Freezing Point Not available
Flammability Limits in Air **Lower** Not available **Upper** Not available
Explosive Properties Not available
Oxidizing Properties Not available
Evaporation Rate 0.37 for solvent (ether = 1)
Vapor Pressure <1 mmHg @ 68 °F
Vapor Density <1 @ Air = 1
Specific Gravity 1.3
Solubility Slightly soluble

9. PHYSICAL AND CHEMICAL PROPERTIES

Water Solubility slightly soluble
Volatiles Not available
VOC Content 0 g/l

10. STABILITY AND REACTIVITY

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition.

Incompatible Materials Strong oxidizing agents.

Hazardous Decomposition Products Carbon monoxide. Carbon dioxide (CO2). Hydrocarbons.

Possibility of Hazardous Reactions Hazardous polymerisation does not occur

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Fluoranthene	2 g/kg Rat	3180 mg/kg Rabbit	
Phenanthrene	700 mg/kg Mouse		
Pyrene	2700 mg/kg Rat		
Naphthalene	490 mg/kg Rat	2500 mg/kg Rat 20 g/kg Rabbit	340 mg/m^3 Rat 1 h

Chronic Toxicity

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA	Mexico
High Temperature Coal Tar Pitch	A1	Group 1	Known	X	A1

Chemical Name	ACGIH	IARC	NTP	OSHA	Mexico
1,2-Benzanthracene	A2	Group 2A	Reasonably Anticipated	X	
1,2-Benzphenanthrene	A3				
Benzo(a)pyrene	A2	Group 2A	Reasonably Anticipated	X	
Indeno(1,2,3-CD)Pyrene		Group 2B	Reasonably Anticipated	X	
Benzo(B)fluoranthene	A2	Group 2B	Reasonably Anticipated	X	
Dibenzo(A,H)pyrene		Group 2B	Reasonably Anticipated	X	
Benzo(J)fluoranthene		Group 2B	Reasonably Anticipated	X	
Benzo(K)fluoranthene		Group 2B	Reasonably Anticipated	X	
Dibenzo(A,E)pyrene		Group 2B	Reasonably Anticipated	X	
Dibenzo(A,I)pyrene		Group 2B	Reasonably Anticipated	X	
Dibenz(A,H)anthracene		Group 2A	Reasonably Anticipated	X	
Naphthalene		Group 2B	Reasonably Anticipated	X	
5-Methylchrysene		Group 2B	Reasonably Anticipated	X	

12. ECOLOGICAL INFORMATION

Ecotoxicity

No information available.

Pyrene

Water Flea Data
water flea EC50=1.8 mg/L (48 h)

1,2-Benzanthracene

Microtox Data
Photobacterium phosphoreum EC50=0.26 mg/L (15 min)
Water Flea Data
water flea EC50=0.01 mg/L (96 h)

1,2-Benzphenanthrene

Water Flea Data
water flea EC50=1.9 mg/L (2 h)

Naphthalene

Freshwater Algae Data
Skeletonema costatum EC50=0.4 mg/L (96 h)
Microtox Data
Photobacterium phosphoreum EC50=0.93 mg/L (30 min)
Pseudomonas putida EC50>20 mg/L (18 h)
Water Flea Data
water flea EC50=2.16 mg/L (48 h)

Persistence/Degradability	Not available
Bioaccumulation/ Accumulation	Not available
Mobility in Environmental Media	Not available

High Temperature Coal Tar Pitch
log Pow = 6.04

Fluoranthene
log Pow = 5.33

Phenanthrene
log Pow = 4.46

Pyrene
log Pow = 4.88

1,2-Benzanthracene
log Pow = 5.61

1,2-Benzphenanthrene
log Pow = 5.61 - 5.91

Benzo(a)pyrene
log Pow = 6.06

Benzo(G,H,I)Perylene
log Pow = 7.23

Indeno(1,2,3-CD)Pyrene
log Pow = 6.584

Benzo(B)fluoranthene
log Pow = 6.57

Benzo(K)fluoranthene
log Pow = 6.84

Dibenz(A,H)anthracene
log Pow = 6.50

Naphthalene
log Pow = 3.3

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose of in accordance with local regulations.

Contaminated Packaging Empty containers should be taken for local recycling, recovery or waste disposal.

US EPA Waste Number D001

Chemical Name	RCRA
Fluoranthene - 206-44-0	waste number U120

Chemical Name	RCRA
1,2-Benzanthracene - 56-55-3	waste number U018
1,2-Benzphenanthrene - 218-01-9	waste number U050
Benzo(a)pyrene - 50-32-8	waste number U022
Indeno(1,2,3-CD)Pyrene - 193-39-5	waste number U137
Benzo(B)fluoranthene - 205-99-2	(hazardous constituent - no waste number)
Dibenzo(A,H)pyrene - 189-64-0	(hazardous constituent - no waste number)
Benzo(J)fluoranthene - 205-82-3	(hazardous constituent - no waste number)
Benzo(K)fluoranthene - 207-08-9	(hazardous constituent - no waste number)
Dibenzo(A,E)pyrene - 192-65-4	(hazardous constituent - no waste number)
Dibenzo(A,I)pyrene - 189-55-9	waste number U064
Dibenz(A,H)anthracene - 53-70-3	waste number U063
Naphthalene - 91-20-3	waste number U165

14. TRANSPORT INFORMATION

DOT Not Regulated

Proper Shipping Name	Environmentally hazardous substance, solid, n.o.s
Hazard Class	9
Subsidiary Class	
UN-No	UN3077
Packing Group	III
Reportable Quantity (RQ)	Dibenz[a,i]pyrene, RQ kg = 1816 Indeno1,2,3-cdpyrene, RQ kg = 4585.858 Fluoranthene, RQ kg = 1297.143 Chrysene, RQ kg = 3242.857 Benz[a]anthracene, RQ kg = 324.2857 Acenaphthene, RQ kg = 9659.574 Naphthalene, RQ kg = 18916.67
Description	Environmentally hazardous substances, solid, n.o.s.(Dibenz[a,i]pyrene,Indeno(1,2,3-cd)pyrene,Fluoranthene,Chrysene,Benz[a]anthracene,Acenaphthene,Naphthalene),9,UN3077,PG III,RQ

TDG Not regulated

Proper Shipping Name	Environmentally hazardous substance, solid, n.o.s
Hazard Class	9
Subsidiary Class	
UN-No	UN3077
Packing Group	III
Description	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., Class 9,UN3077,PG III

MEX Not regulated

Proper Shipping Name	Environmentally hazardous substance, solid, n.o.s
Hazard Class	9
Subsidiary Class	
UN-No	UN3077
Packing Group	III
Description	UN3077 Environmentally hazardous substance, solid, n.o.s.,9,III

ICAO Not regulated

UN-No	UN3077
Proper Shipping Name	Environmentally hazardous substance, solid, n.o.s
Hazard Class	9
Subsidiary Class	
Packing Group	III

14. TRANSPORT INFORMATION

Description Environmentally hazardous substance, solid, n.o.s.*,UN3077,PG III

IATA Not regulated

UN-No UN3077
Proper Shipping Name Environmentally hazardous substance, solid, n.o.s
Hazard Class 9
Subsidiary Class
Packing Group III
ERG Code 9L
Description Environmentally hazardous substance, solid, n.o.s.*,UN3077,PG III

IMDG/IMO Not regulated

Proper Shipping Name Environmentally hazardous substance, solid, n.o.s
Hazard Class 9
Subsidiary Class
UN-No UN3077
Packing Group III
EmS No. F-A, S-F
Description Environmentally hazardous substance, solid, n.o.s.,UN3077,PG III

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	CHINA	KECL	PICCS	AICS
High Temperature Coal Tar Pitch	X	X	-	X	-	X	X	X	X	X
Fluoranthene	X	-	X	X	-	X	X	-	-	X
Phenanthrene	X	X	-	X	-	X	X	X	X	X
Pyrene	X	X	-	X	-	X	X	-	X	X
1,2-Benzanthracene	X	-	X	X	-	-	X	-	-	-
1,2-Benzphenanthrene	X	X	-	X	-	-	-	X	-	X
Benzo(a)pyrene	X	X	-	X	-	-	X	X	X	-
Benzo(G,H,I)Perylene	-	-	-	X	-	-	-	-	-	-
Indeno(1,2,3-CD)Pyrene	X	-	X	X	-	-	-	-	-	-
Benzo(B)fluoranthene	-	-	-	X	-	-	-	-	-	-
Dibenzo(A,H)pyrene	-	-	-	X	-	-	-	-	-	-
Benzo(J)fluoranthene	-	-	-	X	-	-	-	-	-	-
Benzo(K)fluoranthene	-	-	-	X	-	-	-	-	-	-
Dibenzo(A,E)pyrene	-	-	-	X	-	-	-	-	-	-
Dibenzo(A,I)pyrene	-	-	-	X	-	-	-	-	-	-
Dibenz(A,H)anthracene	X	-	X	X	-	-	X	-	-	-
Naphthalene	X	X	-	X	-	X	X	X	X	X
5-Methylchrysene	-	-	-	-	-	-	-	-	-	-

TSCA Does not Comply
DSL Does not Comply
NDSL Does not Comply
EINECS Does not Comply
ELINCS Does not Comply
ENCS Does not Comply
CHINA Does not Comply
KECL Does not Comply

PICCS Does not Comply
AICS Does not Comply

USA

Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372:

Chemical Name	SARA 313 - Threshold Values
Fluoranthene (CAS #: 206-44-0)	1.0%
Phenanthrene (CAS #: 85-01-8)	1.0%
1,2-Benzanthracene (CAS #: 56-55-3)	0.1%
1,2-Benzphenanthrene (CAS #: 218-01-9)	0.1%
Benzo(a)pyrene (CAS #: 50-32-8)	0.1%
Benzo(G,H,I)Perylene (CAS #: 191-24-2)	1.0%
Indeno(1,2,3-CD)Pyrene (CAS #: 193-39-5)	0.1%
Benzo(B)fluoranthene (CAS #: 205-99-2)	0.1%
Dibenzo(A,H)pyrene (CAS #: 189-64-0)	0.1%
Benzo(J)fluoranthene (CAS #: 205-82-3)	0.1%
Benzo(K)fluoranthene (CAS #: 207-08-9)	0.1%
Dibenzo(A,E)pyrene (CAS #: 192-65-4)	0.1%
Dibenzo(A,I)pyrene (CAS #: 189-55-9)	0.1%
Dibenz(A,H)anthracene (CAS #: 53-70-3)	0.1%
Naphthalene (CAS #: 91-20-3)	0.1%
5-Methylchrysene (CAS #: 3697-24-3)	0.1%

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any HAPs.

Chemical Name
Naphthalene (CAS #: 91-20-3)

State Regulations

California Proposition 65
WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Chemical Name	CAS-No	Category	Type
1,2-Benzanthracene	56-55-3	Carcinogen	
1,2-Benzphenanthrene	218-01-9	Carcinogen	
Benzo(a)pyrene	50-32-8	Carcinogen	
Indeno(1,2,3-CD)Pyrene	193-39-5	Carcinogen	
Benzo(B)fluoranthene	205-99-2	Carcinogen	
Dibenzo(A,H)pyrene	189-64-0	Carcinogen	
Benzo(J)fluoranthene	205-82-3	Carcinogen	
Benzo(K)fluoranthene	207-08-9	Carcinogen	
Dibenzo(A,E)pyrene	192-65-4	Carcinogen	
Dibenzo(A,I)pyrene	189-55-9	Carcinogen	
Dibenz(A,H)anthracene	53-70-3	Carcinogen	
Naphthalene	91-20-3	Carcinogen	

Chemical Name	CAS-No	Category	Type
5-Methylchrysene	3697-24-3	Carcinogen	

State Right-to-Know

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
High Temperature Coal Tar Pitch	X	X	X	X	
Fluoranthene	X	X	X		
Phenanthrene	X	X	X		
Pyrene	X	X	X	X	
1,2-Benzanthracene	X	X	X	X	X
1,2-Benzphenanthrene	X	X	X	X	X
Benzo(a)pyrene	X	X	X	X	X
Benzo(G,H,I)Perylene	X	X	X	X	
Indeno(1,2,3-CD)Pyrene	X	X	X	X	
Benzo(B)fluoranthene	X	X	X	X	X
Dibenzo(A,H)pyrene	X	X	X	X	X
Benzo(J)fluoranthene	X	X	X	X	X
Benzo(K)fluoranthene	X	X	X	X	
Dibenzo(A,E)pyrene	X	X	X	X	X
Dibenzo(A,I)pyrene	X	X	X	X	X
Dibenz(A,H)anthracene	X	X	X	X	X
Naphthalene	X	X	X	X	X
5-Methylchrysene	X		X	X	

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
D2A Very toxic materials

16. OTHER INFORMATION

Revision Date 16-Apr-2007

Revision Summary Not available

Disclaimer
The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS

Material Safety Data Sheet

Version 4.1
Revision Date 01/17/2012
Print Date 09/13/2012

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Barium
Product Number	:	237094
Brand	:	Aldrich
Supplier	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone # (For both supplier and manufacturer)	:	(314) 776-6555
Preparation Information	:	Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Water Reactive, Irritant

GHS Classification
Substances, which in contact with water, emit flammable gases (Category 2)
Skin irritation (Category 2)
Eye irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 3)

GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H261	In contact with water releases flammable gases.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Precautionary statement(s)

P231 + P232	Handle under inert gas. Protect from moisture.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P422	Store contents under inert gas.

HMIS Classification

Health hazard:	2
Flammability:	3
Physical hazards:	1

NFPA Rating

Health hazard: 2
Fire: 0
Reactivity Hazard: 1
Special hazard.: W

Potential Health Effects

Inhalation May be harmful if inhaled. Causes respiratory tract irritation.
Skin May be harmful if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.
Ingestion May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : Ba
Molecular Weight : 137.33 g/mol

Component		Concentration
Barium		
CAS-No.	7440-39-3	-
EC-No.	231-149-1	

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media
Dry powder Carbon dioxide (CO2)

Extinguishing media which shall not be used for safety reasons
Water

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Barium oxide

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Store under inert gas.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
Barium	7440-39-3	TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Eye, skin, & Gastrointestinal irritation Muscular stimulation Not classifiable as a human carcinogen			

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
impervious clothing, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	Rods
Colour	grey

Safety data

pH	no data available
Melting point/freezing point	Melting point/range: 725 °C (1,337 °F) - lit.
Boiling point	1,640 °C (2,984 °F) - lit.
Flash point	not applicable
Ignition temperature	no data available

Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	3.6 g/mL at 25 °C (77 °F)
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions

Reacts violently with water.

Conditions to avoid
Exposure to moisture.

Materials to avoid
Oxidizing agents, Water, acids, Oxygen, Chlorinated solvents, Carbon dioxide (CO2), Halogens, Halogenated hydrocarbon, Alcohols, Sulphur compounds, Hydrogen sulfide gas

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Barium oxide
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
no data available

Inhalation LC50
no data available

Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity

no data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. Causes skin irritation.
Eyes	Causes eye irritation.

Signs and Symptoms of Exposure
Stomach/intestinal disorders, Nausea, Vomiting, Drowsiness, Dizziness, Gastrointestinal disturbance, Weakness, Tremors, Seizures.

Synergistic effects
no data available

Additional Information
RTECS: CQ8370000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 500 mg/l - 96 h
	LC50 - Cyprinodon variegatus (sheepshead minnow) - > 500 mg/l - 96 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium
Reportable Quantity (RQ): 1000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1400 Class: 4.3 Packing group: II EMS-No: F-G, S-O
Proper shipping name: BARIUM
Marine pollutant: No

IATA
UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium

15. REGULATORY INFORMATION

OSHA Hazards
Water Reactive, Irritant

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

SARA 311/312 Hazards
Reactivity Hazard, Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

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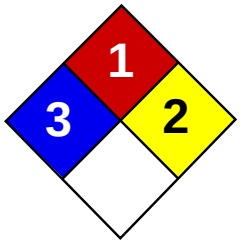
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.





Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic Pennsylvania RTK: Arsenic Massachusetts RTK: Arsenic TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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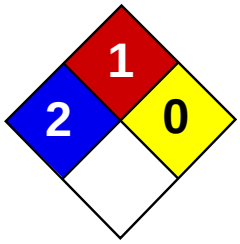

Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
1,1,2,2-Tetrachloroethane MSDS

Section 1: Chemical Product and Company Identification

Product Name: 1,1,2,2-Tetrachloroethane

Catalog Codes: SLT1927

CAS#: 79-34-5

RTECS: KI8575000

TSCA: TSCA 8(b) inventory: 1,1,2,2-Tetrachloroethane

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: C2H2Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{1,1,2,2-}Tetrachloroethane	79-34-5	100

Toxicological Data on Ingredients: 1,1,2,2-Tetrachloroethane: ORAL (LD50): Acute: 250 mg/kg [Rat]. DERMAL (LD50): Acute: 6400 mg/kg [Rabbit]. VAPOR (LC50): Acute: 2250 ppm 4 hour(s) [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (irritant, permeator). Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified 2 (Reasonably anticipated.) by NTP. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, kidneys, the nervous system, liver. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (ppm) from ACGIH (TLV) SKIN TWA: 6.9 (mg/m3) from ACGIH SKIN Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 167.86 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: 146.5°C (295.7°F)

Melting Point: -44°C (-47.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.5866 (Water = 1)

Vapor Pressure: 8 mm of Hg (@ 20°C)

Vapor Density: 5.77 (Air = 1)

Volatility: Not available.

Odor Threshold: 3 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 250 mg/kg [Rat]. Acute dermal toxicity (LD50): 6400 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 2250 ppm 4 hour(s) [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified 2 (Reasonably anticipated.) by NTP. The substance is toxic to blood, kidneys, the nervous system, liver.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethane : UN1702 PG: II

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: 1,1,2,2-Tetrachloroethane California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 1,1,2,2-Tetrachloroethane Pennsylvania RTK: 1,1,2,2-Tetrachloroethane Massachusetts RTK: 1,1,2,2-Tetrachloroethane TSCA 8(b) inventory: 1,1,2,2-Tetrachloroethane SARA 313 toxic chemical notification and release reporting: 1,1,2,2-Tetrachloroethane CERCLA: Hazardous substances.: 1,1,2,2-Tetrachloroethane

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).

DSCL (EEC):
R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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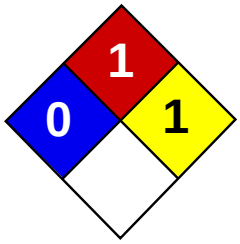



Material Safety Data Sheet
Zinc Metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Zinc Metal

Catalog Codes: SLZ1054, SLZ1159, SLZ1267, SLZ1099, SLZ1204

CAS#: 7440-66-6

RTECS: ZG8600000

TSCA: TSCA 8(b) inventory: Zinc Metal

CI#: Not applicable.

Synonym: Zinc Metal Sheets; Zinc Metal Shot; Zinc Metal Strips

Chemical Name: Zinc Metal

Chemical Formula: Zn

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Zinc Metal	7440-66-6	100

Toxicological Data on Ingredients: Zinc Metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials, of acids, of alkalis, of moisture. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Zinc + NaOH causes ignition. Oxidation of zinc by potassium proceeds with incandescence. Residues from zinc dust /acetic acid reduction operations may ignite after long delay if discarded into waste bins with paper. Incandescent reaction when Zinc and Arsenic or Tellurium, or Selenium are combined. When hydrazine mononitrate is heated in contact with zinc, a flamming decomposition occurs at temperatures a little above its melting point. Contact with acids and alkali hydroxides (sodium hydroxide, postasium hydroxide, calcium hydroxide, etc.) results in evolution of hydrogen with sufficient heat of reaction to ignite the hydrogen gas. Zinc foil ignites if traces of moisture are present. It is water reactive and produces flammable gases on contact with water. It may ignite on contact with water or moist air.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Flammable solid that, in contact with water, emits flammable gases. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Cover with dry earth, sand or other non-combustible material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents, acids, alkalis, moisture.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep from any possible contact with water. Do not allow water to get into container because of violent reaction.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid. Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 65.39 g/mole

Color: Bluish-grey

pH (1% soln/water): Not applicable.

Boiling Point: 907°C (1664.6°F)

Melting Point: 419°C (786.2°F)

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, moisture

Incompatibility with various substances:
Reactive with oxidizing agents, acids, alkalis. Slightly reactive to reactive with moisture. The product may react violently with water to emit flammable but non toxic gases.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with acids, halogenated hydrocarbons, NH_4NO_3, barium oxide, $Ba(NO_3)_2$, Cadmium, CS_2, chlorates, Cl_2, CrO_3, F_2, Hydroxylamine, $Pb(N_3)_2$, $MnCl_2$, HNO_3, performic acid, $KClO_3$, KNO_3, N_2O_2, Selenium, $NaClO_3$, Na_2O_2, Sulfur, Te, water, $(NH_4)_2S$, As_2O_3, CS_2, $CaCl_2$, chlorinated rubber, catalytic metals, halocarbons, o-nitroanisole, nitrobenzene, nonmetals, oxidants, paint primer base, pentacarbonoyliron, transition metal halides, seleninyl bromide, HCl, H_2SO_4, (Mg +$Ba(NO_3)_2$ +BaO_2), (ethyl acetoacetate +tribromoneopentyl alcohol. Contact with Alkali Hydroxides(Sodium Hydroxide, Potassium Hydroxide, Calcium Hydroxide, etc) results in evolution of hydrogen. Ammonium nitrate + zinc + water causes a violent reaction with evolution of steam and zinc oxide. May react with water.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Dermal exposure to zinc may produce leg pains, fatigue, anorexia and weight loss. Eyes: May cause eye irritation. Ingestion: May be harmul if swallowed. May cause digestive tract irritation with tightness in throat, nausea, vomiting, diarrhea, loss of appetite, malaise, abdominal pain. fever, and chills. May affect behavior/central nervous system and autonomic nervous system with ataxia, lethargy, staggering gait, mild derrangement in cerebellar function, lightheadness, dizzness, irritability, muscular stiffness, and pain. May also affect blood. Inhalation: Inhalation of zinc dust or fumes may cause respiratory tract and mucous membrane irritation with cough and chest pain. It can also cause "metal fume fever", a flu-like condition characterized appearance of chills, headached fever, maliase, fatigue, sweating, extreme thirst, aches in the legs and chest, and difficulty in breathing. A sweet taste may also be be present in metal fume fever, as well as a dry throat, aches, nausea, and vomiting, and pale grey cyanosis. The toxicological properties of this substance have not been fully investisgated.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Zinc Metal Rhode Island RTK hazardous substances: Zinc Metal Pennsylvania RTK: Zinc Metal Florida: Zinc Metal Michigan critical material: Zinc Metal Massachusetts RTK: Zinc Metal New Jersey: Zinc Metal California Director's List of Hazardous Substances: Zinc Metal TSCA 8(b) inventory: Zinc Metal TSCA 12(b) one time export: Zinc Metal SARA 313 toxic chemical notification and release reporting: Zinc Metal CERCLA: Hazardous substances.: Zinc Metal: 1000 lbs. (453.6 kg)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not Available

DSCL (EEC):
R15- Contact with water liberates extremely flammable gases. R17- Spontaneously flammable in air. S7/8- Keep container tightly closed and dry.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 1

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 1

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 12:18 AM

Last Updated: 06/09/2012 12:00 PM

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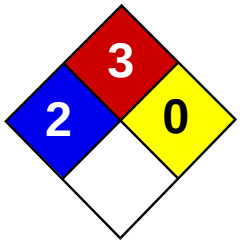



Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air. Containers may explode when heated. May polymerize explosively when heated. An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined

areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 (ppm) [Canada] TWA: 435 (mg/m3) [Canada] TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States] TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2119 mg/kg [Mouse]. Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. Can be absorbed through skin. Eyes: Causes eye irritation. Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves. Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/ kidneys. May cause effects similar to those of acute inhalation. Chronic Potential Health Effects: Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding. Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes Illinois chemical safety act: Xylenes New York acutely hazardous substances: Xylenes Rhode Island RTK hazardous substances: Xylenes Pennsylvania RTK: Xylenes Minnesota: Xylenes Michigan critical material: Xylenes Massachusetts RTK: Xylenes Massachusetts spill list: Xylenes New Jersey: Xylenes New Jersey spill list: Xylenes Louisiana spill reporting: Xylenes California Director's List of Hazardous Substances: Xylenes TSCA 8(b) inventory: Xylenes SARA 302/304/311/312 hazardous chemicals: Xylenes SARA 313 toxic chemical notification and release reporting: Xylenes CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R10- Flammable. R21- Harmful in contact with skin. R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S36/37- Wear suitable protective clothing and gloves. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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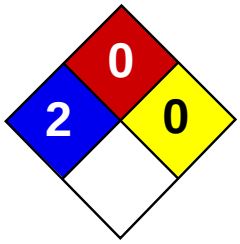



Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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MSDS Number: **T4940** * * * * * *Effective Date:* ***09/16/09*** * * * * * *Supercedes:* ***12/06/07***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRICHLOROETHYLENE

1. Product Identification

Synonyms: Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride
CAS No.: 79-01-6
Molecular Weight: 131.39
Chemical Formula: C2HCl3
Product Codes:
J.T. Baker: 5376, 9454, 9458, 9464, 9473
Mallinckrodt: 8600, 8633

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.
Ingestion:
Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.
Skin Contact:
Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.
Eye Contact:
Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.
Chronic Exposure:
Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.
Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

5. Fire Fighting Measures

Fire:
Autoignition temperature: 420C (788F)
Flammable limits in air % by volume:
lel: 8; uel: 12.5
Explosion:
A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use water spray to keep fire exposed containers cool. If substance does ignite, use CO2, dry chemical or foam.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Trichloroethylene:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA), 200 ppm (Ceiling),
300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):
10 ppm (TWA) 25 ppm (STEL); A2 Suspected Human Carcinogen.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Chloroform-like odor.
Solubility:
Practically insoluble in water. Readily miscible in organic solvents.
Specific Gravity:
1.47 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
87C (189F)
Melting Point:
-73C (-99F)
Vapor Density (Air=1):
4.5
Vapor Pressure (mm Hg):
57.8 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.
Conditions to Avoid:
Heat, flame, ignition sources, light, moisture, incompatibles

11. Toxicological Information

Toxicological Data:
Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
This material has been linked to mutagenic effects in humans.

--------\Cancer Lists\----------

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Trichloroethylene (79-01-6)	No	Yes	2A

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmental Toxicity:
The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 4L

15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                    TSCA  EC   Japan  Australia
----------------------------------------------  ----  ---  -----  ---------
Trichloroethylene (79-01-6)                    Yes  Yes   Yes      Yes

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                      --Canada--
Ingredient                                    Korea  DSL   NDSL  Phil.
----------------------------------------------  -----  ---   ----  -----
Trichloroethylene (79-01-6)                    Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                        -SARA 302-    ------SARA 313------
Ingredient                              RQ    TPQ     List  Chemical Catg.
----------------------------------------  ---   -----   ----  --------------
Trichloroethylene (79-01-6)             No    No      Yes        No

--------\Federal, State & International Regulations - Part 2\----------------
                                                    -RCRA-    -TSCA-
Ingredient                              CERCLA     261.33     8(d)
----------------------------------------  ------     ------    ------
Trichloroethylene (79-01-6)             100        U228       No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Pure / Liquid)
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WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **2** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

SODIUM HYDROXIDE

1. Product Identification

Synonyms: Caustic soda; lye; sodium hydroxide solid; sodium hydrate
CAS No.: 1310-73-2
Molecular Weight: 40.00
Chemical Formula: NaOH
Product Codes:
J.T. Baker: 1508, 3717, 3718, 3721, 3722, 3723, 3728, 3734, 3736, 5045, 5565
Mallinckrodt: 7001, 7680, 7708, 7712, 7772, 7798

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Hydroxide	1310-73-2	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS.

Potential Health Effects

Inhalation:
Severe irritant. Effects from inhalation of dust or mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Severe pneumonitis may occur.
Ingestion:
Corrosive! Swallowing may cause severe burns of mouth, throat, and stomach. Severe scarring of tissue and death may result. Symptoms may include bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appears days after exposure.
Skin Contact:
Corrosive! Contact with skin can cause irritation or severe burns and scarring with greater exposures.

Eye Contact:
Corrosive! Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.
Chronic Exposure:
Prolonged contact with dilute solutions or dust has a destructive effect upon tissue.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. Hot or molten material can react violently with water. Can react with certain metals, such as aluminum, to generate flammable hydrogen gas.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Adding water to caustic solution generates large amounts of heat.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal.
US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Always add the caustic to water while stirring; never the reverse. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Do not store with aluminum or magnesium. Do not mix with acids or organic materials.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL):
2 mg/m3 Ceiling
- ACGIH Threshold Limit Value (TLV):
2 mg/m3 Ceiling

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are

not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:

White, deliquescent pellets or flakes.

Odor:

Odorless.

Solubility:

111 g/100 g of water.

Specific Gravity:

2.13

pH:

13 - 14 (0.5% soln.)

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1390C (2534F)

Melting Point:

318C (604F)

Vapor Density (Air=1):

> 1.0

Vapor Pressure (mm Hg):

Negligible.

Evaporation Rate (BuAc=1):

No information found.

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10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Very hygroscopic. Can slowly pick up moisture from air and react with carbon dioxide from air to form sodium carbonate.

Hazardous Decomposition Products:

Sodium oxide. Decomposition by reaction with certain metals releases flammable and explosive hydrogen gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Sodium hydroxide in contact with acids and organic halogen compounds, especially

trichloroethylene, may causes violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry.

Conditions to Avoid:

Moisture, dusting and incompatibles.

---

11. Toxicological Information

Irritation data: skin, rabbit: 500 mg/24H severe; eye rabbit: 50 ug/24H severe; investigated as a mutagen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sodium Hydroxide (1310-73-2)	No	No	None

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12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SODIUM HYDROXIDE, SOLID

Hazard Class: 8

UN/NA: UN1823

Packing Group: II

Information reported for product/size: 300LB

International (Water, I.M.O.)

Proper Shipping Name: SODIUM HYDROXIDE, SOLID
Hazard Class: 8
UN/NA: UN1823
Packing Group: II
Information reported for product/size: 300LB

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Sodium Hydroxide (1310-73-2)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sodium Hydroxide (1310-73-2)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313- List	Chemical Catg.
Sodium Hydroxide (1310-73-2)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sodium Hydroxide (1310-73-2)	1000	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: Yes (Pure / Solid)

Australian Hazchem Code: 2R

Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **1**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.

Appendix E
HDR H&S Procedures

1.0 OBJECTIVE

This procedure addresses the hazards associated with the use of mobile drilling equipment, and the safety requirements to be implemented to avoid these hazards. Although it is not anticipated that HDR employees will ever operate mobile drilling equipment, HDR employees may often work near or with drilling teams and are exposed to the associated hazards. Several other HDR Health and Safety Procedures may also be pertinent and should be reviewed by HDR employees when working on these sites. These include:

HDR H&S Pro #3	Slip, Trip and Fall Protection
HDR H&S Pro #4	Electrical Safety
HDR H&S Pro #9	Respiratory Protection
HDR H&S Pro #12	Fall Protection
HDR H&S Pro #20	Hazardous and Toxic Waste
HDR H&S Pro #21	PPE

2.0 PURPOSE

The purpose of this procedure is to ensure the safety of HDR personnel when working near mobile drill rigs. **Activities in many States are regulated by State OSHA plans, which may have certain requirements which differ, and are more stringent than, the requirements presented here. When performing services in these State plan areas, HDR will comply with the State promulgated OSHA regulations (reference the HDR Corporate H&S Program, Part 1, Section 8.0, for a listing of the State Plan States).**

3.0 APPLICABILITY

The HDR Drilling Operations Safety Program implemented in this Procedure applies to all HDR personnel at HDR project sites. This program will impact all employees, regardless of HDR Department.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC).

4.1 **National Director of Safety**. The Director of Safety shall:

- Periodically review at least annually, the effectiveness of this program, identify any deficiencies, and ensure that they are corrected; and assist OSCs and project professionals, as requested, in the implementation of this Procedure and regulatory interpretations.

Project Manager (PM). The Project Manager will:

Determine if any project will require the use of a mobile drill rig, and verify that all field personnel scheduled to work in proximity to the rig operation have read this procedure, and understand it's contents.

Office Safety Coordinators. The OSCs will:

Provide initial training on this Procedure to their respective office staff who work on drilling sites, make sure that this procedure is readily available in each office, and interface with the Director of Safety regarding any unsafe office or project site conditions that have been discovered, and need addressing or interpretation.

5.0 DEFINITIONS

Cathead - A smooth drummed winch used to raise the drill string or drop hammer by hand wrapping the lifting rope around the spinning drum.

Catline - The rope that is wrapped around the cathead to provide a means of lifting loads.

Cribbing - A system of timbers, arranged in a rectangular pattern, used to support and distribute the weight of equipment.

Drilling Fluid - Fluid that is pumped into a drilled hole and used to wash cuttings from the hole.

Drilling Mud - Drilling mud is a type of drilling fluid made of clay and water slurry which is used to coat and support the sides of the drill hole and seal off permeable strata.

Hammer - 140-pound weight, dropped 30 inches, which generates the force that drives the sample tube into the soil.

Float - The bearing pad at the end of the rig support leg. The float distributes the rig weight over a larger surface area, and should sit level on the ground.

6.0 SAFE PRACTICES FOR RIG OPERATION

The drill rig operator always has the primary responsibility for rig safety and maintenance. While it is not anticipated that HDR personnel will ever serve as drill operators, it is important to understand the **safety equipment** that the drill rig should be equipped with, and the **safe operational practices** that should be employed by the rig operator. Whenever HDR personnel work around mobile drill rigs, it is important that they attend a safety meeting with the drill rig operator, where personnel responsibilities and safety features of the drill rig are explained. **It is the responsibility of all HDR employees to stay clear of all moving parts!** Although HDR employees do not have direct responsibility for safe rig operation, if potentially unsafe conditions are observed the HDR employee shall immediately move to a safe location and immediately advise the drill rig operator of the reason for the relocation. If, in the opinion of the HDR employee, the unsafe condition is not corrected adequately, the HDR employee shall document the potentially unsafe condition using the *Potentially Unsafe Condition Report*, provide the original copy of the report to the senior drilling supervisor on-site, and contact the HDR Project Manager for resolution with the drilling company and/or client. The following are drill rig safety features and safe operation practices that should be followed by the drill rig operator:

- Before being placed into service at a site, a competent person, normally the rig operator, should **conduct an inspection** of the rig in accordance with the manufacturer's requirements. The manufacturer's operating manual should be kept with the rig, and available for reference, at all times.

- All drill rigs should be equipped with at least one emergency shutdown device, (two, if working on a U.S. Army Corps of Engineers project) often called the "**kill switch**." Typically, this will either be a red push button, or a line that can be pulled to stop the rig. The kill switch should be tested at the beginning of all rig operations.

- Prior to starting or engaging equipment, the operator should **verbally alert** employees and **visually ensure** employees are clear from dangerous parts of equipment.

- The **operating area around the auger** must be kept free of obstructions, soil cuttings, drill fluids, and tools.

- All **guards** and safety devices must be maintained and in proper operating condition and configuration.

- **Fire extinguishers** shall be maintained on or near drill rigs for extinguishing small, incipient stage fires.
- Before a drill rig is positioned to drill, the area on which the rig is to be positioned should be cleared of removable obstacles and vegetation and the **rig should be leveled**. The mast should not be raised until the rig has been leveled.
- Outriggers, if used, shall be extended per the manufacturer specifications.
- Hoists should be used only for their intended purpose and not loaded beyond rated capacity. If the hoist appears to be straining to lift a load, due to friction or weight, HDR personnel shall clear the area.
- Loads should be picked up by the hoists slowly to prevent kickout hazards.
- When using the “Cathead”, the operator must be positioned attentively at the rig controls. This device and the associated rope ("catline") present **entanglement hazards**. Care must be taken to ensure that the user and adjacent personnel do not become entangled and that hands are kept clear of the winch.
- Catlines should only be used on a revolving cathead. Wire rope is susceptible to kinking and wears grooves into the cathead, so should never be wound around the cathead. Loads requiring more that six turns around the cathead should not be lifted by this means.
- Only natural fiber (e.g., hemp) rope should be used with the cathead, since synthetic rope will melt when overheated.
- The cathead should not be used when the rope is wet (rain) since wet natural rope tends to grab or stick on the cathead drum, causing the operator to lose control of the hammer.
- Auger guides shall be used when drilling through hard surfaces. Controls, such as a water spray, should be employed if excessive dust is being generated.
- Drill rod tool joints shall not be made up, tightened, or loosened while the rod column is supported by a rod slipping device.
- The discharge of drilling fluids from the borehole shall be channeled away from the work area to prevent slipping hazards and ponding of water.

7.0 SAFE PRACTICES FOR WORKING ON A DRILLING TEAM

- HDR employees should employ the following safe work practices whenever working as part of a drilling team or near mobile drill rigs:
- Never wear loose-fitting clothes or have long hair exposed that could get caught in moving parts.
- Keep the work areas and walkways clear of obstructions to provide unimpeded access and egress and eliminate tripping hazards.
- Drilling in streets, parking lots or other areas of vehicular traffic requires definition of the work zones with cones, warning tape, etc. and compliance with local requirements. All HDR personnel working on or immediately adjacent to a roadway shall wear orange safety vests with reflective striping.
- Work should cease and HDR personnel should seek shelter during **lightning storms, severe weather and extremely high winds.**
- HDR Personnel are prohibited from climbing onto the drilling mast at any time.
- Drilling and associated activities often require the use of bagged material (e.g., bentonite, concrete, gravel, etc.). When manually handling these materials, proper positioning and lifting techniques must be implemented to minimize the potential for strains and sprains.
- Cap and flag open boreholes.
- If methane or other flammable/explosive gases are suspected in the area, a combustible gas instrument (CGI) shall be used to monitor the air near the borehole. All work must stop, and the hole ventilated, if the CGI indicates flammable gas concentrations at or above 10 percent of the Lower Explosive Limit (LEL).

8.0 BURIED AND OVERHEAD UTILITIES

The location of overhead and buried utility lines must be determined before drilling begins, and the locations should be noted on boring plans. When working near overhead power lines, the drill rig mast should not be raised until the distance between the rig and the nearest power line has been determined and the utility company has been contacted to determine the voltage in the line. If overhead electric lines are not to be deenergized, minimum clearance distances in accordance with HDR H&S Procedure 4 -

Electrical Safety must be followed. The drill rig operator or assistant should walk completely around the rig to make sure that the overhead equipment does not have the capability of coming within the required clearances. Be aware that hoist lines and power lines can be moved towards each other by wind; additional clearance should be maintained to guard against this possibility.

9.0 SAFE HANDLING OF DRILL STEM AND AUGERS

- Never place hands or fingers under the bottom of an auger flight or drill stem when hoisting the augers or rods over the top of another auger or drill stem in the ground or other hard surfaces, such as the drill rig platform.
- Never allow feet to get under the auger or drill rod while they are being hoisted.
- When the drill is rotating, stay clear of the drill string and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.
- Move auger cuttings away from the auger with a long-handled shovel or spade; **never use hands or feet**.
- Never clean excess soils from an auger attached to the drill rig unless the transmission is in neutral, the engine is idled down, the auger has stopped rotating and the operator is stationed attentively at the controls.

10.0 OPERATION OF HIGH-PRESSURE WASHERS

High-pressure washers are often used in conjunction with environmental drilling operations for decontamination operations. Whenever operating high-pressure washers, whether HDR owned, rented or property of separate entity, HDR employees should review and comply with the operating manual for the unit. Additionally, the following safety rules apply when using high-pressure washers:

- Before use, the operator should inspect the pressure washer, the hoses and the lance to ensure that all equipment is in acceptable operating condition. The operator should carefully inspect the relief device to ensure proper functioning.
- No modifications can be made to the equipment except those authorized by the manufacturer. **Do not modify the lance!** The lance barrel, from trigger block to the tip, should not be less than 48 inches as recommended

by manufacturers of hydroblasting equipment. This is to prevent the operator from inadvertently directing the lance at himself. The lance must always be pointed at the work area and never at the operator or other personnel. Additionally, HDR employees should only use lances made of seamless stainless steel (identify by shiny surface free of corrosion). Do not use lances made of carbon steel, which can corrode and result in weakening of the lance.

- The operator should ensure that the work area is free of slip, trip and fall hazards and maintain good footing at all times.
- The operator must have an assistant to aid in moving the hose to different areas and backing up the operator. The assistant must remain behind the operator at all time, should monitor the operating pressure and be ready to shut down the equipment if necessary.
- Non-operators should remain at least 25 feet from the operator.
- The operating pressure should never exceed that which is necessary to complete the job.
- Equipment should be cleaned often to avoid oil or dirt build-up, especially around the trigger and guard area.
- Always increase pressure slowly to inspect for leaks. All leaks or malfunctioning equipment must be repaired immediately or the unit taken out-of-service.
- A serious risk of infection and further complications is possible from a hydroblasting laceration. If an injection injury is suspected, the injured employee must be examined or treated by a physician or other licensed health care professional.

11.0 PERSONAL PROTECTIVE EQUIPMENT

When working near mobile drilling equipment or any rotating machinery, jewelry and loose fitting clothing should not be worn. The following personal protective equipment (PPE) listed below should be worn by HDR employees **at all times** while engaged in drilling activities.

1. Hard hat
2. Safety goggles or glasses with sideshields

3. Safety boots with steel toes

4. Appropriate work gloves

Additional PPE may be required depending on the hazards present at the site. The following additional PPE that may be required and the conditions that may warrant their use:

- Orange safety vests with reflective striping, when exposed to traffic hazards.
- Personal flotation devices, when on or near water where the potential for drowning exists.
- Respiratory protection, when exposed to inhalation hazards.
- Chemically resistant clothing, when exposed to dermal hazards associated with chemical contact.
- Barricading and/or fall protection devices, when large diameter borings are being drilled and the potential exists for personnel falling into and being engulfed in the borehole. Where fall protection devices are used, precautions must be taken to ensure entanglement hazards are not increased. During boring operations, the in-place auger may be used to prevent personnel from falling into the hole.

When using high pressure washers, the following additional PPE is mandatory:

- Goggles and a face shield.
- Heavy duty PVC rain suit or equivalent.
- Heavy chemical resistant gloves.
- Hearing protection.

12.0 WORKING ON HAZARDOUS SUBSTANCE/WASTE SITES

When working around drill rigs on hazardous waste/substance sites, chemical and respiratory protective equipment is often required. When utilizing this equipment, a heightened level of awareness must be exhibited. For PPE use, the following considerations must be addressed:

- Use of loose fitting over boots especially those with “flap-over closures” (i.e., Tingley’s) should be avoided or flaps secured.

- Loose fitting gloves should be avoided.
- Where any of the above cannot be avoided, the loose clothing should be taped down to reduce the hazard.
- Use of respiratory protective devices reduces the field of vision and increases the exertion required to perform the work. Additional care must be exercised to ensure safe operations.
- Use of airline-Level B PPE impedes the ability of personnel and introduces an additional entanglement hazard. Precautions must be implemented to ensure that these hazardous are properly managed.

13.0 TRAINING

All HDR employees will be trained prior to working on drill teams or working in close proximity to mobile drill rigs, via a safety meeting to be held with the drill rig operator prior to the commencement of drilling activities. This training should include the following elements:

- The operation, inspection and maintenance of the equipment;
- The safety features and procedures to be used during the operation, inspection and maintenance of the equipment (including the location of all kill switches), and
- Overhead electrical line and underground hazards.

Additionally, HDR employees who are engaged in working on drill teams or in close proximity to mobile drill rigs shall be informed of the existence of this Procedure, and be provided an opportunity to review the Procedure prior to field mobilization.

1.0 OBJECTIVE

HDR Inc., (HDR) employees frequently perform project services in cold environmental temperatures, where extended exposure could result in cold-related disorders. This procedure describes the hazards associated with exposure to low temperatures, and the proper responses that will prevent or minimize adverse health effects. The guidelines contained in this procedure are in conformance with both the Occupational Safety and Health Administration's (OSHA) 5(a)(1) general duty clause, and the recommendations presented in the publication, *Threshold Limit Values for Chemical Substances and Physical Agents (latest year)*, published by the American Conference of Governmental Industrial Hygienists (ACGIH).

NOTE: This Procedure has been revised to reflect the National Weather Service's November 1, 2001, modifications to the Wind Chill index.

2.0 PURPOSE

The purpose of this procedure is to present information regarding the hazards and physiological effects of exposure to low temperatures/water/wind, and the practices that should be implemented to prevent cold-induced injury. The purpose is ultimately to protect our employees from a dangerous drop in deep core body temperatures ("hypothermia"), and to prevent cold injury to body extremities ("frostbite").

3.0 APPLICABILITY

The HDR Cold Stress Prevention Program implemented in this Procedure may apply to all HDR personnel at both HDR client sites and all HDR facilities, when faced with exposure to cold environments. All employees, regardless of HDR Department, could be impacted by this program.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC).

National Director of Safety. The Director of Safety shall:

- Periodically review, at least annually, the effectiveness of this program, identify any deficiencies, and ensure that they are corrected; and
- Assist OSCs and project professionals, as requested, in the implementation of this procedure and regulatory interpretations.

Office Safety Coordinators. The OSCs shall:

- Provide initial training on this procedure to their respective office staff, and make sure that this procedure is readily available in each office; and
- Interface with the Director of Safety regarding any office or project site conditions that have been discovered to present dangerously low absolute or wind chill temperatures, and need addressing or interpretation.

Site Health and Safety Officers. The Site Health and Safety Officers (HSO) shall:

- Verify that initial training on this procedure has been received by their respective project staff (as applicable), and make sure that this procedure is available at the project site; and
- Interface with the OSC and/or Director of Safety regarding any cold stress project site conditions that are present (with the potential for generating cold disorders), and need addressing or interpretation.

5.0 DEFINITIONS

Wind Chill – The wind chill temperature is the temperature that it feels like outside to people and animals. Wind chill is based on the rate of heat loss from exposed skin caused by combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the both the skin temperature and eventually the internal body temperature. Therefore, the wind makes it feel much colder. If the temperature is 0° Fahrenheit and the wind is blowing at 15 mph, the wind chill is -19° Fahrenheit. At this wind chill temperature, exposed skin can freeze in 30 minutes.

Information provided in this Cold Stress Procedure reflects the latest National Weather Service (NWS) revisions to the Wind Chill index. Specifically, the new WCT index:

- uses calculated wind speed at an average height of five feet (typical height of an adult human face) based on readings from the national standard height of 33 feet (typical height of an anemometer);
- is based on a human face model;
- incorporates modern heat transfer theory (heat loss from the body to its surroundings, during cold and breezy/windy days);

- lowers the calm wind threshold to 3 mph;
- uses a consistent standard for skin tissue resistance; and
- assumes no impact from the sun (i.e. clear night sky).

The Wind Chill Table, presented in the Appendix to this Procedure, should be reviewed along with local temperature and wind speed data prior to extended work in the cold, and preventative work restrictions and preventions, presented herein, should be followed.

Frostbite - Frostbite occurs when body tissue freezes and damage to that tissue occurs. The most susceptible parts of the body are the extremities such as fingers, toes, ear lobes, or the tip of the nose. Symptoms include a loss of feeling in the extremity and a white or pale appearance. Medical attention is needed immediately for frostbite. The area should be SLOWLY re-warmed.

Hypothermia - Hypothermia is when the body temperature falls below 95° Fahrenheit. Determine this by taking ones temperature. Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Medical attention is needed immediately. If it is not available, begin warming the body SLOWLY. Warm the body core first, not the extremities. To warm the extremities first, drives the cold blood to the heart and can cause the body temperature to drop further which may lead to heart failure. Get the person into dry clothing and wrap in a warm blanket covering the head and neck. Do not give the person alcohol, drugs, coffee, or any HOT beverage or food. WARM broth and food is better. NOTE: Alcohol intake should be avoided prior to cold exposure, as it depresses body temperature.

(About 20% of all cold related deaths occur in the home. Young children under the age of two and the elderly, those over 60 years of age, are most susceptible to hypothermia. Hypothermia can set in over a period of time. To avoid this problem, keep the thermostat above 69° Fahrenheit; wear warm clothing; eat food for warmth and drink plenty of water (or fluids other than alcohol) to keep hydrated.)

Anoxia – lack of oxygen.

6.0 GENERAL DISCUSSION

The human body is designed to maintain a constant and uniform internal temperature. The average human deep body temperature (referred to as the "core body temperature") is approximately 99.6° Fahrenheit (37.7° Celsius). The

average body temperature that we are all familiar with, 98.6° F, is the "oral" temperature.

When the body loses heat faster than it can produce it, the result is hypothermia. Hypothermia means "low (body) temperature." This situation is initially characterized by the constriction of blood vessels in the skin in an attempt to conserve the body's internal heat. This protective action serves to trap the remaining heat inside the body cavity, where the vital metabolic processes are occurring, than to continue to let the bloodstream carry heat to the extremities (arms and feet), and lost to the environment through the skin. So at the outset of hypothermia, body areas with high surface area-to-volume ratios, such as fingers, toes and ears, are initially affected. If the body continues to lose heat, involuntary shivering begins. This is the body's attempt to generate additional heat, and it is usually the first real warning sign of hypothermia. Further heat loss produces speech difficulty, loss of manual dexterity, forgetfulness, collapse, and finally death. Clinical manifestations of the increasing loss of body heat are presented in Table 1.

While it is critical that the core body temperature be maintained in a relatively narrow range, the temperature of the hands and feet can drop as much as 40 to 50° F below normal body temperature without permanent injury, provided that the condition is relatively brief.

The body's "perception" of cold is a relative factor. Many cases of hypothermia have occurred in temperatures well above freezing. How fast heat is lost from the body is dependent upon many factors, not just air temperature. Moisture on the skin will conduct heat away from the body many times faster than dry skin (Water conducts heat 240 times faster than air).

Another way in which localized hypothermia, and actual frostbite can occur, is when the skin of a worker is exposed to an escaping gas with a high vapor pressure, or is in contact with a liquid with a very low boiling point. Examples include liquid ammonia, gasoline or various alcohols. All liquids must have heat added to them in order to evaporate (change of physical state). The liquid acquires the necessary heat from its immediate surroundings. If the liquid is on human skin, the heat will be drawn from the warm skin surface, resulting in very rapid cooling of the skin surface. Numerous cases of localized frostbite have occurred this way. Never allow a pressurized liquid to contact any exposed body part!

An important factor that determines the rate of cooling, and a term we are all familiar with, is "wind chill." The wind chill index is the cooling effect of any combination of cool temperature and wind speed (velocity). There is a thin layer of still air that surrounds the body, even when unclothed. This layer warms and

acts as an insulation blanket, keeping cooler environmental air away from the skin surface. When air is moving across your skin, it carries away this insulation layer of air. Heat brought from the body core to the skin surface, through the circulatory system, is then removed by the cooler air (conduction/convection).

The wind chill index is presented as an Appendix. Wind Chill is simply a number, calculated by the integration of the actual air temperature and the wind speed into a formula that indicates the perceived chill on the exposed skin. It is a measure of the chilling effect felt by a warm-blooded body.

Table 1

Progressive Clinical Presentations of Hypothermia*

Core Temperature		
°C	**°F**	**Clinical Signs**
37.6	99.6	"Normal" rectal temperature
37	98.6	"Normal" oral temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
30	86.0	Progressive loss of consciousness; muscular rigidity increases;
		Pulse and blood pressure difficult to obtain; respiratory rate decreases
27	80.6	Voluntary motion ceases
26	78.8	Victim seldom conscious
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover
9	48.2	Lowest artificially cooled hypothermia patient to recover

* Presentations approximately related to core temperature. Modified from the *Threshold Limit Values for Chemical Substances and Physical Agents (1998)*, published by the American Conference of Governmental Industrial Hygienists (ACGIH).

7.0 COLD-RELATED ILLNESSES

There are four types of cold-induced injury resulting from prolonged exposure to a low Wind Chill Index. These are:

7.1 Hypothermia

Normally, the core body temperature should generally not be allowed to fall below 96.8° F (36° C), but one occasional excursion (per exposure) to 95° F (35° C) is permitted by the most current ACGIH Threshold Limit Value. This is the point that severe shivering occurs. As previously discussed in Section 6.0, hypothermia results when the body core temperature falls below 95° F (35° C). If the body core temperature drops below this critical level, the victim cannot produce enough body heat by himself to recover. At this point, a true medical emergency exists. Table 1 presents the clinical effects of hypothermia. True hypothermia always requires immediate attention, since untreated hypothermia can lead to ventricular fibrillation (heart attack) and death.

7.2 Frostbite

Frostbite is the actual freezing of body tissue. There are three degrees of frostbite:

- First degree: freezing without blistering or peeling;
- Second degree: freezing with blistering or peeling;
- Third degree: freezing with skin tissue death and possible deep tissue damage.

The extremities are most commonly affected, and therefore frostbite generally first appears in toes, fingers, nose and ears. The initial stage of frostbite is termed “Frost-Nip”, when only a localized, superficial freezing of extremities has occurred. Regardless of the Wind Chill, frostbite does not occur until the absolute ambient temperature falls below freezing, 32° F (0° C). However, frostbite can occur when bare skin comes into contact with objects whose surface temperature is below freezing, despite warm environmental temperatures. The first warning of frostbite is often a sharp prickling sensation. Frostbitten skin is characterized initially by turning red, then blue/red, and finally by loss of color and feeling in the affected tissue. The skin may become waxy pale in appearance because of a lack of oxygen. Frostbite damage **may be reversible** if properly treated in the first 12 to 24 hours. If not treated, frostbitten areas may become gangrenous. Workers who have suffered frostbite are susceptible to future recurrences and subsequent injury.

7.3 Immersion Foot

"Immersion foot" is caused by chronic cooling for prolonged periods, and is most commonly seen in workers who stand in cold water for long continuous periods. Injury is thought to be due to persistent local tissue anoxia, resulting in damage to the blood capillary walls. The condition may be aggravated by tight footwear. Industrially, trench workers are at risk. It is characterized by intense pain, tingling, itching and discoloration of the foot. Immersion foot is rarely observed now, but was once fairly common among mine workers and in trenching operations.

7.4 Raynaud's Phenomenon

The term "Raynaud's Phenomenon", also called "white fingers", is used to describe a vascular abnormality characterized by a loss of circulation associated with exposure to cold, and/or vibration. It is essentially a disorder of the blood vessels and nerves in the fingers. There is a historical background incidence in the general population of approximately 5 percent, with females being the most susceptible. The onset of Raynaud's Phenomenon is gradual, and is characterized by several stages. The initial stage is manifested by occasional pain, and a slight loss of hand sensitivity. If removed from cold and vibration, it is usually reversible at this stage. As the condition worsens, pain and numbness increases, and finger sensitivity decreases. As the blood vessels are damaged, blood flow slows and the skin temperature decreases. In the pronounced stages, fingers become white and the hands feel cold and moist. At this point, the condition is irreversible. Current research suggests that this disease appears to be related to vibrational energy in the 40-125 Hertz (cycles per second) range, and cold temperatures play a co-antagonistic role. Employees who routinely work in cold environments should limit the duration that they use rotating or vibrating tools.

8.0 FIRST AID

All cold related injuries require immediate removal from the cold environment and proper medical treatment. The supportive first aid measures included here are to be used only until proper medical treatment by a qualified physician can begin.

8.1 Hypothermia

Hypothermia is a life-threatening condition that requires immediate response. Remove the victim to a warm area out of any wind. All cold wet clothing should be removed, and the victim should be wrapped in warm blankets. Immediate medical attention should be summoned. The victim may be disoriented and

unable to talk clearly or understand simple questions. If conscious and able to converse, they may be given hot (non-caffeinated, non-alcoholic) liquids to drink, and sweetened foods high in carbohydrates. Keep victim awake until medical assistance arrives.

8.2 Trench Foot, Frostnip and Frostbite

The affected area should be gradually warmed (immediate or sudden heating of affected areas must be avoided, to minimize further tissue damage). Superficially frostbitten areas (characterized by a sudden blanching or whitening of the skin, firm to the touch, resilient tissue beneath) are best warmed by placing them next to warm skin. A good guideline when rewarming frostbitten areas is to not raise the temperature much above that of the body. The abdomen and the armpit are body areas that can be used to rewarm frostbitten areas. Deep frostbitten tissue is characterized by cold, pale or darkened tissue that is solid to the touch. Do not rub the frostbitten part, and do not break any blisters. Wrap the affected part lightly, and protect from further injury. Provide warm drinks (not caffeinated or alcoholic), and do not let the victim smoke. Remember that the tissue will be very painful as it thaws. The victim should not use the affected limb or area until cleared by a physician.

9.0 COLD MONITORING

OSHA currently does not have a promulgated health standard on cold stress. As in heat stress, OSHA enforces cold exposures by relying on the ACGIH TLV for cold stress, and would issue citations through the use of the general duty clause. The TLV objective is to prevent the deep body temperature from falling below 96.8° F (36° C), and simultaneous prevention of cold injury to body extremities.

Unlike heat stress, however, there is no currently available instrumentation that can effectively sample the Wind Chill, and warn of “overexposure.” Therefore, HDR will prevent cold-related disorders through compliance with the guidelines presented below.

10.0 PREVENTION OF COLD DISORDERS

10.1 Physiological Limits and Medical Considerations

1. Maximum **severe shivering** develops when the deep core body temperature falls to 95° F (35° C). Medical experience indicates that, beginning at this level of decreased core temperature, mental functioning becomes impaired. Therefore, exposure to cold should be immediately terminated for any HDR employee when observable shivering occurs.

The employee should warm up, and don additional clothing, before returning to the cold area. Unless there are unusual or extenuating circumstances, cold injury to the non-extremity portions of the body is unlikely without the development of the initial signs of hypothermia (severe shivering).

2. **Pain in the extremities** is commonly the first early warning sign of the onset of cold stress. While frostbite will occur only at absolute temperatures below freezing, 32° F (0° C), regardless of wind speed, unpleasant cold sensations in extremities may be felt at higher temperatures, and heat loss in extremities can assist in the onset of hypothermia. Don additional warm, dry clothing, especially on the affected body part (hands, feet, head).

3. Wear adequate insulating dry clothing if work is to be performed in air temperatures below 40° F (4° C). Below 40° F, use the wind chill values in Table 1 as guidelines for the relative danger posed by the ambient conditions, and add additional insulating layers of clothing as necessary.

4. Workers who are **suffering from diseases or taking medication that interferes with normal body temperature regulation**, or which reduces tolerance to cold environments, should be excluded from prolonged work in cold below 30° F (–1° C).

5. For **exposed** skin, continuous exposure should not be permitted when the wind chill reaches -25° F (–32° C). If outside work must be conducted in the extreme cold, cover all exposed skin with clothing, layering as necessary. Take frequent breaks in a warm shelter, loosening clothing to allow sweat to evaporate.

6. At air temperatures of 35.6°F (2°C) or less, it is imperative that **workers who become immersed in water or whose clothing becomes wet** (from external sources, not incidental sweat) be immediately provided a change of clothing and observed for symptoms of hypothermia.

7. Cold temperatures increase the susceptibility to **vibration-induced injury**. When working in cold environments, limit exposure time to vibrating tools and mechanical processes.

8. **Dehydration** occurs insidiously in cold environments, and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to replenish caloric intake and fluid volume. The intake of coffee, however, should be limited because of the diuretic and

circulatory effects. The same applies to alcohol consumption, which increases blood circulation to the skin, and interferes with mental acuity, which can lead to risk taking.

9. These recommendations apply to healthy employees in fair to good physical condition. Older employees, or those with circulatory problems may need to avoid extremely cold environments, or wear extra clothing; if in doubt, the employee should consult a physician familiar with cold stress factors and their medical condition.

10.2 Personal Protective Clothing Considerations

1. **Eye protection** for workers employed out-of-doors in a snow and/or ice covered terrain should be supplied. Safety glasses/goggles possessing ultraviolet/glare protection should be worn when there is an expanse of snow coverage causing a potential eye hazard from blowing ice crystals or reflective radiation.

2. In general, **gloves or mittens** should be worn whenever the air temperatures fall below 40° F. If the task precludes the wearing of gloves, then special provisions should be established to allow the workers to frequently warm their hands. Some possible methods include battery-operated hand warmers, contact warm plates or radiant heaters.

3. If the work involved presents the possibility of becoming wet through splashing, an **outer layer of clothing impermeable to water** should be worn.

4. If the ambient temperature is not excessively cold, but a low wind chill is present due to high winds, a **light windbreak jacket** will significantly reduce the potential for cold stress, without trapping excess perspiration.

5. Use of **steel-toed safety shoes** may become uncomfortable, as low ground temperatures are transmitted to the user's feet. It may become necessary to substitute alternative protective footwear, such as high impact plastic/rubber-composition footwear, during cold periods.

6. The insulation value of any clothing is determined by the quantity of still air that it can trap between the skin and the outside environment. **Many layers of light clothing are better than one or two heavy layers**. This is due to the many layers of trapped insulating air between each garment. Also, workers can shed layers as necessary, to maintain the optimum body temperature condition. The outer layer should be wind-resistant, and the layers should be capable of being vented at the wrist,

neck and waist to reduce wetting by perspiration (If worn during project activities on a hazardous waste site, however, this obviously may not be possible). Water and moisture (sweat) both reduces the insulating quality of clothing, and removes heat from the skin surface through evaporation.

Avoidance of extremely cold, windy environments is obviously the preferred method of avoiding hypothermia or frostbite. Try to preplan outside duties so that work is performed during the middle, warmest periods of the day. Dress appropriately - wear several layers of loose-fitting, lightweight, warm clothing. Trapped air between the layers is the best insulation, and layers can be removed to avoid sweating and subsequent chill. Outer garments should be tightly woven, wind resistant and water repellent, and hooded. Wear a hat because up to half of lost body heat escapes from the head. Protect the lungs from the entry of extremely cold air by wearing a covering (scarf, etc.). Mittens, snug at the wrist, are better than gloves. Above all, try to stay dry and out of the wind.

10.3 Work Procedures

1. To prevent contact frostbite, **bare skin to metal contact should be avoided** at absolute temperatures below freezing, 32° F (0° C). Metal tool handles should be covered by insulation. Or alternately, where fine manual dexterity is not required, insulating gloves may be worn.

2. Employees should take extra care when handling evaporative liquids (gasoline, alcohol, cleaning fluids, etc.) at air temperatures below 39.2° F (4° C). If these liquids are soaked into clothing or gloves, the subsequent rapid evaporative cooling can result in frostbite.

3. If work is performed continuously at or below a wind chill of 19° F (–7° C), a **heated shelter** (car, rest room, tent, office, etc.) nearby is required. Employees should be instructed to monitor and be aware of the onset of hypothermia and/or frostbite ⇐ *severe shivering, pain in extremities, excessive fatigue, or drowsiness* require an immediate return to the shelter. When entering the shelter, the outer layer of clothing should be removed, and the remainder loosened, to permit the evaporation of sweat. A change of dry clothing should be provided as necessary.

4. For work in environments below 10° F (–12° C) wind chill the following guidelines should apply:

   a. The buddy system should be implemented;

b. All site workers should be provided training on the information contained in the Procedure, with special emphasis on:

- Proper clothing practices
- Proper eating and drinking habits
- Recognition of impending frostbite and signs/symptoms of hypothermia
- Cold injury avoidance work practices

APPENDIX

COLD STRESS
H&S PROCEDURE #29

Wind Chill Chart

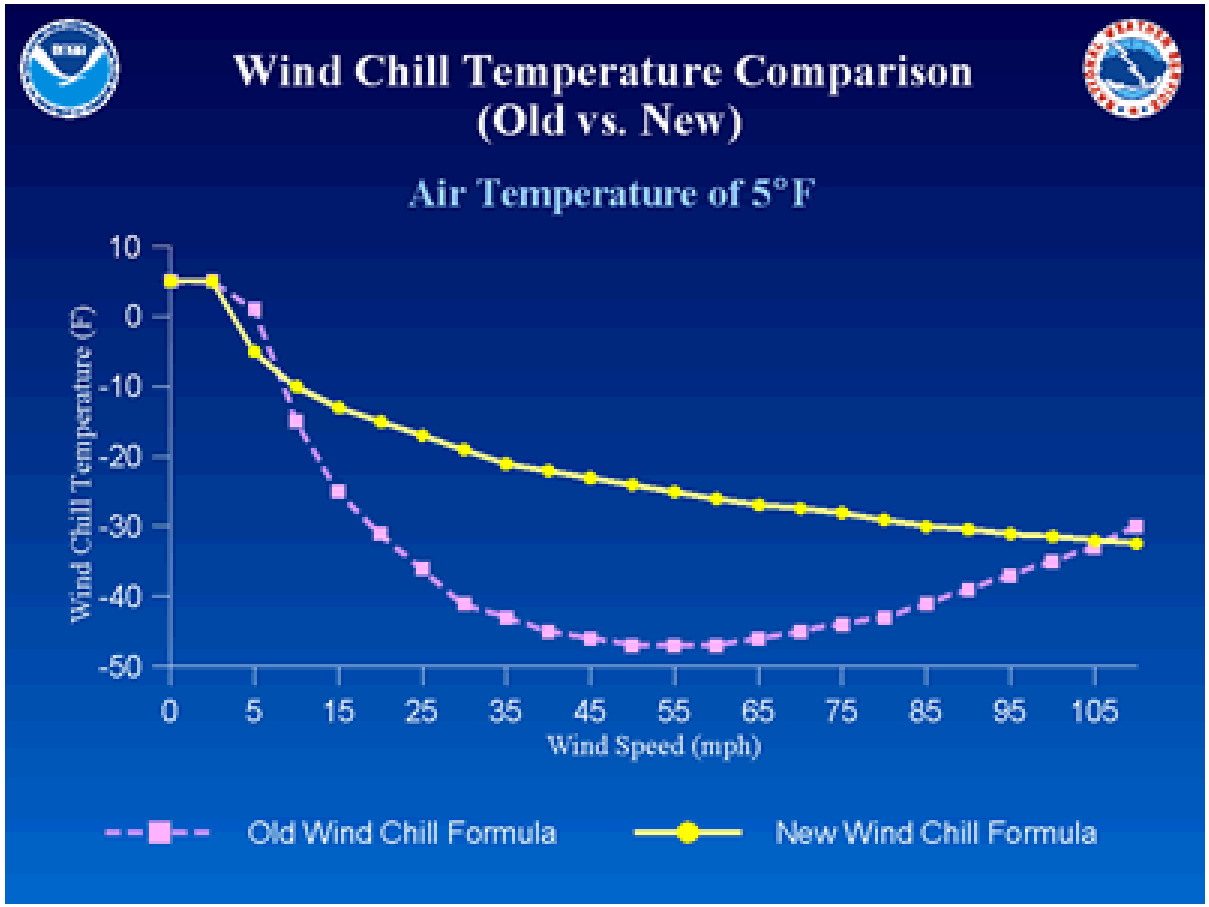
Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times — 30 minutes — 10 minutes — 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01


Wind Chill Temperature Comparison
(Old vs. New)
Air Temperature of 5°F
Wind Chill Temperature (F)
10
0
-10
-20
-30
-40
-50
0
5
15
25
35
45
55
65
75
85
95
105
Wind Speed (mph)
Old Wind Chill Formula
New Wind Chill Formula

1.0 OBJECTIVE

Biological hazards include snakes, spiders, mites, insects, noxious plants, bacteria, viruses, fungi, and any other living organism that can cause injury or illness. It is the objective of HDR to provide proper training and equipment to workers who may be exposed to biological hazards when conducting project-related field activities.

2.0 PURPOSE

The purpose of this procedure is to provide information to HDR employees to assist them in recognizing and avoiding biological hazards encountered at project work sites.

3.0 APPLICABILITY

This Procedure covers occupational exposure to biological hazards and applies to all HDR personnel. NOTE: Biological hazards associated with human body fluid contact are addressed in H&S Procedure # 8 - *Bloodborne Pathogens*. All employees, regardless of HDR Department, may be impacted by this program.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC) and project-specific Site Health and Safety Officer.

National Director of Safety. The Director of Safety shall:

- Periodically review the effectiveness of this program, identify any deficiencies, ensure that they are corrected, and
- Assist OSCs and project professionals, as requested, in the implementation of this Program.

Office Safety Coordinators. The OSCs will:

- Provide initial training on this Procedure to any impacted office staff, make sure that this Procedure is readily available in each office, and
- Interface with the Director of Safety regarding any biological hazards that have been discovered and need addressing.

Site Health and Safety Officers. The Site Health and Safety Officers will:

- Provide initial training on this Procedure to their impacted project staff, make sure that this Procedure is readily available, and
- Interface with the Director of Safety regarding any unsafe biological site conditions that have been discovered as necessary.

5.0 SOURCES OF BIOLOGICAL HAZARDS

Sources of biological hazards include insects, mites, arachnids, animals, plants, and microbial agents present in the air, water and soil. These hazards can cause a variety of health effects, including skin irritation, allergies, infections or illness. Due to the nature and location of many HDR project assignments, exposure to biological hazards is unavoidable.

This procedure provides information on the types of hazards that employees may reasonably be expected to encounter, the potential health effects associated with exposure, protective measures that should be taken to reduce risks, and actions to be taken by employees if an exposure or suspected exposure occurs.

6.0 DEFINITIONS

Feral – Refers to any formerly domesticated animal that is now living as a wild animal. They are particularly dangerous because (1) their appearance as a familiar pet causes people to assume they will act like one, and (2) former association with people often causes feral animals to act without fear of humans. Term most frequently applied to dogs and cats.

Necrosis – Pathological death of a living plant or animal tissue.

Pathogen – A microbial agent capable of causing disease in humans.

Vector – Carrier or transmitter of a pathogen.

7.0 INSECT BITES & STINGS

Noxious insects are ubiquitous, and will be encountered in a variety of outdoor project settings. Their presence in the field is temperature dependent – they are not present in the cold seasons. Table 1 presents descriptions and habitat information for various types of stinging or biting insects, as well as protective measures that can be taken to avoid injury. In addition to the information presented in Table 1, the following preventative measures should always taken to minimize the chances of experiencing an insect bite or sting:

- Do not wear perfumes or colognes when performing field activities as they often attract stinging insects.
- Use an insect repellent with N,N-diethyltoluamide (DEET) (unless prevented by medical sensitivity).
- Wear protective clothing (long sleeves, long pants, and gloves).

The two greatest risks from most insect stings are allergic reaction (which can be fatal) and infection. General guidelines to follow if you experience an insect sting are as follows:

- For bee stings, remove the stinger by gently scraping it out with a blunt-edged object, such as a credit card or dull knife. Don't try to pull it out; this may release more venom.
- For all types of stings, wash the area carefully with soap and water. Do this two to three times a day until skin is healed.
- Apply a cold pack, an ice pack wrapped in a cloth.
- Apply a paste of baking soda and water for 15 to 20 minutes.
- Over-the-counter acetaminophen products may reduce pain.
- Another remedies for pain and itching is to applying a small amount of household ammonia to the bite area. There are also over-the-counter products for insect stings that contain ammonia.
- Some over-the-counter antihistamines advertise that they alleviate pain/swelling.
- Any employee who receives multiple stings should seek immediate medical attention.
- **Any employee who knows that they are allergic to insect stings/bites should consult their own physician concerning the prudence of carrying self-administered anti-toxin injectable medicine.**
- A sting in the mouth or nose warrants immediate medical attention, because swelling may block airways. You should also seek emergency care if you see any of the following symptoms, which may indicate an allergic reaction:
  - large area of swelling
  - abnormal breathing

- tightness in throat or chest
- dizziness
- hives
- fainting
- nausea or vomiting
- persistent pain or swelling (over 72 hours)

8.0 Mite Infestations – Chiggers (aka "Red Bug")



The only mite that causes a real problem to field staff is the parasitic larvae stage of the harvest mite, *Trombicula alfreddugesi*, commonly referred to as a "chigger". These arachnids, related to spiders, ticks and scorpions, are virtually invisible to the naked eye, measuring only 1/16 of an inch in length. Chiggers feed on low vegetation, but need vertebrate (including humans!) tissue as a source of protein. Chiggers are very mobile, moving quickly onto passersby's feet. Once on a person's skin, chiggers will move to confined areas where the skin is thin and moist – ankles, wrist, behind the knee, thighs, groin, armpit or waistline. Sitting on mite-infested ground will frequently result in severe chigger attacks around the crotch and under the beltline. Contrary to popular opinion, chiggers do not burrow into the skin, but rather attach themselves to the opening of a hair shaft and inject saliva into the skin, which prevents blood clotting and liquefies tissue, on which the chigger feeds. The immediate skin area around the bite becomes inflamed (an allergenic reaction to the chigger saliva), with a hard white center. The inflamed tissue camouflages the tiny red chigger. The mite will remain in this area, feeding, from one-to four days, or until physically removed by washing. The bite area will redden (mild inflammation) and begin to itch (reaction to injected fluids) a short time following the initial bite. Sweat and heat increase the itching sensation. Symptoms are transitory, generally abating without treatment in about one week, with no long-term complications unless physical scratching of the inflamed area results in infection. In rare individuals, a high density of chigger bites combined with a hyper-allergenic response could require medical attention.

Chiggers are a real menace to HDR staff in the southern sections of the country, becoming active in the late spring, with chigger "bites" beginning in early June and reaching the most severe frequency around the 4th of July. Chigger populations are especially dense in old-field sucessional areas with high moisture and shade, where high (2-3 ft) annuals such as Queen Anne's Lace grow.

Another favorite plant species harboring chiggers is Sericia Lespedeza, grown to improve game bird habitat. They are sparsely present in forested areas. Most people report chigger bites to be the most irritating and long-lasting bites made by all the summer arthropod pests!

Removing clothes and washing immediately after field work will reduce the probability of chigger bites, as chiggers generally move about the body for some time before settling down to feed. A DEET-containing repellent sprayed around the ankles and waist will deter chiggers for a limited time. One folk remedy that alleviates the itching of chigger bites is applying fingernail polish over the red inflamed area. Clear top-coat polish is best; otherwise, you may appear to co-workers to be covered in measles!

Table 1

Stinging & Biting Insects & Mites

Organism	Description	Habitat	Problem	Severity	Protection
Hornet	One inch long with some body hair. Abdomen is mostly black. Many species.	Round, paper like nest hanging from trees, shrubs, or under eaves of buildings.	**Sting**. One nest may contain up to 100,000 hornets, which may attack in force at the slightest provocation.	Severe pain, allergic reactions similar to bees. Can be fatal.	Do not come near or disturb nest. If a hornet investigates you, do not move.
Mosquito	Small, dark, fragile body with transparent wings. From 1/8 to ¼ inch long. Actually a species of fly.	Wherever water is available for breeding. Common throughout arable U.S., very bad in North Central US, Canada and Alaska.	**Bites** and sucks blood. Itching and swelling result. Disease vector.	Can transmit encephalitis, malaria and other diseases. Scratching causes secondary infections.	Use plenty of insect repellant and wear gloves. Stay in windy areas. Topical application of toothpaste may relieve itching. Ultrasound devices or Vitamin B do not prevent mosquito bites.
Wasp	Very thin waist. Many species. Color can be black, yellow or orange with stripes.	Underground nest; also paper-like honeycomb nest in abandoned buildings, hollow trees, etc.	**Stings**. Some species will attack en masse if you disturb or even closely approach the nest.	Severe pain, allergic reactions similar to bees. Can be fatal.	Avoid Nest. Do not swat at them.
Bee	Variable in size and color, many species ranging in size from microscopic to Bumblebee. European Honey Bee most familiar. Has two pair of wings.	Hollow logs, underground nest, and old buildings.	**Stings** when annoyed. Honey Bee leaves venom sac in victim. The ripping away of the venom sac kills the individual bee.	If person is allergic, nausea, shock, and constriction of the airway can result. Death may result.	Be careful and watch where you walk. Cover exposed skin. Avoid areas where bees are swarming. Avoid wearing sweet fragrances and bright clothing. Move slowly or stand still when bees are swarming about you.

Organism	Description	Habitat	Problem	Severity	Protection
Flies	One pair of wings; Variable in size and color; some species microscopic (biting Midges), others (Horse flies) bumblebee size.	Variable, may range far from wetland breeding areas. Common around rural farmlands, swamps, very bad in northern latitudes (e.g., Alaska).	**Bites. Bloodsucking.** Black Flies, Horse flies and Yellow Flies, in particular, can be vicious biters.	Very painful bites. Often more inhibiting during daytime lowland work than mosquitoes.	Wear thick protective clothing. Use plenty of insect repellant.
Fire Ant	Small reddish to brown ant. Imported from South America. Identify by presence of large visible colony mounds. Mounds appear after heavy rains overnight in areas where presence was not suspected.	Rural or residential, prefers sandy soils, limited to southern US (VA, TN southward). Cold weather intolerant.	**Sting.** Highly aggressive, attacks en masse. Multiple stings almost always occur.	Severe pain, allergic reactions possible similar to bees. Can be fatal.	Avoid disturbing mounds; wear boots when in sandy, coastal plain habitats. Individual colonies can be eliminated (temporarily) with pesticide application.
Chigger	Microscopic parasitic mite larvae (not an insect)	Old fields with high weeds, especially abundant in stands of Sericea Lespedeza and Queen Anne's Lace. Common throughout, very common in SE.	Injects anti-clot fluid into tissue and feeds, causing redness, swelling and intense itching. Locates around top of ankles, waistline, under arms.	Not serious or fatal, but temporarily irritating, due to itching sensation. Allergenic response to injected saliva causes itch.	Avoid walking in high weed fields, cover exposed skin. Apply DEET. Tuck pants inside socks. Shower promptly. Application of clear fingernail polish over welt will decrease itching.

8.1 Diseases Transmitted By Mosquitoes.

8.1.1 West Nile Virus

West Nile Virus is a mosquito transmitted viral disease that causes a serious, potentially life-threatening inflammation of the brain in people, horses, many species of birds, and possible other animals. It spreads through the bite of a mosquito carrier, but there is no evidence that it can be spread from person to person or animal to person. Originally an African disease, it has recently spread to the United States and Europe, with the first U.S. case reported in 1999.

At this time, human infection is rare, and the most impacted animals have been birds and horses. However, by the end of 2002, human cases have been reported from all U.S. states east of the Rocky Mountains, plus California.

Most people who become infected with West Nile virus will either have no symptoms, or very mild ones. Symptoms appear 3 to 14 days following infection. The CDC estimates that 20% of those infected develop clinical symptoms. Symptoms include fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands.

Rarely, however, the infection can result in severe and fatal illnesses. Symptoms of severe infection (West Nile encephalitis or meningitis) include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. It is estimated that 1 in 150 persons infected with the West Nile virus will develop a more severe form of disease.

Prevention

- Be on the lookout for dead birds, as a biological indicator of the area presence of West Nile. While over 110 species of birds may contract the disease, Jays and Crows are particularly susceptible and may die in large numbers in an infected area. Report the observation of multiple dead birds in an area to your local health department, unless instructed not to do so.

- Avoid outside activity in these areas at dawn and dusk, the periods when mosquitoes are most active.

- Wear a DEET-containing repellent to minimize the possibility of a mosquito bite.
- Wear maximum protective clothing – long pants and sleeves, hat, etc. to reduce the available mosquito target areas on the body.

8.1.2 Encephalitis (General)

Encephalitis is a serious but very rare viral illness transmitted by a species of swamp breeding mosquito, which acquires the virus by feeding on the blood of infected wild birds. In most years, the virus is limited to these birds and bird-biting mosquitoes, but occasionally the virus is transmitted to other mosquito species known to bite humans and horses. The virus transmission by mosquitoes ends with the first heavy frost.

Encephalitis can affect the brain. The symptoms, which appear 5 to 15 days after being bitten, include high fever, headache, stiff neck and decreased consciousness. One in three infected individuals will come down with the serious disease, while in two-thirds the effects disappear and the victim recovers. Where serious symptoms appear, however, encephalitis is fatal in 30-50% of cases. Individuals with symptoms suggestive of encephalitis should contact a physician immediately.

8.1.3 Malaria

Malaria is caused by a protozoan parasite (*Plasmodium sp*.) that is transmitted from person to person by the bite of an infected female *Anopheles sp.* mosquito. These mosquitoes are present in almost all countries in the tropics and subtropics, and all 48 continental states in the U.S. Although thought to have been eradicated by the mid-1950s, recently several cases have occurred. The threat is most probable during **hot** summers.

While there is no vaccine, malaria can often be prevented by the use of anti-malarial drugs prior to, during, and after, traveling into malarial areas, and the use of personal protection measures against mosquito bites (e.g., use of mosquito netting over sleeping areas, application of insect repellent to exposed skin and to thin clothing). *Anopheles* mosquitoes bite during nighttime hours, from dusk to dawn. Therefore, anti-malarial drugs are only recommended for employees who will have exposure during evening and nighttime hours in malaria endemic areas. At risk HDR employees will be those traveling or working in tropical & sub-tropical foreign countries. Employees at risk should contact their

private physician about the need to begin an anti-malarial medical program.

Symptoms of malaria include fever, chills, headache, muscle ache, and malaise. Early stages of malaria may resemble the onset of the flu. Individuals who become ill with a fever during or after work in a malaria risk area should seek prompt medical attention and inform the physician of their recent travel history. Malaria symptoms can develop as early as 6-8 days after being bitten by an infected mosquito or as late as several months or years (dormancy) after departure from a malarious area, after anti-malarial drugs are discontinued. Malaria can be treated effectively in its early stages, but delaying treatment can have serious consequences.

9.0 SPIDER BITES

While all spiders are venomous, only the few listed here are capable of biting humans and pose a risk to field personnel.

9.1 Black Widow.

The black widow is a moderately large, glossy black spider with very fine hairs over its body that gives it a silky appearance. On the abdomen is a characteristic red, crimson or yellow marking in the form of an hourglass. Only the female is poisonous; the male, which is smaller, is harmless.

Black widow spiders can be found almost anywhere in the Western Hemisphere in damp and dark places. Favored haunts are woodpiles, tree stumps, trash piles, storage sheds, bathhouses, fruit and vegetable gardens, stone walls, and under rocks. When in structures, they will go to dark places like closets or garages. They are non-aggressive and bite only when roughly handled or sat on. A person bitten by a black widow spider may be unaware, since the bite may feel like a pinprick and go unnoticed. In about 30 to 40 minutes, the area of the bite will swell and pain appears.

If you have any reason to suspect you have been bitten by a black widow spider, go to the hospital emergency room. Symptoms include:

- a deep blue or purple area around the bite, surrounded by a whitish ring and a large outer red ring
- body rash
- muscle spasms, tightness, and stiffness
- abdominal pain

- headache or fever
- general "sick" feeling
- lack of appetite
- joint pain
- signs of infection around the bite (swelling and redness)
- pink or red urine

Black widow spider bites rarely result in death, but it's important to get medical attention as soon as possible. Wash the bite well with soap and water. If being transported, the victim should apply an ice pack to the bite to slow down the spread of the spider's venom. Try to elevate the area and keep still to retard the spread of venom.

If it's safe to do so, catch and bring the spider to the medical facility with you - this is important because it is sometimes hard to diagnose a spider bite correctly. The spider can be killed first; just be sure not to disfigure it so much that species identification is impossible.

9.2 Brown Recluse.

The brown recluse spider has long, skinny legs and is about one-half inch in length. Its entire body is brown, except for a dark mark in the shape of a violin on its head. Its poisonous relatives may be gray, orange, reddish-brown, or pale brown.

Brown recluse spiders are most commonly found in the Midwestern and Southern states, and they are usually found in dark places. In the outdoors, they inhabit piles of rocks, wood, or leaves. If they come inside, they will go to dark closets, attics, or basements. Brown recluse spiders are non-aggressive and bite only when disturbed.

The venom of the brown recluse causes a limited destruction of red blood cells, tissue necrosis and may cause other blood changes. The victim may develop chills, fever, joint pains, nausea, or vomiting. A person who gets bitten by a brown recluse spider may not notice it or may only feel a little prick. After about four to eight hours, the bite will start to hurt a little more. It might look like a bruise or might form a blister surrounded by a bluish-purple area. Without treatment, the local tissue will continue to die, and the discolored area will enlarge. Brown recluse spider bites rarely kill people, but the tissue necrosis can be disfiguring and lead to serious medical consequences.

If you have any reason to suspect you have been bitten by a brown recluse spider, seek immediate medical treatment. As with Black Widow bites, wash the bite well with soap and water, and apply ice to the area, elevate it, and keep it still. If safe to do so, bring the spider to the medical facility with you.

9.3 Tarantulas

A tarantula is a black, hairy spider about two to three inches long. They live in nests in the ground and are timid, avoiding contact with humans. Those found in the southwestern United States are not highly poisonous, but occasionally a victim will have an allergic reaction to the injected venom. Other tarantula species brought into the country in imported fruit shipments may have more toxic venom. Their bites may cause marked pain and local redness with swelling. Death from a tarantula bite is extremely rare.

If a person gets bitten by a tarantula, the bite will probably feel and looks like a bee sting, with pain, redness and swelling in the area of the bite. Because of the tarantula's weak venom, it's unusual to have severe reactions involving other parts of the body.

If you think you've been bitten by a tarantula, wash the bite with soap and water. Mix up some meat tenderizer and water, and rub the bite with a cotton ball that's been soaked in the solution. If you have no meat tenderizer, hold an ice cube against the bite.

10.0 SCORPIONS

Scorpions are brown arachnids, ranging in size from 1 to 8 inches long, with eight legs and a front pair of prominent lobster-like claws. U.S. species are less than three inches long. A scorpion's stinger, supplied by a pair of poison glands, is at the end of its long tail, which is curved upward and forward over the back. Scorpions prefer shaded dry places, and HDR field personnel may encounter them under fallen wood, rocks and junk piles. They are primarily nocturnal and are more active when it rains.

There are 1400 species of scorpions worldwide, and about 40 species are found in the Southern and Southwestern United States. Scorpions inject a neurotoxin, which attacks the nervous system. Most species of scorpions in this country inject a toxin that, while painful, is not especially dangerous to humans (although stings of the U.S. species *Centrureides sculpturatus* has proved fatal to young children, and is potentially fatal to adults). The sting results in localized swelling and discoloration, similar to a wasp sting, and, like other stinging animals, may sometimes cause serious allergic reactions. More severe reactions from the venom involving other parts of the body can also occur.

If you think you've been stung by a scorpion, seek immediate medical treatment. Because of the possibility of allergenic reaction, and the possibility that the sting was that of *Centrureides sculpturatus*, all scorpion stings should be treated by a doctor. Put an ice pack on the sting immediately to help retard the spread of venom.

11.0 TICKS

A tick is a tiny brown mite that attaches itself to the skin of a mammal, bird or reptile and sucks blood. Ticks range in size from 1 to 4 millimeters, but may greatly enlarge as they consume blood. There are hundreds of species of ticks, and they can be found almost everywhere.

Ticks inhabit woods or grasslands in various regions of the U.S. Lacking wings, ticks climb onto small bushes or tall grass usually close to the ground, and wait for an animal or person to pass near them. They are attracted by carbon dioxide, which is generated during respiratory exhalation. As a host animal or human passes by, they latch on to the skin with their legs, use their “nose” to secure themselves, and cut a hole into the skin by means of a pair of sharp mandibles that saw back and forth. Blood is then sucked into their abdomen until fully engorged, at which time they drop off. During the ingestion of blood, ticks may transmit any disease agent present in their system, causing the host animal, if susceptible, to contract the disease. Various species of U.S. ticks are vectors for serious human diseases (See Section 11.2). A person who gets bitten by a tick usually won't feel it; there may be some redness around the area of the bite, but no pain. Medical attention is generally not required.

11.1 Tick Avoidance and Treatment.

In areas where ticks are found, outdoor workers should take the following precautions to protect themselves:

- Wear protective light-colored clothing to prevent ticks from getting access to your skin. This includes long sleeve shirts that fit tightly around the wrist, and long-legged pants tucked into stockings or boots. The light color assists in seeing small ticks on your clothing.
- Use insect repellants that effectively repel ticks (such as those containing DEET), unless prevented due to sensitivity. Apply the repellent to pant legs, socks, shoes, and the skin.
- Always check for ticks on and under clothing after working in tick-infested areas. A daily total-body skin inspection greatly reduces the risk of infection

since ticks may take several hours to two days to attach to the skin and feed. Pay special attention to your head, back, neck, armpits, and groin area.

If ticks are found on your body, take the following actions:

- Carefully remove ticks found attached to the skin. Gently use tweezers to grasp head and mouth parts of the tick close to the skin as possible. Pull slowly to remove the whole tick. Try not to squash or crush them since this can squeeze ingested blood, contaminated with disease agents, back into your body.
- Wash affected area with soap and water or disinfect after removing ticks. This minimizes the possibility of having the puncture infected from tick excrement, which is known to harbor disease agents.
- Contact a doctor immediately if you have an illness that resembles Lyme disease or Rocky Mountain Spotted Fever (see Section 11.2), especially when you have been in areas supporting high tick populations.

11.2 Tick Transmitted Diseases

11.2.1 Lyme Disease

Lyme disease was first recognized in North America in 1975 when doctors discovered an unusual number of people with arthritis in the town of Lyme, Connecticut. The disease is caused by a bacterium, *Borrelia burgdorferi*, which resides in some ticks. In about 75 percent of reported cases of Lyme disease, the victims develop a rash around or near the tick bite usually within one week. In many cases, a peculiar, bright red, circular rash develops. It soon expands to form a ring-shaped "bull's-eye" that can grow to the size of a dinner plate. Often, however, a more mild, general rash appears anywhere on the body. The rashes fade after several weeks. Some victims, however, never develop a rash, yet experience more advanced symptoms of the disease.

Lyme disease is an occupational concern for HDR personnel who work outdoors in certain geographical regionssupporting dense populations of ticks. It affects people differently, often going unnoticed but may cause serious health problems in others. If this disease is treated at its onset, it's rare for there to be any permanent effects to a person's health. If left untreated, it can cause disability.

11.2.2 Rocky Mountain Spotted Fever

Rocky Mountain Spotted Fever affects about 800 people in the U.S. each year. The disease usually occurs in the eastern U.S. from New York to Florida, and from Alabama to Texas.

Disease symptomology typically appears 3 to 12 days following a tick bite. During the bite, a rickettsiae parasite is transmitted to the human victim, which causes the fever. The most common symptoms are fever, headache, rash, nausea and vomiting. If untreated, death, while rare, is possible.

There is no current vaccine for Rocky Mountain Spotted Fever. If you get a high fever, rash or nausea within two weeks of a tick bite, get immediate medical care.

12.0 SNAKES

Every state but Maine, Alaska and Hawaii is home to at least one of 20 poisonous snake species. A bite from one of these, in which the snake may inject varying degrees of toxic venom, should always be considered a medical emergency. Because victims can't always positively identify a snake, they should seek prompt care for any bite, though they may think the snake is nonpoisonous. Even a bite from a so-called "harmless" snake can cause an infection or allergic reaction in some people. Two groups of venomous snakes are native to the United States: pit vipers and coral snakes.

12.1 Pit Vipers

The pit vipers, belonging to the family Crotalidae, include rattlesnakes, copperheads and cottonmouths (a.k.a. “water moccasins”). While copperheads and rattlesnakes are fairly distinctive, the many species of harmless watersnakes are often mistaken for cottonmouths. Pit vipers all have a small "pit" between the eye and nostril that allows the snake to sense prey at night. Most are thick, heavy-bodied snakes, and have vertical pupils (like a cat’s) that are easily seen from a safe distance. They deliver venom through two long retractable fangs that swing outward when the mouth is opened. About 99 percent of all venomous snakebites in the U.S. are from pit vipers. Individual pit viper species vary in the toxicity of their venom. All inject a venom that is principally haemotoxic in nature – it destroys red blood cells and tissue. Some species -- Mojave rattlesnakes or canebrake rattlesnakes, for example—deliver a highly toxic venom dose. Copperheads, on the other hand, deliver weaker, less dangerous venom that sometimes may not require antivenin treatment. Refer to Appendix A for range maps of common pit vipers.

12.2 Coral Snakes

The other U.S. family of poisonous snakes is Elapidae, which includes two species of coral snakes, *Micrurus fulvius spp*. Coral snakes have a thin form and have small mouths with short fixed fangs, which give them a less efficient venom delivery than pit vipers. Because of their small mouths, fingers and toes are most frequently bitten and the bite is often difficult to detect.

Because of the coral snake's reclusive nature and docile temperament, coral snakebites are rare in the United States--only about 25 a year by some estimates—but if bitten, the snake's neurotoxin venom (affects the nervous system) is very dangerous. Several victims have experienced respiratory paralysis, one of the hazards of neurotoxin venom. Coral snakes inhabit the coastal plain regions of the southern U.S., from North Carolina through central Texas. The U.S. range of coral snakes is presented in Appendix A.

12.3 Non-poisonous "Mimics"

Some nonpoisonous snakes, such as the scarlet king snake *Lampropeltis triangulum elapsoides* and the scarlet snake *Cemophora coccinea*, mimic the bright red, yellow and black coloration of the coral snake and inhabit the same general range. This potential for confusion underscores the importance of seeking care for any snakebite (unless positive identification of a nonpoisonous snake can be made). Table 2 presents the field identifying characteristics of the coral snake and its mimics.

Table 2 – Identification of Coral Snake and "Mimics"

SPECIES	COLOR OF SNOUT	BODY PATTERN
Coral Snake	Black Snout	Red & Yellow body rings touch
Scarlet Snake	Red Snout	Red rings touch black rings
Scarlet King Snake	Red Snout	Red rings touch black rings

12.4 Snakebite First Aid

The bites of both pit vipers and coral snakes can be effectively treated with antivenin. But other factors, such as part of body bitten, time elapsed prior to treatment and care taken before arriving at the hospital, also are critical. The American Red Cross recommends the following first aid measures:

- Wash the bite with soap and water.

- Immobilize the bitten area and keep it lower than the heart.
- Get medical help.
- If a victim is unable to reach medical care within 30 minutes, a bandage, wrapped two to four inches above the bite, may help slow venom. The bandage should not cut off blood flow from a vein or artery. A good rule of thumb is to make the band loose enough that a finger can slip under it.
- A suction device may be placed over the bite to help draw venom out of the wound without making cuts. Suction instruments often are included in commercial snakebite kits.

Recommendations of **what not to do** if bitten by a snake include the following:

- **No ice** or any other type of cooling on the bite. Research has shown this to be potentially harmful.
- **No tourniquets**. This cuts blood flow completely and may result in loss of the affected limb.
- **No electric shock**. This method is under study and has yet to be proven effective. It could harm the victim.
- **No incisions in the wound**. Such measures have not been proven useful and may cause further injury.

Some bites, such as those inflicted when snakes are accidentally stepped on or encountered in wilderness settings, are nearly impossible to prevent. But the following precautions can lower the risk of being bitten:

- **Leave snakes alone**. Many people are bitten because they try to kill a snake or get a closer look at it.
- **Stay out of tall grass** unless you wear thick leather boots, and remain on hiking paths as much as possible.
- **Keep hands and feet out of areas you can't see**. Don't pick up rocks or firewood unless you are out of a snake's striking distance. (A snake can strike half its length.)
- **When turning over rocks or logs, always lift them towards your body**, thus shielding yourself from any snake hiding beneath.

- **Be cautious and alert when climbing rocks**, especially during early spring and fall, as venomous snakes will be moving to or from communal denning sites, and their local densities around these favored areas may be quite high.

If you encounter a snake when working, just walk around the snake. Give it a little berth, six feet is plenty, leave it alone and don't try to catch it.

13.0 ALLIGATORS (Information also generally applies to American Crocodile)

The American Alligator, *Alligator mississippiensis*, is a very common large reptile across the southeast U.S., ranging from Georgia to Texas, and especially Florida. It inhabits fresh water of any size and kind, from ditches and ponds to sloughs, marshes, rivers and reservoirs. In suburban areas they wander onto golf courses and into family swimming pools or conveyance canals.

This reptile grows to lengths in excess of 12 feet, and feeds on a wide variety of animals, including fish, turtles, ducks and any mammal that it can grasp, subdue and drag under the water and drown. Domestic dogs are an especially attractive prey item.

While human attacks are rare, given the frequency of human-gator contact, and humans are not normally viewed as a prey "item" by alligators, attacks do occur. HDR staff working in and around suitable gator habitat should take the following precautions:

- Never encourage the approach of alligators. Never, ever feed alligators, as it is illegal – they will eat almost anything, and once fed, will return for more handouts, quickly losing their fear of humans. Once this fear has subdued, they will begin to charge humans due to the association with food. This dooms the alligator to an eventual death, as "habituated" gators, like bears, they become a threat and have to be killed by authorities for public safety reasons.

- Never take any pet, such as dogs or cats, in a boat in alligator areas. Alligators won't view you as food, but the dog or cat certainly will be. Any pet jumping into the water will most certainly be attacked, and any boat or canoe capsized by the attack of a large alligator will throw the human occupants in the water along with the intended prey animals, and humans may be seized during the ensuing confusion.

- Don't walk dogs on the edge of lakes, rivers, canals, or ponds likely to harbor alligators – you are inviting attack by walking a "meal".

- Alligators spend a lot of time sunning on the banks of open water, and appear lazy, but are aware of intruders and can run very fast for short distances. Don't approach to look or yell, taunt, or throw anything in their direction.
- Female alligators make large nest mounds out of plant materials – don't knowingly walk on or around these.
- If an aggressive alligator is sighted, try to get GPS Coordinates or photos to document its location and call the local Fish and Wildlife Commission for handling or relocation.

14.0 BEARS

All species of bears are dangerous and should be avoided if possible. Specific guidance on the hazards of working around bears, and the actions to take if confronted by a bear are presented in Appendix B – *Working in Proximity to Bears,* of this Procedure, and should be referenced as pertinent to field operations.

15.0 OTHER ANIMALS

Employees conducting work at landfills, abandoned buildings, or urban project locations may encounter feral animals. Do not feed, chase, act threatening or call to these animals, or try to pet them. These animals should be left alone unless they interfere with project activities or act in an unusual or threatening manner; in this case, back away from the immediate area while facing the animal. **Feral dogs can become pack oriented, very aggressive, and represent serious risk of harm to unprotected workers**.

Avoidance and protection protocols include watching for animal dens, using good housekeeping to discourage foraging, and using repellents (visual-wear bright clothing, audio-announce your approach or presence with loud whistling, talking, radios, etc., and chemical – mace, etc.).

Animal transmitted diseases include rabies and hantavirus.

15.1 Rabies.

The major risk of rabies comes from contact with the saliva, body fluids, or tissue of infected animals. Animals that can be infected with rabies include all mammals, but in particular:

- wild mammals--primarily foxes, skunks, bats, and raccoons
- livestock--mostly cattle but occasionally horses, sheep, goats, and pigs

- domestic cats and dogs
- wolves, coyotes and other meat-eating mammals

15.1.1 Disease Progression

In humans, the incubation period (the time between initial virus contact and onset of the overt symptoms) is dependent on dose and species of animal vector, but generally ranges from two to eight weeks. In rare cases, it can vary from 10 days to 2 years. Rabies progresses through several stages. Initially, a person who is bitten may notice unusual feelings or tingling around the wound. Soon afterwards, there is a period of tiredness with lack of appetite, and usually accompanied by headache, fever, cough, sore throat, abdominal pain, nausea, vomiting, and diarrhea. A period of extreme worry, irritability, inability to sleep, and depression follows, possibly with hallucinations. "Furious rabies" may follow, for which the signs are strange behavior including biting other people. At this stage, victims have an uncontrollable fear of water. This is why rabies has sometimes been called "Hydrophobia." Alternatively, "Paralytic rabies" may develop where the muscles gradually become paralyzed, starting at the site of the bite or scratch. A coma slowly develops, with eventual death.

Workers who may have been exposed to rabies must never wait until they develop symptoms of the disease. Once the symptoms appear, the disease is almost inevitably fatal. It is important to recognize the signs of rabies in animals and take precautions immediately following bites, scratches, or other potentially infectious contact.

In **animals**, rabies appears in two different forms. It may appear as *furious rabies* in which the animal changes behavior, becomes restless, wanders aimlessly, and bites any animal, person, or object in its way. Eventually the animal becomes paralyzed in the throat and hind legs, and dies. Or it may appear as "*dumb rabies*" in which an animal changes behavior, becomes withdrawn or more affectionate, tries to hide, has difficulty swallowing, and dies after a few days without ever becoming violent.

All animals **do not** behave in the same manner when they have rabies.

- Foxes and skunks may lose their shyness and fear of people, pets, or livestock. Back away from any wild mammal that is acting unafraid.

- Cattle usually become restless and aggressive, bellow loudly, drool, may show weakness in the hind legs, and appear to be choking.
- Cats can often become extremely vicious.
- Dogs usually become excitable, wander aimlessly, and may be vicious and bite for no reason.

If an animal is threatening and dangerous and cannot be scared away, or is suspected of having rabies, withdraw, call 911, requesting the local police or animal control personnel, and continue to observe its movements (if possible). If an animal must be killed, try to avoid damaging its head. An undamaged brain is important for a rapid, accurate laboratory diagnosis. Do not handle the animal or carcass (but if necessary, for any reason, wear protective gloves, masks and goggles).

15.1.2 Action to Take if Exposed or Potentially Exposed

Workers who have come into contact with saliva, body fluids, or tissue of animals suspected of having rabies must take the following steps without delay:

- Immediately clean the wound with soap or detergent and flush the wound to full depth with water for several minutes. Washing the wound is probably the most effective procedure in the prevention of rabies. While this is being done, shield the eyes, nose, and mouth from spray from the wound.
- Apply a household antiseptic, 70 percent alcohol (ethanol), tincture or aqueous solution of iodine, or 0.1 percent quaternary ammonium compound such as benzalkonium chloride.
- Remove any clothing that may be contaminated, place it in a plastic bag properly labeled and wash it promptly and separately from other clothing.
- Call a doctor or hospital emergency room and contact the police, the local humane society, or a local veterinarian. If possible, provide the following information:
  - the name and address of all persons attacked or exposed to the animal's saliva, body fluids or tissues,
  - the time and place of the incident, and

- any other information to help find and identify the offending animal.

People who have had contact with the rabies virus require both the rabies immune globulin and the rabies vaccine as soon as possible. Only a single dose of rabies immune globulin is necessary. In previously vaccinated people, two doses of the vaccine are required after a biting incident, one immediately and another three days later.

15.2 Hantavirus

Hantavirus is a virus present in the urine, saliva, or droppings of infected deer mice, *Peromyscus sp.*, and some other wild rodents. Unfortunately, deer mice are very common and widespread across the continental U.S. Hantavirus causes a rare but serious lung disease called Hantavirus Pulmonary Syndrome (HPS). This disease is extremely serious since 50-60% of the people who get the disease die.

People can contract the Hantavirus infection through inhalation of respirable droplets of saliva or urine, or through the dust of feces from infected wild rodents. Transmission can also occur when contaminated material gets into broken skin, or possibly, ingested in contaminated food or water.

The disease begins as a flu-like illness. In the early stage, a worker may experience fever, chills, muscle aches, headaches, nausea, vomiting and shortness of breath. However, the disease progresses rapidly and infected people experience an abnormal decrease in blood pressure and their lungs will fill with fluid. Workers experiencing any of these symptoms within 45 days after their last potential exposure should seek medical attention immediately and tell their physician of possible Hantavirus exposure.

When working in areas where the disease has been reported, the following precautions should be taken to reduce the likelihood of exposure to potentially infectious materials:

- Avoid coming into contact with rodents and rodent burrows or disturbing dens (such as rat nests).
- When performing project work that requires entry into confined spaces, where obvious signs of rodent infestation are present, wear disposable gloves and a fit-tested respirator with HEPA filter to prevent inhalation of fecal dust (Reference HDR H&S Procedure # 9 – *Respiratory Protection*).

- Do not dwell in areas that are in proximity to rodent droppings or burrows or near areas that may shelter rodents or provide food for them (e.g., woodpiles, large supplies of birdseed).

- Keep food, birdseed, etc. in rodent-proof containers.

16.0 PLANTS

Toxic plants are found among trees, shrubs, vegetables, and vines. The largest number of plant poisonings occur from ingestion. However, the largest concern for HDR field workers comes from contact with plants that can cause a skin rash due to allergic reaction. Poison ivy, poison oak, poison sumac and wild parsnip are the most common plants that cause a skin rash.

16.1 **Poison ivy**, *Rhus radicans*, can be found in every region of the United States except the Southwest, Alaska and Hawaii. It grows in the form of a vine (and shrub in its early growth) along riverbanks, rocky fields, pastures, thickets, woods, and waste places and often climbs trees, fences, and dwellings. The plant is identified by having shiny green leaves grouped in threes, and the woody vine generates a proliferation of aerial rootlets, which resemble a reddish beard. The leaves turn red in fall. Another feature used to identify poison ivy is its small waxy globe-shaped, white, berry-like fruits. **All HDR field personnel should become familiar with the appearance of poison ivy!**

16.2 **Poison oak**, *Rhus diversiloba*, is found on the west coast (CA, OR, WA). Poison oak is a perennial shrub with slender stems, which are erect and woody, with one or a few erect branches. It does not climb nor does it have aerial roots. The leaves are similar in number (3), arrangement and coloration to poison ivy. The leaves are oblong (resembling oak leaves), are hairy on the top surface and velvety beneath. The fruit is a small pale green to whitish-tan berry. Poison oak grows in dry barrens, sandy wastes, pinewoods, and sandy woods.

16.3 **Poison Sumac** grows abundantly along the Mississippi River and swamps of eastern North America, but is far less common in other regions. It grows as a shrub to approximately 25 feet in height. Each stem contains seven to thirteen leaves arranged in pairs. The leaf and leaflet stalks are reddish with clustered whitish fruits, which resembles those of poison ivy. **In autumn, all three poisonous species produce whitish berries, whereas all other members of the Sumac family produce red berries (and are harmless).**

16.4 Exposure, Symptoms, and Treatment

Each of the plants described above contain an oil, which when in contact with the skin causes a rash. All parts of the plant contain this oil – leaves, vines and berries. This oil is present in the woody parts of the plant even in winter.

Not everyone is allergic to these plants, but immunity seems to be transitory – individuals may seem to be immune to the effects of poison ivy for years, and then suddenly develop the rash upon the next exposure. Exposure, and symptom development, can occur when they:

- Touch poison ivy, poison oak or poison sumac
- Touch clothing or shoes that have the sap on them
- Touch the skin or clothing of an exposed person
- Touch pets or animals that have the sap on them
- Come in contact with the smoke of these burning plants, or of logs that still have the poison ivy vine attached

Symptoms usually appear within several hours to 3 days of exposure, but may appear as long as 3 weeks later and include the following:

- redness and extreme itching are the first signs
- rash erupts on areas that were exposed, often in the pattern of streaks or patches consistent with where the plant touched the skin
- rash is in the form of red pimples and may form large, weeping blisters
- the worst stage of the rash is experienced four to seven days after exposure
- the rash may last for one to two weeks
- reactions can vary from very mild in some individuals to very severe in highly sensitive individuals, sometimes even requiring hospitalization

General first aid for exposure includes the following:

- The skin should be washed with soap and warm water as soon as possible following exposure. After ten minutes, the oils have penetrated the skin and cannot be washed off

- Scrub under the fingernails with a brush to prevent spreading of the oils to other parts of the body by touching or scratching
- Wash the clothing and shoes of the exposed person with soap and water. Oils can linger on these surfaces for several days
- Body heat and sweating can aggravate itching. Keep the victim cool and apply cool compresses to the skin
- Calamine lotion (not Caladryl) may be applied to the skin to decrease itching
- 1% hydrocortisone cream may be applied four times per day to relieve inflammation and itching
- In cases of severe or extensive rash, especially around the face or genitals, your physician may prescribe oral steroids

Call immediately for emergency medical assistance if:

- the rash covers more than one quarter of the body
- the victim is suffering a severe allergic reaction such as swelling and/or difficulty breathing or has had a severe reaction to a past exposure
- the victim is coughing following exposure to the smoke of burning plants

Call a physician if:

- the itching is severe and cannot be controlled
- the rash affects the face, lips, eyes or genitals
- the rash shows signs of infection such as pus, yellow fluid leaking from blisters, odor or increased tenderness

Prevention

Species identification and avoidance is the only truly effective preventative. All field personnel should learn to recognize poison ivy/oak, in two different habit's of growth - as a woody climbing vine, and as a free standing bush. Additionally, personnel should wear long pants, long sleeves, and gloves to minimize the possibility of exposure. **There are also barrier creams that, when applied to the exposed skin, offer good protection for a limited time, and have been used by field personnel with success**.

16.5 **Wild Parsnip**, *Pastinaca sativa*, is a noxious, non-native member of the mustard family that grows more than 5 feet tall and has a yellow, umbrella-shaped cluster of flowers. Common in the North Central US, the plant contains juices that when smeared on human skin and activated by the presence of natural sunlight, causes nasty chemical burns ("phyto-photo-dermatitis") about 24-48 hours after exposure. The sap contains photosensitive chemicals; unlike poison ivy/oak, there is apparently no natural immunity. The sap is lipid-soluble, meaning it is rapidly absorbed into the skin, so washing is effective only if done immediately after contact. However, the potency of the sap seems to diminish over time, so the exposed skins sensitivity to UV light appears to peak 30-120 minutes post contact.

In mild cases, the skin reddens and appears sunburned for a day or so. In severe cases, blisters form and eventually erupt. In some cases, may leave a brownish pigmentation that can persist for years.

Wild Parsnip grows in clusters, and aggressively invades soils found in roadside ditches and other areas of recent disturbance where the natural vegetation is spars or missing. Unlike poison ivy, just brushing against the plant doesn't produce the symptoms – you must get the crushed leaf or stem juice on your skin, and then it must receive direct ultra violet radiation found in sunlight. Cases may be misdiagnosed as poison ivy.

Like poison ivy, the only truly effective preventative is to avoid contact with the plant – learn what it looks like in all its growing stages, and beware open disturbed edge-habitat and pasture areas.

17.0 WATERBORNE PATHOGENS

Water-borne pathogens can be present in various types of water bodies encountered at project sites. Two more common water-related pathogens are *giardia* and *cryptosporidium*, which cause gastrointestinal illness when ingested. These microorganisms are present in human and animal fecal matter, and enter water-bodies through point and non-point sources. Combined sewer overflows may, during times of high rainfall, be a primary source of pathogens entering water-bodies. Runoff from ground spreading of septage, sludge and manure, as well as discharges from malfunctioning septic systems, may also be sources of these pathogens.

The most common means of contracting these pathogens is by drinking contaminated water, and through accidental ingestion while swimming and/or performing sewer inspection services (splash hazard). Avoidance consists of not drinking from, and minimizing body immersion into streams, lakes, ponds, etc., regardless of how clear the water may appear. If immersion is necessary, wear

waders and other appropriate apparel to prevent skin contact, and avoid hand-to-mouth contact.

18.0 AIRBORNE PATHOGENS

Several infectious diseases are transmitted through the air by inhalation of contaminated material - Legionnaires' disease, Valley Fever, and Histoplasmosis.

18.1 Legionnaires' Disease

The bacterium responsible for Legionnaires' disease belongs to the genus *Legionella*. There are approximately 35 Legionella species known to produce the disease. Legionella species are commonly found in any aquatic environment. They can survive for several months in a wet environment and multiply in the presence of algae and organic matter.

HDR employees most at risk from the disease are those with job assignments involving inspection of water cooling towers in air conditioning systems. The published literature suggests that some outdoor job assignments may additionally be at risk - where soil is disturbed by bulldozing, and areas where surface or aerosolized water discharge occurs.

Legionnaires' disease usually begins with a headache, pain in the muscles and a general feeling of unwellness. These symptoms are followed by high fever (up to 40°-40.5°C or about 104°-105°F) and shaking chills. Nausea, vomiting, and diarrhea may occur. On the second or third day, dry coughing begins and chest pain might occur. Difficulty with breathing is often reported.

The prevention of *Legionella* infection can be best achieved by good engineering practices in the operation and maintenance of air and water handling systems.

18.2 Valley Fever

Valley Fever is primarily a disease of the lungs that is common in the southwestern United States and northwestern Mexico. It is caused by the fungus *Coccidioides immitis*, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. Resistant spores, produced by this fungus, become airborne when the soil is disturbed by winds, construction, farming and other activities. These spores are the infective agent.

Valley Fever is prevalent in the San Joaquin and Central Valleys of California, and in the hot, desert regions of southern Arizona (especially in the Phoenix and Tucson areas), southern Nevada, southern Utah, southern New Mexico, western

Texas (especially around El Paso), Mexico (in the states of Sonora and Chihuahua), and in semiarid and arid areas in Central and South America.

Employees with potential risk of exposure are those assigned duties involving disturbance of desert soils, particularly around rodent burrows, Indian ruins and burial grounds. In these settings, infections are more likely to be severe because of intensive exposure to a large number of spores. Exposure to windstorms or recently disrupted soils may increase the chances of infection. Valley Fever infections are more prevalent during certain seasons. In Arizona, the highest incidence of infection occurs during June and July, and October through November. In California, the risk of infection is highest from June through November, without the late summer break.

Valley Fever symptoms generally occur within three weeks of exposure. Most cases are very mild. It is thought that over 60% of infected people have either no symptoms or experience flu-like symptoms and never seek medical attention. Of those patients seeking medical care, the most common symptoms are fatigue, cough, chest pain, fever, rash, headache and joint aches. Some victims develop painful red bumps on their shins or elsewhere that gradually turn brown (the medical term for these is "erythema nodosum"). Since the common symptoms are not unique to Valley Fever, positive identification of Valley Fever as the cause of illness requires specific laboratory tests.

Otherwise healthy people generally have complete recovery within six months following the onset of Valley Fever. In about five percent of cases of Valley Fever, pneumonia results. In another five percent of Valley Fever patients, apparently benign lung cavities develop after their initial infection. These cavities occur most often in older adults, usually without symptoms, and about 50% of them disappear within two years. Occasionally, these cavities rupture, causing chest pain and difficulty breathing, and require surgical repair.

Of the Valley Fever patients that seek medical attention, one to two percent develops disease that has spread to other parts of the body. The most common site of dissemination is the skin in the form of lesions. Bones and joints (especially the knees, vertebrae, and wrists) are other frequent sites of dissemination.

18.3 Histoplasmosis

Histoplasmosis is an infectious disease of the lungs caused by inhalation of a fungus, *Histoplasma capsulatum*. The infection sometimes can spread to other parts of the body. *Histoplasma c.* thrives in moderate temperatures and moist environments. Droppings from chickens, pigeons, starlings, blackbirds, and bats support its growth. Birds are not infected with it because of their high body

temperatures, but they can carry it on their feathers. Bats can be infected and can excrete the organism in their droppings. The symptoms of the infection appear within 5 to 18 days after exposure, most commonly in 10 days. There are five different forms of infection, as follows:

- **Asymptomatic** is when the victim does not show any symptoms and is unaware of the infection.
- **Acute disseminated** involves short-term affects to organs other than the lungs. It is usually confined to young children and is marked by fever, cough, exhaustion and enlargement of the liver and spleen.
- **Acute benign respiratory** is produced by a heavy exposure and marked by weakness, fever, chest pains, and cough. The severity of the symptoms depends upon the magnitude of the exposure.
- **Chronic disseminated** is of long duration (chronic) and it involves other organs outside of the lungs. It occurs in people with a reduced capacity to fight disease, such as patients with leukemia and persons being treated with drugs that suppress the body's immune system. The chronic disseminated form is marked by fever, anemia, hepatitis, pneumonia, inflammation of the lining of the heart cavity, meningitis, and ulcers of the mouth, tongue, nose and larynx. Disabling.
- **Chronic pulmonary** occurs in persons with pre-existing lung diseases such as emphysema. It resembles tuberculosis and is more common in males over 40 years of age.

Most patients who develop histoplasmosis do not require treatment. Some may only require supportive treatment that relieves the symptoms of the disease. Severe symptoms with a large involvement of the lungs require treatment with specific antifungal drugs.

HDR employees at potential risk for exposure are those whose job duties involve contact with soil enriched with bird and bat droppings. Prevention of histoplasmosis relies on avoiding exposure to soil/dust in a contaminated environment. Spraying with water is advisable to reduce dust.

Decontamination with 3% formaldehyde has been shown to be effective. However, formaldehyde solutions should be used with caution since this chemical may cause adverse health effects following inhalation, ingestion, or skin or eye contact.

Persons working in known contaminated areas should use protective clothing such as gloves and coveralls, and a respirator equipped with a high efficiency particulate air (HEPA) filter (for spore-laden dusts). If formaldehyde is concurrently applied, a HEPA combination cartridge, suitable for also absorbing formaldehyde vapor may be required. For major soil clean up operations of prolonged exposure, a Powered Air Purifying (PAPR) or supplied air respirator (ASR – airline or SCBA) may be necessary. Refer to HDR H&S Procedure #9 - Respiratory Protection, for information on these respirators.

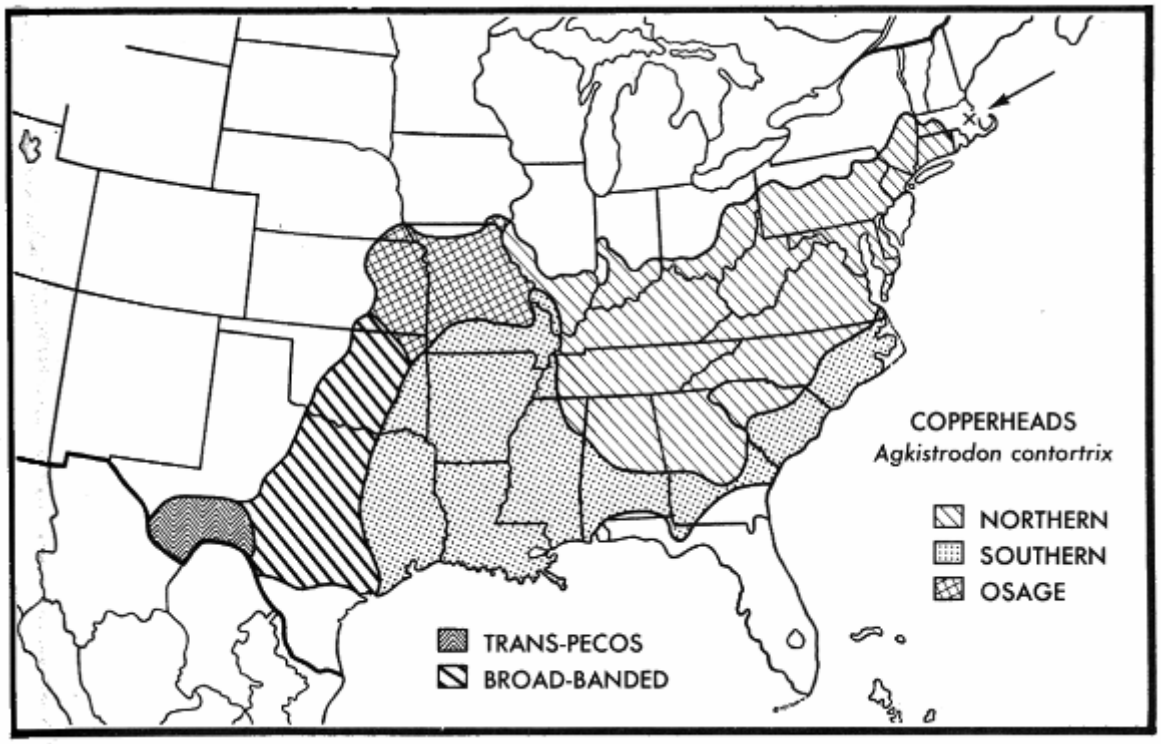
19.0 SOIL PATHOGENS

19.1 Tetanus

Tetanus is a bacteria common in soil and can infect the cells in open wounds. Any open skin that comes into contact with tetanus spores from the soil can become infected. Symptoms of tetanus include the following:

- Violent muscle spasms,
- "lockjaw" spasms of jaw muscles which keep the mouth from opening,
- difficulty breathing

Immunization is the best way to prevent tetanus. Immunization is generally given in childhood and should be repeated every 10 years throughout adulthood. Booster shots can be given to trauma victims who are at risk of having been exposed. If any HDR employee suffers a puncture wound, they should complete an accident report and consult with the HDR physician (see HDR H&S Procedure #35 – *Medical Monitoring*) regarding the prudence of receiving a tetanus booster.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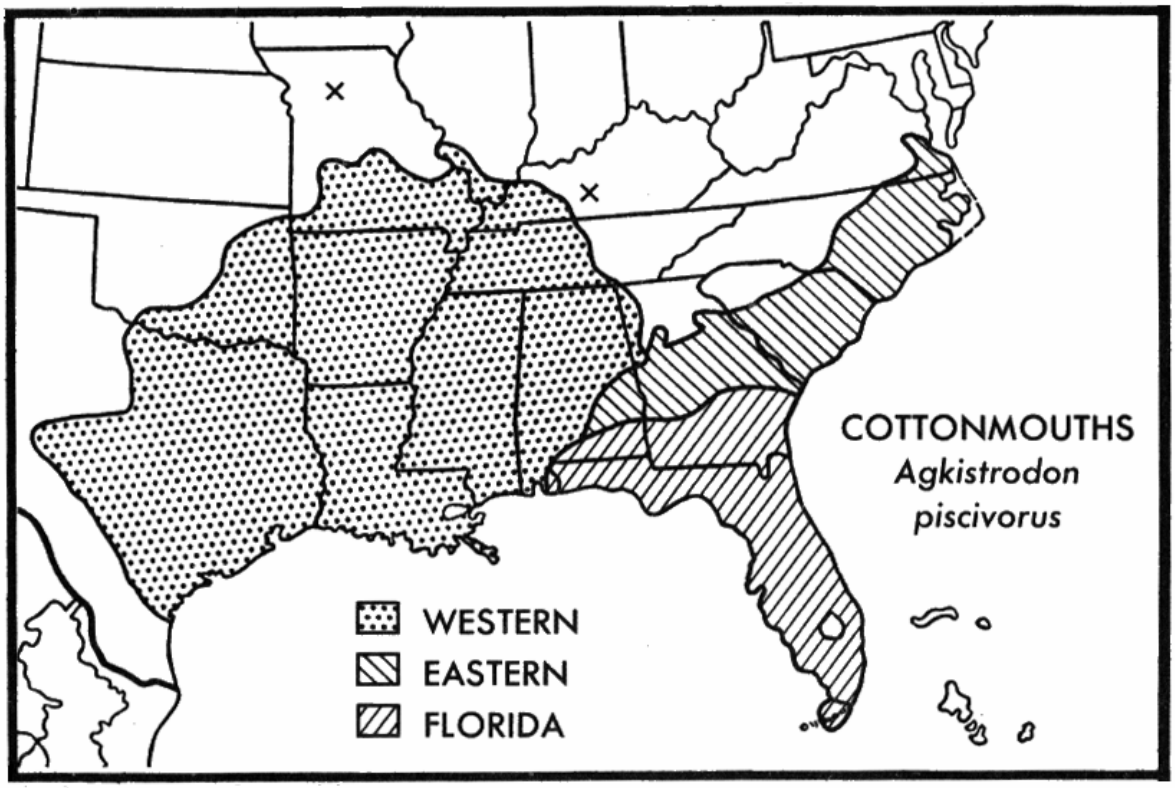
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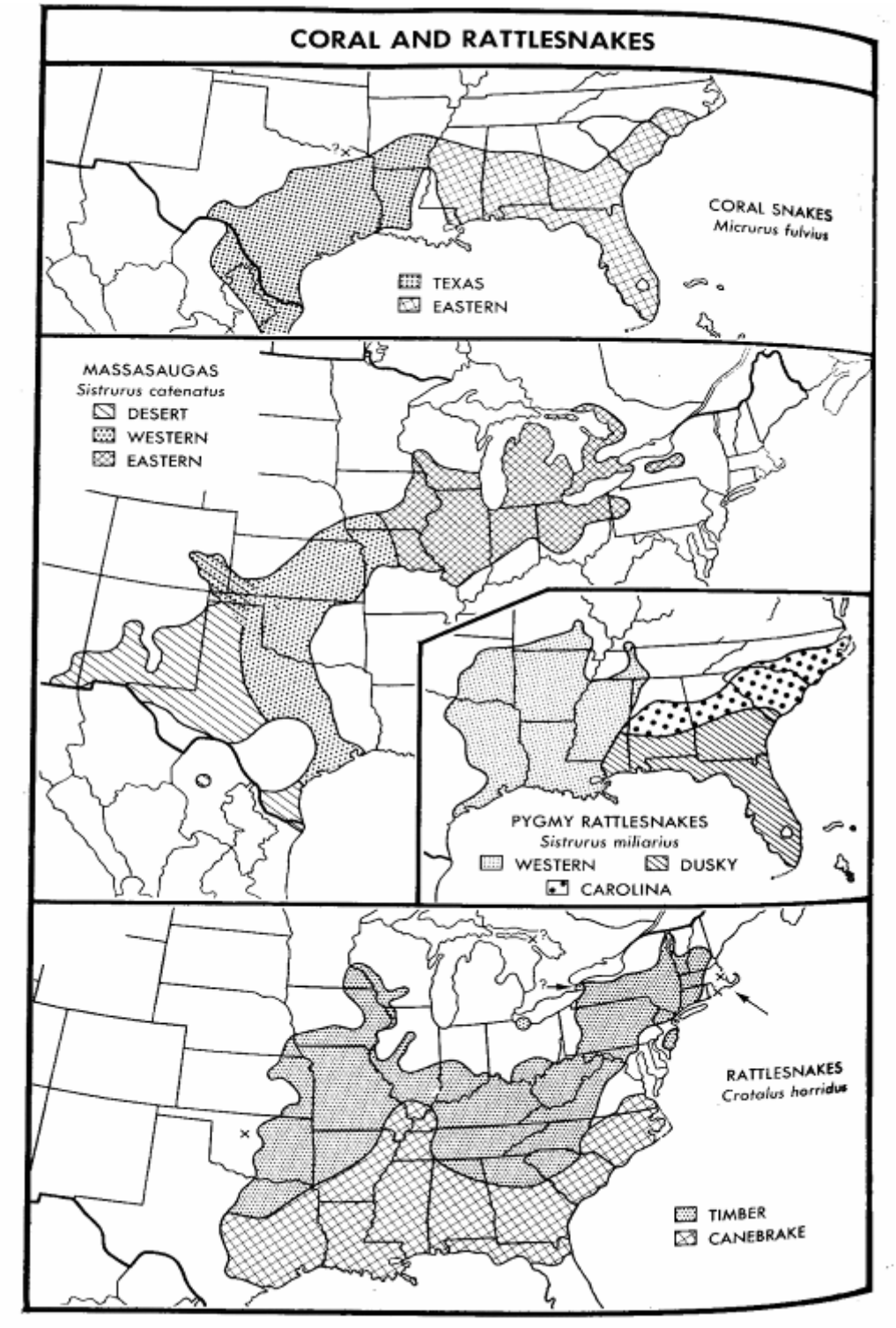
CORAL AND RATTLESNAKES
CORAL SNAKES
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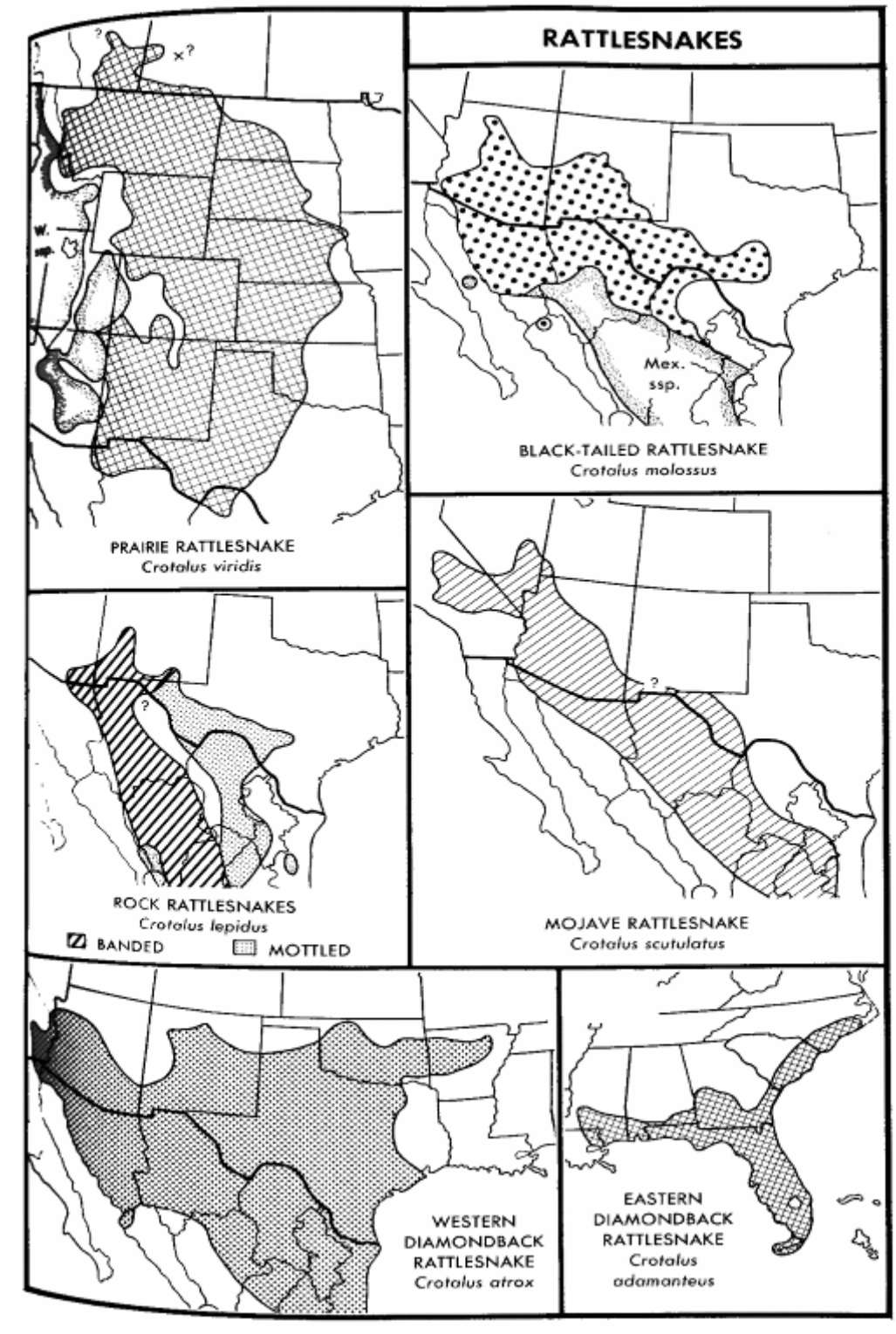
TEXAS
EASTERN
MASSASAUGAS
Sistrurus catenatus
DESERT
WESTERN
EASTERN
PYGMY RATTLESNAKES
Sistrurus miliarius
WESTERN
DUSKY
CAROLINA
RATTLESNAKES
Crotalus horridus
TIMBER
CANEBRAKE


RATTLESNAKES
PRAIRIE RATTLESNAKE
Crotalus viridis
BLACK-TAILED RATTLESNAKE
Crotalus molossus
Mex. ssp.
ROCK RATTLESNAKES
Crotalus lepidus
BANDED
MOTTLED
MOJAVE RATTLESNAKE
Crotalus scutulatus
WESTERN DIAMONDBACK RATTLESNAKE
Crotalus atrox
EASTERN DIAMONDBACK RATTLESNAKE
Crotalus adamanteus

Working in Proximity of Bears

This addendum is applicable to HDR employees who perform work in areas where bears may be present in medium to high densities such as Alaska, Canada, and northern and western regions of the United States. Employees required to work in these regions should be trained to work safely in bear country and be positively protected against a bear attack.

1.1 Bear Characteristics

Brown (including Grizzlies) and black bears are the two species of bears expected to be encountered most often by HDR employees while working in the United States and Canada.

Characteristic	Black Bear, *Ursus americanus*	Brown Bear ("Grizzly"), Ursus arctos horriblis, Ursus arctos middendorffi
Color	Black, brown or bluish gray	Dark blonde to brown to black
Muzzle Markings	Tan or brown	None
Face profile	Straight or "Roman"	Slightly concave
Average Weight Female	100 to 250 lbs.	250 to 600 lbs.
Average Weight Male	200 to 400 lbs.	600 to 1000 lbs.
Average Shoulder Height	3 Feet	5 Feet
Average Standing height	6 Feet	9 feet
Claws	Short, curved	Long and straight
Other		Pronounced hump between shoulders

1.2 Bear Activity Patterns

Bears leave their dens in April or May and begin their search for food which may be scarce during the spring months. Mating, which typically occurs from mid-May through the end of July creates movement of the bears throughout their home ranges. During this period, if one bear is observed in the area, there is a good chance that another bear is nearby. During the summer months the bears tend to localize near food sources such as ripe vegetation and streams. In the Fall, bears tend to move between food sources such as areas with ripe berries and well stocked Salmon rivers. In late fall the bears begin to prepare dens for winter hibernation. During hibernation, bears may still react quickly if they are disturbed.

1.3 Bear Behavior

Bears typically exhibit predictable behavior regarding humans, opting to avoid humans unless forced to react when they feel threatened, startled, or required to protect their food or young. Bears spend much of their time feeding and will protect their food sources from other bears, animals and humans. NEVER disturb a feeding bear.

Bears will also react to new situations in their environment and if scared off initially, may return to investigate. Bears are social and non-territorial; however they will defend their personal space if threatened. Also, bears are often not aware of their surroundings if focused on food trails or looking for mates and may blunder into an unsuspecting person. For these reasons HDR employees must be aware of their surroundings at all times when they are working in bear country. Specific examples of what to be aware of include:

- Wind direction. Traveling with the wind at your back allows bears to smell you and leave the area prior to your arrival.
- Noise. Areas with high background noise levels such as along streams do not allow bears to hear you approaching until it becomes startled by your appearance.
- Smells. Odors such as dead/rotting animals (e.g., moose carcass) may indicate a bear in the area protecting its food.
- Visuals. Torn up insect-infested logs, fresh scat, or fresh tracks may indicate the nearby presence of a bear.

1.4 Bear Communication

Bears will often use threats and displays of action as an alternative to fighting.

- Subordinate displays – moves away, sits or lies down
- Dominant displays – approaches by walking or running, typically with ears cocked forward
- Head and mouth actions – carries head high as it circles the adversary, dropping head and beginning short series of short open-mouthed lunges showing aggression
- Flattened ears – about to make contact

Although a bear standing on its hind legs has commonly been considered a threatening display, it is often a non-threatening action where the bear is just trying to get a better look at its surroundings.

Bears also use vocalizations to show apprehension and an agitated bear may salivate and yawn.

- Black bears – low guttural noise, blowing sounds
- Brown bears – low level vocalizations, popping sounds

1.5 Bear Reactions to Human Encounters

An encounter with humans may trigger threat displays or may be predatory in nature.

Threat Displays may include:

- Communication such as huffing, panting, hissing or growling
- Looking at you directly with lowered head and ears laid back
- Turning sideways to display its size
- Walking with stiffened front legs
- Charging to within 4 to 5 feet then stopping suddenly or veering to the side
- Slapping one or both front feet on the ground or swatting vegetation; or
- Jaw popping by rapidly opening and closing its mouth

Some threats will lead to a charge intended to make physical contact while others may end with the bear walking or running away.

Predatory Behavior:

Although unprovoked bear attacks on humans is very rare, a few cases have been cited where the bear considers humans to be potential prey and stalks or attacks them. The predatory behavior does not trigger threat displays but rather the bear makes a direct approach at a fast walk or run, follows or circles you. The predatory bear shows no fear, but rather an intense interest.

1.6 General Bear Safety Training

Standard industry bear safety training should be provided for any employee required to work in bear country, especially in areas where bears are present in medium to high densities. The training should include an introduction to bear behavior, biology and body language, bear avoidance, use of deterrents, and bear encounter scenarios including how to react in case of an attack.

An awareness level video titled *"Staying Safe in Bear County"* presented by the Safety in Bear Country Society (in co-operation with the International Association

for Bear Research and Management) is available through the HDR Anchorage office. Many live instructor courses are also available in Alaska, Western Canada, and in the lower 48 United States. Courses may be found in listings on the Internet or by contacting local agencies, such as the U.S. Forest Service.

1.7 Protection from Bears

HDR employees should be positively protected from a bear attack while working in bear country by the presence of trained personnel carrying either (a) firearms capable of stopping an attacking bear or (b) an industry accepted chemical bear deterrent, i.e., Bear Spray. Under no circumstances, should an HDR employee work alone in bear prone areas.

The method of positive protection chosen for each project will vary depending on the project location, type of work, bear population and risk of attacks, project logistics, and the client's policies and procedures. It is recommended that the method of protection be chosen prior to the project start and that this choice and all associated requirements be communicated to all team members and the client. This will help to ensure that all employees affected by the decision are aware of and agree with the method selected.

A "Bear Guard" should be assigned to accompany a group of workers for any field work performed in medium to high density bear areas, where the number of workers and/or the worker experience is not adequate to provide the positive protection needed. The designation of "Bear Guard" is assigned only to trained individuals whose sole responsibility is to provide positive protection against bears for the group of workers they are accompanying. HDR employees, whose primary responsibility is to perform field work, are not considered "Bear Guards" even if carrying a firearm or bear deterrent.

The project manager or team leader is responsible for verifying that the assigned Bear Guard is competent to perform the job duties through completion of the required firearm safety course and any additional training course completion, past experience or certification by an independent third party.

All bear guards, whether HDR or third party, must be included in their employer's random drug and alcohol testing program. All third party bear guards must have passed a pre-employment drug and alcohol test prior to serving as bear guard for HDR personnel.

1.8 Firearms and Bear Guarding

Firearms may be carried by HDR employees, an independent third party, or the client; whoever is carrying the firearms shall have successfully completed the following:

- A formal training class (and refresher training, as required) on firearm safety, sponsored by the National Safety Council, National Rifle Association or other nationally recognized safety organization, and has provided a copy of the training records to the project manager or OSC for retention. (HDR Anchorage staff recommends that Bear Guards trained through the "Learn to Return" program receive a minimum rating of 3 to be eligible for a "Bear Guard" position); and

- A formal training class on bear awareness and response, sponsored by a recognized organization in the field of bear safety.

HDR employees must also review and demonstrate compliance with HDR Procedure #31, Firearm Safety.

1.9 Firearm Recommendations

The choice of weapon and ammunition combinations for protection against bears should be based on each carriers experience with firearms and comfort with weapon size, weight, and recoil. Weapon type and size in combination with ammunition should be tested prior to use in the field to ensure that the carrier can accurately shoot the weapon in an attack situation with confidence.

Guidance on weapons and ammunition should be obtained during bear safety training. Additional resources include the Alaska Department of Natural Resources, who recommend a minimum of a 12-guage shotgun or .300 magnum rifle, and the United States Department of Agriculture document, *Safety in Bear Country: Protective Measures and Bullet Performance at Short Range. (1983)*

1.10 Bear Spray

HDR encourages each individual to carry a bear deterrent such as pepper spray when working in bear prone areas. The spray canister should be carried in a holster on a belt, shoulder strap or pack to allow quick response if needed.

Caution must be used when discharging the spray to make sure that the individual is upwind from the spray to avoid exposure to the irritating and possibly disabling effects of the deterrent. Training for the use of Bear Spray should be obtained through bear safety classes or live training presented by experienced HDR employees.

Please note: Bear Spray products are considered hazardous materials for ground and air common carrier transport. Each product should be handled according to applicable regulations and transportation providers should be alerted about its presence. Prior to shipping Bear Spray, contact Lonnie Fredrickson, HDR Mailroom Supervisor, @ (402) 399-1245 for manifest preparation. Privately commissioned air transport does not fall under the air common carrier regulations and therefore does not require a formal manifest.

1.11 Personal Protective Equipment

All employees should wear orange or orange/yellow vests when working alongside a team member or Bear Guard who is carrying a firearm, and during any hunting seasons that are occurring near the project area.

Since bear attacks are sudden and without warning, it will probably not be possible to install ear hearing protection prior to the discharge of a weapon. In the case that it is essential, it should be of a type that can be worn at all times (allows passage of normal frequency sounds) while performing the bear guard service.

1.12 References and Resources

"Staying Safe in Bear County" presented by the Safety in Bear Country Society (in co-operation with the International Association for Bear Research and Management)

U.S. Department of Agriculture, *Safety in Bear Country: Protective Measures and Bullet Performance at Short Range*, General Technical Report PNW-152, 1983.

National Audubon Society, *Living in Harmony with Bears,* 2000.

Herrero, Stephan, *Bear Attacks – Their Causes and Avoidance*, Nick Lyons Books, New York, NY, 1985.

Smith, David, *Backcountry Bear Basics, A Definitive Guide to Avoiding Unpleasant Encounters*, The Mountaineers, Seattle WA, 1997.

"Learn to Return" Training Systems, Inc., Anchorage, Alaska

1.0 OBJECTIVE

HDR employees must recognize the inherent hazards associated with working in and around water, whether directly exposed through wading/swimming, or potentially exposed while performing services on surface watercraft or near water bodies.

2.0 PURPOSE

This procedure presents information and guidelines on the safe performance of work on or near water, where the possibility of drowning exists. It conforms to the requirements of 29 CFR 1926.106 – *Working Over or Near Water*, 29 CFR 1926.802 – Cofferdams, and 29 CFR 1926.605 – *Marine Operations and Equipment [Barges]*.

NOTE: Activities in many states are regulated by state OSHA plans, which may have certain requirements that differ, and are more stringent than the Federal requirements presented here. When performing services in these state plan areas, HDR will comply with the state promulgated OSHA regulations. It is not anticipated these will differ significantly from the Federal-based regulations presented here (Reference the HDR Corporate H&S Program, Section 2, for a listing of the State Plan States).

3.0 APPLICABILITY

This procedure applies to all HDR personnel at HDR client sites and at HDR facilities. All employees that perform surface services on or around water, where the potential for drowning exists, will be impacted by this procedure.

> NOTE: Section 13 of this Procedure addresses certain boating & water operations associated with the use of large open water craft primarily used in the New York and Alaska Departments. Additionally, Appendices A & B address operational hazards associated with specific NY Dept. watercraft.

This procedure excludes railroad structure inspections over water, addressed in HDR H&S Procedure # 14 – *Railroad Safety*, and marine diving operations, which are addressed by HDR H&S Procedure # 23 – *Scientific Diving*. HDR field professionals are responsible for evaluating work locations and tasks to determine whether the requirements contained in this procedure apply. If client project requirements differ from those presented herein, the more stringent requirements shall apply.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety, and locally by the Office Safety Coordinator(s).

National Director of Safety The Director of Safety shall:

- Review, at least annually, the effectiveness of the program, identify any deficiencies, and ensure they are corrected.
- Provide guidance to OSCs and HDR professionals concerning Water/Boating Safety issues.
- Assist OSCs in the selection of equipment, Personal Flotation Devices (PFDs) and other necessary items to allow employees to work safely around water hazards.

Office Safety Coordinators The Office Safety Coordinator(s) shall:

- Determine any additional State OSHA Water/Boating Safety requirements, and relay this information to their office staff and Corporate Safety.
- Provide technical assistance to Project Managers during project planning and proposal preparation.
- Provide Water/Boating Safety awareness level training to HDR professionals as necessary.
- Interface with Corporate Safety on related questions they have and when guidance is necessary.
- Provide technical assistance to project personnel, as possible.

Project Managers Project Managers shall:

- Determine if any project task will subject HDR personnel to water hazards, and incorporate appropriate preplanning into the project design. Preplanning includes the identification and acquisition of necessary equipment (PFDs, skiffs, etc.) and the verification that exposed personnel have the knowledge and training to correctly use the equipment.

Project Personnel All project personnel shall:

- Read, understand and follow the contents of this procedure when engaged in site activities that present water hazards.

5.0 DEFINITIONS

Bulwark – The side of a ship extending above the upper deck.

Cofferdam – A temporary structure used to keep water (and earth) out of an excavation during construction of the permanent structure.

Coaming – The raised frame, curb or rim around a barge deck (e.g., hold) opening designed to keep out water. Presents trip hazard.

Gangway – Any ramp, stairway or ladder provided for personnel to board/leave a vessel.

Rode -- A length of chain that connects an anchor to line (rope). This is used in lieu of attaching the rope directly to the anchor because the chain is stronger and more resistant to frictional abrasion than the rope.

Jacob's Ladder – A flexible ladder made of rope or chain with wood or metal rungs.

Life Ring – Type IV life ring, without a retrieval rope attached. Thrown to immersed personnel.

Personal Flotation Device (PFD) – Equipment designed to prevent drowning. The USCG is the approving agency and divides all PFDs into 5 current classifications. Three classes are approved for HDR use – Class III, IV and V. Types III and V are designed to be worn as apparel around the body during all times of exposure, and are commonly referred to as "life vests, life preservers, float coats, or float suits." Type IV are circular life rings designed to be thrown to personnel who are in the water, as a rescue measure.

Ring Buoy – Type IV life ring, with a retrieval rope attached.

Safety Blocks – Large floating blocks which may be quickly pushed into the water to protect individuals who have fallen in the water from being crushed by vessels. Used along wharves and docks.

Skiff – A shallow draft, flat bottomed open boat used for rescue.

Throw Bag – A nylon bag approximately 8x6 inches, containing a length of rope. During a rescue, the bag is opened, and the rescuer throws out the rope to the victim, who grabs it, and can then be retrieved. While considered a water rescue aid, it is not a PFD.

Trawling – as used herein, the dragging through the water of a dredge, net or other apparatus used as a fishing appliance.

Waders – Water impermeable apparel worn in two styles – either as a single large pants unit, or as individual leg protectors. Worn when wading to prevent exposure of the leg or lower torso to water, when performing E&RM field sampling activities.

Work Vest – A Type V PFD that is designed to maximize freedom of movement, limiting the flotation material to the back and chest.

6.0 PFDs AND PERSONAL PROTECTIVE EQUIPMENT

A personal flotation device is a floating aid designed to keep the wearer from drowning, by adding sufficient buoyancy to the torso when the wearer is free floating in deep water. The classification "PFD" includes apparel such as life vests (commonly called "life preservers"), float suits, and float coats as well as retrieval life rings. PFDs must meet design and use criteria regulated by the United States Coast Guard (USCG). Table 6-1 presents the various USCG classifications and OSHA approvals:

TABLE 6-1
Personal Flotation Devices

Classification	Design	OSHA / Comments
Type I – Offshore Life Jacket	Designed to turn an unconscious person in water to vertical position. Open ocean apparel. *Designed with minimum 35 lbs. buoyancy*	While acceptable, they are very bulky and will limit mobility. Emergency use only. Not for everyday use.
Type II – Nearshore Buoyant Vest	Designed to turn an unconscious person to a vertical position. Coastlines, Great Lakes, etc. *>15½ lbs. buoyancy.*	While acceptable, they are very bulky and will limit mobility. Not for everyday use.
Type III – Flotation Aid	Designed to keep a conscious person in a vertical position. Designed for everyday water activities (e.g., boating, skiing) *Minimum 15½ lbs. buoyancy.*	Acceptable for all HDR activities. (New Type III inflatable PFDs are approved only if rated for commercial or industrial use).
Type IV – Throwable Device (Life Ring)	Throwrings designed to be thrown into the water for rescue. Not worn on body. *Minimum 16½ lbs. buoyancy.*	Required in boats, on wharfs and in certain shore situations.

Type V – Special Use Device	Catchall category - various designs for specific water activities – includes deck suits, work vests, hybrid PFDs, etc. *Minimum 15½ lbs. buoyancy*.	Acceptable for HDR activities as long as mfg. label does not exclude from use in planned work activity. (See note below)

NOTE: There are many new Type V PFDs marketed recently. If a question arises as to whether they may be approved for HDR use, check the manufacturer's instructions and limitations. OSHA specifies that only Type V PFDs approved for "commercial" or industrial" use are allowed to be worn during employment activities. This prohibits the use, by HDR personnel, of some specialty PFDs, including inflatables, that are advertised for recreational use.

6.1 Life Vests/Preservers, Float Coats, and Float Suits

*__NOTE__: For cold weather work on boats, or on floating docks where the risk of falling into the water is present, if the water plus air temperature is less than 110 degrees Fahrenheit a float coat or a float suit must be worn in lieu of a vest-type PFD.

Simply stated:

Water temperature + air temperature < 110˚F = float coat or suit required.

Water temperature + air temperature ≥ 110˚F = vest-type PFD allowed.

- USCG approved International Orange life vests* classed as Type III or Type V shall be provided to, and worn by, all HDR employees in the following circumstances:

  (a) on floating pipelines, pontoons, barges, rafts, or stages;
  (b) on structures extending over or adjacent to water, **except** where guardrails (not safety nets) are provided for employees, or where the employee is protected from falling into water at all times through the use of a personal fall positioning or arrest system (harness, lanyard, anchorage, self-retracting lifeline, etc. PFDs are required when nets are the form of fall protection employed. See HDR H&S Procedure #12 - *Fall Protection)*;
  (c) working alone at night where there are drowning hazards, regardless of other safeguards (e.g., guardrails, etc.) provided;
  (d) in skiffs, small boats, or launches;

(e) wherever there is a drowning hazard. Generally any body of water with a depth of 4 feet or greater is considered a drowning hazard; however, other factors need to be considered when deciding whether a drowning hazard exists. Other factors may include flow velocities, water temperature, ability to rescue injured employees, and existence of other hazards.

- Before and after each use, the PFD shall be inspected for defects which would alter its strength or buoyancy. The design requirements for PFDs specify that any device with less than 13 pounds buoyancy is defective, and shall be removed from service. While HDR has no field method of determining the buoyancy rating, employees should examine the PFD to determine the original float material is present, that all seams are sealed and securely stitched, and that all buckles and straps are in working order. **If a defect is noticed, DO NOT USE**!
- All newly purchased PFDs shall be equipped with retro-reflective tape. These are required when working on US Corps of Engineers (USACE) projects. Existing HDR-owned PFDs without this tape, but otherwise acceptable, may continue to be used on non-USACE projects (daylight only).
- PFDs provided on vessels used on the Great Lakes or ocean service shall be equipped with approved PFD lights (work vests are exempt from this lighting requirement if an additional approved PFD is available on board).

6.2 Life Rings/Ring Buoys

- Type IV life rings (no rope attached) and ring buoys (rope attached) shall be U.S. Coast Guard approved. Ring buoys should have attached at least 90 feet of 3/8-inch solid braid polypropylene or equivalent. Life rings or ring buoys shall be readily available and shall be provided, regardless of the fall protection provided, at the following places:

(a) at least one on each safety skiff;
(b) at least one on all motor boats up to 40 feet in length and at least two for motor boats 40 feet in length or longer;
(c) at least two on any other piece or group of floating barge up to 100 feet in length and one additional for each increase in length of 100 feet or fraction thereof; and
(d) at least one at intervals of not more than 200 feet on pipelines, walkways, wharves, piers, bulkheads, lock walls, scaffolds, platforms, and similar structures extending over or immediately adjacent to water, unless the fall distance to the water is more than 45 feet, in which case a life ring shall be used. The length of line for

ring buoys at these locations shall be evaluated based on the specific potential hazards, but may not be less than 70 feet.

- PFD lights shall be required whenever there is a potential need for life rings to be used after dark. On shore installations, at least one life ring, and every third one thereafter, shall have a PFD light attached. PFD lights on life rings are required only in locations where adequate general lighting (e.g., floodlights, light stanchions) is not provided.
- On Coast Guard certified vessels, Type IV PFDs are required to have automatic floating electric water lights: on all other floating barges or plants, at least one life ring, and every third one thereafter, shall have an automatic floating electric water light attached.

6.3 Waders

- Waders are worn by many HDR personnel to prevent immersion of their lower body in water when performing field sampling or collection activities. There are many different types of waders which can be used to coincide with field conditions. Please check with project manager's to see what the minimum standard is for each respective project. Various types of waders used within HDR are as follows:
- **Hip Waders –** Hip Waders are one-piece waders that cover the legs to the hips and generally come equipped with straps that attach to the belt or belt loops to keep the waders in place during work. Best used in slow or still water conditions; if the work is in areas of varying water conditions and levels hip waders may not be appropriate, as they can fill with water when exposed to waves or splashes, etc.
- **Chest Waders –** Chest Waders typically have shoulder straps and waist belts and typically extend to the users' upper chest. These are a more appropriate choice when working in varying or rough water conditions. Chest waders also come in a variety of materials.
- **Rubber Waders** – Typically booted waders constructed of outer rubber and interior cloth materials. These waders can be worn in various conditions with appropriate layering or undergarments, but can cause problems by retaining moisture. While readily available and offering a variety of insulation levels, tear resistant coatings, etc., rubber waders do not breathe well and may initiate heat or cold stress related problems (For more info, refer to Procedures # 28 – *Heat Stress*, and # 29 – *Cold Stress*).
- **Breathable Waders** – Typically made from synthetic materials such as Gortex which allow perspiration and moisture to pass through the material while keeping the ambient water out. For working in conditions where high

temperatures are a concern or there is potential for overheating, these may be a good choice. Most are lightweight and **not recommended for work in cold water or climates**.

- **Neoprene Waders** - Appropriate when working in cold water conditions to help prevent exposure or possible hypothermia. Neoprene waders also provide extra buoyancy if the wearer slips and falls into the water.

The critical selection factors are that the wader be appropriate both seasonally and regionally, and be comfortable for the user. Some project work may necessitate that two sets of waters be acquired - e.g., rubber and either neoprene or breathable, for use depending on temperature of water and climate changes.

The use of appropriate waders cannot be stressed too much – the weather, water conditions and task should drive this selection, NOT just what is currently available in the supply cabinet.

6.3.1 Wader Belts

Most waders are belted to provide an extra barrier if a fall in the water should occur. Always use the provided belt to reduce the risk of taking on water which will add extra weight, and in rapid water can increase the risk of drowning. If work is being conducted in water where a drowning hazard is present, a Type III or V PFD is required, as described in Table 6.1.

6.3.2 Wader Soles - Footing

Another consideration when choosing waders is whether to purchase ones designed with felt soles or not. Felt soles aid in the prevention of slipping or falling when working on slippery surfaces such as rocks. However, felt soles are not good in very cold water, as they become frozen and hard – rubber soles provide better traction. Discuss site conditions with PM during project safety guide development to determine which soles are necessary. Some felt soled waders are studded, which provide additional traction when working in very slippery stream conditions (round rock, algae, fast flow, etc.) or winter work when ice is present.

Tip - Typically, rubber waders designed with a formed foot are not felt soled.

6.4 Safety Blocks

- At navigation locks, docks, wharves or other shoreline installations where the movement of docked vessels presents a hazard to overboard employees, safety blocks should be available. These are quickly thrown

into the water to protect employees who have fallen into the water from being crushed by the wave movement of docked vessels. If the use of blocks is found unacceptable, alternative safety measures (positive fall protection, barriers) shall be developed.

6.5 Additional Personal Protective Equipment

- Hard Hats must be worn in specified areas, including plant sites and all boats equipped with boom and masts that are in use for towing equipment, and any other areas specified by the supervisor or designated Crew Chief.
- Safety Glasses or Goggles must be worn if exposure exists from formalin or other chemicals used in the field/on board vessels.

7.0 BOAT EQUIPMENT

Many items of equipment are required for safe boat operation. Some are needed to meet legal requirements, others for safety in basic operations, or for the general comfort and health of the crew. HDR considers compasses, depth finders, radar, GPS, charts, cellular phones and basic boating equipment as safety equipment. Without such items, accidents could easily occur.

- When mounting radar equipment, note that a “safety distance” of ~3 feet must be maintained when the apparatus is in operation.

These basic items of required equipment, and the quantities required of each depend upon the size class of the vessel, the type of boating activities, the particular water body and other factors (e.g., the amount of electrical power available on board, work operations, and required professional gear).

8.0 SAFETY/RESCUE SKIFFS

- Where HDR employees work over or immediately adjacent to water that presents a drowning hazard (i.e. inspections or work on bridges, piers, bulkheads, etc.), regardless of the fall protection employed, at least one skiff shall be immediately available for use in rescue. In quiet, indoor or protected locations like wastewater pools, an inflatable flat-bottomed boat may be substituted for a skiff, as long as it is equipped for rescue, and sufficiently stable so that rescue may be performed without fear of capsizing.
- Personnel trained in launching and operating the skiff shall be readily available at all times while project exposure to the water hazard exists.

- Skiffs shall be kept afloat or ready for instant launching.
- Required equipment must be on board and meet or exceed U.S. Coast Guard requirements. Skiffs shall be equipped as follows:

  (a) 4 oars (2 if the skiff is motor powered);
  (b) oarlocks attached to gunwales or the oars;
  (c) 1 ball-pointed boat hook;
  (d) 1 ring buoy with 90 feet of 3/8-inch solid braid polypropylene or equivalent line attached, and
  (e) PFD's in number equaling the skiff rating for the maximum number of personnel allowed on board.

- In locations where waters are rough, swift, or where manually operated boats are not practical, a powerboat suitable for the waters shall be provided and equipped for lifesaving.
- Skiffs and powerboats shall have flotation tanks or buoyant material capable of floating the boat and its equipment and the crew.
- All boats will use navigation and running lights during night operations on bodies of water where other watercraft may be encountered.
- On skiffs without permanently mounted navigation lights, portable battery-operated navigation lights will be available and used for night operations.

9.0 COFFERDAMS

Work within cofferdams may present a severe water hazard, since a sudden rupture can result in the employees becoming instantly inundated. When engaged in project activities using cofferdams within waterways, the following requirements apply:

- If overtopping of the cofferdams by high water is possible, provisions for controlled flooding of the work area must be designed into the system.
- If personnel or equipment are required or permitted on cofferdams, standard railings or equivalent protection shall be provided.
- At least two means of rapid exit shall be provided for personnel and equipment working on cofferdam walkways, bridges or ramps.
- A plan (including warning signals) for evacuation of personnel and equipment in case of emergency and for controlled flooding shall be developed and posted in the immediate project area.
- Cofferdams located close to navigable shipping channels shall be protected from vessels in transit.

10.0 WORK NEAR DAMS

Dams, which impound water flow, are typically of two types and present different hazards to boating operations. These two types are discussed below.

1. A *highhead dam*, which is a large structure, generally higher than 10 feet and frequently much higher, designed to impound large reservoirs usually for the purpose of power generation and/or flood control. Large dams are usually marked well ahead of the approach to the structure. These dams may have a lock channel to allow for passage of vessels from one pool elevation to the other during navigation (either higher → lower or lower → higher water elevations). Boat operations in the vicinity of dams should be limited to the approaches of the navigational channel. Boat operators, especially for small boats, should be aware and exercise caution in the area of locks due to turbulence, especially at the lower elevation, associated with lock operations.

   When working below dams, boat operators should be aware of the potential for rapidly rising or receding water levels associated with adjusting impoundment levels, electric generation or dam bypass activities. Recreational fishing is also frequently present in the area below dams.

2. The *low-head dam* is a man-made structure, typically constructed to back up water for a particular purpose. This structure pools water behind it as water flows over the crest to a lower elevation below the structure. Typically low-head dam structures span the entire width of a waterway and have a drop of less than 10 feet. This drop in the water creates a “hydraulic” which is a backwash immediately below the structure that traps and recirculates anything that floats or is neutrally buoyant.

The dangers associated with a low-head dam structure are very real and extreme. Often the approach from the upstream direction can be misleading to the boat operator as the water surface can appear smooth and even across the entire water body. A boat operating below the low-head dam that approaches too closely can be drawn into the turbulent water (hydraulic zone) where, due to the tumbling action, it could be trapped at the face of the dam or swamped. A boat operating above the low-head dam may be drawn over the dam by the force of the current flow and subjected to the same dangers associated with the hydraulic condition at the downstream face of the dam.

The following actions will help ensure the safety of boats and crew when working in the vicinity of dams:

- Know the water body in which the work is to be conducted; refer to navigational charts and other sources for the locations of any dams, etc.
- Avoid working in close proximity above or below any dam.
    - o If a hydraulic line has been established by the entity responsible for the low-head dam, crews will not enter this area to perform any work unless safety protocols, specific to the particular structure, have been established.
- If it is essential to work above any dam the boat must be equipped with a second source of power (engine) and both the primary and secondary engines will both be running in the event of an emergency.
- The boat will always carry an anchor of adequate size for the craft, with a chain rode and sufficient line (equal to three to five times the water depth) ready to deploy, with the other end of the line attached to the boat, in the event of an emergency.
- Cutting implements should be readily available on the boat to clear any line that might become fouled on the boat or engine.
- Never approach the face of a low-head dam from downstream.
- Never attempt a rescue from the face of a low-head dam without a safety line securely attached to a second boat facing downstream to pull the rescue boat out of the hydraulic zone.

11.0 FLOATING BARGES

Whenever HDR personnel must work on, or travel on floating barges, the following requirements apply:

11.1 Access

- Ramps for access of vehicles to or between barges shall be of adequate strength, provided with sideboards, well maintained and properly secured.
- Unless employees can step safely to or from the wharf, float, barge or river towboat, either a ramp, or a safe walkway shall be provided.
- Jacob's ladders shall be of the double rung or flat tread type. Prior to using, grab the rope lines and tug. They must be securely fastened at the top. Look at each of the rungs. They should be well maintained, with no visible cracks or defects.
- A Jacob's ladder must either hang without slack from its lashings or be pulled up entirely.

- When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.
- Obstructions shall not be laid on or across the gangway.
- The means of access shall be adequately illuminated for its full length.
- The means of access shall not pass over employees' heads, if possible.

11.2 Working Surfaces of Barges

- Employees shall not be permitted to walk along the sides of barges with coamings more than 5 feet high, unless there is a 3-foot clear walkway, or a grab rail, or a taut hand line is provided.
- The deck and other working surfaces shall be maintained in a safe condition.
- HDR employees should not walk fore and aft, over, or around deckloads, unless there is a clear aisleway. Never climb over deckloads.
- If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 vertical inches of bulwark, rail, coaming, or other protection exists, all HDR employees must be provided with a suitable means of protection against falling from the deckload.

11.3 First-Aid and Lifesaving Equipment

- A first aid kit shall be available on the barge.
- OSHA requires that in the vicinity of each barge in use, there be at least one U.S. Coast Guard-approved 30-inch ring buoy with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the HDR employee should request the barge owner/renter/operator furnish it during the time the HDR employee is working on the barge.
- HDR employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved Type III or V PFDs.

12.0 TRAWLING ACTIVITIES

For any survey that requires the towing of sampling equipment off the stern of a boat that is greater than 20 ft. in length and on bodies of water where other traffic may be encountered, HDR follows the procedures outlined in the United States Code – Title 33 Navigation and Navigable Waters – Chapter 34 Inland Navigational Rules – Subchapter I Rules – Part C Lights and Shapes –

Section 2026 Fishing Vessels (Rule 26). The following guidelines for trawling activities are outlined in this rule and must be followed:

- A vessel (greater than 20 ft. yet less than 150 feet), when engaged in trawling (i.e., the dragging through the water of a dredge, net, or other apparatus used as a fishing appliance), shall exhibit:
  - Two all-around lights in a vertical line, the upper being green and the lower white to indicate that gear is in tow at night, or a shape consisting of two cones with their apexes together in a vertical line one above the other to indicate that gear is in tow during daylight hours.

13.0 LARGE CRAFT SAFETY PROCEDURES

This section presents information applicable to the operation of large open water craft (e.g., powered boats designed for use in large open lakes/estuaries/rivers or coastal salt water operations), used primarily in the HDR New York and Alaska departments. Job titles used herein have been adopted by these organizations.

13.1 Boat inspection checklists

There are two ways in which the condition of each HDR boat is inspected for safety:

13.1.1 The Facility Safety Officer or their designee will visually inspect the boat on a quarterly basis and review the boat's maintenance records and incident sheets.

- The Facility Safety Officer will review the Crew Chief Reports before making the quarterly visual inspection. Each boat will be inspected, keeping in mind any safety incidents that have occurred during the period, and checked to see that all deficiencies have been corrected.

13.1.2 The Warehouse Coordinator (or someone assigned the responsibilities of boat maintenance) will check it once a month.

13.1.3 Each time a boat is taken out the Crew Chief will visually inspect it's condition;

- At the beginning of each survey, the Crew Chief will visually inspect the boat for the condition and/or presence of the following:

- Sufficient fuel
- Oil
- Transmission fluid
- Engine coolant
- Fire extinguishers
- Marine Radio
- Tool kit
- Properly functioning navigational lights
- Sheath knife
- Oars/paddles (outboards)
- Boat hook
- Properly functioning depth finder
- First aid kit and blanket
- Distress equipment (flares and flags)
- Mast and boom rigging (if applicable)
- General condition (cleanliness, orderliness, etc.)
- Life raft (if applicable)
- PFDs

▪ The Crew Chief will notify the Warehouse Coordinator or Field Supervisor of any problems and will make sure the boat is in good operating condition before the survey is initiated. The Crew Chief will record the results of this inspection, along with any mishaps or malfunctions that occur during a field activity, on a Crew Chief Report Form and submit a copy to the Warehouse Coordinator.

13.2 Marine Radio

Marine radios transmit along VHF/FM frequencies and are much more reliable than Citizen's Band (CB) radios. In addition to this more advanced technology, Marine Radios have designated channels that are monitored 24/7. Channel 16 is the international channel for all distress calls.

How to Call for Help:

- Makes sure you radio is transmitting on Channel 16
- **If you are in distress:**
  - Call "MAYDAY, MAYDAY, MAYDAY"
- If you are not in distress:
  - Call "Coast Guard"

What to Tell the Coast Guard:

- Your location or position
- Exact nature of the problem or emergency
- Number of people on board
- Your boat's name, registration, and description
- Safety equipment on board

When to Call Back:

- A medical emergency develops
- A storm approaches
- Your boat begins to take on water
- Your last reported position changes

The following are some useful Channels to know, the most important of which is: **CHANNEL 16 VHF/FM 2182 khz HF/SSB** for international distress, safety and calling.

Channel Number	Ship Transmit MHz	Ship Receive MHz	Use
6	156.300	156.300	Intership Safety
07A	156.350	156.350	Commercial
9	156.450	156.450	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	Commercial
13	156.650	156.650	Intership Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in US waters.
16	156.800	156.800	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
21A	157.050	157.050	U.S. Coast Guard only
22A	157.100	157.100	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.

13.3 Winter Operations

Decisions to cancel a field operation due to severe weather conditions will be based on information provided to the Field Supervisor by the Crew Chief.

Crews must be prepared to work in cold temperatures, and should have the following cold weather gear available:

- Insulated under clothing (multiple layers are recommended)

- Survival coat or suit
- Hooded jacket
- Insulated socks and gloves
- Insulated boots, waders, hip boots

Frostbite and hypothermia are the two most serious safety problems during the cold weather. (Refer to HDR H&S Procedure 29 “Cold Stress.”)

Workloads for crews using boats with outboard engines and little protection from the weather should be designed with weather conditions in mind. The crew on boats will not be expected to complete the same amount of work performed under ideal conditions. The Crew Chief will have to assess the weather conditions (wind, precipitation, temperature etc.) before initiating a field survey.

The Crew Chief/Captain will make the final decision as to whether a survey (i.e., trawls, seines, larval tows, water quality, etc.) is canceled due to weather.

14.0 EMERGENCY PROCEDURES

14.1 Person Overboard

Falls overboard account for a large percentage of annual boating injuries and deaths. In most of the cases documented, had the person falling overboard been wearing a life jacket, he/she would have survived.

The following procedures will be followed for “person overboard” rescues:

1. When a person falls overboard, the boat operator should take the boat out of gear (e.g., transmission placed in neutral) and look for the person.
2. After determining location of the person, approach the area against the current so the boat will not drift over the person in the water. Stop the boat when the person is within reach of a boat hook or life ring. He/she should be brought immediately into the boat.
3. If the person in the water is injured or unconscious, the victim should be lifted into the boat with great care.
4. No one will deliberately enter the water during person overboard rescues. If the victim is unconscious or injured, and cannot be otherwise retrieved into the boat, the Crew Chief or a volunteer from the crew may go overboard with a safety line tied to the boat in order to retrieve the victim.
5. First aid should be ready for the victim as he/she may be suffering from shock, exposure or suffocation. Emergency medical aid may be obtained

by placing a MAYDAY distress call on the marine radio or, if available, by calling 911 on a cellular phone.

14.2 Missing Person Overboard

When it is noticed that a crew member is missing, it must be assumed that he or she has fallen overboard. The following procedures must be followed:

1. The boat crew will determine when and where the missing crew member was last seen, and, with the aid of compass and charts, retrace their course to that point.
2. While the initial search is being conducted, a radio call will be placed to the U.S. Coast Guard to "stand by" and then to the field supervisor to advise of the situation. If after 5 min of searching the missing person has not been found, the Coast Guard must be contacted for search and rescue aid.
3. Until a formal Rescue Director from the Coast Guard or local rescue facility arrives, the Crew Chief will retain command of all rescue operations.

A person remaining in water colder than **70°F (21°C)** for any length of time will be suffering from exposure and the Crew Chief should be prepared to rescue an unconscious or immobile person. Immediate emergency medical aid must be ready in case the person in the water is in an advanced stage of hypothermia.

14.3 Fire Aboard

There is little that can be done to put out a boat fire unless it is detected in its very early stages. Fire extinguishers are on board all boats. Dry-powder A/B/C type extinguishers should be turned over and shaken frequently, as boat vibration tends to cake the powder. If possible, the fire department or other emergency services should be notified of any fire. If fire spreads to the vicinity of a fuel tank, the crew must **abandon ship** rapidly.

The person discovering the fire will yell, "FIRE ABOARD" and describe its location and intensity. The following procedures will be implemented in the event of a boat fire:

1. To control fire:

    a. Cut off air supply to fire - close hatches, ports, doors, ventilators, etc.

b. Immediately spray portable fire extinguishers at the base of the flames for combustible materials, flammable liquids or electrical fires OR apply water for fires in ordinary combustible materials.
c. If fire is in machinery space, shut off fuel supply and ventilation.
d. Maneuver vessel to minimize effect of wind on fire.

2. If the fire cannot be rapidly extinguished, the Crew Chief should:

   a. Direct the crew to prepare to abandon ship;
   b. Send a MAYDAY distress call on the marine radio;
   c. On gasoline-powered outboards and inboards, the abandon ship call will be made whenever open flames are apparent;
   d. On diesel-powered inboards, the crew will abandon ship, following the direction of the Crew Chief, as soon as it becomes apparent the fire cannot be contained, or reaches the vicinity of fuel lines or tanks.

3. In all cases where a boat is abandoned due to fire aboard, it is the Crew Chief's responsibility to see that all crew members are off the boat before he/she leaves (see also the section on Abandon Ship below).

14.4 Abandon Ship

The situations that could lead to abandoning ship include collision with another vessel or fixed object, running aground, being holed by ice or floating debris, capsizing or swamping in high winds or seas, and fire aboard. **Abandon ship is the most serious of all emergencies on the water**.

The procedures used in abandon ship situations vary with the condition and location of the boat and with the weather. For example, do not attempt to stay aboard a gasoline-powered outboard on fire; however, an outboard swamped by high seas will probably float if it is wood or has built-in flotation. In the latter situation, do not abandon ship.

Once the decision to abandon ship is made by the Crew Chief, his instructions must be carefully followed.

In case of collision with another vessel, fixed object, ice, or floating debris in deep water, the Crew Chief will:

1. Ascertain if any of the crew has been injured.
   a. If one or more crew members have been injured, direct the remaining crew members to administer first aid and ensure the victims' life jackets are secured properly.

2. Determine the extent of damage to the vessel.
   a. Examine hull for holes and/or leaks and, if water is entering the hull, turn on the bilge pump.
   b. If water is entering the hull, estimate the length of time the boat can stay afloat and whether emergency repairs can be made.

If water is entering the hull at a slow rate and the boat is operable:

1. Head for the nearest docking area after the injured have been secured.
2. While heading for the docking area, instruct crew members to launch the life raft if the boat appears to be sinking before it reaches a docking area.
3. Detail a crew member to act as lookout and use flares or other distress signals as required, to signal any passing vessel to act as escort.
4. Place a MAYDAY distress call and inform the Coast Guard of the situation and the intended course of action.
5. If the boat appears to be sinking and land is near, consider GENTLY running the boat aground to prevent sinking.

If the boat is filling rapidly:

1. Initiate abandon ship procedures immediately.
2. Direct two crew members to release and launch the life raft.
3. Place a MAYDAY distress call on the marine radio.
4. Give the order to abandon ship, being certain that injured crew members are placed in the life raft first, and that all crew are in the life raft before leaving boat.
5. Once in the life raft, direct one crew member to act as lookout and use flares or other distress signals to signal any passing vessel for aid.
6. Administer or have first aid administered to any injured crew members and pick up survivors in the water.

14.5 Running aground

The Crew Chief will:

1. Ascertain whether any of the crew has been injured and, if so, have first aid administered.
2. Examine the boat for damage or influx of water.
3. If the boat is not taking on water and does not have any holes that would be submerged when the boat is re-floated, attempt to unground.

   a. If the boat is aground by the bow (facing forward) and the nearest deep water is astern, cast a light anchor as far astern as possible.

b. While the stern anchor rope is being pulled with a winch, attempt to back the boat into deep water. A close watch will be kept on the engine temperature as the cooling water intake may be blocked. Moving all equipment and crew weight to the stern may aid in ungrounding.
c. If the boat does not unground, determine whether the tide is rising or falling (in tidal areas). If the tide is rising, leave an anchor astern to prevent the boat from being driven further aground, and inform the laboratory of the situation by marine radio or cellular phone.
d. If the boat runs aground at high tide, the assistance of another vessel will probably be required to re-float it.

4. If the boat is taking on water, no attempt to unground should be made unless the hole or leaks have been blocked.

   a. Cast a light anchor as far off the bow as possible to prevent the boat from being ungrounded by wind, wave or tidal action.
   b. If the boat will rest on the bottom with the superstructure above water after sinking, direct the crew to prepare to abandon ship, but do not execute this operation unless waves are sweeping the boat or the boat capsizes.
   c. Direct two crew members to release, inflate, and launch the life raft. Direct the remaining crew members to assist in the launch if needed.
   d. Make a MAYDAY distress call on the marine radio, and proceed as directed by Coast Guard authorities. However, decide whether or not to abandon ship, as conditions require. When the decision to abandon ship is made, notify the Coast Guard.
   e. It is likely that, having abandoned ship, the boat crew in the life raft will quickly be washed or blown ashore. They should be prepared for a rough landing. Alternatively, consider remaining moored to the boat until help arrives.

14.6 Swamping or capsizing.

If the engine or steering fails in high seas, the boat is in danger of swamping or capsizing. In such cases, the Crew Chief will:

1. Immediately deploy an anchor.
2. Ensure that all crew's life jackets are secured properly.
3. Detail two crew members to be ready to launch the life raft when directed.
4. Place a call to the U.S. Coast Guard on the marine radio. If the situation deteriorates, a MAYDAY call will be made.

5. If the boat starts to take on more water than can be cleared with the bilge pumps, the life raft should be launched and a MAYDAY distress call made.
6. Order, “abandon ship” when it becomes obvious the boat will sink shortly. Prior to leaving the boat, make a MAYDAY distress call.

14.7 Operational breakdowns

There are two important operational breakdowns that have been experienced by HDR field crews:

1. Fouling of a boat's propeller with ropes or nets,
2. Snagging of gear on obstructions on the bottom of a river or lake.

Any attempt to correct the situation must be supervised by the Crew Chief and his/her instructions must be followed. Consideration will be given to the season, location, current, and turbidity of water.

14.8 Storms

Boating storm response is dependent on the gear and vessel type and size that will be utilized, the water environment and other locale factors. Updated weather forecasts must also be utilized in order to properly access the incoming weather and related hazards, and to plan appropriate actions. The following inclement weather procedures should be implemented as applicable:

14.9 Electrical Storms

If caught "unaware" in an electrical storm, the following precautions must be taken:

1. Individuals should remain inside a closed boat as much as practicable during an electrical storm;
2. Persons should avoid making contact with any items connected to a lightning protective conductor, especially in such a way as to bridge between two parts of the grounding system. For example, it is undesirable to touch either the reverse lever or spotlight control, particularly in contact with both at the same time;
3. In an open boat, immediately motor to the nearest shore, secure boat and get out of it. Move away from the water. Seek safe shelter;
4. No one should be in the water during a lightning storm.

14.10 Tornados

In the event of tornado warnings, all boats should attempt to return to shore as soon as possible. Once on shore, if possible get inside a building. If shelter is not available or there is no time to get indoors, lie in a ditch or low-lying area or crouch near a strong building.

14.11 Injuries and Medical Emergencies

By its very nature, there is a possibility of injuries or medical emergencies in field work. A small work boat cannot carry the amount of medical equipment or trained personnel needed to deal with the range of medical emergencies that may be encountered.

A well-prepared first aid kit, a marine radio, crew members with basic first aid training, and pre-arrangements with local ambulance services are provided. (An optional cellular phone could be used to contact local emergency personnel.)

Most medical emergencies will be self-evident, but some have mild symptoms. The Crew Chief or first aid provider should be on the lookout for the following:

- Shock
- Chemicals in eyes
- Advanced stages of hypothermia
- Frostbite
- Early stages of heart attack
- Heat exhaustion
- Back injuries

The Crew Chief will have personnel with the above injuries taken to a hospital immediately. An ambulance can be obtained by making a marine radio call through the local marine operator or calling 911 on a cellular telephone.

If a marine operator cannot be reached, a medical safety call should be made. The Coast Guard should be informed of the situation and asked if they can arrange to have an ambulance sent to the location where the boat will be docking.

If the boat cannot reach shore for medical aid, a MAYDAY distress call should be made on the marine radio.

The following must be adhered to:

- Every boat shall be equipped with a moisture-tight, portable first aid kit.
- Crew members must report to their Crew Chief all injuries and any first aid treatment received.

15.0 TRAINING AND RECORDS RETENTION

- Each HDR employee who is subject to water hazards will be provided awareness level training on the applicable contents of this Procedure and the use of PFDs. Training shall be provided by the **OSC** or other designated employee who, through experience and/or past training, has the necessary water safety knowledge and skills. The training session must include a demonstration of the correct way to don a life vest, and the importance of pre-use inspection. It is the responsibility of the **Project Manager** to identify affected project personnel, and to verify they have received this training through coordination with their OSC. The training will be documented, and record of this training will be maintained in the local office, and a copy forwarded to HDR Corporate Safety for retention.
- Crew Chiefs who are responsible for operation of boats will be expected to participate in a Coast Guard or Power Squadron Safe Boating Program.

HEATHER M II HYDRAULIC SYSTEMS STANDARD OPERATING PROCEDURES

INTRODUCTION:

- The Heather M II is a 42' fiberglass Bruno & Stillman lobster style boat. She is rigged as an inshore trawler with a mast, steel A-frame and gantry. A hydraulic system comprised of two deck mounted winches located aft of the main mast on the forward portion of the work deck and a dual head capstan located at the base of the main mast immediately forward of the winches provide mechanical lifting, etc. capabilities for the deployment and retrieval of various types of sampling gear.
- The winches and capstan are driven by a hydraulic pump coupled to the forward end of the vessels engine, a Detroit Diesel 671, via a power take off (PTO). A steel hydraulic fluid reservoir, holding approximately 20 gallons of hydraulic oil, is located just forward of the engine hatch, immediately aft of the dashboard. A spool valve, located below the helm, controls the flow of hydraulic fluid to the winches and capstan. The hydraulic systems are controlled and operated, after the PTO clutch is engaged, via several valves and levers which will be described under each section below.
- The following descriptions provide general operational guidelines for the hydraulic systems on the Heather M II.
- **NOTE:** DO NOT OPERATE THE VESSEL HYDRAULICS without first reading this document and receiving a "hands-on" demonstration and training on the equipment, controls and proper use by one of the senior Crew Chiefs.

POWER TAKE OFF (PTO):

- The PTO, engaged via a lever located below-deck (down stairs and mid-ship) at the forward end of the engine (on the port side) activates the hydraulic systems of the boat, i.e. the port & starboard winches and capstan. The PTO lever is pulled "up" to engage the system, and pushed "down" to disengage the system. The lever is coupled to an aluminum arm which extends upward to the main deck. This arm allows the PTO clutch to be engaged and disengaged from the cabin without having to go below deck. T**he PTO clutch must only be engaged or disengaged when engine is at idle.** Failure to wait for the engine RPM to drop to idle will cause damage to the PTO clutch and/or engine. The PTO should only be engaged when using the winches or capstan, i.e. deploying or retrieving gear and should be disengaged (in the down position) when transiting between stations or running to and from port.

Failure to follow this protocol can result in excessive wear and damage to the PTO and engine.

WINCHES:

- The two winches are located on the forward portion of the work deck, aft of the main mast, with one to the port and one to the starboard side of mid-ships. Each winch drum is ~12" in diameter and ~7" wide and is loaded with approximately 600' of ¼" diameter 7x19 wire rope (cable or tow cable). Each winch has its own hydraulic valve; located below control lever on the forward side of winch, control lever; located above hydraulic valve on the forward side of winch and a brake handle. The two winches can be operated independently of each other or simultaneously.

Winch Operations:

1. **Deployment Of Gear Requiring PTO Control**:

   - This includes IP sleds, clam dredges and other gear of insufficient weight to pull cable from the winches during free-spool deployment.
   - All rigging associated with the operation of the winches, i.e. cable, blocks, booms, etc. should be inspected prior to use.
   - Gear to be deployed is set-up and ready for deployment.
   - Check to make sure brakes are set on both winches.
   - Check ALL winch and capstan control levers for "neutral" status before engaging PTO.
   - Activation of the vessels hydraulic systems is done only after the captain signifies to do so.
   - PTO must then be pulled up (on) to engage the hydraulic pump and activate the hydraulic system. **Note: The crew member operating the winches should not leave the winch control station while the winch is "active."**
   - The appropriate winch control valve is opened;
   - Winch control valve should be in the "on"/"off" position as follows:
     - Port winch valve handle horizontal to deck – winch operational
     - Port winch valve handle vertical to deck – winch off with drum in free spool
     - Starboard winch handle vertical to deck – winch operational
     - Starboard winch valve handle horizontal to deck – winch off with drum in free spool

- The brake is then released by pulling the handle toward the operator (forward). **Note:** the brake should be released before activating the control lever to avoid stalling the vessel's engine.
- Gear is deployed from the vessel; the winch control lever is pushed away from operator (toward the stern of the vessel) to power cable out from the drum. Speed of winch drum (deployment) is controlled by how far the control lever is pushed away from the neutral position.
- After the requisite amount of wire rope has been deployed for the specific gear type, the control lever is returned to the neutral position and the brake is applied until it locks in place.
- The PTO is then disengaged (pushed back down to the off position) for the duration of the gear deployment.

2. Deployment Of Gear Not Requiring PTO Control:

- This includes Bottom Trawls, Smith-McIntyre Dredge grabs, Tucker Trawls and other gear types heavy enough to pull cable from winch drums during free spool.
- Gear to be deployed is set-up and ready for deployment.
- Check to make sure brakes are set on both winches.
- Check ALL winch and capstan control handles (levers) for "neutral" status before engaging PTO.
- Activation of the vessels hydraulic systems is done only after the captain signifies to do so. **Note: The crew member operating the winch should not leave the winch control station while the winch is "active."**
- The brake is then released by pulling the handle toward the operator (forward).
- Gear is deployed, and the control lever is pushed away from operator (toward the stern of the vessel) to release cable from the drum. **Note:** because the PTO is not engaged, speed of cable deployment is controlled by the forward speed of the vessel and use of the brake.
- After the requisite amount of cable has been deployed, the control lever is returned to the neutral position, and the brake is applied until it locks in place.

3. Winch Retrieval:

- All gear types.
- Before engaging the PTO, check all control levers for neutral position, and make sure brake is applied on both winches.

- After the vessel has returned to idle speed, and the captain gives the OK, the PTO lever is engaged (pulled up) to activate the PTO.).**Note: The crew member operating the winch should not leave the winch control station while the winch is "active."**
- The appropriate winch control valve is opened.
- Winch control valve should be in the "on"/"off" position as follows:

    - Port winch valve handle horizontal to deck – winch operational
    - Port winch valve handle vertical to deck – winch off with drum in free spool
    - Starboard winch handle vertical to deck – winch operational
    - Starboard winch valve handle horizontal to deck – winch off with drum in free spool

- The brake is released slowly, and then the control lever is moved toward the operator (forward) to start recovery of the cable onto the winch drum (retrieval). Speed of recovery is controlled by the extent to which the control lever is pulled back or pushed forward.
- **Note**: It may become necessary, should wire rope begin to load unevenly onto the winch drum, to have a crew member deflect the cable to the opposite side of the drum. This is to be done ONLY by pushing/pulling against the cable (away from where cable loads onto the drum) with open hands while wearing leather/rubber coated gloves. Crew members' hands should never be closed around the cable, nor should the cable be allowed to run across a stationary hand during deployment or retrieval of cable from a winch. If vessel traffic or space permits, the manner in which the cable loads onto the drum can be varied by having the captain turn the boat to port and/or starboard to keep the cable from overloading on one side of the drum.
- Once the gear nears the vessel, retrieval speed is slowed to ensure a safe, controlled retrieval of the gear onto the vessel.
- Once gear is secured on deck, the control lever is moved to the neutral position, the brake applied and the PTO is returned to the off position.

CAPSTAN:

- The capstan provides a superior mechanical advantage over the winches and is used to lift or manipulate heavy objects from the water or on the deck, i.e. recovery of a trawl net with a heavy catch at the stern of the vessel. It is used in conjunction with tackle, either trawl blocks or block

and tackle, located on the A-frame or one of the boat's two booms. The capstan and associated rigging should be inspected on a regular basis.

- The capstan is located on the aft of the main mast (actually attached to the mast) and immediately forward of the winches. Two "cat-head" drums, ~6" in diameter and ~6" wide, mounted horizontally on each side of the mechanism, rotate when activated by the control lever. The drums rotate clockwise or counterclockwise depending on the position of the control lever which is located on the starboard side of the mast above the capstan. The drums of the capstan can be used simultaneously or independent of each other.
- **Note**: The capacity of the capstan on the Heather M II is 2000 lbs; however,
- Captains, Crew Chiefs and crew should always be aware that the entire system, including all lines, rigging, blocks, booms, A-frame and other hardware, must be considered before commencing with a lifting operation.

Capstan Operation:

- All rigging associated with the operation of the capstan, i.e. booms, blocks, lines, etc. should be inspected prior to use. **Note**: only fibrous rope should be used on the capstan drums.
- The working line should be attached to the load, run through a block and led to the capstan drum before the PTO is engaged. **Note:** the working line should be of sufficient strength to handle the load to be lifted.
- Check ALL control levers for winches and capstan for "neutral" status before engaging PTO.
- After the engine RPM has returned to idle speed, and the captain gives the OK, the PTO lever is engaged (pulled up) to activate the PTO. **Note: The crew member operating the capstan should not leave the control station while the capstan is "active."**
- The capstan is activated by moving the control lever up or down to start the cat-head drum rotating. The speed of drum rotation is controlled by how far the control lever is moved from neutral; however, the capstan is designed for power and the drum does not rotate at a fast rate.
- The working line should be wrapped around the drum a minimum of three times, in the direction of drum rotation, starting from the inside portion of the drum and wrapping outward before tension is applied to the line. This allows excess line to be removed from the outside portion of the cat-head as it is retrieved.
- When the capstan's drum rotation is stopped, the line, while still wrapped around the drum, should be secured to the cleat on the mast above the

capstan until it is determined how to deal with the load at the working end of the line.

- To relieve a load on the working end of the line the capstan drum rotation can be slowly reversed or the tension on the retrieval line can be slowly eased off from the drum.
- When both drums are being used simultaneously it is possible to “float” the line on one drum (maintain without taking up or letting out line) while taking up line on the other drum. This is accomplished by very slowly reducing the tension on the line coming off the drum to the point where the drum rotates but does not retrieve additional line. This line should be secured when the capstan rotation is stopped.
- When the use of the capstan is no longer required the PTO should be disengaged.

AIRBOAT SPECIFIC PROTOCOLS

Unlike other boats, Airboat propulsion systems consist of an engine that powers a 6 foot diameter propeller mounted on the rear of the boat. In many ways, airboats are more similar to aircraft than regular boats with regard to both maintenance and safety considerations.

The following operational guidelines must always be followed:

1. Prior to every run, the “Pre-Flight Checklist” must be completed. This check includes fluid checks, visual inspection of the boat and propulsion system as well as pressure checks for various systems.
2. All personnel operating the airboat will go through a hands-on training period with another employee who is deemed to be a qualified trainer.
3. Always make sure there are no people or obstructions near (within 15 feet) the propeller before starting the airboat. Serious damage, injury or death can result if people or materials come in contact with the propeller when it is spinning.
4. The key must be OUT of the ignition unless there is someone in the driver’s seat.
5. The key must be OUT of the ignition if there is anyone working on or near the stern of the boat (as in an inspection, maintenance, etc.).
6. Operators and passengers on airboats must comply with the Hearing Conservation Program protocols set in place, as the airboats exceed the 85dB level for an 8-hour TWA.

1.0 OBJECTIVE

Each year, physical injuries due to common slips, trips and falls from the same level surface account for a significant percentage of all reportable accidents in the USA. Most of these accidents are preventable through proper housekeeping, correct walking surfaces and proper precautions. It is the objective of HDR to prevent injuries or "near misses" occurring from slip, trip, or fall hazards by the identification, elimination and/or control of these hazardous conditions.

2.0 PURPOSE

This procedure describes work practices that will reduce or eliminate slips, trips, and falls and thereby reduce or prevent the injuries associated with these types of accidents. The intent is to prevent injuries, maintain a safe workplace and a healthy workforce.

3.0 APPLICABILITY

The HDR Slip, Trip and Fall Prevention Program implemented in this Procedure applies to all HDR personnel at HDR client sites and at all HDR facilities working on horizontal surfaces. All employees, regardless of HDR Department, will be impacted by this program. Fall hazards due to climbing or working on elevated surfaces are addressed in the following HDR H&S Procedures: #12 – *Fall Protection*, and #2 – *Portable Ladders*.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC).

National Director of Safety. The Director of Safety shall:

- Periodically review, at least annually, the effectiveness of this program, identify any deficiencies, and ensure that they are corrected; and
- Assist OSCs and project professionals, as requested, in the implementation of this Procedure and regulatory interpretations.

Office Safety Coordinators. The OSCs shall:

- Provide initial training on this Procedure to their respective office staff, and make sure that this procedure is readily available in each office, and

- Interface with the Director of Safety regarding any unsafe office or project site conditions that have been discovered, and need addressing or interpretation.

5.0 REQUIREMENTS

The following requirements detail a number of rules and methods to prevent slips, trips, and falls. These requirements shall be implemented at all HDR offices where we control the physical environment. Employees should also be alert for these hazards at project sites, where the hazardous conditions are not usually created by HDR, nor even under our control. HDR employees at these sites should look for, and avoid, these potential hazards to prevent suffering an injury.

5.1 **General Housekeeping**. Personnel shall keep the working area clean and orderly. Tools must not be left lying on floors, walkways or decking where they present tripping hazards.

5.2 **Debris**. Small, loose items such as pop cans, rope, trash or other small objects and debris shall not be left lying around in any place, particularly in areas where personnel walk.

5.3 **Walkways and Grating**. Walkways and grating must be kept free of obstacles that could cause trips. Openings in walkways and grating are very hazardous and should never be left unattended – either close, repair or cover before leaving them. If not immediately repaired, the openings must be roped or barricaded off until corrected. Also be alert for raised portions of walkway surfaces, such as sidewalk section edges, which create trip hazards. If necessary, bank the raised portion with wood or sandbag to cover the abrupt raised edge and provide a gradual transition to the upper walkway surface.

5.4 **Access Points**. Access points or holes in gratings must be covered or surrounded by an adequate guard rail.

5.5 **Spills**. Oil spills, water (including ice cubes in break areas) and spills of other slippery materials must be cleaned up immediately. Tracking through even a small spill will significantly reduce the friction coefficient between your shoes and any hard floor material, making a slip more likely. Not only are oil spills a slip hazard, but combustible oils also present a fire hazard.

5.6 **Steel Decks**. Personnel shall take extra precautions when walking on steel decking or catwalks during wet weather, such as establishing firm hand holds, wearing suitable footwear, and walking slowly. If possible, spread sand across the flooring to increase traction.

5.7 **Jumping**. Personnel shall not jump from elevated places or the backs of trucks or equipment. Employees should also refrain from jumping laterally across any excavation, even a shallow one. If excessive width prevents a normal stepping motion, find another route of access.

5.8 **Tools**. Personnel using hand and mechanical tools must position themselves properly to avoid slipping, considering required leverage as well as anticipating likely consequences if the tool suddenly moves or gives way. This pre-planning becomes even more critical when working at heights.

5.9 **Climbing Surfaces**. Personnel shall not walk or climb on piping, valves, fittings, diagonal cross-bracing or any other equipment not designed as walking or climbing surfaces. When ascending ladders or fixed vertical stairs, do not carry tools, notebooks, etc. by hand – this is dangerous! Pre-plan prior to site arrival, and either place these items in a backpack/fanny pack, or else ascend to the upper working surface and then hoist them by means of a rope and bucket.

5.10 **Stairways, Walkovers, and Ramps**. Stairways, walkovers or ramps shall be installed where personnel must walk or step over equipment in the course of their normal duties. In client facilities where these crossovers exist, use them! In our office buildings, it is particularly important to keep stairways and landings clear of any obstacles. DO NOT USE STAIRWAYS OR LANDINGS AS STORAGE AREAS!

5.11 **Extension Cords**. Electrical extension cords and electrical wiring must be kept clear of walking and working areas and/or covered, elevated, buried or otherwise secured. Exposure to loose extension cords is one of the most common causes of trips in the office environment. (By definition, an extension cord is for temporary power only; it is not to be used as a substitute for permanent wiring.) If an extension cord must be left across a walkway, tape it in place or cover it with a non-conductive (e.g., rubberized) mat to prevent dislodgment.

5.12 **Winter Conditions**. Walking and working surfaces must be properly maintained during inclement winter weather. Ice on sidewalks/parking lots account for many falls. Either physically remove the ice, or apply a chemical de-icer to traveled pathways to remove the ice. As an immediate (but less effective) alternative, sand or cinders may be thrown over the ice to improve traction. Hard-packed snow can also reduce the traction of walkers and should be removed by physical or chemical means. **Never walk on any elevated surface (scaffold, outside fixed stairway, ladder) when ice is present**!

5.13 **Running**. Running is prohibited on job sites unless under emergency conditions.

5.14 **Lunch Areas**. Lunch areas should be kept clear of empty bottles, containers and papers. Trash receptacles should be provided and used.

5.15 **Lighting**. Adequate lighting allows employees to see potential obstructions and prevents many falls. Make sure that all halls, passageways and stairs have adequate illumination; replace all burned out bulbs or defective receptacles.

5.16 **Elevated Work Platforms**. When working on scaffolds, stairwells, unfinished floors or any area presenting restricted body movement, place all tools to one side/corner of the area to prevent stepping on or kicking them during site activities.

5.17 **Windy Conditions**. Be aware of the hazards when working in high winds. Sudden gusts can cause a loss of balance, or blow tools, papers, hardhats, etc., causing a distraction and corresponding quick body movement that could result in falls. When preparing for site activities in windy conditions, secure hardhats with chin straps and use notebooks that will hold papers securely, eliminating the distraction caused by flapping papers. Also, preplan each body movement, anticipating sudden gusts and their effects on your body.

6.0 FALL PROTECTION

Fall hazards of 4 feet or more should be evaluated to determine what fall preventative steps might be implemented. Fall protection is required at heights of 6 feet or greater. This rule also applies if walking/stepping across an excavation 6 feet or deeper. Reference HDR H&S Pro #12 – *Fall Protection*, for more information.

1.0 OBJECTIVE

Many operations and equipment encountered at project sites produce noise. Exposure to prolonged excessive levels of noise can result in a permanent loss of hearing acuity, development of tinnitus (i.e., ringing of the ears), a possible increase in blood pressure, and stress-related problems. Noise may also cause difficulty in communicating or working effectively and safely. It is the objective of HDR to provide proper training, protective equipment, and (if necessary) audiometric monitoring to prevent permanent and temporary occupational hearing loss resulting from noise exposure.

2.0 PURPOSE

The purpose of this information is to assist HDR employees in recognizing and avoiding noise hazards encountered at project work sites, thereby preventing hearing loss due to workplace noise exposures. It is the goal of this HDR Noise program to prevent employees from being subjected to noise exposures in excess of 85 dBA, as a daily, time-weighted average.

3.0 APPLICABILITY

This Procedure applies to occupational exposure to noise hazards and applies to all HDR personnel at HDR client sites and at HDR facilities. Depending on assigned tasks, all employees, regardless of HDR Department, may be impacted by this program. The standards set forth in this procedure for preventing hearing loss are based on OSHA 29 CFR 1910.95, 29 CFR 1926.52 and the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygienists (ACGIH).

4.0 PROGRAM IMPLEMENTATION

This plan will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC) and project-specific Site Health and Safety Officer.

National Director of Safety. The Director of Safety shall:

- Periodically review, at least annually, the effectiveness of this program, identify any deficiencies, and ensure that they are corrected; and
- Assist OSCs and project professionals, as requested, in the implementation of this Procedure and regulatory interpretations.

Office Safety Coordinators (OSCs) and Site Health and Safety Officers (HSOs). The OSCs and HSOs shall:

- Provide initial training on this Procedure to their respective office staff, and make sure that this procedure is readily available in each office;
- Interface with the Director of Safety regarding any unsafe office or project site conditions that have been discovered, and need addressing or interpretation;
- Assist employees exposed to noise levels that exceed the Action Limit to become enrolled in the HDR Hearing Conservation Program, as outlined in this Procedure, and
- Enforce the use of hearing protectors where required.

5.0 DEFINITIONS

Action Level - A routine daily exposure to an 8-hour time-weighted average noise level in excess of 85 decibels, when measured with a dosimeter or sound-level meter on the A-scale at slow response. The action level is the criterion for instituting employee participation in the Hearing Conservation Program, which includes audiometric testing.

Administrative Control - Any procedure that limits the noise dose by limiting the time or intensity of exposure, such as changes in the work schedule, increasing the distance between the noise source and the worker, or reducing exposure time through job rotation.

Audiogram - Charts, graphs or tables that result from an audiometric test. An audiogram shows an individual's hearing threshold level as a function of frequency (Hz). The HDR Hearing Conservation Program consists of a baseline, or initial audiogram, and annual audiograms thereafter. Annual audiograms detect shifts in an individual's threshold of hearing by comparison to their baseline audiogram.

Decibel (dB) - A unit of measurement of sound-pressure level. The decibel level of a sound is related to the logarithm of the ratio of sound pressure to a reference pressure. The dB has meaning only when the reference is known. The internationally accepted reference pressure is 20 micropascals.

Decibels, A-Weighted (dBA) - A sound level reading in decibels made on the A- weighted network of a sound-level meter at slow response. The "A" scale mimics the auditory response of the human ear.

Decibels, Peak (dBP) - A unit used to express peak sound-pressure level of impact noise.

Engineering Control - Any mechanical device, barrier, enclosure, or other design procedure that permanently reduces the sound level at the source of noise generation, or along the path of travel.

Hertz (Hz) - A unit of measurement of frequency; equal to cycles per second.

Impact Noise - Variations in noise levels that involve peaks of intensity that occur at intervals greater than one second. If the noise peaks occur at intervals of one second or less, the noise is considered *continuous*.

Common project impact noises occur during drill rig auger hammering, hammer forge operations, sheet pile installation, etc.

"Loudness" – An individual's perception of the intensity of sound pressure level. Arbitrary and without scientific meaning.

Noise - Unwanted sound. Considered a physical contaminant.

Noise Dose - A measure of cumulative noise exposure over a stated period, which takes into account both the intensity of the sound and the duration of the exposure.

Noise Dosimeter - An electronic instrument that integrates cumulative noise exposure over time and yields a noise dose, expressed as a time-weighted average in decibels.

Noise Hazard Area - Any work area with a continuous noise level of 85 dBA or greater.

Representative Exposure - The measurements of an employee's noise dose, which is representative of the exposure of an employee in a work area or job classification.

Standard Threshold Shift (STS) - An average hearing threshold shift of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. A threshold shift can be temporary or permanent. *Temporary threshold shift* is a change in hearing threshold, primarily due to exposure to short-term, high-intensity noise, that is usually recovered in 14 to 72 hours after exposure ceases. Any loss that remains after an adequate recovery period is termed *permanent threshold shift*.

Sound-pressure level - The term used to identify the intensity of sound (expressed in decibels), commonly perceived as "loudness."

Sound-level meter (SLM) - An electronic, hand-held portable instrument used to measure sound pressure levels, conforming to the requirements for a Type II sound-level meter as specified in ANSI S1.4-1983. Battery powered, SLMs are used for area surveys, and to determine the sound pressure levels generated by specific point-source machines or processes. Yields instantaneous sound pressure readings; does not give time-weighted averages.

Time-Weighted Average (TWA) Sound Level - The accumulated, average sound level over a defined period, usually 8 hours. Thus it is normally referred to as an "8 hr TWA". OSHA standards for maximum permissible noise exposures are given in 8 hr TWA decibels. **OSHA requires that HDR employees exposed to an average, daily noise level of > 85 dBA (8 hr TWA) wear ear protection, and participate in our Hearing Conservation Program**. TWA integrated values are measured with a noise dosimeter.

6.0 CHARACTERISTICS OF SOUND

Sound is generated by the reception of airborne pressure waves caused by any vibrating source. The ear receives this mechanical energy, and transforms it to electrochemical impulses that are transmitted to the brain, resulting in the perception of sound. When exposed to high pressure levels for long periods of time, the receiving transmitters in the inner ear become deadened, resulting in a permanent reduction of hearing ability. **The intensity of sound pressure levels varies inversely with distance, so moving a short distance away from a source can greatly reduce the dose**.

7.0 REGULATORY NOISE LIMITS

7.1 Eight-hour, Time-weighted Average Exposure Limits.

The OSHA action level for an 8-hour, time-weighted average exposure is 85 decibels (dB) of sound pressure measured on the A-weighted scale (dBA). This means that if an employee's daily noise exposure level, averaged over 8 hours, exceeds 85 dBA, then they must be enrolled in a hearing conservation program, and must be provided hearing protection. For single exposures of shorter or longer duration, the exposure limit must be adjusted.

Since the functions of our project staff generally afford them the option of moving freely about the project site, there is no reason for HDR employees to ever be exposed to excessively loud noises for extended periods of time (one exception is when operating boats or motorized specialty vehicles, where we are required to remain at the point of noise generation). If a nearby process generates high noise levels, our employees should move a short distance away, until normal conversations can be understood (administrative control). This will preclude the possibility that we will receive noise doses in excess of

the OSHA Action Level. **Thus, because of the inherent mobility afforded most of our project personnel, it is our goal that employees never exceed the OSHA TWA Action Level of 85 dBA**. These OSHA limits are shown in Table 1.

Table 1

OSHA Action Level

Continuous Noise

Duration Per Day (Hours)		Action Level (dBA)*[1]
16		80
8		**85**
4		90
2		95
1		100[2]
0.5	(=30 minutes)	105
0.25	(=15 minutes)	110
0.125 or less	(< 7.5 minutes)	115

* Measured on the A-scale of a standard sound-level meter set at slow response.

Protection against the effects of noise exposure shall be provided at no cost to the employee, and must be worn, whenever sound levels exceed those in Table 1.

Whenever an employee's noise exposure equals or exceeds an eight-hour time-weighted average of 85 dBA, the employee shall be enrolled in HDR's Hearing Conservation Program. Elements of HDR's Hearing Conservation Program include audiometric testing and training.

[1] Note that every 5-decibel increase is a doubling of the sound pressure level, and therefore cuts the permissible exposure time in half. This 5 dB doubling value is termed the "exchange rate" and is admittedly imprecise; other countries use a 3 dB exchange rate.

[2] When continuous sound pressure levels exceed 100 dBA on a time weighted basis, both plugs AND muffs must be worn simultaneously. When both are worn, add 5 to the half-value NRR of the higher published NRR to obtain the combination protection afforded. For example, if the NRR for the plugs is 24 and the muffs is 20, then the actual reduction in noise decibels afforded is 24/2=12 + 5 = 17.

For purposes of the Hearing Conservation Program, employee noise exposures shall be computed without regard to any attenuation provided by the use of personal protective equipment.

7.2 Maximum & Impact Noise Limits

For practical purposes, exposure to continuous noise above 115 dBA for any length of time is not permitted unless hearing protection is worn. The maximum exposure limit for impact noise is 140 dB (measured on any scale).

7.3 Speech Interference and Annoying Noise

In some cases noise may not exceed standards established to protect hearing, but still interferes with speech or causes annoyance, either of which can reduce productivity. Although there are no mandatory standards for nuisance noise in the occupational setting, these guidelines and recommendations should be followed to protect employees from exposure to this type of noise.

Speech Interference

Most of the information conveyed through speech is in the mid-frequencies -- from about 500 to 2000 Hz. Thus, noise in these frequencies often interferes with speech recognition. Mid-frequency range levels below 50 dB are desirable in a typical conference room; those above 70 dB often present a problem in such settings. Background mid-range noise levels above 60 dB make telephone conversation difficult. If elimination and/or reduction of this noise is infeasible, ear protection designed to filter some of the noise in the mid-ranges may make speech easier to understand.

Annoying Noise

Noise may be annoying because of its level, frequency, or aspects of its modulation. A noise may not be very “loud”, but its frequency may be high enough to cause headaches in susceptible individuals. Alternatively, a noise may not be that loud but may start and stop suddenly. This can disturb concentration or frighten exposed personnel. Annoyance caused by irregular noises can sometimes be masked by running an appliance, such as a fan, that generates a low constant “white” noise.

8.0 CONTROL OF NOISE EXPOSURE

The three ways to reduce employee noise exposure are through the use of:

- Engineering controls - Best option

- Administrative controls - Good option
- Hearing protectors – Worn when other controls fail.

8.1 Engineering Controls

Engineering controls are defined as a permanent reduction in noise through any modification, insulation, isolation or replacement of the noise source. Examples include replacing old, noisy equipment; increasing sound dampening around equipment; or improving muffler design. Engineering controls should be formally considered before other types of controls are implemented. This is the best, and only permanent, option to eliminate the hazards posed by excessive noise. Unfortunately, HDR employees do not typically control noisy operations or mechanical noise sources, so we will rarely be able to implement engineering controls.

Any reduction in employee noise exposure is beneficial. However, if engineering controls are infeasible, or fail to reduce sound levels to within the limits of Table 1, administrative controls or usage of hearing-protective equipment must be used.

8.2 Administrative Controls

Administrative controls are changes in work schedules or operations to reduce the employees total noise dose. Common administrative controls include increasing the distance between the noise source and the worker, or reducing exposure time through job rotation. 2nd best option. **Because our workers are not tied to one project site location, this will be the easiest, inexpensive and most frequently implemented form of noise exposure control for HDR project personnel.**

In essence, implementing administrative control simply

means moving well away from the noise source!

8.3 Hearing Protectors

Hearing protectors should only be used as a last resort when engineering and administrative measures have been considered, and further protection is still needed. Hearing protection must be worn by HDR personnel when the workplace noise levels are:

- Greater than the Action Level(s) shown in Table 1 (continuous noise), or
- 120 + dB peak sound pressure level (impact noise)

Hearing protectors must reduce employee noise exposure, inside the ear, to a level of 85 dBA or below. Each hearing protector will state, on the package, a "noise-reduction rating" (NRR) number, which is the level of noise reduction (in decibels) the protector will provide if it is fitted and worn properly. The larger the NRR value, the better protection is afforded. In real practice, however, the advertised NRR is rarely achieved (especially for plugs), because of variability in workers ear canal size, improper installation, etc. Therefore, OSHA assigns a real-world attenuation value by dividing the advertised NRR rating in half. So a plug with an NRR of 24 would actually reduce the "noise level" inside the ear by 12 decibels. **HDR will use this "half-value" safety factor when determining the adequate protection needed.**

Although typically rated at lower NRR values, muffs (which can be attached to the hardhat) often provide superior protection to plugs, since there is less error in fitting and use. They also are more hygienic. HDR employees may select any plug or muff they prefer, as long as it has a sufficient NRR "half-value" rating to reduce the environmental noise below 85 dBA inside the ear. Plugs should carry a minimum rating of 24 (Half-value = 12 dB); good muffs will carry a rating of at least 20 (Half-Value = 10).

Types of Hearing Protective Devices (Ear PPE)

a. **Insert Type Earplugs**

Hearing protection is provided at no cost to HDR employees. These devices are designed to provide an air-tight seal with the ear canal. There are three types of insert earplugs - premolded, formable, and custom earplugs.

1. **Premolded Earplugs**

   Premolded earplugs are pliable devices of fixed proportions. These are available in two standard styles, single flange and triple flange, come in various sizes, and will fit most people. While premolded earplugs are reusable they may deteriorate, and should be replaced periodically.

2. **Formable Earplugs**

   Formable earplugs come in one standard size. Most are made of material which, after being compressed and inserted, expands to form a seal in the ear canal. After insertion, each earplug must be held in place while it expands enough to remain firmly seated. When properly inserted, they provide noise attenuation values that

are similar to those from correctly fitted premolded earplugs. These are typically considered disposable after one day's use; some manufacturers, however, may authorize longer periods of use.

3. **Custom Molded Earplugs**

   A small percentage of the population cannot be fitted with standard premolded or formable earplugs, due to small ear canals, ear injury, etc. In these cases, custom earplugs can be made to fit the exact size and shape of the individual's ear canal. These plugs are expensive, and muffs should be tried before ordering custom plugs. The HDR Director of Safety should be consulted prior to purchase. Individuals needing custom earplugs will be referred to an audiologist.

b. **Earmuffs**

Earmuffs are cup devices worn over both ears to reduce the level of noise that reaches the ear. Their effectiveness depends on an air-tight seal between the cushion and the head. Because of seal interference, large earrings should not be worn with muffs. Generally, earmuffs are more likely to be worn correctly than are earplugs; thus, the actual noise reduction provided by earmuffs in the field is closer to the stated value. Additional advantages are: (1) it is easier to verify that employees are wearing muffs in noise hazard areas than plugs, (2) muffs provide insulative protection in cold weather, and (3) it is easier to momentarily remove muffs to converse than to remove plugs, and more hygienic, since the user does not have to handle the skin-muff surface area.

One brand of muff highly recommended is Peltor™, available through safety catalogs, or from most local safety suppliers.

9.0 NOISE MONITORING

Noise is measured through the use of two instruments – **Sound Level Meters (SLM)** and **Noise Dosimeters**. SLMs are hand-held instruments that give an immediate reading of the noise at that instant of time. SLMs are used to survey an area or operation.

Dosimeters are worn on the hip with a wire running to a microphone that is clipped to an employee's shirt lapel. The dosimeter is usually worn all day, and will take readings each second, adding them to the sum total, and gives a cumulative average noise exposure value (dose) representing the period sampled (Any employee sampled must be notified of the results). Dosimeters incorporate all continuous, intermittent and impulsive sound levels from 80 to

130 dBA into the TWA dose value. These are used to determine personnel exposures, and to verify compliance with the limits presented in Table 1.

On construction sites, since project conditions change constantly, dosimeter personnel sampling is rarely performed. Potential noise levels are more frequently estimated by use of an SLM or by assuming overexposure, and enrolling project personnel in the HDR hearing conservation program.

As a general guideline, if employees are unable to converse with each other, in a normal tone and volume, at a distance of 3 feet or less, ambient noise levels will generally exceed 85 decibels.

10.0 MEDICAL SURVEILLANCE

NOTE: Employee noise exposure shall be determined without regard to any sound attenuation provided by the use of hearing protectors.

If any HDR employee is, or is expected to be, routinely occupationally exposed to continuous noise at or above the Action Level (regardless of whether ear protection is worn), the employee shall be enrolled in HDR's Hearing Conservation Program. The Hearing Conservation Program complies with the requirements of 29 CFR 1910.95 and includes:

- Annual education on the health effects of noise exposure and instructions on how to fit and wear hearing protectors;
- A baseline audiogram, and annual follow-up audiometric testing.

To enroll in the HDR Hearing Conservation Program, contact the Corporate Health & Safety Department.

The H&S Department will direct the employee to contact an approved clinic in the employee's locale. The employee shall receive initial information concerning the effects of noise, the purpose of audiometric testing, and a survey of any pre-existing medical conditions that may adversely impact the audiometric test. The employee shall provide information regarding their work history to document past noise exposures, and possible nonoccupational noise exposures.

The employee must have no apparent or suspected ear, nose, or throat problems that might compromise the validity of the audiogram. If an employee is determined to be suffering from an acute disease, which may compromise the validity of the test, the baseline audiogram will be delayed until the condition has abated.

When it is discovered that employees have been working where they encounter hazardous noise or incur exposures that exceed the Action Level and have not had a baseline audiogram, one shall be conducted within 30 days. The audiogram must follow at least 14 hours of no known exposure to sound levels in excess of 85 dBA. This "quiet time" interval will allow recovery from a noise-induced temporary threshold shift, should one have occurred.

Standard Threshold Shift - If any annual audiogram result indicates that a standard threshold shift has occurred, the affected employee shall be notified of this fact, in writing, within 21 days of the determination. A retest shall be conducted within 30 days of the first audiogram, with that result considered the annual audiogram. The physician may request further medical evaluation, and the affected employee shall be either removed from the high-noise environment or required to wear hearing protection.

Existing Ear Disease - Personnel who suffer from acute diseases of the ear shall not be placed in hazardous noise areas until the condition has abated, particularly if such diseases preclude the wearing of hearing protectors, cause hearing impairment, or produce tinnitus.

Exit Audiogram -All HDR employees participating in the Hearing Conservation program shall receive a final audiometric examination before termination of employment with HDR or after job changes that would alter noise exposure.

11.0 EMPLOYEE TRAINING

Each employee who participates in the Hearing Conservation Program shall receive annual training. The OSC is responsible for providing this training. This information may be presented through the use of videos, available from corporate safety. The training program will provide information about the adverse effects of noise; and how to prevent noise-induced hearing loss. At a minimum, all training will cover the following topics:

a. Noise-induced hearing loss;

b. Recognizing hazardous noise;

c. Symptoms of overexposure to hazardous noise;

d. Hearing protection devices - advantages and limitations;

e. Selection, fitting, use, and maintenance of ear PPE;

f. Explanation of noise measurement procedures;

g. Hearing conservation program requirements.

Employees will also be provided access, through our H&S Intranet site, to the OSHA noise standard (29 CFR 1910.95) and this Procedure.

HDR employees are also encouraged to use hearing protective devices when they are exposed to hazardous noise during activities at home; e.g., from lawn mowers, chain saws, etc.

12.0 RECORD KEEPING

Audiograms and noise-exposure records shall be maintained as a permanent part of employee medical records. If noise exposure measurement records are representative of the exposures of other employees participating in the Hearing Conservation Program, the range of noise levels, and the average noise dose will additionally be made a permanent part of the medical records of the other employees.

In addition to audiometric test data, each medical record will, at a minimum, identify:

- The audiometric reference level to which the audiometer was calibrated at the time of testing.
- The date of the last calibration of the audiometer.
- The name, the social security number, and job classification of the employee tested.
- The employee's most recent noise exposure assessment.
- The date(s) hearing conservation training was received.

Accurate records of the background sound-pressure levels in the audiometric test rooms, and data and information concerning calibration and repair of sound-measuring equipment and audiometers (as well as all audiometric test data) will be maintained for the duration of the affected employee's employment.

13.0 REFERENCES

1. Occupational Noise Exposure, 29 Code of Federal Regulations (CFR) 1910.95 [General Industry], and § 1926.52 [Construction].

2. American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices for Physical Agents in the Work Environment, Noise, current edition.

3. NIOSH, A Practical Guide to Effective Hearing Conservation Programs in the Workplace, September 1990.

4. Video, “Sound Advice: Hearing Conservation on the Jobsite”, HDR #0020.

1.0 OBJECTIVE

It is the objective of HDR, Inc. (HDR) to provide a comprehensive Medical Surveillance Program to evaluate the impact on employee health from exposure to noise and chemical hazards, and to ensure employees are physically capable of performing assigned tasks and safely utilizing Personal Protective Equipment (PPE).

2.0 PURPOSE

This procedure presents the HDR Medical Surveillance Program and conforms to the medical surveillance requirements of the various Occupational Safety and Health Administration (OSHA) standards that require pre-employment and routine medical examinations. The purpose of the HDR Medical Surveillance Program is to protect the health of HDR employees when potentially exposed to noise or chemical hazards, or physiological strain resulting from the wearing of PPE.

3.0 APPLICABILITY

This Medical Surveillance Program applies to all HDR employees whose project duties may expose them to potentially hazardous substances or physiological strain from the use of protective PPE. Specifically, the following situations are covered by this procedure:

A. Work on Hazardous Waste Sites (also referred to as “HazWoper” or “HazWaste” Sites), following 29 CFR 1910.120;

B. Work on sites that present hazards from specific toxic compounds regulated by OSHA;

C. Hazards associated with continual, long term exposure to damaging ambient sound pressure levels (noise), following 29 CFR 1910.95;

D. Potential exposure to Bloodborne Pathogens, following 29 CFR 1910.1030, and

E. The required usage of respirators on any site, following 29 CFR 1910.134.

In any of the situations described above, the employee must first be enrolled in the HDR Medical Surveillance Program.

This Procedure does not address the HDR drug & alcohol testing program; that is addressed in H&S Procedure # 43 - *Drug and Alcohol Program*.

4.0 PROGRAM IMPLEMENTATION

The HDR Medical Surveillance Program is directed by a third party provider, Concentra, CMCA Dept., Addison, Texas,.

This Program is administered nationally by the HDR Director of Safety, delegating the implementation to Ms. Stacy Meacham, Health & Safety Manager, (402) 926-7077. In terms of this Program, Ms. Meacham will serve as the Medical Monitoring Coordinator.

National Director of Safety The Director of Safety shall:

- Review, at least annually, the effectiveness of the Program, identify any deficiencies and ensure they are corrected.
- Provide guidance to OSCs and HDR professionals concerning medical monitoring issues.

Medical Monitoring Coordinator The Medical Monitoring Coordinator shall:

- Assist OSCs and employees in locating appropriate medical facilities;
- Maintain records of all employees enrolled in the HDR Medical Surveillance Program;
- Notify employees enrolled in the Program of their forthcoming annual physical and provide all necessary paperwork for completing an exam, and
- Maintain a list of local medical facilities that can provide exam services.

Office Safety Coordinators The Office Safety Coordinator(s) will:

- Assist Project Managers in determining when, and what types of medical monitoring may be necessary for a particular project, and
- Interface with Corporate Safety on medical monitoring questions when guidance is necessary.

Project Personnel All project personnel shall:

- Read, understand and follow the contents of this procedure when performing project duties with medical surveillance requirements.

5.0 OVERVIEW

The project duties that many HDR employees perform involve potential exposure to hazardous chemicals and substances; a few employees are exposed to high noise hazards on a regular basis. Project Managers and project personnel are jointly responsible for examining project site conditions for potential chemical or

high noise exposure hazards. These hazards may exist on projects considered as hazardous waste sites, construction sites where renovation or demolition activities are occurring, refuse sorting projects that present potential for exposure to blood/bodily waste, or when operating watercraft that generate very high noise levels.

Many of the hazards HDR employees could face are regulated by established OSHA standards (e.g., lead, cadmium, noise, etc.), which require the use of respirators and/or routine medical monitoring. The required use of respirators requires an evaluation of the wearer's ability to utilize the respirator safely without adverse effect to the wearer's health.

In sum, the purpose of medical monitoring is to (a) identify undiagnosed medical predispositions that might be exacerbated by the imposed strain placed on the body by wearing respiratory protection, (b) to verify the continuing effectiveness of the PPE, and (c) to ascertain both baseline (pre-exposure) and periodic body retention of harmful toxic compounds or the effects of harmful noise levels. The providing of vaccinations for hepatitis is also covered in this Procedure.

6.0 ENROLLMENT IN THE HDR MEDICAL SURVEILLANCE PROGRAM

6.1 Enrollment of Employees with No Previous Monitoring Records

Concentra, CMCA Dept., Addison, Texas, is responsible for managing the HDR Medical Surveillance Program. They have a team of doctors and nurses directing the Program. Concentra is headquartered at:

Concentra, CMCA Dept.
5080 Spectrum Drive, Suite 1200 West Tower
Addison, TX 75001
Phone: 1-972-725-6990
Fax: 1-972-725-6974

Our Program is organized so that it is the responsibility of each employee needing medical monitoring services to contact our medical monitoring coordinator to arrange for these services. The local OSC can also provide assistance in making this contact. The coordinator shall maintain a list of medical providers and medical clinics in the vicinity of the participating employee which is authorized to provide medical services. The coordinator will also provide all necessary paperwork to enroll an employee in the program.

Once the required medical service has been completed,

- The clinic or medical provider will forward all samples collected (i.e., blood work and urine) to analyzing laboratories according to the protocol sheet provided.

- Following completion of analysis and tests, a medical physician will review the results of all exam components and issue a written statement regarding the employee's exposure levels (e.g., lead exposure), hearing acuity or clearance for work (respirator usage or HazWoper evaluations).

- A detailed exam result report will be provided to the employee via home mail delivery. Per the Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations, this information will not be forwarded to HDR and shall remain confidential. The HDR Corporate Safety office will receive only a written statement regarding the employee's clearance status for their intended work activities. (HDR provides a Pass/Fail Form for the lab to fax back to HDR immediately following the review.)

- If the exam discovered any unhealthful or suspect medical conditions, this will be stated on the private information mailed to the employee. HDR will not be informed. Therefore, it is up to the employee to contact a physician to investigate the condition and recommended treatment options.

6.2 Enrollment of Employees with Previous Monitoring Records

Occasionally, HDR employees may receive medical monitoring services from providers and clinics that are not a part of the HDR Medical Surveillance Program. This should be avoided whenever possible. However, if it occurs (e.g., new incoming employees, emergency medical support in remote areas, etc.), to ensure consistency in management and record keeping, results of these exams must be forwarded by the employee's former examining physician to Concentra, CMCA Dept., Addison, Texas, so that an employee file can be created/maintained. All future exams should then be handled by clinics/providers approved by Concentra.

Contact the HDR Medical Monitoring Coordinator, Ms. Stacy Meacham, (402) 926-7077, to notify her of the impending transfer and to answer any questions regarding the transfer of medical records.

NOTE: TO BE ENROLLED IN THE HDR MEDICAL MONITORING PROGRAM, IT IS ABSOLUTELY IMPERATIVE THAT EITHER; *(A)* A CONCENTRA APPROVED CLINIC/PROVIDER IS USED, OR *(B)* EXAM RECORDS ARE FORWARDED TO CONCENTRA, CMCA DEPT., ADDISON, TEXAS.

IF RECORDS ARE NOT FORWARDED, THE HDR CORPORATE SAFETY OFFICE WILL HAVE NO MEANS BY WHICH TO TRACK THE EMPLOYEE STATUS AND THE EMPLOYEE WILL NOT BE ENROLLED IN THE MEDICAL MONITORING PROGRAM.

7.0 MEDICAL MONITORING

7.1 Hazardous Waste Site Medical Monitoring

HDR employees with the potential to handle hazardous waste may be exposed to toxic chemicals, biological hazards, radiation or physical dangers. A medical monitoring program for these employees is essential to assess worker health and fitness, both prior to project assignment and during the course of work. The HDR hazardous waste site medical monitoring program has been established for employees with potential exposure to toxic substances on a regular basis. All examinations and evaluations of the medical monitoring program are provided at no cost to HDR employees. As required by the 29 CFR 1910.120(f)/29 CFR 1926.65(f) OSHA Standard, *"Hazardous Waste Operations and Emergency Response"*, participation in the HDR hazardous waste site medical monitoring program is mandatory for the following employees (see HDR H&S Procedure #20 - Hazardous Waste Operations):

- All employees who have or may reasonably be exposed at or above the permissible exposure limits (or, where there is no permissible exposure limit, above other recognized published exposure limits) for 30 or more days a year;
- All employees who wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134[1];
- All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation, and
- Members of HAZMAT teams (NOTE: HDR does not currently conduct HAZMAT functions or duties).

The HDR medical monitoring program for hazardous waste site workers includes the following components:

1. a *baseline physical* prior to project assignment;

[1] The OSHA respirator standard (29 CFR 1910.134) states that no employee be assigned to a task that requires the use of a respirator unless it has been determined the person is physically able to perform under such conditions. See H&S Pro # 9 – Respiratory Protection, Section 17.

2. a *biennial physical* thereafter (unless a specific project requires it annually), and

3. an *exit physical* upon either leaving the company or changing to project assignments that do not involve hazardous waste exposure. Protocols for each exam type are shown in the following table:

	Examination Type		
Protocol	Baseline	Annual/Biennial	Exit
History and Physical Exam			
Complete medical and occupational history	X		X
Interval history		X	
Physical exam by physician	X	X	X
Height and weight	X	X	X
Temperature, pulse, respiration rate, blood pressure	X	X	X
Visual Acuity	X	X	X
Routine Laboratory Test/Procedures			
Pulmonary Function	X	X	X
Audiometry	X	X	X
Electrocardiogram	X	O	O
Chest X-ray	X	5Y	(1Y)
Complete Blood Count	X	X	X
Routine Urinalysis	X	X	X
Blood Count	X	X	X
Blood Chemistry	X	X	X

X Exam Component
O > 40 years of age or for medical indications
5Y five-year frequency
(1Y) if not done within the past year

The examining physician will generate personal medical reports for all employees examined and mail them to their private residence within 15 working days of the date the employee is examined. The results will list each test, individually indicating whether a result is normal or abnormal and, if appropriate, a recommendation for referral to the employee's private physician will be made. In addition, the personal medical report will contain:

- The physician's opinion as to whether the employee has any detected medical condition(s), which would place the employee at increased risk of material health impairment from work exposures and practices.
- Determination of the employee's ability to wear a respirator or any other personal protective equipment.

The examining physician will forward to the HDR Corporate Safety ONLY the following:

- A written opinion as to whether the employee's health would be at increased risk of material impairment from the HazWaste work environment, and
- A written statement regarding the employee's ability to wear a respirator or other protective equipment.

7.2 Noise

If HDR employees are assigned duties that expose them to sustained ambient noise levels in excess of 85 dBA, and they cannot escape the noise by moving away, then they will need to be enrolled in our Hearing Conservation Program at no cost to the employee. Full details of this program are contained the HDR H&S Procedure #26 - *Noise,* Section 10.0. In short, employees identified as needing to be enrolled by their supervisors shall contact the Medical Monitoring Coordinator, and she will arrange for the employee to travel to a local audiometric testing facility. The employee will receive a copy of their audiometric testing results and then the employee will be instructed in the proper use of hearing protective devices.

7.3 Chemical/Hazard Specific Medical Monitoring

Several OSHA standards include medical surveillance requirements for employees with potential exposure to specific toxic chemicals/materials. These applicable standards are summarized in Table 2. It should be noted these standards typically state specific conditions, such as frequency of exposure, minimum concentrations, employee age, chemical form, route of exposure, etc., under which the medical provisions are necessary or even warranted. Employees are encouraged to access these OSHA standards from their OSC, corporate safety or the OSHA web site @ www.OSHA.gov and read the specific information relating to medical surveillance requirements for that specific chemical.

When employees are working on Hazardous Waste Sites that present exposure to any of these specific toxic compounds, they may receive the medical monitoring tests required by these OSHA standards in addition to, or as an add-on component of, the standard Hazwoper medical exam at no cost to the employee.

It is the responsibility of project personnel and project managers to determine if there is a potential for such exposure for each project site. Concentra is available (see Section 6.0) for assistance in determining medical monitoring requirements for specific project sites and specific chemicals/hazards.

Table 2
Chemical/Hazard Specific Medical Monitoring Requirements

Chemical/Hazard	Applicable OSHA Standard
Acrylonitrile	1910.1045(n), App. C,
Arsenic	1910.1018(n), App. C
Asbestos	1910.1001(l) and 1910.1001(m)(3), App. D, App. E, App. H, 1926.1101(m), and 1926.1101(n)(3), App. D, App. E, App. I, 1915.1001(m), and 1915.1001(n)(3), App. C, App. D, App. I,
Benzene	1910.1028(i), App. C
1,3-Butadiene	1910.1051(k)(8), App. C, App. F
Cadmium	1910.1027(l), 1928.1027, 1915.1027, App. D, App. F, 1926.1127(l)
2-Acetylaminofluorene	1910.1003(g), 1910.1014
4-Aminodiphenyl	1910.1003(g), 1910.1011
Benzidine	1910.1003(g), 1910.1010
bis-Chloromethyl Ether	1910.1003(g), 1910.1008
3,3'-Dichlorobenzidine (and its salts)	1910.1003(g), 1910.1007
4-Dimethylaminoazobenzene	1910.1003(g), 1910.1015
Ethyleneimine	1910.1003(g), 1910.1012
Methyl Chloromethyl Ether	1910.1003(g), 1910.1006
alpha-Napathylamine	1910.1003(g), 1910.1004
beta-Naphthylamine	1910.1003(g), 1910.1009
4-Nitrobiphenyl, etc.	1910.1003(g), 1910.1003
N-Nitrosodimethylamine	1910.1003(g), 1910.1016
beta-Propiolactone	1910.1003(g), 1910.1013
Coke Oven Emissions	1910.1029(j), App. B, 1926.1129
Compressed Air	1926.803(b)
Cotton Dust	1910.1043(h), App. B-I, App. C, App. D
1,2-Dibromochloropropane, 3-Chloropropane	1910.1044(i)(5), App. C
Ethylene Oxide	1910.1047(i), App. C
Formaldehyde	1910.1048(l), App. C
Lead	1910.1025(j), App. C, 1926.62(j), App. C
4,4' Methylenedianiline (MDA)	Final Rule: 57:35630 (1992, October 8)
Methylene Chloride	1910.1052(j), App. B
Vinyl Chloride	1910.1017(k), App. A
Noise[2]	1910.95(g)

[2] The OSHA occupational noise standard (29 CFR 1910.95) requires an employer to administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of the standard, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For specifics, see HDR H&S Procedure #26 – Noise (Hearing Conservation).

7.4 Bloodborne Pathogens

In accordance with HDR H&S Procedure #8 - *Bloodborne Pathogens*, all HDR employees with the potential for exposure to blood or other potentially infectious materials must be offered the Hepatitis B vaccine. The employee may go to their own family doctor for the vaccine; they do not need to go through Concentra. The employee may decline the vaccination if they choose.

7.4.1 Immunizations and Vaccinations

All HDR employees who have been identified as having likely exposure to blood or other potentially infectious materials will be offered the Hepatitis B vaccine, at no cost to the employee. The vaccine will be offered within 10 working days of their initial assignment to work involving the potential for occupational exposure to blood or other potentially infectious materials, unless the employee has previously had the vaccine or wishes to submit to antibody testing which shows the employee to have sufficient immunity.

7.4.2 Vaccination Process

The current vaccine process consists of three shots. After the initial shot, a second is given one-two months later, and the third is administered four-five months following the second. Therefore, the full three shot immunization series takes a total of six months. While over time a slow decrease in the vaccine's effectiveness will occur, persons with declining antibody levels are still protected against clinical illness and chronic disease. Immunized employees who continue to work for years in situations where exposure is likely should consult their personal physician about the need for a booster shot, and when it should be received. Currently, the vaccine is for immunization against Hepatitis B only, but as new strains of Hepatitis are discovered, protection against multiple strains may be included in the vaccine 'cocktail" – ask the administering physician for the latest information.

7.4.3 Scheduling and Payment

Unlike other medical surveillance activities, there is no need to run the Hepatitis B vaccination request through our medical provider, Concentra. All employees who qualify to receive this vaccination and desire to do so (to qualify, supervisor must approve, based on expected job duties and resulting exposure potential) should schedule this service through their own personal physician, with the invoice submitted through, and paid by their local department (discuss with DM best method of payment – departmental credit card, etc.) DO NOT FILE THROUGH WORKERS COMPENSATION OR MEDICAL INSURANCE.

8.0 MEDICAL RECORDS AND PROGRAM REVIEW

8.1 Medical Records

All medical records will be maintained and preserved by Concentra, CMCA Dept., Addison, Texas, for 30 years after an employee leaves HDR employment. The results of medical testing and full medical records will be made available to workers, their authorized representatives and OSHA inspection staff. To obtain the full record, contact an HDR client support representative at Concentra, CMCA Dept., Addison, Texas:

Concentra, CMCA Dept.
5080 Spectrum Drive, Suite 1200 West Tower
Addison, TX 75001
Phone: 1-972-725-6990
Fax: 1-972-725-6974

8.2 Program Review

Regular maintenance and review of medical records and test results will be conducted to assess the effectiveness of this Program. The HDR Corporate Safety Department will:

- Evaluate each accident or illness promptly to determine the cause and make necessary changes in health and safety procedures;
- In conjunction with our medical provider, periodically evaluate the efficacy of specific medical testing in the context of potential site exposures;
- In conjunction with our medical provider and their recommendations, add or delete medical test(s) as suggested by current industrial hygiene and environmental data;
- Review potential exposures and safety plans at new sites, as identified or requested by staff, to determine whether additional testing is required.

1.0 OBJECTIVE

HDR Inc., (HDR) employees frequently perform services in high temperature/humidity areas, where extended exposure could result in heat-related disorders. This procedure describes the hazards associated with exposure to high thermal temperatures, and the proper responses that will prevent or minimize adverse health effects. The guidelines contained in this procedure are in conformance with both the Occupational Safety and Health Administration's (OSHA) 5(a)(1) general duty clause, and the recommendations presented in the publication, *Threshold Limit Values for Chemical Substances and Physical Agents (latest year)*, published by the American Conference of Governmental Industrial Hygienists (ACGIH).

2.0 PURPOSE

The purpose of this Procedure is to present information regarding the hazards and physiological effects of exposure to high temperatures, and the recommended work practices to avoid illness due to heat strain.

3.0 APPLICABILITY

The HDR Heat Prevention Program implemented in this Procedure applies to all HDR personnel at both HDR client sites and all HDR facilities, when faced with exposure to hot environments. All employees, regardless of HDR Department, could be impacted by this program.

4.0 PROGRAM IMPLEMENTATION

This program will be administered nationally by the HDR Director of Safety and locally by the Office Safety Coordinator (OSC).

National Director of Safety. The Director of Safety shall:

- Periodically review, at least annually, the effectiveness of this program, identify any deficiencies, and ensure that they are corrected, and
- Assist OSCs and project professionals, as requested, in the implementation of this Procedure and regulatory interpretations.

Office Safety Coordinators. The OSCs shall:

- Provide initial training on this Procedure, as applicable, to office staff, and make sure that this Procedure is readily available in each office, and
- Interface with the Director of Safety regarding any high-heat office or project site conditions that have been discovered, and need addressing or interpretation.

Project Health and Safety Officers. Project Health and Safety Officers (HSO) shall:

- Verify that initial training on this Procedure has been received by their respective project staff, if applicable, and make sure that this Procedure is available at the project site, and
- Interface with the OSC and/or Director of Safety regarding any heat stress project site conditions that are present (with the potential for generating heat strain) and need addressing or interpretation.

5.0 DEFINITIONS

Aural – The external, visible ear structure (pinnae).

Heat Stress – The terms "heat stress" and "heat strain" are erroneously used interchangeably, when in fact there is a distinct difference. Heat Stress is any external environmental heat stimulus that causes your body to react outside its normal range of activities. Put another way, heat stress is the cumulative environmental condition (hot outside temperatures, high humidity, winds, etc.) that cause your body to react. Heat stress is a necessary precursor to heat strain. Each individual may react differently to heat stress, depending on individual susceptibility to heat, age, physical condition, alcoholic intake, etc. Heat stress does not necessarily result in adverse health effects.

Heat Strain – Heat strain is the human body's physiological response to heat stress. Excessive heat strain results in a heat-related disorder.

Environmental Monitoring – Determines the degree of heat stress. Determined by the use of a WBGT monitor, with the numerical result compared against the ACGIH developed limits presented in Table 1. Used by OSHA to substantiate overexposures to heat stress. General indication of the potential for exposed employees to suffer heat strain.

Physiological Monitoring – Measurement of the individual employees' physical response to the heat stress conditions; a specific measure of the degree of heat strain.

WBGT – Acronym, means "Wet Bulb Globe Temperature." A numerical reading, in Fahrenheit (F°) or Celsius (C°), developed by integrating the following 3 parameters:

- ✓ **Ambient temperature – Dry Bulb Thermometer**
- ✓ **Wind & Humidity – Static Wet Bulb Thermometer**
- ✓ **Radiant Heat – Globe Thermometer**

Usually determined through the use of a WIDGET™ integrated monitor or equivalent (available through rental companies).

6.0 GENERAL DISCUSSION

6.1 The Body – Heat Evolution and Dissipation

Overview

Human beings are warm-blooded, or homeothermic. We produce heat, through the chemical breakdown of food, to supply our internal body environment. In order for the metabolic processes to operate, to break down food into energy, to utilize oxygen and to get rid of wastes, the internal environment within the body must be kept within a very narrow temperature range ("homeostasis"). All of the hundreds of thousands of chemical reactions that occur each second in our body are only designed to operate within this narrow temperature range. Outside this range, these metabolic processes cannot proceed efficiently. Thus, it is critical to our well being that we maintain a uniform, constant internal temperature. The average human deep body temperature (referred to as the "core body temperature") is 37.7° Celsius or 99.6° Fahrenheit. The average body temperature that we are all familiar with, 98.6° F is the "oral" temperature.

Heat Gain and Loss

The metabolic heat generated by the average person sitting quietly is about equal to that of a 100-watt incandescent light bulb. We also acquire, or gain, heat from outside sources, such as the sun or from exposure to radiant heat sources, such as molten metal in a foundry. A small percentage of this heat, whether generated internally or acquired externally, is used to maintain our critical, narrow body temperature range. The excess heat is transported by our blood to the skin surface as well as our lungs, where it is transferred to the air within. This unneeded excess heat is then shed by breathing it out, by losing it

to cool wind currents or cool objects that contact our skin, or by the process of sweating.

Sweating is Heat Loss
When our body has excess heat present, nerve messages from the brain automatically start the process of sweating. Remember that it takes the input of energy to raise matter from a dense (low) matter state to a less dense (higher) state. In order for water (sweat) on your skin surface to change into water vapor (evaporate), energy must be added. Approximately 80 calories of energy are required to evaporate 1 gram of water. That energy is in the form of body heat, because heat is energy. Therefore, as you sweat, and the sweat evaporates, you lose heat.

Humidity Effects on Heat Gain/Loss
We have all heard of the weather term "relative humidity (RH)". Relative humidity is a ratio of the amount of water in the air, at a specific temperature, compared to the maximum absolute amount that it could hold. Warm air can hold more water than cold air (So when warm, moist air cools down, it rains). The human body can only lose heat through sweat evaporation if the air can accept the water vapor. Sweat will rapidly evaporate and cool the body when a low relative humidity is present. But if the RH is high, sweat will sit on the skin, and no benefit (heat loss) will be gained from sweating. The body will continue to sweat in an attempt to shed heat, and dehydration is a dangerous possibility. If the RH is 100%, the body cannot lose any heat through sweating.

Now that we understand how the body loses heat, let's look at the effect that clothing has on this process.

6.2 Effects of Protective Clothing (PPE)

All clothing affords some protection from exposure to the elements, and therefore, retards the efficient circulation of air. This reduction of air movement reduces the evaporation of sweat (transpiration), the loss of heat through direct air movement (convection) and to a lesser degree, the loss through direct contact with cooler surrounding objects (conductance). Conversely, clothing will prevent conductance through contact with hotter objects, as well as radiant heat gain from sunshine and hot nearby objects.

Normal work clothing, which allows some (although restricted) passage of air and sweat from the skin to the environment, is considered *permeable*. The restriction of air circulation is not usually of significant health concern, unless the volume of clothing worn is great.

Some personal protective equipment and clothing (PPE), such as Tyvek™ coveralls, respirators, etc. are designed to prevent air/liquid environmental contaminants from passing through the clothing and contacting the skin. Unfortunately, the *impermeable nature of this fabric also prevents* heat and sweat from passing through the PPE and escaping the suit. Additionally, the extra weight of this equipment and clothing, and the restriction of body motions that bulky PPE imposes, causes the wearer to work harder than normal, and more heat is generated. Thus, when impermeable PPE is worn, more metabolic heat than usual is generated, and the heat cannot readily escape the clothing. Cool outside air temperatures do not help significantly, since the PPE is impermeable. So wearing this PPE is equivalent of wearing a sauna around the body, and the body responds by producing more sweat. Therefore, use of impermeable protective clothing can greatly increase the potential for heat-related illnesses, even in relatively benign ambient temperatures.

7.0 HEAT-RELATED ILLNESSES

There are four typical types of heat-related illnesses (result of heat strain) resulting from prolonged exposure to high thermal environments (stressor which causes the strain). These are described below:

7.1 Heat Rash (Prickly Heat)

Heat rash is a painful temporary condition caused by clogged sweat pores, typically from hot sleeping quarters.

Commonly observed in tropical climates, heat rash is caused by the plugging of sweat ducts due to the swelling of the moist keratin layer of the skin which leads to inflammation of the sweat glands. Heat rash appears as tiny red bumps on the skin, and can impair sweating, resulting in diminished heat tolerance. It is not a common concern in North American employment. Heat rash can usually be cured by providing cool sleeping quarters; body powder may also help absorb moisture.

7.2 Heat Cramps

Heat cramps are characterized by painful intermittent spasms of the voluntary muscles following hard physical work in a hot environment. Heat cramps usually occur after heavy sweating, and often begin at the end of the workday. The cramps are caused by a loss of electrolytes, principally salt. This results in fluids leaving the blood and collecting in muscle tissue, resulting in painful spasms. Treatment consists of increased ingestion of commercially available

electrolytic “sports” drinks (because of individual sensitivity, it is best to double the amount of water required by package directions, or add water to the liquid form).

7.3 Heat Exhaustion

This condition is characterized by profuse sweating, **weakness**, low blood pressure, rapid pulse, dizziness, and frequently nausea and/or headache. The skin is cool and clammy, and appears pale. The body core temperature is normal or depressed. Victim may faint and/or vomit. First aid consists of placing the victim in a cool area, loosen clothing, place in a head-low (shock prevention) position, and provide rest and plenty of fluids. This is the most common form of serious heat illness encountered during employment activities. **Any worker who is a victim of heat exhaustion may not be exposed to a hot working environment for an absolute minimum of 24 hours, and if fainting has occurred, the victim should not return to work until authorized by a physician.**

7.4 Heat Stroke

This is the most serious heat disorder, and is life-threatening. Heat stroke is a true medical emergency. This results when the body's heat dissipating system is overwhelmed and shuts down (thermoregulatory failure). Heat stroke results in a continual rise in the victim's deep core body temperature, which is fatal if not checked. The symptoms are hot, dry, flushed skin, elevated body core temperature, convulsions, delirium, unconsciousness, and possibly, death. First aid consists of immediately moving victim to a cool area; cool the body rapidly by immersion in cool (not cold) water or sponging the body with cool water; treat for shock and obtain immediate medical assistance. Treatment response time is critical when assisting a victim of heat stroke! Do not give coffee, tea or alcoholic beverages.

8.0 HEAT MONITORING

There are two methods of monitoring for the detection of heat-related illnesses – environmental monitoring (monitoring heat stress) and physiological monitoring (monitoring heat strain).

8.1 Environmental Monitoring (Heat Stress Monitoring)

8.1.1 Description

Typical industrial control of heat **strain** is accomplished by reducing the heat stress through environmental/administrative controls, such as cooling the work area, installation of fans, shielding radiant heat sources such as furnaces, elimination of steam leaks, or rotating employees to reduce exposure time. These control methods are practical and feasible for workers wearing normal permeable work clothing in inside, fixed-location facilities.

OSHA currently does not have a promulgated health standard on heat (or cold) stress. When inspecting the typical industrial workplace, OSHA compliance officers verify that workplace environmental conditions are acceptable for the work being performed by using the WBGT Heat Stress Index (Table 1). To determine the numerical enforcement value (permissible exposure limit), OSHA utilizes a WBGT monitor that incorporates real-time readings for ambient temperature, radiant heat load, and humidity (wind speed is factored indirectly). This method of monitoring the ambient environmental conditions in the workplace, and making assumptions about its effect on every exposed worker is termed "**environmental"** monitoring. OSHA utilizes this type of monitoring because it is non-invasive to the employee, and generates a single value that can be compared against a standardized numerical exposure limit, shown in Table 1. Overexposures are cited under the OSHA general duty clause. The WBGT heat stress index, while not correlating especially well with heat strain, has been used for many years by the military and has the official sanction of the American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH).

8.1.2 Procedure

In using this method, frequent readings (every 15 minutes is recommended, every half-hour is minimally acceptable) should be taken and averaged at the end of the workday. If the final value exceeds the Index Table value, an overexposure has occurred.

8.1.3 Limitations

This method of monitoring is appropriate for monitoring inside or outside areas, but only when the workers are wearing permeable, normal work clothes (jeans, dress attire, etc.)

One problem with this method is the fact that work in naturally hot outside environments, such as in southern states during the summer, will consistently yield WBGT readings in excess of the Index Table limits, often before 10 a.m. Strict adherence to these values would prevent work at these locations for several months each year, while not proving heat-induced illness has occurred. Therefore, since this method only measures the environmental conditions, not the employee response to these conditions, it is not typically used when performing outside site activities. In these situations, physiological monitoring is more appropriate.

Table 1

Examples of Permissible Heat Exposure Threshold Limit Values
[Values are given in ºC and (ºF) WBGT]*

	WORK LOAD							
	ACCLIMATIZED				UNACCLIMATIZED			
Work–Rest Regimen	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
Continuous work	29.5 (85)	27.5 (81)	26 (79)		27.5 (81)	25 (77)	22.5 (73)	
75% Work–25% Rest, each hour	30.5 (87)	28.5 (83)	27.5 (81)		29 (84)	26.5 (80)	24.5 (76)	
50% Work–50% Rest, each hour	31.5 (89)	29.5 (85)	28.5 (83)	27.5 (81)	30 (86)	28 (82)	26.5 (80)	25 (77)
25% Work–75% Rest, each hour	32.5 (90)	31 (88)	30 (86)	29.5 (85)	31 (88)	29 (84)	28 (82)	26.5 (80)

* As workload increases, the heat stress impact on an unacclimatized worker is exacerbated.

For unacclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5º C.

8.2 Physiological Monitoring (Heat Strain)

8.2.1 Description

Heat strain results in an increase in heart rate, as the cardiovascular system works harder to bring heat from the deep parts of the body to the skin surface. Since heat is being generated faster than it can be shed, the body temperature also rises. So heat strain can be measured by comparing a worker's temperature and pulse rate against his/her normal "resting" values.

Physiological monitoring is the method adopted by OSHA to monitor employees who are wearing impermeable clothing while performing services. A through presentation of the components of a good **physiological** monitoring program (written for Hazardous Waste Site workers, but the principles remain the same) is presented in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, produced by NIOSH/OSHA/USCG/EPA, October 1985 (available from corporate safety).

The HDR physiological monitoring protocol, presented below, incorporates the core features of these recommendations (with improvements, based on experience and current ACGIH information).

8.2.2 When to Institute Physiological Monitoring

The necessity to conduct heat strain monitoring is site-specific, and no definite "absolute" answer can be given. The following factors should be warning flags that may require the initiation of monitoring:

- Performing extended outside services during **summer months**. Begin monitoring when ambient temperature are consistently (greater than ½ the workday) above 80° F (26.7° C), especially when relative humidity exceeds 80%;
- Performing extended outside services on project sites located in the **deep south**;
- Performing extended services in the proximity of **radiant heat sources** (foundries, etc.);
- Presence on-site of an employee with a **history of heat illness**;
- Requirement to wear **impermeable PPE at any temperature**.

While ambient temperatures in the southwest routinely exceed 80° F, relative humidity levels are typically very low. This, combined with the acclimatization of the HDR employees accustomed to the climate and the employees' ability to access cool shelter when desired, will minimize the necessity to monitor on many project sites. Again, each project site and set of employee tasks is different; project personnel should consult their OSC or the Director of Safety if guidance is needed.

8.2.3 Procedures

The HDR physiological monitoring program consists of monitoring each affected employee by the simultaneous monitoring of the following two parameters:

1. **Heart rate** - Each individual will count his/her radial (wrist) pulse upon arriving at the site, prior to work each morning. This will be considered the "background", or resting pulse. This information will be provided to the project Health & Safety Officer (HSO). This provides the HSO with the "normal" resting pulse of that employee, since people exhibit a natural variability in pulse rates. Then each employee will monitor his/her pulse for 30 seconds as early as possible at the beginning of each rest period (breaks, lunch, end of workday). If the heart rate of any individual exceeds 110 beats per minute at the beginning of a rest period, then the subsequent work cycle will be decreased by one-third. The rest period length will remain the same.

2. **Aural temperature** - Each individual will measure his/her aural (ear) temperature with an electronic ear clip/scan thermometer at the same time, and on the same schedule, as the pulse readings. Past use has shown a close correlation between oral and aural temperatures (oral temperature collection by use of thermometers is allowed, but discouraged, due to the invasiveness of the procedure and the issue of hygiene). This temperature is also correlated with the deep core body temperature, which is what is important. If the aural temperature exceeds 99.6° F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. At no time will any employees aural temperature be allowed to exceed 100.4° F (38° C); if exceedance occurs, the employee shall not be permitted to continue to work in the hot environment, but must rest in a cool location, be provided cool drinks (non-caffeinated, non-alcoholic), and not return to the hot work environment until the following day. (NOTE: The new battery-powered ear scan digital thermometers, which read the temperature of the eardrum, are recommended for project work. They cost about $50 and are readily available through any national chain discount store. Individual-use covers are placed over the scanner probe, and discarded between users, thus avoiding any hygiene concerns. An adequate number of covers should be maintained on-site.)

   The project or designated HSO shall record all monitoring results on the HDR Heat Stress Log (see example, Attachment A). The designated HSO shall have a minimum of current Red Cross first-aid certification (which includes training to recognize the symptoms of heat-induced illness). **NOTE: If initial results indicate that the site acclimatized workers are not suffering any symptoms of heat induced strain, then the HSO may contact the HDR Director of Safety and request to reduce the level of future monitoring.**

9.0 PREVENTION OF HEAT DISORDERS

It is interesting to note that if a person works continually, for about a week, in a hot environment, he/she tolerates much hotter conditions than initially. This process of adjustment is termed "acclimatization", and it has been intensively studied and is well known. Acclimatization is essential if work is to be frequently performed in hot environments. Essentially, in acclimatized workers, their core body temperatures and heart rates are slower than non-acclimatized workers, and they sweat more but with less salt loss. Acclimatization to heat can, however, be lost almost as rapidly as it is acquired, if the worker is removed from the hot environment for a few days.

In order to prevent the onset of heat-related disorders, HDR employees should rely on the physiological monitoring methods described above, and practice good health measures, such as:

- Maximize daily fluid intake and realize that thirst is not an adequate indicator of sweat loss. Cool water or other non-alcoholic beverages should be consumed at a target rate of one cup every 20 minutes at a minimum. The beverages should be cool (50 to 60° F), and readily available;
- The workers should be as physically fit as possible. This is especially important concerning hot work. Obesity predisposes individuals to heat disorders;
- The rest area should be shaded from the sun, and cool (air-conditioned if possible);
- Older workers are at a disadvantage in hot work because the aging process results in a sluggish response of sweat glands, resulting in a less effective control of body temperature;
- A victim of a heat-related disorder is permanently predisposed to suffering a recurrence;
- Every worker is unique in his/her ability to handle heat. Work/rest periods should be based on the individual's capacity to safely handle the heat, not on a predetermined or inflexible time length;
- Alcohol has been commonly associated with the occurrence of heat-related disorders. Alcohol reduces heat tolerance;
- Inform female workers of the possible adverse consequences of hot work while pregnant, due to elevated core body temperatures.

HDR HEAT STRESS LOG

Name	Date & Time	Air Temp. ºF/% Sunshine	Resting Heart Rate (IF OVER 110 BPM, REDUCE WORK PERIOD)	Aural/Oral (circle one) Temperature (if over 100.4 F, remove from heat)

1.0 OBJECTIVE

It is the objective of HDR, Inc. (HDR) to protect its employees from the hazards associated with open excavations by either (1) learning to recognize and avoid these hazards; or (2) in the situation where HDR is responsible for an excavation (e.g. an archeological dig), implement necessary actions to control open excavation hazards.

2.0 REGULATORY REQUIREMENTS

This procedure will follow the guidelines of 2R 1926, Subpart P-Excavations. In the event of a conflict between these referenced standards and specific client requirements, the more stringent will prevail.

3.0 APPLICABILITY

This procedure applies to all HDR personnel at project sites and at HDR facilities when they perform services in or around excavations or trenches.

In general, HDR does not create or control excavations at project sites, and therefore must rely on the contractor to control excavation related hazards. Under these circumstances, HDR employees must possess sufficient knowledge to identify and avoid such hazards. Under no circumstances should an HDR employee enter an unsafe excavation, rather the employee should utilize the guidance presented in HDR Safety Memo “Safety & Health Considerations While on Projects Sites” to facilitate correction of the unsafe condition. Under the unusual circumstance where HDR is in control of an excavation, an HDR employee (competent person) must not only identify excavation related hazards, but also control and if necessary correct them.

Most of the sections of this procedure apply to all excavations, including trenches made in the earth’s surface. The competent person must decide specifically which sections apply and how all hazards presented by the excavation are being controlled.

4.0 EXCAVATION COMPETENT PERSON

Before excavation activity begins, an excavation competent person who will oversee all activity in and around the excavation must be designated. At most construction sites, the competent person is a contractor or subcontractor employee. Under the unusual circumstance where HDR is in control of an excavation, the competent person will usually be a specially trained HDR

employee, subconsultant or a subcontractor's employee. This competent person will determine the safety measures needed at projects which involve excavation.

4.1 **Competent Person Responsibilities**. The competent person is defined as one who is capable of identifying existing and predicable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

The competent person must also perform or be capable of performing the following tasks:

- Application of 29 CFR 1926 Subpart P to the excavation activity;
- Daily inspections of the excavation including an inspection after a hazard increasing event such as a thunderstorm;
- Classifying soil at the excavation;
- Determining proper protective requirements;
- Determining the need for excavation de-watering operations and monitoring all de-watering activity;
- If HDR is in control of the excavation, complete the *HDR Competent Person Excavation Trenching Assessment.* (See Attachment 1)

5.0 SOIL CLASSIFICATION

Appendix A of 29 CFR 1926 Subpart P outlines the minimum requirements for the classification of soil. Upon determining the soil type, the competent person must determine the proper protection system which will be used to protect employees who may enter the excavation.

Note: The competent person has the option of following the requirements in Section 5 of this procedure to determine soil type or assuming the soil to be Type C and following the protection requirements for Type C soil.

5.1 **OSHA Soil Classifications**. The following are the soil classifications recognized by OSHA in 29 CFR 1926 Subpart P.

5.1.1 Type A soil means:

Cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

- The soil is fissured; or
- The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
- The soil has been previously disturbed; or
- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope or four horizontal to one vertical (4H:1V) or greater; or
- The material is subjected to other factors that would require it to be classified as a less stable material.

5.1.2 Type B soil means:

- Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
- Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
- Previously disturbed soils except those which would otherwise be classified by Type C soil.
- Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subjected to vibration; or
- Dry rock that is not stable; or

- Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

5.1.3 Type C soil means:

- Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
- Granular soils including gravel, sand, and loamy sand; or
- Submerged soil or soil from which water is freely seeping; or
- Submerged rock that is not stable; or
- Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

5.2 **Soil Classification Requirements**. The competent person must classify each soil and rock deposit associated with a trench or excavation as stable rock, Type A, Type B, or Type C soil.

5.3 **Basis of Classification**. The classification of soil type must be accomplished by at least one "visual" and one "manual" test. There are several allowable tests that can be used to determine soil type. This testing must be done by the competent person and performed prior to and during the job. Refer to Appendix A of Subpart P for acceptable "manual" and "visual" test procedures.

5.4 **Reclassification**. If, after the soil has been classified, conditions change, the competent person is responsible for evaluating the situation and, if necessary, change the classification.

5.5 **OSHA Soil Texture Classes**

5.5.1 Stable Rock

Stable rock is not one of the texture classes. However, it is one of the OSHA classifications of soil. Stable rock is solid mineral material which can be excavated; and the sides stand vertical and remain stable and vertical throughout construction. Coral is not considered stable rock.

5.5.2 Cemented Soil

Cemented soils are soils that are held together by a chemical agent such as calcium carbonate. Examples of cemented soils would include caliche and hardpan. Cemented soils are classified as Type A soils with an unconfined compressive strength greater than 1.5 tsf.

5.5.3 Cohesive Soil

Cohesive soils are basically fine-grained soils. Cohesive soils range from clay through clay loam. A cohesive soil will stand unsupported when excavated and is plastic when moist. That is, cohesive soil can be rolled into a ribbon. A cohesive soil is hard to break up when it is dry. Cohesive soils are classified as Type A soils with an unconfined compressive strength greater than 1.5 tsf.

5.5.4 Granular Soil

Granular soils are composed of coarse-grained material that has very little cohesive strength. Granular soils include loamy sand, sand and gravel. A soil is classified as granular if more than 65% of the grains are distinguishable with the unaided eye. Granular soils, when excavated, will not stand and the walls of the excavation can crumble easily. Some granular soils will exhibit cohesion when wet, but when dry will fall apart. This type of soil is especially dangerous when found at a construction site because the walls of a trench appear to stand with no support. However, when they dry, they could crumble and fall into the trench bottom. Granular soils are classified as soil Type B or C, and may require the highest degree of protection. Type C soils would have an unconfined compressive strength of less than 0.5 tsf.

5.5.5 Granular Cohesionless

Soils that range from silt through sandy loam or are composed of angular particles are said to be granular cohesionless soils. These are difficult soils to work with because the group ranges from a very stable Type B to the unstable Type C soil. Course angular granular soils are classified as Type B soils and have an unconfined compressive strength range from 0.5 to 1.5 tsf.

5.5.6 Layered Soil System

A layered soils system is composed of two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered. The layers may lie on a horizontal plane or be sloped. When they are sloped into the excavation, they represent a collapse hazard to the trench wall. A slope greater than 4H:1V would classify any soils as Type C. Sloped layers less than 4H:1V would be classified as Type B soil. No layered system can be Type A soil.

6.0 SELECTION OF PROTECTIVE SYSTEMS

29 CFR 1926.652 requires that each employee in an excavation be protected from cave-ins by an adequate protective system unless excavations are made in stable rock or are less than five feet in depth and examination by the competent person provides no indication of potential cave-in.

Additionally, whichever protection system is chosen must have the capacity to resist without failure all loads that are intended or could reasonably be applied to the system.

6.1 **Design of Sloping and Benching Systems**. The slopes and configurations of sloping and benching systems must be determined by the competent person in accordance with the requirements of 29 CFR 1926(b)(1) through (b)(4) as well as 29 CFR 1926 Subpart P-Appendix B.

After the competent person has determined the soil type based on one visual and one manual test, he may design the sloping and benching system for excavations less than 20 feet deep using the following table.

MAXIMUM ALLOWABLE SLOPES
BASED ON SOIL CLASSIFICATION

Soil Line	Maximum Allowable Slope for Excavations Less than 20 Feet Deep
Stable Rock	Vertical Slides (90°)
Type A Soil	3/4H:1V (53°)
Type B Soil	1H:1V (45°)
Type C Soil	1 1/2H:1V (34°)

Notes:

- Sloping and benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.
- Appendix B of Subpart P presents additional acceptable excavation sloping configurations, including short duration; combining vertical cuts with sloping; combining trench shields with sloping; and layered systems.

6.2 **Design of Support Systems, Shield Systems and Other Protection Systems**. If the competent person determines that personnel will be protected from cave-ins by a protective system other than sloping and benching, the design of the support systems, shield systems, and other protective systems will be based on the conditions at the project site and data provided by an HDR or subcontracted registered professional engineer or from tabulated data provided by the manufacturers of the protective systems.

The design of the protective system must be in accordance with the requirements of 29 CFR 1926.652(c)(1) through (c)(4) and 29 CFR 1926 Subpart P-Appendices C, D and E.

In large/deep excavations where traditional shoring and sloping are not practical, alternate protective measures may be implemented to protect personnel in the excavation. Additionally, the top of the excavation must be protected with stop logs, earthen berms, or other types of protective barriers which will keep pedestrians and vehicles from approaching the edge of the excavation. Any deviations from traditional protective systems must be approved by the Corporate Health & Safety Officer.

7.0 EXCAVATION SAFETY REQUIREMENTS

Excavation activity exposes HDR personnel to many dangers which, if not recognized, can cause death or serious injury. Control of these hazards, particularly at construction sites, is usually the responsibility of the contractor and/or subcontractor, however, for their own safety, HDR personnel need to recognize and avoid these hazards when they are not properly controlled.

7.1 **Surface Hazards**. The excavation area should be inspected and any debris, structures and surface protrusions that are located so as to create a hazard to employees shall be removed as necessary to safeguard employees. Any buildings on the site should be evaluated for structural integrity and supported if necessary.

7.2 **Underground Installations/Utility Locations**. Before conducting any excavation work, the location of utility installations, such as sewer, telephone, fuel, electric, water lines, fiber optics or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined. This requirement is in addition to the requirements in the procedure titled Buried Utility Location and Associated Subsurface Field Activity.

Utility companies or the state utility protection service shall be contacted at least two working days prior to excavation activities to be advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

Care should be taken to protect and preserve the markings of approximate locations of utilities until the markings are no longer required for safe and proper excavations.

If the markings of utility locations are destroyed or removed before excavation commences or is completed, the competent person must notify the utility company or utility protection service to inform them that the markings have been destroyed and need replaced. Normally, it will take two working days advance notice for the utility protection service to remark the locations.

Equipment operators shall maintain at least 3-foot clearance between any underground utility and the cutting edge or point of powered equipment. When excavating with powered equipment within 36 inches of the underground utility markings, personnel should conduct the excavation in a careful and prudent manner, excavating by hand to determine the precise location of the utility and to prevent damage.

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

7.3 **Access and Egress**. A safe means of access to and egress from all excavations shall be provided. The following are considered acceptable methods of entering and exiting excavations.

7.3.1 Structural Ramps

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by the competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in

structural design or structural engineering, and shall be constructed in accordance with the design.

Structural members used for ramps and runways shall be of uniform thickness. Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping. Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

7.3.2 Means of Egress from Trench Excavations

A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees. Any ramp used for employee egress must be sloped at an angle which would allow employees to walk upright out of the excavation.

7.4 **Exposure to Vehicular Traffic**. HDR personnel who may be exposed to vehicular traffic, both on projects and public highways, shall be provided with and shall wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

7.5 **Exposure to Falling Loads**. No HDR employee shall be permitted underneath loads handled by lifting or digging equipment. Personnel must stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Truck drivers may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped with over-cab protective structures, in accordance with 29 CFR 1926.601(b)(6), to provide adequate protection for the operator from falling objects during loading and unloading operations.

7.6 **Warning System for Mobile Equipment**. When heavy equipment and trucks operate adjacent to an excavation or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals or stop logs. If possible, the approach grade should be away from the excavation.

7.7 **Hazardous Atmospheres**. When there is a likelihood excavation activity may involve hazardous atmospheres, the competent person must ensure acceptable atmospheric conditions exist.

The competent person or a designee shall perform direct reading atmospheric monitoring in excavations of any depth into which personnel must enter where a hazardous atmosphere exists, or could reasonably be expected to exist. If there are any questions, the competent person should treat the excavation like a confined space and follow the Permit-Required Confined Space Entry procedure.

Based on the competent person's visual observation of the excavation and the soil and/or fill material, atmospheric monitoring may not be necessary. However, if conditions change, the competent person must re-evaluate whether atmospheric monitoring is required.

7.7.1 Atmospheric Monitoring

When atmospheric monitoring is required, the competent person or a designee must check the atmosphere for the following in the order shown (or simultaneously using a 4-Way meter):

- Oxygen Content – acceptable conditions: 21%
- Flammable Conditions – acceptable conditions: less than 10% Lower Explosive Limit (LEL)
- Toxic Atmospheres (typically carbon monoxide and hydrogen sulfide) – less than established OSHA Permissible Exposure Limits (PEL) or American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Values (TLV)

NOTE: Any oxygen reading other than 21% must be investigated prior to employees entering the excavation.

7.7.2 Ventilation

Adequate precautions shall be taken, for example, providing ventilation to prevent employee exposure to harmful atmospheres. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, direct reading air monitoring shall be conducted periodically as determined by the competent person to ensure that the atmosphere remains safe.

7.7.3 Emergency Rescue Equipment

Emergency rescue equipment, such as Self-Contained Breathing Apparatus (SCBA), a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist, or may reasonably be expected to develop during work in an excavation. This equipment shall be kept close to the excavation for use in an emergency.

7.8 **Protection From Hazards Associated With Water Accumulation**. Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use a safety harness and lifeline.

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to run-off from heavy rains will require an inspection by a competent person.

7.9 **Stability of Adjacent Structures**. Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

- A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

- A support system, such as underpinning, designed by a registered professional engineer is provided to ensure the safety of employees and the stability of the structure; or

- The excavation is in stable rock; or

- A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

- If a support system has been put in place to stabilize an adjacent structure, it must be inspected for movement and structural integrity daily by the competent person.

Sidewalks, pavements, and other structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

7.10 **Protection of Employees from Loose Rock or Soil**. Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the excavation face to stop and contain falling material; or other means that provide equivalent protection.

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both, if necessary.

7.11 **Inspections**. Daily inspection of excavations, the adjacent areas and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are required when employee exposure can be reasonably anticipated.

If HDR is in control of an excavation or trenching operation, the *HDR Competent Person Excavation Trenching Assessment* (see Attachment 1) must be completed by the competent person to document the inspections. Canceled excavation/trenching permits should be placed in the project file upon completion of the project.

When the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

7.12 **Fall Protection**. Walkways or bridges with standard guardrails must be provided when employees or equipment are required or permitted to cross over excavations when the excavation is six feet or more in depth and wider than 30 inches at the top. (OSHA Letter of Interpretation dated August 10, 1995).

Employees at the edge of an excavation 6 feet or more in depth shall be protected from falling by guardrail systems, fences or barricades when excavations are not readily seen because of plant growth or other visual barrier.

Since open excavations are often an attractive nuisance to the public, adequate barrier for physical protection should be provided at all excavations. Remotely located excavations may require special protection including, but not limited to, highly visible snow fence, concrete “jersey” barriers, chain-link fence and flashing warning light. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be covered or backfilled. Note this is not an OSHA requirement, so it must be included in project specifications (or equivalent) in order for HDR to enforce it.

8.0 HDR COMPETENT PERSON EXCAVATION TRENCHING ASSESSMENT

When HDR is in control of an excavation or trenching operation, the *HDR Competent Person Excavation Trenching Assessment* (see Attachment 1) must be completed by the competent person each day that an excavation is open and possesses safety hazards to HDR personnel who work around or may have to enter the excavation.

If an HDR project site has several excavations open and active, each excavation must have its own permit completed. Conversely, a project site

which has an open excavation that is not active does not require a daily *HDR Competent Person Excavation Trenching Assessment.*

If the competent person determines that the excavation is NOT posing hazards to site personnel or the public, and is adequately guarded, the competent person will determine what type of inspections and documentation will be required.

The *HDR Competent Person Excavation Trenching Assessment* should be retained in the project file, and it will serve as a record of daily excavation inspection.

9.0 HDR EXCAVATION ENTRY PERMIT

HDR discourages any employee from entering a trench excavation unless there is no other means of conducting the work. If entry into a trench excavation is deemed necessary to conduct the work, an *HDR Excavation Entry Permit* (see Attachment 2) must be completed **by each** HDR employee, **every time** the employee enters a trench excavation, even for the same trench.

The *HDR Excavation Entry Permit* should be retained with the HDR employee's daily reports and subsequently placed in the project file. The *HDR Excavation Entry Permit* provides guidance to the entering employee in making sure that an excavation is safe to enter. Retention of the completed *HDR Excavation Entry Permit* serves as a permanent record of excavation conditions at the time of entry.

Attachment 1

HDR Competent Person Excavation Trenching Assessment

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HDR Competent Person Excavation Trenching Assessment

Project Name:	
Project Location:	Project Number:
Name of Competent Person:	Permit Good on This Date Only:

EMPLOYEE TRAINING AND PRE-EXCAVATION BRIEFING

1. Does this job require special training: ☐ Yes ☐ No
2. Safe excavation and rescue training conducted on: Date: _____
3. Mandatory pre-excavation briefing conducted on: Date: _____

SOIL CLASSIFICATION

1. Will the competent person classify the soil based on its properties and site conditions? ☐ Yes ☐ No

   If yes, proceed to 2-6 of this section. If no, then soil is assumed to be Type C and the competent person will apply the requirements for Type C protective systems.

2. Based on visual observation, which best describes the soil in this excavation?

   ☐ Stable Rock ☐ Cemented Soil ☐ Cohesive Soil ☐ Granular Soil

   ☐ Granular Cohesionless ☐ Layered System

3. Based on visual observation, which best describes the moisture condition of the soil?

   ☐ Dry Soil ☐ Moist Soil ☐ Wet Soil ☐ Saturated Soil

4. Is a pocket penetrometer available for use on site? ☐ Yes ☐ No ☐ NA

   If yes, what is the average tons-per-square-foot of the soil in this excavation? _____ tsf

The HDR Competent Person Excavation Trenching Assessment is to remain on the job as long as trench is OPEN.

5. Based on at least one manual test, what classification is the soil in this excavation?

   ☐ Stable Rock ☐ Type A Soil ☐ Type B Soil ☐ Type C Soil

6. What manual test was used to determine the soil type?

   ☐ Plasticity ☐ Dry Strength ☐ Thumb Penetration ☐ Other _____

ELECTRICAL SAFETY

1.	Are all electrical devices grounded and/or GFCI protected?	☐ Yes	☐ No	☐ NA

SURFACE ENCUMBRANCES

1.	Have all surface encumbrances that are located so as to create a hazard to employees been removed or supported as necessary, to safeguard employees?	☐ Yes	☐ No	☐ NA

UNDERGROUND INSTALLATIONS

1.	Have the estimated locations of all underground installations been determined prior to excavation?	☐ Yes	☐ No	☐ NA
2.	Have utility companies been contacted and advised of proposed work?	☐ Yes	☐ No	☐ NA
3.	If underground installations are exposed, are they protected, supported or removed while excavation is open?	☐ Yes	☐ No	☐ NA

ACCESS AND EGRESS

1.	Are stairways, ladders or ramps provided every 25 feet?	☐ Yes	☐ No	☐ NA
2.	Are structural ramps that are used for access and egress of equipment and/or personnel designed by a competent person qualified in structural design and constructed in accordance with the design?	☐ Yes	☐ No	☐ NA

EXPOSURE TO VEHICULAR TRAFFIC

1.	Are personnel exposed to public or project vehicular traffic wearing reflectorized or high visibility vests?	☐ Yes	☐ No	☐ NA

EXPOSURE TO FALLING LOADS

1.	Are employees prohibited from standing underneath loads handled by lifting or digging equipment?	☐ Yes	☐ No	☐ NA

The HDR Competent Person Excavation Trenching Assessment is to remain on the job as long as trench is OPEN.

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WARNING SYSTEMS FOR MOBILE EQUIPMENT

1. Are warning systems utilized when mobile equipment is operated adjacent to or at the edge of an excavation? ☐ Yes ☐ No ☐ NA

   If yes, which type if being used?

   ☐ Hand Signals ☐ Stop Logs ☐ Earthen Berm ☐ Other _____

TESTING FOR HAZARDOUS ATMOSPHERES

1. Are the atmospheric hazards that can be reasonably expected to exist in excavations greater than 4 feet deep tested and controlled? ☐ Yes ☐ No ☐ NA

2. Is testing conducted as often as necessary to ensure safety or personnel? ☐ Yes ☐ No ☐ NA

TIMES & READINGS:	Time:__ _____ LEL:___% Oxygen:_% Toxic:__PPM of_____	Time:__ _____ LEL:___% Oxygen:_% Toxic:__PPM Of_____	Time:__ _____ LEL:___% Oxygen:_% Toxic:__PPM of_____	Time:__ _____ LEL:___% Oxygen:_% Toxic:__PPM of_____	Time:_____ LEL:___% Oxygen:_% Toxic:__PPM of_____
SPECIAL PRECAUTIONS:					

EMERGENCY RESCUE EQUIPMENT

1. Is emergency rescue equipment such as SCBA, safety harness and line or basket stretcher readily available and attended when hazardous atmospheric conditions exist? ☐ Yes ☐ No ☐ NA

PROTECTION FROM HAZARDS ASSOCIATED WITH WATER ACCUMULATION

1. Is water being controlled or prevented from accumulating in excavation by the use of water removal equipment? ☐ Yes ☐ No ☐ NA

2. Is water control equipment operation being monitored by a competent person? ☐ Yes ☐ No ☐ NA

STABILITY OF ADJACENT STRUCTURES

1. Are support systems such as shoring, bracing or underpinning provided to ensure stability of adjoining structures (i.e., buildings, walls) endangered by excavation activities? ☐ Yes ☐ No ☐ NA

2. Has the support system been designed by a registered professional engineer? ☐ Yes ☐ No ☐ NA

The HDR Competent Person Excavation Trenching Assessment is to remain on the job as long as trench is OPEN.

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PROTECTION OF EMPLOYEES FROM LOOSE ROCK OR SOIL

1.	Are the employees protected from excavated or other material and equipment by placing this material a minimum of two (2) feet from the edge of excavations or by the use of retaining devices?	☐ Yes	☐ No	☐ NA

INSPECTIONS

1.	Are daily inspections of excavations where employee exposure can be reasonably anticipated being done by the competent person?	☐ Yes	☐ No	☐ NA
2.	Are inspections being performed by a competent person after every rainstorm or other hazard increasing occurrence?	☐ Yes	☐ No	☐ NA
3.	Are employees removed from the excavation if the competent person finds evidence at any time of a situation that could result in a possible cave-in, protective system failure, hazardous atmosphere or other hazardous conditions?	☐ Yes	☐ No	☐ NA

FALL PROTECTION

1.	Are standard guardrails provided on walkways and bridges that cross over excavations?	☐ Yes	☐ No	☐ NA
2.	Are all remotely located excavations adequately barricaded or covered?	☐ Yes	☐ No	☐ NA

SHORING AND OTHER PROTECTIVE SYSTEM

1.	Has all shoring and/or other protective system been designed by a registered professional engineer or accompanied by tabulated data from the manufacturer?	☐ Yes	☐ No	☐ NA
2.	Is shoring and other protective system checked/measured each day to detect movement and possible failure?	☐ Yes	☐ No	☐ NA

I have inspected the excavation described in this permit:

Print Legal Name (First M. Last)	HDR Employee ID
Legal Signature	Date

Copy: Project File

The HDR Competent Person Excavation Trenching Assessment is to remain on the job as long as trench is OPEN.

Attachment 2

HDR Excavation Entry Permit

(Note: Form is designed for two-sided printing.)

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HDR EXCAVATION ENTRY PERMIT

Date:	Project Name:
Time:	Location:

DO NOT ENTER excavation unless answers are Y or NA	Y	N	NA
Cave-In Protection			
General: Is cave-in protection in place if deeper than 5 ft?			
Benching: Does a 4'x4' bench repeat as needed?			
Sloping: Sides sloped correctly (B. 1:1, C. 1.5:1)?			
Sloping-Box Combo: Box extends 18" above toe of slope?			
Box alone: Box height is even or above top of excavation?			
Box: Minimal gap between box and excavation sides?			
Box: Tabul. data on-site showing adequate box strength?			
Shoring: Cross braces level and secured? Tab data on-site?			
PE: Stamped by PE if deeper than 20 ft?			
Access – Egress			
Access: Ladder provided within 25 ft if deeper than 4 ft?			
Access: Ladder located in a protected area?			
Miscellaneous			
Water: Controlled so it is not present in excavation?			
Spoil Pile: At least 2 feet from entire excavation edge?			
Crossovers: Guardrails present if deeper than 6 ft?			
Adjacent Structures, utilities, etc: Adequately supported?			
Vehicular Traffic: Isolated from excavation?			

HDR does not allow you to enter the excavation if any questions are answered "No".

Signature of Entrant:

Title:

HDR EXCAVATION ENTRY PERMIT

Date:	Project Name:
Time:	Location:

DO NOT ENTER excavation unless answers are Y or NA	Y	N	NA
Cave-In Protection			
General: Is cave-in protection in place if deeper than 5 ft?			
Benching: Does a 4'x4' bench repeat as needed?			
Sloping: Sides sloped correctly (B. 1:1, C. 1.5:1)?			
Sloping-Box Combo: Box extends 18" above toe of slope?			
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Access – Egress			
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Miscellaneous			
Water: Controlled so it is not present in excavation?			
Spoil Pile: At least 2 feet from entire excavation edge?			
Crossovers: Guardrails present if deeper than 6 ft?			
Adjacent Structures, utilities, etc: Adequately supported?			
Vehicular Traffic: Isolated from excavation?			

HDR does not allow you to enter the excavation if any questions are answered "No".

Signature of Entrant:

Title:

HDR EXCAVATION ENTRY PERMIT

- This Permit is to be completed by the HDR entrant prior to entering an excavation or trench.
- If a group of HDR employees are to enter a trench, only one Permit need be completed.
- This Permit should NOT be completed if HDR staff will not be entering an excavation or trench.

Instructions (complete other side)

1. **Fill in date, time and project information.**
2. **Answer all questions.**
3. **Sign and print job title.**
4. **DO NOT ENTER if any questions are answered "No"**

Entrant Comments

Distribution

Upon termination of the entry, this original shall be maintained in the project file for a minmum of one year.

HDR EXCAVATION ENTRY PERMIT

- This Permit is to be completed by the HDR entrant prior to entering an excavation or trench.
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- This Permit should NOT be completed if HDR staff will not be entering an excavation or trench.

Instructions (complete other side)

1. **Fill in date, time and project information.**
2. **Answer all questions.**
3. **Sign and print job title.**
4. **DO NOT ENTER if any questions are answered "No"**

Entrant Comments

Distribution

Upon termination of the entry, this original shall be maintained in the project file for a minmum of one year.

July 12, 2013

Mr. Matthew Hubicki
Environmental Engineer
Remedial Bureau C
Division of Environmental Remediation
NYS Dept. of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233-7012

RE: NYSDEC Standby Engineering Contract D007625
WA#5 Remedial Design – Magna Metals (Site #36003)
Pre-Design Investigation Summary Report

Dear Mr. Hubicki:

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) has prepared this letter report to summarize the results of the pre-design investigation conducted by HDR on NYSDEC's behalf, for the Magna Metals State Superfund Site located in Cortlandt, New York. The purpose of the pre-design investigation was to delineate the extent of impacted soil/sediment to refine the limit of the selected remedial design, which includes excavation of on-site and off-site contaminated soils and sediments at concentrations exceeding the soil cleanup objectives (SCO) identified in the Record of Decision (ROD). The investigation tasks completed and summarized in this report included the collection of sediment samples in the off-site areas of concerns (AOCs) defined as AOC 5- Freshwater Wetland and Unnamed Tributary area, AOC 6- Off-Site Pond area, and AOC 7- Furnace Brook area in the Pre-Design Investigation (PDI) Work Plan (WP).

The collection of soil samples from the on-site areas (Leach Pit Area, Refuse Area, Upland Area, and Former Magna Metals Building) identified as AOCs 1-4 in the PDI WP will be completed in the future after the former Magna Metals Building has been demolished.

Field Activities

As part of the PDI, a total of 215 sediment samples (including 13 background sediment samples and 7 duplicate samples) were collected from 109 locations. Surface samples were collected using disposable spoons and bowls and subsurface samples were collected using a manual geo-probe. Soil sample locations were surveyed by YEC or by HDR staff using a handheld global positioning system (GPS) unit.

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in association with HDR Engineering, Inc.
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Pearl River, NY 10965
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Fax: (845) 735-7466
www.hdrinc.com

AOC 5- Freshwater Wetland and Unnamed Tributary

A total of 50 sediment samples were collected from 25 locations in the wetland area to delineate sediment impacts horizontally and vertically. The borings were advanced to a maximum depth of 4.5 feet. Sediment samples were collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. A total of 50 sediment samples were collected from the 25 locations. Of the 25 soil borings, 11 were sidewall and 14 were bottom sample locations. The boring locations were selected to delineate the vertical and horizontal extents of the impacted sediments in this area. Soil boring locations are shown on Figure 1.

AOC 6- Off-Site Pond

Sediment samples were collected from 23 locations in the Off-Site Pond area to delineate sediment impacts horizontally and vertically. The borings were advanced to a maximum depth of 4.5 feet. Sediment samples were collected from each boring at various depths depending on location, sample purpose (sidewall/bottom), and detected contaminant concentrations. A total 62 sediment samples were collected from the 23 locations. Of the 23 soil borings, 7 were sidewall and 16 were bottom sample locations. Soil boring locations are shown on Figure 2.

AOC 7- Furnace Brook

Sediment samples were collected from 48 of the 59 sample locations proposed in Furnace Brook. Samples proposed at locations BRSD726 – BRSD 735 were unable to be collected because the access agreement with 7 Cross Road was not in place. The locations were located in transects spaced approximately every 75 feet upstream of the culvert and every 100 feet down stream of the culvert. Each transect consisted of two sidewall samples and one bottom sample. The soil boring locations are shown on Figure 3 and Figure 4. The borings were advanced to a maximum depth of 4.5 feet bgs upstream of the culvert and six inches downstream of the culvert. Sediment samples were collected from each boring at various depths depending on location and sample purpose (sidewall/bottom). A total of 90 sediment samples were collected from the 48 locations

Background Samples

Thirteen sediment background samples were collected in the wetland and Furnace Brook, up gradient of the impacted area of the Site. Background sediment samples were evaluated to establish the average background concentrations of nickel, copper, and zinc in sediment since the ROD defined the pre-release background levels as the average of the background sample concentrations for these metals. Soil boring locations are shown on Figure 5.

Sample Analytical Results

All sediment samples were analyzed for metals. Sediment sample results were compared to the Site specific cleanup objectives (SCOs) identified in the ROD. For the off-site areas consisting of the AOCs 5, 6 and 7, the Site specific criteria was defined as the greater of the pre-release/background conditions or the New York State Lowest Effect Levels (LELs) for metals.

Thirteen sediment background samples were collected and analyzed for metals in the wetland and upstream section of Furnace Brook, up gradient of the impacted area of the Site. Sample results are summarized on Figure 5. Metals detected above the LELs included total chromium, copper, manganese, nickel, and zinc. The averages of these metals compared to the LEL are summarized in the table below.

Metal	Average Concentration (mg/kg)	LEL Concentrations (mg/kg)
Total Chromium	11.8	26
Copper	7.2	16
Manganese	187.2	460
Nickel	20.0	16
Zinc	27.3	120

Based on the results the LELs for metals were used as the soil cleanup objectives with the exception of nickel, which was compared to the average of the background sample results. The results for the samples are discussed for each AOC separately.

The results of the sediment samples were also compared to the Unrestricted Use SCOs (UUSCOs) and Restricted Use Residential SCOs (RURSCOs), in addition to the greater of the LELs or average background sample results. The sample results for AOCs 5, 7, and 7 are discussed below.

AOC 5- Freshwater Wetland and Unnamed Tributary

All samples exceeded the site specific SCOs. Metals that exceeded the SCOs included arsenic, cadmium, total chromium, copper, iron, mercury, nickel, silver, and zinc. The greatest concentrations of metals (total chromium, copper, nickel, and zinc) were detected at location WTSD505. At this location metal concentrations were found from 2 to 4.5 feet bgs with the greatest concentrations at the surface and trending down with depth. Concentrations at 2-2.5 feet bgs of total chromium was 1,100 mg/kg, copper was 38,000 mg/kg, lead was 95 mg/kg, nickel was 910 mg/kg and zinc was 910 mg/kg. Concentrations for these metals at 4-4.5 feet bgs were 150 mg/kg, 3,600 mg/kg, 14 mg/kg, 820 mg/kg, and 160 mg/kg, respectively. Concentrations of copper at 4.5 feet bgs were greater than 200 times the LELs at location WTSD505. The surrounding sample results at locations WTSD504, WTSD506, WTSD507 and WTSD508 also had concentrations of metals greater than the SCOs to depths of 4.5 feet bgs. Sidewall samples for this area included WTSD501 through WTSD507. Sample results at these

locations exceeded the SCOs for one or more metals including arsenic, cadmium, total chromium, copper, lead, nickel, and zinc.

Bottom samples collected outside the potential source area at locations WTSD517, WTSD512, WTSD511, WTSD510 and WTSD509 also exceeded SCOs for one or more metals. The deepest samples collected at these locations exceeded for copper and nickel at locations WTSD510 and WTSD511 and only copper at location WTSD509. The concentrations of copper were 44 mg/kg (WTSD510), 27 mg/kg (WTSD511), and 26 mg/kg (WTSD512) which exceed the LEL of 16 mg/kg, but are less than the UUSCO (50 mg/kg) and RURSCO (270 mg/kg) SCOs. Concentrations of nickel were 24 mg/kg (WTSD510) and 21 mg/kg (WTSD512) which are greater than the average background concentration of 20 mg/kg, but less than the UUSCO (30 mg/kg) and RURSCO (140 mg/kg) SCOs.

Sample results are summarized on Figure 1.

AOC 6- Off-Site Pond

All sample results exceeded the site specific SCOs. Metals that exceeded the SCOs included arsenic, cadmium, total chromium, copper, iron, lead, mercury, nickel, and zinc. Samples collected along the perimeter of the pond all had one or more metal concentrations that exceeded the SCOs. There were no bottom samples that met the SCOs. The sample collected at PASD621 had a concentration of copper at 27 mg/kg at a depth of 2.5-3 feet bgs and at PASD607 the concentration of copper was 33 mg/kg at a depth of 4-4.5 feet bgs, which were greater than the LEL of 16 mg/kg, but less than the UUSCO (50 mg/kg) and RURSCO (270 mg/kg). The remaining deepest samples collected at locations PASD603, PASD605, PASD606, PASD608 through PASD611, PASD613 through PASD618, and PASD622 had concentrations of copper between 59 to 370 mg/kg and nickel between 45 mg/kg to 300 mg/kg.

Sample results are summarized on Figure 2.

AOC 7- Furnace Brook

All sample results exceeded the site specific SCOs. Metals that exceeded the SCOs included arsenic, cadmium, total chromium, copper, iron, lead, mercury, nickel, and zinc. Samples were collected in transects along the channel which included one location in the middle of the channel and two locations on either side of the bank. Bottom samples were collected along the brook at locations BRSD703, BRSD704, BRSD705, BRSD706, BRSD708, BRSD712, BRSD715, BRSD718, and BRSD721. The maximum concentration of copper (1,400 mg/kg) was found from 2-2.5 feet bgs at location BRSD705. Sample results generally did not indicate a downward trend of metals concentrations with depth, with the exception of locations BRSD715 and BRSD705. At BRSD715 copper and nickel were found at concentrations of 110 mg/kg and 200 mg/kg respectively at 2-2.5 feet bgs. These concentrations dropped to 35 mg/kg (copper) and 21 mg/kg (nickel) at a depth of 4-4.5 feet bgs. At BRSD705 concentrations of copper and nickel at 2-2.5 feet bgs were 1,400 mg/kg and 290 mg/kg. At a depth of 4-4.5 feet bgs the concentrations decreased to 84 mg/kg (copper) and 29 mg/kg (nickel). Samples collected at the downstream section of Furnace Brook all had one or more metals exceed the SCOs.

Sample results are summarized on Figures 3 and 4.

If you have any questions or require additional information, please do not hesitate to contact me at 845-735-8300 ext. 269.

Very truly yours,



Thomas M. Connors, P.E., MBA
Project Manager

Cc: M. Lehtinen, HDR Program Manager
HDR File

WTSD 505	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 9.9	< 15	< 16
Arsenic	130	51	25
Cadmium	4.5	2.9	2.3
Chromium, Total	1,100	170	150
Copper	38,000	8,100	3,600
Iron	16,000	9,100	5,900
Lead	95	24	14
Manganese	280	340	190
Mercury	0.32	0.24	0.19
Nickel	910	1,300	820
Silver	5	< 3.2	< 3.5
Zinc	910	510	160

WTSD 501	0-0.5
Metals	
Antimony	< 12
Arsenic	9.1
Cadmium	1.4
Chromium, Total	33
Copper	590
Iron	14,000
Lead	76
Manganese	330
Mercury	0.19
Nickel	250
Silver	< 2.5
Zinc	150

WTSD 504	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 11	< 9.8	< 11
Arsenic	7.1	8.5	< 4.9
Cadmium	1.3	2.3	< 0.8
Chromium, Total	140	110	42
Copper	440	570	170
Iron	8,600	11,000	6,800
Lead	11	11	4
Manganese	130	150	59
Mercury	0.082	0.16	< 0.042
Nickel	350	450	140
Silver	< 2.5	< 2.1	< 2.4
Zinc	410	320	150

WTSD 502	0-0.5
Metals	
Antimony	< 15
Arsenic	< 6.8
Cadmium	< 1.1
Chromium, Total	12
Copper	380
Iron	8,000
Lead	18
Manganese	99
Mercury	< 0.054
Nickel	190
Silver	< 3.3
Zinc	130

WTSD 503	0-0.5
Metals	
Antimony	< 3.4
Arsenic	< 1.5
Cadmium	1
Chromium, Total	80
Copper	61
Iron	26,000
Lead	75
Manganese	1,600
Mercury	0.066
Nickel	150
Silver	< 0.73
Zinc	170

SD-07*	0.5
Metals	
Arsenic	16.9
Cadmium	1
Chromium, Total	R
Copper	2,080
Iron	23,600
Lead	62.9
Manganese	220
Mercury	< 0.24
Nickel	494
Silver	0.66
Zinc	1,890

SD-06*	0.5
Metals	
Arsenic	19.3
Cadmium	1.4
Chromium, Total	R
Copper	2,330
Iron	20,200
Lead	48.2
Manganese	841
Mercury	< 0.3
Nickel	835
Silver	0.72
Zinc	938

SD-15*	0.5
Metals	
Arsenic	8.3
Cadmium	< 0.18
Chromium, Total	158
Copper	1,040
Iron	10,900
Lead	32.2
Manganese	958
Mercury	0.15
Nickel	332
Silver	< 0.42
Zinc	528

SD-19A*	0.5
Metals	
Arsenic	12.2
Cadmium	< 0.3
Chromium, Total	133
Copper	281
Iron	17,400
Lead	91.5
Manganese	302
Mercury	0.14
Nickel	365
Silver	< 0.69
Zinc	176

WTSD 506	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 10	< 9.2	< 6.9
Arsenic	10	48	9.2
Cadmium	1.2	2.8	0.87
Chromium, Total	32	43	34
Copper	360	2,000	860
Iron	4,700	8,700	13,000
Lead	3.7	15	17
Manganese	140	160	130
Mercury	0.067	0.13	0.063
Nickel	350	3,300	260
Silver	< 2.2	< 2	< 1.5
Zinc	20	240	66

WTSD 509	2-2.5
Metals	
Antimony	< 3.7
Arsenic	2
Cadmium	0.65
Chromium, Total	78
Copper	100
Iron	16,000
Lead	22
Manganese	450
Mercury	0.078
Nickel	170
Silver	0.84
Zinc	96

WTSD 507	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 6.9	< 7.8	< 9.5
Arsenic	35	4.7	5.9
Cadmium	2.6	1	1.2
Chromium, Total	200	120	50
Copper	6,400	360	680
Iron	24,000	14,000	14,000
Lead	59	9.6	8
Manganese	270	200	150
Mercury	0.14	0.05	0.049
Nickel	900	440	390
Silver	2.1	< 1.7	< 2.1
Zinc	280	44	58

SD-08*	0.5
Metals	
Arsenic	4.7
Cadmium	0.63
Chromium, Total	34
Copper	46.2
Iron	17,900
Lead	7.9
Manganese	R
Mercury	< 0.15
Nickel	45.6
Silver	< 0.25
Zinc	67.7

WTSD 508	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 8.7	< 7.6	< 8.8
Arsenic	7.5	4.7	< 3.9
Cadmium	1.5	1.2	0.88
Chromium, Total	140	49	42
Copper	240	260	190
Iron	11,000	9,100	13,000
Lead	9.8	5.5	6.7
Manganese	290	110	130
Mercury	0.21	0.084	< 0.032
Nickel	370	290	250
Silver	< 1.9	< 1.7	< 1.9
Zinc	36	23	56

WTSD 510	1-1.5	2-2.5	3-3.5
Metals			
Antimony	< 4.2	< 3.9	< 2.4
Arsenic	4.1	10	1.2
Cadmium	1.1	1.3	0.31
Chromium, Total	110	72	15
Copper	790	380	44
Iron	16,000	12,000	7,000
Lead	27	27	5.6
Manganese	360	530	71
Mercury	0.1	0.11	0.026
Nickel	450	140	24
Silver	< 0.92	< 0.85	< 0.52
Zinc	97	17	29

WTSD 518	2-2.5
Metals	
Antimony	< 3
Arsenic	2.5
Cadmium	0.38
Chromium, Total	51
Copper	58
Iron	7,400
Lead	2.9
Manganese	51
Mercury	0.023
Nickel	75
Silver	< 0.65
Zinc	20

SD-16*	0.5
Metals	
Arsenic	3.7
Cadmium	< 0.1
Chromium, Total	43.4
Copper	107
Iron	12,400
Lead	22.9
Manganese	313
Mercury	0.06
Nickel	143
Silver	< 0.24
Zinc	139

SD-18*	0.5
Metals	
Arsenic	12
Cadmium	< 0.21
Chromium, Total	166
Copper	327
Iron	14,400
Lead	88.7
Manganese	241
Mercury	0.17
Nickel	460
Silver	< 0.49
Zinc	290

WTSD 511	1-1.5	2-2.5	3-3.5
Metals			
Antimony	< 4	< 2.4	< 2.2
Arsenic	< 1.8	< 1.1	< 1
Cadmium	0.69	0.31	0.29
Chromium, Total	45	16	14
Copper	210	15	27
Iron	16,000	12,000	9,000
Lead	24	8.9	6.8
Manganese	140	71	91
Mercury	0.064	0.013	< 0.0082
Nickel	290	15	13
Silver	< 0.87	< 0.53	< 0.49
Zinc	210	39	34

WTSD 519	0-0.5
Metals	
Antimony	< 3.2
Arsenic	19
Cadmium	1.6
Chromium, Total	270
Copper	110
Iron	52,000
Lead	27
Manganese	720
Mercury	0.11
Nickel	280
Silver	< 0.69
Zinc	76

WTSD 513	0-0.5
Metals	
Antimony	< 3
Arsenic	< 1.4
Cadmium	0.66
Chromium, Total	60
Copper	77
Iron	10,000
Lead	13
Manganese	66
Mercury	0.1
Nickel	160
Silver	< 0.66
Zinc	44

WTSD 517	1-1.5	2-2.5	3-3.5
Metals			
Antimony	< 4.4	< 3.3	< 2.9
Arsenic	2.2	< 1.5	< 1.3
Cadmium	0.77	0.58	0.43
Chromium, Total	67	59	96
Copper	73	38	57
Iron	14,000	16,000	9,300
Lead	23	6	3.5
Manganese	260	110	78
Mercury	0.07	< 0.013	0.014
Nickel	130	94	86
Silver	< 0.96	< 0.73	< 0.63
Zinc	92	44	27

WTSD 516	0-0.5
Metals	
Antimony	< 2.9
Arsenic	< 1.3
Cadmium	0.75
Chromium, Total	100
Copper	66
Iron	52,000
Lead	11
Manganese	580
Mercury	0.04
Nickel	200
Silver	< 0.63
Zinc	58

SD-09*	0.5
Metals	
Arsenic	5.8
Cadmium	1.8
Chromium, Total	144
Copper	129
Iron	38,600
Lead	63.2
Manganese	R
Mercury	< 0.3
Nickel	264
Silver	< 0.82
Zinc	226

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	1.6
Chromium, Total	180
Copper	150
Iron	42,000
Lead	86
Manganese	620
Mercury	0.23
Nickel	270
Silver	< 1.7
Zinc	220

WTSD 512	1-1.5	2-2.5	3-3.5	4-4.5
Metals				
Antimony	< 7	< 2.3	< 2.3	< 2.2
Arsenic	9.5	1.1	< 1	< 0.97
Cadmium	2.8	< 0.17	< 0.17	< 0.16
Chromium, Total	110	22	15	15
Copper	340	28	12	26
Iron	12,000	10,000	7,500	9,400
Lead	16	5.3	3	3.8
Manganese	170	73	53	88
Mercury	0.069	< 0.0092	< 0.0085	< 0.0084
Nickel	410	31	11	21
Silver	< 1.5	< 0.51	< 0.51	< 0.47
Zinc	73	40	23	27

WTSD 514	0-0.5
Metals	
Antimony	< 8.4
Arsenic	< 3.7
Cadmium	1.6
Chromium, Total	120
Copper	150
Iron	37,000
Lead	81
Manganese	560
Mercury	0.2
Nickel	230
Silver	< 1.8
Zinc	200

SD-10*	0.5
Metals	
Arsenic	1.1
Cadmium	0.31
Chromium, Total	11.4
Copper	12.3
Iron	9,820
Lead	3.9
Manganese	R
Mercury	< 0.11
Nickel	26.9
Silver	< 0.18
Zinc	36.8

SD-17*	0.5
Metals	
Arsenic	1.5
Cadmium	< 0.06
Chromium, Total	16.4
Copper	9.9
Iron	6,590
Lead	6.7
Manganese	337
Mercury	0.01
Nickel	35.6
Silver	< 0.14
Zinc	37.3

SD-11*	0.5
Metals	
Arsenic	1.2
Cadmium	0.37
Chromium, Total	13.1
Copper	17.2
Iron	12,800
Lead	5
Manganese	R
Mercury	< 0.12
Nickel	36
Silver	< 0.24
Zinc	47.2

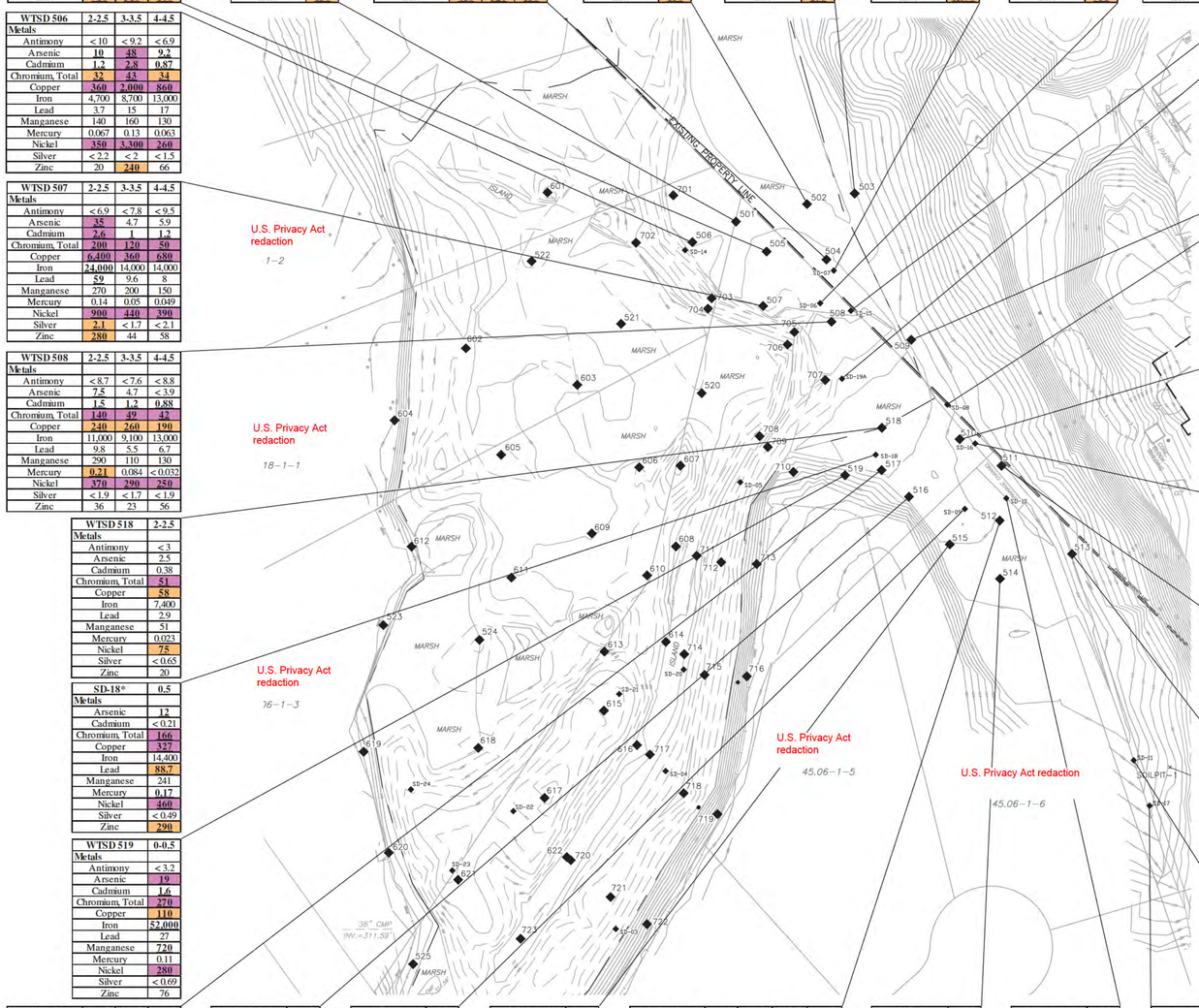
U.S. Privacy Act redaction 1–2

U.S. Privacy Act redaction 18–1–1

U.S. Privacy Act redaction 16–1–3

U.S. Privacy Act redaction 45.06–1–5

U.S. Privacy Act redaction 45.06–1–6



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LEGEND:

- PROPERTY LINE
- WETLAND
- SD-15 / 515 PDI SEDIMENT SAMPLE LOCATION
- RD SEDIMENT SAMPLE LOCATION
- SCO SOIL CLEANUP OBJECTIVE
- R INDICATES COMPOUND VALUE WAS REJECTED AND DEEMED UNUSABLE
- LEL LOWEST EFFECT LEVELS
- NYSDEC NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	1.6
Chromium, Total	180
Copper	150
Iron	42,000
Lead	86
Manganese	620
Mercury	0.23
Nickel	270
Silver	< 1.7
Zinc	220

- SAMPLE DEPTH OR INTERVAL
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
- ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
- ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:

1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE PRE-DESIGN INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.

0 60 120
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	6/30/2013	PRELIMINARY SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

PRELIMINARY REMEDIAL DESIGN
MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - WETLAND AREA

0

FILENAME
SCALE 1"= 60'

SHEET FIGURE 1

PASD 604	0-0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	0.37
Chromium, Total	110
Copper	89
Iron	20,000
Lead	9.2
Manganese	310
Mercury	0.056
Nickel	88
Silver	< 0.62
Zinc	47

PASD 605	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 5.1	< 4.5	< 6.4
Arsenic	< 2.3	< 2	< 2.8
Cadmium	0.62	0.5	0.97
Chromium, Total	62	70	73
Copper	94	48	100
Iron	12,000	12,000	12,000
Lead	10	9.9	12
Manganese	190	180	210
Mercury	0.076	0.073	0.067
Nickel	96	91	120
Silver	< 1.1	< 0.98	< 1.4
Zinc	41	41	40

PASD 602	0-0.5
Metals	
Antimony	< 16
Arsenic	11
Cadmium	1.4
Chromium, Total	43
Copper	92
Iron	11,000
Lead	6.9
Manganese	620
Mercury	0.071
Nickel	160
Silver	< 3.4
Zinc	48

PASD 601	0-0.5
Metals	
Antimony	< 9.6
Arsenic	< 4.3
Cadmium	1.9
Chromium, Total	59
Copper	220
Iron	29,000
Lead	51
Manganese	910
Mercury	0.2
Nickel	140
Silver	< 2.1
Zinc	200

WTSD 522	0-0.5
Metals	
Antimony	< 7.8
Arsenic	< 3.5
Cadmium	0.96
Chromium, Total	53
Copper	53
Iron	11,000
Lead	13
Manganese	390
Mercury	0.08
Nickel	98
Silver	< 1.7
Zinc	39

WTSD 521	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 11	< 12	< 12
Arsenic	9.9	12	7.8
Cadmium	1.9	1.4	1.1
Chromium, Total	110	180	220
Copper	500	310	200
Iron	17,000	11,000	8,900
Lead	87	40	22
Manganese	700	590	390
Mercury	0.24	0.15	0.084
Nickel	250	320	200
Silver	< 2.4	< 2.7	< 2.5
Zinc	150	71	61

PASD 603	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 13	< 15	< 12
Arsenic	7.4	< 6.7	11
Cadmium	1.2	1.2	1.8
Chromium, Total	68	46	43
Copper	64	62	190
Iron	9,800	5,600	6,500
Lead	6.3	3	3.8
Manganese	410	200	120
Mercury	0.097	0.067	0.098
Nickel	180	160	160
Silver	< 2.7	< 3.3	< 2.7
Zinc	19	11	12

WTSD 520	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 11	< 8.1	< 8.9
Arsenic	< 4.8	6	6.3
Cadmium	1.8	1.9	1.4
Chromium, Total	110	130	70
Copper	220	190	370
Iron	24,000	23,000	13,000
Lead	71	51	7.9
Manganese	680	770	230
Mercury	0.19	0.22	0.1
Nickel	220	290	300
Silver	< 2.3	< 1.8	< 1.9
Zinc	150	76	31

PASD 612	0-0.5
Metals	
Antimony	< 3.8
Arsenic	9.8
Cadmium	0.68
Chromium, Total	94
Copper	120
Iron	24,000
Lead	19
Manganese	550
Mercury	0.06
Nickel	120
Silver	< 0.83
Zinc	120

PASD 611	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 8.9	< 7.1	< 7.6
Arsenic	6.7	< 3.2	< 3.4
Cadmium	0.83	0.89	0.85
Chromium, Total	59	62	84
Copper	130	49	59
Iron	19,000	10,000	9,600
Lead	92	10	6.9
Manganese	330	160	160
Mercury	0.26	0.11	0.11
Nickel	110	120	180
Silver	< 1.9	< 1.6	< 1.7
Zinc	84	26	24

PASD 606	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 13	< 12	< 15
Arsenic	6.1	< 5.6	7.8
Cadmium	1.6	1.8	2.1
Chromium, Total	88	49	53
Copper	120	250	320
Iron	17,000	13,000	8,600
Lead	38	4.9	6.3
Manganese	800	230	190
Mercury	0.2	0.11	0.16
Nickel	180	200	250
Silver	< 2.8	< 2.7	< 3.2
Zinc	74	12	17

PASD 607	1-1.5	2-2.5	3-3.5	4-4.5
Metals				
Antimony	< 12	< 7.4	< 4.7	< 2.2
Arsenic	< 5.3	< 3.3	< 2.1	1.3
Cadmium	< 0.86	< 0.54	< 0.34	< 0.16
Chromium, Total	49	47	23	8.5
Copper	2,600	1,100	510	33
Iron	17,000	10,000	9,100	11,000
Lead	26	14	7.4	4.2
Manganese	690	320	170	210
Mercury	0.12	0.051	0.05	< 0.0086
Nickel	370	180	80	17
Silver	< 2.6	< 1.6	< 1	< 0.48
Zinc	76	42	29	22

WTSD 523	0-0.5
Metals	
Antimony	< 3.9
Arsenic	6.2
Cadmium	1.1
Chromium, Total	90
Copper	130
Iron	24,000
Lead	17
Manganese	430
Mercury	0.061
Nickel	110
Silver	< 0.85
Zinc	190

WTSD 524	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 6.7	< 7.4	< 7.8
Arsenic	< 3	< 3.3	< 3.5
Cadmium	0.72	0.73	< 0.57
Chromium, Total	68	66	47
Copper	34	31	32
Iron	11,000	9,800	7,200
Lead	8.4	7	4.7
Manganese	150	140	120
Mercury	0.081	0.069	0.06
Nickel	120	120	98
Silver	< 1.5	< 1.6	< 1.7
Zinc	32	38	28

PASD 609	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 9.8	< 8.8	< 12
Arsenic	6.2	4.6	7.5
Cadmium	1.3	1.3	1.7
Chromium, Total	54	48	44
Copper	90	86	150
Iron	16,000	12,000	7,600
Lead	42	35	3.9
Manganese	370	260	130
Mercury	0.16	0.19	0.074
Nickel	130	140	170
Silver	< 2.1	< 1.9	< 2.5
Zinc	62	46	28

PASD 608	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 7.8	< 7	< 13	< 10
Arsenic	4.1	4.7	11	11
Cadmium	0.93	0.92	1.2	2.1
Chromium, Total	79	50	60	75
Copper	140	93	63	230
Iron	19,000	8,200	7,700	5,900
Lead	39	16	8.8	5
Manganese	420	170	200	38
Mercury	0.065	0.062	0.052	0.092
Nickel	170	87	92	230
Silver	< 1.7	< 1.5	< 2.8	< 2.3
Zinc	86	23	20	11

PASD 618	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 4.6	< 6.7	< 8.4
Arsenic	< 2	< 3	6.1
Cadmium	1	1.1	1.2
Chromium, Total	24	64	37
Copper	120	59	110
Iron	26,000	18,000	10,000
Lead	15	15	6
Manganese	170	240	280
Mercury	0.028	0.074	0.068
Nickel	45	110	110
Silver	< 1	< 1.5	< 1.8
Zinc	61	76	22

PASD 610	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 13	< 15	< 15	< 14
Arsenic	10	8.3	< 6.6	< 6.3
Cadmium	3.2	2.2	< 1.1	1.2
Chromium, Total	46	40	19	52
Copper	330	170	170	160
Iron	12,000	14,000	11,000	14,000
Lead	9.4	5.7	3.2	9.4
Manganese	250	120	58	160
Mercury	0.11	0.21	< 0.057	< 0.052
Nickel	210	190	130	230
Silver	< 2.9	< 3.3	< 3.2	< 3.1
Zinc	31	23	12	42

SD-22*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.52
Chromium, Total	78.3
Copper	415
Iron	35,300
Lead	53.9
Manganese	693
Mercury	0.25
Nickel	170
Silver	< 1.2
Zinc	195

SD-24*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.52
Chromium, Total	76.3
Copper	216
Iron	34,700
Lead	42.2
Manganese	338
Mercury	0.2
Nickel	161
Silver	< 1.2
Zinc	170

PASD 614	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 5.5	< 9.5	< 11	< 12
Arsenic	< 2.5	< 4.3	< 5.1	< 5.6
Cadmium	0.55	1.5	1.1	1
Chromium, Total	53	81	84	64
Copper	67	91	71	63
Iron	11,000	16,000	13,000	8,900
Lead	25	63	20	10
Manganese	160	200	140	95
Mercury	0.1	0.1	0.11	0.11
Nickel	82	280	150	120
Silver	< 1.2	< 2.1	< 2.5	< 2.7
Zinc	39	130	24	19

SD-23*	0.5
Metals	
Arsenic	< 2
Cadmium	< 0.4
Chromium, Total	73.7
Copper	194
Iron	26,600
Lead	48.7
Manganese	525
Mercury	0.14
Nickel	155
Silver	< 0.91
Zinc	270

PASD 620	0-0.5
Metals	
Antimony	< 2.9
Arsenic	9.6
Cadmium	< 0.21
Chromium, Total	210
Copper	100
Iron	17,000
Lead	5.8
Manganese	220
Mercury	0.025
Nickel	96
Silver	< 0.64
Zinc	41

PASD 613	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 12	< 16	< 13	< 15
Arsenic	7.5	< 7.3	8.3	< 6.8
Cadmium	1.3	1.3	1.2	1.2
Chromium, Total	43	40	38	34
Copper	99	150	120	110
Iron	14,000	7,800	5,100	8,300
Lead	30	6.8	3.9	4.2
Manganese	950	300	240	210
Mercury	0.15	0.08	0.057	0.06
Nickel	130	160	150	170
Silver	< 2.6	< 3.6	< 2.8	< 3.3
Zinc	74	26	20	22

SD-21*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.53
Chromium, Total	60.5
Copper	403
Iron	30,100
Lead	112
Manganese	735
Mercury	0.22
Nickel	180
Silver	< 1.2
Zinc	191

PASD 621	2-2.5	2.5-3
Metals		
Antimony	< 2.2	< 2.2
Arsenic	< 0.98	< 1
Cadmium	0.34	0.29
Chromium, Total	11	13
Copper	16	27
Iron	12,000	11,000
Lead	4.3	3.7
Manganese	120	150
Mercury	< 0.0082	< 0.0081
Nickel	12	12
Silver	< 0.48	< 0.49
Zinc	22	21

WTSD 525	0-0.5
Metals	
Antimony	< 6.5
Arsenic	3.5
Cadmium	0.78
Chromium, Total	38
Copper	67
Iron	13,000
Lead	7.9
Manganese	530
Mercury	0.061
Nickel	63
Silver	< 1.4
Zinc	69

SD-01*	0.5
Metals	
Arsenic	10.3
Cadmium	1.3
Chromium, Total	78.1
Copper	493
Iron	21,100
Lead	29.2
Manganese	154
Mercury	< 0.58
Nickel	284
Silver	1.4
Zinc	180

PASD 623	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	0.98
Chromium, Total	190
Copper	690
Iron	70,000
Lead	11
Manganese	920
Mercury	0.017
Nickel	640
Silver	< 0.55
Zinc	51

PASD 617	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 18	< 10	< 5.9
Arsenic	< 7.9	< 4.6	< 2.7
Cadmium	1.5	1.3	0.86
Chromium, Total	32	42	29
Copper	150	120	63
Iron	27,000	43,000	29,000
Lead	7.6	12	9.6
Manganese	160	200	150
Mercury	< 0.065	0.044	0.026
Nickel	290	190	95
Silver	< 3.8	< 2.2	< 1.3
Zinc	87	91	68

PASD 622	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 10	< 4.1	< 4.4
Arsenic	< 4.6	2.6	2.8
Cadmium	< 0.75	0.66	0.69
Chromium, Total	16	26	26
Copper	33	44	49
Iron	8,700	14,000	17,000
Lead	9.3	13	12
Manganese	520	80	140
Mercury	0.07	0.045	0.031
Nickel	28	42	45
Silver	< 2.2	< 0.9	< 0.95
Zinc	110	41	52

PASD 616	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 11	< 12	< 11	< 15
Arsenic	< 4.9	< 5.2	7.9	< 6.7
Cadmium	1	1.1	1.4	1.5
Chromium, Total	37	37	79	65
Copper	90	95	81	130
Iron	12,000	15,000	10,000	10,000
Lead	29	17	28	18
Manganese	340	170	130	93
Mercury	0.11	0.064	0.11	0.082
Nickel	100	130	100	150
Silver	< 2.4	< 2.5	< 2.5	< 3.3
Zinc	40	40	41	38

PASD 615	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 17	< 13	< 13
Arsenic	< 7.8	< 5.8	< 5.8
Cadmium	1.3	1.1	1
Chromium, Total	36	32	28
Copper	150	86	82
Iron	11,000	10,000	8,600
Lead	13	6.3	5.1
Manganese	200	120	130
Mercury	0.072	< 0.048	0.051
Nickel	180	120	130
Silver	< 3.8	< 2.8	< 2.8
Zinc	56	92	72

U.S. Privacy Act redaction

34.18–1–2

U.S. Privacy Act redaction

34.18–1–1

U.S. Privacy Act redaction

45.06–1–3

U.S. Privacy Act redaction

45.06–1–5

U.S. Privacy Act redaction

45.06–1–6

U.S. Privacy Act redaction

45.06–1–4

U.S. Privacy Act redaction

5.06–1–12

U.S. Privacy Act redaction

45.06

LEGEND:

- PROPERTY LINE
- WETLAND
- SD-15 PDI SEDIMENT SAMPLE LOCATION
- 515 RD SEDIMENT SAMPLE LOCATION
- SCO SOIL CLEANUP OBJECTIVE
- R INDICATES COMPOUND VALUE WAS REJECTED AND DEEMED UNUSABLE
- LEL LOWEST EFFECT LEVELS
- NYSDEC NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	1.6
Chromium, Total	180
Copper	150
Iron	42,000
Lead	86
Manganese	620
Mercury	0.23
Nickel	270
Silver	< 1.7
Zinc	220

SAMPLE DEPTH OR INTERVAL

ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)

ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)

ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:

1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE PRE-DESIGN INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.

0 60 120

SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	6/30/2013	PRELIMINARY SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

PRELIMINARY REMEDIAL DESIGN
MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - POND AREA

0

FILENAME

SCALE 1"= 60'

SHEET FIGURE 2

BRSD 709	1-1.5
Metals	
Antimony	< 5.4
Arsenic	6.7
Cadmium	1.3
Chromium, Total	130
Copper	850
Iron	23,000
Lead	27
Manganese	330
Mercury	0.094
Nickel	260
Silver	< 1.2
Zinc	240

BRSD 708	0-0.5	1-1.5	2-2.5
Metals			
Antimony	4.9	< 5.4	8.5
Arsenic	< 2.6	< 2.4	7.3
Cadmium	0.94	1.1	1.7
Chromium, Total	120	190	130
Copper	71	160	210
Iron	18,000	26000	16000
Lead	18	25	9.3
Manganese	500	270	360
Mercury	0.089	0.087	0.072
Nickel	110	210	330
Silver	< 0.94	< 1.2	< 1.4
Zinc	75	49	52

BRSD 706	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 6.4	< 4.2	< 2.7	2.5
Arsenic	4.3	3.3	< 1.2	< 1.1
Cadmium	0.66	0.67	0.45	0.47
Chromium, Total	61	38	20	19
Copper	140	100	28	27
Iron	6600	5200	14000	15,000
Lead	6.8	3.7	6.5	7.3
Manganese	130	64	110	130
Mercury	0.094	0.031	0.011	< 0.0089
Nickel	170	150	37	26
Silver	< 1.4	< 0.91	< 0.58	< 0.53
Zinc	27	27	47	44

BRSD 702	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 13	< 12	< 14
Arsenic	< 5.8	< 5.2	< 6.3
Cadmium	1.2	0.88	< 1
Chromium, Total	45	40	46
Copper	120	70	93
Iron	17000	10000	4800
Lead	42	16	3
Manganese	590	480	190
Mercury	0.16	0.12	0.095
Nickel	160	180	280
Silver	< 2.8	< 2.5	< 3
Zinc	110	47	9.9

BRSD 701	0-0.5
Metals	
Antimony	< 8.4
Arsenic	< 3.8
Cadmium	1.1
Chromium, Total	36
Copper	130
Iron	14000
Lead	37
Manganese	400
Mercury	0.16
Nickel	130
Silver	< 1.8
Zinc	57

SD-14*	0.5
Metals	
Arsenic	8.3
Cadmium	< 0.26
Chromium, Total	49.1
Copper	672
Iron	13,600
Lead	39.5
Manganese	598
Mercury	0.12
Nickel	300
Silver	< 0.6
Zinc	146

BRSD 703	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 11	< 12	< 11
Arsenic	< 4.8	6.8	< 4.9
Cadmium	0.98	1.5	1.3
Chromium, Total	30	78	42
Copper	580	1200	270
Iron	7500	18000	13000
Lead	11	24	8
Manganese	220	370	140
Mercury	0.16	0.097	0.056
Nickel	180	390	230
Silver	< 2.4	< 2.7	< 2.4
Zinc	66	170	83

BRSD 704	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 11	11	< 12	< 8.6
Arsenic	< 4.9	9.9	9.4	< 3.8
Cadmium	1.1	2.1	1.8	0.86
Chromium, Total	72	76	58	48
Copper	300	360	300	160
Iron	10000	13000	7600	11,000
Lead	12	14	8	5.6
Manganese	380	650	400	110
Mercury	0.15	0.13	0.097	0.039
Nickel	230	350	330	230
Silver	< 2.4	< 2.2	< 2.5	< 1.9
Zinc	78	69	46	49

BRSD 705	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 5.2	< 2.5	< 2.5
Arsenic	7	< 1.1	< 1.1
Cadmium	1.2	0.33	0.32
Chromium, Total	140	17	16
Copper	1400	64	84
Iron	19000	11000	11000
Lead	29	4.2	5.3
Manganese	390	100	96
Mercury	0.11	0.011	0.011
Nickel	290	26	29
Silver	< 1.1	< 0.54	< 0.54
Zinc	610	49	46

SD-05*	0.5
Metals	
Arsenic	7
Cadmium	1.1
Chromium, Total	8
Copper	690
Iron	28,000
Lead	46.2
Manganese	321
Mercury	< 0.28
Nickel	231
Silver	0.66
Zinc	441

BRSD 707	1-1.5	2-2.5
Metals		
Antimony	< 2.5	< 2.3
Arsenic	< 1.1	< 1
Cadmium	0.29	0.32
Chromium, Total	25	20
Copper	31	24
Iron	10,000	13,000
Lead	4.4	5
Manganese	63	90
Mercury	0.011	< 0.0085
Nickel	20	17
Silver	< 0.54	< 0.51
Zinc	24	28

BRSD 711	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.1	< 7.6	< 7.4	< 7.8
Arsenic	< 4.1	4.4	3.8	8.8
Cadmium	0.77	0.74	0.68	1.3
Chromium, Total	51	60	55	93
Copper	120	140	130	98
Iron	14,000	15,000	14,000	15,000
Lead	23	15	15	49
Manganese	120	94	83	180
Mercury	0.066	0.05	0.066	0.11
Nickel	140	140	140	170
Silver	< 2	< 1.7	< 1.6	< 1.7
Zinc	65	50	52	86

BRSD 710	0-0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	0.99
Chromium, Total	140
Copper	72
Iron	63,000
Lead	16
Manganese	330
Mercury	0.041
Nickel	360
Silver	< 0.58
Zinc	60

BRSD 714	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.7	< 9.2	< 9.2	< 9.9
Arsenic	< 4.3	< 4.1	< 4.1	< 4.4
Cadmium	0.9	0.94	1.4	1.4
Chromium, Total	50	51	87	65
Copper	130	130	130	140
Iron	15,000	15,000	21,000	15,000
Lead	40	37	51	8.6
Manganese	160	130	260	180
Mercury	0.087	0.091	0.14	0.088
Nickel	140	160	210	170
Silver	< 2.1	< 2	< 2	< 2.2
Zinc	67	56	92	27

BRSD 713	0-0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	1
Chromium, Total	34
Copper	63
Iron	33,000
Lead	10
Manganese	380
Mercury	0
Nickel	83
Silver	< 0.52
Zinc	35

SD-20*	0.5
Metals	
Arsenic	4.1
Cadmium	< 0.5
Chromium, Total	62.7
Copper	241
Iron	18,200
Lead	38.9
Manganese	482
Mercury	0.15
Nickel	200
Silver	< 1.1
Zinc	258

BRSD 712	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 2.3	< 2.4	< 2.2
Arsenic	< 1	1.2	< 1
Cadmium	0.17	< 0.18	0.21
Chromium, Total	16	13	29
Copper	80	66	230
Iron	15,000	11,000	10,000
Lead	5.1	4	4.7
Manganese	160	140	120
Mercury	0.077	0.015	0.0099
Nickel	28	28	90
Silver	< 0.49	< 0.52	< 0.49
Zinc	32	27	26

BRSD 715	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 8.4	< 2.3	< 2.2
Arsenic	47	2.5	< 0.99
Cadmium	0.88	0.25	0.22
Chromium, Total	63	31	28
Copper	110	27	35
Iron	24,000	12,000	17,000
Lead	8.1	4.9	5.1
Manganese	100	90	120
Mercury	< 0.031	< 0.0092	< 0.0083
Nickel	200	27	21
Silver	< 1.8	< 0.51	< 0.48
Zinc	73	37	38

BRSD 716	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	0.83
Chromium, Total	170
Copper	69
Iron	61,000
Lead	14
Manganese	780
Mercury	0.022
Nickel	260
Silver	< 0.55
Zinc	54

BRSD 717	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.3	< 7.5	7.2	6.9
Arsenic	< 4.1	< 3.4	< 3	< 2.5
Cadmium	0.79	1.5	1.7	1.9
Chromium, Total	48	210	250	400
Copper	69	140	91	210
Iron	13,000	33,000	44,000	73,000
Lead	24	45	73	89
Manganese	390	260	360	440
Mercury	0.079	0.12	0.12	0.045
Nickel	77	230	210	470
Silver	< 2	< 1.6	< 1.4	< 1.2
Zinc	64	93	110	180

BRSD 720	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 6.2	< 3.2	< 6
Arsenic	< 2.8	< 1.5	< 2.7
Cadmium	0.57	0.5	0.57
Chromium, Total	23	23	22
Copper	42	75	34
Iron	11,000	15,000	11,000
Lead	20	9.8	15
Manganese	200	81	55
Mercury	0.12	0.06	0.094
Nickel	39	33	29
Silver	< 1.4	< 0.71	< 1.3
Zinc	60	38	42

BRSD 723	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 3.5	< 3.5	< 9.9	< 11
Arsenic	< 1.6	< 1.6	9.7	9.7
Cadmium	0.68	0.52	1.2	1.1
Chromium, Total	71	55	64	37
Copper	53	37	50	70
Iron	24,000	18,000	9,200	6,400
Lead	12	7.9	14	2.4
Manganese	100	98	78	120
Mercury	0.044	0.03	0.13	0.081
Nickel	47	54	120	86
Silver	< 0.77	< 0.76	< 2.2	< 2.5
Zinc	33	33	46	13

SD-04*	0.5
Metals	
Arsenic	9.1
Cadmium	1
Chromium, Total	1.3
Copper	603
Iron	19,500
Lead	29.3
Manganese	167
Mercury	< 0.32
Nickel	234
Silver	1.3
Zinc	209

SD-02*	0.5
Metals	
Arsenic	3
Cadmium	0.78
Chromium, Total	43
Copper	162
Iron	2,160
Lead	19.4
Manganese	R
Mercury	< 0.14
Nickel	180
Silver	< 0.35
Zinc	155

BRSD 725	0-0.5
Metals	
Antimony	< 5.7
Arsenic	< 2.6
Cadmium	0.75
Chromium, Total	64
Copper	70
Iron	18,000
Lead	16
Manganese	530
Mercury	0.058
Nickel	110
Silver	< 1.2
Zinc	98

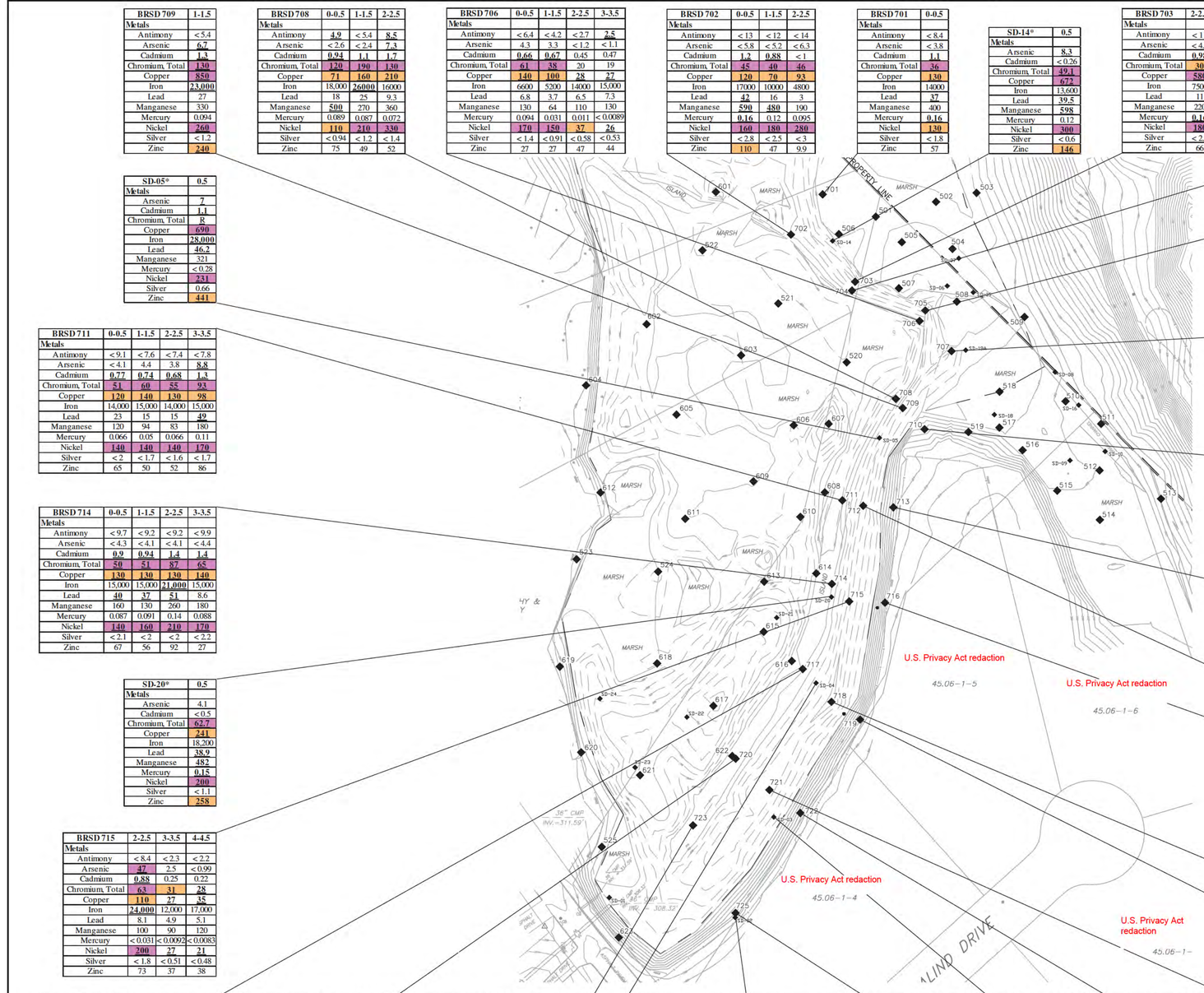
SD-03*	0.5
Metals	
Arsenic	4.4
Cadmium	1.1
Chromium, Total	106
Copper	398
Iron	27,000
Lead	15.4
Manganese	R
Mercury	< 0.23
Nickel	212
Silver	0.58
Zinc	133

BRSD 722	0-0.5
Metals	
Antimony	9.2
Arsenic	< 1.1
Cadmium	0.38
Chromium, Total	160
Copper	58
Iron	45,000
Lead	13
Manganese	700
Mercury	0.032
Nickel	220
Silver	< 0.52
Zinc	61

BRSD 721	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 2.5	< 2.2	< 2.3
Arsenic	1.4	< 0.99	< 1
Cadmium	< 0.18	0.38	0.47
Chromium, Total	15	15	14
Copper	22	22	24
Iron	13,000	14,000	15,000
Lead	2.9	5.7	6.7
Manganese	82	130	190
Mercury	< 0.0089	< 0.0087	0.0092
Nickel	23	20	18
Silver	< 0.54	< 0.48	< 0.51
Zinc	23	35	44

BRSD 719	0-0.5
Metals	
Antimony	< 2.3
Arsenic	< 1.1
Cadmium	0.65
Chromium, Total	99
Copper	84
Iron	37,000
Lead	5.9
Manganese	390
Mercury	0.016
Nickel	92
Silver	< 0.51
Zinc	37

BRSD 718	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 12	< 13	< 16
Arsenic	< 5.5	< 5.8	< 7
Cadmium	1	< 0.94	1.2
Chromium, Total	38	50	36
Copper	120	38	110
Iron	11,000	17,000	19,000
Lead	5	5.6	6.5
Manganese	97	96	100
Mercury	< 0.046	< 0.048	< 0.058
Nickel	150	69	270
Silver	< 2.7	< 2.8	< 3.4
Zinc	67	63	66



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LEGEND:

- PROPERTY LINE
- WETLAND
- SD-15 / 515 — PDI SEDIMENT SAMPLE LOCATION
- RD SEDIMENT SAMPLE LOCATION
- SCO — SOIL CLEANUP OBJECTIVE
- R — INDICATES COMPOUND VALUE WAS REJECTED AND DEEMED UNUSABLE
- LEL — LOWEST EFFECT LEVELS
- NYSDEC — NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	1.6
Chromium, Total	180
Copper	150
Iron	42,000
Lead	86
Manganese	620
Mercury	0.23
Nickel	270
Silver	< 1.7
Zinc	220

SAMPLE DEPTH OR INTERVAL

ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)

ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)

ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:

1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE PRE-DESIGN INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.

0 60 120
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	6/30/2013	PRELIMINARY SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

PRELIMINARY REMEDIAL DESIGN
MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

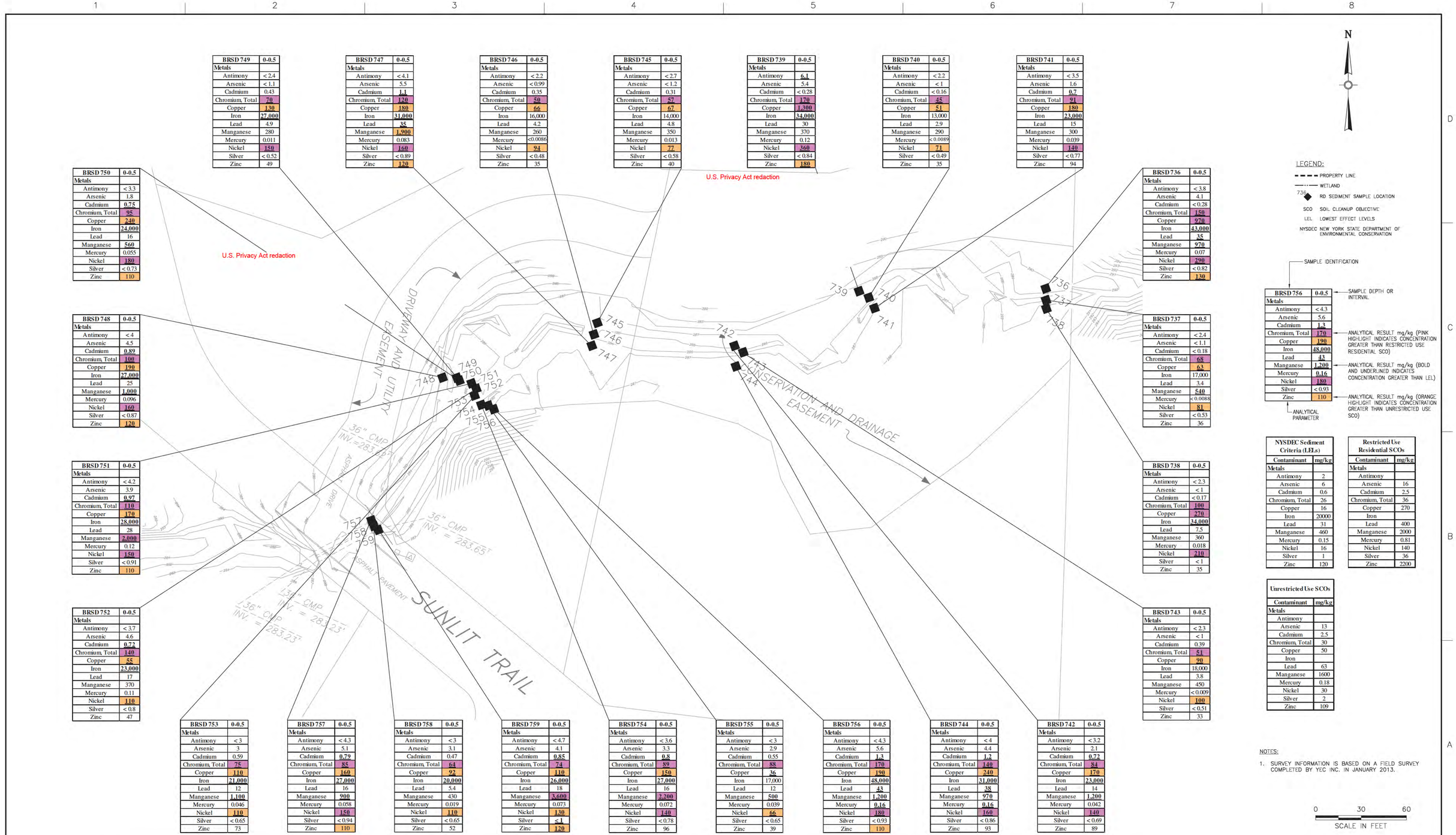
CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - UPPER FURNACE BROOK

0

FILENAME
SCALE 1"= 60'

SHEET FIGURE 3



HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	6/30/2013	PRELIMINARY SUBMISSION TO NYSDEC

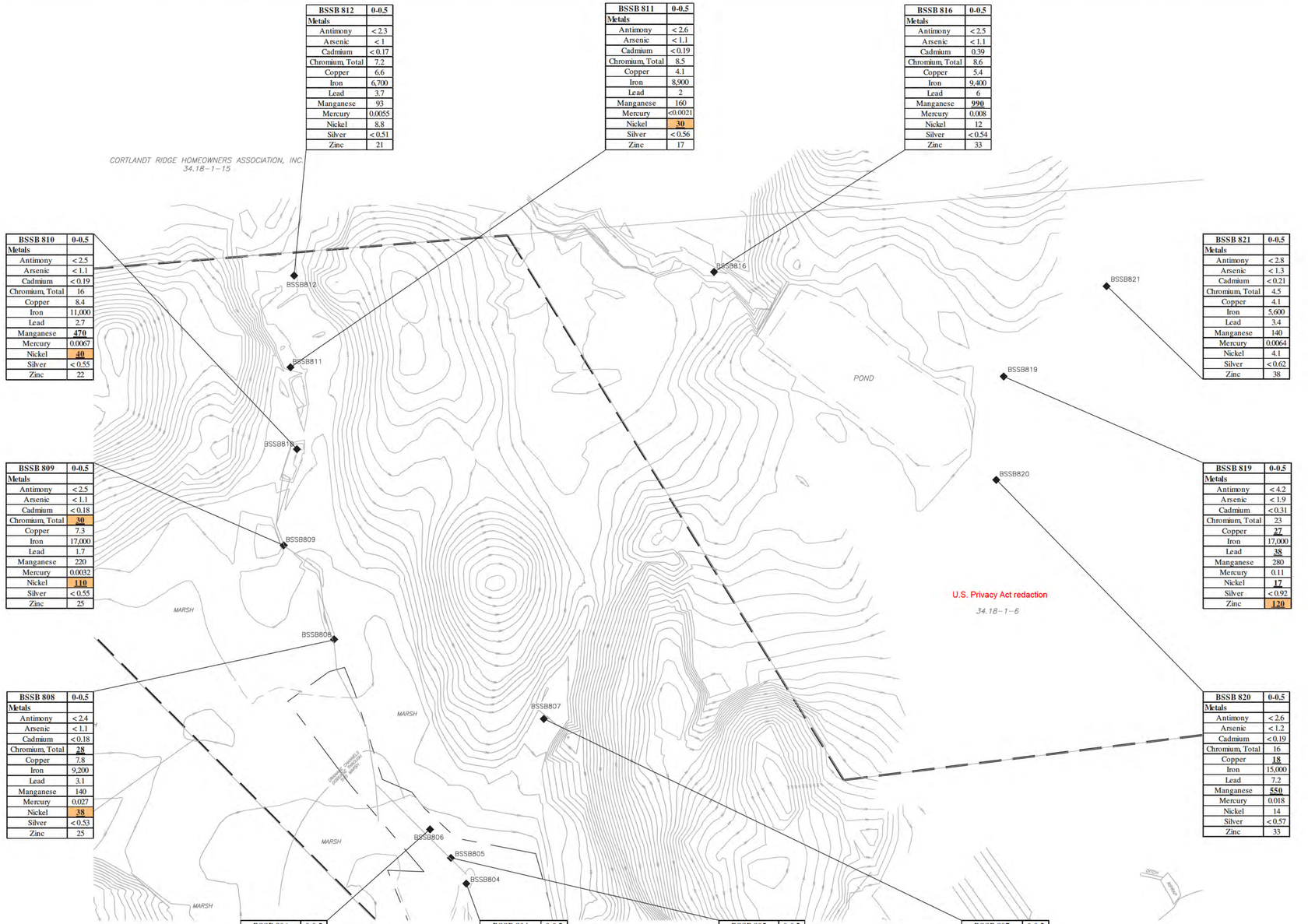
PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

PRELIMINARY REMEDIAL DESIGN
MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - LOWER FURNACE BROOK

FILENAME
SCALE 1"=30'
SHEET FIGURE 4



BSSB 812	0-0.5
Metals	
Antimony	< 2.3
Arsenic	< 1
Cadmium	< 0.17
Chromium, Total	7.2
Copper	6.6
Iron	6,700
Lead	3.7
Manganese	93
Mercury	0.0055
Nickel	8.8
Silver	< 0.51
Zinc	21

BSSB 811	0-0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.1
Cadmium	< 0.19
Chromium, Total	8.5
Copper	4.1
Iron	8,900
Lead	2
Manganese	160
Mercury	<0.0021
Nickel	30
Silver	< 0.56
Zinc	17

BSSB 816	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	0.39
Chromium, Total	8.6
Copper	5.4
Iron	9,400
Lead	6
Manganese	990
Mercury	0.008
Nickel	12
Silver	< 0.54
Zinc	33

BSSB 810	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	< 0.19
Chromium, Total	16
Copper	8.4
Iron	11,000
Lead	2.7
Manganese	470
Mercury	0.0067
Nickel	40
Silver	< 0.55
Zinc	22

BSSB 821	0-0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	< 0.21
Chromium, Total	4.5
Copper	4.1
Iron	5,600
Lead	3.4
Manganese	140
Mercury	0.0064
Nickel	4.1
Silver	< 0.62
Zinc	38

BSSB 809	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	30
Copper	7.3
Iron	17,000
Lead	1.7
Manganese	220
Mercury	0.0032
Nickel	110
Silver	< 0.55
Zinc	25

BSSB 819	0-0.5
Metals	
Antimony	< 4.2
Arsenic	< 1.9
Cadmium	< 0.31
Chromium, Total	23
Copper	27
Iron	17,000
Lead	38
Manganese	280
Mercury	0.11
Nickel	17
Silver	< 0.92
Zinc	120

BSSB 808	0-0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	28
Copper	7.8
Iron	9,200
Lead	3.1
Manganese	140
Mercury	0.027
Nickel	38
Silver	< 0.53
Zinc	25

BSSB 820	0-0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	< 0.19
Chromium, Total	16
Copper	18
Iron	15,000
Lead	7.2
Manganese	550
Mercury	0.018
Nickel	14
Silver	< 0.57
Zinc	33

BSSB 806	0-0.5
Metals	
Antimony	< 3
Arsenic	< 1.3
Cadmium	< 0.22
Chromium, Total	10
Copper	4.9
Iron	5,500
Lead	3
Manganese	110
Mercury	0.012
Nickel	15
Silver	< 0.66
Zinc	21

BSSB 804	0-0.5
Metals	
Antimony	< 6.7
Arsenic	< 3
Cadmium	< 0.49
Chromium, Total	41
Copper	35
Iron	18,000
Lead	24
Manganese	190
Mercury	0.13
Nickel	70
Silver	< 1.5
Zinc	130

BSSB 805	0-0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	< 0.21
Chromium, Total	7.7
Copper	4.4
Iron	4,900
Lead	2.2
Manganese	120
Mercury	0.0081
Nickel	15
Silver	< 0.62
Zinc	18

BSSB 807	0-0.5
Metals	
Antimony	< 3.2
Arsenic	2.2
Cadmium	< 0.23
Chromium, Total	35
Copper	10
Iron	15,000
Lead	28
Manganese	280
Mercury	0.093
Nickel	26
Silver	< 0.69
Zinc	42

N

LEGEND:

- PROPERTY LINE
- WETLAND
- 804 RD BACKGROUND SEDIMENT SAMPLE LOCATION
- SCO SOIL CLEANUP OBJECTIVE
- LEL LOWEST EFFECT LEVELS
- NYSDEC NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION

BRSD 756	0-0.5
Metals	
Antimony	< 4.3
Arsenic	5.6
Cadmium	1.3
Chromium, Total	170
Copper	190
Iron	48,000
Lead	43
Manganese	1,200
Mercury	0.16
Nickel	180
Silver	< 0.93
Zinc	110

SAMPLE DEPTH OR INTERVAL

ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)

ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)

ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:

1. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.

0 60 120
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	6/30/2013	PRELIMINARY SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

PRELIMINARY REMEDIAL DESIGN
MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - BACKGROUND

0

FILENAME	
SCALE	1"= 60'

SHEET FIGURE 5

March 14, 2014

Mr. Matthew Hubicki
Environmental Engineer
Remedial Bureau C
Division of Environmental Remediation
NYS Dept. of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233-7012

RE: NYSDEC Standby Engineering Contract D007625
WA#5 Remedial Design – Magna Metals (Site #36003)
Pre-Design Investigation Summary Report – On Site

Dear Mr. Hubicki:

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) has prepared this letter report to summarize the results of the pre-design investigation conducted by HDR on NYSDEC's behalf, for the Magna Metals State Superfund Site located in Cortlandt, New York. The purpose of the pre-design investigation was to delineate the extent of impacted soil/sediment to refine the limit of the selected remedial design, which includes excavation of on-site and off-site contaminated soils and sediments at concentrations exceeding the soil cleanup objectives (SCO) identified in the Record of Decision (ROD). The investigation tasks completed and summarized in this report included the collection of soil samples in the on-site areas of concerns (AOCs) defined as AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 3 – Refuse Area and AOC 4 – Former Magna Metals Building Area in the Pre-Design Investigation (PDI) Work Plan (WP).

The collection of sediment samples from the off-site areas AOC 5 – Freshwater Wetland and Unnamed Tributary, AOC 6 – Off-Site Pond, and AOC 7 – Furnace Brook in the PDI WP was completed and the results presented in a separate Pre-Design Investigation Summary Report submitted on July 12, 2013.

Field Activities

As part of the PDI, a total of 67 soil samples were collected from 34 locations. Surface samples were collected using disposable spoons and bowls and subsurface samples were collected using a geo-probe. Soil sample locations were surveyed by YEC. Boring logs are included as Attachment A. Soil sample locations for all AOCs are shown on Figure 1.

Henningson, Durham & Richardson Architecture and Engineering, P.C.
in association with HDR Engineering, Inc.
One Blue Hill Plaza, 12th Floor
P.O. Box 1509
Pearl River, NY 10965
Phone: (845) 735-8300
Fax: (845) 735-7466
www.hdrinc.com

AOC-1 – Leach Pit Area

Thirteen soil borings were advanced around the perimeter of the excavation area to horizontally delineate impacted soils. Soil samples were collected at two or three depth intervals, depending upon the depth to bedrock. Bedrock was encountered at all locations between 5 to 14.5 feet below ground surface (bgs), except for LPSB109. Surface samples were collected from 0.5 to 1 foot bgs. Additional samples were collected from 6 – 6.5 or 9-9.5 feet bgs and just above the top of bedrock. Soil samples were analyzed for volatile organic compounds (VOCs) and metals. A total 31 samples were collected from the 13 soil borings.

AOC-2 – Upland Area

Ten soil borings were advanced in the Upland Area to delineate soil impacts horizontally and vertically along the slope. The locations were spaced to approximate a frequency of one sample every 75 linear feet of side wall and one sample for every 3,600 square feet of bottom area. Borings were advanced to a maximum depth of 5 feet (or bedrock). Soil samples were collected from each boring at various depths depending on location, sample purpose (sidewall/bottom) and field screening (PID readings, staining, olfactory). A total of 23 samples were collected from the ten borings and analyzed for VOCs and metals.

AOC-3 – Refuse Area

Five soil borings were advanced in the Refuse Area. Bedrock was encountered at all boring locations, between 1 to 5.5 feet bgs. Surface soil samples were collected at locations RASB301, RASB302, and RASB303. Bottom samples were collected at the top of bedrock at borings RASB303 and RASB304. Six samples were collected from the five boring locations and analyzed for metals.

AOC-4 – Former Magna Metals Building

Six soil borings were advanced within the former Magna Metals Building footprint to investigate potential soil impacts beneath the building. The location spacing approximates a frequency of one sample every 30 linear feet of sidewall and one sample for every 1,200 square feet of bottom area. Of the borings advanced, five were sidewall samples collected at a depth interval of 1-1.5 feet bgs and one bottom sample collected at 6-6.5 feet bgs. A total of seven samples were collected from the six borings and analyzed for VOCs and metals.

Sample Analytical Results

Soil samples were collected and sent to Con-Test Analytical Laboratory for sample analysis under standard chain of custody procedures. Soil samples results were compared to the site specific soil cleanup objectives (SCOs). Lead, mercury, and zinc were compared to the commercial use SCOs. Arsenic, chromium, copper, nickel, selenium and volatile organic compounds (VOCs) were compared to the lower of the protection of groundwater and commercial use SCOs. The sample results for AOCs 1, 2, 3, and 4 are summarized on Figure 1 and discussed below.

AOC 1- Leach Pit Area

There were no chemical concentrations in excess of SCOs for surface samples collected in the leach pit area with the exception of LPSB112 which had a concentration of chromium of 30 mg/kg and LPSB110 with a concentration of copper at 520 mg/kg. Samples collected from the deeper intervals (6-6.5 feet bgs, 9-9.5 feet bgs and/or 14-14.5 feet bgs or bedrock) were below applicable SCOs for sample locations LPSB110, LPSB109, LPSB108, LPSB107, and LPSB104. The remaining locations (LPSB101, LPSB102, LPSB103, LPSB105, LPSB106, LPSB111, LPSB112, LPSB113) all had concentrations of metals in excess of applicable SCOs at the interval corresponding to the depth of the leach pits (from 6.5-9.5 feet bgs). For borings that did not hit refusal (LPSB102, LPSB103), soil samples collected from beneath the leach pits from 12-14.5 feet bgs did not contain metals in excess of the SCOs. The only exception was location LPSB112 which was impacted from the surface to 13 feet bgs. Metals exceeding the SCOs included chromium (20 to 230 mg/kg), copper (280 to 5,300 mg/kg), and nickel (130 to 400 mg/kg). There were no VOCs detected above their applicable SCOs.

AOC 2 – Upland Area

There were no chemical concentrations in excess of SCOs for all sample intervals collected at UASB207 and UASB208. Surface samples collected from the remaining sample locations (UASB201, UASB202, UASB203, UASB205, UASB206, UASB209, and UASB210), with the exception of UASB204 had metals in excess of SCOs. One clean bottom sample was collected at UASB205 at 4-4.5 feet bgs; the other four bottom samples had impacts at the deepest interval sampled. Metals exceeding the SCOs included chromium (20 to 110 mg/kg), copper (480 to 2800 mg/kg), nickel (130 to 450 mg/kg), and selenium (8.4 to 19 mg/kg).

AOC-3 – Refuse Area

There were no chemical concentrations in excess of SCOs for surface samples collected at RASB305 and RASB304. All other samples had detections of chromium greater than the applicable SCO of 19 mg/kg. Sample location RASB303 also had a concentration of barium (410 mg/kg) in excess of the commercial use SCO of 400 mg/kg.

AOC-4 – Former Magna Metals Building

Sample locations BDSB402, BDSB403, and BDSB406 all collected at 1-1.5 feet bgs had no chemical concentrations in excess of the SCOs. Metals concentrations of barium (420 mg/kg) and chromium (69 mg/kg) exceeded the SCOs at BDSB401 at 1-1.5 feet bgs. Arsenic (110 mg/kg), chromium (23 mg/kg), copper (2900 mg/kg), and nickel (1000 mg/kg) exceeded the SCOs at BDSB404 at 1-1.5 feet bgs. Chromium (20 mg/kg), copper (1200 and 520 mg/kg), and selenium (220 mg/kg) were exceeded at BDSB405 at depths of 1-1.5 feet bgs and 6-6.5 feet bgs.

If you have any questions or require additional information, please do not hesitate to contact me at 845-735-8300 ext. 269.

Very truly yours,



Thomas M. Connors, P.E., MBA
Project Manager

Cc: M. Lehtinen, HDR Program Manager
HDR File

Att.: Figure 1 – Summary of On-Site Analytical Results
Attachment A – Boring Logs

UASB201	11/8/13
	0-0.5
VOCs	
Methylene Chloride	< 0.0099
TCE	< 0.0013
Xylenes (mp)	< 0.0024
Xylene (o)	< 0.00098
Metals	
Arsenic	< 1.2
Barium	75
Chromium	**53**
Copper	39
Lead	35
Mercury	0.087
Nickel	65
Selenium	< 1
Zinc	75

LPSB102	11/7/13	11/7/13	11/7/13
	0-0.5	9-9.5	12.5-13
VOCs			
Methylene Chloride	0.01	0.012	0.011
TCE	< 0.0011	< 0.0012	< 0.001
Xylenes (mp)	< 0.002	3.6	< 0.0019
Xylene (o)	< 0.00082	1.5	< 0.00078
Metals			
Arsenic	< 1	1.9	< 1
Barium	57	230	50
Chromium	17	**62**	8.4
Copper	82	**5300**	36
Lead	29	430	3.1
Mercury	0.02	0.081	< 0.0018
Nickel	16	**250**	76
Selenium	< 0.88	< 1.1	< 0.86
Zinc	77	8700	26

UASB202	11/8/13
	0-0.5
VOCs	
Methylene Chloride	0.011
TCE	< 0.0012
Xylenes (mp)	< 0.0023
Xylene (o)	< 0.00095
Metals	
Arsenic	< 1.1
Barium	94
Chromium	**59**
Copper	95
Lead	55
Mercury	0.081
Nickel	**130**
Selenium	< 0.93
Zinc	240

LPSB101	11/8/13	11/8/13
	0-0.5	6.5-7
VOCs		
Methylene Chloride	0.0086	0.0083
TCE	< 0.001	< 0.001
Xylenes (mp)	< 0.0019	< 0.0019
Xylene (o)	< 0.0008	< 0.0008
Metals		
Arsenic	< 1	< 1.1
Barium	57	170
Chromium	15	**85**
Copper	56	**850**
Lead	16	640
Mercury	0.046	0.087
Nickel	16	120
Selenium	1.3	2.6
Zinc	82	920

LPSB103	11/7/13	11/7/13	11/7/13
	0-0.5	9-9.5	12-13.5
VOCs			
Methylene Chloride	0.0084	0.0086	0.0066
TCE	< 0.00098	< 0.00086	< 0.00083
Xylenes (mp)	< 0.0019	< 0.0016	< 0.0016
Xylene (o)	< 0.00076	< 0.00067	< 0.00065
Metals			
Arsenic	< 0.97	< 1	< 0.96
Barium	62	72	45
Chromium	18	**20**	9.3
Copper	45	59	31
Lead	18	19	4.8
Mercury	0.018	0.012	0.002
Nickel	24	24	10
Selenium	< 0.83	< 0.86	< 0.82
Zinc	99	120	25

RASB301	11/5/13
	0-0.5
VOCs	
Methylene Chloride	NA
TCE	NA
Xylenes (mp)	NA
Xylene (o)	NA
Metals	
Arsenic	< 0.95
Barium	350
Chromium	**68**
Copper	74
Lead	14
Mercury	0.044
Nickel	59
Selenium	< 1.6
Zinc	66

RASB303	11/5/13
	1-1.5
VOCs	
Methylene Chloride	NA
TCE	NA
Xylenes (mp)	NA
Xylene (o)	NA
Metals	
Arsenic	< 0.95
Barium	**410**
Chromium	**37**
Copper	56
Lead	9.9
Mercury	0.053
Nickel	52
Selenium	< 4.1
Zinc	72

RASB302	11/5/13
	0-0.5
VOCs	
Methylene Chloride	NA
TCE	NA
Xylenes (mp)	NA
Xylene (o)	NA
Metals	
Arsenic	< 1
Barium	66
Chromium	**25**
Copper	37
Lead	6.1
Mercury	0.05
Nickel	42
Selenium	< 0.85
Zinc	65

RASB304	11/5/13	11/5/13
	0-0.5	4-4.5
VOCs		
Methylene Chloride	NA	NA
TCE	NA	NA
Xylenes (mp)	NA	NA
Xylene (o)	NA	NA
Metals		
Arsenic	1.5	< 0.9
Barium	60	230
Chromium	14	**45**
Copper	26	78
Lead	14	1.8
Mercury	0.02	< 0.0016
Nickel	15	75
Selenium	< 0.76	< 0.77
Zinc	280	12

UASB204	11/8/13	11/8/13	11/8/13
	0-0.5	1-1.5	2-2.5
VOCs			
Methylene Chloride	0.0085	0.0088	0.011
TCE	< 0.001	< 0.001	< 0.00092
Xylenes (mp)	< 0.0019	< 0.0019	< 0.0017
Xylene (o)	< 0.00078	< 0.0008	< 0.00072
Metals			
Arsenic	< 0.98	< 0.97	< 0.99
Barium	43	79	63
Chromium	18	**24**	**26**
Copper	74	120	120
Lead	13	8	9.8
Mercury	0.034	0.013	0.01
Nickel	21	31	35
Selenium	1.7	< 0.83	< 0.85
Zinc	73	60	40

LPSB104	11/7/13	11/7/13
	0-0.5	9-9.5
VOCs		
Methylene Chloride	0.0083	0.0073
TCE	< 0.001	< 0.00087
Xylenes (mp)	< 0.002	< 0.0016
Xylene (o)	< 0.00081	< 0.00068
Metals		
Arsenic	< 1	< 0.94
Barium	60	47
Chromium	16	17
Copper	25	23
Lead	14	6.8
Mercury	0.031	0.017
Nickel	12	15
Selenium	< 0.89	< 0.8
Zinc	40	24

BDSB401	11/5/13
	1-1.5
VOCs	
Methylene Chloride	< 0.0076
TCE	< 0.00097
Xylenes (mp)	< 0.0018
Xylene (o)	< 0.00075
Metals	
Arsenic	< 0.97
Barium	**420**
Chromium	**69**
Copper	52
Lead	21
Mercury	0.041
Nickel	71
Selenium	< 0.83
Zinc	430

RASB305	11/5/13
	0-0.5
VOCs	
Methylene Chloride	NA
TCE	NA
Xylenes (mp)	NA
Xylene (o)	NA
Metals	
Arsenic	1.2
Barium	41
Chromium	11
Copper	30
Lead	30
Mercury	0.024
Nickel	17
Selenium	< 0.74
Zinc	130

UASB203	11/8/13	11/8/13	11/8/13
	0-0.5	1-1.5	2-2.5
VOCs			
Methylene Chloride	< 0.01	0.01	0.01
TCE	< 0.0013	< 0.0011	< 0.00097
Xylenes (mp)	< 0.0024	< 0.0021	< 0.0018
Xylene (o)	< 0.00099	< 0.00087	< 0.00075
Metals			
Arsenic	< 1.1	< 1.1	< 1.1
Barium	73	70	44
Chromium	**32**	**33**	**29**
Copper	**570**	**480**	130
Lead	77	14	4.5
Mercury	0.11	0.047	0.0051
Nickel	41	54	45
Selenium	< 0.95	2	< 0.9
Zinc	76	66	31

BDSB402	11/5/13
	1-1.5
VOCs	
Methylene Chloride	0.01
TCE	0.0016
Xylenes (mp)	< 0.002
Xylene (o)	< 0.00083
Metals	
Arsenic	< 0.95
Barium	89
Chromium	18
Copper	20
Lead	6
Mercury	0.0094
Nickel	17
Selenium	< 0.81
Zinc	32

BDSB404	11/5/13
	1-1.5
VOCs	
Methylene Chloride	< 0.0077
TCE	0.0053
Xylenes (mp)	< 0.0018
Xylene (o)	< 0.00075
Metals	
Arsenic	**110**
Barium	60
Chromium	**23**
Copper	**2900**
Lead	14
Mercury	0.0055
Nickel	**1000**
Selenium	< 0.89
Zinc	890

LPSB105	11/7/13	11/7/13
	0-0.5	7.5-8
VOCs		
Methylene Chloride	< 0.0089	< 0.0076
TCE	< 0.0011	< 0.000096
Xylenes (mp)	< 0.0021	0.017
Xylene (o)	< 0.00087	0.0097
Metals		
Arsenic	< 0.94	< 1
Barium	70	110
Chromium	15	**300**
Copper	39	71
Lead	17	21
Mercury	0.026	0.0043
Nickel	14	**400**
Selenium	< 0.81	1.1
Zinc	50	82

LPSB106	11/7/13	11/7/13
	0-0.5	9-9.5
VOCs		
Methylene Chloride	< 0.0089	< 0.0069
TCE	< 0.0011	< 0.00087
Xylenes (mp)	< 0.0021	< 0.0016
Xylene (o)	< 0.00088	< 0.00068
Metals		
Arsenic	< 0.95	< 0.92
Barium	130	170
Chromium	**26**	**45**
Copper	130	**280**
Lead	36	7.2
Mercury	0.026	< 0.0016
Nickel	31	**130**
Selenium	< 0.82	< 0.78
Zinc	89	35

BDSB403	11/5/13
	1-1.5
VOCs	
Methylene Chloride	0.0092
TCE	0.04
Xylenes (mp)	< 0.0019
Xylene (o)	< 0.00079
Metals	
Arsenic	7.3
Barium	75
Chromium	15
Copper	61
Lead	13
Mercury	0.05
Nickel	14
Selenium	< 0.92
Zinc	34

LPSB108	11/6/13	11/6/13
	0-0.5	4.5-5
VOCs		
Methylene Chloride	< 0.0083	< 0.011
TCE	< 0.0011	< 0.0013
Xylenes (mp)	< 0.002	< 0.0025
Xylene (o)	< 0.00082	< 0.001
Metals		
Arsenic	< 0.9	< 0.96
Barium	48	310
Chromium	7.6	9.9
Copper	25	43
Lead	10	6.7
Mercury	0.022	0.0071
Nickel	8.2	11
Selenium	< 0.77	< 0.82
Zinc	590	120

UASB205	11/8/13	11/8/13	11/8/13
	2-2.5	3-3.5	4-4.5
VOCs			
Methylene Chloride	< 0.0088	< 0.0071	0.0089
TCE	< 0.0011	< 0.0009	< 0.00084
Xylenes (mp)	< 0.0021	< 0.0017	< 0.0016
Xylene (o)	< 0.00087	< 0.0007	< 0.00065
Metals			
Arsenic	< 1.3	< 0.98	< 0.97
Barium	82	50	51
Chromium	**21**	13	17
Copper	**2800**	140	170
Lead	55	4.6	6
Mercury	0.11	< 0.0018	0.0083
Nickel	**300**	38	44
Selenium	< 1.1	< 0.84	1.2
Zinc	52	22	27

BDSB405	11/5/13	11/5/13
	1-1.5	6-6.5
VOCs		
Methylene Chloride	0.0081	< 0.0064
TCE	< 0.00095	< 0.00082
Xylenes (mp)	< 0.0018	< 0.0015
Xylene (o)	< 0.00074	< 0.00064
Metals		
Arsenic	1.8	< 1
Barium	40	77
Chromium	9.3	**20**
Copper	**1200**	**520**
Lead	39	12
Mercury	0.019	0.015
Nickel	11	22
Selenium	**220**	< 0.87
Zinc	480	42

BDSB406	11/5/13
	1-1.5
VOCs	
Methylene Chloride	0.0097
TCE	< 0.00097
Xylenes (mp)	< 0.0018
Xylene (o)	< 0.00075
Metals	
Arsenic	1.4
Barium	33
Chromium	11
Copper	24
Lead	5.3
Mercury	0.0032
Nickel	11
Selenium	< 0.84
Zinc	35

UASB206	11/8/13	11/8/13
	0-0.5	1-1.5
VOCs		
Methylene Chloride	< 0.0099	0.012
TCE	< 0.0013	< 0.00098
Xylenes (mp)	< 0.0024	< 0.0019
Xylene (o)	< 0.00098	< 0.00076
Metals		
Arsenic	< 1.1	< 0.93
Barium	68	63
Chromium	**22**	18
Copper	80	26
Lead	29	9.4
Mercury	0.11	0.016
Nickel	21	15
Selenium	< 0.91	< 0.8
Zinc	130	35

UASB208	11/8/13	11/8/13	11/8/13
	0-0.5	1-1.5	2-2.5
VOCs			
Methylene Chloride	< 0.0098	0.014	0.016
TCE	< 0.0012	< 0.0011	< 0.0011
Xylenes (mp)	< 0.0023	< 0.0021	< 0.002
Xylene (o)	< 0.00096	< 0.00087	< 0.00084
Metals			
Arsenic	< 1.1	< 0.95	< 0.99
Barium	42	51	50
Chromium	11	16	15
Copper	30	29	21
Lead	11	15	8.7
Mercury	0.064	0.054	0.032
Nickel	13	15	13
Selenium	< 0.93	< 0.81	< 0.85
Zinc	56	100	59

LPSB107	11/6/13	11/6/13	11/6/13
	0-0.5	10-10.5	13.5-14
VOCs			
Methylene Chloride	< 0.0075	< 0.0085	< 0.0066
TCE	< 0.00095	< 0.0011	< 0.00083
Xylenes (mp)	< 0.0018	< 0.002	< 0.0016
Xylene (o)	< 0.00074	< 0.00084	< 0.00065
Metals			
Arsenic	1.1	3.4	13
Barium	48	57	37
Chromium	11	7.1	9.3
Copper	23	47	87
Lead	5.1	4	2.8
Mercury	0.013	< 0.0016	< 0.0017
Nickel	11	10	24
Selenium	< 0.8	< 0.76	< 0.78
Zinc	32	31	26

UASB210	11/8/13	11/8/13
	0-0.5	1-1.5
VOCs		
Methylene Chloride	< 0.011	< 0.0078
TCE	< 0.0014	< 0.00099
Xylenes (mp)	< 0.0027	< 0.0019
Xylene (o)	< 0.0011	< 0.00077
Metals		
Arsenic	2.7	8
Barium	85	62
Chromium	**20**	**52**
Copper	**510**	**690**
Lead	63	29
Mercury	0.19	0.066
Nickel	62	**280**
Selenium	< 1.1	**8.4**
Zinc	180	220

UASB209	11/8/13	11/8/13
	0-0.5	1-1.5
VOCs		
Methylene Chloride	< 0.013	< 0.014
TCE	< 0.0016	< 0.0018
Xylenes (mp)	< 0.003	< 0.0035
Xylene (o)	< 0.0012	< 0.0014
Metals		
Arsenic	6.8	**21**
Barium	340	330
Chromium	**52**	**110**
Copper	**680**	**1400**
Lead	26	39
Mercury	0.11	0.13
Nickel	**220**	**450**
Selenium	**9**	**19**
Zinc	170	370

LPSB109	11/6/13	11/6/13	11/6/13
	0-0.5	9-9.5	14-14.5
VOCs			
Methylene Chloride	< 0.0074	< 0.0068	< 0.0071
TCE	< 0.00094	< 0.00087	< 0.0009
Xylenes (mp)	< 0.0018	< 0.0016	< 0.0017
Xylene (o)	< 0.00073	< 0.00067	< 0.0007
Metals			
Arsenic	< 0.94	< 0.87	9.8
Barium	45	36	28
Chromium	9	5.1	5.6
Copper	29	29	69
Lead	7.3	2.8	3.1
Mercury	0.013	< 0.0016	< 0.0017
Nickel	8.7	6.5	20
Selenium	< 0.8	< 0.75	< 0.79
Zinc	68	19	17

LPSB110	11/6/13	11/6/13
	0-0.5	5.5-6
VOCs		
Methylene Chloride	< 0.0073	< 0.0081
TCE	< 0.00092	< 0.001
Xylenes (mp)	< 0.0017	< 0.0019
Xylene (o)	< 0.00072	< 0.00079
Metals		
Arsenic	1.2	2.8
Barium	100	120
Chromium	12	9
Copper	**520**	240
Lead	40	3.8
Mercury	0.024	< 0.0017
Nickel	19	44
Selenium	< 0.83	< 0.82
Zinc	160	39

LPSB112	11/7/13	11/7/13	11/7/13
	0-0.5	9-9.5	12.5-13
VOCs			
Methylene Chloride	< 0.0079	< 0.0069	< 0.0067
TCE	< 0.001	< 0.00087	< 0.00085
Xylenes (mp)	< 0.0019	< 0.0016	< 0.0016
Xylene (o)	< 0.00078	< 0.00068	< 0.00066
Metals			
Arsenic	1.1	< 0.94	**19**
Barium	71	69	130
Chromium	**30**	**23**	**130**
Copper	99	27	110
Lead	41	2.9	2.4
Mercury	0.026	0.0027	< 0.0016
Nickel	32	28	38
Selenium	< 0.9	< 0.8	0.91
Zinc	99	17	25

LPSB113	11/6/13	11/6/13
	0-0.5	9-9.5
VOCs		
Methylene Chloride	< 0.0074	< 0.0072
TCE	< 0.00094	< 0.00091
Xylenes (mp)	< 0.0018	< 0.0017
Xylene (o)	< 0.00073	< 0.00071
Metals		
Arsenic	3.2	**25**
Barium	40	62
Chromium	14	**130**
Copper	66	**520**
Lead	16	6.5
Mercury	0.016	< 0.0017
Nickel	13	83
Selenium	< 0.84	< 4
Zinc	68	41

LPSB111	11/6/13	11/6/13
	0-0.5	6.5-7
VOCs		
Methylene Chloride	< 0.0083	< 0.0077
TCE	< 0.0011	< 0.00097
Xylenes (mp)	< 0.002	< 0.0018
Xylene (o)	< 0.00082	< 0.00076
Metals		
Arsenic	< 1	< 0.95
Barium	68	110
Chromium	16	**230**
Copper	69	44
Lead	16	4
Mercury	0.021	< 0.0017
Nickel	16	66
Selenium	< 0.86	< 0.81
Zinc	86	23

UASB207	11/8/13	11/8/13	11/8/13
	2-2.5	3-3.5	4-4.5
VOCs			
Methylene Chloride	0.012	0.009	0.011
TCE	< 0.0011	< 0.001	0.001
Xylenes (mp)	< 0.002	< 0.002	< 0.0018
Xylene (o)	< 0.00084	< 0.00081	< 0.00074
Metals			
Arsenic	< 1.1	< 0.97	< 1.1
Barium	67	49	55
Chromium	16	18	17
Copper	200	28	31
Lead	14	6.5	9.7
Mercury	0.033	< 0.0018	0.0074
Nickel	81	16	19
Selenium	2.7	< 0.83	< 0.93
Zinc	100	32	41

Site Specific SCOs

Contaminant	mg/kg
VOCs	
1,1,2,2-TTCA	0.6
Total Xylene	1.6
Methylene Chloride	0.05
PCE	1.3
TCE	0.47
1,1-DCE	0.33
cis-1,2-DCE	0.25
trans-1,2-DCE	0.19
Metals	
Arsenic	16
Barium	400
Chromium	19
Copper	270
Lead	1000
Mercury	2.8
Nickel	130
Selenium	4
Zinc	10000

LEGEND:

- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- RD SOIL SAMPLE

1,1,2,2–TTCA	1,1,2,2–TETRACHLOROETHANE
TCE	TRICHLOROETHENE
PCE	TETRACHLOROETHENE
DCE	DICHLOROETHENE
VOCs	VOLATILE ORGANIC COMPOUNDS
SCOs	SOIL CLEANUP OBJECTIVES
NA	NOT AVAILABLE
MG/KG	MILLIGRAM PER KILOGRAM
RD	REMEDIAL DESIGN

SAMPLE IDENTIFICATION

BDSB404	11/5/13
	1-1.5
VOCs	
Methylene Chloride	< 0.0077
TCE	0.0053
Xylenes (mp)	< 0.0018
Xylene (o)	< 0.00075
Metals	
Arsenic	**110**
Barium	60
Chromium	**23**
Copper	**2900**
Lead	14
Mercury	0.0055
Nickel	**1000**
Selenium	< 0.89
Zinc	890

SAMPLE DEPTH OR INTERVAL

< SIGN INDICATES STANDARD WAS NOT DETECTED ABOVE THE ANALYTICAL METHOD LIMIT

ANALYTICAL RESULT MG/KG (BOLD AND PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN MAGNA METALS ROD STANDARDS)

ANALYTICAL PARAMETER

NOTES:

1. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
2. ANALYTICAL INFORMATION IS SHOWN FOR ONLY THOSE COMPOUNDS WITH DETECTIONS AT ONE OR MORE LOCATIONS.

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	3/14/2014	SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

DRAFT

PRELIMINARY REMEDIAL DESIGN MAGNA METALS SUPERFUND SITE NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS - ON SITE AREA

0 30' 60'

FILENAME

SCALE 1"= 30'

SHEET FIGURE 1

C:\powerking\dirtd\66910170OC-01.dwg, On-site, 3/14/2014 2:10:42 PM, sking

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER BDSB401

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 350.73 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	16-12-20-13 (32)	19.2	2.0	(FILL) FILL, concrete and gravel with some c-m sand 348.7	PID = 0	

Bottom of borehole at 2.0 feet.

BORING NUMBER BDSB402

HDR Engineering, Inc.

CLIENT NYSDEC **PROJECT NAME** Magna Metals State Superfund Site

PROJECT NUMBER NYSDEC Site # 360003 **PROJECT LOCATION** Cortlandt, New York

DATE STARTED 11/5/13 **COMPLETED** 11/5/13 **GROUND ELEVATION** 350.52 ft AMSL **HOLE SIZE** 3 inch

DRILLING CONTRACTOR Nothnagle Drilling Inc. **GROUND WATER LEVELS:**

DRILLING METHOD HSA with CME 55 Low Clearance Drill **AT TIME OF DRILLING** ---

LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip **AT END OF DRILLING** ---

NOTES **AFTER DRILLING** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	2-3-30-50 (33)	16.8		0.2 Asphalt 350.3 (SP) FINE SAND, organge/brown, some gravel,little silt 2.0 348.5	PID = 0	
	SS	20-50	7.2		(SP) FINE SAND, organge/brown, some gravel,little silt 4.0 346.5	PID = 0	
5	SS	40-50	1.2		(SW) F-C SAND , gray, little gravel, trace silt, hard pieces of schist 6.0 344.5	PID = 0	
	SS		1.2		6.1 0.1 inches of hard micaceous schist in shoe, EOB 6.1' 344.4	PID = 0	

Bottom of borehole at 6.1 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER BDSB403

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 350.2 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	2-3-2-2 (5)	13.2		0.8 Asphalt 349.4 (SM) C-F SAND, brown, some silt 2.0 348.2	PID = 0	

Bottom of borehole at 2.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER BDSB404

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 350.06 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
	SS	3-1-1-1 (2)	8.4		0.4 Asphalt 349.7 (SP) F-M SAND, brown, some silt, trace gravel 2.0 348.1	PID = 0	

Bottom of borehole at 2.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER BDSB405

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 349.83 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	1-2-3-6 (5)	18		2.0	(SM) FINE SAND,organge/tan, trace silt, gravel 347.8	PID = 0	
	SS	44-23-33-6 (56)	3.6		4.0	(SC) FINE SAND and clay, brown, trace gravel 345.8	PID = 0	
5	SS	2-7-9-12 (16)	21.6		6.0	(SC) FINE SAND and clay, brown, trace gravel 343.8	PID = 0	
	SS	29-25-24-50 (49)	20.4		7.6	(SC) FINE SAND and clay, brown, trace gravel, some layers of weathered rock/quartz 342.2	PID = 0	
	SS	50			8.5	(SCH) Weathered schist 341.3	PID = 0	

Refusal at 8.5 feet.
Bottom of borehole at 8.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER BDSB406

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 350.56 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	12-6-3-3 (9)	18		0.4 Asphalt 350.2 (SM) FINE SAND, tan, trace silt 2.0 348.6	PID = 0	

Bottom of borehole at 2.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB101

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 315.72 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	12-1-23-33 (24)	15.6		2.0	(SM) FINE SAND and silt, brown, trace gravel, cobble at 0.29' 313.7	PID = 0	
	SS	8-5-7-24 (12)	18		3.2	(SM) SAND and silt, grey 312.5	PID = 0	
					4.0	Wood, metal ribbon in shoe 311.7		
5	SS	2-2-5-7 (7)	8.4		6.0	(SM) FINE SAND and silt, grey, trace gravel and glass pieces 309.7	PID = 0	
	SS	16-24-25-50/0"	8.4		7.5	(SM) FINE SAND and silt, grey, trace gravel and glass pieces; refusal @ 7.5 308.2	PID = 0	

Refusal at 7.5 feet.
Bottom of borehole at 7.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB102

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 333.9 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	4-8-14-15 (22)	21.6		2.0	(SM) M-F SAND and silt, brown, some gravel 331.9	PID = 0	
	SS	10-7-7-4 (14)	13.2		3.0	(SM) M-F SAND and silt, brown, some gravel 330.9	PID = 0	
					4.0	(SM) FINE SAND and silt, gray, little gravel, refusal at 3.2' 329.9		
5	SS	17-7-8-6 (15)	0		6.0	No recovery 327.9	PID = 0	
	SS	6-5-8-6 (13)	9.6		7.2	(CL) CLAY, red 326.7	PID = 0	
					8.0	Black, hard, foreign metal hard but brittle white/yellow 325.9		
10	SS	12-13-12-16 (25)	3.6		10.0	(CL) CLAY, gray, rock at 8.2 323.9	PID = 0	
	SS	21-61-43-32 (104)			10.5	(CL) CLAY, gray 323.4	PID = 0	
					12.5	Weathered rock 321.4	PID = 0	
	SS	31-32-36-50/1"			13.6	(SP) FINE SAND and silt, gray, refusal at 13.6', rock in a shoe, EOB 13.6' 320.3		

Refusal at 13.6 feet.
Bottom of borehole at 13.6 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB103

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 334.99 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	SS	8-16-21-26 (37)	20.4		2.0	(SP) FINE SAND and silt, tan, some gravel, little cobbles	333.0	PID = 0	
	SS	9-13-14-19 (27)	6		4.0	(SP) FINE SAND and silt, tan, some gravel, little cobbles	331.0	PID = 0	
5	SS	11-17-11-10 (28)	8.4		6.0	(SP) FINE SAND and silt, tan, some gravel, little cobbles	329.0	PID = 0	
	SS	2-3-2-2 (5)	0		8.0	No recovery	327.0	PID = 0	
10	SS	4-12-8-3 (20)	0		10.0	No recovery	325.0	PID = 0	
	SS	0-0-0-3 (0)			12.0	(SP) C-F SAND, dark gray, some cobbles	323.0	PID = 0	
	SS	11-23-50/2"			13.2	(SM) FINE SAND and silt, gray	321.8	PID = 0	

Refusal at 13.2 feet.
Bottom of borehole at 13.2 feet.

BORING NUMBER LPSB104

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 334.37 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	SS	24-50	4.8		2.0	(SM) M-F SAND,brown, little silt	332.4	PID = 0	
	SS	9-26-14-17 (40)	12		4.0	(SM) M-F SAND,brown, little silt	330.4	PID = 0	
5	SS	1-7-8-6 (15)	2.4		6.0	(SM) FINE SAND and silt, gray	328.4	PID = 0	
	SS	3-3-6-7 (9)			8.0	(SM) FINE SAND and silt, gray	326.4	PID = 0	
	SS	8-8-30-50/0"			9.0	(SM) FINE SAND and silt, gray	325.4	PID = 0	
					9.5	(SP) C-M SAND,brown, some gravel, little silt, refusal at 9.5'	324.9		

Refusal at 9.5 feet.
Bottom of borehole at 9.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB105

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 334.67 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	4-3-14-20 (17)	14.4		2.0	(SM) M-F SAND, tan, some silt, little cobbles at 1.7 & 1.8, trace glass gravel 332.7	PID = 0	
	SS	6-6-34-23 (40)	9.6		4.0	(SM) M-F SAND, tan, some silt, little cobbles 330.7	PID = 0	
5	SS	7-7-4-6 (11)	14.4		5.6	(SM) M-F SAND, tan, some silt, little cobbles 329.1	PID = 0	
					6.0	(SM) M-F SAND, grey, some silt 328.7		
	SS	3-16-13-10 (29)			8.0	(ML) SILT, dark brown, some sand, little gravel, trace glass, plastic 0.7-0.3; soil turns blue, refusal at 8' 326.7	PID = 0	

Refusal at 8.0 feet.
Bottom of borehole at 8.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB106

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 335.59 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	SS	16-42-23-36 (65)	12		(SP) F-M SAND, brown, some gravel, little silt, cobbles at 1.5' and 2'		PID = 0	
						2.0 / 333.6		
	SS		19.2		(SP) F-M SAND, brown, some gravel, little silt		PID = 0	
						4.0 / 331.6		
5	SS	8-33-25-18 (58)	13.2		(SP) F-M SAND, brown, some gravel, little silt		PID = 0	
						5.8 / 329.8		
					Light brown materials appear to be fire brick	6.0 / 329.6		
			16.8		Light brown materials appear to be fire brick	6.2 / 329.4	PID = 0	
	SS	16-15-14-25 (29)			(ML) SILT, dark brown, some sand, trace glass, plastic, gravel	6.8 / 328.8		
					(SP) FINE SAND,tan, some silt, little gravel			
						8.0 / 327.6		
	SS	20-36-42-30 (78)	19.2		(SP) M-C SAND, brown, little cobbles, trace silt		PID = 0	
10						10.0 / 325.6		
	SS	50/1"			(SP) Refusal at 10.1'	10.1 / 325.5	PID = 0	

Refusal at 10.1 feet.
Bottom of borehole at 10.1 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB107

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/6/13 **COMPLETED** 11/6/13
GROUND ELEVATION 336.11 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	0-17-39-20 (56)	15.6		2.0	(SM) F-M SAND and silt, brown, some gravel, trace cobbles 334.1	PID = 0	
	SS	12-14-7-16 (21)	16.8		4.0	(SM) F-M SAND and silt, brown, some gravel, trace cobbles 332.1	PID = 0	
5	SS	19-12-14-11 (26)	3.6		6.0	(SM) F-M SAND and silt, brown, some gravel, trace cobbles 330.1	PID = 0	
	SS	8-6-9-7 (15)	10.8		8.0	(SM) F-M SAND and silt, brown, some gravel, trace cobbles 328.1	PID = 0	
10	SS	30-52-50 (102)	0		10.0	No recovery 326.1	PID = 0	
	SS	11-22-26-24 (48)	21.6		12.0	(SM) FINE SAND, tan, little silty, cobbles 324.1	PID = 0	
	SS	24-25-34-35 (59)	4.8		14.0	(SM) FINE SAND, tan, little silty, cobbles 322.1	PID = 0	
	SS	16-50/0"	0		14.5	(SM) FINE SAND, tan, little silty, cobbles, refusal at 14.5 321.6	PID = 0	

Refusal at 14.5 feet.
Bottom of borehole at 14.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB108

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 344.01 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	14-12-25-36 (37)	8.4		(SM) M-F SAND, tan, little silt	PID = 0	
					1.8 342.2		
					2.0 (SM) Concrete 1.8'-2' 342.0		
	SS	11-19-13-17 (32)	3.6		(SM) FINE SAND, tan, little silt, trace gravel; rock in shoe	PID = 0	
					4.0 340.0		
5	SS	10-26-50/0"	1.2		(SM) FINE SAND, dark brown, little silt, refusal @ 5 rock in shoe; EOB 5'	PID = 0	
					5.0 339.0		

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB109

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/6/13 **COMPLETED** 11/6/13
GROUND ELEVATION 339.3 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	6-14-16-23 (30)	20.4		2.0	(SM) FINE SAND, tan, little silt, trace gravel 337.3	PID = 0	
	SS	10-10-6-9 (16)	14.4		4.0	(SM) FINE SAND, tan, little silt, trace gravel 335.3	PID = 0	
5	SS	5-8-7-8 (15)	13.2		6.0	(SM) FINE SAND, tan, little silt, trace gravel 333.3	PID = 0	
	SS	7-6-5-7 (11)	13.2		8.0	(SM) FINE SAND, tan, little silt, trace gravel 331.3	PID = 0	
10	SS	11-20-33-47 (53)	19.2		10.0	(SP) FINE SAND, beige, trace cobble @ 9' trace cobbles 329.3	PID = 0	
	SS	10-18-20-21 (38)	18		12.0	(SP) FINE SAND, beige, trace cobble 327.3	PID = 0	
	SS	10-22-21-49 (43)	0		14.0	No recovery 325.3	PID = 0	
15	SS		0		16.0	No recovery, quartz @ 14.2, 15 & 16 bgs; EOB 16' 323.3	PID = 0	

Bottom of borehole at 16.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB110

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/6/13 **COMPLETED** 11/6/13
GROUND ELEVATION 344.47 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	SS	11-7-7-8 (14)	3.6		1.0	(SM) FINE SAND, tan, little silt, trace gravel/cobbles	343.5	PID = 0	
					2.0	Concrete	342.5		
	SS	4-1-1-1 (2)	2.4		2.3	Concrete	342.2	PID = 0	
					4.0	(SM) FINE SAND, tan, trace silt	340.5		
5	SS	7-15-25-53 (40)	12		6.0	(SM) FINE SAND, tan, trace silt, refusal at 6'	338.5	PID = 0	

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB111

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/6/13 **COMPLETED** 11/6/13
GROUND ELEVATION 345.29 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	15-17-18-12 (35)	13.2		2.0	(SM) FINE SAND and silt, brown, little gravel, cobbles 343.3	PID = 0	
	SS		15.6		3.2	(SM) FINE SAND and silt, brown, little gravel, slow transition 342.1	PID = 0	
					4.0	(SM) C-M-F SAND and silt, brown, some gravel 341.3		
5	SS	14-26-29-32 (55)	14.4		6.0	(SM) C-M-F SAND and silt, brown, some gravel 339.3	PID = 0	
	SS	32-36-41-44 (77)	19.2		7.0	(SM) C-M-F SAND and silt, brown, some gravel 338.3	PID = 0	
					8.0	Weathered rock, refusal at 8' 337.3		

Refusal at 8.0 feet.
Bottom of borehole at 8.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB112

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/7/13 **COMPLETED** 11/7/13
GROUND ELEVATION 345.07 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	3-6-6-8 (12)	22.8		2.0	(SM) C-M-F SAND and silt, brown, little gravel, roots 0-0.4 343.1	PID = 0	
	SS	8-4-4-5 (8)	13.2		4.0	(SM) C-M-F SAND and silt, brown, little gravel 341.1	PID = 0	
5	SS	1-2-2-2 (4)	10.8		6.0	(SM) C-F SAND and silt, brown 339.1	PID = 0	
	SS	3-8-13-10 (21)	13.2		8.0	(SM) C-F SAND and silt, brown 337.1	PID = 0	
10	SS	32-46-26-21 (72)	15.6		10.0	(SM) C-F SAND and silt, brown 335.1	PID = 0	
	SS	13-15-14-15 (29)	20.4		12.0	(SM) C-F SAND and silt, brown 333.1	PID = 0	
	SS	23-36-61-50/1"			13.6	(SP) C-M SAND, brown, little gravel, trace silt, refusal @ 13.6' 331.5	PID = 0	

Refusal at 13.6 feet.
Bottom of borehole at 13.6 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER LPSB113

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/6/13 **COMPLETED** 11/6/13
GROUND ELEVATION 346.71 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	SS	3-9-12-12 (21)	22.8		2.0	(SM) FINE SAND, brown, some silt, little gravel, cobbles, organics (roots) 0-0.3'	344.7	PID = 0	
	SS	6-6-6-4 (12)	21.6		4.0	(SM) FINE SAND, brown, some silt, little gravel, cobbles	342.7	PID = 0	
5	SS	3-2-4-10 (6)	9.6		6.0	(CL) CLAY and sand, brown, trace gravel, rock in shoe	340.7	PID = 0	
	SS	11-13-23-29 (36)	21.6		8.0	(SM) M-F SAND, brown, trace silt, gravel	338.7	PID = 0	
10	SS	16-26-23-35 (49)	10.8		10.0	Refusal @8.5' ; rock in shoe switch to 2" shoe same result	336.7	PID = 0	
	SS	13-18-19-25 (37)	19.2		12.0	Rock in shoe	334.7	PID = 0	

Refusal at 8.5 feet.
Bottom of borehole at 12.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER RASB301

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 350.77 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0								
	SS	0-27-50/0"	7.2		0.3 (SP) FINE SAND, brown, little gravel, trace silt	350.5	PID = 0	
					1.0 Rock; refusal at 1'	349.8		

Refusal at 1.0 feet.
Bottom of borehole at 1.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER RASB302

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 352.36 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
	SS	1-50	0	1.0	(SM) FINE SAND, brown, trace silt, refusal at 1' outcrop on the side of slope spoon/shoe folded and could not open, EOB 1' 351.4	PID = 0	

Refusal at 1.0 feet.
Bottom of borehole at 1.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER RASB303

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 353.02 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
	SS	1-11-21-50/1"	8.4		(SP) FINE SAND, light brown/tan, trace gravel, rock in shoe; refusal at 1.6'	PID = 0	
1.6					351.4		

Refusal at 1.6 feet.
Bottom of borehole at 1.6 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER RASB304

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 351.56 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	3-10-15-11 (25)	21.6		2.0	(SP) FINE SAND, tan, some gravel 349.6	PID = 0	
	SS	15-21-31-40 (52)	20.4		4.0	(SP) FINE SAND, tan, some gravel 347.6	PID = 0	
5	SS	19-50-50 (100)	0		5.5	(SP) FINE SAND, tan, some gravel, refusal at 5.5' 346.1	PID = 0	

Refusal at 5.5 feet.
Bottom of borehole at 5.5 feet.

BORING NUMBER RASB305

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/5/13 **COMPLETED** 11/5/13
GROUND ELEVATION 313.06 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD HSA with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0								
	SS	10-25-32-27 (57)	16.8		(SP) M-C SAND, light brown, little silt, trace gravel	312.6	PID = 0	
					(GP) GRAVEL, little sand			
2	SS	50/2"	4.8		Rock, refusal @ 2.2'	310.9	PID = 0	

Refusal at 2.2 feet.
Bottom of borehole at 2.2 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB203

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 313.8 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS		24	0.8	(ML) SILT and sand, dark brown 313.0	PID = 0	
				3.0	(SM) FINE SAND and silt, tan, little gravel 310.8		

Bottom of borehole at 3.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB204

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 323.42 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	1-3-10-6 (13)	24		(SP) FINE SAND, tan, some gravel	PID = 0	
	SS	15		3.0	320.4	PID = 0	

Bottom of borehole at 3.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB205

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 313.06 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	0-1-3-4 (4)			(ML) SILT, black/brown, little sand, trave gravel	PID = 0	
					2.0 311.1		
	SS	17-16-16-24 (32)	18		(ML) SILT, black/brown, little sand, trave gravel	PID = 0	
5	SS	19-18			5.0 308.1	PID = 0	

Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB206

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 313.06 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
	SS	1-8-16-50/1"		1.6	(SM) FINE SAND, tan, little silt, trace gravel, refusal @1.6 rock in shoe 311.5	PID = 0	

Refusal at 1.6 feet.
Bottom of borehole at 1.6 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB207

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 314.74 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	1-1-4-7 (5)	13.2		(SM) C-M-F SAND, tan, some silt	PID = 0	
2.0					312.7		
	SS	3-3-11-13/0"			(SM) C-M-F SAND, tan, some silt, driven 3 ft	PID = 0	
3.0					311.7		

Bottom of borehole at 3.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB208

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION 320.19 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	1-1-1-2 (2)	21.6		(SM) FINE SAND, tan, little silt, trace gravel, EOB 3 ft	PID = 0	
	SS	2-3				PID = 0	
3.0					317.2		

Bottom of borehole at 3.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB209

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS	0-0-2-3 (2)	7.2	2.0	(SM) SILT, brown, some sand,organics	PID = 0	

Bottom of borehole at 2.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 3/14/14 13:36 - \\PRL-SRV3\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GINT_FO

BORING NUMBER UASB210

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 11/8/13 **COMPLETED** 11/8/13
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Nothnagle Drilling Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with CME 55 Low Clearance Drill
AT TIME OF DRILLING ---
LOGGED BY Michael Pantliano **CHECKED BY** Jiss Philip
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	SS		3.6	2.0	(SM) M-F SAND, brown, little silt	PID = 0	

Bottom of borehole at 2.0 feet.

August 18, 2015

Mr. Matthew Hubicki
Environmental Engineer
Remedial Bureau C
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7012

Re: NYSDEC Standby Engineering Contract D007625
WA #5 Remedial Design — Magna Metals (Site #36003)
Pre-Design Investigation (February – April 2015) Summary Report

Dear Mr. Hubicki

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) has prepared this third letter report to summarize the results of an additional pre-design investigation (PDI) conducted by HDR on NYSDEC's behalf, for the Magna Metals State Superfund Site located in Cortlandt, New York. The first letter report was submitted on July 12, 2013 summarizing the PDI conducted in 2013 in the off-site areas of concern (AOCs) including AOC 5 - Freshwater Wetland and Unnamed Tributary Area, AOC 6 – Off-Site Pond Area, and AOC 7 – Furnace Brook Area. The second letter report was submitted on March 14, 2014 summarizing PDI conducted in 2013 in the on-site AOCs including AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 3 – Refuse Area and AOC 4 – Former Magna Metals Building Area.

The additional PDI (referenced as the 2015 PDI) was conducted from February 3, to April 8, 2015, to further delineate the extent of impacted soil/sediment. The investigation tasks completed for the 2015 PDI summarized in this report include:

1. On-site AOCs
    a. AOC 1 – Leach Pit Area
    b. AOC 2 – Upland Area (UASB215, UASB217, UASB218, and UASB222)
2. Off-site AOCs
    a. AOC 2- Upland Area
    b. AOC 5- Freshwater Wetland and Unnamed Tributary Area (Wetland Area)
    c. AOC 6- Off-Site Pond Area
    d. AOC 7- Furnace Brook (Upper Furnace Brook)

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(201) 335-9300

The results from the sediment samples collected further downstream on Furnace Brook (Lower Furnace Brook) are summarized in a separate report that is being submitted concurrently, and are therefore not included in this summary report.

Field Activities

Soil/sediment borings were collected from 94 locations using a variety of sampling techniques. In AOC 1 (Leach Pit Area), subsurface samples were collected utilizing a track mounted Geoprobe 6620 rig. In AOC 2 (Upland Area), the Geoprobe 6620 rig was used, as well as a Geoprobe peat sampler for subsurface samples and a shovel for surface samples. In AOC 5 (Wetland Area), a Geoprobe peat sampler, a hand auger, or a tripod mounted drilling hammer were used to collect the subsurface samples. In AOC 6 (Off-Site Pond Area) and AOC 7 (Upper Furnace Brook), a Geoprobe 420M mounted to a raft platform or a peat sampler was used to collect subsurface samples. Parratt Wolff was retained as the drilling subcontractor, and YEC Inc. was the surveyor.

Lithologic descriptions for each soil/sediment boring were recorded and logged following the Unified Soil Classification System (USCS) with accompanying Munsell color descriptions. All of the boring logs are included in Appendix A of this report. Additionally, an Oxford Instruments handheld X-MET 7500 X-Ray Fluorescence (XRF) was used to scan samples for metal concentrations in the field and provide real time data. XRF samples were collected on 1-foot intervals at each of the locations provided there was adequate sample recovery. In the field, samples were scanned for a full suite of metals and metalloids, but only three metals including copper, chromium, and nickel were recorded in the boring log. These three metal concentrations readouts from the XRF instrument were utilized to bias the depth interval for analytical sample collection. A total of 708 XRF samples were collected from all of the AOC locations. The total depth at each location was determined by XRF screening results compared to the site specific soil cleanup objectives (SCOs) or when bedrock refusal or mechanical refusal was encountered. The location of all soil borings conducted during the 2015 PDI are shown on Figures 1 - 5. The boring locations were selected to delineate the vertical and horizontal extents of the impacted soil and sediment and to serve as future clean sidewall and bottom elevations for excavation.

Analytical Sample Results

As part of the 2015 PDI, soil and sediment samples were sent to Con-Test Analytical Laboratory for analysis. A total of 188 analytical samples (including 8 duplicate samples) were collected and analyzed for the target analyte list (TAL) metals, hexavalent chromium,

cyanide, and percent moisture. The sample results were compared to the SCOs identified in the ROD and is presented in Tables 1 - 5.

Chromium occurs in the environment primarily in two valence states, trivalent chromium (Cr III) and hexavalent chromium (Cr VI), with trivalent chromium being much less toxic than hexavalent chromium. Total chromium (the combined concentrations of Cr III + Cr VI) was analyzed during the 2013 PDI in which elevated levels were detected in a wide range of samples. In an effort to determine the speciation of chromium, samples collected during the 2015 PDI were analyzed for hexavalent chromium in addition to total chromium. Hexavalent chromium was detected in 39 of 217 samples (including duplicates) collected during the 2015 PDI. In 14 of these 39 samples, Cr VI was detected at concentration exceeding the Unrestricted Use SCOs (UUSCOs) of 1 mg/kg. The greatest concentration (7.3 mg/kg) of Cr VI was detected at location WTSB541, which is less than the Restricted Use Residential SCOs (RURSCOs) of 22 mg/kg. Hexavalent chromium was not detected at concentrations exceeding the UUSCOs in any of the sample collected in AOC 1 and AOC 2. Based on these results, it appears that the majority of the total chromium concentrations are mainly made up of trivalent chromium. Therefore, since there is no NYSDEC UUSCO or RURSCO standard for total chromium, the trivalent chromium standards were used to evaluate the data.

AOC 1 and a select list of AOC 2 soil sample results were compared to the site specific SCOs. Lead, mercury, and zinc, were compared to the commercial use SCOs. Arsenic, chromium (hexavalent and total), copper, nickel, and selenium were compared to the lower of the protection of groundwater and commercial use SCOs.

The off-site AOC sediment samples were compared to the site specific criteria that were defined as the greater of the pre-release/background conditions or the New York State Lowest Effect Levels (LELs) for metals. The results of the sediment samples were also compared to the UUSCOs RURSCOs.

The sample results are discussed below, broken down by AOC location.

AOC 1- Leach Pit Area

3 soil borings (LPSB114, LPSB116, and LPSB117) and 6 analytical soil samples were collected in AOC 1. Each soil boring was advanced to bedrock refusal using a Geoprobe 6620 track mounted rig. Bedrock was encountered from 4 feet below ground surface (bgs) at LPSB117 to 14 feet bgs at LPSB116. Bedrock was encountered at 11 feet bgs at

LPSB114, which is located west of the concrete block building in the southern portion of AOC 1.

Soil borings were completed to delineate the horizontal and vertical extent of impacted soil in the northern and southern portion of the Leach Pit Area. Figure 1 illustrates the sample locations and a select list of analytical results for each location, and Table 1 presents the full analytical results. Metals that exceeded the SCOs were total chromium and barium. The greatest concentration of total chromium (85 mg/kg) was detected at LPSB116 from 3.5-4 feet bgs. The greatest concentration of barium (1,100 mg/kg) was detected at LPSB116 from 13-14 feet bgs. There were no metal concentrations in excess of SCOs detected in subsurface soil samples collected from the soil boring LPSB114 which is located in the southern portion of AOC 1.

AOC 2- Upland Area

23 soil borings were completed to delineate the extent of impacted soil horizontally in the northern and southern portion of the upland area and vertically at locations where they were not delineated during the 2013 PDI. The borings were advanced to bedrock or mechanical refusal using either the Geoprobe 6620 track mounted rig or the handheld peat sampler. Bedrock and/or mechanical refusal were encountered at depths between 4 to 27 feet bgs. Shallow refusal (approximately 4 to 6 feet bgs) was encountered at borings located in the southern portion of the AOC. The maximum bedrock depth of 26 to 27 feet bgs was encountered at UASB206A and UASB208A. Soil samples were collected from most locations at various depths depending on the location and XRF field screening readings. UASB203A, UASB206A, UASB208A, and UASB209A were collected to determine depth to bedrock and were logged and screened with the XRF; however, no analytical samples were collected at these locations. Proposed soil borings UASB212 and UASB227 were relocated to the south and renamed UASB230 and UASB231. Additional surface grab samples were collected at UASB232, UASB233, and UASB234 located at the southern extent of the property. In total, 59 soil samples (including 4 duplicate samples) were collected from 23 locations in AOC 2.

In the 2013 PDI, samples collected from AOC 2 were compared to the soil SCOs as it was included as part of the on-site soil AOCs. However, based on the wetlands delineation/ buffer results AOC 2 is now split with borings UASB215, UASB217, UASB218, and UASB222 still being compared to the on-site soil criteria, and the rest of the AOC 2 borings included as part of the off-site sediment AOCs and compared to the SCOs which include LEL, UUSCOs, and RURSCOs.

Metal concentrations detected in 50 of the 59 samples exceeded the SCOs for at least one analyte in AOC 2. Figures 1 and 2 illustrate the sample locations and a select list of analytical results for each location, and Tables 1 and 2 present the full analytical results. Metals that exceeded the SCOs include antimony, arsenic, barium, cadmium, total chromium, copper, iron, lead, manganese, nickel, and silver. Of these metals, copper, total chromium, and nickel were detected above the SCOs in the majority of the samples. The greatest concentration of total chromium (360 mg/kg) was detected at UASB220 from 15-16 feet bgs. The greatest concentration of copper (770 mg/kg) was detected at UASB228 from 2-2.5 feet bgs. The greatest concentration of nickel (730 mg/kg) was detected at UASB219 from 4-5 feet bgs.

AOC 5- Freshwater Wetland and Unnamed Tributary Area

42 sediment borings were completed to delineate the horizontal extent of impacted sediment in the northern and southern portion of the wetland area and vertically at locations where they were not delineated during the 2013 PDI. The borings were advanced using the peat sampler for all locations except for WTSB536 and WTSB542, where the tripod mounted drilling hammer was used. A maximum depth of 21 feet bgs was achieved at boring WTSB524. Shallow refusal (approximately 2 to 6 feet bgs) was encountered in most of the northern and southern locations, with deeper refusal depths in the center of the AOC 5 ranging from 14 to 16 bgs at borings WTSB537, WTSB538, WTSB501, WTSB502, and WTSB505. Sediment samples were collected from each boring at various depths depending on the location and XRF field screening readings. A total of 80 sediment samples (including 3 duplicate samples) were collected from AOC 5 locations.

Metal concentrations were detected in exceedance of the SCOs for at least one analyte in 67 of the 80 samples collected in AOC 5. Figures 3a, 3b, and 4 illustrate the sample locations and a select list of analytical results for each location, and Table 3 presents the full analytical results. Metals that exceeded the SCOs include antimony, arsenic, barium, cadmium, hexavalent chromium, total chromium, copper, iron, lead, manganese, mercury,

nickel, selenium, silver, and zinc. Of these metals, hexavalent chromium, total chromium, copper, and nickel were detected above the SCOs in the majority of the samples. The greatest concentration of hexavalent chromium (7.3 mg/kg) was detected at boring WTSB541 from 0-1 feet below top of sediment (bts). The greatest concentration of total chromium (180 mg/kg) was detected at boring WTSB503 from 1-2 feet bts. The greatest concentration of copper (360 mg/kg) was detected at boring WTSB502 from 3-4 feet bts. The greatest concentration of nickel (290 mg/kg) was detected at boring WTSB533 from 3-4 feet bts. Sample recovery was minimal at several AOC 5 locations (WTSB547, WTSB548, WTSB549, WTSB550, and WTSB551) due to the nature of the soft sediment material. Sample volume was improved at these locations by over drilling the two foot sample barrel core and interpreting the material compression when logging the boring and collecting samples. These interpretations were noted in the soil boring logs.

Additional surface XRF samples were collected at WTSB552 to WTSB557, to delineate the northern extent of impacted sediment in AOC 5.

AOC 6- Off-Site Pond Area

16 sediment borings were completed to delineate impacted soil horizontally in the northern and southern portion of the pond area and vertically at locations where they were not delineated during the 2013 PDI. The borings were advanced to a maximum depth of 21 feet bts using either the raft platform mounted Geoprobe 420M or the peat sampler. Bedrock and/or mechanical refusal were encountered at all locations between 2 to 21 feet bts. Shallow refusal (approximately 2 to 6 feet bgs) was encountered in the northern (PASB627) and southern (PASB621 and PASB624) areas. The deepest refusal depths (approximately 20 to 21 feet bts) were encountered in the center of the pond at borings PASB603, PASB605, PASB609, PASB611, and PASB613.

No boring logs or analytical samples were collected at PASB602 and PASB605 due to no recoverable material. The drillers attempted three times at each location and were unable to yield a recovery. The drillers described the material as very sandy that would drop out of the core barrel upon removal. Mechanical refusal was encountered at 11 feet bts at both locations.

Metal concentrations exceeded the SCOs in at least one analyte for each of the 28 samples that were collected in AOC 6. Figure 4 illustrates the sample locations and a select list of analytical results for each location, and Table 4 presents the full analytical results. Metals that exceeded the SCOs include antimony, arsenic, barium, cadmium, hexavalent chromium, total chromium, copper, iron, lead, manganese, mercury, nickel,

selenium, and zinc. Of these metals, total chromium, copper, and nickel were detected above the SCOs in the majority of the samples. The greatest concentration of total chromium (65 mg/kg) was detected at PASB605 from 4-7 feet bts. The greatest concentration of copper (140 mg/kg) was detected at PASB613 from 15-16 feet bts. The greatest concentration of nickel (240 mg/kg) was detected at PASB603 from 4-7 feet bts. Hexavalent chromium was detected in 3 samples in exceedance of the SCOs with the greatest concentration (4.7 mg/kg) detected at PASB611 from 19-21 feet bts.

Similar to AOC 5, sample recovery was minimal at several locations (PASB603, PASB605, PASB609, PASB611, PASB613, PASB615, PASB616, and PASB616) due to the nature of the soft sediment. Sample volume was improved at these locations by over drilling the sample barrel core and interpreting the compression when logging the boring and collecting samples. These interpretations were noted in the soil boring logs.

AOC 7- Furnace Brook

10 sediment borings were completed to delineate the horizontal and vertical extent of the impacted sediment in the AOC 7 locations where delineation during the 2013 PDI was not achieved. The borings were advanced to a maximum depth of 16 feet bts using either the raft platform mounted Geoprobe 420M or the peat sampler. Bedrock and/ or mechanical refusal ranged from 5 to 16 feet bts at all locations, with the deepest elevations in the north (BRSB760, BRSB763, and BRSB766) ranging from 13 to 16 feet bts.

Sediment borings BRSB761, BRSB762, BRSB764, BRSB765, BRSB767, and BRSB768 were eliminated from the sampling plan due to redundancy. A boring log and sediment sample for BRSB718 was unable to be completed due to no sample recovery. The drillers noted the material as very hard and rocky/ gravelly material that would drop out of the core barrel upon retrieval. Standard sample basket catches were used in each sample, but the material still dropped out of the sampler. Bedrock refusal was encountered at 15 feet bts at location BRSB718.

Metal concentrations were detected in exceedance of the SCOs for at least one analyte in 10 of the 15 samples collected in AOC 7. Figure 5 illustrates the sample locations and a select list of analytical results for each location, and Table 5 presents the full analytical results. Metals that exceeded the SCOs include antimony, arsenic, barium, cadmium, hexavalent chromium, total chromium, copper, iron, manganese, nickel, selenium, and zinc. Of these metals, copper, and nickel were detected above the SCOs in the majority of the samples. The greatest concentration of copper (330 mg/kg) was detected at

BRSB709 from 4-5 feet bts. The greatest concentration of nickel (140 mg/kg) was detected at BRSB705 from 10-11 feet bts.

I would like to schedule a meeting with you to discuss these results and our path forward in more detail. In the mean time, if you have any questions or require additional information, please do not hesitate to contact me at (201) 335-9348.

Very truly yours,



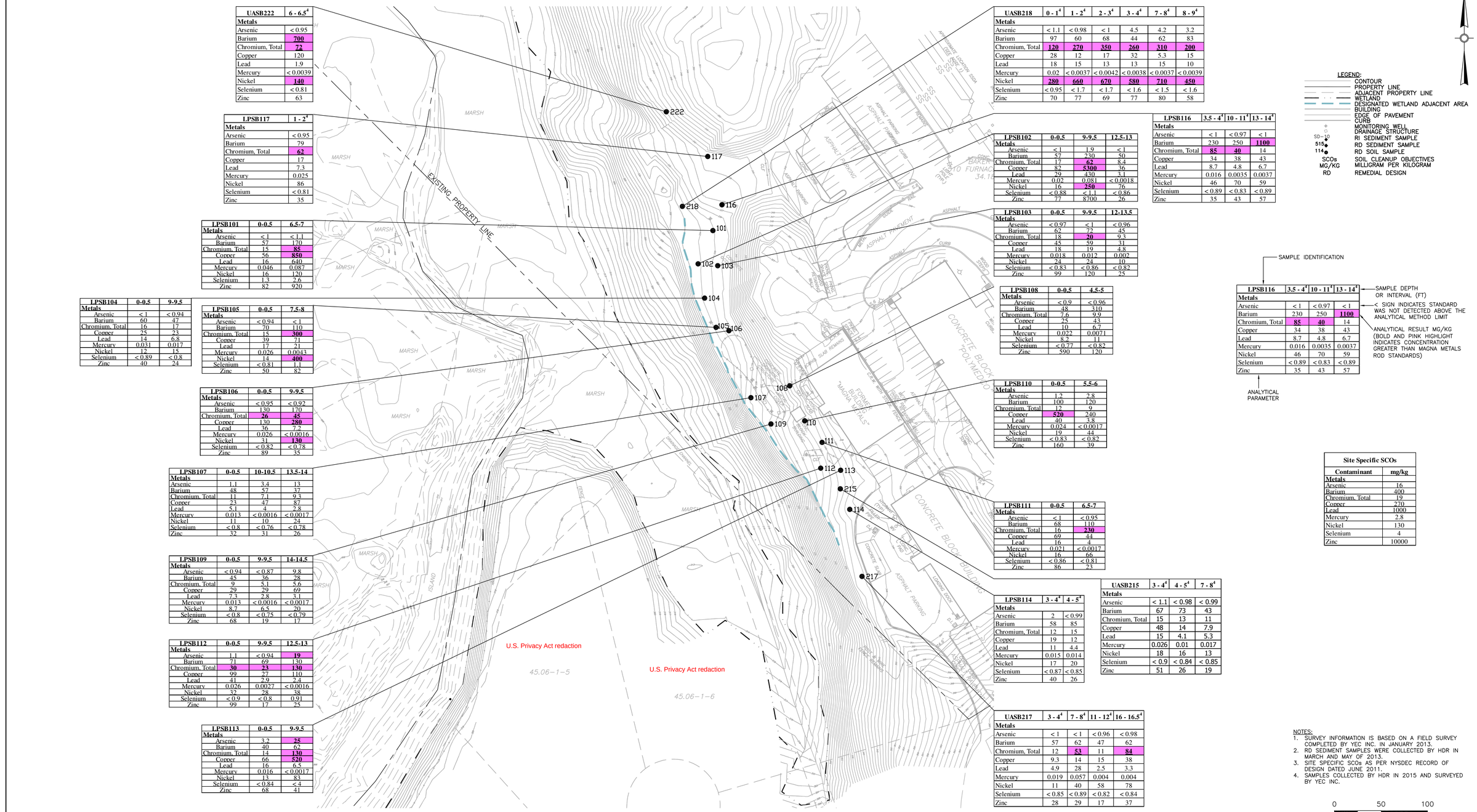
Thomas M. Connors, P.E., MBA

Project Manager

Cc: E. Zimmerman, HDR Contract Manager
HDR File

Att.: Figures 1-5
Tables 1-5
Attachment A – Boring Logs

FIGURES



UASB222	6 - 6.5[4]
Metals	
Arsenic	< 0.95
Barium	**700**
Chromium, Total	**72**
Copper	120
Lead	1.9
Mercury	< 0.0039
Nickel	**140**
Selenium	< 0.81
Zinc	63

LPSB117	1 - 2[4]
Metals	
Arsenic	< 0.95
Barium	79
Chromium, Total	**62**
Copper	17
Lead	7.3
Mercury	0.025
Nickel	86
Selenium	< 0.81
Zinc	35

LPSB101	0-0.5	6.5-7
Metals		
Arsenic	< 1	< 1.1
Barium	57	170
Chromium, Total	15	**85**
Copper	56	**850**
Lead	16	640
Mercury	0.046	0.087
Nickel	16	120
Selenium	1.3	2.6
Zinc	82	920

LPSB104	0-0.5	9-9.5
Metals		
Arsenic	< 1	< 0.94
Barium	60	47
Chromium, Total	16	17
Copper	25	23
Lead	14	6.8
Mercury	0.031	0.017
Nickel	12	15
Selenium	< 0.89	< 0.8
Zinc	40	24

LPSB105	0-0.5	7.5-8
Metals		
Arsenic	< 0.94	< 1
Barium	70	110
Chromium, Total	15	**300**
Copper	39	71
Lead	17	21
Mercury	0.026	0.0043
Nickel	14	**400**
Selenium	< 0.81	1.1
Zinc	50	82

LPSB106	0-0.5	9-9.5
Metals		
Arsenic	< 0.95	< 0.92
Barium	130	170
Chromium, Total	**26**	**45**
Copper	130	**280**
Lead	36	7.2
Mercury	0.026	< 0.0016
Nickel	31	**130**
Selenium	< 0.82	< 0.78
Zinc	89	35

LPSB107	0-0.5	10-10.5	13.5-14
Metals			
Arsenic	1.1	3.4	13
Barium	48	57	37
Chromium, Total	11	7.1	9.3
Copper	23	47	87
Lead	5.1	4	2.8
Mercury	0.013	< 0.0016	< 0.0017
Nickel	11	10	24
Selenium	< 0.8	< 0.76	< 0.78
Zinc	32	31	26

LPSB109	0-0.5	9-9.5	14-14.5
Metals			
Arsenic	< 0.94	< 0.87	9.8
Barium	45	36	28
Chromium, Total	9	5.1	5.6
Copper	29	29	69
Lead	7.3	2.8	3.1
Mercury	0.013	< 0.0016	< 0.0017
Nickel	8.7	6.5	20
Selenium	< 0.8	< 0.75	< 0.79
Zinc	68	19	17

LPSB112	0-0.5	9-9.5	12.5-13
Metals			
Arsenic	1.1	< 0.94	**19**
Barium	71	69	130
Chromium, Total	**30**	**23**	**130**
Copper	99	27	110
Lead	41	2.9	2.4
Mercury	0.026	0.0027	< 0.0016
Nickel	32	28	38
Selenium	< 0.9	< 0.8	0.91
Zinc	99	17	25

LPSB113	0-0.5	9-9.5
Metals		
Arsenic	3.2	**25**
Barium	40	62
Chromium, Total	14	**130**
Copper	66	**520**
Lead	16	6.5
Mercury	0.016	< 0.0017
Nickel	13	83
Selenium	< 0.84	< 4
Zinc	68	41

UASB218	0 - 1[4]	1 - 2[4]	2 - 3[4]	3 - 4[4]	7 - 8[4]	8 - 9[4]
Metals						
Arsenic	< 1.1	< 0.98	< 1	4.5	4.2	3.2
Barium	97	60	68	44	62	83
Chromium, Total	**120**	**270**	**350**	**260**	**310**	**200**
Copper	28	12	17	32	5.3	15
Lead	18	15	13	13	15	10
Mercury	0.02	< 0.0037	< 0.0042	< 0.0038	< 0.0037	< 0.0039
Nickel	**280**	**660**	**670**	**580**	**710**	**450**
Selenium	< 0.95	< 1.7	< 1.7	< 1.6	< 1.5	< 1.6
Zinc	70	77	69	77	80	58

LPSB102	0-0.5	9-9.5	12.5-13
Metals			
Arsenic	< 1	1.9	< 1
Barium	57	230	50
Chromium, Total	17	**62**	8.4
Copper	82	**5300**	36
Lead	29	430	3.1
Mercury	0.02	0.081	< 0.0018
Nickel	16	**250**	76
Selenium	< 0.88	< 1.1	< 0.86
Zinc	77	8700	26

LPSB116	3.5 - 4[4]	10 - 11[4]	13 - 14[4]
Metals			
Arsenic	< 1	< 0.97	< 1
Barium	230	250	**1100**
Chromium, Total	**85**	**40**	14
Copper	34	38	43
Lead	8.7	4.8	6.7
Mercury	0.016	0.0035	0.0037
Nickel	46	70	59
Selenium	< 0.89	< 0.83	< 0.89
Zinc	35	43	57

LPSB103	0-0.5	9-9.5	12-13.5
Metals			
Arsenic	< 0.97	< 1	< 0.96
Barium	62	72	45
Chromium, Total	18	**20**	9.3
Copper	45	59	31
Lead	18	19	4.8
Mercury	0.018	0.012	0.002
Nickel	24	24	10
Selenium	< 0.83	< 0.86	< 0.82
Zinc	99	120	25

LPSB108	0-0.5	4.5-5
Metals		
Arsenic	< 0.9	< 0.96
Barium	48	310
Chromium, Total	7.6	9.9
Copper	25	43
Lead	10	6.7
Mercury	0.022	0.0071
Nickel	8.2	11
Selenium	< 0.77	< 0.82
Zinc	590	120

LPSB110	0-0.5	5.5-6
Metals		
Arsenic	1.2	2.8
Barium	100	120
Chromium, Total	12	9
Copper	**520**	240
Lead	40	3.8
Mercury	0.024	< 0.0017
Nickel	19	44
Selenium	< 0.83	< 0.82
Zinc	160	39

LPSB111	0-0.5	6.5-7
Metals		
Arsenic	< 1	< 0.95
Barium	68	110
Chromium, Total	16	**230**
Copper	69	44
Lead	16	4
Mercury	0.021	< 0.0017
Nickel	16	66
Selenium	< 0.86	< 0.81
Zinc	86	23

LPSB114	3 - 4[4]	4 - 5[4]
Metals		
Arsenic	2	< 0.99
Barium	58	85
Chromium, Total	12	15
Copper	19	12
Lead	11	4.4
Mercury	0.015	0.014
Nickel	17	20
Selenium	< 0.87	< 0.85
Zinc	40	26

UASB215	3 - 4[4]	4 - 5[4]	7 - 8[4]
Metals			
Arsenic	< 1.1	< 0.98	< 0.99
Barium	67	73	43
Chromium, Total	15	13	11
Copper	48	14	7.9
Lead	15	4.1	5.3
Mercury	0.026	0.01	0.017
Nickel	18	16	13
Selenium	< 0.9	< 0.84	< 0.85
Zinc	51	26	19

UASB217	3 - 4[4]	7 - 8[4]	11 - 12[4]	16 - 16.5[4]
Metals				
Arsenic	< 1	< 1	< 0.96	< 0.98
Barium	57	62	47	62
Chromium, Total	12	**53**	11	**84**
Copper	9.3	14	15	38
Lead	4.9	28	2.5	3.3
Mercury	0.019	0.057	0.004	0.004
Nickel	11	40	58	78
Selenium	< 0.85	< 0.89	< 0.82	< 0.84
Zinc	28	29	17	37

SAMPLE IDENTIFICATION

LPSB116	3.5 - 4[4]	10 - 11[4]	13 - 14[4]
Metals			
Arsenic	< 1	< 0.97	< 1
Barium	230	250	**1100**
Chromium, Total	**85**	**40**	14
Copper	34	38	43
Lead	8.7	4.8	6.7
Mercury	0.016	0.0035	0.0037
Nickel	46	70	59
Selenium	< 0.89	< 0.83	< 0.89
Zinc	35	43	57

ANALYTICAL PARAMETER

SAMPLE DEPTH OR INTERVAL (FT)

< SIGN INDICATES STANDARD WAS NOT DETECTED ABOVE THE ANALYTICAL METHOD LIMIT

ANALYTICAL RESULT MG/KG (BOLD AND PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN MAGNA METALS ROD STANDARDS)

Site Specific SCOs	
Contaminant	**mg/kg**
Metals	
Arsenic	16
Barium	400
Chromium, Total	19
Copper	270
Lead	1000
Mercury	2.8
Nickel	130
Selenium	4
Zinc	10000

NOTES:
1. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
2. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
3. SITE SPECIFIC SCOs AS PER NYSDEC RECORD OF DESIGN DATED JUNE 2011.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.

0 50 100
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - LEACH PIT AREA

0 50' 100'

FILENAME	
SCALE	1"= 50'

SHEET FIGURE 1

UASB223	0 - 1[4]	4 - 4.5[4]
Metals		
Antimony	< 2.2	< 2.2
Arsenic	< 1	< 0.99
Cadmium	< 0.16	< 0.16
Chromium, Total	**40**	**35**
Copper	**44**	**73**
Iron	**20000**	**57000**
Lead	3.9	1.9
Manganese	200	260
Mercury	0.023	< 0.004
Nickel	**51**	**60**
Silver	< 0.49	< 0.48
Zinc	28	65

UASB221	0 - 1[4]	5.5 - 6.5[4]	6.5 - 7.5[4]
Metals			
Antimony	< 2.2	< 2.2	< 2
Arsenic	< 1	< 0.98	< 0.9
Cadmium	< 0.16	< 0.16	< 0.15
Chromium, Total	14	5.6	**26**
Copper	**17**	10	**66**
Iron	11000	8800	**22000**
Lead	3	2.3	1.2
Manganese	210	280	310
Mercury	0.0099	< 0.0037	< 0.0036
Nickel	16	6.3	**190**
Silver	< 0.49	< 0.48	< 0.44
Zinc	24	16	26

UASB224	3 - 4[4]	5 - 6[4]	18 - 19[4]
Metals			
Antimony	< 2.2	< 2.4	< 2.4
Arsenic	< 1	< 1.1	< 1.1
Cadmium	0.53	0.22	**0.77**
Chromium, Total	**93**	13	**240**
Copper	**23**	**68**	**47**
Iron	**44000**	12000	**70000**
Lead	5.6	3	0.22
Manganese	**580**	260	**870**
Mercury	0.034	0.008	0.044
Nickel	**150**	**25**	**450**
Silver	< 0.49	< 0.51	< 0.53
Zinc	40	14	52

UASB225	3 - 4[4]	4 - 5[4]	8 - 9[4]
Metals			
Antimony	< 2.3	< 2.1	< 2.4
Arsenic	< 1	< 0.93	< 1.1
Cadmium	< 0.17	0.2	< 0.18
Chromium, Total	17	8.4	5.1
Copper	**54**	14	10
Iron	13000	9500	7300
Lead	3.9	2.5	8.5
Manganese	**470**	180	170
Mercury	< 0.0038	< 0.0039	< 0.0038
Nickel	**40**	14	6.1
Silver	< 0.49	< 0.45	< 0.53
Zinc	21	15	12

UASB203	0 - 0.5	1 - 1.5	2 - 2.5
Metals			
Antimony	< 2.5	< 2.5	< 2.4
Arsenic	< 1.1	< 1.1	< 1.1
Cadmium	< 0.18	0.34	0.22
Chromium, Total	**32**	**33**	**29**
Copper	**570**	**480**	**130**
Iron	15000	18000	19000
Lead	27	14	4.5
Manganese	190	160	240
Mercury	0.11	0.047	0.0051
Nickel	**41**	**54**	**45**
Silver	< 0.54	< 0.54	< 0.51
Zinc	76	66	31

UASB226	2 - 2.5[4]	4 - 4.5[4]	6 - 6.5[4]
Metals			
Antimony	< 2.3	< 2.4	< 2.4
Arsenic	< 1	< 1.1	< 1.1
Cadmium	< 0.17	< 0.18	< 0.17
Chromium, Total	8.6	15	6.2
Copper	**260**	**110**	**26**
Iron	**26000**	16000	12000
Lead	7.5	5.5	4
Manganese	**470**	260	320
Mercury	0.0055	< 0.0044	< 0.0037
Nickel	**48**	**39**	9.8
Silver	< 0.49	< 0.53	< 0.52
Zinc	42	24	16

UASB205	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 2.8	< 2.2	< 2.2
Arsenic	< 1.3	< 0.98	< 0.97
Cadmium	< 0.21	< 0.16	< 0.16
Chromium, Total	21	13	17
Copper	**2800**	**140**	**170**
Iron	12000	9000	16000
Lead	25	4.6	6
Manganese	340	93	180
Mercury	0.11	< 0.0018	0.0083
Nickel	**300**	**38**	**44**
Silver	< 0.62	< 0.48	< 0.47
Zinc	52	22	27

UASB207	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 2.5	< 2.2	< 2.4
Arsenic	< 1.1	< 0.97	< 1.1
Cadmium	< 0.18	0.25	< 0.18
Chromium, Total	16	18	17
Copper	**200**	**28**	**31**
Iron	12000	18000	11000
Lead	14	6.5	9.7
Manganese	140	89	70
Mercury	0.033	< 0.0018	0.0074
Nickel	**81**	16	19
Silver	< 0.55	< 0.47	< 0.53
Zinc	100	32	41

UASB228	2 - 2.5[4]	7.5 - 8[4]
Metals		
Antimony	< 2.6	< 2.2
Arsenic	5	< 1
Cadmium	< 0.19	< 0.16
Chromium, Total	23	6.3
Copper	**770**	**42**
Iron	**24000**	10000
Lead	11	3.6
Manganese	180	220
Mercury	0.05	< 0.004
Nickel	**140**	16
Silver	< 0.58	< 0.49
Zinc	44	19

UASB210	0-0.5	1-1.5
Metals		
Antimony	< 2.8	< 2.4
Arsenic	2.7	**8**
Cadmium	**0.67**	0.26
Chromium, Total	20	**52**
Copper	**510**	**690**
Iron	12000	14000
Lead	**63**	29
Manganese	220	93
Mercury	**0.19**	0.066
Nickel	**62**	**280**
Silver	< 0.62	< 0.52
Zinc	**180**	**220**

UASB213	2 - 3[4]	3 - 4[4]	5 - 5.5[4]
Metals			
Antimony	**2.5**	< 2.4	< 2.4
Arsenic	< 0.99	< 1.1	< 1.1
Cadmium	0.37	0.27	0.28
Chromium, Total	13	11	9.9
Copper	**59**	**29**	**17**
Iron	15000	13000	12000
Lead	13	5	4
Manganese	110	71	150
Mercury	0.023	0.016	0.0099
Nickel	14	17	13
Silver	< 0.48	< 0.52	< 0.53
Zinc	28	17	14

UASB214	1 - 2[4]	3 - 3.8[4]
Metals		
Antimony	**2.7**	< 2.2
Arsenic	1.7	< 1
Cadmium	0.47	0.34
Chromium, Total	24	**33**
Copper	**28**	6.4
Iron	19000	**20000**
Lead	19	5.3
Manganese	190	100
Mercury	0.073	0.012
Nickel	**31**	**47**
Silver	< 0.56	< 0.49
Zinc	42	24

UASB216	1 - 2[4]	3 - 3.8[4]
Metals		
Antimony	< 2.5	< 2.5
Arsenic	1.2	< 1.1
Cadmium	0.46	0.37
Chromium, Total	20	**41**
Copper	**38**	7.4
Iron	15000	19000
Lead	19	6.2
Manganese	340	93
Mercury	0.047	0.019
Nickel	**46**	**99**
Silver	< 0.55	< 0.55
Zinc	44	16

UASB229	3 - 4[4]
Metals	
Antimony	**3.2**
Arsenic	< 1.2
Cadmium	0.44
Chromium, Total	**80**
Copper	**130**
Iron	**22000**
Lead	5.5
Manganese	190
Mercury	0.018
Nickel	**150**
Silver	< 0.57
Zinc	41

UASB230	4 - 5[4]	10 - 11[4]
Metals		
Antimony	< 2.2	< 2.3
Arsenic	< 0.97	< 1
Cadmium	< 0.16	< 0.17
Chromium, Total	**120**	**120**
Copper	**190**	**190**
Iron	**32000**	**31000**
Lead	3.1	2.8
Manganese	**490**	**470**
Mercury	< 0.0037	< 0.0042
Nickel	**410**	**160**
Silver	< 0.47	< 0.51
Zinc	32	34

UASB201	0-0.5
Metals	
Antimony	< 2.7
Arsenic	< 1.2
Cadmium	0.46
Chromium, Total	**53**
Copper	**39**
Iron	19000
Lead	**35**
Manganese	300
Mercury	0.087
Nickel	**65**
Silver	< 0.59
Zinc	75

UASB202	0-0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	0.39
Chromium, Total	**59**
Copper	**95**
Iron	**27000**
Lead	**55**
Manganese	**460**
Mercury	0.065
Nickel	**130**
Silver	< 0.53
Zinc	**240**

UASB206	0 - 0.5	1 - 1.5
Metals		
Antimony	< 2.4	< 2.1
Arsenic	< 1.1	< 0.93
Cadmium	< 0.17	< 0.15
Chromium, Total	22	18
Copper	**80**	**26**
Iron	16000	16000
Lead	29	9.4
Manganese	190	170
Mercury	0.11	0.016
Nickel	**21**	15
Silver	< 0.52	< 0.45
Zinc	**130**	35

UASB209	0 - 0.5	1 - 1.5
Metals		
Antimony	< 3.1	< 3.1
Arsenic	**6.8**	**21**
Cadmium	0.27	0.59
Chromium, Total	**52**	**110**
Copper	**680**	**1400**
Iron	8800	15000
Lead	26	**39**
Manganese	270	140
Mercury	0.11	0.13
Nickel	**220**	**450**
Silver	< 0.67	< 0.68
Zinc	**170**	**370**

UASB231	0 - 2[4]	2-4[4]
Metals		
Antimony	< 2.2	< 2.1
Arsenic	< 1	< 0.93
Cadmium	< 0.16	< 0.15
Chromium, Total	**88**	**140**
Copper	**52**	**85**
Iron	**28000**	**37000**
Lead	11	2.4
Manganese	400	**590**
Mercury	0.028	< 0.0037
Nickel	**110**	**210**
Silver	< 0.49	< 0.45
Zinc	42	38

UASB233	0 - 0.5[4]
Metals	
Antimony	**3.5**
Arsenic	< 1.3
Cadmium	0.55
Chromium, Total	**33**
Copper	**29**
Iron	**22000**
Lead	**42**
Manganese	380
Mercury	0.067
Nickel	**54**
Silver	< 0.64
Zinc	77

UASB234	0 - 0.5[4]
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	0.48
Chromium, Total	**27**
Copper	**22**
Iron	19000
Lead	**33**
Manganese	240
Mercury	0.069
Nickel	**35**
Silver	< 0.57
Zinc	57

UASB232	0 - 0.5[4]
Metals	
Antimony	< 2.6
Arsenic	< 1.1
Cadmium	0.55
Chromium, Total	**88**
Copper	**49**
Iron	**26000**
Lead	29
Manganese	350
Mercury	0.049
Nickel	**65**
Silver	< 0.56
Zinc	53

UASB220	3 - 4[4]	7 - 8[4]	15 - 16[4]
Metals			
Antimony	< 2.2	**2.2**	< 2.4
Arsenic	< 1	< 0.94	< 1.1
Cadmium	0.32	0.28	**0.62**
Chromium, Total	**28**	7.3	**360**
Copper	**39**	14	**81**
Iron	**20000**	17000	**71000**
Lead	2.9	2.7	1.3
Manganese	270	330	**860**
Mercury	0.011	< 0.0039	< 0.0042
Nickel	**28**	11	**300**
Silver	< 0.49	< 0.46	< 0.51
Zinc	20	28	58

UASB219	1 - 2[4]	4 - 5[4]	5 - 6[4]	6 - 7[4]	7 - 7.5[4]
Metals					
Antimony	< 2.2	**14**	**13**	**11**	**11**
Arsenic	1	5.8	**6.1**	4.6	4.7
Cadmium	< 0.16	< 0.17	< 0.16	< 0.17	< 0.18
Chromium, Total	**280**	**320**	**280**	**290**	**330**
Copper	**170**	**18**	6.4	4.3	4.3
Iron	**91000**	**140000**	**150000**	**130000**	**130000**
Lead	11	14	15	14	13
Manganese	**610**	**1100**	**1100**	**1000**	**1000**
Mercury	< 0.0039	< 0.0036	< 0.0039	< 0.0036	< 0.0041
Nickel	**490**	**730**	**710**	**660**	**650**
Silver	< 0.49	< 0.51	0.46	< 0.51	< 0.52
Zinc	51	68	76	64	59

UASB204	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 2.2	< 2.2	< 2.2
Arsenic	< 0.98	< 0.97	< 0.99
Cadmium	< 0.16	< 0.16	< 0.16
Chromium, Total	18	24	**26**
Copper	**74**	**120**	**120**
Iron	9900	16000	19000
Lead	13	8	9.8
Manganese	200	140	200
Mercury	0.034	0.013	0.01
Nickel	**21**	**31**	**35**
Silver	< 0.48	< 0.47	< 0.48
Zinc	73	60	40

UASB211	1 - 2[4]	4 - 5[4]
Metals		
Antimony	< 2.8	< 2.1
Arsenic	1.4	**9.3**
Cadmium	0.37	0.43
Chromium, Total	13	16
Copper	**65**	**370**
Iron	13000	10000
Lead	8.7	4.3
Manganese	73	90
Mercury	0.049	0.012
Nickel	**32**	**47**
Silver	< 0.61	< 0.46
Zinc	46	28

UASB208	0 - 0.5	1 - 1.5	2 - 2.5
Metals			
Antimony	< 2.4	< 2.1	< 2.2
Arsenic	< 1.1	< 0.95	< 0.99
Cadmium	0.26	0.37	0.28
Chromium, Total	11	16	15
Copper	**30**	**29**	**21**
Iron	11000	14000	13000
Lead	11	15	8.7
Manganese	190	160	110
Mercury	0.064	0.054	0.032
Nickel	13	15	13
Silver	< 0.53	< 0.46	< 0.48
Zinc	56	100	59

UASB230	4 - 5[4]	10 - 11[4]
Metals		
Antimony	< 2.2	< 2.3
Arsenic	< 0.97	< 1
Cadmium	< 0.16	< 0.17
Chromium, Total	**120**	**120**
Copper	**190**	**190**
Iron	**32000**	**31000**
Lead	3.1	2.8
Manganese	**490**	**470**
Mercury	< 0.0037	< 0.0042
Nickel	**410**	**160**
Silver	< 0.47	< 0.51
Zinc	32	34

SAMPLE IDENTIFICATION*

SAMPLE DEPTH OR INTERVAL (FT)

ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)

ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	**mg/kg**
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

LEGEND:
- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- SD-10 RI SEDIMENT SAMPLE
- 515 RD SEDIMENT SAMPLE
- 114 RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

NOTES:
1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE REMEDIAL INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
3. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.
5. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.
6. BORING LOCATIONS 203A, 206A, 208A AND 209A WERE ADVANCED TO BEDROCK REFUSAL AND FIELD SCREENED WITH XRF, BUT NO ANALYTICAL WERE SAMPLES COLLECTED.

0 50 100
SCALE IN FEET

U.S. Privacy Act redaction

45.06-1-5

45.06-1-6

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

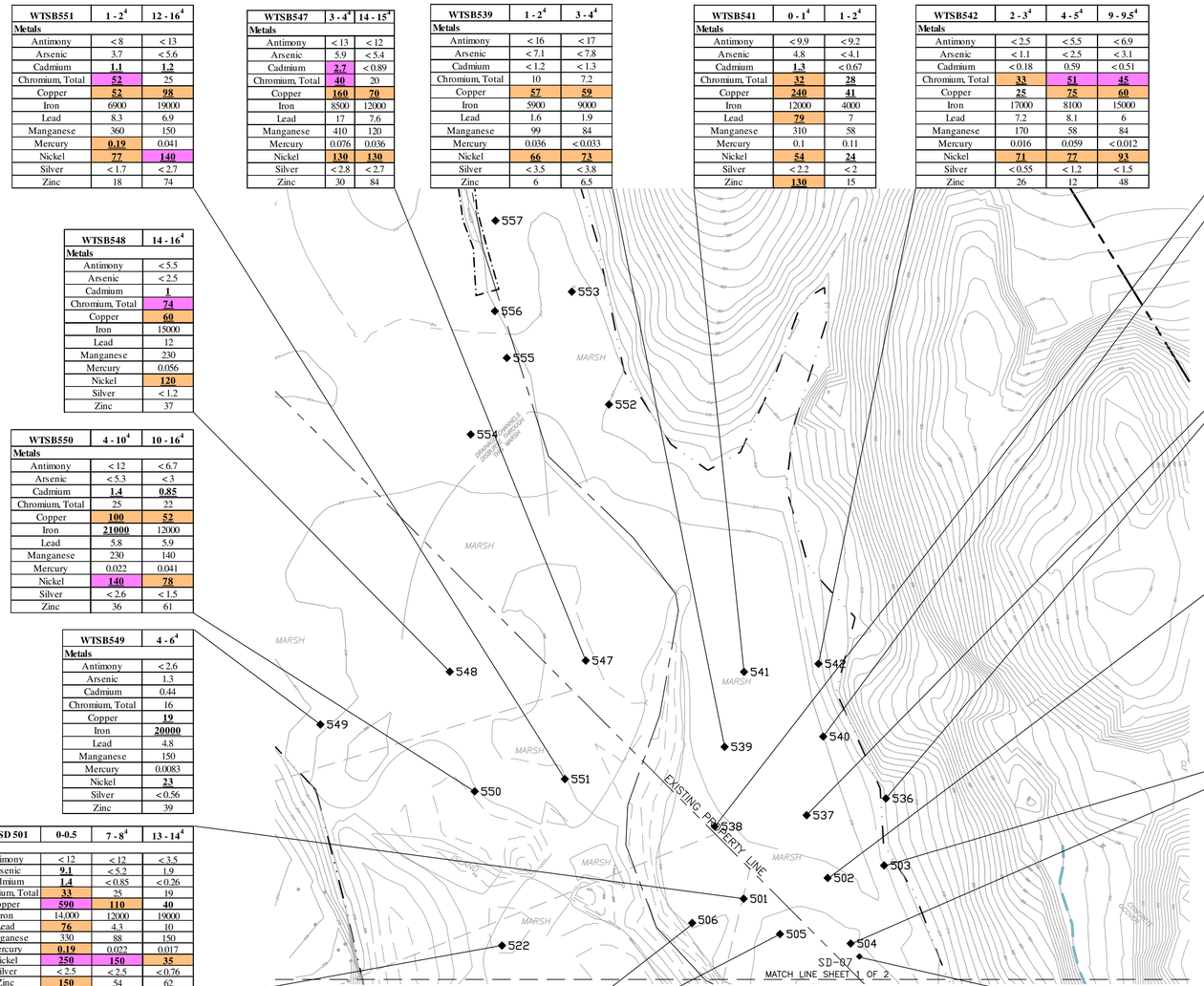
CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - UPLAND AREA

0 50' 100'

FILENAME
SCALE 1"= 50'

SHEET FIGURE 2



WTSB551	1 - 2[4]	12 - 16[4]
Metals		
Antimony	< 8	< 13
Arsenic	3.7	< 5.6
Cadmium	**1.1**	**1.2**
Chromium, Total	**52**	25
Copper	**52**	**98**
Iron	6900	19000
Lead	8.3	6.9
Manganese	360	150
Mercury	**0.19**	0.041
Nickel	**77**	**140**
Silver	< 1.7	< 2.7
Zinc	18	74

WTSB547	3 - 4[4]	14 - 15[4]
Metals		
Antimony	< 13	< 12
Arsenic	5.9	< 5.4
Cadmium	**2.7**	< 0.89
Chromium, Total	**40**	20
Copper	**160**	**70**
Iron	8500	12000
Lead	17	7.6
Manganese	410	120
Mercury	0.076	0.036
Nickel	**130**	**130**
Silver	< 2.8	< 2.7
Zinc	30	84

WTSB539	1 - 2[4]	3 - 4[4]
Metals		
Antimony	< 16	< 17
Arsenic	< 7.1	< 7.8
Cadmium	< 1.2	< 1.3
Chromium, Total	10	7.2
Copper	**57**	**59**
Iron	5900	9000
Lead	1.6	1.9
Manganese	99	84
Mercury	0.036	< 0.033
Nickel	**66**	**73**
Silver	< 3.5	< 3.8
Zinc	6	6.5

WTSB541	0 - 1[4]	1 - 2[4]
Metals		
Antimony	< 9.9	< 9.2
Arsenic	4.8	< 4.1
Cadmium	**1.3**	< 0.67
Chromium, Total	**32**	**28**
Copper	**240**	**41**
Iron	12000	4000
Lead	**79**	7
Manganese	310	58
Mercury	0.1	0.11
Nickel	**54**	**24**
Silver	< 2.2	< 2
Zinc	**130**	15

WTSB542	2 - 3[4]	4 - 5[4]	9 - 9.5[4]
Metals			
Antimony	< 2.5	< 5.5	< 6.9
Arsenic	< 1.1	< 2.5	< 3.1
Cadmium	< 0.18	0.59	< 0.51
Chromium, Total	**33**	**51**	**45**
Copper	**25**	**75**	**60**
Iron	17000	8100	15000
Lead	7.2	8.1	6
Manganese	170	58	84
Mercury	0.016	0.059	< 0.012
Nickel	**71**	**77**	**93**
Silver	< 0.55	< 1.2	< 1.5
Zinc	26	12	48

WTSB538	3 - 4[4]	9 - 10[4]	15 - 16[4]
Metals			
Antimony	< 15	< 4.3	< 3.3
Arsenic	< 6.7	< 1.9	2
Cadmium	< 1.1	< 0.32	< 0.24
Chromium, Total	12	21	21
Copper	**59**	**45**	**43**
Iron	7700	**23000**	**27000**
Lead	2.7	11	12
Manganese	81	150	160
Mercury	< 0.026	0.024	0.02
Nickel	**99**	**44**	**34**
Silver	< 3.2	**1.3**	< 0.73
Zinc	11	71	66

WTSB540	1 - 2[4]	5 - 6[4]
Metals		
Antimony	< 6.8	< 9.7
Arsenic	< 3.1	< 4.3
Cadmium	**0.61**	< 0.71
Chromium, Total	**59**	23
Copper	**77**	**60**
Iron	6700	16000
Lead	7.7	9.1
Manganese	40	83
Mercury	0.043	< 0.016
Nickel	**86**	**94**
Silver	< 1.5	< 2.1
Zinc	9.1	51

WTSB548	14 - 16[4]
Metals	
Antimony	< 5.5
Arsenic	< 2.5
Cadmium	**1**
Chromium, Total	**74**
Copper	**60**
Iron	15000
Lead	12
Manganese	230
Mercury	0.056
Nickel	**120**
Silver	< 1.2
Zinc	37

WTSB537	1 - 2[4]	13 - 14[4]	5 - 6[4]	7 - 8[4]
Metals				
Antimony	< 11	< 4.5	< 18	< 12
Arsenic	< 4.8	< 2	< 8.1	< 5.5
Cadmium	< 0.79	< 0.33	< 1.3	< 0.9
Chromium, Total	**57**	22	13	25
Copper	**160**	**31**	**120**	**86**
Iron	7700	19000	5000	19000
Lead	5.4	7.7	< 1.3	5.1
Manganese	66	120	57	86
Mercury	0.061	0.0083	< 0.033	< 0.023
Nickel	**130**	**39**	**69**	**140**
Silver	< 2.4	< 0.99	< 3.9	< 2.7
Zinc	9.3	63	8.3	58

WTSB536	0 - 1[4]	1 - 2[4]	3 - 4[4]
Metals			
Antimony	< 2.9	< 2.2	< 2.8
Arsenic	1.7	< 0.98	< 1.2
Cadmium	< 0.21	< 0.16	< 0.2
Chromium, Total	**47**	**27**	22
Copper	10	3.7	**17**
Iron	17000	16000	**26000**
Lead	15	5.4	7.3
Manganese	200	62	260
Mercury	0.046	0.0061	< 0.0044
Nickel	**62**	**24**	**29**
Silver	< 0.62	< 0.48	< 0.6
Zinc	26	17	61

WTSB550	4 - 10[4]	10 - 16[4]
Metals		
Antimony	< 12	< 6.7
Arsenic	< 5.3	< 3
Cadmium	**1.4**	**0.85**
Chromium, Total	25	22
Copper	**100**	**52**
Iron	**21000**	12000
Lead	5.8	5.9
Manganese	230	140
Mercury	0.022	0.041
Nickel	**140**	**78**
Silver	< 2.6	< 1.5
Zinc	36	61

WTSD 502	0-0.5	3 - 4[4]	5 - 6[4]	9 - 10[4]
Metals				
Antimony	< 15	< 19	< 10	< 2.4
Arsenic	< 6.8	< 8.6	< 4.5	1.4
Cadmium	< 1.1	< 1.4	< 0.74	< 0.18
Chromium, Total	12	18	**29**	11
Copper	**380**	**360**	**93**	**17**
Iron	8,000	8800	14000	12000
Lead	18	6.4	5.6	5.3
Manganese	99	89	100	100
Mercury	< 0.054	< 0.034	0.02	< 0.0042
Nickel	**190**	**160**	**140**	16
Silver	< 3.3	< 4.2	< 2.2	< 0.52
Zinc	**130**	24	59	30

WTSB549	4 - 6[4]
Metals	
Antimony	< 2.6
Arsenic	1.3
Cadmium	0.44
Chromium, Total	16
Copper	**19**
Iron	**20000**
Lead	4.8
Manganese	150
Mercury	0.0083
Nickel	**23**
Silver	< 0.56
Zinc	39

WTSD 503	0-0.5	1 - 2[4]	2 - 3[4]
Metals			
Antimony	< 3.4	< 3.5	< 2.5
Arsenic	< 1.5	5.3	2
Cadmium	**1**	< 0.26	< 0.19
Chromium, Total	**80**	**180**	**95**
Copper	**61**	**19**	12
Iron	**26,000**	18000	13000
Lead	**75**	19	7.1
Manganese	**1,600**	120	74
Mercury	0.066	0.092	0.019
Nickel	**150**	**37**	19
Silver	< 0.73	< 0.76	< 0.55
Zinc	**170**	52	31

WTSD 504	2-2.5	3-3.5	4-4.5	4 - 6[4]
Metals				
Antimony	< 11	< 9.8	< 11	< 8.9
Arsenic	**7.1**	**8.5**	< 4.9	< 4
Cadmium	**1.3**	**2.3**	< 0.8	< 0.65
Chromium, Total	**140**	**110**	**42**	**26**
Copper	**440**	**570**	**170**	**57**
Iron	8,600	11,000	6,800	13000
Lead	11	11	4	5.6
Manganese	130	150	59	88
Mercury	0.082	**0.16**	< 0.042	0.019
Nickel	**350**	**450**	**140**	**100**
Silver	< 2.5	< 2.1	< 2.4	< 1.9
Zinc	**410**	**320**	**150**	50

WTSB522	13 - 14[4]
Metals	
Antimony	< 2.5
Arsenic	2.4
Cadmium	0.26
Chromium, Total	4.8
Copper	9.2
Iron	11000
Lead	2.5
Manganese	99
Mercury	< 0.0042
Nickel	5.3
Silver	< 0.55
Zinc	15

WTSD 501	0-0.5	7 - 8[4]	13 - 14[4]
Metals			
Antimony	< 12	< 12	< 3.5
Arsenic	**9.1**	< 5.2	1.9
Cadmium	**1.4**	< 0.85	< 0.26
Chromium, Total	**33**	25	19
Copper	**590**	**110**	**40**
Iron	14,000	12000	19000
Lead	**76**	4.3	10
Manganese	330	88	150
Mercury	**0.19**	0.022	0.017
Nickel	**250**	**150**	**35**
Silver	< 2.5	< 2.5	< 0.76
Zinc	**150**	54	62

WTSD 506	2-2.5	3-3.5	4-4.5	5 - 6[4]	10 - 12[4]
Metals					
Antimony	< 10	< 9.2	< 6.9	< 11	< 2.5
Arsenic	**10**	**48**	**9.2**	< 4.9	< 1.1
Cadmium	**1.2**	**2.8**	**0.87**	< 0.8	< 0.18
Chromium, Total	**32**	**43**	**34**	22	9.1
Copper	**360**	**2,000**	**860**	**92**	**20**
Iron	4,700	8,700	13,000	13000	9900
Lead	3.7	15	17	4.4	4.3
Manganese	140	160	130	91	100
Mercury	0.067	0.13	0.063	0.027	0.0067
Nickel	**350**	**3,300**	**260**	**140**	13
Silver	< 2.2	< 2	< 1.5	< 2.4	< 0.55
Zinc	20	**240**	66	50	24

WTSD 505	2-2.5	3-3.5	4-4.5	7 - 8[4]	11 - 12[4]	13 - 14[4]
Metals						
Antimony	< 9.9	< 15	< 16	< 16	< 5.2	< 3.5
Arsenic	**130**	**51**	**25**	< 6.9	< 2.3	< 1.6
Cadmium	**4.5**	**2.9**	**2.3**	< 1.1	< 0.38	< 0.26
Chromium, Total	**1,100**	**170**	**150**	22	20	20
Copper	**38,000**	**8,100**	**3,600**	**190**	**37**	**35**
Iron	16,000	9,100	5,900	**20000**	**21000**	**20000**
Lead	**95**	24	14	6.7	8.3	9.9
Manganese	280	340	190	100	120	140
Mercury	**0.32**	**0.24**	**0.19**	0.03	0.011	0.014
Nickel	**910**	**1,300**	**820**	**200**	**43**	**37**
Silver	**5**	< 3.2	< 3.5	< 3.4	< 1.1	**1**
Zinc	**910**	**510**	**160**	67	60	63

SD-07*	0.5
Metals	
Arsenic	**16.9**
Cadmium	**1**
Chromium, Total	R
Copper	**2,080**
Iron	**23,600**
Lead	**62.9**
Manganese	220
Mercury	< 0.24
Nickel	**494**
Silver	0.66
Zinc	**1,890**

LEGEND:
- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- SD-10 RI SEDIMENT SAMPLE
- 515◆ RD SEDIMENT SAMPLE
- 114● RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

- SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	**1.6**
Chromium, Total	**180**
Copper	**150**
Iron	**42,000**
Lead	**86**
Manganese	**620**
Mercury	**0.23**
Nickel	**270**
Silver	< 1.7
Zinc	**220**

- SAMPLE DEPTH OR INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
- ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
- ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)
- ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	**mg/kg**
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:
1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE REMEDIAL INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
3. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.
5. AT LOCATIONS WTSB552–557, SAMPLES WERE NOT COLLECTED FOR LABORATORY ANALYSIS; HOWEVER, SOIL SAMPLES WERE FIELD SCREENED USING XRF INSTRUMENT.
6. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.

0 50 100
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

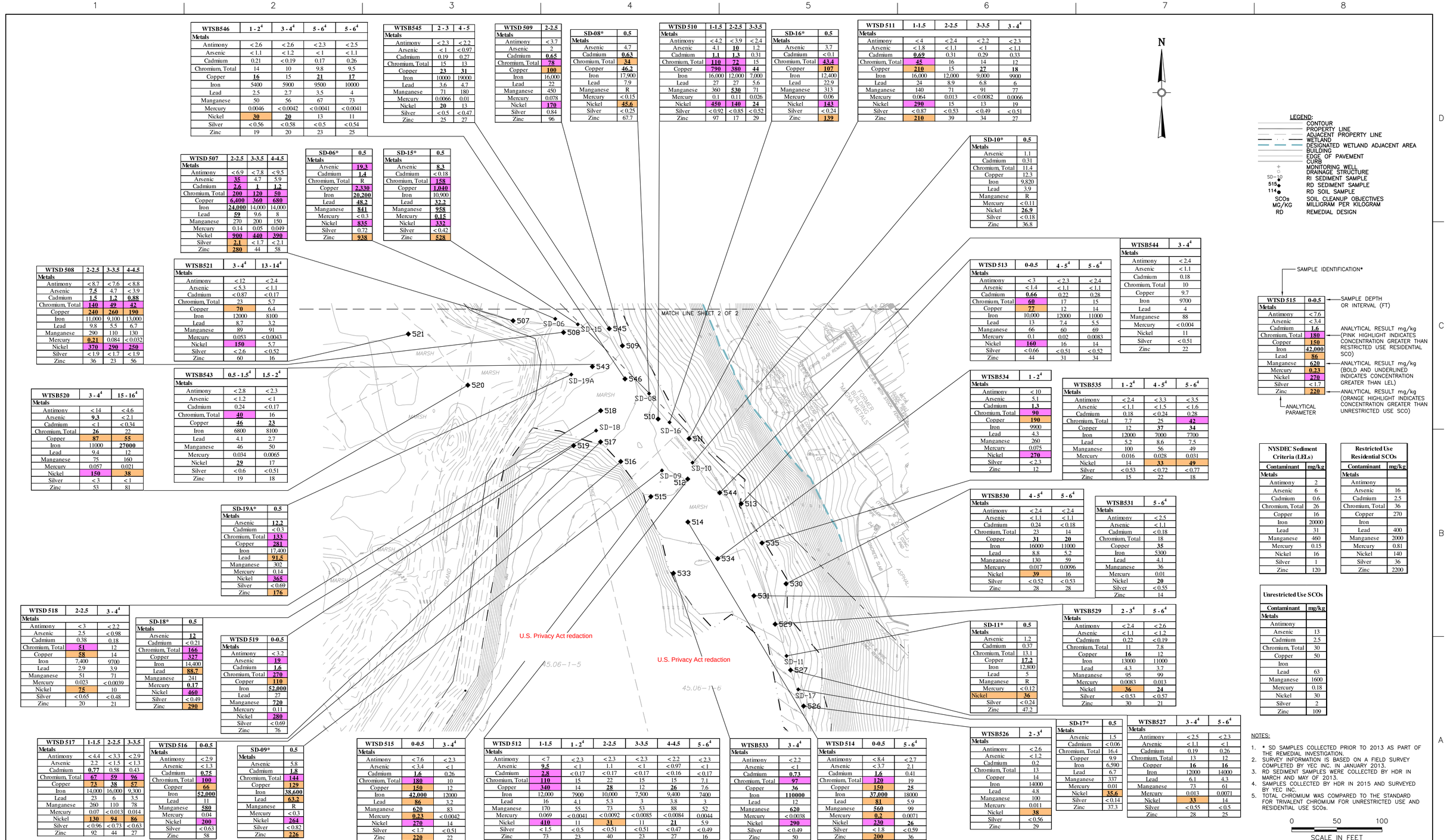
CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - WETLAND AREA (NORTH)

0' 50' 100'

FILENAME	
SCALE	1"= 50'

SHEET FIGURE 3A



WTSB546	1 - 2[4]	3 - 4[4]	5 - 6[4]	5 - 6[4]
Metals				
Antimony	< 2.6	< 2.6	< 2.3	< 2.5
Arsenic	< 1.1	< 1.2	< 1	< 1.1
Cadmium	0.21	< 0.19	0.17	0.26
Chromium, Total	14	10	9.8	9.5
Copper	**16**	15	**21**	**17**
Iron	5400	5900	9500	10000
Lead	2.5	2.7	3.5	4
Manganese	50	56	67	73
Mercury	0.0046	< 0.0042	< 0.0041	< 0.0041
Nickel	**30**	**20**	13	11
Silver	< 0.56	< 0.58	< 0.5	< 0.54
Zinc	19	20	23	25

WTSB545	2 - 3	4 - 5
Metals		
Antimony	< 2.3	< 2.2
Arsenic	< 1	< 0.97
Cadmium	0.19	0.27
Chromium, Total	15	13
Copper	**23**	**31**
Iron	10000	19000
Lead	3.6	4.7
Manganese	71	180
Mercury	0.0066	0.01
Nickel	**20**	13
Silver	< 0.5	< 0.47
Zinc	25	27

WTSD 509	2-2.5
Metals	
Antimony	< 3.7
Arsenic	2
Cadmium	**0.65**
Chromium, Total	**78**
Copper	**100**
Iron	16,000
Lead	22
Manganese	450
Mercury	0.078
Nickel	**170**
Silver	0.84
Zinc	96

SD-08*	0.5
Metals	
Arsenic	4.7
Cadmium	**0.63**
Chromium, Total	**34**
Copper	**46.2**
Iron	17,900
Lead	7.9
Manganese	R
Mercury	< 0.15
Nickel	**45.6**
Silver	< 0.25
Zinc	67.7

WTSD 510	1-1.5	2-2.5	3-3.5
Metals			
Antimony	< 4.2	< 3.9	< 2.4
Arsenic	4.1	**10**	1.2
Cadmium	**1.1**	**1.3**	0.31
Chromium, Total	**110**	**72**	15
Copper	**790**	**380**	**44**
Iron	16,000	12,000	7,000
Lead	27	27	5.6
Manganese	360	**530**	71
Mercury	0.1	0.11	0.026
Nickel	**450**	**140**	**24**
Silver	< 0.92	< 0.85	< 0.52
Zinc	97	17	29

SD-16*	0.5
Metals	
Arsenic	3.7
Cadmium	< 0.1
Chromium, Total	**43.4**
Copper	**107**
Iron	12,400
Lead	22.9
Manganese	313
Mercury	0.06
Nickel	**143**
Silver	< 0.24
Zinc	**139**

WTSD 511	1-1.5	2-2.5	3-3.5	3 - 4[4]
Metals				
Antimony	< 4	< 2.4	< 2.2	< 2.3
Arsenic	< 1.8	< 1.1	< 1	< 1.1
Cadmium	**0.69**	0.31	0.29	0.33
Chromium, Total	**45**	16	14	12
Copper	**210**	15	**27**	**18**
Iron	16,000	12,000	9,000	9900
Lead	24	8.9	6.8	6
Manganese	140	71	91	77
Mercury	0.064	0.013	< 0.0082	0.0066
Nickel	**290**	15	13	19
Silver	< 0.87	< 0.53	< 0.49	< 0.51
Zinc	**210**	39	34	27

WTSD 507	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 6.9	< 7.8	< 9.5
Arsenic	**35**	4.7	5.9
Cadmium	**2.6**	**1**	**1.2**
Chromium, Total	**200**	**120**	**50**
Copper	**6,400**	**360**	**680**
Iron	**24,000**	14,000	14,000
Lead	**59**	9.6	8
Manganese	270	200	150
Mercury	0.14	0.05	0.049
Nickel	**900**	**440**	**390**
Silver	**2.1**	< 1.7	< 2.1
Zinc	**280**	44	58

SD-06*	0.5
Metals	
Arsenic	**19.3**
Cadmium	**1.4**
Chromium, Total	R
Copper	**2,330**
Iron	**20,200**
Lead	**48.2**
Manganese	**841**
Mercury	< 0.3
Nickel	**835**
Silver	0.72
Zinc	**938**

SD-15*	0.5
Metals	
Arsenic	**8.3**
Cadmium	< 0.18
Chromium, Total	**158**
Copper	**1,040**
Iron	10,900
Lead	**32.2**
Manganese	**958**
Mercury	**0.15**
Nickel	**332**
Silver	< 0.42
Zinc	**528**

SD-10*	0.5
Metals	
Arsenic	1.1
Cadmium	0.31
Chromium, Total	11.4
Copper	12.3
Iron	9,820
Lead	3.9
Manganese	R
Mercury	< 0.11
Nickel	**26.9**
Silver	< 0.18
Zinc	36.8

WTSD 508	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 8.7	< 7.6	< 8.8
Arsenic	**7.5**	4.7	< 3.9
Cadmium	**1.5**	**1.2**	**0.88**
Chromium, Total	**140**	**49**	**42**
Copper	**240**	**260**	**190**
Iron	11,000	9,100	13,000
Lead	9.8	5.5	6.7
Manganese	290	110	130
Mercury	**0.21**	0.084	< 0.032
Nickel	**370**	**290**	**250**
Silver	< 1.9	< 1.7	< 1.9
Zinc	36	23	56

WTSB521	3 - 4[4]	13 - 14[4]
Metals		
Antimony	< 12	< 2.4
Arsenic	< 5.3	< 1.1
Cadmium	< 0.87	< 0.17
Chromium, Total	23	5.7
Copper	**70**	6.4
Iron	12000	8100
Lead	8.7	3.2
Manganese	89	91
Mercury	0.053	< 0.0043
Nickel	**150**	5.7
Silver	< 2.6	< 0.52
Zinc	60	16

WTSD 513	0-0.5	4 - 5[4]	5 - 6[4]
Metals			
Antimony	< 3	< 2.3	< 2.4
Arsenic	< 1.4	< 1.1	< 1.1
Cadmium	**0.66**	0.22	0.28
Chromium, Total	**60**	17	15
Copper	**77**	12	14
Iron	10,000	12000	11000
Lead	13	7.4	5.5
Manganese	66	60	69
Mercury	0.1	0.02	0.0083
Nickel	**160**	16	14
Silver	< 0.66	< 0.51	< 0.52
Zinc	44	31	34

WTSB544	3 - 4[4]
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	0.18
Chromium, Total	10
Copper	9.7
Iron	9700
Lead	4
Manganese	88
Mercury	< 0.004
Nickel	11
Silver	< 0.51
Zinc	22

WTSB520	3 - 4[4]	15 - 16[4]
Metals		
Antimony	< 14	< 4.6
Arsenic	**9.3**	< 2.1
Cadmium	< 1	< 0.34
Chromium, Total	**26**	23
Copper	**87**	**55**
Iron	11000	**27000**
Lead	9.4	12
Manganese	75	160
Mercury	0.057	0.021
Nickel	**150**	**38**
Silver	< 3	< 1
Zinc	53	81

WTSB543	0.5 - 1.5[4]	1.5 - 2[4]
Metals		
Antimony	< 2.8	< 2.3
Arsenic	< 1.2	< 1
Cadmium	0.24	< 0.17
Chromium, Total	**40**	16
Copper	**46**	**23**
Iron	6800	8100
Lead	4.1	2.7
Manganese	46	50
Mercury	0.034	0.0065
Nickel	**29**	17
Silver	< 0.6	< 0.51
Zinc	19	18

WTSB534	1 - 2[4]
Metals	
Antimony	< 10
Arsenic	5.1
Cadmium	**1.3**
Chromium, Total	**90**
Copper	**190**
Iron	9900
Lead	4.3
Manganese	260
Mercury	0.075
Nickel	**270**
Silver	< 2.3
Zinc	12

WTSB535	1 - 2[4]	4 - 5[4]	5 - 6[4]
Metals			
Antimony	< 2.4	< 3.3	< 3.5
Arsenic	< 1.1	< 1.5	< 1.6
Cadmium	0.18	< 0.24	0.28
Chromium, Total	7.7	25	**42**
Copper	12	**37**	**34**
Iron	12000	7000	7700
Lead	5.2	8.6	7.5
Manganese	100	56	49
Mercury	0.016	0.028	0.031
Nickel	14	**33**	**49**
Silver	< 0.53	< 0.72	< 0.77
Zinc	15	22	18

WTSB530	4 - 5[4]	5 - 6[4]
Metals		
Antimony	< 2.4	< 2.4
Arsenic	< 1.1	< 1.1
Cadmium	0.24	< 0.18
Chromium, Total	23	14
Copper	**31**	**20**
Iron	16000	11000
Lead	8.8	5.2
Manganese	130	59
Mercury	0.017	0.0096
Nickel	**39**	16
Silver	< 0.52	< 0.53
Zinc	28	28

WTSB531	5 - 6[4]
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	18
Copper	**35**
Iron	5300
Lead	4.1
Manganese	36
Mercury	0.01
Nickel	**20**
Silver	< 0.55
Zinc	14

SD-19A*	0.5
Metals	
Arsenic	**12.2**
Cadmium	< 0.3
Chromium, Total	**133**
Copper	**281**
Iron	17,400
Lead	**91.5**
Manganese	302
Mercury	0.14
Nickel	**365**
Silver	< 0.69
Zinc	**176**

WTSD 518	2-2.5	3 - 4[4]
Metals		
Antimony	< 3	< 2.2
Arsenic	2.5	< 0.98
Cadmium	0.38	0.18
Chromium, Total	**51**	12
Copper	**58**	14
Iron	7,400	9700
Lead	2.9	3.9
Manganese	51	71
Mercury	0.023	< 0.0039
Nickel	**75**	10
Silver	< 0.65	< 0.48
Zinc	20	21

SD-18*	0.5
Metals	
Arsenic	**12**
Cadmium	< 0.21
Chromium, Total	**166**
Copper	**327**
Iron	14,400
Lead	**88.7**
Manganese	241
Mercury	**0.17**
Nickel	**460**
Silver	< 0.49
Zinc	**290**

WTSD 519	0-0.5
Metals	
Antimony	< 3.2
Arsenic	**19**
Cadmium	**1.6**
Chromium, Total	**270**
Copper	**110**
Iron	**52,000**
Lead	27
Manganese	**720**
Mercury	0.11
Nickel	**280**
Silver	< 0.69
Zinc	76

SD-11*	0.5
Metals	
Arsenic	1.2
Cadmium	0.37
Chromium, Total	13.1
Copper	**17.2**
Iron	12,800
Lead	5
Manganese	R
Mercury	< 0.12
Nickel	**36**
Silver	< 0.24
Zinc	47.2

WTSB529	2 - 3[4]	5 - 6[4]
Metals		
Antimony	< 2.4	< 2.6
Arsenic	< 1.1	< 1.2
Cadmium	0.22	< 0.19
Chromium, Total	11	7.8
Copper	**16**	12
Iron	13000	11000
Lead	4.3	3.7
Manganese	95	99
Mercury	0.0083	0.013
Nickel	**36**	**24**
Silver	< 0.53	< 0.57
Zinc	30	21

WTSD 517	1-1.5	2-2.5	3-3.5
Metals			
Antimony	< 4.4	< 3.3	< 2.9
Arsenic	2.2	< 1.5	< 1.3
Cadmium	**0.77**	0.58	0.43
Chromium, Total	**67**	**59**	**96**
Copper	**73**	**38**	**57**
Iron	14,000	16,000	9,300
Lead	23	6	3.5
Manganese	260	110	78
Mercury	0.07	< 0.013	0.014
Nickel	**130**	**94**	**86**
Silver	< 0.96	< 0.73	< 0.63
Zinc	92	44	27

WTSB516	0-0.5
Metals	
Antimony	< 2.9
Arsenic	< 1.3
Cadmium	**0.75**
Chromium, Total	**100**
Copper	**66**
Iron	**52,000**
Lead	11
Manganese	**580**
Mercury	0.04
Nickel	**200**
Silver	< 0.63
Zinc	58

SD-09*	0.5
Metals	
Arsenic	5.8
Cadmium	**1.8**
Chromium, Total	**144**
Copper	**139**
Iron	**38,600**
Lead	**63.2**
Manganese	R
Mercury	< 0.3
Nickel	**264**
Silver	< 0.82
Zinc	**226**

WTSD 515	0-0.5	3 - 4[4]
Metals		
Antimony	< 7.6	< 2.3
Arsenic	< 3.4	< 1
Cadmium	**1.6**	0.26
Chromium, Total	**180**	10
Copper	**150**	12
Iron	**42,000**	12000
Lead	**86**	3.2
Manganese	620	83
Mercury	**0.23**	< 0.0042
Nickel	**270**	14
Silver	< 1.7	< 0.51
Zinc	**220**	22

WTSD 512	1-1.5	1 - 2[4]	2-2.5	3-3.5	4-4.5	5 - 6[4]
Metals						
Antimony	< 7	< 2.3	< 2.3	< 2.3	< 2.2	< 2.3
Arsenic	**9.5**	< 1	1.1	< 1	< 0.97	< 1
Cadmium	**2.8**	< 0.17	< 0.17	< 0.17	< 0.16	< 0.17
Chromium, Total	**110**	15	22	15	15	7.1
Copper	**340**	14	**28**	12	**26**	7.6
Iron	12,000	7900	10,000	7,500	9,400	7400
Lead	16	4.1	5.3	3	3.8	3
Manganese	170	55	73	53	88	52
Mercury	0.069	< 0.0041	< 0.0092	< 0.0085	< 0.0084	0.0044
Nickel	**410**	11	**31**	11	**21**	5.9
Silver	< 1.5	< 0.5	< 0.51	< 0.51	< 0.47	< 0.49
Zinc	73	23	40	23	27	16

WTSB533	3 - 4[4]
Metals	
Antimony	< 2.2
Arsenic	< 1
Cadmium	**0.73**
Chromium, Total	**97**
Copper	**36**
Iron	**110000**
Lead	12
Manganese	**620**
Mercury	< 0.0038
Nickel	**290**
Silver	< 0.49
Zinc	50

WTSD 514	0-0.5	5 - 6[4]
Metals		
Antimony	< 8.4	< 2.7
Arsenic	< 3.7	2.1
Cadmium	**1.6**	0.41
Chromium, Total	**120**	19
Copper	**150**	**25**
Iron	**37,000**	18000
Lead	**81**	5.9
Manganese	**560**	99
Mercury	**0.2**	0.0071
Nickel	**230**	**26**
Silver	< 1.8	< 0.59
Zinc	**200**	36

WTSB526	2 - 3[4]
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	0.2
Chromium, Total	13
Copper	14
Iron	14000
Lead	4.8
Manganese	100
Mercury	0.011
Nickel	**38**
Silver	< 0.56
Zinc	29

SD-17*	0.5
Metals	
Arsenic	1.5
Cadmium	< 0.06
Chromium, Total	16.4
Copper	9.9
Iron	6,590
Lead	6.7
Manganese	337
Mercury	0.01
Nickel	**35.6**
Silver	< 0.14
Zinc	37.3

WTSB527	3 - 4[4]	5 - 6[4]
Metals		
Antimony	< 2.5	< 2.3
Arsenic	< 1.1	< 1
Cadmium	0.19	0.26
Chromium, Total	13	12
Copper	**16**	**16**
Iron	12000	14000
Lead	6.1	4.3
Manganese	73	61
Mercury	0.013	0.0071
Nickel	**33**	14
Silver	< 0.55	< 0.5
Zinc	28	25

NYSDEC Sediment Criteria (LELs)	
Contaminant	**mg/kg**
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

LEGEND:
- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- SD-10 RI SEDIMENT SAMPLE
- 515 RD SEDIMENT SAMPLE
- 114 RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	**1.6**
Chromium, Total	**180**
Copper	**150**
Iron	**42,000**
Lead	**86**
Manganese	**620**
Mercury	**0.23**
Nickel	**270**
Silver	< 1.7
Zinc	**220**

- SAMPLE DEPTH OR INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
- ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
- ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)
- ANALYTICAL PARAMETER

NOTES:
1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE REMEDIAL INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
3. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.
5. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.

0 50 100
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003
CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - WETLAND AREA (SOUTH)

0 50' 100'

FILENAME
SCALE 1"= 50'

SHEET FIGURE 3B

PASD 604	0-0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	0.37
Chromium, Total	**110**
Copper	**89**
Iron	**20,000**
Lead	9.2
Manganese	310
Mercury	0.056
Nickel	**88**
Silver	< 0.62
Zinc	47

PASB605	0-0.5	1-1.5	2-2.5	4 - 7[4]	19 - 21[4]
Metals					
Antimony	< 5.1	< 4.5	< 6.4	**5.4**	< 12
Arsenic	< 2.3	< 2	< 2.8	4.4	< 5.3
Cadmium	**0.62**	0.5	**0.97**	**0.75**	< 0.87
Chromium, Total	**62**	**70**	**73**	**65**	23
Copper	**94**	**48**	**100**	**26**	**71**
Iron	12,000	12,000	12,000	9800	11000
Lead	10	9.9	12	9.8	4.8
Manganese	190	180	210	120	110
Mercury	0.076	0.073	0.067	0.061	0.036
Nickel	**96**	**91**	**120**	**82**	**130**
Silver	< 1.1	< 0.98	< 1.4	< 0.97	< 2.6
Zinc	41	41	40	29	69

PASD 602	0-0.5
Metals	
Antimony	< 16
Arsenic	**11**
Cadmium	**1.4**
Chromium, Total	**43**
Copper	**92**
Iron	11,000
Lead	6.9
Manganese	**620**
Mercury	0.071
Nickel	**160**
Silver	< 3.4
Zinc	48

PASB627	3 - 4[4]	5 - 5.5[4]
Metals		
Antimony	< 6.3	< 4.9
Arsenic	< 2.8	< 2.2
Cadmium	**0.77**	0.51
Chromium, Total	**29**	20
Copper	**50**	**32**
Iron	8700	7700
Lead	5.2	5.9
Manganese	140	120
Mercury	0.031	0.03
Nickel	**74**	**50**
Silver	< 1.4	< 1.1
Zinc	51	36

PASB626	8 - 9[4]
Metals	
Antimony	< 2.2
Arsenic	1.3
Cadmium	0.33
Chromium, Total	11
Copper	**17**
Iron	14000
Lead	3.5
Manganese	96
Mercury	< 0.0039
Nickel	**24**
Silver	< 0.49
Zinc	26

PASB601	0-0.5	9 - 10[4]	15 - 16[4]
Metals			
Antimony	< 9.6	< 9.9	< 10
Arsenic	< 4.3	< 4.4	< 4.7
Cadmium	**1.9**	**0.97**	**0.91**
Chromium, Total	**59**	24	**26**
Copper	**220**	**79**	**73**
Iron	**29,000**	15000	14000
Lead	**51**	5.8	5.2
Manganese	**910**	120	130
Mercury	**0.2**	0.017	0.037
Nickel	**140**	**150**	**120**
Silver	< 2.1	< 2.2	< 2.3
Zinc	**200**	72	67

WTSD 522	0-0.5
Metals	
Antimony	< 7.8
Arsenic	< 3.5
Cadmium	**0.96**
Chromium, Total	**53**
Copper	**53**
Iron	11,000
Lead	13
Manganese	390
Mercury	0.08
Nickel	**98**
Silver	< 1.7
Zinc	39

WTSD 521	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 11	< 12	< 12
Arsenic	**9.9**	**12**	**7.8**
Cadmium	**1.9**	**1.4**	**1.1**
Chromium, Total	**110**	**180**	**220**
Copper	**500**	**310**	**200**
Iron	17,000	11,000	8,900
Lead	**87**	**40**	22
Manganese	**700**	**590**	390
Mercury	**0.24**	**0.15**	0.084
Nickel	**250**	**320**	**200**
Silver	< 2.4	< 2.7	< 2.5
Zinc	**150**	71	61

PASB603	0-0.5	1-1.5	2-2.5	4 - 7[4]	19 - 21[4]
Metals					
Antimony	< 13	< 15	< 12	< 16	< 2.7
Arsenic	**7.4**	< 6.7	**11**	**10**	4.1
Cadmium	**1.2**	**1.2**	**1.8**	**1.4**	0.38
Chromium, Total	**68**	**46**	**43**	**31**	14
Copper	**64**	**62**	**190**	**130**	**19**
Iron	9,800	5,600	6,500	**33000**	19000
Lead	6.3	3	3.8	9	5.9
Manganese	410	200	120	180	160
Mercury	0.097	0.067	0.098	0.048	0.0089
Nickel	**180**	**160**	**160**	**240**	16
Silver	< 2.7	< 3.3	< 2.7	< 3.4	< 0.59
Zinc	19	11	12	84	35

PASD 612	0-0.5
Metals	
Antimony	< 3.8
Arsenic	**9.8**
Cadmium	**0.68**
Chromium, Total	**94**
Copper	**120**
Iron	**24,000**
Lead	19
Manganese	**550**
Mercury	0.06
Nickel	**120**
Silver	< 0.83
Zinc	**120**

PASB611	0-0.5	1-1.5	2-2.5	4 - 7[4]	7 - 10[4]	19 - 21[4]
Metals						
Antimony	< 8.9	< 7.1	< 7.6	< 7.3	< 10	< 10
Arsenic	**6.7**	< 3.2	< 3.4	4.7	< 4.7	< 4.7
Cadmium	**0.83**	**0.89**	**0.85**	**1.1**	**0.86**	**0.91**
Chromium, Total	**59**	**62**	**84**	**64**	**57**	23
Copper	**130**	**49**	**59**	**44**	**57**	**67**
Iron	19,000	10,000	9,600	9000	6900	13000
Lead	**92**	10	6.9	11	6.2	4.8
Manganese	330	160	160	170	110	110
Mercury	**0.26**	0.11	0.11	0.081	0.065	0.048
Nickel	**110**	**120**	**180**	**120**	**120**	**110**
Silver	< 1.9	< 1.6	< 1.7	< 1.6	< 2.3	< 2.3
Zinc	84	26	24	22	17	60

PASD 606	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 13	< 12	< 15
Arsenic	**6.1**	< 5.6	**7.8**
Cadmium	**1.6**	**1.8**	**2.1**
Chromium, Total	**88**	**49**	**53**
Copper	**120**	**250**	**320**
Iron	17,000	13,000	8,600
Lead	**38**	4.9	6.3
Manganese	**800**	230	190
Mercury	**0.2**	0.11	**0.16**
Nickel	**180**	**200**	**250**
Silver	< 2.8	< 2.7	< 3.2
Zinc	74	12	17

WTSD 520	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 11	< 8.1	< 8.9
Arsenic	< 4.8	**6**	**6.3**
Cadmium	**1.8**	**1.9**	**1.4**
Chromium, Total	**110**	**130**	**70**
Copper	**220**	**190**	**370**
Iron	**24,000**	**23,000**	13,000
Lead	**71**	**51**	7.9
Manganese	**680**	**770**	230
Mercury	**0.19**	**0.22**	0.1
Nickel	**220**	**290**	**300**
Silver	< 2.3	< 1.8	< 1.9
Zinc	**150**	76	31

WTSD 523	0-0.5
Metals	
Antimony	< 3.9
Arsenic	**6.2**
Cadmium	**1.1**
Chromium, Total	**90**
Copper	**130**
Iron	**24,000**
Lead	17
Manganese	430
Mercury	0.061
Nickel	**110**
Silver	< 0.85
Zinc	**190**

WTSB524	0-0.5	1-1.5	2-2.5	5 - 7[4]	8 - 10[4]	19 - 21[4]
Metals						
Antimony	< 6.7	< 7.4	< 7.8	< 17	< 17	< 11
Arsenic	< 3	< 3.3	< 3.5	< 7.7	< 7.5	< 5
Cadmium	**0.72**	**0.73**	< 0.57	**1.7**	< 1.2	**1**
Chromium, Total	**68**	**66**	**47**	23	11	19
Copper	**34**	**31**	**32**	**94**	**41**	**52**
Iron	11,000	9,800	7,200	**24000**	11000	11000
Lead	8.4	7	4.7	4.7	1.8	4.4
Manganese	150	140	120	440	360	150
Mercury	0.081	0.069	0.06	0.049	< 0.031	0.043
Nickel	**120**	**120**	**98**	**180**	**92**	**77**
Silver	< 1.5	< 1.6	< 1.7	< 3.8	< 3.7	< 2.4
Zinc	32	38	28	43	25	52

PASB609	0-0.5	1-1.5	2-2.5	4 - 7[4]	7 - 10[4]	19 - 21[4]
Metals						
Antimony	< 9.8	< 8.8	< 12	< 15	< 12	< 13
Arsenic	**6.2**	4.6	**7.5**	< 6.8	< 5.2	< 6
Cadmium	**1.3**	**1.3**	**1.7**	**1.5**	**1.5**	< 0.99
Chromium, Total	**54**	**48**	**44**	**49**	**29**	**31**
Copper	**90**	**86**	**150**	**120**	**130**	**97**
Iron	16,000	12,000	7,600	12000	9800	9700
Lead	**42**	**35**	3.9	20	1.9	4.4
Manganese	370	260	130	310	110	83
Mercury	**0.16**	**0.19**	0.074	0.11	0.046	0.039
Nickel	**130**	**140**	**170**	**140**	**240**	**160**
Silver	< 2.1	< 1.9	< 2.5	< 3.3	< 2.5	< 2.9
Zinc	62	46	28	45	24	57

PASD 607	1-1.5	2-2.5	3-3.5	4-4.5
Metals				
Antimony	< 12	< 7.4	< 4.7	< 2.2
Arsenic	< 5.3	< 3.3	< 2.1	1.3
Cadmium	< 0.86	< 0.54	< 0.34	< 0.16
Chromium, Total	**49**	**47**	23	8.5
Copper	**2,600**	**1,100**	**510**	**33**
Iron	17,000	10,000	9,100	11,000
Lead	26	14	7.4	4.2
Manganese	**690**	320	170	210
Mercury	0.12	0.051	0.05	< 0.0086
Nickel	**370**	**180**	**80**	**17**
Silver	< 2.6	< 1.6	< 1	< 0.48
Zinc	76	42	29	22

PASD 610	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 13	< 15	< 15	< 14
Arsenic	**10**	**8.3**	< 6.6	< 6.3
Cadmium	**3.2**	**2.2**	< 1.1	**1.2**
Chromium, Total	**46**	**40**	19	**52**
Copper	**330**	**170**	**170**	**160**
Iron	12,000	14,000	11,000	14,000
Lead	9.4	5.7	3.2	9.4
Manganese	250	120	58	160
Mercury	0.11	**0.21**	< 0.057	< 0.052
Nickel	**210**	**190**	**130**	**230**
Silver	< 2.9	< 3.3	< 3.2	< 3.1
Zinc	31	23	12	42

PASD 608	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 7.8	< 7	< 13	< 10
Arsenic	4.1	4.7	**11**	**11**
Cadmium	**0.93**	**0.92**	**1.2**	**2.1**
Chromium, Total	**79**	**50**	**60**	**75**
Copper	**140**	**93**	**63**	**230**
Iron	19,000	8,200	7,700	5,900
Lead	**39**	16	8.8	5
Manganese	420	170	200	38
Mercury	0.065	0.062	0.052	0.092
Nickel	**170**	**87**	**92**	**230**
Silver	< 1.7	< 1.5	< 2.8	< 2.3
Zinc	86	23	20	11

PASD 614	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 5.5	< 9.5	< 11	< 12
Arsenic	< 2.5	< 4.3	< 5.1	< 5.6
Cadmium	0.55	**1.5**	**1.1**	**1**
Chromium, Total	**53**	**81**	**84**	**64**
Copper	**67**	**91**	**71**	**63**
Iron	11,000	16,000	13,000	8,900
Lead	25	**63**	20	10
Manganese	160	200	140	95
Mercury	0.1	0.1	0.11	0.11
Nickel	**82**	**280**	**150**	**120**
Silver	< 1.2	< 2.1	< 2.5	< 2.7
Zinc	39	**130**	24	19

PASB613	0-0.5	1-1.5	2-2.5	3-3.5	15 - 16[4]	19 - 20[4]
Metals						
Antimony	< 12	< 16	< 13	< 15	**12**	< 5.4
Arsenic	**7.5**	< 7.3	**8.3**	< 6.8	< 5.3	5.8
Cadmium	**1.3**	**1.3**	**1.2**	**1.2**	< 0.86	**0.81**
Chromium, Total	**43**	**40**	**38**	**34**	**45**	**26**
Copper	**99**	**150**	**120**	**110**	**140**	**52**
Iron	14,000	7,800	5,100	8,300	**48000**	**28000**
Lead	30	6.8	3.9	4.2	12	11
Manganese	**950**	300	240	210	230	150
Mercury	**0.15**	0.08	0.057	0.06	0.055	0.028
Nickel	**130**	**160**	**150**	**170**	**210**	**67**
Silver	< 2.6	< 3.6	< 2.8	< 3.3	< 2.6	< 1.2
Zinc	74	26	20	22	**120**	77

PASB615	2-2.5	3-3.5	4-4.5	12 - 14[4]
Metals				
Antimony	< 17	< 13	< 13	**4.1**
Arsenic	< 7.8	< 5.8	< 5.8	3
Cadmium	**1.3**	**1.1**	**1**	< 0.39
Chromium, Total	**36**	**32**	**28**	19
Copper	**150**	**86**	**82**	**33**
Iron	11,000	10,000	8,600	**23000**
Lead	13	6.3	5.1	8.2
Manganese	200	120	130	220
Mercury	0.072	< 0.048	0.051	0.02
Nickel	**180**	**120**	**130**	**27**
Silver	< 3.8	< 2.8	< 2.8	< 0.87
Zinc	56	92	72	47

PASD 621	2-2.5	2.5-3
Metals		
Antimony	< 2.2	< 2.2
Arsenic	< 0.98	< 1
Cadmium	0.34	0.29
Chromium, Total	11	13
Copper	**16**	**27**
Iron	12,000	11,000
Lead	4.3	3.7
Manganese	120	150
Mercury	< 0.0082	< 0.0081
Nickel	12	12
Silver	< 0.48	< 0.49
Zinc	22	21

WTSD 525	0-0.5
Metals	
Antimony	< 6.5
Arsenic	3.5
Cadmium	**0.78**
Chromium, Total	**38**
Copper	**67**
Iron	13,000
Lead	7.9
Manganese	**530**
Mercury	0.061
Nickel	**63**
Silver	< 1.4
Zinc	69

SD-01*	0.5
Metals	
Arsenic	**10.3**
Cadmium	**1.3**
Chromium, Total	**78.1**
Copper	**493**
Iron	**21,100**
Lead	29.2
Manganese	154
Mercury	< 0.58
Nickel	**284**
Silver	**1.4**
Zinc	**180**

PASD 623	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	**0.98**
Chromium, Total	**190**
Copper	**690**
Iron	**70,000**
Lead	11
Manganese	**920**
Mercury	0.017
Nickel	**640**
Silver	< 0.55
Zinc	51

PASB624	4 - 5[4]
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	0.36
Chromium, Total	**34**
Copper	**21**
Iron	17000
Lead	2.9
Manganese	210
Mercury	< 0.0045
Nickel	**54**
Silver	< 0.55
Zinc	27

PASD 622	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 10	< 4.1	< 4.4
Arsenic	< 4.6	2.6	2.8
Cadmium	< 0.75	**0.66**	**0.69**
Chromium, Total	16	**26**	**26**
Copper	**33**	**44**	**49**
Iron	8,700	14,000	17,000
Lead	9.3	13	12
Manganese	**520**	80	140
Mercury	0.07	0.045	0.031
Nickel	**28**	**42**	**45**
Silver	< 2.2	< 0.9	< 0.95
Zinc	110	41	52

PASB617	2-2.5	3-3.5	4-4.5	11 - 12[4]
Metals				
Antimony	< 18	< 10	< 5.9	**5.2**
Arsenic	< 7.9	< 4.6	< 2.7	**7.9**
Cadmium	**1.5**	**1.3**	**0.86**	0.33
Chromium, Total	**32**	**42**	**29**	16
Copper	**150**	**120**	**63**	**28**
Iron	**27,000**	**43,000**	**29,000**	**27000**
Lead	7.6	12	9.6	10
Manganese	160	200	150	220
Mercury	< 0.065	0.044	0.026	0.015
Nickel	**290**	**190**	**95**	14
Silver	< 3.8	< 2.2	< 1.3	< 0.53
Zinc	87	91	68	34

PASB616	0-0.5	1-1.5	2-2.5	3-3.5	11 - 12[4]	14 - 15[4]
Metals						
Antimony	< 11	< 12	< 11	< 15	**10**	**8.1**
Arsenic	< 4.9	< 5.2	**7.9**	< 6.7	< 3.2	< 2.2
Cadmium	**1**	**1.1**	**1.4**	**1.5**	< 0.52	< 0.36
Chromium, Total	**37**	**37**	**79**	**65**	**36**	25
Copper	**90**	**95**	**81**	**130**	**60**	**59**
Iron	12,000	15,000	10,000	10,000	**38000**	**25000**
Lead	29	17	28	18	10	11
Manganese	340	170	130	93	200	180
Mercury	0.11	0.064	0.11	0.082	0.036	0.032
Nickel	**100**	**130**	**100**	**150**	**100**	**61**
Silver	< 2.4	< 2.5	< 2.5	< 3.3	< 1.5	< 1.1
Zinc	40	40	41	38	90	87

SD-21*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.53
Chromium, Total	**60.5**
Copper	**403**
Iron	**30,100**
Lead	**112**
Manganese	**735**
Mercury	**0.22**
Nickel	**180**
Silver	< 1.2
Zinc	**191**

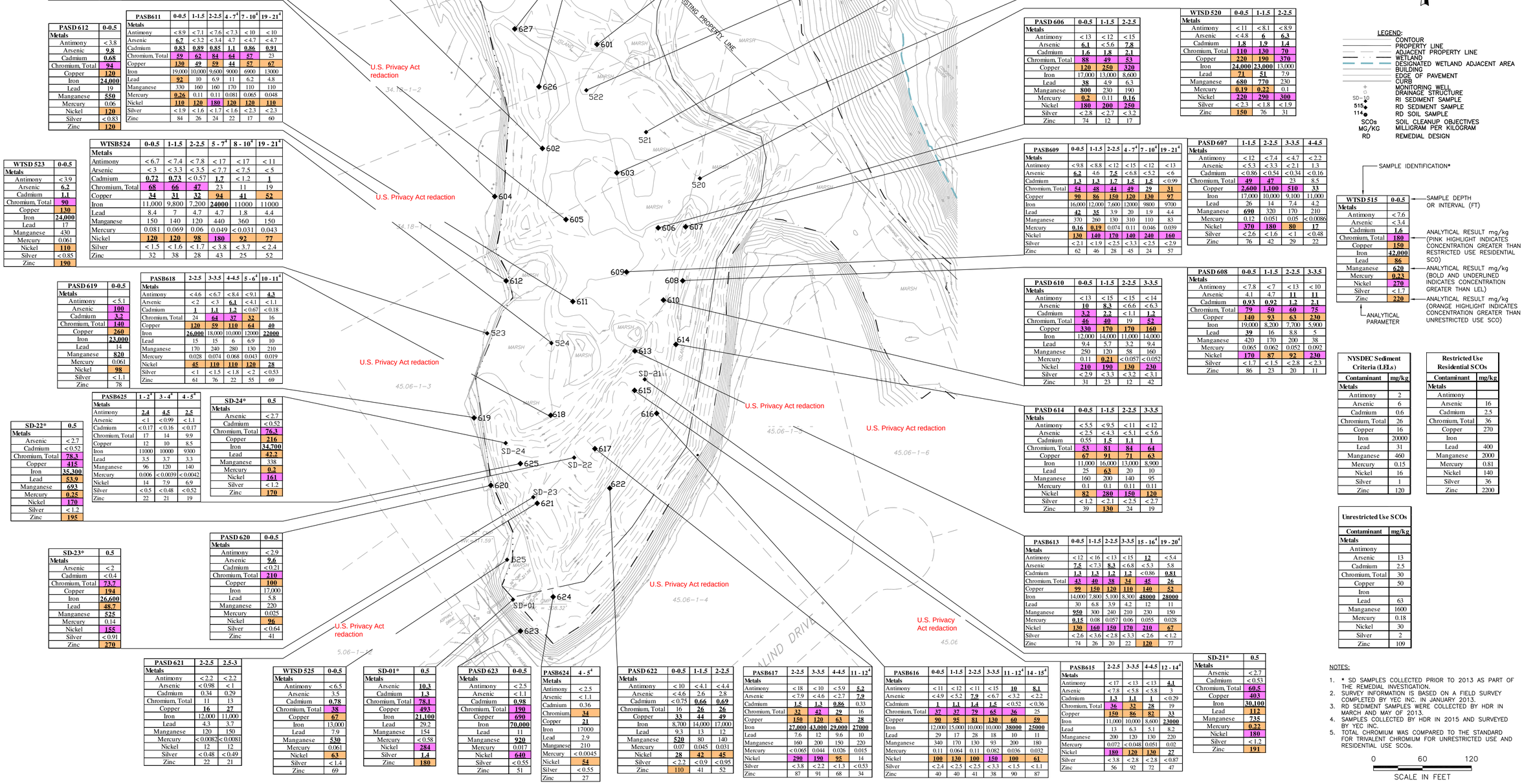
SD-22*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.52
Chromium, Total	**78.3**
Copper	**415**
Iron	**35,300**
Lead	**53.9**
Manganese	**693**
Mercury	**0.25**
Nickel	**170**
Silver	< 1.2
Zinc	**195**

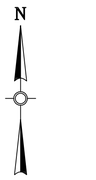
SD-23*	0.5
Metals	
Arsenic	< 2
Cadmium	< 0.4
Chromium, Total	**73.7**
Copper	**194**
Iron	**26,600**
Lead	**48.7**
Manganese	**525**
Mercury	0.14
Nickel	**155**
Silver	< 0.91
Zinc	**270**

PASB625	1 - 2[4]	3 - 4[4]	4 - 5[4]
Metals			
Antimony	**2.4**	**4.5**	**2.5**
Arsenic	< 1	< 0.99	< 1.1
Cadmium	< 0.17	< 0.16	< 0.17
Chromium, Total	17	14	9.9
Copper	12	10	8.5
Iron	11000	10000	9300
Lead	3.5	3.7	3.3
Manganese	96	120	140
Mercury	0.006	< 0.0039	< 0.0042
Nickel	14	7.9	6.9
Silver	< 0.5	< 0.48	< 0.52
Zinc	22	21	19

SD-24*	0.5
Metals	
Arsenic	< 2.7
Cadmium	< 0.52
Chromium, Total	**76.3**
Copper	**216**
Iron	**34,700**
Lead	**42.2**
Manganese	338
Mercury	**0.2**
Nickel	**161**
Silver	< 1.2
Zinc	**170**

PASD 620	0-0.5
Metals	
Antimony	< 2.9
Arsenic	**9.6**
Cadmium	< 0.21
Chromium, Total	**210**
Copper	**100**
Iron	17,000
Lead	5.8
Manganese	220
Mercury	0.025
Nickel	**96**
Silver	< 0.64
Zinc	41





LEGEND:
- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- RI SEDIMENT SAMPLE
- RD SEDIMENT SAMPLE
- RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	**1.6**
Chromium, Total	**180**
Copper	**150**
Iron	**42,000**
Lead	**86**
Manganese	**620**
Mercury	**0.23**
Nickel	**270**
Silver	< 1.7
Zinc	**220**

- SAMPLE DEPTH OR INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
- ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
- ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)
- ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	**mg/kg**
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:
1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE REMEDIAL INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
3. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.
5. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.

0 60 120
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - POND AREA

0

FILENAME	
SCALE	1"= 60'

SHEET FIGURE 4

BRSB702	0-0.5	1-1.5	2-2.5	4 - 5[4]	6 - 7[4]
Metals					
Antimony	< 1.3	< 12	< 14	< 2.3	< 2.3
Arsenic	< 5.8	< 5.2	< 6.3	< 1	< 1
Cadmium	**1.2**	**0.88**	< 1	0.2	0.21
Chromium, Total	**45**	**40**	**46**	6.6	8
Copper	**120**	**70**	**93**	12	14
Iron	17,000	10,000	4,800	8200	11000
Lead	**42**	16	3	2.7	3.8
Manganese	**590**	**480**	190	79	150
Mercury	**0.16**	0.12	0.095	0.007	0.005
Nickel	**160**	**130**	**280**	6.8	12
Silver	< 2.8	< 2.5	< 3	< 0.51	< 0.51
Zinc	110	47	9.9	14	21

BRSB760	3 - 4[4]	15 - 16[4]
Metals		
Antimony	< 14	< 4.2
Arsenic	< 6.4	< 1.9
Cadmium	**1.6**	< 0.31
Chromium, Total	17	20
Copper	**85**	**51**
Iron	9100	**23000**
Lead	11	11
Manganese	220	150
Mercury	0.085	0.026
Nickel	**110**	**50**
Silver	< 3.1	< 0.92
Zinc	14	83

BRSB763	3 - 4[4]	15 - 16[4]
Metals		
Antimony	< 2.6	< 2.4
Arsenic	< 1.2	1.5
Cadmium	0.22	0.28
Chromium, Total	15	7.9
Copper	5.5	7.5
Iron	6200	13000
Lead	2.1	2.9
Manganese	51	89
Mercury	0.0054	< 0.0042
Nickel	**40**	5.9
Silver	< 0.58	< 0.52
Zinc	20	16

BRSB766	3 - 4[4]	12 - 13[4]
Metals		
Antimony	< 12	< 8.8
Arsenic	**18**	4.5
Cadmium	**1.3**	**0.98**
Chromium, Total	24	**30**
Copper	**82**	**38**
Iron	6200	**32000**
Lead	4.9	13
Manganese	340	350
Mercury	0.073	< 0.017
Nickel	**49**	**28**
Silver	< 2.6	< 1.9
Zinc	12	68

BRSD 701	0-0.5	15 - 16[4]
Metals		
Antimony	< 8.9	< 2.4
Arsenic	< 4	< 1.1
Cadmium	**1.1**	0.2
Chromium, Total	**36**	5.7
Copper	**130**	7.8
Iron	14,000	6400
Lead	**37**	2.4
Manganese	400	65
Mercury	**0.16**	< 0.0041
Nickel	**130**	5.5
Silver	< 1.9	< 0.53
Zinc	62	13

SD-14*	0.5
Metals	
Arsenic	**8.3**
Cadmium	< 0.26
Chromium, Total	**49.1**
Copper	**672**
Iron	13,600
Lead	**39.5**
Manganese	**598**
Mercury	0.12
Nickel	**300**
Silver	< 0.6
Zinc	**146**

BRSD 703	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 11	< 12	< 11
Arsenic	< 4.8	**6.8**	< 4.9
Cadmium	**0.98**	**1.5**	**1.3**
Chromium, Total	**30**	**78**	**42**
Copper	**580**	**1200**	**270**
Iron	7500	18000	13000
Lead	11	24	8
Manganese	220	370	140
Mercury	**0.16**	0.097	0.056
Nickel	**180**	**390**	**230**
Silver	< 2.4	< 2.7	< 2.4
Zinc	66	**170**	83

BRSD 704	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 11	**11**	< 12	< 8.6
Arsenic	< 4.9	**9.9**	**9.4**	< 3.8
Cadmium	**1.1**	**2.1**	**1.8**	**0.86**
Chromium, Total	**72**	**76**	**58**	**48**
Copper	**300**	**460**	**300**	**160**
Iron	10000	13000	7600	11,000
Lead	12	14	8	5.6
Manganese	380	**650**	400	110
Mercury	**0.15**	0.13	0.097	0.039
Nickel	**230**	**350**	**330**	**230**
Silver	< 2.4	< 2.2	< 2.5	< 1.9
Zinc	78	69	46	49

BRSD 706	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 6.4	< 4.2	< 2.7	**2.5**
Arsenic	4.3	3.3	< 1.2	< 1.1
Cadmium	**0.66**	**0.67**	0.45	0.47
Chromium, Total	**61**	**38**	20	19
Copper	**140**	**100**	**28**	**27**
Iron	6600	5200	14000	15,000
Lead	6.8	3.7	6.5	7.3
Manganese	130	64	110	130
Mercury	0.094	0.031	0.011	< 0.0089
Nickel	**170**	**150**	**37**	**26**
Silver	< 1.4	< 0.91	< 0.58	< 0.53
Zinc	27	27	47	44

BRSB705	2-2.5	3-3.5	4-4.5	10 - 11[4]
Metals				
Antimony	< 5.2	< 2.5	< 2.5	< 10
Arsenic	**7**	< 1.1	< 1.1	< 4.6
Cadmium	**1.2**	0.33	0.32	**0.85**
Chromium, Total	**140**	17	16	25
Copper	**1,400**	**64**	**84**	**100**
Iron	19,000	11,000	11,000	15000
Lead	29	4.2	5.3	4.6
Manganese	390	100	96	100
Mercury	0.11	0.011	0.011	< 0.017
Nickel	**290**	**26**	**29**	**140**
Silver	< 1.1	< 0.54	< 0.54	< 2.2
Zinc	**610**	49	46	65

BRSD 708	0-0.5	1-1.5	2-2.5
Metals			
Antimony	**4.9**	< 5.4	**8.5**
Arsenic	< 2.6	< 2.4	**7.3**
Cadmium	**0.94**	**1.1**	**1.7**
Chromium, Total	**120**	**190**	**130**
Copper	**71**	**160**	**210**
Iron	18,000	**26000**	16000
Lead	18	25	9.3
Manganese	**500**	270	360
Mercury	0.089	0.087	0.072
Nickel	**110**	**210**	**330**
Silver	< 0.94	< 1.2	< 1.4
Zinc	75	49	52

BRSB709	1-1.5	4 - 5[4]
Metals		
Antimony	< 5.4	< 2.4
Arsenic	**6.7**	1.3
Cadmium	**1.3**	0.31
Chromium, Total	**130**	12
Copper	**850**	**330**
Iron	**23,000**	12000
Lead	27	5.4
Manganese	330	93
Mercury	0.094	< 0.0042
Nickel	**260**	19
Silver	< 1.2	< 0.52
Zinc	**240**	20

BRSD 710	0-0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	**0.99**
Chromium, Total	**140**
Copper	**72**
Iron	**63,000**
Lead	16
Manganese	**830**
Mercury	0.041
Nickel	**360**
Silver	< 0.58
Zinc	60

BRSD 707	1-1.5	2-2.5
Metals		
Antimony	< 2.5	< 2.3
Arsenic	< 1.1	< 1
Cadmium	0.29	0.32
Chromium, Total	25	20
Copper	**31**	**24**
Iron	10,000	13,000
Lead	4.4	5
Manganese	63	90
Mercury	0.011	< 0.0085
Nickel	**20**	**17**
Silver	< 0.54	< 0.51
Zinc	24	28

SD-05*	0.5
Metals	
Arsenic	**7**
Cadmium	**1.1**
Chromium, Total	**R**
Copper	**690**
Iron	**28,000**
Lead	**46.2**
Manganese	321
Mercury	< 0.28
Nickel	**231**
Silver	0.66
Zinc	**441**

BRSD 711	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.1	< 7.6	< 7.4	< 7.8
Arsenic	< 4.1	4.4	3.8	**8.8**
Cadmium	**0.77**	**0.74**	**0.68**	**1.3**
Chromium, Total	**51**	**60**	**55**	**93**
Copper	**120**	**140**	**130**	**98**
Iron	14,000	15,000	14,000	15,000
Lead	23	15	15	**49**
Manganese	120	94	83	180
Mercury	0.066	0.05	0.066	0.11
Nickel	**140**	**140**	**140**	**170**
Silver	< 2	< 1.7	< 1.6	< 1.7
Zinc	65	50	52	86

BRSD 713	0-0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	1
Chromium, Total	**34**
Copper	**63**
Iron	**33,000**
Lead	10
Manganese	380
Mercury	0
Nickel	**83**
Silver	< 0.52
Zinc	35

BRSB712	2-2.5	3-3.5	4-4.5	5 - 6[4]	8 - 9[4]
Metals					
Antimony	< 2.3	< 2.4	< 2.2	< 2.5	< 2.1
Arsenic	< 1	1.2	< 1	2.6	< 0.96
Cadmium	0.17	< 0.18	0.21	0.3	0.24
Chromium, Total	16	13	**29**	9.4	4.7
Copper	**80**	**66**	**230**	**18**	**18**
Iron	15,000	11,000	10,000	12000	9500
Lead	5.1	4	4.7	5.2	1.9
Manganese	160	140	120	260	**480**
Mercury	0.077	0.015	0.0099	0.007	< 0.0039
Nickel	**28**	**28**	**90**	11	6.4
Silver	< 0.49	< 0.52	< 0.49	< 0.54	< 0.47
Zinc	32	27	26	19	13

BRSD 714	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.7	< 9.2	< 9.2	< 9.9
Arsenic	< 4.3	< 4.1	< 4.1	< 4.4
Cadmium	**0.9**	**0.94**	**1.4**	**1.4**
Chromium, Total	**50**	**51**	**87**	**65**
Copper	**130**	**130**	**130**	**140**
Iron	15,000	15,000	**21,000**	15,000
Lead	**40**	**37**	**51**	8.6
Manganese	160	130	260	180
Mercury	0.087	0.091	0.14	0.088
Nickel	**140**	**160**	**210**	**170**
Silver	< 2.1	< 2	< 2	< 2.2
Zinc	67	56	92	27

BRSD 716	0-0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	**0.83**
Chromium, Total	**170**
Copper	**69**
Iron	**61,000**
Lead	14
Manganese	**780**
Mercury	0.022
Nickel	**260**
Silver	< 0.55
Zinc	54

SD-20*	0.5
Metals	
Arsenic	4.1
Cadmium	< 0.5
Chromium, Total	**62.7**
Copper	**241**
Iron	18,200
Lead	**38.9**
Manganese	**482**
Mercury	**0.15**
Nickel	**200**
Silver	< 1.1
Zinc	**258**

BRSB715	2-2.5	3-3.5	4-4.5	6 - 9[4]
Metals				
Antimony	< 8.4	< 2.3	< 2.2	< 2.3
Arsenic	**47**	2.5	< 0.99	5.9
Cadmium	**0.88**	0.25	0.22	0.41
Chromium, Total	**63**	**31**	**28**	16
Copper	**110**	**27**	**35**	**22**
Iron	**24,000**	12,000	17,000	17000
Lead	8.1	4.9	5.1	5
Manganese	100	90	120	110
Mercury	< 0.031	< 0.0092	< 0.0083	0.011
Nickel	**200**	**27**	**21**	16
Silver	< 1.8	< 0.51	< 0.48	< 0.5
Zinc	73	37	38	35

BRSD 719	0-0.5
Metals	
Antimony	< 2.3
Arsenic	< 1.1
Cadmium	**0.65**
Chromium, Total	**99**
Copper	**84**
Iron	**37,000**
Lead	5.9
Manganese	390
Mercury	0.016
Nickel	**92**
Silver	< 0.51
Zinc	37

BRSD 718	2-2.5	3-3.5	4-4.5
Metals			
Antimony	< 12	< 13	< 16
Arsenic	< 5.5	< 5.8	< 7
Cadmium	**1**	< 0.94	**1.2**
Chromium, Total	**38**	**50**	**36**
Copper	**120**	**38**	**110**
Iron	11,000	17,000	19,000
Lead	5	5.6	6.5
Manganese	97	96	100
Mercury	< 0.046	< 0.048	< 0.058
Nickel	**150**	**69**	**270**
Silver	< 2.7	< 2.8	< 3.4
Zinc	67	63	66

BRSD 717	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 9.3	< 7.5	**7.2**	**6.9**
Arsenic	< 4.1	< 3.4	< 3	< 2.5
Cadmium	**0.79**	**1.5**	**1.7**	**1.9**
Chromium, Total	**48**	**210**	**250**	**400**
Copper	**69**	**140**	**91**	**210**
Iron	13,000	**33,000**	**44,000**	**73,000**
Lead	24	**45**	**73**	**89**
Manganese	390	260	360	440
Mercury	0.079	0.12	0.12	0.045
Nickel	**77**	**230**	**210**	**470**
Silver	< 2	< 1.6	< 1.4	< 1.2
Zinc	64	93	110	**180**

BRSD 720	0-0.5	1-1.5	2-2.5
Metals			
Antimony	< 6.2	< 3.2	< 6
Arsenic	< 2.8	< 1.5	< 2.7
Cadmium	0.57	0.5	0.57
Chromium, Total	23	23	22
Copper	**42**	**75**	**34**
Iron	11,000	15,000	11,000
Lead	20	9.8	15
Manganese	200	81	55
Mercury	0.12	0.06	0.094
Nickel	**39**	**33**	**29**
Silver	< 1.4	< 0.71	< 1.3
Zinc	60	38	42

BRSD 723	0-0.5	1-1.5	2-2.5	3-3.5
Metals				
Antimony	< 3.5	< 3.5	< 9.9	< 11
Arsenic	< 1.6	< 1.6	**9.7**	**9.7**
Cadmium	**0.68**	0.52	**1.2**	**1.1**
Chromium, Total	**71**	**55**	**64**	**37**
Copper	**53**	**37**	**50**	70
Iron	**24,000**	18,000	9,200	6,400
Lead	12	7.9	14	2.4
Manganese	100	98	78	120
Mercury	0.044	0.03	0.13	0.081
Nickel	**47**	**54**	**120**	**86**
Silver	< 0.77	< 0.76	< 2.2	< 2.5
Zinc	33	33	46	13

SD-04*	0.5
Metals	
Arsenic	**9.1**
Cadmium	**1**
Chromium, Total	R
Copper	**603**
Iron	19,500
Lead	29.3
Manganese	167
Mercury	< 0.32
Nickel	**234**
Silver	**1.3**
Zinc	**209**

SD-02*	0.5
Metals	
Arsenic	3
Cadmium	**0.78**
Chromium, Total	**43**
Copper	**162**
Iron	2,160
Lead	19.4
Manganese	R
Mercury	< 0.14
Nickel	**180**
Silver	< 0.35
Zinc	**155**

BRSD 725	0-0.5
Metals	
Antimony	< 5.7
Arsenic	< 2.6
Cadmium	**0.75**
Chromium, Total	**64**
Copper	**70**
Iron	18,000
Lead	16
Manganese	**530**
Mercury	0.058
Nickel	**110**
Silver	< 1.2
Zinc	98

SD-03*	0.5
Metals	
Arsenic	4.4
Cadmium	**1.1**
Chromium, Total	**106**
Copper	**398**
Iron	**27,000**
Lead	15.4
Manganese	R
Mercury	< 0.23
Nickel	**212**
Silver	0.58
Zinc	**133**

BRSD 722	0-0.5
Metals	
Antimony	**9.2**
Arsenic	< 1.1
Cadmium	0.38
Chromium, Total	**160**
Copper	**58**
Iron	**45,000**
Lead	13
Manganese	**700**
Mercury	0.032
Nickel	**220**
Silver	< 0.52
Zinc	61

BRSB721	2-2.5	3-3.5	4-4.5	4 - 5[4]
Metals				
Antimony	< 2.5	< 2.2	< 2.3	< 2.5
Arsenic	1.4	< 0.99	< 1	2.3
Cadmium	< 0.18	0.38	0.47	0.27
Chromium, Total	15	15	14	9.5
Copper	**22**	**22**	**24**	12
Iron	13,000	14,000	15,000	13000
Lead	2.9	5.7	6.7	3.2
Manganese	82	130	190	210
Mercury	< 0.0089	< 0.0087	0.0092	< 0.0046
Nickel	**23**	**20**	**18**	9.1
Silver	< 0.54	< 0.48	< 0.51	< 0.54
Zinc	23	35	44	20

U.S. Privacy Act redaction 34.18–1–3
U.S. Privacy Act redaction 34.18–1–2
U.S. Privacy Act redaction 34.18–1–1
U.S. Privacy Act redaction 45.06–1–3
U.S. Privacy Act redaction 45.06–1–5
U.S. Privacy Act redaction 45.06–1–6
U.S. Privacy Act redaction 45.06–1–4
U.S. Privacy Act redaction 45.06–1–12
U.S. Privacy Act redaction 45.06–1–7

766 763 760 701 702 SD-14 703 704 705 706 707 708 709 710 SD-05 711 712 713 714 SD-20 715 716 717 SD-04 718 719 720 721 722 723 SD-03 724 725 SD-02

EXISTING PROPERTY LINE

ROSALIND DRIVE

N

LEGEND:
- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- SD–10 RI SEDIMENT SAMPLE
- 515 RD SEDIMENT SAMPLE
- 114 RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

SAMPLE IDENTIFICATION*

WTSD 515	0-0.5
Metals	
Antimony	< 7.6
Arsenic	< 3.4
Cadmium	**1.6**
Chromium, Total	**180**
Copper	**150**
Iron	**42,000**
Lead	**86**
Manganese	**620**
Mercury	**0.23**
Nickel	**270**
Silver	< 1.7
Zinc	**220**

- SAMPLE DEPTH OR INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
- ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
- ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	**mg/kg**
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	**mg/kg**
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:
1. * SD SAMPLES COLLECTED PRIOR TO 2013 AS PART OF THE REMEDIAL INVESTIGATION.
2. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
3. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.
4. SAMPLES COLLECTED BY HDR IN 2015 AND SURVEYED BY YEC INC.
5. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.

0 80 160
SCALE IN FEET

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - UPPER FURNACE BROOK

0

FILENAME
SCALE 1"= 80'
SHEET FIGURE 5

TABLES

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

		Location ID	LPSB114		LPSB114		LPSB116		LPSB116		LPSB116		LPSB117		UASB215		UASB215		UASB215		UASB215	
		Sample ID	LPSB114-3-4		LPSB114-4-5		LPSB116-3.5-4		LPSB116-10-11		LPSB116-13-14		LPSB117-1-2		UASB215-3-4		UASB215-4-5		UASB215-4-5-1		UASB215-7-8	
		Start Depth (feet bgs)	3		4		3.5		10		13		1		3		4		4		7	
		End Depth (feet bgs)	4		5		4		11		14		2		4		5		5		8	
Analyte	**Cas No.**	**Onsite Soil**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																						
Aluminum	7429-90-5	NA	10000	B	11000	B	17000		15000		37000		14000		11000	B	9200	B	10000	B	10000	
Antimony	7440-36-0	NA	2.3	U	2.2	U	2.3	JU	2.2	U	2.3	U	2.1	U	2.3	U	2.1	U	2.2	U	2.4	J
Arsenic	7440-38-2	16	2	J	0.99	U	1	U	0.97	U	1	U	0.95	U	1.1	U	0.95	U	0.98	U	0.99	U
Barium	7440-39-3	**400**	58		85		230		250		**1100**		79		67		59		73		43	
Beryllium	7440-41-7	47	0.46		0.48		0.67		0.76		0.91		1		0.49		0.4		0.45		0.65	
Cadmium	7440-43-9	9.3	0.17	J	0.16	U	0.17	U	0.16	U	0.17	U	0.43		0.17	U	0.16	U	0.16	U	0.27	J
Calcium	7440-70-2	NA	4900		1500		2500		1200		15000		1300		2000		1300		1500		760	
Chromium, Hexavalent	18540-29-9	19	0.099	U	0.097	U	0.1	U	0.091	U	0.097	U	0.097	U	0.1	U	0.096	U	0.097	U	0.097	U
Chromium, Total	7440-47-3	**19**	12		15		**85**		**40**		14		**62**		15		12		13		11	
Cobalt	7440-48-4	NA	7		8.5		36		25		29		23		8.3		8.2		8.1		7.2	
Copper	7440-50-8	**270**	19		12		34		38		43		17		48		12		14		7.9	
Cyanide	57-12-5	27	0.44		0.46	U	0.39	U	0.32	U	0.39	U	0.47	U	0.52	U	0.36	U	0.41	U	0.5	U
Iron	7439-89-6	NA	13000		15000		37000	D	39000	D	75000	D	26000	D	15000		13000		14000		16000	
Lead	7439-92-1	1000	11		4.4		8.7		4.8		6.7		7.3		15		3.6		4.1		5.3	
Magnesium	7439-95-4	NA	4400		3100		7400	D	17000	D	36000	D	16000		3500		2900		3100		2300	
Manganese	7439-96-5	2000	210		280		730		250		450		320		340		300		270		260	
Mercury	7439-97-6	2.8	0.015	J	0.014	J	0.016	J	0.0035	J	0.0037	J	0.025	J	0.026	J	0.0086	J	0.01	J	0.017	J
Nickel	7440-02-0	**130**	17		20		46		70		59		86		18		16		16		13	
Potassium	7440-09-7	NA	790		1000		1100		6000		11000		980		880		920		1200		480	
Selenium	7782-49-2	**4**	0.87	U	0.85	U	0.89	U	0.83	U	0.89	U	0.81	U	0.9	U	0.81	U	0.84	U	0.85	U
Silver	7440-22-4	1500	0.5	U	0.48	U	0.51	U	0.47	U	0.51	U	0.46	U	0.51	U	0.46	U	0.48	U	0.48	U
Sodium	7440-23-5	NA	290		230		260		660		1900		88	J	100	J	93	J	110	J	61	J
Thallium	7440-28-0	NA	0.94	U	0.91	U	0.96	U	0.89	U	0.96	U	0.87	U	0.97	U	0.88	U	0.9	U	0.91	U
Vanadium	7440-62-2	NA	20		26		66		51		70		27		24		18		22		18	
Zinc	7440-66-6	10000	40		26		35		43		57		35		51		25		26		19	
Chemistry Parameters																						
Solids, Percent	SOLID	NA	88.2		89.8		86.3		95.6		88.9		88.2		84.9		91.1		90.3		89.9	

Notes:
bgs - below ground surface
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available
-As a result of the revised wetlands buffer zone, samples UASB215, 271, 218, and 222 were compared to the onsite soil criteria

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

		Location ID	UASB217		UASB217		UASB217		UASB217		UASB218		UASB218		UASB218		UASB218		UASB218		UASB218	
		Sample ID	UASB217-3-4		UASB217-7-8		UASB217-11-12		UASB217-16-16.5		UASB218-0-1		UASB218-1-2		UASB218-2-3		UASB218-3-4		UASB218-7-8		UASB218-8-9	
		Start Depth (feet bgs)	3		7		11		16		0		1		2		3		7		8	
		End Depth (feet bgs)	4		8		12		16.5		1		2		3		4		8		9	
Analyte	**Cas No.**	**Onsite Soil**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																						
Aluminum	7429-90-5	NA	11000	B	14000	B	5500	B	7100	B	11000		9500		11000		6600		9300		18000	
Antimony	7440-36-0	NA	2.2	U	2.3	U	2.2	U	2.2	U	7.4		12		7.4		14		14		9.6	
Arsenic	7440-38-2	16	1	U	1	U	0.96	U	0.98	U	1.1	U	0.98	U	1	U	4.5		4.2		3.2	
Barium	7440-39-3	**400**	57		62		47		62		97		60		68		44		62		83	
Beryllium	7440-41-7	47	0.49		0.62		0.043	U	0.044	U	0.34		0.19	J	0.27	J	0.16	J	0.13	J	0.2	J
Cadmium	7440-43-9	9.3	0.16	U	0.17	U	0.16	U	0.16	U	0.74		0.16	U	0.17	U	0.15	U	0.15	U	0.16	U
Calcium	7440-70-2	NA	1200		1000		1800		3000		2400		3200		3000		2800		2500		9000	
Chromium, Hexavalent	18540-29-9	19	0.097	U	0.1	U	0.094	U	0.095	U	0.12	U	0.099	U	0.15	J	0.095	U	0.094	U	0.095	U
Chromium, Total	7440-47-3	**19**	12		**53**		11		**84**		**120**		**270**		**350**		**260**		**310**		**200**	
Cobalt	7440-48-4	NA	6.9		15		7.1		33		55		120		110		110		120		79	
Copper	7440-50-8	**270**	9.3		14		15		38		28		12		17		32		5.3		15	
Cyanide	57-12-5	27	0.43	U	0.35	U	0.31	U	0.68		0.32	U	0.43	U	0.48	U	0.45	U	0.42	U	0.44	U
Iron	7439-89-6	NA	13000		19000		11000		28000	D	45000	D	140000	D	110000	D	130000	D	160000	D	120000	D
Lead	7439-92-1	1000	4.9		28		2.5		3.3		18		15		13		13		15		10	
Magnesium	7439-95-4	NA	2700		4200		2400		13000		52000	D	210000	D	160000	D	180000	D	280000	D	220000	D
Manganese	7439-96-5	2000	170		170		270		450		520		1100		920		940		1100		680	
Mercury	7439-97-6	2.8	0.019	J	0.057		0.004	J	0.004	J	0.02	J	0.0037	U	0.0042	U	0.0038	U	0.0037	U	0.0039	U
Nickel	7440-02-0	**130**	11		40		58		78		**280**		**660**		**670**		**580**		**710**		**450**	
Potassium	7440-09-7	NA	810		390		840		1600		850		280		360		130		150		440	
Selenium	7782-49-2	**4**	0.85	U	0.89	U	0.82	U	0.84	U	0.95	U	1.7	U	1.7	U	1.6	U	1.5	U	1.6	U
Silver	7440-22-4	1500	0.49	U	0.51	U	0.47	U	0.48	U	0.54	U	0.48	U	1		0.45	U	0.44	U	0.46	U
Sodium	7440-23-5	NA	230		340		220		310		140		250		220		260		160		310	
Thallium	7440-28-0	NA	0.92	U	0.96	U	0.89	U	0.9	U	1	U	1.8	U	1.9	U	1.7	U	1.7	U	0.88	U
Vanadium	7440-62-2	NA	22		31		17		28		24		13		15		14		10		20	
Zinc	7440-66-6	10000	28		29		17		37		70		77		69		77		80		58	
Chemistry Parameters																						
Solids, Percent	SOLID	NA	90.3		84.4		90.9		90.8		76.1		88		86.5		91.6		92.8		92.5	

Notes:
bgs - below ground surface
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available
-As a result of the revised wetlands buffer zone, samples UASB215, 271, 218, and 222 were compared to the onsite soil criteria

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

		Location ID	UASB222	
		Sample ID	UASB222-6-6.5	
		Start Depth (feet bgs)	6	
		End Depth (feet bgs)	6.5	
Analyte	**Cas No.**	**Onsite Soil**	**Result**	**Qual.**
Metals				
Aluminum	7429-90-5	NA	20000	B
Antimony	7440-36-0	NA	2.1	JU
Arsenic	7440-38-2	16	0.95	U
Barium	7440-39-3	**400**	**700**	
Beryllium	7440-41-7	47	0.042	U
Cadmium	7440-43-9	9.3	0.16	U
Calcium	7440-70-2	NA	10000	
Chromium, Hexavalent	18540-29-9	19	0.092	U
Chromium, Total	7440-47-3	**19**	**72**	
Cobalt	7440-48-4	NA	43	
Copper	7440-50-8	**270**	120	J
Cyanide	57-12-5	27	1.8	
Iron	7439-89-6	NA	49000	JD
Lead	7439-92-1	1000	1.9	
Magnesium	7439-95-4	NA	17000	
Manganese	7439-96-5	2000	430	
Mercury	7439-97-6	2.8	0.0039	U
Nickel	7440-02-0	**130**	**140**	J
Potassium	7440-09-7	NA	4300	
Selenium	7782-49-2	**4**	0.81	U
Silver	7440-22-4	1500	0.46	U
Sodium	7440-23-5	NA	630	
Thallium	7440-28-0	NA	4.4	JU
Vanadium	7440-62-2	NA	83	
Zinc	7440-66-6	10000	63	
Chemistry Parameters				
Solids, Percent	SOLID	NA	92.2	

Notes:
bgs - below ground surface
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available
-As a result of the revised wetlands buffer zone, samples UASB215, 271, 218, and 222 were compared to the onsite soil criteria

Table - 2
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	UASB211		UASB211		UASB213		UASB213		UASB213		UASB214		UASB214		UASB216		UASB216		UASB219	
				Sample ID	UASB211-1-2		UASB211-4-5		UASB213-2-3		UASB213-3-4		UASB213-5-5.5		UASB214-1-2		UASB214-3-3.8		UASB216-1-2		UASB216-3-3.8		UASB219-1-2	
				Start Depth (feet bgs)	1		4		2		3		5		1		3		1		3		1	
				End Depth (feet bgs)	2		5		3		4		5.5		2		3.8		2		3.8		2	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	11000		7100		10000		9600		7100		14000		9400		9400		10000		21000	
Antimony	7440-36-0	**2**	NA	NA	2.8	U	2.1	U	**2.5**	**J**	2.4	U	2.4	U	**2.7**	**J**	2.2	U	2.5	U	2.5	U	2.2	U
Arsenic	7440-38-2	**6**	13	16	1.4	J	**9.3**		0.99	U	1.1	U	1.1	U	1.7	J	1	U	1.2	J	1.1	U	1	J
Barium	7440-39-3	NA	350	350	54		55		49		55		63		96		110		85		120		260	
Beryllium	7440-41-7	NA	7.2	14	0.66		0.52		0.64		0.52		0.57		0.98		0.89		0.78		0.89		0.41	
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.37		0.43		0.37		0.27	J	0.28	J	0.47		0.34		0.46		0.37		0.16	U
Calcium	7440-70-2	NA	NA	NA	1200		740		2000		780		880		1700		1000		1600		1200		4600	
Chromium, Hexavalent	18540-29-9	NA	1	22	0.11	U	0.097	U	0.1	U	0.1	U	0.098	U	0.59	U	0.73	JD	0.54	U	0.21	U	0.099	U
Chromium, Total	7440-47-3	**26**	30	36	13		16		13		11		9.9		24		**33**		20		**41**		**280**	
Cobalt	7440-48-4	NA	NA	NA	5.1		5.1		5.1		5.1		5.5		11		6.5		10		8.8		79	
Copper	7440-50-8	**16**	50	270	**65**		**370**		**59**		**29**		**17**		**28**		6.4		**38**		7.4		**170**	
Cyanide	57-12-5	NA	27	27	0.53	U	0.49	U	0.42	U	0.29	U	0.5	U	0.53	U	2.5		0.46	U	0.53	U	0.35	U
Iron	7439-89-6	**20000**	NA	NA	13000	D	10000	D	15000	D	13000	D	12000	D	19000	D	**20000**	**D**	15000	D	19000	D	**91000**	**D**
Lead	7439-92-1	**31**	63	400	8.7		4.3		13		5		4		19		5.3		19		6.2		11	
Magnesium	7439-95-4	NA	NA	NA	1900		1300		2100		1800		2000		3700		3200		2900		2100		84000	D
Manganese	7439-96-5	**460**	1600	2000	73	B	90	B	110	B	71	B	150	B	190	B	100	B	340	B	93	B	**610**	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.049		0.012	J	0.023	J	0.016	J	0.0099	J	0.073		0.012	J	0.047		0.019	J	0.0039	U
Nickel	7440-02-0	**20**	30	140	**32**		**47**		14		17		13		**31**		**47**		**46**		**99**		**400**	
Potassium	7440-09-7	NA	NA	NA	360		310		340		360		580		680		770		530		450		3600	
Selenium	7782-49-2	NA	3.9	36	1.1	U	0.81	U	0.84	U	0.9	U	0.93	U	0.99	U	0.86	U	0.97	U	0.97	U	1.7	U
Silver	7440-22-4	**1**	2	36	0.61	U	0.46	U	0.48	U	0.52	U	0.53	U	0.56	U	0.49	U	0.55	U	0.55	U	0.49	U
Sodium	7440-23-5	NA	NA	NA	160		160		110		120		120	J	230		160		170		190		1000	
Thallium	7440-28-0	NA	NA	NA	1.2	U	0.87	U	0.91	U	0.97	U	1	U	1.1	U	0.92	U	1	U	1	U	0.92	U
Vanadium	7440-62-2	NA	NA	NA	22		17		20		18		18		31		28		25		27		33	
Zinc	7440-66-6	**120**	109	2200	46		28		28		17		14		42		24		44		16		51	
Parameters																								
Solids, Percent	SOLID	NA	NA	NA	78.4		87.6		84.2		83		88		73.3		86.1		78.4		81.5		85.6	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 2
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	UASB219		UASB219		UASB219		UASB219		UASB219		UASB220		UASB220		UASB220		UASB221		UASB221		UASB221	
					Sample ID	UASB219-4-5		UASB219-4-5-1		UASB219-5-6		UASB219-6-7		UASB219-7-7.5		UASB220-3-4		UASB220-7-8		UASB220-15-16		UASB221-0-1		UASB221-5.5-6.5			
					Start Depth (feet bgs)	4		4		5		6		7		3		7		15		0		5.5			
					End Depth (feet bgs)	5		5		6		7		7.5		4		8		16		1		6.5			
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																										
Aluminum	7429-90-5	NA	NA	NA	9100		9800		7700		8200		8700		10000		8300		8500		9100	B	5400	B		
Antimony	7440-36-0	**2**	NA	NA	**14**		**14**		**13**		**11**		**11**		2.2	U	**2.2**	**J**	2.4	JU	2.2	U	2.2	U		
Arsenic	7440-38-2	**6**	13	16	4.4		5.8		**6.1**		4.6		4.7		1	U	0.94	U	1.1	JU	1	U	0.98	U		
Barium	7440-39-3	NA	350	350	83		86		72		70		68		430		94		88		41		47			
Beryllium	7440-41-7	NA	7.2	14	0.19	J	0.21	J	0.2	J	0.18	J	0.18	J	1.1		0.55		2		0.41		0.27	J		
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.17	U	0.16	U	0.16	U	0.17	U	0.18	U	0.32		0.28		**0.62**		0.16	U	0.16	U		
Calcium	7440-70-2	NA	NA	NA	1300		1400		1300		1200		1200		1600		1200		2300		790		1200			
Chromium, Hexavalent	18540-29-9	NA	1	22	0.097	U	0.096	U	0.095	U	0.094	U	0.093	U	0.097	U	0.095	U	0.15	J	0.33	JD	0.097	U		
Chromium, Total	7440-47-3	**26**	30	36	**290**		**320**		**280**		**290**		**330**		**28**		7.3		**360**		14		5.6			
Cobalt	7440-48-4	NA	NA	NA	130		120		130		120		120		12		6.4		95	J	7.7		4.9			
Copper	7440-50-8	**16**	50	270	14		**18**		6.4		4.3		4.3		**39**		14		**81**		**17**		10			
Cyanide	57-12-5	NA	27	27	0.45	U	0.3	U	0.44	U	0.33	U	0.34	U	1		0.46	U	0.42	U	0.39	U	0.43	U		
Iron	7439-89-6	**20000**	NA	NA	**140000**	**D**	**120000**	**D**	**150000**	**D**	**130000**	**D**	**130000**	**D**	**20000**		17000		**71000**	**D**	11000		8800			
Lead	7439-92-1	**31**	63	400	14		13		15		14		13		2.9		2.7		1.3		3		2.3			
Magnesium	7439-95-4	NA	NA	NA	220000	D	180000	D	250000	D	210000	D	220000	D	7700		4800		32000	D	2200		2000			
Manganese	7439-96-5	**460**	1600	2000	**1100**		**1100**		**1100**		**1000**		**1000**		270		330		**860**		210		280			
Mercury	7439-97-6	**0.15**	0.18	0.81	0.0036	U	0.0039	U	0.0039	U	0.0036	U	0.0041	U	0.011	J	0.0039	U	0.0042	U	0.0099	J	0.0037	U		
Nickel	7440-02-0	**20**	30	140	**730**		**690**		**710**		**660**		**650**		**28**		11		**300**		16		6.3			
Potassium	7440-09-7	NA	NA	NA	430		540		270		190		190		3200		2800		220		760		680			
Selenium	7782-49-2	NA	3.9	36	1.8	U	1.7	U	1.6	U	1.8	U	1.8	U	0.86	U	0.81	U	0.9	JU	0.85	U	0.84	U		
Silver	7440-22-4	**1**	2	36	0.51	U	0.48	U	0.46	U	0.51	U	0.52	U	0.49	U	0.46	U	0.51	U	0.49	U	0.48	U		
Sodium	7440-23-5	NA	NA	NA	160		200		170		160		190		110	J	93	J	150		77	J	75	J		
Thallium	7440-28-0	NA	NA	NA	1.9	U	1.8	U	1.7	U	1.9	U	2	U	0.93	U	0.87	U	0.97	U	0.92	U	0.9	U		
Vanadium	7440-62-2	NA	NA	NA	15		16		13		14		15		45		12		35		19		11			
Zinc	7440-66-6	**120**	109	2200	68		66		76		64		59		20		28		58		24		16			
Parameters																										
Solids, Percent	SOLID	NA	NA	NA	90.6		90.8		91.2		92.5		91.2		90.3		92.2		83.5		89.8		90.2			

Notes:
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B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
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NA - Not Available

Table - 2
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	UASB221		UASB223		UASB223		UASB224		UASB224		UASB224		UASB224		UASB225		UASB225		UASB225	
					Sample ID	UASB221-6.5-7.5		UASB223-0-1		UASB223-4-4.5		UASB224-3-4		UASB224-5-6		UASB224-5-6-1		UASB224-18-19		UASB225-3-4		UASB225-4-5		UASB225-8-9	
					Start Depth (feet bgs)	6.5		0		4		3		5		5		18		3		4		8	
					End Depth (feet bgs)	7.5		1		4.5		4		6		6		19		4		5		9	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		9800	B	17000	B	17000	B	16000		6100		6200		4500		6000	B	4000		2900	
Antimony	7440-36-0	**2**	NA	NA		2	U	2.2	U	2.2	U	2.2	U	2.4	U	2.3	U	2.4	U	2.3	U	2.1	U	2.4	U
Arsenic	7440-38-2	**6**	13	16		0.9	U	1	U	0.99	U	1	U	1.1	U	1	U	1.1	U	1	U	0.93	U	1.1	U
Barium	7440-39-3	NA	350	350		510		94		170		84		46		38		50		69		41		24	
Beryllium	7440-41-7	NA	7.2	14		0.04	U	0.66		0.044	U	1.6		0.47		0.46		2		0.32		0.38		0.28	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.15	U	0.16	U	0.16	U	0.53		0.22	J	0.2	J	**0.77**		0.17	U	0.2	J	0.18	U
Calcium	7440-70-2	NA	NA	NA		6200		1600		1000		800		970		830		1800		910		1200		1300	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.089	U	0.1	U	0.096	U	0.2	U	0.19	U	0.098	U	0.43		0.098	U	0.095	U	0.095	U
Chromium, Total	7440-47-3	**26**	30	36		**26**		**40**		**35**		**93**		13		12		**240**		17		8.4		5.1	
Cobalt	7440-48-4	NA	NA	NA		43		18		23		42		5.4		5.1		90		6		4.3		3.3	
Copper	7440-50-8	**16**	50	270		**66**		**44**		**73**		**23**		**58**		**68**		**47**		**54**		14		10	
Cyanide	57-12-5	NA	27	27		0.34	U	0.43	U	0.41	U	0.46	U	0.46	U	0.27	U	0.5	U	0.36	U	0.49		0.46	U
Iron	7439-89-6	**20000**	NA	NA		**22000**		**20000**		**57000**	**D**	**44000**	**D**	12000		12000		**70000**	**D**	13000		9500		7300	
Lead	7439-92-1	**31**	63	400		1.2		3.9		1.9		5.6		3		3.2		0.22	J	3.9		2.5		8.5	
Magnesium	7439-95-4	NA	NA	NA		7300		5500		9500		25000	D	2000		1800		49000	D	2600		2100		1400	
Manganese	7439-96-5	**460**	1600	2000		310		200		260		**580**		260		250		**870**		**470**		180		170	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0036	U	0.023	J	0.004	U	0.034		0.008	J	0.0045	J	0.044		0.0038	U	0.0039	U	0.0038	U
Nickel	7440-02-0	**20**	30	140		**190**		**51**		**60**		**150**		**25**		**22**		**450**		**40**		14		6.1	
Potassium	7440-09-7	NA	NA	NA		4500		1000		3900		860		530		470		100	J	900		630		470	
Selenium	7782-49-2	NA	3.9	36		0.77	U	0.85	U	0.85	U	0.86	U	0.9	U	0.88	U	0.93	U	0.86	U	0.8	U	0.93	U
Silver	7440-22-4	**1**	2	36		0.44	U	0.49	U	0.48	U	0.49	U	0.51	U	0.5	U	0.53	U	0.49	U	0.45	U	0.53	U
Sodium	7440-23-5	NA	NA	NA		420		180		230		130		85	J	83	J	150		74	J	76	J	77	J
Thallium	7440-28-0	NA	NA	NA		0.83	U	0.92	U	4.6	U	0.92	U	0.97	U	0.94	U	1	U	0.93	U	0.86	U	1	U
Vanadium	7440-62-2	NA	NA	NA		41		43		92		27		13		13		17		14		10		8.2	
Zinc	7440-66-6	**120**	109	2200		26		28		65		40		14		13		52		21		15		12	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		97.8		87.2		89.8		87.5		89.4		88.7		84.5		89.3		91.5		90	

Notes:
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D - Indentified Compound in A Diluted Analysis
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NA - Not Available

Table - 2
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	UASB226		UASB226		UASB226		UASB228		UASB228		UASB229		UASB229		UASB230		UASB230		UASB231	
					Sample ID	UASB226-2-2.5		UASB226-4-4.5		UASB226-6-6.5		UASB228-2-2.5		UASB228-7.5-8		UASB229-3-4		UASB229-3-4-1		UASB230-4-5		UASB230-10-11		UASB231-0-2	
					Start Depth (feet bgs)	2		4		6		2		7.5		3		3		4		10		0	
					End Depth (feet bgs)	2.5		4.5		6.5		2.5		8		4		4		5		11		2	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		14000		8600		4200		9900		4100		9300		9500		4500	B	3900	B	8200	B
Antimony	7440-36-0	**2**	NA	NA		2.3	U	2.4	U	2.4	U	2.6	U	2.2	U	**3.2**		**3.1**	**J**	2.2	U	2.3	U	2.2	U
Arsenic	7440-38-2	**6**	13	16		1	U	1.1	U	1.1	U	5		1	U	0.99	U	1.2	U	0.97	U	1	U	1	U
Barium	7440-39-3	NA	350	350		110		55		53		89		50		110		110		81		36		49	
Beryllium	7440-41-7	NA	7.2	14		0.58		0.32		0.18	J	0.49		0.18	J	0.96		0.97		0.16	J	0.16	J	0.37	
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.17	U	0.18	U	0.17	U	0.19	U	0.16	U	0.42		0.44		0.16	U	0.17	U	0.16	U
Calcium	7440-70-2	NA	NA	NA		1800		2000		1300		1000		1700		2100		1900		2200		1300		1200	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.099	U	0.16	J	0.098	J	0.1	U	0.096	U	0.1	U	0.21	U	0.094	U	0.15	J	0.097	U
Chromium, Total	7440-47-3	**26**	30	36		8.6		15		6.2		23		6.3		**79**		**80**		**120**		**120**		**88**	
Cobalt	7440-48-4	NA	NA	NA		11		6.4		4.1		8.1		5.4		21		33		67		75		37	
Copper	7440-50-8	**16**	50	270		**260**		**110**		**26**		**770**		**42**		**120**		**130**		**190**		**190**		**52**	
Cyanide	57-12-5	NA	27	27		0.49	U	0.36	U	0.31	U	3.8		3.4		0.52	U	0.37	U	0.32	U	0.34	U	0.47	U
Iron	7439-89-6	**20000**	NA	NA		**26000**	**D**	16000	D	12000	D	**24000**	**D**	10000	D	**22000**	**D**	**22000**	**D**	**32000**	**D**	**31000**	**D**	**28000**	**D**
Lead	7439-92-1	**31**	63	400		7.5		5.5		4		11		3.6		5.1		5.5		3.1		2.8		11	
Magnesium	7439-95-4	NA	NA	NA		7200	D	3000		1800		2800		2000		6800	D	5700	D	22000	D	16000		16000	
Manganese	7439-96-5	**460**	1600	2000		**470**		260		320		180		220		130	B	190	B	**490**		**470**		400	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0055	J	0.0044	U	0.0037	U	0.05		0.004	U	0.011	J	0.018	J	0.0037	U	0.0042	U	0.028	
Nickel	7440-02-0	**20**	30	140		**48**		**39**		9.8		**140**		16		**150**		**150**		**410**		**160**		**110**	
Potassium	7440-09-7	NA	NA	NA		2400		930		720		780		870		840		820		180		190		420	
Selenium	7782-49-2	NA	3.9	36		0.86	U	0.93	U	0.91	U	40		0.86	U	0.85	U	0.99	U	0.83	U	2.9	J	0.86	U
Silver	7440-22-4	**1**	2	36		0.49	U	0.53	U	0.52	U	0.58	U	0.49	U	0.48	U	0.57	U	0.47	U	0.51	U	0.49	U
Sodium	7440-23-5	NA	NA	NA		140		160		77	J	140		130		290		280		81	J	280		86	J
Thallium	7440-28-0	NA	NA	NA		0.93	U	1	U	0.98	U	1.1	U	0.92	U	0.91	U	1.1	U	1.8	U	1.9	U	1.8	U
Vanadium	7440-62-2	NA	NA	NA		33		26		12		33		13		33		32		22		20		25	
Zinc	7440-66-6	**120**	109	2200		42		24		16		44		19		39		41		32		34		42	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		86		86.7		91.5		82		90.3		83.9		83.5		92.1		85.9		89.7	

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Table - 2
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	UASB231		UASB232		UASB233		UASB234	
					Sample ID	UASB231-2-4		UASB232-0-0.5		UASB233-0-0.5		UASB234-0-0.5	
					Start Depth (feet bgs)	2		0		0		0	
					End Depth (feet bgs)	4		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals													
Aluminum	7429-90-5	NA	NA	NA		5000	B	11000		11000		12000	
Antimony	7440-36-0	**2**	NA	NA		2.1	U	2.6	U	**3.5**	**J**	2.6	U
Arsenic	7440-38-2	**6**	13	16		0.93	U	1.1	U	1.3	U	1.2	U
Barium	7440-39-3	NA	350	350		73		57		73		64	
Beryllium	7440-41-7	NA	7.2	14		0.18	J	1.1		0.88		0.83	
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.15	U	0.55		0.55		0.48	
Calcium	7440-70-2	NA	NA	NA		2100		1700		4200		2100	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.089	U	0.22	R	0.82	JD	0.24	U
Chromium, Total	7440-47-3	**26**	30	36		**140**		**88**		**33**		**27**	
Cobalt	7440-48-4	NA	NA	NA		60		26		17		12	
Copper	7440-50-8	**16**	50	270		**85**		**49**		**29**		**22**	
Cyanide	57-12-5	NA	27	27		0.38	U	0.51	U	0.94		0.61	U
Iron	7439-89-6	**20000**	NA	NA		**37000**	**D**	**26000**		**22000**		19000	
Lead	7439-92-1	**31**	63	400		2.4		29		**42**		**33**	
Magnesium	7439-95-4	NA	NA	NA		34000	D	8700		11000		5800	
Manganese	7439-96-5	**460**	1600	2000		**590**		350		380		240	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0037	U	0.049		0.067		0.069	
Nickel	7440-02-0	**20**	30	140		**210**		**65**		**54**		**35**	
Potassium	7440-09-7	NA	NA	NA		260		490		710		730	
Selenium	7782-49-2	NA	3.9	36		0.8	U	0.98	U	1.1	U	1	U
Silver	7440-22-4	**1**	2	36		0.45	U	0.56	U	0.64	U	0.57	U
Sodium	7440-23-5	NA	NA	NA		110		65	J	74	J	64	J
Thallium	7440-28-0	NA	NA	NA		1.7	U	1.1	U	1.2	U	1.1	U
Vanadium	7440-62-2	NA	NA	NA		22		35		24		28	
Zinc	7440-66-6	**120**	109	2200		38		53		77		57	
Parameters													
Solids, Percent	SOLID	NA	NA	NA		96.4		77.2		69.4		71.8	

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Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB501		WTSB501		WTSB502		WTSB502		WTSB502		WTSB503		WTSB503		WTSB504		WTSB505		WTSB505	
					Sample ID	WTSB501-7-8		WTSB501-13-14		WTSB502-3-4		WTSB502-5-6		WTSB502-9-10		WTSB503-1-2		WTSB503-2-3		WTSB504-4-6		WTSB505-7-8		WTSB505-11-12	
					Start Depth (feet bgs)	7		13		3		5		9		1		2		4		7		11	
					End Depth (feet bgs)	8		14		4		6		10		2		3		6		8		12	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		5400		9300		2500		6500		5300		17000	B	9600	B	5900		5100		7500	
Antimony	7440-36-0	**2**	NA	NA		12	U	3.5	U	19	U	10	U	2.4	U	3.5	U	2.5	U	8.9	U	16	U	5.2	U
Arsenic	7440-38-2	**6**	13	16		5.2	U	1.9	J	8.6	U	4.5	U	1.4	J	5.3		2	J	4	U	6.9	U	2.3	U
Barium	7440-39-3	NA	350	350		110		79		120		96		36		260		150		90		120		75	
Beryllium	7440-41-7	NA	7.2	14		0.23	U	0.47		0.38	U	0.22	J	0.25	J	0.84		0.43		0.26	J	0.31	U	0.35	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.85	U	0.26	U	1.4	U	0.74	U	0.18	U	0.26	U	0.19	U	0.65	U	1.1	U	0.38	U
Calcium	7440-70-2	NA	NA	NA		5300		2600		13000		5800		2200		3400		2300		4100		6000		2700	
Chromium, Hexavalent	18540-29-9	NA	1	22		5.2	U	0.74	U	8.2	U	2.3	U	0.1	U	1.4	U	0.1	U	2	U	3.4	U	1.5	JD
Chromium, Total	7440-47-3	**26**	30	36		25		19		18		**29**		11		**180**		**95**		**26**		22		20	
Cobalt	7440-48-4	NA	NA	NA		11	J	10		6.2	J	12	J	6		7.2		5.1		10	J	13	J	9.2	
Copper	7440-50-8	**16**	50	270		**110**		**40**		**360**		**93**		**17**		**19**		12		**57**		**190**		**37**	
Cyanide	57-12-5	NA	27	27		2.5	U	0.57	U	3.5	U	2.2	U	0.5	U	1.8		0.8		1.7	U	3.3	U	0.85	U
Iron	7439-89-6	**20000**	NA	NA		12000		19000	D	8800		14000		12000	D	18000	BD	13000	BD	13000		**20000**		**21000**	**D**
Lead	7439-92-1	**31**	63	400		4.3	J	10		6.4	J	5.6		5.3		19		7.1		5.6		6.7		8.3	
Magnesium	7439-95-4	NA	NA	NA		2800		4600		3400		3700		3000		3500		2700		3400		2700		3900	
Manganese	7439-96-5	**460**	1600	2000		88		150		89		100		100		120		74		88		100		120	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.022	J	0.017	J	0.034	U	0.02	J	0.0042	U	0.092		0.019	J	0.019	J	0.03	J	0.011	J
Nickel	7440-02-0	**20**	30	140		**150**		**35**		**160**		**140**		16		**37**		19		**100**		**200**		**43**	
Potassium	7440-09-7	NA	NA	NA		460	J	1800		170	J	700		1100		620		900		540		610	J	1200	
Selenium	7782-49-2	NA	3.9	36		4.4	U	1.3	U	7.4	U	3.8	U	0.92	U	1.3	U	0.97	U	3.4	U	5.9	U	2	U
Silver	7440-22-4	**1**	2	36		2.5	U	0.76	U	4.2	U	2.2	U	0.52	U	0.76	U	0.55	U	1.9	U	3.4	U	1.1	U
Sodium	7440-23-5	NA	NA	NA		280	U	100	J	590	J	240	U	85	J	150	J	130		220	J	370	U	130	U
Thallium	7440-28-0	NA	NA	NA		4.8	U	1.4	U	7.9	U	4.1	U	0.99	U	1.4	U	1	U	3.7	U	6.4	U	2.2	U
Vanadium	7440-62-2	NA	NA	NA		16		27		13		17		17		28		17		20		21		22	
Zinc	7440-66-6	**120**	109	2200		54		62		24		59		30		52		31		50		67		60	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		17		58.8		10.5		19		85.1		61.5		86		22.4		13.1		41.8	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB505		WTSB505		WTSB506		WTSB506		WTSB511		WTSB512		WTSB512		WTSB513		WTSB513		WTSB513	
					Sample ID	WTSB505-13-14		WTSB505-13-14-1		WTSB506-5-6		WTSB506-10-12		WTSB511-3-4		WTSB512-1-2		WTSB512-5-6		WTSB513-4-5		WTSB513-5-6		WTSB513-5-6-1	
					Start Depth (feet bgs)	13		13		5		10		3		1		5		4		5		5	
					End Depth (feet bgs)	14		14		6		12		4		2		6		5		6		6	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		9200		8800		5400		4700		7300		5700		3900		10000		7200		4100	B
Antimony	7440-36-0	**2**	NA	NA		3.5	U	3.7	U	11	U	2.5	U	2.3	U	2.3	JU	2.3	U	2.3	U	2.4	U	2.5	U
Arsenic	7440-38-2	**6**	13	16		1.6	U	1.7	U	4.9	U	1.1	U	1.1	U	1	U	1	U	1.1	U	1.1	U	1.1	U
Barium	7440-39-3	NA	350	350		78		78		89		35		44		65		37		110		62		40	
Beryllium	7440-41-7	NA	7.2	14		0.45		0.43	J	0.22	J	0.21	J	0.58		0.38		0.28		0.52		0.64		0.24	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.26	U	0.27	U	0.8	U	0.18	U	0.33		0.17	U	0.17	U	0.22	J	0.28	J	0.18	U
Calcium	7440-70-2	NA	NA	NA		2800		2800		4900		3500		1400		1800		1300		1900		1800		1100	
Chromium, Hexavalent	18540-29-9	NA	1	22		1.6	U	0.83	U	2.5	U	0.57	U	0.1	U	0.097	U	0.1	U	0.11	U	0.1	U	0.1	U
Chromium, Total	7440-47-3	**26**	30	36		19		20		22		9.1		12		15		7.1		17		15		8.1	
Cobalt	7440-48-4	NA	NA	NA		9.3		9.4		11	J	5.5		7.8		4.6		3		5.8		6		4.1	
Copper	7440-50-8	**16**	50	270		**35**		**35**		**92**		**20**		**18**		14		7.6		12		14		9.9	
Cyanide	57-12-5	NA	27	27		0.82	U	0.7	U	2	U	0.37	U	0.4	U	0.51	U	0.4	U	0.52	U	0.39	U	0.42	U
Iron	7439-89-6	**20000**	NA	NA		**20000**	**D**	19000	D	13000		9900	D	9900	D	7900	D	7400	D	12000	D	11000	D	5300	B
Lead	7439-92-1	**31**	63	400		9.9		9.5		4.4		4.3		6		4.1		3		7.4		5.5		3.1	
Magnesium	7439-95-4	NA	NA	NA		4500		4400		2700		3500		2900		2500		2100		3000		3000		1800	
Manganese	7439-96-5	**460**	1600	2000		140		140		91		100		77		55		52		60		69		42	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.014	J	0.012	J	0.027	J	0.0067	J	0.0066	J	0.0041	U	0.0044	J	0.02	J	0.0066	J	0.0083	J
Nickel	7440-02-0	**20**	30	140		**36**		**37**		**140**		13		19		11		5.9		16		14		9.7	
Potassium	7440-09-7	NA	NA	NA		1700		1600		490	J	1100		870		940		770		1000		980		480	
Selenium	7782-49-2	NA	3.9	36		1.4	U	1.4	U	4.2	U	0.96	U	0.9	U	0.88	U	0.86	U	0.9	U	0.91	U	0.96	U
Silver	7440-22-4	**1**	2	36		**1**		0.81	U	2.4	U	0.55	U	0.51	U	0.5	U	0.49	U	0.51	U	0.52	U	0.55	U
Sodium	7440-23-5	NA	NA	NA		100	J	100	J	260	U	100	J	120		130		85	J	230		170		100	J
Thallium	7440-28-0	NA	NA	NA		1.5	U	1.5	U	4.5	U	1	U	0.97	U	0.94	U	0.93	U	0.97	U	0.98	U	1	U
Vanadium	7440-62-2	NA	NA	NA		26		26		16		14		20		13		7.6		19		24		14	
Zinc	7440-66-6	**120**	109	2200		63		62		50		24		27		23		16		31		34		24	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		54.3		52.7		17.2		76		83.8		87.4		86.1		79.9		86.3		84.9	

Notes:
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB514		WTSB515		WTSB518		WTSB520		WTSB520		WTSB521		WTSB521		WTSB522		WTSB524		WTSB524	
					Sample ID	WTSB514-5-6		WTSB515-3-4		WTSB518-3-4		WTSB520-3-4		WTSB520-15-16		WTSB521-3-4		WTSB521-13-14		WTSB522-13-14		WTSB524-5-7		WTSB524-8-10	
					Start Depth (feet bgs)	5		3		3		3		15		3		13		13		5		8	
					End Depth (feet bgs)	6		4		4		4		16		4		14		14		7		10	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		6800		4900		4900		7500	B	11000	B	7900	B	2700	B	3500		3300		1900	
Antimony	7440-36-0	**2**	NA	NA		2.7	U	2.3	U	2.2	U	14	U	4.6	JU	12	U	2.4	U	2.5	U	17	U	17	U
Arsenic	7440-38-2	**6**	13	16		2.1	J	1	U	0.98	U	**9.3**	**J**	2.1	U	5.3	U	1.1	U	2.4	J	7.7	U	7.5	U
Barium	7440-39-3	NA	350	350		67		34		51		150		99		100		27		20		220		170	
Beryllium	7440-41-7	NA	7.2	14		0.86		0.46		0.4		0.44	J	0.67		0.38	J	0.12	J	0.41		1.4	J	0.87	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.41		0.26	J	0.18	J	1	U	0.34	U	0.87	U	0.17	U	0.26	J	**1.7**	**J**	1.2	U
Calcium	7440-70-2	NA	NA	NA		2200		1600		1600		11000		2800		9000		2200		4000		22000		19000	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.11	U	0.1	U	0.13	J	4.3	JD	0.29	J	4	JD	0.11	J	0.1	U	6.7	JD	7.6	U
Chromium, Total	7440-47-3	**26**	30	36		19		10		12		**26**		22		23		5.7		4.8		23		11	
Cobalt	7440-48-4	NA	NA	NA		8.5		5.8		5.4		14	J	13		16		3.4		3.3		16	J	6.7	J
Copper	7440-50-8	**16**	50	270		**25**		12		14		**87**		**55**		**70**		6.4		9.2		**94**		**41**	
Cyanide	57-12-5	NA	27	27		0.51	U	0.38	U	0.48	U	2.6	U	0.76	U	2.2	U	0.53	U	0.37	U	3	U	3.8	U
Iron	7439-89-6	**20000**	NA	NA		18000	D	12000	D	9700	D	11000	B	**27000**	**BD**	12000	B	8100	BD	11000	D	**24000**		11000	
Lead	7439-92-1	**31**	63	400		5.9		3.2		3.9		9.4		12		8.7		3.2		2.5		4.7	J	1.8	J
Magnesium	7439-95-4	NA	NA	NA		4000		2900		2600		4400		5700		4400		2300		3400		4900		4500	
Manganese	7439-96-5	**460**	1600	2000		99		83		71		75		160		89		91		99	B	440		360	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0071	J	0.0042	U	0.0039	U	0.057	J	0.021	J	0.053	J	0.0043	U	0.0042	U	0.049	J	0.031	U
Nickel	7440-02-0	**20**	30	140		**26**		14		10		**150**		**38**		**150**		5.7		5.3		**180**		**92**	
Potassium	7440-09-7	NA	NA	NA		1400		1000		1100		750		2600		700		590		740		480	J	350	J
Selenium	7782-49-2	NA	3.9	36		1	U	0.89	U	0.84	U	5.3	U	1.8	U	4.5	U	0.91	U	0.97	U	6.6	U	6.4	U
Silver	7440-22-4	**1**	2	36		0.59	U	0.51	U	0.48	U	3	U	1	U	2.6	U	0.52	U	0.55	U	3.8	U	3.7	U
Sodium	7440-23-5	NA	NA	NA		140		85	J	100	J	380	J	150	J	290	U	58	U	61	U	420	U	410	U
Thallium	7440-28-0	NA	NA	NA		1.1	U	0.95	U	0.9	U	5.7	U	1.9	U	4.9	U	0.98	U	1	U	7.1	U	6.9	U
Vanadium	7440-62-2	NA	NA	NA		31		12		11		36		30		19		7.8		8.4		44		19	
Zinc	7440-66-6	**120**	109	2200		36		22		21		53		81		60		16		15		43		25	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		77		84.1		88.1		15.7		47.3		17.6		83.9		84.5		11		11.3	

Notes:
bgs - below ground surface
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Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
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D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB524		WTSB526		WTSB527		WTSB527		WTSB529		WTSB529		WTSB530		WTSB530		WTSB531		WTSB533	
					Sample ID	WTSB524-19-21		WTSB526-2-3		WTSB527-3-4		WTSB527-5-6		WTSB529-2-3		WTSB529-5-6		WTSB530-4-5		WTSB530-5-6		WTSB531-5-6		WTSB533-3-4	
					Start Depth (feet bgs)	19		2		3		5		2		5		4		5		5		3	
					End Depth (feet bgs)	21		3		4		6		3		6		5		6		6		4	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		7400		3200	B	3500	B	4300	B	4200	B	3300	B	7800	B	5200	B	4200	B	1900	
Antimony	7440-36-0	**2**	NA	NA		11	U	2.6	U	2.5	U	2.3	U	2.4	U	2.6	U	2.4	U	2.4	U	2.5	U	2.2	U
Arsenic	7440-38-2	**6**	13	16		5	U	1.2	U	1.1	U	1	U	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1	U
Barium	7440-39-3	NA	350	350		130		30		32		41		31		25		93		67		69		78	
Beryllium	7440-41-7	NA	7.2	14		0.67	J	0.23	J	0.18	J	0.4		0.26	J	0.14	J	0.42		0.22	J	0.21	J	1.8	
Cadmium	7440-43-9	**0.6**	2.5	2.5		**1**	**J**	0.2	J	0.19	J	0.26	J	0.22	J	0.19	U	0.24	J	0.18	U	0.18	U	**0.73**	
Calcium	7440-70-2	NA	NA	NA		7100		2800		2100		1600		2000		4200		1300		1400		900		860	
Chromium, Hexavalent	18540-29-9	NA	1	22		5.1	U	0.12	U	0.11	U	0.099	U	0.21	JU	0.11	U	0.69	JD	0.096	U	0.69	JD	0.095	U
Chromium, Total	7440-47-3	**26**	30	36		19		13		13		12		11		7.8		23		14		18		**97**	
Cobalt	7440-48-4	NA	NA	NA		10	J	6.6		5.2		6.5		7		4.6		5.9		4.2		3.5		63	
Copper	7440-50-8	**16**	50	270		**52**		14		**16**		**16**		**16**		12		**31**		**20**		**35**		**36**	
Cyanide	57-12-5	NA	27	27		2.4	U	0.54	U	0.56	U	0.31	U	0.45	U	0.37	U	0.4	U	0.5	U	0.57	U	0.36	U
Iron	7439-89-6	**20000**	NA	NA		11000		14000	BD	12000	BD	14000	BD	13000	BD	11000	BD	16000	BD	11000	BD	5300	B	**110000**	**D**
Lead	7439-92-1	**31**	63	400		4.4		4.8		6.1		4.3		4.3		3.7		8.8		5.2		4.1		12	
Magnesium	7439-95-4	NA	NA	NA		3200		3800		2800		2600		2900		4000		2000		2300		1800		160000	D
Manganese	7439-96-5	**460**	1600	2000		150		100		73		61		95		99		130		59		36		**620**	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.043	J	0.011	J	0.013	J	0.0071	J	0.0083	J	0.013	J	0.017	J	0.0096	J	0.01	J	0.0038	U
Nickel	7440-02-0	**20**	30	140		**77**		**38**		**33**		14		**36**		**24**		**39**		16		**20**		**290**	
Potassium	7440-09-7	NA	NA	NA		550	J	300		360		690		550		290		370		690		540		160	
Selenium	7782-49-2	NA	3.9	36		8.3	J	0.99	U	0.96	U	0.87	U	0.92	U	1	U	0.91	U	0.92	U	0.96	U	0.86	U
Silver	7440-22-4	**1**	2	36		2.4	U	0.56	U	0.55	U	0.5	U	0.53	U	0.57	U	0.52	U	0.53	U	0.55	U	0.49	U
Sodium	7440-23-5	NA	NA	NA		270	U	120	J	120	J	100	J	64	J	73	J	140		100	J	100	J	69	J
Thallium	7440-28-0	NA	NA	NA		4.6	U	1.1	U	1	U	0.94	U	0.99	U	1.1	U	0.98	U	0.99	U	1	U	0.92	U
Vanadium	7440-62-2	NA	NA	NA		16		8.9		11		16		11		6.2		13		10		15		8.7	
Zinc	7440-66-6	**120**	109	2200		52		29		28		25		30		21		28		28		14		50	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		17.2		73.3		75.4		88.6		80.4		80.7		78.1		88.4		78.2		91.1	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB534		WTSB534		WTSB535		WTSB535		WTSB535		WTSB536		WTSB536		WTSB536		WTSB537		WTSB537	
					Sample ID	WTSB534-1-2		WTSB534-3-4		WTSB535-1-2		WTSB535-4-5		WTSB535-5-6		WTSB536-0-1		WTSB536-1-2		WTSB536-3-4		WTSB537-1-2		WTSB537-5-6	
					Start Depth (feet bgs)	1		3		1		4		5		0		1		3		1		5	
					End Depth (feet bgs)	2		4		2		5		6		1		2		4		2		6	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		5900		6400		4400	B	7600	B	10000	B	9200	B	7400	B	12000	B	8700	B	2400	B
Antimony	7440-36-0	**2**	NA	NA		10	U	5.6	U	2.4	U	3.3	U	3.5	U	2.9	U	2.2	U	2.8	U	11	U	18	U
Arsenic	7440-38-2	**6**	13	16		5.1	J	2.5	U	1.1	U	1.5	U	1.6	U	1.7	J	0.98	U	1.2	U	4.8	U	8.1	U
Barium	7440-39-3	NA	350	350		300		110		32		78		120		110		92		110		500		140	
Beryllium	7440-41-7	NA	7.2	14		0.74	J	0.47	J	0.23	J	0.22	J	0.31	J	0.39		0.3		0.47		0.84	J	0.36	U
Cadmium	7440-43-9	**0.6**	2.5	2.5		**1.3**		0.44	J	0.18	J	0.24	U	0.28	J	0.21	U	0.16	U	0.2	U	0.79	U	1.3	U
Calcium	7440-70-2	NA	NA	NA		19000		3700		680		1500		2400		2200		1200		2800		18000		11000	
Chromium, Hexavalent	18540-29-9	NA	1	22		4.6	U	1.1	JU	0.11	U	0.68	U	0.73	U	0.65	U	0.1	U	0.11	U	4.4	U	7.7	U
Chromium, Total	7440-47-3	**26**	30	36		**90**		17		7.7		25		**42**		**47**		**27**		22		**57**		13	
Cobalt	7440-48-4	NA	NA	NA		13		5.5	J	4.7		5		4.8		12		5.7		12		4.2	J	2.6	J
Copper	7440-50-8	**16**	50	270		**190**		**47**		12		**37**		**34**		10		3.7		**17**		**160**		**120**	
Cyanide	57-12-5	NA	27	27		3.6		0.95	U	0.38	U	0.63	U	0.74	U	0.91		0.78		0.38	J	2.1	U	4	U
Iron	7439-89-6	**20000**	NA	NA		9900		9900		12000	BD	7000	B	7700	B	17000	BD	16000	BD	**26000**	**BD**	7700	BD	5000	BD
Lead	7439-92-1	**31**	63	400		4.3		6.8		5.2		8.6		7.5		15		5.4		7.3		5.4		1.3	U
Magnesium	7439-95-4	NA	NA	NA		5700		3900		1500		1600		1600		3500		2400		5900		3700		3000	
Manganese	7439-96-5	**460**	1600	2000		260		83		100		56		49		200		62		260		66		57	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.075	J	0.014	J	0.016	J	0.028	J	0.031	J	0.046		0.0061	J	0.0044	U	0.061	J	0.033	U
Nickel	7440-02-0	**20**	30	140		**270**		**44**		14		**33**		**49**		**62**		**24**		**29**		**130**		**69**	
Potassium	7440-09-7	NA	NA	NA		290	J	1100		310		320		360		320		880		6100		220	J	150	U
Selenium	7782-49-2	NA	3.9	36		4	U	2.1	U	0.92	U	1.3	U	1.3	U	1.1	U	0.84	U	1.1	U	4.1	U	6.9	U
Silver	7440-22-4	**1**	2	36		2.3	U	1.2	U	0.53	U	0.72	U	0.77	U	0.62	U	0.48	U	0.6	U	2.4	U	3.9	U
Sodium	7440-23-5	NA	NA	NA		260	J	180	J	73	J	140	J	180		170		130		130	J	490	J	440	U
Thallium	7440-28-0	NA	NA	NA		4.3	U	2.3	U	0.99	U	1.3	U	1.4	U	1.2	U	0.9	U	1.1	U	4.4	U	7.4	U
Vanadium	7440-62-2	NA	NA	NA		34		18		10		12		11		22		18		31		40		17	
Zinc	7440-66-6	**120**	109	2200		12		37		15		22		18		26		17		61		9.3		8.3	J
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		18.9		38.2		81		62.7		58.2		66.3		86.7		79.6		20.2		11.2	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
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B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB537		WTSB537		WTSB538		WTSB538		WTSB538		WTSB539		WTSB539		WTSB540		WTSB540		WTSB541	
					Sample ID	WTSB537-7-8		WTSB537-13-14		WTSB538-3-4		WTSB538-9-10		WTSB538-15-16		WTSB539-1-2		WTSB539-3-4		WTSB540-1-2		WTSB540-5-6		WTSB541-0-1	
					Start Depth (feet bgs)	7		13		3		9		15		1		3		1		5		0	
					End Depth (feet bgs)	8		14		4		10		16		2		4		2		6		1	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		5700	B	7800	B	4300		10000		10000		3700		3500		11000	B	6100	B	14000	B
Antimony	7440-36-0	**2**	NA	NA		12	U	4.5	U	15	U	4.3	U	3.3	U	16	U	17	U	6.8	U	9.7	U	9.9	U
Arsenic	7440-38-2	**6**	13	16		5.5	U	2	U	6.7	U	1.9	U	2	J	7.1	U	7.8	U	3.1	U	4.3	U	4.8	J
Barium	7440-39-3	NA	350	350		110		72		160		95		87		190		150		370		110		280	
Beryllium	7440-41-7	NA	7.2	14		0.24	U	0.35	J	0.3	U	0.52	J	0.54		0.32	U	0.35	U	1.1		0.22	J	0.72	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.9	U	0.33	U	1.1	U	0.32	U	0.24	U	1.2	U	1.3	U	**0.61**	**J**	0.71	U	**1.3**	
Calcium	7440-70-2	NA	NA	NA		5400		2900		12000		2900		2800		18000		14000		9600		4700		12000	
Chromium, Hexavalent	18540-29-9	NA	1	22		2.8	U	1	U	6.2	U	1	JU	0.76	U	7	U	7.8	U	2.9	U	0.79	JU	7.3	JD
Chromium, Total	7440-47-3	**26**	30	36		25		22		12		21		21		10		7.2		**69**		23		**32**	
Cobalt	7440-48-4	NA	NA	NA		12	J	10		6.7	J	11		11		5.2	J	2.4	J	3.7	J	10	J	9.7	J
Copper	7440-50-8	**16**	50	270		**86**		**31**		**59**		**45**		**43**		**57**		**59**		**77**		**60**		**240**	
Cyanide	57-12-5	NA	27	27		2.8	U	0.97	U	2.9	U	0.89	U	0.7	U	3.6	U	3.9	U	1.6		3.7		94	
Iron	7439-89-6	**20000**	NA	NA		19000	BD	19000	BD	7700		**23000**	**D**	**27000**	**D**	5900		9000		6700	B	16000	B	12000	B
Lead	7439-92-1	**31**	63	400		5.1		7.7		2.7	J	11		12		1.6	J	1.9	J	7.7		9.1		**79**	
Magnesium	7439-95-4	NA	NA	NA		3100		4300		3700		4900		5100		4300		3400		2500		3300		3500	
Manganese	7439-96-5	**460**	1600	2000		86		120		81		150		160		99		84		40		83		310	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.023	U	0.0083	J	0.026	U	0.024	J	0.02	J	0.036	J	0.033	U	0.043	J	0.016	U	0.1	J
Nickel	7440-02-0	**20**	30	140		**140**		**39**		**99**		**44**		**34**		**66**		**73**		**86**		**94**		**54**	
Potassium	7440-09-7	NA	NA	NA		610	J	1300		130	J	1900		2100		140	U	150	U	240	J	590		500	
Selenium	7782-49-2	NA	3.9	36		4.7	U	1.7	U	5.7	U	1.7	U	1.3	U	6.1	U	6.7	U	5.5	J	3.7	U	3.8	U
Silver	7440-22-4	**1**	2	36		2.7	U	0.99	U	3.2	U	**1.3**		0.73	U	3.5	U	3.8	U	1.5	U	2.1	U	2.2	U
Sodium	7440-23-5	NA	NA	NA		300	U	140	J	360	U	110	J	120	J	390	U	420	U	460		230	U	290	J
Thallium	7440-28-0	NA	NA	NA		5	U	1.9	U	6.1	U	1.8	U	1.4	U	6.6	U	7.2	U	2.8	U	4	U	4.1	U
Vanadium	7440-62-2	NA	NA	NA		18		26		20		29		29		38		20		38		21		38	
Zinc	7440-66-6	**120**	109	2200		58		63		11		71		66		6	J	6.5	J	9.1		51		**130**	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		15.4		43		14.1		43.2		57		12.3		11		29.8		21.4		19.7	

Notes:
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Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB541		WTSB542		WTSB542		WTSB542		WTSB543		WTSB543		WTSB544		WTSB545		WTSB545		WTSB546	
					Sample ID	WTSB541-1-2		WTSB542-2-3		WTSB542-4-5		WTSB542-9-9.5		WTSB543-0.5-1.5		WTSB543-1.5-2		WTSB544-3-4		WTSB545-2-3		WTSB545-4-5		WTSB546-1-2	
					Start Depth (feet bgs)	1		2		4		9		0.5		1.5		3		2		4		1	
					End Depth (feet bgs)	2		3		5		9.5		1.5		2		4		3		5		2	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	8100	B	11000	B	16000	B	8500	B	6300		3800		5000		6500		6300		5000	
Antimony	7440-36-0	**2**	NA	NA	9.2	U	2.5	U	5.5	U	6.9	U	2.8	U	2.3	U	2.4	U	2.3	U	2.2	U	2.6	U
Arsenic	7440-38-2	**6**	13	16	4.1	U	1.1	U	2.5	U	3.1	U	1.2	U	1	U	1.1	U	1	U	0.97	U	1.1	U
Barium	7440-39-3	NA	350	350	210		83		420		100		200		59		46		42		41		82	
Beryllium	7440-41-7	NA	7.2	14	0.59	J	0.33		1.4		0.32	J	0.33	J	0.22	J	0.39		0.44		0.74		0.23	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.67	U	0.18	U	0.59	J	0.51	U	0.24	J	0.17	U	0.18	J	0.19	J	0.27		0.21	J
Calcium	7440-70-2	NA	NA	NA	12000		1700		12000		4400		1700		1300		1500		1700		1700		1200	
Chromium, Hexavalent	18540-29-9	NA	1	22	7.1	JD	0.53	U	2.5	U	1.5	U	0.11	U	0.1	U	0.099	U	0.098	U	0.096	U	0.11	U
Chromium, Total	7440-47-3	**26**	30	36	**28**		**33**		**51**		**45**		**40**		16		10		15		13		14	
Cobalt	7440-48-4	NA	NA	NA	3.2	J	12		5.5	J	13		4.6		3.5		4.8		6.9		7.2		7.5	
Copper	7440-50-8	**16**	50	270	**41**		**25**		**75**		**60**		**46**		**23**		9.7		**23**		**31**		**16**	
Cyanide	57-12-5	NA	27	27	5		0.44		1.7		2.2		0.52	U	0.66		0.37	U	0.48	J	0.4	U	3.4	
Iron	7439-89-6	**20000**	NA	NA	4000	B	17000	BD	8100	B	15000	B	6800	D	8100	D	9700	D	10000	D	19000	D	5400	
Lead	7439-92-1	**31**	63	400	7		7.2		8.1		6		4.1		2.7		4		3.6		4.7		2.5	
Magnesium	7439-95-4	NA	NA	NA	2000		3800		3500		4900		2300		2000		2100		2800		2900		1800	
Manganese	7439-96-5	**460**	1600	2000	58		170		58		84		46		50		88		71		180		50	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.11	J	0.016	J	0.059	J	0.012	U	0.034		0.0065	J	0.004	U	0.0066	J	0.01	J	0.0046	J
Nickel	7440-02-0	**20**	30	140	**24**		**71**		**77**		**93**		**29**		17		11		**20**		13		**30**	
Potassium	7440-09-7	NA	NA	NA	220	J	700		650		660		830		860		820		730		1400		430	
Selenium	7782-49-2	NA	3.9	36	3.5	U	0.96	U	2.1	U	2.6	U	1.1	U	0.89	U	0.9	U	0.88	U	0.83	U	0.98	U
Silver	7440-22-4	**1**	2	36	2	U	0.55	U	1.2	U	1.5	U	0.6	U	0.51	U	0.51	U	0.5	U	0.47	U	0.56	U
Sodium	7440-23-5	NA	NA	NA	230	J	110	J	160	J	170	U	150		100	J	130		100	J	88	J	130	J
Thallium	7440-28-0	NA	NA	NA	3.8	U	1	U	2.3	U	2.8	U	1.1	U	0.96	U	0.97	U	0.94	U	0.89	U	1.1	U
Vanadium	7440-62-2	NA	NA	NA	19		29		31		30		14		7.2		11		16		20		10	
Zinc	7440-66-6	**120**	109	2200	15		26		12		48		19		18		22		25		27		19	
Parameters																								
Solids, Percent	SOLID	NA	NA	NA	20.4		81.2		33.7		29.8		77.4		86.1		88.3		86.9		89.3		77.9	

Notes:
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Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	WTSB546		WTSB546		WTSB546		WTSB547		WTSB547		WTSB548		WTSB549		WTSB550		WTSB550		WTSB551	
					Sample ID	WTSB546-3-4		WTSB546-5-6		WTSB546-5-6-1		WTSB547-3-4		WTSB547-14-15		WTSB548-14-16		WTSB549-4-6		WTSB550-4-10		WTSB550-10-16		WTSB551-1-2	
					Start Depth (feet bgs)	3		5		5		3		14		14		4		4		10		1	
					End Depth (feet bgs)	4		6		6		4		15		16		6		10		16		2	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		4300		4400		5000		6300	B	5400	B	26000		9000		8900		11000		13000	
Antimony	7440-36-0	**2**	NA	NA		2.6	U	2.3	U	2.5	U	13	U	12	U	5.5	U	2.6	U	12	U	6.7	U	8	U
Arsenic	7440-38-2	**6**	13	16		1.2	U	1	U	1.1	U	5.9	J	5.4	U	2.5	U	1.3	J	5.3	U	3	U	3.7	J
Barium	7440-39-3	NA	350	350		36		36		42		420		120		510		62		190		130		360	
Beryllium	7440-41-7	NA	7.2	14		0.18	J	0.3		0.4		1	J	0.31	J	1		0.95		1.3	J	0.76	J	0.69	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.19	U	0.17	J	0.26	J	**2.7**		0.89	U	**1**		0.44		**1.4**	**J**	**0.85**		**1.1**	
Calcium	7440-70-2	NA	NA	NA		1100		1200		1700		28000		5300		7100		2700		12000		4700		13000	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.1	U	0.1	U	0.1	U	2.7	JD	2.6	U	2.4	U	0.11	U	4.6	U	0.61	U	3.2	U
Chromium, Total	7440-47-3	**26**	30	36		10		9.8		9.5		**40**		20		**74**		16		25		22		**52**	
Cobalt	7440-48-4	NA	NA	NA		4.2		4.9		5		9.8	J	13	J	17		9.4		14	J	12		4.8	J
Copper	7440-50-8	**16**	50	270		15		**21**		**17**		**160**		**70**		**60**		**19**		**100**		**52**		**52**	
Cyanide	57-12-5	NA	27	27		2.6		4.7		4		2.2	U	2.6	U	1.1	U	0.31	U	2.2	U	1.3	U	1.3	U
Iron	7439-89-6	**20000**	NA	NA		5900		9500	D	10000	D	8500	B	12000	B	15000	D	**20000**	**D**	**21000**		12000		6900	
Lead	7439-92-1	**31**	63	400		2.7		3.5		4		17		7.6		12		4.8		5.8		5.9		8.3	
Magnesium	7439-95-4	NA	NA	NA		1800		2200		2400		4200		3100		3900		6700	D	4400		4400		2200	
Manganese	7439-96-5	**460**	1600	2000		56		67		73		410		120		230	B	150	B	230	B	140	B	360	B
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0042	U	0.0041	U	0.0041	U	0.076	J	0.036	J	0.056	J	0.0083	J	0.022	J	0.041	J	**0.19**	
Nickel	7440-02-0	**20**	30	140		**20**		13		11		**130**		**130**		**120**		**23**		**140**		**78**		**77**	
Potassium	7440-09-7	NA	NA	NA		550		800		1100		370	J	790		670		1400		510	J	880		630	
Selenium	7782-49-2	NA	3.9	36		1	U	0.87	U	0.94	U	48		4.6	U	3.1	J	0.98	U	4.5	U	2.6	U	3.1	U
Silver	7440-22-4	**1**	2	36		0.58	U	0.5	U	0.54	U	2.8	U	2.7	U	1.2	U	0.56	U	2.6	U	1.5	U	1.7	U
Sodium	7440-23-5	NA	NA	NA		110	J	96	J	110	J	370	J	290	U	140	J	120	J	280	U	160	U	270	J
Thallium	7440-28-0	NA	NA	NA		1.1	U	0.94	U	1	U	5.3	U	5	U	2.3	U	1.1	U	4.8	U	2.8	U	3.3	U
Vanadium	7440-62-2	NA	NA	NA		6.9		8.6		11		47		18		41		31		44		21		21	
Zinc	7440-66-6	**120**	109	2200		20		23		25		30		84		37		39		36		61		18	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		82.8		86		86		16.7		16.9		36		77.8		18.5		28.3		27.3	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 3
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	WTSB551	
				Sample ID	WTSB551-12-16	
				Start Depth (feet bgs)	12	
				End Depth (feet bgs)	16	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**
Metals						
Aluminum	7429-90-5	NA	NA	NA	7300	
Antimony	7440-36-0	**2**	NA	NA	13	U
Arsenic	7440-38-2	**6**	13	16	5.6	U
Barium	7440-39-3	NA	350	350	140	
Beryllium	7440-41-7	NA	7.2	14	1.1	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**1.2**	**J**
Calcium	7440-70-2	NA	NA	NA	6500	
Chromium, Hexavalent	18540-29-9	NA	1	22	2.5	U
Chromium, Total	7440-47-3	**26**	30	36	25	
Cobalt	7440-48-4	NA	NA	NA	17	
Copper	7440-50-8	**16**	50	270	**98**	
Cyanide	57-12-5	NA	27	27	2.1	U
Iron	7439-89-6	**20000**	NA	NA	19000	
Lead	7439-92-1	**31**	63	400	6.9	
Magnesium	7439-95-4	NA	NA	NA	4000	
Manganese	7439-96-5	**460**	1600	2000	150	B
Mercury	7439-97-6	**0.15**	0.18	0.81	0.041	J
Nickel	7440-02-0	**20**	30	140	**140**	
Potassium	7440-09-7	NA	NA	NA	870	
Selenium	7782-49-2	NA	3.9	36	4.8	U
Silver	7440-22-4	**1**	2	36	2.7	U
Sodium	7440-23-5	NA	NA	NA	300	U
Thallium	7440-28-0	NA	NA	NA	5.2	U
Vanadium	7440-62-2	NA	NA	NA	31	
Zinc	7440-66-6	**120**	109	2200	74	
Parameters						
Solids, Percent	SOLID	NA	NA	NA	17.2	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
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B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 4
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	PASB601		PASB601		PASB603		PASB603		PASB605		PASB605		PASB609		PASB609		PASB609		PASB611	
					Sample ID	PASB601-9-10		PASB601-15-16		PASB603-4-7		PASB603-19-21		PASB605-4-7		PASB605-19-21		PASB609-4-7		PASB609-7-10		PASB609-19-21		PASB611-4-7	
					Start Depth (feet bgs)	9		15		4		19		4		19		4		7		19		4	
					End Depth (feet bgs)	10		16		7		21		7		21		7		10		21		7	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		6600		8200		8500		7300		20000		5800		7800		3200		5400		19000	
Antimony	7440-36-0	**2**	NA	NA		9.9	U	10	U	16	U	2.7	U	**5.4**	**JB**	12	U	15	U	12	U	13	U	7.3	U
Arsenic	7440-38-2	**6**	13	16		4.4	U	4.7	U	**10**	**J**	4.1		4.4	J	5.3	U	6.8	U	5.2	U	6	U	4.7	J
Barium	7440-39-3	NA	350	350		110		130		130		63		650		100		360		260		100		520	
Beryllium	7440-41-7	NA	7.2	14		0.72	J	0.62	J	1.3	J	0.64		1.3		0.84	J	1.4	J	1.1	J	0.78	J	1.4	
Cadmium	7440-43-9	**0.6**	2.5	2.5		**0.97**	**J**	**0.91**	**J**	**1.4**	**J**	0.38		**0.75**		0.87	U	**1.5**	**J**	**1.5**		0.99	U	**1.1**	
Calcium	7440-70-2	NA	NA	NA		5000		5700		8000		2700		4900		5100		17000		18000		5600		8600	
Chromium, Hexavalent	18540-29-9	NA	1	22		2.2	U	0.67	J	3.4	U	0.12	U	0.97	U	2.6	U	6.7	U	1	JD	3	U	3.4	U
Chromium, Total	7440-47-3	**26**	30	36		24		**26**		**31**		14		**65**		23		**49**		**29**		**31**		**64**	
Cobalt	7440-48-4	NA	NA	NA		16		15		19	J	8.1		10		13	J	8.4	J	11	J	12	J	13	
Copper	7440-50-8	**16**	50	270		**79**		**73**		**130**		**19**		**26**		**71**		**120**		**130**		**97**		**44**	
Cyanide	57-12-5	NA	27	27		3		2.4	U	3.5	J	0.38	U	0.81	U	2	U	3.5	U	2.4	U	3		3.7	
Iron	7439-89-6	**20000**	NA	NA		15000		14000		**33000**		19000	D	9800		11000		12000		9800		9700		9000	
Lead	7439-92-1	**31**	63	400		5.8		5.2		9		5.9		9.8		4.8		20		1.9	J	4.4	J	11	
Magnesium	7439-95-4	NA	NA	NA		4000		4400		4500		3900		3100		3300		4500		5200		3200		3100	
Manganese	7439-96-5	**460**	1600	2000		120		130		180		160		120		110		310		110		83		170	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.017	J	0.037	J	0.048	J	0.0089	J	0.061		0.036	J	0.11	J	0.046	J	0.039	J	0.081	J
Nickel	7440-02-0	**20**	30	140		**150**		**120**		**240**		16		**82**		**130**		**140**		**240**		**160**		**120**	
Potassium	7440-09-7	NA	NA	NA		700		690		1400		1800		620		710		720	J	400	J	680		630	
Selenium	7782-49-2	NA	3.9	36		3.8	U	4	U	11	J	1	U	1.7	U	7.9	J	5.8	U	4.5	U	5.4	J	2.8	U
Silver	7440-22-4	**1**	2	36		2.2	U	2.3	U	3.4	U	0.59	U	0.97	U	2.6	U	3.3	U	2.5	U	2.9	U	1.6	U
Sodium	7440-23-5	NA	NA	NA		240	U	250	U	430	J	160		170	J	290	U	540	J	310	J	330	U	220	J
Thallium	7440-28-0	NA	NA	NA		4.1	U	4.3	U	6.4	U	1.1	U	1.8	U	4.9	U	6.3	U	4.8	U	5.5	U	3	U
Vanadium	7440-62-2	NA	NA	NA		23		22		34		20		28		16		42		33		14		32	
Zinc	7440-66-6	**120**	109	2200		72		67		84		35		29		69		45		24		57		22	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		20.1		18.7		12.8		74.2		44.2		16.7		12.9		17.2		14.7		26.1	

Notes:
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 4
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	PASB611		PASB611		PASB613		PASB613		PASB615		PASB616		PASB616		PASB617		PASB618		PASB618	
				Sample ID	PASB611-7-10		PASB611-19-21		PASB613-15-16		PASB613-19-20		PASB615-12-14		PASB16-11-12		PASB616-14-15		PASB617-11-12		PASB618-5-6		PASB618-10-11	
				Start Depth (feet bgs)	7		19		15		19		12		11		14		11		5		10	
				End Depth (feet bgs)	10		21		16		20		14		12		15		12		6		11	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	12000		7600		9700	B	10000		7300	B	9800	B	12000	B	5700	B	8600	B	7900	B
Antimony	7440-36-0	**2**	NA	NA	10	U	10	U	**12**	**J**	5.4	U	**4.1**	**J**	**10**		**8.1**		**5.2**		9.1	U	**4.3**	
Arsenic	7440-38-2	**6**	13	16	4.7	U	4.7	U	5.3	U	5.8	J	3	J	3.2	U	2.2	U	**7.9**		4.1	U	1.1	U
Barium	7440-39-3	NA	350	350	290		120		150		96		74		100		110		96		120		67	
Beryllium	7440-41-7	NA	7.2	14	1.2	J	0.79	J	0.77	J	1.1		0.51		0.57	J	0.8		0.38		0.45	J	0.53	
Cadmium	7440-43-9	**0.6**	2.5	2.5	**0.86**	**J**	**0.91**	**J**	0.86	U	**0.81**		0.29	U	0.52	U	0.36	U	0.33		0.67	U	0.18	U
Calcium	7440-70-2	NA	NA	NA	11000		4800		7500		3200		6800		3600		3300		7500		5500		4300	
Chromium, Hexavalent	18540-29-9	NA	1	22	2.4	U	4.7	JD	1	JU	0.47	U	0.37	U	0.56	U	0.22	U	0.16	J	2.7	JD	0.11	U
Chromium, Total	7440-47-3	**26**	30	36	**57**		23		**45**		**26**		19		**36**		25		16		**32**		16	
Cobalt	7440-48-4	NA	NA	NA	12	J	13		33		14		11		18		16		11		14		9	
Copper	7440-50-8	**16**	50	270	**57**		**67**		**140**		**52**		**33**		**60**		**59**		**28**		**64**		**27**	
Cyanide	57-12-5	NA	27	27	2.3	U	2.4	J	2.6	U	1.1	U	0.89	U	1.3	U	1.1	U	0.5	U	1.5	U	0.53	U
Iron	7439-89-6	**20000**	NA	NA	6900		13000		**48000**		**28000**	**D**	**23000**		**38000**		**25000**		**27000**		12000		16000	
Lead	7439-92-1	**31**	63	400	6.2		4.8		12		11		8.2		10		11		10		6.9		7.5	
Magnesium	7439-95-4	NA	NA	NA	3200		3400		7000		5100		6500		5700		6100		5700		4100		5500	
Manganese	7439-96-5	**460**	1600	2000	110		110		230		150		220		200		180		220		130		180	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.065	J	0.048	J	0.055	J	0.028	J	0.02	J	0.036	J	0.032	J	0.015	J	0.043	J	0.01	J
Nickel	7440-02-0	**20**	30	140	**120**		**110**		**210**		**67**		**27**		**100**		**61**		14		**120**		19	
Potassium	7440-09-7	NA	NA	NA	480	J	890		1500		1800		1700		1600		2400		1500		710		1900	
Selenium	7782-49-2	NA	3.9	36	4	U	4.3	J	15	J	6.3	J	1.5	U	8.3	J	4	J	0.93	U	5.2	J	0.93	U
Silver	7440-22-4	**1**	2	36	2.3	U	2.3	U	2.6	U	1.2	U	0.87	U	1.5	U	1.1	U	0.53	U	2	U	0.53	U
Sodium	7440-23-5	NA	NA	NA	250	U	250	U	280	U	170	J	150	J	170	U	140	J	130		220	U	130	
Thallium	7440-28-0	NA	NA	NA	4.3	U	4.3	U	4.8	U	2.2	U	1.6	U	2.9	U	2	U	1	U	3.8	U	1	U
Vanadium	7440-62-2	NA	NA	NA	28		17		42		31		31		31		37		22		22		24	
Zinc	7440-66-6	**120**	109	2200	17		60		**120**		77		47		90		87		34		55		49	
Parameters																								
Solids, Percent	SOLID	NA	NA	NA	18.6		18.5		16.9		36.9		47.4		31		40		76.5		22.9		79.3	

Notes:
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D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 4
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID															
					Sample ID	PASB618-10-11-1		PASB624-4-5		PASB625-1-2		PASB625-3-4		PASB625-4-5		PASB626-8-9		PASB627-3-4		PASB627-5-5.5	
					Start Depth (feet bgs)	10		4		1		3		4		8		3		5	
					End Depth (feet bgs)	11		5		2		4		5		9		4		5.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential		Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																					
Aluminum	7429-90-5	NA	NA	NA		10000	B	4900		4000	B	3800	B	3400	B	5000		9800		7200	
Antimony	7440-36-0	**2**	NA	NA		**6.3**		2.5	U	**2.4**	**J**	**4.5**		**2.5**	**J**	2.2	U	6.3	U	4.9	U
Arsenic	7440-38-2	**6**	13	16		1.7	U	1.1	U	1	U	0.99	U	1.1	U	1.3	J	2.8	U	2.2	U
Barium	7440-39-3	NA	350	350		86		50		43		37		32		37		160		110	
Beryllium	7440-41-7	NA	7.2	14		0.7		0.71		0.25	J	0.24	J	0.2	J	0.58		0.7	J	0.53	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.27	U	0.36		0.17	U	0.16	U	0.17	U	0.33		**0.77**	**J**	0.51	J
Calcium	7440-70-2	NA	NA	NA		3900		6100		3900		3700		5400		1800		8100		4100	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.16	U	0.11	U	0.14	J	0.096	U	0.15	J	0.099	U	1.4	U	1	U
Chromium, Total	7440-47-3	**26**	30	36		20		**34**		17		14		9.9		11		**29**		20	
Cobalt	7440-48-4	NA	NA	NA		12		13		6.2		4.8		4.5		7.8		11		8.1	
Copper	7440-50-8	**16**	50	270		**40**		**21**		12		10		8.5		**17**		**50**		**32**	
Cyanide	57-12-5	NA	27	27		0.64	U	0.45	U	0.45	U	0.41	U	0.53	U	0.42	U	1.4	U	1	U
Iron	7439-89-6	**20000**	NA	NA		**22000**		17000		11000		10000		9300		14000		8700		7700	
Lead	7439-92-1	**31**	63	400		10		2.9		3.5		3.7		3.3		3.5		5.2		5.9	
Magnesium	7439-95-4	NA	NA	NA		6300		13000		4300		3700		3700		4500		5200		3400	
Manganese	7439-96-5	**460**	1600	2000		210		210		96		120		140		96		140	B	120	B
Mercury	7439-97-6	**0.15**	0.18	0.81		0.019	J	0.0045	U	0.0057	J	0.0039	U	0.0042	U	0.0039	U	0.031	J	0.03	J
Nickel	7440-02-0	**20**	30	140		**28**		**54**		14		7.9		6.9		**24**		**74**		**50**	
Potassium	7440-09-7	NA	NA	NA		2400		930		1100		970		820		990		660		520	
Selenium	7782-49-2	NA	3.9	36		3.3	J	0.96	U	0.87	U	0.84	U	2.6	J	0.86	U	2.4	U	1.9	U
Silver	7440-22-4	**1**	2	36		0.81	U	0.55	U	0.5	U	0.48	U	0.52	U	0.49	U	1.4	U	1.1	U
Sodium	7440-23-5	NA	NA	NA		150	J	130		100	J	79	J	72	J	60	J	180	J	150	J
Thallium	7440-28-0	NA	NA	NA		1.5	U	1	U	0.94	U	0.91	U	0.97	U	0.92	U	2.6	U	2	U
Vanadium	7440-62-2	NA	NA	NA		32		16		17		13		11		16		23		17	
Zinc	7440-66-6	**120**	109	2200		69		27		22		21		19		26		51		36	
Parameters																					
Solids, Percent	SOLID	NA	NA	NA		53.1		80.2		86.4		90		83.3		87.6		30.3		42.5	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 5
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSB701		BRSB702		BRSB702		BRSB705		BRSB709		BRSB712		BRSB712		BRSB715		BRSB721		BRSB760	
					Sample ID	BRSB701-15-16		BRSB702-4-5		BRSB702-6-7		BRSB705-10-11		BRSB709-4-5		BRSB712-5-6		BRSB712-8-9		BRSB715-6-9		BRSB721-4-5		BRSB760-3-4	
					Start Depth (feet bgs)	15		4		6		10		4		5		8		6		4		3	
					End Depth (feet bgs)	16		5		7		11		5		6		9		9		5		4	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		3200		3400		5000		5500		5600		4700		3400		6500		4300		3400	B
Antimony	7440-36-0	**2**	NA	NA		2.4	U	2.3	U	2.3	U	10	U	2.4	U	2.5	U	2.1	U	2.3	U	2.5	U	14	U
Arsenic	7440-38-2	**6**	13	16		1.1	U	1	U	1	U	4.6	U	1.3	J	2.6	J	0.96	U	5.9		2.3	J	6.4	U
Barium	7440-39-3	NA	350	350		20		31		42		100		45		46		76		47		51		210	
Beryllium	7440-41-7	NA	7.2	14		0.27	J	0.33		0.48		0.6	J	0.57		0.58		0.31		0.74		0.39		0.42	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.2	J	0.2	J	0.21	J	**0.85**	**J**	0.31		0.3	J	0.24	J	0.41		0.27	J	**1.6**	**J**
Calcium	7440-70-2	NA	NA	NA		2200		1600		6700		4600		2900		28000		26000		3200		7400		18000	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.15	J	0.13	J	0.1	U	2.1	U	0.13	J	0.11	U	0.095	U	0.1	U	0.12	J	2.9	U
Chromium, Total	7440-47-3	**26**	30	36		5.7		6.6		8		25		12		9.4		4.7		16		9.5		17	
Cobalt	7440-48-4	NA	NA	NA		3.3		3.6		5.5		13	J	8.9		4.9		4.2		7.4		4.8		13	J
Copper	7440-50-8	**16**	50	270		7.8		12		14		**100**		**330**		**18**		**18**		**22**		12		**85**	
Cyanide	57-12-5	NA	27	27		0.33	U	0.29	U	0.44	U	1.7	U	0.42	U	0.45	U	0.35	U	0.53	U	0.36	U	2.9	U
Iron	7439-89-6	**20000**	NA	NA		6400	D	8200		11000		15000		12000		12000	D	9500	D	17000	D	13000	D	9100	B
Lead	7439-92-1	**31**	63	400		2.4		2.7		3.8		4.6		5.4		5.2		1.9		5		3.2		11	
Magnesium	7439-95-4	NA	NA	NA		2300		2300		5200		3600		3800		15000		11000		4600		5000		3700	
Manganese	7439-96-5	**460**	1600	2000		65		79		150		100		93		260		**480**		110		210		220	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.0041	U	0.0074	J	0.0049	J	0.017	U	0.0042	U	0.007	J	0.0039	U	0.011	J	0.0046	U	0.085	J
Nickel	7440-02-0	**20**	30	140		5.5		6.8		12		**140**		19		11		6.4		16		9.1		**110**	
Potassium	7440-09-7	NA	NA	NA		680		710		1100		740		810		1200		1100		1300		1000		280	J
Selenium	7782-49-2	NA	3.9	36		0.92	U	0.89	U	0.89	U	3.9	U	0.9	U	0.94	U	0.82	U	0.87	U	0.94	U	5.5	U
Silver	7440-22-4	**1**	2	36		0.53	U	0.51	U	0.51	U	2.2	U	0.52	U	0.54	U	0.47	U	0.5	U	0.54	U	3.1	U
Sodium	7440-23-5	NA	NA	NA		70	J	73	J	110	J	290	J	110	J	130		71	J	130		95	J	350	U
Thallium	7440-28-0	NA	NA	NA		0.99	U	0.96	U	0.96	U	4.2	U	0.97	U	1	U	0.88	U	0.94	U	1	U	5.9	U
Vanadium	7440-62-2	NA	NA	NA		8.6		11		13		17		18		14		6.4		29		10		54	
Zinc	7440-66-6	**120**	109	2200		13		14		21		65		20		19		13		35		20		14	
Parameters																									
Solids, Percent	SOLID	NA	NA	NA		85		86.2		85.6		20.8		87.4		81.4		89.8		84.9		80.1		15.1	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 5
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSB760		BRSB763		BRSB763		BRSB766		BRSB766	
					Sample ID	BRSB760-15-16		BRSB763-3-4		BRSB763-15-16		BRSB766-3-4		BRSB766-12-13	
					Start Depth (feet bgs)	15		3		15		3		12	
					End Depth (feet bgs)	16		4		16		4		13	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals															
Aluminum	7429-90-5	NA	NA	NA		10000	B	4300		3900		5100		15000	
Antimony	7440-36-0	**2**	NA	NA		4.2	U	2.6	U	2.4	U	12	U	8.8	U
Arsenic	7440-38-2	**6**	13	16		1.9	U	1.2	U	1.5	J	**18**		4.5	J
Barium	7440-39-3	NA	350	350		100		30		35		140		110	
Beryllium	7440-41-7	NA	7.2	14		0.57		0.21	J	0.52		0.69	J	1.5	
Cadmium	7440-43-9	**0.6**	2.5	2.5		0.31	U	0.22	J	0.28	J	**1.3**	**J**	**0.98**	**J**
Calcium	7440-70-2	NA	NA	NA		2900		1500		3300		14000		13000	
Chromium, Hexavalent	18540-29-9	NA	1	22		0.2	U	0.12	U	0.099	U	4.1	JD	0.42	J
Chromium, Total	7440-47-3	**26**	30	36		20		15		7.9		24		**30**	
Cobalt	7440-48-4	NA	NA	NA		14		7		4.1		4	J	18	
Copper	7440-50-8	**16**	50	270		**51**		5.5		7.5		**82**		**38**	
Cyanide	57-12-5	NA	27	27		0.81	U	0.59	U	0.37	U	2.4	U	1.6	U
Iron	7439-89-6	**20000**	NA	NA		**23000**	**BD**	6200	D	13000	D	6200	D	**32000**	**D**
Lead	7439-92-1	**31**	63	400		11		2.1		2.9		4.9		13	
Magnesium	7439-95-4	NA	NA	NA		5300		1900		3300		3300		12000	
Manganese	7439-96-5	**460**	1600	2000		150		51		89		340		350	
Mercury	7439-97-6	**0.15**	0.18	0.81		0.026	J	0.0054	J	0.0042	U	0.073	J	0.017	U
Nickel	7440-02-0	**20**	30	140		**50**		**40**		5.9		**49**		**28**	
Potassium	7440-09-7	NA	NA	NA		2200		360		1100		220	J	3300	
Selenium	7782-49-2	NA	3.9	36		1.6	U	1	U	0.91	U	16		3.4	U
Silver	7440-22-4	**1**	2	36		0.92	U	0.58	U	0.52	U	2.6	U	1.9	U
Sodium	7440-23-5	NA	NA	NA		120	J	110	J	73	J	330	J	360	J
Thallium	7440-28-0	NA	NA	NA		1.7	U	1.1	U	0.97	U	4.9	U	3.6	U
Vanadium	7440-62-2	NA	NA	NA		28		6.7		13		44		48	
Zinc	7440-66-6	**120**	109	2200		83		20		16		12		68	
Parameters															
Solids, Percent	SOLID	NA	NA	NA		44.4		73.7		88.1		16.9		21.2	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
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U - Analytical Non-Detect Value
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D - Indentified Compound in A Diluted Analysis
mg/kg - milligrams per kilogram
NA - Not Available

APPENDIX A – Boring Logs

BORING NUMBER LPSB114

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 348.57 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24		(SM) Silty f SAND, brown (10YR4/3), wet, firm, fractured rock from 3-4ft.		0: Cr= ND, Cu= 30, Ni= 17 1: Cr= ND, Cu= 36, Ni= 21 2: Cr= ND, Cu= 47, Ni= ND 3: Cr= ND, Cu= 19, Ni= ND
4.0					344.6		
5	UD		9.6		(SM) Silty f SAND, brown (10YR4/3), wet, firm, micaceous, fractured rock at 8ft.		4: Cr= ND, Cu= ND, Ni= ND 6: Cr= ND, Cu= ND, Ni= ND
8.0					340.6		
10	NR		0		No Recovery		8: Cr= ND, Cu= ND, Ni= ND
11.0					337.6		

Refusal at 11.0 feet.
Bottom of borehole at 11.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER LPSB116

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/5/15 **COMPLETED** 2/5/15
GROUND ELEVATION 336.32 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.6 TOPSOIL, angular fractured granite at 0.6 ft. 335.7		
					1.2 (SM) f SAND, brown (10YR4/3), moist, stiff 335.1		1: Cr= ND, Cu= 21, Ni= 170
					2.0 (SM) f SAND and Silt, very dark grayish green (10Y-5GY3/2), moist, stiff 334.3		2: Cr= ND, Cu= ND, Ni= 49
					(SM) f SAND, dark yellowish brown (10YR4/4)		3: Cr= ND, Cu= ND, Ni= 42
					4.0 332.3		4: Cr= ND, Cu= 17, Ni= 27
5					(GM) f-m SAND, some angular gravel, yellowish brown (10YR5/6), moist, dense/ stiff, Till		5: Cr= ND, Cu= 19, Ni= 27
					7.0 329.3		6: Cr= ND, Cu= 21, Ni= ND
					8.0 (SW) f SAND, yellowish brown (10YR5/4), moist, firm 7.5: 1" angular rock in core 328.3		7: Cr= ND, Cu= 25, Ni= 15
					(GM) f SAND with angular fractured rock and gravel, dark yellowish brown (10YR4/4) with gray (10YR5/1) fractured rock, moist, very dense		8: Cr= ND, Cu=17, Ni= ND
10					12.0 324.3		10: Cr= ND, Cu= ND, Ni= 43
					(GP-GC) f SAND and fractured/ weathered rock, gray (10YR5/1), wet (~13 ft bgs), very dense		11: Cr= ND, Cu= ND, Ni= 46
					14.0 322.3		12: Cr= ND, Cu= ND, Ni= ND
							13: Cr= ND, Cu= 36, Ni= 37
							14: Cr= ND, Cu= 26, Ni= 41

Refusal at 14.0 feet.
Bottom of borehole at 14.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER LPSB117

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 339.46 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		34.9		(SW) f SAND, dark brown (10YR3/3), dry, very stiff, micaceous, pulvarized rock from 2-4 ft.		0: Cr= ND, Cu= ND, Ni= 44 1: Cr= 157, Cu= 16, Ni= 85
4.0					335.5		

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER PASB601

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/26/15 **COMPLETED** 3/26/15
GROUND ELEVATION 307.63 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24		(ML) SILT, very dark gray (10YR3/1), wet, soft 1.0 — 306.6		
					(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat 4.0 — 303.6		1: Cr= ND, Cu= 21, Ni= 52 2: Cr= ND, Cu= 29, Ni= 69 3: Cr= ND, Cu= 35, Ni= 22
5	NR		0		No recovery 6.0 — 301.6		4: Cr= ND, Cu= ND, Ni= ND
	UD		24		(ML) SILT, dark grayish brown (10YR4/2), wet, soft		6: Cr= 80, Cu= 19, Ni= 64 8: Cr= ND, Cu= 38, Ni= 44
10	UD		9.6				10: Cr= ND, Cu= 41, Ni= 50
15					16.0 — 291.6		16: Cr= ND, Cu= 33, Ni= 51

Refusal at 16.0 feet.
Bottom of borehole at 16.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER PASB603

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/8/15 **COMPLETED** 4/8/15
GROUND ELEVATION 308 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24		(ML) SILT, dark yellowish brown (10YR3/4), wet, firm		0: Cr= ND, Cu= ND, Ni= 33
10	UD				10.0 298.0 (CL-ML) Clayey SILT, dark gray (10YR4/1), wet, firm		10: Cr= ND, Cu= 34, Ni= 36
20					20.0 288.0		

(Continued Next Page)

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20							
					Bottom of borehole at 21.0 feet.		21: Cr= ND, Cu= ND, Ni= ND

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BORING NUMBER PASB605

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/8/15 **COMPLETED** 4/8/15
GROUND ELEVATION 308.3 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24		(ML) SILT, very dark gray (10YR3/1) transitioning to very dark grayish brown (10YR3/2) at 12ft., wet, firm, Peat		0: Cr= ND, Cu= 83, Ni= 30
10	UD						10: Cr= ND, Cu= ND, Ni= 98

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
20									
					21.0	(ML) SILT, very dark gray (10YR3/1) transitioning to very dark grayish brown (10YR3/2) at 12ft., wet, firm, Peat *(continued)*	287.3		21: Cr= ND, Cu= 21, Ni= 22
						Bottom of borehole at 21.0 feet.			

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BORING NUMBER PASB609

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/8/15 **COMPLETED** 4/8/15
GROUND ELEVATION 307.91 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24		(ML) SILT, black (10YR2/1) transitioning to dark brown (10YR3/3) at 12 ft. to dark yellowish brown (10YR4/4), wet, firm, Peat		0: Cr= ND, Cu= 33, Ni= 39
5							
10	UD						10: Cr= ND, Cu= ND, Ni= 50
15							
20							

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20							
					21.0 286.9		21: Cr= ND, Cu= 22, Ni= 33
					Bottom of borehole at 21.0 feet.		

BORING NUMBER PASB611

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/8/15 **COMPLETED** 4/8/15
GROUND ELEVATION 307.89 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24		(ML) SILT, very dark gray (10YR3/1), wet, firm		0: Cr= ND, Cu= 43, Ni= 28
					4.0 303.9		
5					(ML) SILT, very dark grayish brown (10YR3/2), wet, firm, Peat		
10	UD						10: Cr= ND, Cu= 24, Ni= 53
15							
20							

(Continued Next Page)

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20								
					21.0	(ML) SILT, very dark grayish brown (10YR3/2), wet, firm, Peat *(continued)* 286.9		20: Cr= ND, Cu= 24, Ni= 26

Bottom of borehole at 21.0 feet.

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BORING NUMBER PASB613

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 306.32 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			34.9		(ML) SILT, black (10YR2/1), wet, soft		
					2.0 304.3		
					(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, Peat		2: Cr= ND, Cu= 141, Ni= 75
5							
	UD						8: Cr= ND, Cu= 23, Ni= 22
10							
					14.0 292.3		
					(ML) SILT, dark olive gray (5Y3/2), wet, soft		
15							
			48				16: Cr= ND, Cu= 31, Ni= 25
							17: Cr= 88, Cu= 17, Ni= 27
	UD						18: Cr= ND, Cu= ND, Ni= ND
							19: Cr= ND, Cu= 32, Ni= 32
20					20.0 286.3		

Bottom of borehole at 20.0 feet.

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
							20: Cr= ND, Cu= 30, Ni= 25

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BORING NUMBER PASB615

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 301.36 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			27.6		(ML) SILT, black (10YR2/1), wet, soft		
					2.0 / 299.4		
					(ML) SILT, dark brown (10YR3/3), wet, soft, Peat		3: Cr= ND, Cu= 18, Ni= 41
5					6.0 / 295.4		
	UD				(ML) SILT, very dark grayish brown (10YR3/2), wet, soft		8: Cr= ND, Cu= ND, Ni= 21
10					12.0 / 289.4		
					(SM) Silty fm SAND, very dark gray (10YR3/1), wet, medium/ loose		
					14.0 / 287.4		14: Cr= ND, Cu= 15, Ni= ND

Bottom of borehole at 14.0 feet.

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BORING NUMBER PASB616

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 303.52 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			35.6		(ML) SILT, very dark gray (10YR3/1), wet, soft/ loose		2: Cr= ND, Cu= 171, Ni= 108
					4.0 299.5		
					(ML) SILT, dark brown (10YR3/3), wet, firm, Peat		4: Cr= ND, Cu= ND, Ni= 25
5	UD						6: Cr= ND, Cu= 29, Ni= 26
							8: Cr= 70, Cu= ND, Ni= 28
10					10.0 293.5		
					(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, rock in tip of core		10: Cr= ND, Cu= 20, Ni= ND
							12: Cr= ND, Cu= 20, Ni= 22
							13: Cr= 112, Cu= ND, Ni= 26
							14: Cr= ND, Cu= ND, Ni= ND
15					15.5 288.0		15: Cr= ND, Cu= 28, Ni= 16

Refusal at 15.5 feet.
Bottom of borehole at 15.5 feet.

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BORING NUMBER PASB617

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 302.55 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			31.2		(ML) SILT, dark brown (10YR3/3), wet, soft, Peat		1: Cr= ND, Cu= 25, Ni= 47
5	UD				6.0 296.6 (ML) SILT, very dark grayish brown (10YR3/2), wet, soft		6: Cr= ND, Cu= 24, Ni= 18
10					11.0 291.6 (SM) fm SAND, dark gray (10YR4/1), wet, medium 12.0 290.6		12: Cr= ND, Cu= ND, Ni= ND
15					(SW) fmc SAND, dark gray (10YR4/1), wet 15.0 287.6		13: Cr= ND, Cu= ND, Ni= ND

Refusal at 15.0 feet.
Bottom of borehole at 15.0 feet.

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BORING NUMBER PASB618

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 307.06 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		22		(ML) SILT, very dark gray (10YR3/1), wet, soft		0: Cr= ND, Cu= 29, Ni= ND
					1.0 306.1		1: Cr= ND, Cu= 42, Ni= 32
					(ML) SILT, very dark gray (10YR3/1) transitioning to dark brown (10YR3/3) at 4 ft., wet, firm, Peat		2: Cr= ND, Cu= 29, Ni= 39
							3: Cr= ND, Cu= 30, Ni= 49
							4: Cr= ND, Cu= 22, Ni= 22
5	UD		26.4				5: Cr= ND, Cu= 23, Ni= 50
							6: Cr= ND, Cu= ND, Ni= ND
							7: Cr= ND, Cu= 40, Ni= 53
					8.0 299.1		8: Cr= 85, Cu= 36, Ni= 47
			40.8		(ML) SILT, dark gray (10YR4/1), wet, soft		9: Cr= ND, Cu= 29, Ni= ND
10	UD				10.0 297.1		10: Cr= ND, Cu= 28, Ni= 15
					(SM) Silty fm SAND, dark gray (10YR4/1), wet, soft, cobbles		11: Cr= ND, Cu= ND, Ni= ND
					11.0 296.1		

Refusal at 11.3 feet.
Bottom of borehole at 11.3 feet.

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BORING NUMBER PASB621

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 304.17 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		19.2	1.0	(ML) Sandy SILT, very dark grayish brown (10YR3/2), wet, soft/ loose material 303.2		0: Cr= 106, Cu= 65, Ni= 54
				2.0	(SW) fmc SAND, very dark gray (10YR3/1), wet hard, rock in tip of the core 302.2		1: Cr= ND, Cu= ND, Ni= ND

Refusal at 2.0 feet.
Bottom of borehole at 2.0 feet.

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BORING NUMBER PASB624

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/26/15 **COMPLETED** 3/26/15
GROUND ELEVATION 306.39 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					(ML) SILT, very dark gray (10YR3/1), wet, soft		1: Cr= 232, Cu= 58, Ni= 104 2: Cr= 1,079, Cu= 53, Ni= 230
4.0					302.4		
5					(SM) fm SAND, dark gray (5Y4/1), wet, firm		4: Cr= ND, Cu= 29, Ni= 48
5.0					301.4		5: Cr= 88, Cu= ND, Ni= 28

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER PASB625

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/7/15 **COMPLETED** 4/7/15
GROUND ELEVATION 305.43 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe 420M
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		31.2		(ML) SILT, very dark gray (10YR3/1), wet, soft/ loose		0: Cr= ND, Cu= 155, Ni= 99
				1.0	304.4		
					(SW) fm SAND, dark gray (10YR4/1), wet, dense, cobbles		1: Cr= ND, Cu= ND, Ni= ND
							2: Cr= ND, Cu= ND, Ni= ND
							3: Cr= ND, Cu= ND, Ni= ND
			26.4				4: Cr= ND, Cu= ND, Ni= ND
5	UD						5: Cr= ND, Cu= ND, Ni= ND
							6: Cr= ND, Cu= ND, Ni= ND
	NR		0				
10				10.0	295.4		

Refusal at 10.0 feet.
Bottom of borehole at 10.0 feet.

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BORING NUMBER PASB626

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/26/15 **COMPLETED** 3/26/15
GROUND ELEVATION 305.22 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					No recovery		
5							
					8.0 297.2		
					(SM) Silty fm SAND, dark gray (10YR4/1), wet, firm		
					9.0 296.2		

Refusal at 9.0 feet.
Bottom of borehole at 9.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER PASB627

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 308.34 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** Amita Patel
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0					0.5	(SM) Silty fm SAND, black (10YR2/1), wet, soft	307.8		0: Cr= ND, Cu= ND, Ni= ND
	UD		18		4.0	(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, Peat	304.3		1: Cr= ND, Cu= 41, Ni= 58 2: Cr= ND, Cu= 22, Ni= 39 3: Cr= ND, Cu= 22, Ni= 26
5	UD		18		5.5	(SW-SM) Sandy SILT, very dark grayish brown (10YR3/2), wet, soft, Peat	302.8		4: Cr= ND, Cu= 24, Ni= 24 5: Cr= 78, Cu= ND, Ni= 29
						Refusal at 5.5 feet. Bottom of borehole at 5.5 feet.			5.5: Cr= ND, Cu= 23, Ni= 37

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB203A

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/3/15 **COMPLETED** 2/3/15
GROUND ELEVATION 313.8 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** Amita Patel
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.3 (SM) f SAND, dark brown (7.5YR3/2), dry, loose, Topsoil 313.5		
					(SC) clayey SAND, brown (7.5YR4/4), moist, soft		1: Cr= ND, Cu= 85, Ni= ND
					1.4 312.4		
					(SP-SM) Silty f SAND, brown mottled with gray (7.5YR4/3), moist, dense		2: Cr= ND, Cu= 153, Ni= 33
					4.0 309.8		4: Cr= ND, Cu= ND, Ni= ND
5					(SP) f SAND and fm GRAVEL, brown (7.5YR4/3), moist, dense		
					5.0 308.8		5: Cr= ND, Cu= ND, Ni= ND
					(SP) f SAND, brown (7.5YR5/4), moist, dense		
					8.0 305.8		8: Cr= ND, Cu= ND, Ni= ND
10					(SW) f SAND, brown (7.5YR5/4), wet, dense		10: Cr= ND, Cu= ND, Ni= ND
					12.0 301.8		
					(SW) f SAND, gray (7.5YR5/1), wet, dense		13: Cr= ND, Cu= ND, Ni= ND
15					16.0 297.8		
					(SW) f SAND, brown (7.5YR5/2)		17: Cr= ND, Cu= ND, Ni= ND
20					20.0 293.8		

(Continued Next Page)

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20							
					(SW) f SAND, gray (7.5YR6/1), moist, dense		23: Cr= ND, Cu= ND, Ni= ND
				24.0	289.8		

Refusal at 24.0 feet.
Bottom of borehole at 24.0 feet.

BORING NUMBER UASB206A

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/4/15 **COMPLETED** 2/4/15
GROUND ELEVATION 321.112 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** J. Dooley
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					(SM) f SAND, SM, brown (7.5YR4/2), dry, medium, some organics, topsoil		XRF: Cr= ND, Cu= 68 , Ni= 26
					1.8 / 319.3		
					(SW-SM) f SAND and SILT, SW-SM, strong brown (7.5YR4/6), wet (~4 ft. bgs), medium, 0.75 in. angular rock at 4.5 ft. bgs		XRF: Cr= ND, Cu= 31, Ni= 22
							XRF: Cr= ND, Cu= 70, Ni= ND
					4.5 / 316.6		
5					5.0 / (SW) fm SAND, SW, gray mottled with black (7.5YR5/1 & 7.5YR2/1), dry, loose / 316.1		XRF: Cr= ND, Cu= 56, Ni= ND
					(GP) f SAND, some m Gravel, GP, yellowish brown (10YR5/4), wet, dense		XRF: Cr= ND, Cu= 11, Ni= ND
							XRF: Cr= ND, Cu= 19, Ni= 20
					8.0 / 313.1		
					(SW) fm SAND, SW, dark yellowish brown (10YR4/4), wet, loose		XRF: Cr= ND, Cu= ND, Ni= ND
							XRF: Cr= ND, Cu= ND, Ni= ND
10					10.0 / 311.1		
					(SW) fm SAND, SW, dark yellowish brown (10YR5/4), wet, dense		XRF: Cr= ND, Cu= ND, Ni= ND
							XRF: Cr= ND, Cu= ND, Ni= ND
							XRF: Cr= ND, Cu= ND, Ni= ND
15							
					16.0 / 305.1		
					(SW) fm SAND, SW, yellowish brown (10YR5/4), wet, dense, 0.75 in. angular rock at 18 ft.		XRF: Cr= ND, Cu= 32, Ni= ND
20					20.0 / 301.1		

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20							
					(SW) f SAND, SW, yellowish brown (10YR5/4), wet, dense, 0.75 in. angular rocks at 21 ft. and 23 ft. Refusal at 26 ft.		XRF: Cr= ND, Cu= 27, Ni= ND XRF: Cr= ND, Cu= 14, Ni= ND XRF: Cr= ND, Cu= 30, Ni= ND XRF: Cr= ND, Cu= 18, Ni= ND XRF: Cr= ND, Cu= 15, Ni= ND XRF: Cr= ND, Cu= 12, Ni= ND XRF: Cr= ND, Cu= ND, Ni= 17
25				26.0	295.1		

Refusal at 26.0 feet.
Bottom of borehole at 26.0 feet.

BORING NUMBER UASB208A

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/4/15 **COMPLETED** 2/4/15
GROUND ELEVATION 320.18 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0	UD		31.2		2.6	(SW) f SAND, brown (10YR5/3), dry, firm	317.6		1: Cr= ND, Cu= ND, Ni= ND
					3.0	(SW-SM) f SAND and SILT, dark grayish brown (10YR 4/2), moist, firm, organic roots	317.2		3: Cr= ND, Cu= ND, Ni= ND
						(SW-SM) f SAND and SILT, dark yellowish brown (10YR 4/3), moist firm			
	UD		31.2		4.5		315.7		
5						(SM) f SAND, some silt, brown (10YR 4/3), mottled with strong brown (7.5YR 4/6), wet at 4.5 ft. bgs, angular 1/2 in. gravel at 7.5 ft. bgs			5: Cr= ND, Cu= 316, Ni= 20
	UD								7: Cr= ND, Cu= 69, Ni= ND
					8.0		312.2		8: Cr= ND, Cu= 24, Ni= ND
	UD		40.8			(SW) fm SAND and some ml Gravel, brown (10YR5/3), wet, firm			9: Cr= ND, Cu= 30, Ni= 27
10									10: Cr= ND, Cu= 16, Ni= 17
									11: Cr= ND, Cu= ND, Ni= ND
					12.0		308.2		12: Cr= ND, Cu= 16, Ni= ND
	UD		31.2			(SW) f SAND and some ml Gravel, yellowish brown (10YR5/4), wet, firm			13: Cr= ND, Cu= ND, Ni= ND
15									14: Cr= ND, Cu= ND, Ni= ND
									15: Cr= ND, Cu= ND, Ni= ND
	UD		40.8						16: Cr= ND, Cu= ND, Ni= ND
									17: Cr= ND, Cu= ND, Ni= ND
									18: Cr= ND, Cu= ND, Ni= ND
20					20.0		300.2		19: Cr= ND, Cu= ND, Ni= ND

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20			32		(SM) fm SAND, light yellowish brown (10YR 6/4), wet, stiff, fractured rock at 27 ft. bgs		20: Cr= ND, Cu= 16, Ni= ND
	UD						21: Cr= ND, Cu= ND, Ni= ND
							22: Cr= ND, Cu= ND, Ni= ND
							23: Cr= ND, Cu= 12, Ni= ND
			20.4				24: Cr= ND, Cu= ND, Ni= ND
25							25: Cr= ND, Cu= ND, Ni= ND
	UD						26: Cr= ND, Cu= 21, Ni= ND
					27.0 293.2		

Refusal at 27.0 feet.
Bottom of borehole at 27.0 feet.

BORING NUMBER UASB209A

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 321.3 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		14.4		(SM) Topsoil 1.0 / 320.3		0: Cr= ND, Cu= 687, Ni= 120
					(SM) Silty f SAND, dark yellowish brown (10YR4/6), wet, firm 4.0 / 317.3		1: Cr= ND, Cu= 976, Ni= 98
5	UD		32.4		(SW) f SAND, dark yellowish brown (10YR4/4), wet, stiff 8.0 / 313.3		2: Cr= ND, Cu= 1,571, Ni= 93
10	UD		30		(SW) fmc SAND, dark grayish brown (10YR4/2), wet, dense 10.0 / 311.3		3: Cr= ND, Cu= 5,688, Ni= 206
					(SW) f SAND, dark grayish brown (10YR4/2), wet, dense		4: Cr= ND, Cu= 357, Ni= 89
							5: Cr= ND, Cu= 69, Ni= 62
							6: Cr= ND, Cu= ND, Ni= 34
							7: Cr= ND, Cu= 13, Ni= 20
							8: Cr= ND, Cu= 12, Ni= ND
							9: Cr= ND, Cu= ND, Ni= ND
							10: Cr= ND, Cu= 17, Ni= ND
							11: Cr= ND, Cu= 24, Ni= ND
15	NR		0		16.0 / 305.3		12: Cr= ND, Cu= ND, Ni= ND
	UD		16.8		(SW) f SAND & fractured rock, dark grayish brown (10YR4/2), wet, very dense		18: Cr= ND, Cu= ND, Ni= ND
20					20.0 / 301.3		

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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20			43.2		(GW) Gravelly f SAND with angular rock, gray (10YR5/1), wet, dense, Till		20: Cr= ND, Cu= ND, Ni= ND 21: Cr= ND, Cu= ND, Ni= ND 22: Cr= ND, Cu= ND, Ni= ND 23: Cr= ND, Cu= ND, Ni= ND 24: Cr= ND, Cu= ND, Ni= ND 25: Cr= ND, Cu= 27, Ni= ND
	UD						
			18				
25	UD						
					25.5 295.8		

Refusal at 26.5 feet.
Bottom of borehole at 26.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB211

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/24/15 **COMPLETED** 2/24/15
GROUND ELEVATION 321.2 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		15.6		(SM) Sandy SILT, very dark grayish brown (10YR3/2), moist, stiff		0: Cr= ND, Cu= 156, Ni= 22 1: Cr= ND, Cu= 64, Ni= ND
	NR		0				2: Cr= ND, Cu= 63, Ni= 26
					4.0 317.2		
5	UD		12		(SM) Sily f SAND, dark yellowish brown, (10YR4/4), moist, stiff		4: Cr= ND, Cu=86, Ni= 25 5: Cr= ND, Cu= 189, Ni= ND
					5.0 316.2		

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB213

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/24/15 **COMPLETED** 2/24/15
GROUND ELEVATION 321.94 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		15.6		2.0	(SM) Sandy SILT, very dark grayish brown (10YR3/2), dense, moist 319.9		0: Cr= ND, Cu= 244, Ni= 30 1: Cr= ND, Cu= 99, Ni= ND
	UD		14.4		4.0	(SM) f SAND, dark yellowish brown (10YR4/4), wet, firm 317.9		2: Cr= ND, Cu= 254, Ni= ND 3: Cr= ND, Cu= 30, Ni= ND
5	UD		14.4		5.5	(SC) Clayey f SAND, yellowish brown (10YR5/6), wet, firm, angular rocks in core 316.4		4: Cr= ND, Cu= ND, Ni= ND 5: Cr= ND, Cu= ND, Ni= ND 5.5: Cr= ND, Cu= 18, Ni= ND

Refusal at 5.5 feet.
Bottom of borehole at 5.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB214

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/24/15 **COMPLETED** 2/24/15
GROUND ELEVATION 319.91 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		10.9		2.0	(SM) f Sandy SILT, very dark grayish brown (10YR3/2), moist, firm, wood in core 317.9		0: Cr= ND, Cu= ND, Ni= ND 1: Cr= ND, Cu= ND, Ni= 33
	UD		18		3.8	(SM) Silty f SAND, brown (10YR4/3), moist, stiff 316.1		2: Cr= ND, Cu= ND, Ni= 21 3: Cr= ND, Cu= ND, Ni= 77 3.8: Cr= ND, Cu= ND, Ni= 41

Refusal at 3.8 feet.
Bottom of borehole at 3.8 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB215

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 348.88 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0								
						(SM) Silty f SAND, dark grayish brown (10YR4/2), wet, firm, fractured rock at 4ft.		0: Cr= ND, Cu= 28, Ni= ND
								2: Cr= ND, Cu=26, Ni= ND
					4.0	344.9		
						(SW) f SAND, trace gravel, dark gray (10YR4/1), moist, dense		4: Cr= ND, Cu= ND, Ni= ND
5								5: Cr= ND, Cu= ND, Ni= ND
								6: Cr= ND, Cu= ND, Ni= ND
					7.0	341.9		
						(SM) f SAND, dark yellowish brown (10YR4/6), moist, firm/ medium		7: Cr= ND, Cu= ND, Ni= ND
					8.0	340.9		8: Cr= ND, Cu= ND, Ni= ND
						(SW) fm SAND, trace gravel, dark yellowish brown (10YR4/4), wet, dense		9: Cr= ND, Cu= ND, Ni= ND
10								10: Cr= ND, Cu= ND, Ni= ND
								11: Cr= ND, Cu= ND, Ni= ND
					12.0	336.9		12: Cr= ND, Cu= ND, Ni= ND
						No Recovery		13: Cr= ND, Cu= 13, Ni= ND
15								
					16.0	332.9		
						(SW) f SAND, brown (10YR4/3), wet, dense		
					17.5	331.4		

Refusal at 17.5 feet.
Bottom of borehole at 17.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB216

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/23/15 **COMPLETED** 2/23/15
GROUND ELEVATION 318.74 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		13.2		(SM) Silty f SAND, very dark grayish brown (10YR3/2), wet, soft		0: Cr= ND, Cu= 523, Ni= 192 1: Cr= ND, Cu= ND, Ni= 81
2.5	UD		13.2		316.2 (SC) Clayey SAND, yellowish brown (10YR5/4), moist, stiff		2: Cr= ND, Cu= 72, Ni= 51 3: Cr= ND, Cu= ND, Ni= 98
3.8					314.9 Refusal at 3.8 feet. Bottom of borehole at 3.8 feet.		3.8: Cr= ND, Cu= ND, Ni= 59

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB217

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 347.87 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0			30		0.8	(SM) Topsoil	347.1		0: Cr= ND, Cu= 42, Ni= ND
	UD					(SM) f SAND, brown (10YR4/3), moist, stiff, fractured rock (0.8-1.2 ft.)			1: Cr= ND, Cu= 16, Ni= ND 2: Cr= ND, Cu= 16, Ni= 19 3: Cr= ND, Cu= ND, Ni= ND
					4.0		343.9		4: Cr= ND, Cu= ND, Ni= ND
5			21.6			(SM) Silty f SAND, brown (10YR4/3), moist, firm			5: Cr= ND, Cu= ND, Ni= ND
	UD				6.0		341.9		6: Cr= ND, Cu= 16, Ni= 26
					6.5	(SM) fm SAND, very dark grayish brown (10YR3/2), moist, medium	341.4		7: Cr= ND, Cu= 17, Ni= ND
						(SM) f SAND, dark yellowish brown (10YR4/6), firm, moist, fractured rock at 8ft. bgs			8: Cr= ND, Cu= ND, Ni= 24
					8.0		339.9		9: Cr= ND, Cu= ND, Ni= ND
10	UD		33.6			(SW) fm SAND, dark yellowish brown (10YR4/6), firm, moist, fractured rock at 8 ft. bgs			10: Cr= ND, Cu= ND, Ni= 45
					11.0		336.9		11: Cr= ND, Cu= ND, Ni= 26
					12.0	(SW) fm SAND, dark yellowish brown (10YR4/6), firm, moist, cobbles at 12 ft. bgs	335.9		12: Cr= ND, Cu= ND, Ni= ND
15	UD		22.9			(SW) f SAND, yellowish brown (10YR5/6), wet, firm, weather rock from 16- 16.5 ft bgs.			13: Cr= ND, Cu= ND, Ni= 35 14: Cr= ND, Cu= ND, Ni= ND 15: Cr= ND, Cu= ND, Ni= ND
	UD		6		16.5		331.4		16: Cr= ND, Cu= ND, Ni= 33

Refusal at 16.5 feet.
Bottom of borehole at 16.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB218

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/5/15 **COMPLETED** 2/5/15
GROUND ELEVATION 332.79 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					TOPSOIL 331.8		
					1.0 (SW) f SAND, brown (10YR4/3), moist, medium/ firm		1: Cr= 389, Cu= 22, Ni= 236
					4.0 328.8 (SW) f SAND, dark yellowish brown (10YR4/4), moist, stiff, refusal at 9 ft. bgs.		3: Cr= 866, Cu= ND, Ni= 606
5							4: Cr= 879, Cu= 24, Ni= 550
							5: Cr= 864, Cu= 28, Ni= 447
							6: Cr= 1,024, Cu= 28, Ni= 652
							7: Cr= 895, Cu= 24, Ni= 508
							8: Cr= 1,155, Cu= ND, Ni= 659
					9.0 323.8		9: Cr= 785, Cu= 18, Ni= 585

Refusal at 9.0 feet.
Bottom of borehole at 9.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB219

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/5/15 **COMPLETED** 2/5/15
GROUND ELEVATION 330.52 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 Topsoil 330.0		
					(SM) f SAND, brown (10YR4/3), moist, firm, micaceous		1: Cr= 1,081, Cu= 101, Ni= 411
					3.5 327.0		2: Cr= 389, Cu= 312, Ni= 269
					4.0 (SW) fractured angular Rock and f Sand, very dark grayish brown (10YR3/2), moist, firm, micaceous 326.5		3: Cr= 103, Cu= 295, Ni= 93
5					(SW) f SAND, very dark grayish brown (10YR3/2) mottled with dark grayish green (10Y-5GY), moist, firm, micaceous, refusal at 7.5 ft. bgs.		4: Cr= 954, Cu= 22, Ni= 640
							5: Cr= 1,034, Cu= 17, Ni= 670
							6: Cr= 1,026, Cu= 17, Ni= 740
					7.5 323.0		7: Cr= 938, Cu= ND, Ni= 643
					Refusal at 7.5 feet. Bottom of borehole at 7.5 feet.		7.5: Cr= 1,034, Cu= ND, Ni= 660

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BORING NUMBER UASB220

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/25/15 **COMPLETED** 3/25/15
GROUND ELEVATION 318.46 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0			32.4		0.7	(SM) Topsoil	317.8		0: Cr= 320, Cu= 40, Ni= 186
	UD				3.0	(SM) SILT and f SAND, dark yellowish brown (10YR4/4), moist, firm	315.5		1: Cr= 420, Cu= 26, Ni= 189 2: Cr= 105, Cu= 66, Ni= 47
					4.0	(SM) Silty fm SAND, dark yellowish brown (10YR4/4), moist, firm, metallic-like flakes	314.5		3: Cr= ND, Cu= 147, Ni= 22
5	UD		38.4		8.0	(SM) fm SAND, brown (10YR4/3), wet at 6ft., very stiff/ dense, pulvarized rock at 7.5 ft.	310.5		4: Cr= ND, Cu= 54, Ni= ND 5: Cr= ND, Cu= 19, Ni= ND 6: Cr= ND, Cu= 13, Ni= ND 7: Cr= ND, Cu= 13, Ni= ND
10	UD		37.2		12.0	(SM) f SAND, dark yellowish brown (10YR4/4), moist, dense, micaceous	306.5		8: Cr= ND, Cu= ND, Ni= ND 9: Cr= 913, Cu= ND, Ni= 384 10: Cr= 350, Cu= ND, Ni= 292 11: Cr= 671, Cu= 57, Ni= 258
15	UD		48		16.0	(SM) f SAND and SILT and weather rock, dark yellowish brown (10YR4/4) mottled with gray (10YR3/1) and black (10YR2/1), moist, hard, micaceous	302.5		12: Cr= 1,152, Cu= 32, Ni= 208 13: Cr= 631, Cu= ND, Ni= 141 14: Cr= 473, Cu= ND, Ni= 100 15: Cr= 1,183, Cu= 29, Ni= 243 16: Cr= 1,244, Cu= ND, Ni= 280

Refusal at 16.0 feet.
Bottom of borehole at 16.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB221

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/23/15 **COMPLETED** 3/23/15
GROUND ELEVATION 323.78 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.2 (SM) Topsoil 323.6		0: Cr= ND, Cu= ND, Ni= ND
					(SW) f SAND, dark yellowish brown (10YR4/6), moist, hard		1: Cr= ND, Cu= ND, Ni= ND
					2.0 321.8		2: Cr= ND, Cu= ND, Ni= ND
					(SW) f SAND, dark gray (10YR4/1), moist, hard, micaceous, fractured rock at 2.5 ft		3: Cr= ND, Cu= ND, Ni= ND
					4.0 319.8		4: Cr= ND, Cu= ND, Ni= ND
5							5: Cr= ND, Cu= ND, Ni= ND
							6: Cr= ND, Cu= ND, Ni= ND
							7: Cr= 83, Cu= 44, Ni= 190

Refusal at 7.5 feet.
Bottom of borehole at 7.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB222

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/23/15 **COMPLETED** 3/23/15
GROUND ELEVATION 337.82 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		32.4		0.2 (SM) Topsoil 337.6 (SW) f SAND, dark grayish brown (10YR4/2) to dark yellowish brown (10YR4/6), moist, stiff/ dense, micaceous		0: Cr= ND, Cu= 19, Ni= 39 1: Cr= ND, Cu= ND, Ni= ND 2: Cr= ND, Cu= 49, Ni= 173
5	UD		30		6.5 331.3		3: Cr= 193, Cu= 61, Ni= 90 4: Cr= 320, Cu= 43, Ni= 165 5: Cr= 326, Cu= 49, Ni= 90 6: Cr= 247, Cu= 40, Ni= 76

Refusal at 6.5 feet.
Bottom of borehole at 6.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER UASB223

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/23/15 **COMPLETED** 3/23/15
GROUND ELEVATION 315.32 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		30		(SM) Silty f SAND, dark yellowish brown (10YR3/6), wet, firm, micaceous		0: Cr= ND, Cu= ND, Ni= ND 1: Cr= ND, Cu= 16, Ni= 35 2: Cr= ND, Cu= 29, Ni= 69 3: Cr= ND, Cu= 54, Ni= 48
4.0	UD		6		311.3		4: Cr= ND, Cu= ND, Ni= ND

Refusal at 4.5 feet.
Bottom of borehole at 4.5 feet.

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BORING NUMBER UASB224

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/25/15 **COMPLETED** 3/25/15
GROUND ELEVATION 323.5 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24		(SM) Silty f SAND, brown (10YR4/3), moist, firm/ stiff		0: Cr= 384, Cu= ND, Ni= 129 1: Cr= 128, Cu= ND, Ni= 60 2: Cr= ND, Cu= ND, Ni= 34 3: Cr= 462, Cu= ND, Ni= 180
4.0					319.5		
5	UD		39.6		(SW) fm SAND, dark yellowish brown (10YR4/4), wet, dense		4: Cr= ND, Cu= ND, Ni= 26 5: Cr= ND, Cu= ND, Ni= 14 6: Cr= ND, Cu= 18, Ni= ND 7: Cr= ND, Cu= 27, Ni= ND
10	UD		35.6				8: Cr= ND, Cu= 28, Ni= ND 9: Cr= ND, Cu= 40, Ni= ND 10: Cr= ND, Cu= ND, Ni= ND 11: Cr= ND, Cu= 12, Ni= ND
12.0					311.5		
15	UD		46.9		(SW) fmc SAND, dark yellowish brown (10YR4/4), wet, dense		12: Cr= ND, Cu= 18, Ni= ND 13: Cr= ND, Cu= 16, Ni= ND 14: Cr= ND, Cu= 26, Ni= ND
15.0					308.5		
	UD		32.4		(SW) f SAND, dark yellowish brown (10YR4/4), wet, dense		15: Cr= ND, Cu= 26, Ni= ND 16: Cr= ND, Cu= 36, Ni= ND 17: Cr= ND, Cu= 41, Ni= ND
18.0					305.5		18: Cr= ND, Cu= 40, Ni= ND 19: Cr= 749, Cu= 37, Ni=211
					Refusal at 19.0 feet. Bottom of borehole at 19.0 feet.		

BORING NUMBER UASB225

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 314 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION		PID READING (PPM)	REMARKS
0			20.4		0.5	(SM) Topsoil	313.5		0: Cr= 522, Cu= 43, Ni= 216
	UD				4.0	(SM) Silty f SAND, yellowish brown (10YR5/4), wet, dense, fractured rock at 4ft.	310.0		1: Cr= 449, Cu= 212, Ni= 243 2: Cr= ND, Cu= 65, Ni= 50 3: Cr= ND, Cu= 41, Ni= ND
5	UD		38.4			(SW) f SAND, yellowish brown (10YR5/4), wet, stiff			4: Cr= ND, Cu= 33, Ni= ND 5: Cr= ND, Cu= ND, Ni= ND 6: Cr= ND, Cu= ND, Ni= ND 7: Cr= ND, Cu= ND, Ni= ND
10	UD		25.2						8: Cr= ND, Cu= ND, Ni= ND 9: Cr= ND, Cu= ND, Ni= ND 10: Cr= ND, Cu= ND, Ni= ND 11: Cr= ND, Cu= ND, Ni= ND
	UD		36		12.0		302.0		12: Cr= ND, Cu= ND, Ni= ND
					13.0	(SW) fmc SAND, yellowish brown (10YR5/4), wet, medium	301.0		13: Cr= ND, Cu= ND, Ni= ND
					14.0	(SW) f SAND, yellowish brown (10YR5/4), wet, dense	300.0		14: Cr= ND, Cu= ND, Ni= ND
15					15.0	(ML) SILT, trace f sand and angular gravel, gray (10YR5/1), moist, hard, Till	299.0		15: Cr= ND, Cu= ND, Ni= ND

Refusal at 15.0 feet.
Bottom of borehole at 15.0 feet.

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ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB226

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/3/15 **COMPLETED** 2/3/15
GROUND ELEVATION 317.65 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					(SC) Clayey SAND, brown (7.5YR4/2), moist, stiff, some organic roots		
					1.5 316.2		1: Cr= ND, Cu= 32, Ni= 15
					(SW) f SAND, brown (7.5YR5/4), moist, dense		2: Cr= ND, Cu= 336, Ni= 36
					4.0 313.7		4: Cr= ND, Cu= 38, Ni= 21
5							6: Cr= ND, Cu= ND, Ni= ND

Bottom of borehole at 8.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB228

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/4/15 **COMPLETED** 2/4/15
GROUND ELEVATION 318.36 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 Topsoil 317.9		
					(SC) Clayey f SAND, dark yellowish brown (10YR4/4), moist, stiff		1: Cr= ND, Cu= 1,335, Ni= 204 2: Cr= ND, Cu= 637, Ni= 97 3: Cr= ND, Cu= 392, Ni= 78
					4.0 314.4		
5					(SM) f SAND, brown (10YR4/3), wet at 6.5 ft. bgs., stiff		4: Cr= ND, Cu= 200, Ni= 31 5: Cr= ND, Cu= 28, Ni= ND 6: Cr= ND, Cu= 30, Ni= ND 7: Cr= ND, Cu= 26, Ni= ND
					8.0 310.4		8: Cr= ND, Cu= 33, Ni= ND

Bottom of borehole at 8.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB229

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/23/15 **COMPLETED** 2/23/15
GROUND ELEVATION 318.33 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		14.4		(ML) SILT, very dark grayish brown (10YR3/2), moist, stiff		0: Cr= ND, Cu= 57, Ni= 118
					1.5 316.8		1: Cr= 188, Cu= 116, Ni= 268
					(CH) CLAY, dark brown (10YR3/3), moist, firm		
					2.0 316.3		2: Cr= ND, Cu= 77, Ni= 110
	UD		18		(GC) f SAND, CLAY, & GRAVEL, yellowish brown (10YR5/6), moist, stiff		3: Cr= 97, Cu= 97, Ni= 141
					4.0 314.3		4: Cr= 174, Cu= 79, Ni= 128

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB230

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 334.92 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		25.2		0.6 (SM) Topsoil 334.3		0: Cr= 204, Cu= 156, Ni= 107
					(SW) Gravelly f SAND, dark yellowish brown (10YR4/6), moist, dense, micaceous		1: Cr= 607, Cu= 434, Ni= 257
							2: Cr= 597, Cu= 232, Ni= 484
							3: Cr= 864, Cu= 120, Ni= 309
					4.0 330.9		
5	UD		39.6		(SW) Angular gravelly fm SAND, dark yellowish brown (10YR4/6), moist, dense, micaceous		4: Cr= 702, Cu= 679, Ni= 533
							5: Cr= 647, Cu= 339, Ni= 481
							6: Cr= 1,036, Cu= 97, Ni= 217
							7: Cr= 293, Cu= 254, Ni= 613
10	UD		36				8: Cr= 478, Cu= 113, Ni= 176
							9: Cr= 625, Cu= 208, Ni= 215
							10: Cr= 980, Cu= 246, Ni= 190
					11.0 323.9		11: Cr= 357, Cu= 193, Ni= 203

Refusal at 11.0 feet.
Bottom of borehole at 11.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER UASB231

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/24/15 **COMPLETED** 3/24/15
GROUND ELEVATION 339.8 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD DPT with Geoprobe 6620
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		21.6		0.2 (SM) Topsoil 339.6 (GW) fm SAND & fractured/ pulvarized rock, very dark grayish brown (10YR3/2), moist, very dense, micaceous 4.0 335.8		XRF: Cr= ND, Cu= 21ppm, Ni= ND XRF: Cr= 310ppm, Cu= 90ppm, Ni= 36ppm XRF: Cr= 581ppm, Cu= 43ppm, Ni= 115ppm XRF: Cr= 800ppm, Cu= 55ppm, Ni= 240ppm
5	UD		12		Pulvarized/ fractured rock, gray (10YR5/1), micaceous, 5.0 334.8		XRF: Cr= 579ppm, Cu= 21ppm, Ni= 148ppm

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER WTSB501

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/12/15 **COMPLETED** 2/12/15
GROUND ELEVATION 310.23 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		9.6		(ML) SILT, very dark gray (10YR3/1), wet, soft, wood (1-2 ft. bgs), peat		0: Cr= ND, Cu= 929, Ni= 316
	NR		0				
5	UD		12		6.0 304.2 (ML) SILT, very dark grayish brown (10YR3/2), wet, soft		6: Cr= ND, Cu= 18, Ni= 27 7: Cr= ND, Cu= 30, Ni= 34 8: Cr= 75, Cu= 45, Ni= 43
10	UD		6				9: Cr= ND, Cu= 19, Ni= 27
	UD		6				10: Cr= ND, Cu= 32, Ni= 40
	UD		13.2		12.0 298.2 (ML) SILT, very dark gray (5Y3/1), wet, soft		12: Cr= ND, Cu= 38, Ni= 35 13: Cr= ND, Cu= ND, Ni= ND
					14.0 296.2 Bottom of borehole at 14.0 feet.		14: Cr= ND, Cu= 25, Ni= ND

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB502

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/12/15 **COMPLETED** 2/12/15
GROUND ELEVATION 310.26 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24			(ML) SILT, very dark grayish brown (10YR2/2) transitioning to dark yellowish brown (10YR3/4) at 2 ft. bgs., and dark brown (10YR3/3) at 4 ft. bgs., wet, soft, peat		0: Cr= ND, Cu= 9,095, Ni= 942 1: Cr= 172, Cu= 4,477, Ni=678 2: Cr= 85, Cu= 1,647, Ni=303 3: Cr= ND, Cu= ND, Ni= 38 4: Cr= ND, Cu= 98, Ni= 47 5: Cr= ND, Cu= 35, Ni= ND 6: Cr= 61, Cu= ND, Ni= 51 7: Cr= ND, Cu= 22, Ni= ND 8: Cr= ND, Cu= 25, Ni= 27 9: Cr= 27, Cu= 80, Ni= 28 10: Cr= ND, Cu= ND, Ni= ND 11: Cr= ND, Cu= ND, Ni= ND 12: Cr= ND, Cu= ND, Ni= ND 13: Cr= ND, Cu= ND, Ni= ND 14: Cr= ND, Cu= ND, Ni= ND
	UD		7.2					
5	UD		20.4					
	UD		13.2					
	UD		16.8		9.0	301.3		
10					10.0	(SM) Silty f SAND, dark gray (10YR4/1), moist, stiff 300.3		
	UD		38.4		14.0	(SW) fmc SAND, grayish brown (10YR5/2), wet, firm 296.3		

Refusal at 14.0 feet.
Bottom of borehole at 14.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:39 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB503

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/11/15 **COMPLETED** 2/11/15
GROUND ELEVATION 311 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		20.4		(ML) SILT, very dark gray (10YR3/1), moist, soft, roots		0: Cr= 339, Cu= 67, Ni= 174
1.0					310.0		1: Cr= 337, Cu= ND, Ni= 58
					(SM) Silty f SAND, yellowish brown (10YR5/4), wet, soft		2: Cr= ND, Cu= ND, Ni= ND
3.0					308.0		
4.0	NR		0		No Recovery		
					307.0		

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

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BORING NUMBER WTSB504

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/13/15 **COMPLETED** 2/13/15
GROUND ELEVATION 309.88 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	NR		0		(ML) SILT, ML, dark brown (10YR3/3), wet, soft, Peat		
	UD		14.4				2: Cr= ND, Cu= 184, Ni= 137
5	UD		12		303.9		3: Cr= ND, Cu= 58, Ni= 50 4: Cr= 83, Cu= 30, Ni= 59 5: Cr= 83, Cu= 22, Ni= 36
				6.0	Refusal at 6.0 feet. Bottom of borehole at 6.0 feet.		6: Cr= 83, Cu= 25, Ni= 37

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BORING NUMBER WTSB505

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/13/15 **COMPLETED** 2/13/15
GROUND ELEVATION 309.72 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		8.4		(ML) SILT, very dark gray (10YR3/1) transitioning to dark yellowish brown (10YR3/4) at 6 ft. and very dark grayish brown (10YR3/2) at 8 ft., wet, soft, Peat		0: Cr= ND, Cu= 2,713, Ni= 376 1: Cr= ND, Cu= 90, Ni= 35
	NR		0				
5	NR		0				
	UD		15.6				6: Cr= ND, Cu= 102, Ni= 42 7: Cr= ND, Cu= 48, Ni= 38
	UD		12				8: Cr= ND, Cu= 50, Ni= 38 9: Cr= ND, Cu= 49, Ni= 55
10					299.7		
	UD		3.6		(MH) SILT, very dark grayish brown (10YR3/2), wet, soft		10: Cr= ND, Cu= 68, Ni= 69 11: Cr= ND, Cu= 28, Ni= 23
	UD		14.4				12: Cr= ND, Cu= ND, Ni= 23 13: Cr= ND, Cu= 29, Ni= 26
				14.0	295.7		14: Cr= ND, Cu= 20, Ni= 19

Refusal at 14.0 feet.
Bottom of borehole at 14.0 feet.

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BORING NUMBER WTSB506

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/12/15 **COMPLETED** 2/12/15
GROUND ELEVATION 310.18 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	NR		0		(ML) SILT, very dark gray (10YR3/1) transitioning to dark brown (10YR3/3) at 4ft. bgs, wet, soft, Peat		
	UD		14.4				3: Cr= ND, Cu= 155, Ni= 81
	UD		14.4				4: Cr= ND, Cu= 31, Ni= 31
5	UD		13.2				5: Cr= ND, Cu= 41, Ni= 55
	UD		12		7.0 303.2		6: Cr= ND, Cu= 22, Ni= 33
	UD		9.6		(ML) SILT, dark olive gray (5Y3/2), wet, soft		7: Cr= ND, Cu= 33, Ni= 44
10	UD				11.0 299.2		8: Cr= ND, Cu= ND, Ni= 32
					(SW) fm SAND, grayish brown (10YR5/2), wet, firm		9: Cr= ND, Cu= ND, Ni= 23
					12.0 298.2		10: Cr= ND, Cu= 45, Ni= 29
							11: Cr= ND, Cu= ND, Ni= ND

Refusal at 12.0 feet.
Bottom of borehole at 12.0 feet.

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BORING NUMBER WTSB508

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/16/15 **COMPLETED** 2/16/15
GROUND ELEVATION 310.34 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		12		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		0: Cr= 196, Cu= 3,494, Ni= 309 1: Cr= ND, Cu= 70, Ni= 97 2: Cr= 88, Cu= 1,409, Ni= 1,266
	NR		0				
5	NR		0		6.0 304.3		

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB510

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/17/15 **COMPLETED** 2/17/15
GROUND ELEVATION 311.69 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		13.2		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		0: Cr= ND, Cu= 103, Ni= 155 1: Cr= ND, Cu= 3,659, Ni= 440
	UD		13.2				2: Cr= ND, Cu= 557, Ni= 442 3: Cr= ND, Cu= 17, Ni= 17
5	NR		0		6.0 305.7		4: Cr= ND, Cu= 15, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB511

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/17/15 **COMPLETED** 2/17/15
GROUND ELEVATION 311.94 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		22.9		0.5 (SM) Silty fm SAND, dark yellowish brown (10YR4/4), wet, medium — 311.4		0: Cr= ND, Cu= 181, Ni= 72
					(CH) Silty CLAY, black (10YR2/), wet, firm to stiff		1: Cr= 84, Cu= 125, Ni= 352
	UD		19.2		3.0 — 308.9		2: Cr= ND, Cu= 23, Ni= 49
					(SW) fm SAND, dark gray (5Y4/1), wet, dense		3: Cr= ND, Cu= ND, Ni= ND
					4.0 — 307.9		4: Cr= ND, Cu= 15, Ni= ND

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

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BORING NUMBER WTSB512

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/17/15 **COMPLETED** 2/17/15
GROUND ELEVATION 312.2 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24		(ML) SILT, very dark gray (10YR3/1), wet, firm		0: Cr= ND, Cu= 337, Ni= 201
					1.0 311.2		
	UD		10.9		(SW) fm SAND, olive gray (5Y5/2), wet, medium to loose		1: Cr= ND, Cu= 23, Ni= 51
							2: Cr= ND, Cu= ND, Ni= ND
	UD		10.9				3: Cr= ND, Cu= ND, Ni= ND
5							4: Cr= ND, Cu= 15, Ni= 19
	UD						5: Cr= ND, Cu= ND, Ni= ND
					6.0 306.2		6: Cr= ND, Cu= ND, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB513

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/19/15 **COMPLETED** 2/19/15
GROUND ELEVATION 314.47 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		9.6		(ML) SILT, very dark gray (10YR3/1), moist, soft, Peat		0: Cr= ND, Cu= 206, Ni= 317 1: Cr= ND, Cu= 124, Ni= 214
	NR		0		4.0 310.5		2: Cr= ND, Cu= 248, Ni= 141
5	UD		21.6		(CH) CLAY, very dark gray (10YR3/1), wet, stiff 5.0 309.5 (MH) f Sandy SILT, dark gray (5Y4/1), wet, stiff 6.0 308.5		4: Cr= ND, Cu= 143, Ni= 170 5: Cr= ND, Cu= ND, Ni= ND 6: Cr= ND, Cu= ND, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB514

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/18/15 **COMPLETED** 2/18/15
GROUND ELEVATION 312.499 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		9.6		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		0: Cr= ND, Cu= 89, Ni= 137
					2.5		1: Cr= ND, Cu= 106, Ni= 133
	UD		20.4		310.0		2: Cr= 83, Cu= 62, Ni= 118
					(SW) fm SAND, dark yellowish brown (10YR4/4) transitioning to very dark gray (5Y3/1) at 4 ft., wet, medium		3: Cr= ND, Cu= 17, Ni= ND
	UD				4.0		
					308.5		4: Cr= ND, Cu= ND, Ni= 25
5	UD		14.4		(MH) SILT, very dark gray (5Y3/1), wet, soft		5: Cr= ND, Cu= 21, Ni= 25
					6.0		
					306.5		6: Cr= ND, Cu= ND, Ni= ND
	UD		14.4		(SP) f SAND, grayish olive (10Y-5GY4/2), wet, firm		7: Cr= ND, Cu= ND, Ni= ND
					8.0		
					304.5		8: Cr= ND, Cu= ND, Ni= ND

Refusal at 8.0 feet.
Bottom of borehole at 8.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB515

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/18/15 **COMPLETED** 2/18/15
GROUND ELEVATION 311.86 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		4.8			(ML) SILT, very dark gray (10YR3/1) transitioning to dark brown (10YR3/3) at 2 ft., wet, soft, Peat		1: Cr= 74, Cu= 67, Ni= 32
	UD		14.4		3.0	308.9		2: Cr= ND, Cu= 159, Ni= 51
						(SW) fm SAND, dark gray (5Y4/1), wet, medium		3: Cr= ND, Cu= 15, Ni= 33
5	NR		0		6.0	305.9		4: Cr= ND, Cu= ND, Ni= ND
						Refusal at 6.0 feet. Bottom of borehole at 6.0 feet.		6: Cr= ND, Cu= ND, Ni= ND

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB518

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/17/15 **COMPLETED** 2/17/15
GROUND ELEVATION 310.92 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		3.6		2.0	(ML) SILT, very dark gray (10YR3/1), wet, medium, Peat 308.9		1: Cr= ND, Cu= 211, Ni= 27
	UD		15.6		4.0	(SW) fm SAND, dark gray (5Y4/1), wet, medium 306.9		2: Cr= ND, Cu= 19, Ni= 18 3: Cr= ND, Cu= ND, Ni= 16 4: Cr= ND, Cu= ND, Ni= ND

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB520

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 309.03 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		19.2		(ML) SILT, very dark gray (10YR3/1) transitioning to dark gray (10YR4/1) at 14 ft., wet, soft, Peat		1: Cr= ND, Cu= 27, Ni= 33 2: Cr= ND, Cu= 44, Ni= 51 3F: Cr= ND, Cu= ND, Ni= 42 4: Cr= 92, Cu= 32, Ni= 55
5	NR		0				
10	UD		16.8				12: Cr= ND, Cu= 24, Ni= 36 14: Cr=ND, Cu= 26, Ni= 25
15				16.0	293.0		16: Cr=ND, Cu= 16, Ni= ND

Bottom of borehole at 16.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB521

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 309.41 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		15.6			(ML) SILT, very dark gray (10YR3/1) transitioning to gray (10YR5/1) at 12 ft., wet, soft, Peat		1: Cr= ND, Cu= 26, Ni= 58 2: Cr= ND, Cu= 52, Ni= 57 3: Cr= ND, Cu= 24, Ni= 36 4: Cr= ND, Cu= 31, Ni= 49
5	NR		0					
10	UD		13.2		13.0	296.4		10: Cr= ND, Cu= 25, Ni= 50 12: Cr= ND, Cu= 17, Ni= ND
					14.0	(SW) fm SAND, dark gray (10YR4/1), wet, medium 295.4		14: Cr= ND, Cu= ND, Ni= ND

Refusal at 14.0 feet.
Bottom of borehole at 14.0 feet.

BORING NUMBER WTSB522

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 308.62 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		12			(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		1: Cr= ND, Cu= 34, Ni= 66
	UD		12					2: Cr= ND, Cu= 52, Ni= 39
								3: Cr= ND, Cu= 96, Ni= 97
			0					4: Cr= ND, Cu= 29, Ni= 69
5								
	NR							
10								
	UD		14.4		12.5		296.1	12: Cr= ND, Cu= 30, Ni= 45
					13.0	(SM) Silty f SAND, gray (10YR5/1), wet, stiff	295.6	13: Cr= ND, Cu= ND, Ni= ND
					14.0	(SW) fm SAND, dark gray (10YR4/1), wet, dense	294.6	14: Cr= ND, Cu= ND, Ni= ND

Refusal at 14.0 feet.
Bottom of borehole at 14.0 feet.

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BORING NUMBER WTSB524

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 4/8/15 **COMPLETED** 4/8/15
GROUND ELEVATION 307.84 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES Very soft material- compressed core to depth
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24		(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, Peat		1: Cr= 77, Cu= 19, Ni= 21
5							
10							10: Cr= ND, Cu= ND, Ni= ND
15							
20							

(Continued Next Page)

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
20								
					21.0	(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, Peat *(continued)* 286.8		
						Bottom of borehole at 21.0 feet.		21: Cr= ND, Cu= 18, Ni= 21

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BORING NUMBER WTSB526

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/20/15 **COMPLETED** 2/20/15
GROUND ELEVATION 317.9 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		9.6		(SM) f SAND, dark grayish brown (10YR4/2), wet, medium		0: Cr= ND, Cu= 19, Ni= 53 1: Cr= ND, Cu= 19, Ni= 48 2: Cr= ND, Cu= 22, Ni= 54 3: Cr= 77, Cu= ND, Ni= 53
5	NR		0		6.0 311.9		

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB527

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/20/15 **COMPLETED** 2/20/15
GROUND ELEVATION 316.24 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		12		(ML) SILT, dark grayish brown (10YR4/1), moist, firm		0: Cr= ND, Cu= 33, Ni= 70 1: Cr= ND, Cu= 21, Ni= 64
					2.0 314.2		
	UD				(SW) fm SAND, dark grayish brown (10YR4/1), wet, medium to dense		2: Cr= ND, Cu= 22, Ni= 56
			13.2				4: Cr= ND, Cu= 16, Ni= 41
5	UD						5: Cr= 85, Cu= 29, Ni= 63
					6.0 310.2		6: Cr= ND, Cu= ND, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB529

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/19/15 **COMPLETED** 2/19/15
GROUND ELEVATION 314.47 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		10.9		(SM) Silty SAND, dark gray (10YR4/1), wet, medium		0: Cr= ND, Cu= 26, Ni= 50
					1.0 313.5		
					(SW) fm SAND, dark gray (10YR4/1), wet, medium		1: Cr= ND, Cu= 18, Ni= 77
							2: Cr= ND, Cu= ND, Ni= 17
			2.4				3: Cr= ND, Cu= 17, Ni= 65
5	UD						
					6.0 308.5		6: Cr= ND, Cu= ND, Ni= 30

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB530

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/19/15 **COMPLETED** 2/19/15
GROUND ELEVATION 316.21 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		9.6		(SM) Sandy SILT, very dark gray (10YR3/1), moist, stiff, Peat		0: Cr= ND, Cu= 145, Ni= 196 1: Cr= ND, Cu= 175, Ni= 62
	NR		0		312.2		
5	UD		18		(SC) SAND and plastic CLAY, very dark brown (10YR2/2), wet, stiff 4.0 311.2		4: Cr= ND, Cu= 49, Ni= 30 5: Cr= ND, Cu= ND, Ni= ND
					(SM) Silty SAND, some gravel, grayish brown (10YR5/2), wet, hard, Till 5.0 310.2		6: Cr= ND, Cu= ND, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet. 6.0

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BORING NUMBER WTSB531

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/19/15 **COMPLETED** 2/19/15
GROUND ELEVATION 314.15 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			20.4			(ML) SILT, very dark gray (10YR3/1), moist, stiff, Peat		0: Cr= 209, Cu= 232, Ni= 474
					2.0	312.2		1: Cr= ND, Cu= 109, Ni= 234
			21.6			(CL) CLAY, black (10YR2/1), wet, stiff		2: Cr= 160, Cu= 86, Ni= 297
			21.6					3: Cr= ND, Cu= 89, Ni= 173
5					5.0	309.2		4: Cr= 100, Cu= 182, Ni= 336
						(ML) Sandy SILT, very dark gray (10YR3/1), wet, stiff		5: Cr= ND, Cu= 109, Ni= 86
					6.0	308.2		6: Cr= ND, Cu= 41 Ni= 35

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB533

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/18/15 **COMPLETED** 2/18/15
GROUND ELEVATION 313.13 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		24		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		0: Cr= 151, Cu= 31, Ni= 83
1.0					312.1		
					(SM) fm Sandy SILT, very dark gray (10YR3/1), wet, soft, roots in core		1: Cr= 473, Cu= 52, Ni= 195
2.0					311.1		
	UD		24		(GM) Silty fmc SAND and angular GRAVEL, brown (10YR4/3), wet, loose		2: Cr= 556, Cu= 27, Ni= 446
4.0					309.1		3: Cr= 535, Cu= 29, Ni= 276
							4: Cr= 518, Cu= 30, Ni= 291

Refusal at 4.0 feet.
Bottom of borehole at 4.0 feet.

BORING NUMBER WTSB534

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/18/15 **COMPLETED** 2/18/15
GROUND ELEVATION 313.2 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		13.2		(ML) SILT, very dark gray (10YR3/1) transitioning to brown (10YR4/3) at 2 ft., wet, soft, Peat		0: Cr= ND, Cu= 98, Ni= 191 1: Cr= ND, Cu= 28, Ni= 96 2: Cr= ND, Cu= 81, Ni= 37 3: Cr= ND, Cu= 387, Ni= 243 4: Cr= ND, Cu= 46, Ni= 57
	UD		10.9				
5	NR		0				
	NR		0				
10	NR		0		10.0 303.2		

Refusal at 10.0 feet.
Bottom of borehole at 10.0 feet.

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BORING NUMBER WTSB535

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/19/15 **COMPLETED** 2/19/15
GROUND ELEVATION 315.26 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler/ Hand Auger
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		8.4		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat 1.0 / 314.3		0: Cr= ND, Cu= 108, Ni= 49
					(SW) fm SAND, dark yellowish brown (10YR4/4), wet, medium		1: Cr= ND, Cu= 66, Ni= 79
	NR		0		4.0 / 311.3		2: Cr= ND, Cu= ND, Ni= 17
5	UD		24		(SM) Silty f SAND, very dark gray (10YR3/1), wet, soft 6.0 / 309.3		4: Cr= ND, Cu= 66, Ni= ND 5: Cr= ND, Cu= ND, Ni= ND 6: Cr= ND, Cu= 31, Ni= 39

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER WTSB536

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/11/15 **COMPLETED** 2/11/15
GROUND ELEVATION 311.86 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler/ Tripod
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
	UD		14.5		(ML) SILT, very dark gray (10YR3/1), wet, soft, roots in core		0: Cr= 109, Cu= ND, Ni= 62
1.0					310.9		
					(SM) Silty f SAND, dark yellowish brown (10YR3/6), wet, soft		1: Cr= 96, Cu= ND, Ni= 73
2.0					309.9		
	UD		13.2		(SW) f SAND, very dark grayish green (10Y-5GY3/2), wet, firm		2: Cr= ND, Cu= ND, Ni= ND
							3: Cr= ND, Cu= ND, Ni= 38
4.5					307.4		4: Cr=ND, Cu= 30, Ni= 41

Refusal at 4.5 feet.
Bottom of borehole at 4.5 feet.

BORING NUMBER WTSB537

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/11/15 **COMPLETED** 2/11/15
GROUND ELEVATION 309.85 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		13.2		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		0: CR= ND, Cu= 4,641, Ni= 568 1: Cr= ND, Cu= 42, Ni= 57
	UD		2.4		4.0 305.9		2: Cr= ND, Cu= 61, Ni= 65
5	UD		15.6		(ML) SILT, very dark brown (10YR2/2), wet, soft, organic odor, Peat 6.0 303.9		4: Cr= 72, Cu= 520, Ni= 153 5: Cr= ND, Cu= ND, Ni= 19
	UD		24		(ML) SILT, very dark grayish brown (10YR3/2), wet, soft		6: Cr= ND, Cu= ND, Ni= ND 7: Cr= ND, Cu= 682, Ni= 77
10	UD		6		10.0 299.9		8: Cr= ND, Cu= 25, Ni= 26
	UD		12		(SP-SM) SAND and SILT, very dark grayish brown (10YR3/2), wet, soft		10: Cr= 68, Cu= 30, Ni= 28 11: Cr= ND, Cu= 186, Ni= 50
	UD		20.4				12: Cr= ND, Cu= 25, Ni= 24 13: Cr= ND, Cu= 139, Ni= 39
15	UD		8.4		16.0 293.9		14: Cr= ND, Cu= 16, Ni= ND 15: Cr= ND, Cu= 22, Ni= 16

Bottom of borehole at 16.0 feet.

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BORING NUMBER WTSB538

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/12/15 **COMPLETED** 2/12/15
GROUND ELEVATION 310.62 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			3.6		(SM) Silty f SAND, brown (10YR4/3), wet, soft		0: Cr= 16ppm, Cu= ND, Ni= ND
					2.0 308.6		
			12		(ML) SILT, ML, very dark grayish brown (10YR3/2), wet, soft, Peat		2: Cr= ND, Cu=389, Ni= 130
							3: Cr= ND, Cu=32, Ni= 23
			14.4				4: Cr= ND, Cu=28, Ni= 23
5							5: Cr= 70, Cu=25, Ni= 45
			13.2				6: Cr= ND, Cu=20, Ni= 30
							7: Cr= ND, Cu=20, Ni= 30
			18				8: Cr= ND, Cu=22, Ni= 24
					9.0 301.6		9: Cr= ND, Cu=17, Ni= 25
10					(ML) SILT, ML, dark gray (10YR4/1), wet, soft		10: Cr= ND, Cu=21, Ni= 28
			12				11: Cr= ND, Cu=32, Ni= 28
			12				12: Cr= ND, Cu=19, Ni= ND
							13: Cr= ND, Cu=27, Ni= ND
			14.4				14: Cr= ND, Cu=20, Ni= ND
15					16.0 294.6		

Bottom of borehole at 16.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER WTSB539

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/12/15 **COMPLETED** 2/12/15
GROUND ELEVATION 310.1 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			24 / 14.4		(SM) SILT, SM, very dark gray (10YR3/1), wet, soft, Peat	306.1	0: Cr= ND, Cu= 30, Ni= 23 1: Cr= ND, Cu= 42, Ni= 18 2: Cr= ND, Cu= ND, Ni= ND 3: Cr= ND, Cu= 51, Ni= 18 4: Cr= ND, Cu= ND, Ni= ND
4.0					Bottom of borehole at 4.0 feet.		

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BORING NUMBER WTSB540

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/11/15 **COMPLETED** 2/11/15
GROUND ELEVATION 310.17 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		15		(ML) SILT, ML, very dark gray (10YR3/1) transitioning to dark brown (10YR3/1) at 3 ft. bgs , wet, soft, Peat		0: Cr= ND, Cu= 40, Ni= 92 1: Cr= 83, Cu= 68, Ni= 67
	UD		13				2: Cr= ND, Cu= 16, Ni= 22 3: Cr= 76, Cu= 45, Ni= 53
5	UD		16				4: Cr= ND, Cu= 31, Ni= 46 5: Cr= ND, Cu= 26, Ni= 56
				6.0	304.2		6: Cr= ND, Cu= 22, Ni= 43

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB541

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/10/15 **COMPLETED** 2/10/15
GROUND ELEVATION 310.09 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	GB		12		(ML) SILT, black (10YR2/1), wet, soft, Peat		1: Cr= ND, Cu= 18, Ni= ND 2: Cr= ND, Cu= ND, Ni= ND
4.0					306.1		

Bottom of borehole at 4.0 feet.

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BORING NUMBER WTSB542

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/10/15 **COMPLETED** 2/11/15
GROUND ELEVATION 312.27 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler/ Tripod
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					(SM) f SAND, very dark grayish brown (10YR3/2), wet (~1.5 ft. bgs), soft		1: Cr= ND, Cu= ND, Ni= 94
					3.0 309.3		2: Cr= ND, Cu= ND, Ni= 94
					(ML) f Sandy SILT, black (10YR2/1), wet, soft		3: Cr= ND, Cu= 16, Ni= 67
5					5.0 307.3		4: Cr= ND, Cu= 18, Ni= 83
					(ML) SILT, dark yellowish brown (10YR3/4), wet, soft		5: Cr= 63, Cu= ND, Ni= 20
							6: Cr= ND, Cu= 40, Ni= 96
							7: Cr= ND, Cu= 45, Ni= 69
							8: Cr= ND, Cu= 26, Ni= 51
							9: Cr= 78, Cu= 52, Ni= 28
					9.5 302.8		9.5: Cr= ND, Cu= 21, Ni= 28

Refusal at 9.5 feet.
Bottom of borehole at 9.5 feet.

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BORING NUMBER WTSB543

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/16/15 **COMPLETED** 2/16/15
GROUND ELEVATION 310.6 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			9.6		0.5 (ML) SILT, very dark gray (10YR3/1), wet, soft, Peat 310.1		0: Cr= 80, Cu= 208, Ni= 123
					(SM) Silty fm SAND, dark gray (5Y4/1), wet, medium, rounded 1.5 in. rock in tip		1: Cr= ND, Cu= 69, Ni= 28
					2.0 308.6		2: Cr= ND, Cu= ND, Ni= 19

Refusal at 2.0 feet.
Bottom of borehole at 2.0 feet.

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BORING NUMBER WTSB544

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/18/15 **COMPLETED** 2/18/15
GROUND ELEVATION 312.52 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		22.9		(SW) fm SAND, very dark gray (10YR3/1) transitioning to dark yellowish brown (10YR4/4) at 3 ft., wet, dense		0: Cr= ND, Cu= ND, Ni= 31 1: Cr= ND, Cu= ND, Ni= ND
	UD		21.6				2: Cr= ND, Cu= ND, Ni= 17 3: Cr= ND, Cu= ND, Ni= 17
4.0					308.5 Refusal at 4.0 feet. Bottom of borehole at 4.0 feet.		4: Cr= ND, Cu= ND, Ni= ND

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BORING NUMBER WTSB545

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/16/15 **COMPLETED** 2/16/15
GROUND ELEVATION 310.96 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		18		2.0	(ML) SILT, very dark grayish brown (10YR3/2), wet, soft, roots, Peat 309.0		0: Cr= ND, Cu= 199, Ni= 189 1: Cr= 106, Cu= 1,132, Ni= 218
5	UD		12		5.0	(SW) fm SAND, olive gray (5Y3/2) transitioning to dark yellowish brown (10YR4/6), wet, medium 306.0		2: Cr= ND, Cu= 429, Ni= 42 3: Cr= ND, Cu= 25, Ni= ND 4: Cr= ND, Cu= 16, Ni= ND 5: Cr= ND, Cu= 13, Ni= ND

Bottom of borehole at 5.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER WTSB546

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/17/15 **COMPLETED** 2/17/15
GROUND ELEVATION 311.27 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			13.2		(ML) SILT, very dark gray (10YR3/1), wet, soft		0: Cr= ND, Cu= 95, Ni= 125
					1.0 310.3		
					(SW) fm SAND, dark gray (5Y4/1), wet, medium		1: Cr= ND, Cu= 52, Ni= 159
			12				2: Cr= ND, Cu= ND, Ni= ND
							3: Cr= ND, Cu= ND, Ni= ND
			19.2				4: Cr= ND, Cu= ND, Ni= ND
5							5: Cr= ND, Cu= 16, Ni= 15
					6.0 305.3		6: Cr= ND, Cu= 18, Ni= ND

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

BORING NUMBER WTSB547

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 309.74 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG		MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	NR		0			(ML) SILT,very dark gray (10YR3/1), wet, soft, Peat		
	UD		15.6					2: Cr= ND, Cu= 26, Ni= 42 3: Cr= ND, Cu= 88, Ni= 19 4: Cr= ND, Cu= 22, Ni= ND
5	NR		0					
10	UD		14.4					13: Cr= ND, Cu= 27, Ni= 29 14: Cr= ND, Cu= ND, Ni= ND 15: Cr= ND, Cu= 41, Ni= 58
15					15.0	294.7		

Refusal at 15.0 feet.
Bottom of borehole at 15.0 feet.

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BORING NUMBER WTSB548

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 308.99 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0			0		(ML) SILT, very dark gray (10YR3/1), wet, soft, Peat		
5	NR						
10			15.6				13: Cr= ND, Cu= 28, Ni= 40
15	UD						14: Cr= ND, Cu= 20, Ni= 75
					15.0 294.0		15: Cr= ND, Cu= 42, Ni= 66
					(SP-SM) Sandy SILT, dark gray (10YR3/1), wet, soft		
					16.0 293.0		16: Cr= ND, Cu= 90, Ni= 74
					Bottom of borehole at 16.0 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER WTSB549

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/25/15 **COMPLETED** 2/25/15
GROUND ELEVATION 310.2 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	NR		0		(ML) SILT, very dark gray (10YR3/1), wet, soft, peat		
	UD		8.4				2: Cr= ND, Cu= 38, Ni= 82
5							4: Cr= ND, Cu= 20, Ni= 25
					5.0 305.2 (SM) Silty fm SAND, very dark gray (10YR3/1), wet, stiff/ dense 6.0 304.2		6: Cr= ND, Cu= 18, Ni= 22

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/28/15 13:40 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER WTSB550

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/24/15 **COMPLETED** 2/24/15
GROUND ELEVATION 308.28 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	NR		0		(ML) SILT, very dark brown (10YR2/2), wet, soft		
5	UD		15.6				4: Cr= ND, Cu= 95, Ni= 154
10							8: Cr= ND, Cu= 32, Ni= 35
15							12: Cr= ND, Cu= 20, Ni= 21
				16.0	292.3		16: Cr= ND, Cu= 35, Ni= 46

Bottom of borehole at 16.0 feet.

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BORING NUMBER WTSB551

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 2/24/15 **COMPLETED** 2/24/15
GROUND ELEVATION 308.96 ft AMSL **HOLE SIZE** 3 inch
DRILLING CONTRACTOR Parratt-Wolff Inc.
GROUND WATER LEVELS:
DRILLING METHOD Peat Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY**
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0	UD		13.2		(ML) SILT, very dark brown (10YR2/2), wet, soft, Peat		0: Cr= ND, Cu= 35, Ni= 45 1: Cr= ND, Cu= 39, Ni= 64
	NR		0				2: Cr= ND, Cu= 89, Ni= 29
5	NR		0				
	UD		18				8: Cr= ND, Cu= 33, Ni= 31
10							10: Cr= ND, Cu= 24, Ni= 32
							12: Cr= ND, Cu= 30, Ni= 43
15							14: Cr= 80, Cu= 44, Ni= 50
				16.0	293.0		16: Cr= ND, Cu= 29, Ni= 34

Refusal at 16.0 feet.
Bottom of borehole at 16.0 feet.

August 18, 2015

Mr. Matthew Hubicki
Environmental Engineer
Remedial Bureau C
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7012

Re: NYSDEC Standby Engineering Contract D007625
WA #5 Remedial Design — Magna Metals (Site #36003)
Pre-Design Investigation (March & June 2015) Summary Report

Dear Mr. Hubicki

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) has prepared this fourth letter report to summarize the results of an additional pre-design investigation (PDI) conducted by HDR on NYSDEC's behalf, for the Magna Metals State Superfund Site located in Cortlandt, New York. The first letter was submitted on July 12, 2013 summarizing the PDI conducted in 2013 in the off-site areas concerns (AOCs) including AOC 5 - Freshwater Wetland and Unnamed Tributary area, AOC 6- Off-Site Pond area, and AOC 7- Furnace Brook area. The second letter was submitted on March 14, 2014 summarizing the PDI conducted in 2013 in the on-site AOCs including AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 3 – Refuse Area and AOC 4 – Former Magna Metals Building Area. The third letter is being submitted separately summarizing the 2015 PDI in the on-site AOCs including AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 5 – Freshwater and Unnamed Tributary (Wetland Area), AOC 6 – Off-Site Pond, and AOC 7 – Furnace Brook (Upper Furnace Brook).

This investigation was conducted from March 10 to March 12, and June 2 and June 3, 2015, to determine the extent of potentially impacted sediment further downstream of Furnace Brook (Lower Furnace Brook).

Field Activities

The sediment samples were collected using either a petite ponar grab sampler or a shovel, and the locations were accessed by foot or by utilizing an inflatable work boat. Sediment descriptions for each sample location were recorded and logged following the

Unified Soil Classification System (USCS), including Munsell color descriptions, and are included in Appendix A. An Oxford Instruments handheld X-MET 7500 X-Ray Fluorescence (XRF) was used to scan samples for metal concentrations, and provide supplemental backup data in conjunction with the analytical samples that were sent to the laboratory. For the purposes of this investigation, all discussions will be based on the analytical results.

Samples were collected from the centerline of the stream at a rate of approximately 1 per 100 linear feet, and to a depth of 0.5 feet beneath the sediment surface. The sample locations were named in sequential order starting upstream at BRSD832 and finishing downstream beneath the dam near Furnace Woods Road at BRSD886. Additional samples BRSD887 – BRSD890 were collected at the north eastern corner of the lake between 7 Lakeview Ave and 317 Watch Hill Road. The sample locations are shown on Figures 1 and 2.

Sample's BRSD841 and BRSD-847 to BRSD-850 were unable to be accessed and sampled due to obstructions and hazards on the water that prevented the field crew from safely accessing the locations. However, multiple samples were collected immediately upstream (BRSD846) and downstream (BRSD851) of those locations.

Analytical Sample Results

Sediment samples were sent to Con-Test Analytical Laboratory for analysis. A total of 59 analytical sediment samples (including five duplicate samples) were collected from 54 locations and were analyzed for the target analyte list (TAL) metals, hexavalent chromium, cyanide, and moisture content. The sediment samples were compared to the New York State Lowest Effect Levels (LELs) for metals, as well as the Unrestricted Use Soil Cleanup Objectives (UUSCOs) and the Restricted Use Residential Soil Cleanup Objectives (RURSCOs).

Each sediment sample was collected from 0 to 0.5 feet beneath the sediment surface. The sediment samples were collected to delineate the potential downstream extent of impacted sediment. Figures 1 and 2 illustrate the analytical results for each location.

Metals that exceeded the LEL, UUSCOs, and RURSCOs include antimony, arsenic, barium, beryllium, cadmium, calcium, hexavalent chromium, total chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc, and are presented in Table 1. Total chromium, copper and nickel were the most prevalent constituents detected in exceedance of the criteria. There was at least one constituent exceedance reported in 58

of the 59 sample locations. The maximum concentration of total chromium was reported to be 180 mg/kg at BRSD873. There were 5 detections of hexavalent chromium with a maximum concentration of 2.8 mg/kg at BRSD834; therefore, the majority of the total chromium fraction is comprised of trivalent chromium. Hexavalent chromium was analyzed at all of the locations except for BRSD869, and that was due to insufficient sample recovery in the field. BRSD869 is located in a very rocky location and the field crew was unable to collect a full sample. The maximum concentrations for copper and nickel were found to be 2,800 mg/kg and 450 mg/kg, respectively, both from BRSD851.

The extent of the impacted sediment seems to be largely contained above the dam within the lake. Two samples BRSD885 and BRS886 were collected downstream of the dam. BRSD885, approximately 60 feet downstream of the dam had no exceedences. BRSD886, approximately 160 feet downstream of the dam exceeded the criteria for nickel. The nickel concentration (32 mg/kg) exceeded both the LEL (20 mg/kg) and unrestricted (30 mg/kg) criterion.

If you have any questions or require additional information, please do not hesitate to contact me at (201) 335-9348.

Very truly yours,



Thomas M. Connors, P.E., MBA

Project Manager

Cc: E. Zimmerman, HDR Contract Manager
HDR File

Att.: Figures 1 - 2
Table 1

Attachment A – Boring Logs

FIGURES



BRSD858	0 - 0.5
Metals	
Antimony	22
Arsenic	< 8.3
Cadmium	1.8
Chromium, Total	120
Copper	350
Iron	33000
Lead	52
Manganese	240
Mercury	0.26
Nickel	190
Silver	< 4
Zinc	230

BRSD859	0 - 0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	38
Copper	20
Iron	16000
Lead	5.2
Manganese	770
Mercury	< 0.0045
Nickel	33
Silver	< 0.54
Zinc	45

BRSD860	0 - 0.5
Metals	
Antimony	2.9
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	79
Copper	37
Iron	27000
Lead	10
Manganese	370
Mercury	0.0056
Nickel	43
Silver	< 0.54
Zinc	54

BRSD861	0 - 0.5
Metals	
Antimony	< 6.1
Arsenic	< 2.7
Cadmium	< 0.45
Chromium, Total	58
Copper	40
Iron	29000
Lead	27
Manganese	350
Mercury	0.093
Nickel	67
Silver	< 1.3
Zinc	140

BRSD862	0 - 0.5
Metals	
Antimony	< 8.2
Arsenic	< 3.7
Cadmium	< 0.6
Chromium, Total	87
Copper	74
Iron	30000
Lead	54
Manganese	530
Mercury	0.15
Nickel	98
Silver	< 1.8
Zinc	220

BRSD863	0 - 0.5
Metals	
Antimony	< 5.4
Arsenic	< 2.4
Cadmium	< 0.4
Chromium, Total	82
Copper	30
Iron	12000
Lead	4.1
Manganese	270
Mercury	0.04
Nickel	76
Silver	< 1.2
Zinc	38

BRSD864	0 - 0.5
Metals	
Antimony	< 4
Arsenic	< 1.8
Cadmium	< 0.3
Chromium, Total	58
Copper	26
Iron	12000
Lead	4.5
Manganese	200
Mercury	0.037
Nickel	74
Silver	< 0.88
Zinc	33

BRSD857	0 - 0.5
Metals	
Antimony	< 20
Arsenic	< 8.8
Cadmium	< 1.4
Chromium, Total	110
Copper	1000
Iron	31000
Lead	62
Manganese	320
Mercury	0.24
Nickel	250
Silver	< 4.3
Zinc	250

BRSD854	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 5.5
Cadmium	1.8
Chromium, Total	120
Copper	230
Iron	26000
Lead	53
Manganese	490
Mercury	0.19
Nickel	180
Silver	< 2.7
Zinc	160

BRSD853	0 - 0.5
Metals	
Antimony	< 19
Arsenic	< 8.3
Cadmium	2
Chromium, Total	110
Copper	380
Iron	34000
Lead	48
Manganese	440
Mercury	0.22
Nickel	180
Silver	< 4
Zinc	270

BRSD852	0 - 0.5
Metals	
Antimony	< 7
Arsenic	< 3.1
Cadmium	1
Chromium, Total	110
Copper	150
Iron	32000
Lead	21
Manganese	390
Mercury	0.069
Nickel	160
Silver	< 1.5
Zinc	100

BRSD851	0 - 0.5
Metals	
Antimony	< 17
Arsenic	9.1
Cadmium	2.5
Chromium, Total	170
Copper	2800
Iron	49000
Lead	82
Manganese	560
Mercury	0.23
Nickel	450
Silver	< 3.7
Zinc	300

BRSD836	0 - 0.5
Metals	
Antimony	< 9.9
Arsenic	6.1
Cadmium	1.6
Chromium, Total	110
Copper	310
Iron	44000
Lead	44
Manganese	1400
Mercury	0.14
Nickel	190
Silver	< 2.2
Zinc	220

BRSD835	0 - 0.5
Metals	
Antimony	< 11
Arsenic	8.6
Cadmium	1.5
Chromium, Total	68
Copper	120
Iron	14000
Lead	21
Manganese	600
Mercury	0.18
Nickel	130
Silver	< 2.3
Zinc	36

BRSD834	0 - 0.5
Metals	
Antimony	< 9.9
Arsenic	6
Cadmium	1.6
Chromium, Total	89
Copper	160
Iron	11000
Lead	11
Manganese	900
Mercury	0.19
Nickel	110
Silver	< 2.2
Zinc	28

BRSD833	0 - 0.5
Metals	
Antimony	< 16
Arsenic	8.9
Cadmium	1.3
Chromium, Total	66
Copper	120
Iron	15000
Lead	7.2
Manganese	1800
Mercury	0.12
Nickel	120
Silver	< 3.4
Zinc	13

BRSD832	0 - 0.5
Metals	
Antimony	< 11
Arsenic	7.7
Cadmium	1.5
Chromium, Total	120
Copper	170
Iron	11000
Lead	6.9
Manganese	630
Mercury	0.097
Nickel	170
Silver	< 2.5
Zinc	6.8

BRSD838	0 - 0.5
Metals	
Antimony	< 12
Arsenic	6.8
Cadmium	1.8
Chromium, Total	130
Copper	360
Iron	64000
Lead	52
Manganese	1300
Mercury	0.19
Nickel	210
Silver	< 2.6
Zinc	310

BRSD837	0 - 0.5
Metals	
Antimony	< 10
Arsenic	5.9
Cadmium	1.5
Chromium, Total	100
Copper	350
Iron	32000
Lead	46
Manganese	410
Mercury	0.17
Nickel	190
Silver	< 2.2
Zinc	220

BRSD840	0 - 0.5
Metals	
Antimony	< 3.5
Arsenic	< 1.6
Cadmium	0.29
Chromium, Total	32
Copper	18
Iron	6300
Lead	3.1
Manganese	120
Mercury	0.025
Nickel	47
Silver	< 0.77
Zinc	17

BRSD839	0 - 0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	0.37
Chromium, Total	39
Copper	26
Iron	8600
Lead	6.2
Manganese	290
Mercury	0.073
Nickel	33
Silver	< 0.61
Zinc	16

BRSD845	0 - 0.5
Metals	
Antimony	< 17
Arsenic	< 6.3
Cadmium	< 0.57
Chromium, Total	110
Copper	170
Iron	31000
Lead	42
Manganese	870
Mercury	0.22
Nickel	160
Silver	1.1
Zinc	420

BRSD865	0 - 0.5
Metals	
Antimony	18
Arsenic	4.9
Cadmium	1.9
Chromium, Total	89
Copper	130
Iron	28000
Lead	54
Manganese	770
Mercury	0.18
Nickel	110
Silver	0.34
Zinc	210

BRSD866	0 - 0.5
Metals	
Antimony	20
Arsenic	5.2
Cadmium	2
Chromium, Total	96
Copper	130
Iron	34000
Lead	48
Manganese	730
Mercury	0.17
Nickel	120
Silver	0.8
Zinc	210

BRSD867	0 - 0.5
Metals	
Antimony	13
Arsenic	3.2
Cadmium	1.5
Chromium, Total	91
Copper	73
Iron	19000
Lead	32
Manganese	290
Mercury	0.12
Nickel	100
Silver	0.33
Zinc	120

BRSD856	0 - 0.5
Metals	
Antimony	< 3.6
Arsenic	< 1.6
Cadmium	< 0.26
Chromium, Total	52
Copper	55
Iron	16000
Lead	15
Manganese	290
Mercury	0.037
Nickel	69
Silver	< 0.78
Zinc	70

BRSD855	0 - 0.5
Metals	
Antimony	4.8
Arsenic	< 1.2
Cadmium	< 0.19
Chromium, Total	46
Copper	84
Iron	49000
Lead	8.9
Manganese	580
Mercury	0.099
Nickel	130
Silver	< 0.56
Zinc	85

BRSD846	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 5.5
Cadmium	2
Chromium, Total	120
Copper	300
Iron	58000
Lead	57
Manganese	920
Mercury	0.23
Nickel	200
Silver	< 2.7
Zinc	320

BRSD844	0 - 0.5
Metals	
Antimony	< 16
Arsenic	< 6.2
Cadmium	0.67
Chromium, Total	61
Copper	190
Iron	19000
Lead	28
Manganese	350
Mercury	0.22
Nickel	100
Silver	< 0.51
Zinc	190

BRSD843	0 - 0.5
Metals	
Antimony	< 11
Arsenic	< 4.1
Cadmium	0.51
Chromium, Total	120
Copper	180
Iron	36000
Lead	52
Manganese	720
Mercury	0.22
Nickel	150
Silver	1.6
Zinc	370

BRSD842	0 - 0.5
Metals	
Antimony	< 15
Arsenic	< 5.7
Cadmium	0.57
Chromium, Total	130
Copper	140
Iron	32000
Lead	40
Manganese	1400
Mercury	0.26
Nickel	190
Silver	1.2
Zinc	410

LEGEND:
◆ BRSD832 — BROOK SEDIMENT SAMPLE LOCATION (2015 PDI)
SCOs — SOIL CLEANUP OBJECTIVES
LEL — LOWEST EFFECTS LEVEL
mg/kg — MILLIGRAM PER KILOGRAM

BRSD838	0 - 0.5	
Metals		
Antimony	< 12	
Arsenic	6.8	ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
Cadmium	1.8	
Chromium, Total	130	
Copper	360	ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
Iron	64000	
Lead	52	
Manganese	1300	
Mercury	0.19	
Nickel	210	
Silver	< 2.6	
Zinc	310	ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

SAMPLE IDENTIFICATION
SAMPLE INTERVAL (FT)
ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:
1. AERIAL TAKEN FROM NYS GIS CLEARINGHOUSE WEBSITE.
2. SAMPLES WERE COLLECTED BY HDR IN MARCH AND JUNE 2015 AND WERE LOCATED USING A HAND HELD GPS UNIT.
3. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.
4. * LOCATION NOT ACCESSIBLE DUE TO IMPASSABLE OBSTRUCTIONS ON THE WATER.

0 100 200
SCALE IN FEET

PROJECT MANAGER

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT NUMBER

SUPPLEMENTAL PRE-DESIGN INVESTIGATION SAMPLING PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

FURNACE BROOK SUPPLEMENTAL SAMPLE RESULTS

0 100' 200' SCALE 1" = 100'
FILENAME
SHEET FIGURE 1

BRSD876	0 - 0.5
Metals	
Antimony	18
Arsenic	5.9
Cadmium	2.2
Chromium, Total	120
Copper	410
Iron	33000
Lead	75
Manganese	600
Mercury	0.25
Nickel	170
Silver	1
Zinc	230

BRSD874	0 - 0.5
Metals	
Antimony	19
Arsenic	< 6.2
Cadmium	2.2
Chromium, Total	97
Copper	200
Iron	29000
Lead	58
Manganese	200
Mercury	0.25
Nickel	140
Silver	1.3
Zinc	270

BRSD873	0 - 0.5
Metals	
Antimony	24
Arsenic	10
Cadmium	3.1
Chromium, Total	180
Copper	840
Iron	34000
Lead	110
Manganese	150
Mercury	0.25
Nickel	280
Silver	< 0.3
Zinc	360

BRSD872	0 - 0.5
Metals	
Antimony	18
Arsenic	5.6
Cadmium	2
Chromium, Total	97
Copper	160
Iron	30000
Lead	46
Manganese	480
Mercury	0.27
Nickel	120
Silver	0.84
Zinc	230

BRSD871	0 - 0.5
Metals	
Antimony	20
Arsenic	< 6.3
Cadmium	2.3
Chromium, Total	91
Copper	130
Iron	33000
Lead	49
Manganese	890
Mercury	0.2
Nickel	130
Silver	1.1
Zinc	240

BRSD868	0 - 0.5
Metals	
Antimony	5.7
Arsenic	1.4
Cadmium	0.38
Chromium, Total	61
Copper	37
Iron	12000
Lead	3.6
Manganese	160
Mercury	0.021
Nickel	57
Zinc	< 0.08
	44

BRSD869	0 - 0.5
Metals	
Antimony	10
Arsenic	< 1.3
Cadmium	0.36
Chromium, Total	43
Copper	14
Iron	11000
Lead	3.1
Manganese	180
Mercury	0.015
Nickel	34
Silver	0.13
Zinc	33

BRSD870	0 - 0.5
Metals	
Antimony	10
Arsenic	2.6
Cadmium	0.62
Chromium, Total	150
Copper	63
Iron	26000
Lead	38
Manganese	240
Mercury	0.012
Nickel	130
Silver	< 0.083
Zinc	45

BRSD887	0 - 0.5
Metals	
Antimony	17
Arsenic	< 4.2
Cadmium	1.8
Chromium, Total	86
Copper	190
Iron	27000
Lead	48
Manganese	300
Mercury	0.22
Nickel	120
Silver	0.4
Zinc	250

BRSD888	0 - 0.5
Metals	
Antimony	16
Arsenic	< 4.3
Cadmium	1.8
Chromium, Total	84
Copper	160
Iron	26000
Lead	48
Manganese	520
Mercury	0.21
Nickel	110
Silver	0.55
Zinc	270

BRSD877	0 - 0.5
Metals	
Antimony	18
Arsenic	5.6
Cadmium	2.3
Chromium, Total	120
Copper	340
Iron	26000
Lead	68
Manganese	150
Mercury	0.26
Nickel	150
Silver	1.3
Zinc	270

BRSD878	0 - 0.5
Metals	
Antimony	21
Arsenic	6.8
Cadmium	2.3
Chromium, Total	120
Copper	350
Iron	34000
Lead	70
Manganese	340
Mercury	0.23
Nickel	150
Silver	1.1
Zinc	280

BRSD881	0 - 0.5
Metals	
Antimony	24
Arsenic	9.9
Cadmium	2.3
Chromium, Total	110
Copper	250
Iron	43000
Lead	54
Manganese	730
Mercury	0.21
Nickel	140
Silver	1.1
Zinc	240

BRSD882	0 - 0.5
Metals	
Antimony	24
Arsenic	12
Cadmium	2.7
Chromium, Total	140
Copper	410
Iron	39000
Lead	72
Manganese	600
Mercury	0.2
Nickel	170
Silver	1.2
Zinc	250

BRSD885	0 - 0.5
Metals	
Antimony	< 2.7
Arsenic	< 1
Cadmium	< 0.092
Chromium, Total	0.31
Copper	0.29
Iron	< 2.1
Lead	< 0.35
Manganese	< 0.17
Mercury	0.017
Nickel	0.22
Silver	< 0.084
Zinc	< 0.96

BRSD889	0 - 0.5
Metals	
Antimony	21
Arsenic	7.2
Cadmium	2.5
Chromium, Total	91
Copper	210
Iron	28000
Lead	53
Manganese	280
Mercury	0.25
Nickel	120
Silver	1
Zinc	250

BRSD890	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 4.5
Cadmium	0.95
Chromium, Total	130
Copper	490
Iron	34000
Lead	80
Manganese	510
Mercury	0.18
Nickel	180
Silver	1.6
Zinc	300

BRSD875	0 - 0.5
Metals	
Antimony	21
Arsenic	7.1
Cadmium	2.4
Chromium, Total	120
Copper	290
Iron	38000
Lead	62
Manganese	770
Mercury	0.29
Nickel	160
Silver	0.94
Zinc	280

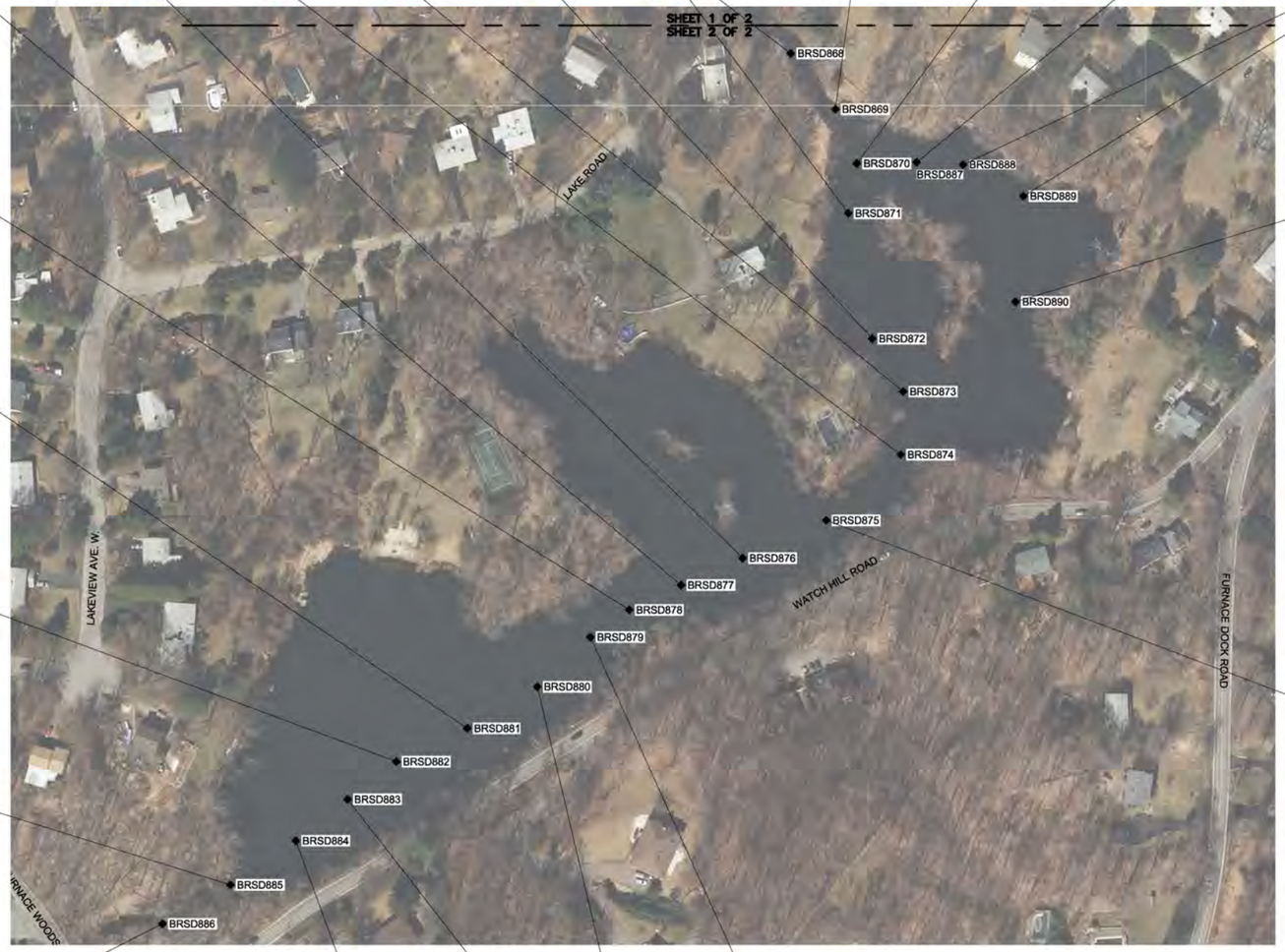
BRSD886	0 - 0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	0.23
Chromium, Total	25
Copper	16
Iron	8500
Lead	4.5
Manganese	80
Mercury	0.0071
Nickel	32
Silver	< 0.56
Zinc	16

BRSD884	0 - 0.5
Metals	
Antimony	19
Arsenic	6.8
Cadmium	2.1
Chromium, Total	99
Copper	260
Iron	31000
Lead	54
Manganese	470
Mercury	0.23
Nickel	150
Silver	1.1
Zinc	210

BRSD883	0 - 0.5
Metals	
Antimony	20
Arsenic	7.8
Cadmium	2.4
Chromium, Total	130
Copper	430
Iron	39000
Lead	75
Manganese	610
Mercury	0.22
Nickel	170
Silver	1.1
Zinc	250

BRSD880	0 - 0.5
Metals	
Antimony	24
Arsenic	8.4
Cadmium	2.6
Chromium, Total	130
Copper	410
Iron	39000
Lead	76
Manganese	610
Mercury	0.22
Nickel	170
Silver	1
Zinc	280

BRSD879	0 - 0.5
Metals	
Antimony	21
Arsenic	6.6
Cadmium	2.4
Chromium, Total	130
Copper	440
Iron	39000
Lead	74
Manganese	740
Mercury	0.24
Nickel	170
Silver	0.81
Zinc	260



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LEGEND:
- BRSD832 ◆ BROOK SEDIMENT SAMPLE LOCATION (2015 PDI)
- SCOs SOIL CLEANUP OBJECTIVES
- LEL LOWEST EFFECTS LEVEL
- mg/kg MILLIGRAM PER KILOGRAM

BRSD877	0 - 0.5	
Metals		
Antimony	18	ANALYTICAL RESULT mg/kg (BOLD AND UNDERLINED INDICATES CONCENTRATION GREATER THAN LEL)
Arsenic	5.6	
Cadmium	2.3	
Chromium, Total	120	ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CONCENTRATION GREATER THAN RESTRICTED USE RESIDENTIAL SCO)
Copper	340	
Iron	26000	
Lead	68	
Manganese	150	
Mercury	0.26	
Nickel	150	
Silver	1.3	
Zinc	270	ANALYTICAL RESULT mg/kg (ORANGE HIGHLIGHT INDICATES CONCENTRATION GREATER THAN UNRESTRICTED USE SCO)

SAMPLE IDENTIFICATION
SAMPLE INTERVAL (FT)
ANALYTICAL PARAMETER

NYSDEC Sediment Criteria (LELs)	
Contaminant	mg/kg
Metals	
Antimony	2
Arsenic	6
Cadmium	0.6
Chromium, Total	26
Copper	16
Iron	20000
Lead	31
Manganese	460
Mercury	0.15
Nickel	16
Silver	1
Zinc	120

Restricted Use Residential SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	16
Cadmium	2.5
Chromium, Total	36
Copper	270
Iron	
Lead	400
Manganese	2000
Mercury	0.81
Nickel	140
Silver	36
Zinc	2200

Unrestricted Use SCOs	
Contaminant	mg/kg
Metals	
Antimony	
Arsenic	13
Cadmium	2.5
Chromium, Total	30
Copper	50
Iron	
Lead	63
Manganese	1600
Mercury	0.18
Nickel	30
Silver	2
Zinc	109

NOTES:
1. AERIAL TAKEN FROM NYS GIS CLEARINGHOUSE WEBSITE.
2. SAMPLES WERE COLLECTED BY HDR IN MARCH AND JUNE 2015 AND WERE LOCATED USING A HAND HELD GPS UNIT.
3. TOTAL CHROMIUM WAS COMPARED TO THE STANDARD FOR TRIVALENT CHROMIUM FOR UNRESTRICTED USE AND RESIDENTIAL USE SCOs.

0 100 200
SCALE IN FEET

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER
PROJECT NUMBER

SUPPLEMENTAL PRE-DESIGN INVESTIGATION SAMPLING PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

FURNACE BROOK SUPPLEMENTAL SAMPLE RESULTS

0 100' 200' FILENAME
SCALE 1" = 100'
SHEET FIGURE 2

TABLE 1

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD832		BRSD833		BRSD834		BRSD835		BRSD836		BRSD837		BRSD838		BRSD839		BRSD840		BRSD840	
				Sample ID	BRSD832-0-0.5		BRSD833-0-0.5		BRSD834-0-0.5		BRSD835-0-0.5		BRSD836-0-0.5		BRSD837-0-0.5		BRSD838-0-0.5		BRSD839-0-0.5		BRSD840-0-0.5		BRSD840-0-0.5-1	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		1	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	9300		7800		12000		13000		11000		13000		15000		8900		5100		6100	
Antimony	7440-36-0	**2**	NA	NA	11	U	16	U	9.9	U	11	U	9.9	U	10	U	12	U	2.8	U	3.5	U	4.2	U
Arsenic	7440-38-2	**6**	13	16	**7.7**	**J**	**8.9**	**J**	**6**	**J**	**8.6**	**J**	**6.1**	**J**	5.9	J	**6.8**	**J**	1.3	U	1.6	U	1.9	U
Barium	7440-39-3	NA	350	350	290		280		440		470		340		290		320		260		120		150	
Beryllium	7440-41-7	NA	7.2	14	1.2	J	1	J	1.2	J	1.5		1.8		1.5		2.2		0.49		0.33	J	0.44	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**1.5**		**1.3**	**J**	**1.6**		**1.5**		**1.5**		**1.5**		**1.8**		0.37		0.29	J	0.37	J
Calcium	7440-70-2	NA	NA	NA	18000		19000		12000		16000		10000		7300		9500		2400		2200		2900	
Chromium, Hexavalent	18540-29-9	NA	1	22	5	U	0.62	U	2.8	JD	0.45	U	0.87	U	2.1	U	1	U	0.16	J	0.73	U	0.35	U
Chromium, Total	7440-47-3	**26**	30	36	**120**		**66**		**89**		**68**		**110**		**100**		**130**		**39**		**32**		**42**	
Cobalt	7440-48-4	NA	NA	NA	8.8	J	14	J	13		14		46		41		52		6.3		15		16	
Copper	7440-50-8	**16**	50	270	**170**		**120**		**160**		**120**		**310**		**350**		**360**		**26**		**18**		**25**	
Cyanide	57-12-5	NA	27	27	7.3		3.1	U	1.9	U	2.2	U	2.1	U	1.8	U	2.4	U	0.32	U	0.61	U	0.68	U
Iron	7439-89-6	**20000**	NA	NA	11000		15000		11000		14000		**44000**	**D**	**32000**	**D**	**64000**	**D**	8600	D	6300		7600	
Lead	7439-92-1	**31**	63	400	6.9		7.2		11		21		**44**		**46**		**52**		6.2		3.1		4.4	
Magnesium	7439-95-4	NA	NA	NA	5400		5400		4300		5600		6900		6900		9100		1600		2000		2400	
Manganese	7439-96-5	**460**	1600	2000	**630**		**1800**		**900**		**600**		**1400**		410		**1300**		290		120		150	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.097	J	0.12	J	**0.19**		**0.18**		0.14		**0.17**		**0.19**		0.073		0.025	J	0.032	J
Nickel	7440-02-0	**20**	30	140	**170**		**120**		**110**		**130**		**190**		**190**		**210**		**33**		**47**		**57**	
Potassium	7440-09-7	NA	NA	NA	380	J	390	J	550		450	J	780		1000		1100		400		290		350	
Selenium	7782-49-2	NA	3.9	36	4.4	U	6	U	3.8	U	4.1	U	3.8	U	3.8	U	4.5	U	1.1	U	1.3	U	1.6	U
Silver	7440-22-4	**1**	2	36	2.5	U	3.4	U	2.2	U	2.3	U	2.2	U	2.2	U	2.6	U	0.61	U	0.77	U	0.92	U
Sodium	7440-23-5	NA	NA	NA	540	J	880		970		420	J	330	J	390	J	1100		160		180		190	J
Thallium	7440-28-0	NA	NA	NA	4.7	U	6.5	U	4.1	U	4.4	U	4.1	U	4.1	U	4.8	U	1.2	U	1.4	U	1.7	U
Vanadium	7440-62-2	NA	NA	NA	49		34		45		51		37		48		49		16		12		16	
Zinc	7440-66-6	**120**	109	2200	6.8		13		28		36		**220**		**220**		**310**		16		17		22	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	17.4		14		20.3		19.3		19.7		20.7		16.3		75.9		59.1		50.6	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD842		BRSD843		BRSD844		BRSD845		BRSD845		BRSD846		BRSD851		BRSD851		BRSD852		BRSD853	
				Sample ID	BRSD842-0-0.5		BRSD843-0-0.5		BRSD844-0-0.5		BRSD845-0-0.5		BRSD845-0-0.5-1		BRSD846-0-0.5		BRSD851-0-0.5		BRSD851-0-0.5-1		BRSD852-0-0.5		BRSD853-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		1		0.5		0.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																								
Aluminum	7429-90-5	NA	NA	NA	12000		14000		7200		12000		9100		16000		17000		19000		8000		15000	
Antimony	7440-36-0	**2**	NA	NA	15	U	11	U	16	U	17	U	17	U	12	U	17	U	17	U	7	U	19	U
Arsenic	7440-38-2	**6**	13	16	5.7	U	4.1	U	6.2	U	6.3	U	6.4	U	5.5	U	**9.1**	**J**	7.4	U	3.1	U	8.3	U
Barium	7440-39-3	NA	350	350	290		270		160		290		250		330		280		300		110		270	
Beryllium	7440-41-7	NA	7.2	14	0.52	J	0.57	J	0.4	U	0.47	J	0.41	U	2.2		2.1	J	2.3		1.2		1.6	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.57	J	0.51	J	**0.67**	**J**	0.57	U	**0.7**	**J**	**2**		**2.5**		**2.7**		**1**		**2**	**J**
Calcium	7440-70-2	NA	NA	NA	8100		9100		5600		8800		7200		8900		5700		5900		3100		7100	
Chromium, Hexavalent	18540-29-9	NA	1	22	3.4	U	2.5	U	3.7	U	3.8	U	1.6	U	0.58	U	0.73	U	0.74	U	0.28	U	1.3	J
Chromium, Total	7440-47-3	**26**	30	36	**130**		**120**		**61**		**110**		**82**		**120**		**170**		**170**		**110**		**110**	
Cobalt	7440-48-4	NA	NA	NA	32		30		19	J	36		34		53		64		72		34		40	
Copper	7440-50-8	**16**	50	270	**140**		**180**		**190**		**170**		**130**		**300**		**2800**		**2500**		**150**		**380**	
Cyanide	57-12-5	NA	27	27	3	U	1.5	U	3.7	U	3.1	U	3.6	U	2.8	U	5.7		3.9	U	1.1	U	2.4	U
Iron	7439-89-6	**20000**	NA	NA	**32000**	**B**	**36000**	**B**	19000	B	**31000**	**B**	**27000**	**B**	**58000**	**D**	**49000**	**D**	**52000**	**D**	**32000**	**D**	**34000**	
Lead	7439-92-1	**31**	63	400	**40**		**52**		28		**42**		**32**		**57**		**82**		**85**		21		**48**	
Magnesium	7439-95-4	NA	NA	NA	6400		8600		4100		7100		5600		8700		7700		8400		19000		8100	
Manganese	7439-96-5	**460**	1600	2000	**1400**	**B**	**720**	**B**	350	B	**870**	**B**	**920**	**B**	**920**		**560**		**600**		390		440	
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.26**		**0.22**		**0.22**		**0.22**		**0.19**	**J**	**0.23**		**0.23**		**0.24**		0.069	J	**0.22**	**J**
Nickel	7440-02-0	**20**	30	140	**190**		**150**		**100**		**160**		**140**		**200**		**450**		**440**		**160**		**180**	
Potassium	7440-09-7	NA	NA	NA	1200		1400		800	J	1300		1100		1200		1500		1700		760		1300	
Selenium	7782-49-2	NA	3.9	36	23	U	17	J	25	U	26	U	26	U	4.7	U	6.5	U	6.3	U	2.7	U	7.1	U
Silver	7440-22-4	**1**	2	36	**1.2**	**J**	**1.6**	**J**	0.51	U	**1.1**	**J**	**1.1**	**J**	2.7	U	3.7	U	3.6	U	1.5	U	4	U
Sodium	7440-23-5	NA	NA	NA	760	J	400	J	470	J	710	J	600	J	300	U	520	J	540	J	170	J	450	U
Thallium	7440-28-0	NA	NA	NA	10	U	7.5	U	11	U	12	U	12	U	5.1	U	7	U	6.8	U	2.9	U	7.6	U
Vanadium	7440-62-2	NA	NA	NA	53		51		29		52		42		53		62		68		32		48	
Zinc	7440-66-6	**120**	109	2200	**410**		**370**		**190**		**420**		**320**		**320**		**300**		**320**		100		**270**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	12.8		17.5		11.7		11.3		11		15.1		12		11.4		31.1		10.7	

Notes:
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Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD854		BRSD855		BRSD856		BRSD857		BRSD858		BRSD859		BRSD860		BRSD860		BRSD861		BRSD862	
				Sample ID	BRSD854-0-0.5		BRSD855-0-0.5		BRSD856-0-0.5		BRSD857-0-0.5		BRSD858-0-0.5		BRSD859-0-0.5		BRSD860-0-0.5		BRSD860-0-0.5-1		BRSD861-0-0.5		BRSD862-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		1		0.5		0.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																								
Aluminum	7429-90-5	NA	NA	NA	12000		3900	B	4100	B	14000	B	16000	B	2800	B	2600	B	2700	B	9100	B	17000	B
Antimony	7440-36-0	**2**	NA	NA	12	U	**4.8**		3.6	U	20	U	**22**	**J**	2.5	U	2.5	U	**2.9**		6.1	U	8.2	U
Arsenic	7440-38-2	**6**	13	16	5.5	U	1.2	U	1.6	U	8.8	U	8.3	U	1.1	U	1.1	U	1	U	2.7	U	3.7	U
Barium	7440-39-3	NA	350	350	260		52		81		240		250		55		29		29		150		260	
Beryllium	7440-41-7	NA	7.2	14	1.5	J	0.18	J	0.17	J	0.58	J	0.78	J	0.13	J	0.21	J	0.19	J	0.39	J	0.6	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**1.8**		0.19	U	0.26	U	1.4	U	**1.8**	**J**	0.18	U	0.18	U	0.17	U	0.45	U	0.6	U
Calcium	7440-70-2	NA	NA	NA	6000		4500		1800		5400		6100		7600		18000		3600		5300		7200	
Chromium, Hexavalent	18540-29-9	NA	1	22	0.56	U	0.11	U	0.17	U	0.88	U	0.84	U	0.11	U	0.13	J	0.1	U	0.27	U	2.2	JD
Chromium, Total	7440-47-3	**26**	30	36	**120**		**46**		**52**		**110**		**120**		**38**		**79**		**56**		**58**		**87**	
Cobalt	7440-48-4	NA	NA	NA	44		33		21		56		43		9.1		11		14		19		25	
Copper	7440-50-8	**16**	50	270	**230**		**84**	**B**	**55**	**B**	**1000**	**B**	**350**	**B**	**20**	**B**	**20**	**B**	**37**	**B**	**40**	**B**	**74**	**B**
Cyanide	57-12-5	NA	27	27	2.4	U	0.43	U	0.77	U	2.7	U	4.1	U	0.43	U	0.53	U	0.46	U	1.4	U	2.5	
Iron	7439-89-6	**20000**	NA	NA	**26000**		**49000**	**D**	16000	D	**31000**		**33000**		16000	D	**25000**	**D**	**27000**	**D**	**29000**	**D**	**30000**	**D**
Lead	7439-92-1	**31**	63	400	**53**		8.9		15		**62**		**52**		5.2		10		5.1		27		**54**	
Magnesium	7439-95-4	NA	NA	NA	6100		43000	D	13000	D	8000		8500		8600	D	18000	D	7600	D	4800		6200	
Manganese	7439-96-5	**460**	1600	2000	**490**		**580**		290		320		240		**770**		370		240		350		**530**	
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.19**		0.0089	J	0.037	J	**0.24**	**J**	**0.26**		0.0045	U	0.0056	J	0.0041	U	0.093		**0.15**	
Nickel	7440-02-0	**20**	30	140	**180**		**130**		**69**		**250**		**190**		**33**		**37**		**43**		**67**		**98**	
Potassium	7440-09-7	NA	NA	NA	890		200		330		1200		1000		240		190		170		570		780	
Selenium	7782-49-2	NA	3.9	36	4.7	U	0.99	U	1.4	U	7.5	U	7.1	U	0.94	U	0.94	U	0.87	U	2.3	U	3.2	U
Silver	7440-22-4	**1**	2	36	2.7	U	0.56	U	0.78	U	4.3	U	4	U	0.54	U	0.54	U	0.5	U	1.3	U	1.8	U
Sodium	7440-23-5	NA	NA	NA	480	J	150		260		760	J	490	J	110	J	120	J	85	J	330		550	
Thallium	7440-28-0	NA	NA	NA	5.1	U	1.1	U	1.5	U	8.1	U	7.6	U	1	U	1	U	0.94	U	2.5	U	3.4	U
Vanadium	7440-62-2	NA	NA	NA	48		16		16		55		68		13		20		19		33		53	
Zinc	7440-66-6	**120**	109	2200	**160**		85		70		**250**		**230**		45		54		40		**140**		**220**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	15.5		77		52		10		10.3		79.1		81		83		32.5		23.7	

Notes:
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B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSD863		BRSD864		BRSD865		BRSD866		BRSD867		BRSD868		BRSD869		BRSD870		BRSD871		BRSD872	
					Sample ID	BRSD863-0-0.5		BRSD864-0-0.5		BRSD865-0-0.5		BRSD866-0-0.5		BRSD867-0-0.5		BRSD868-0-0.5		BRSD869-0-0.5		BRSD870-0-0.5		BRSD871-0-0.5		BRSD872-0-0.5	
					Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
					End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	13000	B	7300	B	14000		16000		12000		3200		3000		3400		15000		15000	
Antimony	7440-36-0	**2**	NA	NA	5.4	U	4	U	**18**	**J**	**20**		**13**		**5.7**		**5.1**		**10**		**20**	**J**	**18**	
Arsenic	7440-38-2	**6**	13	16	2.4	U	1.8	U	4.9	J	5.2	J	3.2	J	1.4	J	1.3	U	2.6	J	6.3	U	5.6	J
Barium	7440-39-3	NA	350	350	190		120		280		350		180		46		51		48		310		260	
Beryllium	7440-41-7	NA	7.2	14	0.38	J	0.28	J	0.76	J	0.82	J	0.59	J	0.19	J	0.17	J	0.28	J	0.81	J	0.76	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.4	U	0.3	U	**1.9**		**2**		**1.5**		0.38		0.36	J	**0.62**		**2.3**		**2**	
Calcium	7440-70-2	NA	NA	NA	4800		2700		7500		7700		5200		1200		1400		1200		7700		6000	
Chromium, Hexavalent	18540-29-9	NA	1	22	1.2	U	0.95	U	2.5	U	3	U	1.7	U	0.11	U			0.12	J U	1.5	U	2.5	U
Chromium, Total	7440-47-3	**26**	30	36	**82**		**58**		**89**		**96**		**91**		**61**		**43**		**150**		**91**		**97**	
Cobalt	7440-48-4	NA	NA	NA	20		22		31		31		31		16		11		25		32		34	
Copper	7440-50-8	**16**	50	270	**30**	**B**	**26**	**B**	**130**		**130**		**73**		**37**		14		**63**		**130**		**160**	
Cyanide	57-12-5	NA	27	27	0.94	U	0.78	U	2.3	U	3.1	U	1.8	U	0.49	U	0.5	U	0.51	U	3.4	U	2.2	U
Iron	7439-89-6	**20000**	NA	NA	12000		12000	D	**28000**		**34000**		19000		12000		11000		**26000**		**33000**		**30000**	
Lead	7439-92-1	**31**	63	400	4.1		4.5		**54**		**48**		**32**		3.6		3.1		3.8		**49**		**46**	
Magnesium	7439-95-4	NA	NA	NA	4000		3300		6100		6400		6300		6300		6300		23000		6800		7400	
Manganese	7439-96-5	**460**	1600	2000	270		200		**770**		**730**		290		160		180		240		**890**		**480**	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.04	J	0.037	J	**0.18**		**0.17**		0.12		0.021	J	0.015	J	0.012	J	**0.2**	**J**	**0.27**	
Nickel	7440-02-0	**20**	30	140	**76**		**74**		**110**		**120**		**100**		**57**		**34**		**130**		**130**		**120**	
Potassium	7440-09-7	NA	NA	NA	290		270		650		790		680		240		350		250		930		890	
Selenium	7782-49-2	NA	3.9	36	2.1	U	1.5	U	16	U	21	U	12	U	3.9	U	5	U	4.1	U	25	U	17	U
Silver	7440-22-4	**1**	2	36	1.2	U	0.88	U	0.34	J	0.8	J	0.33	J	0.08	U	0.13	J	0.083	U	**1.1**	**J**	0.84	J
Sodium	7440-23-5	NA	NA	NA	360		240		590		690	J	350	J	68	J	110	J	100	J	620	J	460	J
Thallium	7440-28-0	NA	NA	NA	2.2	U	1.7	U	7.4	U	9.4	U	5.4	U	1.8	U	2.3	U	1.8	U	11	U	7.6	U
Vanadium	7440-62-2	NA	NA	NA	35		24		47		53		39		12		11		14		54		49	
Zinc	7440-66-6	**120**	109	2200	38		33		**210**		**210**		**120**		44		33		45		**240**		**230**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	35		45.6		17		14.4		25.4		76.9		59.7		73.8		11.9		17.9	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSD873		BRSD873		BRSD874		BRSD875		BRSD876		BRSD877		BRSD878		BRSD879		BRSD880		BRSD881	
					Sample ID	BRSD873-0-0.5		BRSD873-0-0.5-1		BRSD874-0-0.5		BRSD875-0-0.5		BRSD876-0-0.5		BRSD877-0-0.5		BRSD878-0-0.5		BRSD879-0-0.5		BRSD880-0-0.5		BRSD881-0-0.5	
					Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
					End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		19000		24000		16000		18000		16000		19000		19000		20000		21000		22000	
Antimony	7440-36-0	**2**	NA	NA		**18**		**24**		**19**	**J**	**21**		**18**		**18**		**21**		**21**		**24**		**24**	
Arsenic	7440-38-2	**6**	13	16		**6.4**	**J**	**10**	**J**	6.2	U	**7.1**	**J**	5.9	J	5.6	J	**6.8**	**J**	**6.6**	**J**	**8.4**	**J**	**9.9**	**J**
Barium	7440-39-3	NA	350	350		250		320		260		300		240		280		270		290		290		300	
Beryllium	7440-41-7	NA	7.2	14		1	J	1.2	J	0.97	J	0.99	J	0.9	J	0.96	J	1	J	1	J	1.1	J	1	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		**2.4**		**3.1**		**2.2**		**2.4**		**2.2**		**2.3**		**2.3**		**2.4**		**2.6**		**2.3**	
Calcium	7440-70-2	NA	NA	NA		6400		8200		8300		6900		6000		6000		7800		6200		8400		7400	
Chromium, Hexavalent	18540-29-9	NA	1	22		2.3	U	0.85	U	1.4	U	1.2	U	0.96	U	2.9	U	1.2	U	0.99	U	1.2	U	1.1	U
Chromium, Total	7440-47-3	**26**	30	36		**140**		**180**		**97**		**120**		**120**		**120**		**120**		**130**		**130**		**110**	
Cobalt	7440-48-4	NA	NA	NA		50		62		34		45		40		38		37		41		39		42	
Copper	7440-50-8	**16**	50	270		**710**		**840**		**200**		**290**		**410**		**340**		**350**		**440**		**410**		**250**	
Cyanide	57-12-5	NA	27	27		2.1	U	2	U	2.5	U	3	U	2.2	U	1.8	U	2.5	U	2.2	U	2.5	U	2.4	U
Iron	7439-89-6	**20000**	NA	NA		**27000**		**34000**		**29000**		**38000**		**33000**		**26000**		**34000**		**39000**		**39000**		**43000**	
Lead	7439-92-1	**31**	63	400		**87**		**110**		**58**		**62**		**75**		**68**		**70**		**74**		**76**		**54**	
Magnesium	7439-95-4	NA	NA	NA		8400		11000		8400		7900		7200		7600		8600		7800		8800		8800	
Manganese	7439-96-5	**460**	1600	2000		120		150		200		**770**		**600**		150		340		**740**		**610**		**730**	
Mercury	7439-97-6	**0.15**	0.18	0.81		**0.27**		**0.25**		**0.25**		**0.29**		**0.25**		**0.26**		**0.23**		**0.24**		**0.22**		**0.21**	
Nickel	7440-02-0	**20**	30	140		**220**		**280**		**140**		**160**		**170**		**150**		**150**		**170**		**170**		**140**	
Potassium	7440-09-7	NA	NA	NA		1200		1500		1100		1200		1000		1300		1300		1300		1400		1500	
Selenium	7782-49-2	NA	3.9	36		16	U	15	U	25	U	21	U	16	U	20	U	20	U	18	U	21	U	18	U
Silver	7440-22-4	**1**	2	36		0.82	J	0.3	U	**1.3**	**J**	0.94	J	**1**	**J**	**1.3**	**J**	**1.1**	**J**	0.81	J	**1**	**J**	**1.1**	**J**
Sodium	7440-23-5	NA	NA	NA		880		1100		980		500	J	520	J	350	J	390	J	640		430	J	750	
Thallium	7440-28-0	NA	NA	NA		7.2	U	6.8	U	11	U	9.6	U	7.4	U	9.1	U	9.1	U	7.9	U	9.3	U	8.3	U
Vanadium	7440-62-2	NA	NA	NA		63		83		63		59		59		60		62		63		67		66	
Zinc	7440-66-6	**120**	109	2200		**280**		**360**		**270**		**280**		**230**		**270**		**280**		**260**		**280**		**240**	
Chemistry																									
Solids, Percent	SOLID	NA	NA	NA		19		20.2		12.1		14.2		18.3		14.9		15		17.1		14.7		16.4	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD882		BRSD883		BRSD884		BRSD885		BRSD886		BRSD887		BRSD888		BRSD889		BRSD890	
				Sample ID	BRSD882-0-0.5		BRSD883-0-0.5		BRSD884-0-0.5		BRSD885-0-0.5		BRSD886-0-0.5		BRSD887-0-0.5		BRSD888-0-0.5		BRSD889-0-0.5		BRSD890-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																						
Aluminum	7429-90-5	NA	NA	NA	22000		21000		17000		2.6	U	2400		14000		14000		14000		18000	
Antimony	7440-36-0	**2**	NA	NA	**24**		**20**		**19**	**J**	2.7	U	2.6	U	**17**		**16**		**21**		12	JU
Arsenic	7440-38-2	**6**	13	16	**12**	**J**	**7.8**	**J**	**6.8**	**J**	1	U	1.2	U	4.2	U	4.3	U	**7.2**	**J**	4.5	U
Barium	7440-39-3	NA	350	350	290		280		220		0.34	U	36		210		240		290		250	
Beryllium	7440-41-7	NA	7.2	14	1.2	J	1.1	J	0.96	J	0.066	U	0.37		0.77	J	0.79	J	0.95	J	0.66	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**2.7**		**2.4**		**2.1**		0.092	U	0.23	J	**1.8**		**1.8**		**2.5**		**0.95**	**J**
Calcium	7440-70-2	NA	NA	NA	6000		5900		6300		5.3	U	1200		7100		5400		6600		5400	
Chromium, Hexavalent	18540-29-9	NA	1	22	1	U	1.1	U	2.6	R	0.13	U	0.11	U	2.6	U	1	U	3.4	U	2.6	U
Chromium, Total	7440-47-3	**26**	30	36	**140**		**130**		**99**		0.31	J	25		**86**		**84**		**91**		**130**	
Cobalt	7440-48-4	NA	NA	NA	41		38		37		0.12	U	6.5		31		30		29		41	
Copper	7440-50-8	**16**	50	270	**410**		**430**		**260**		0.29	J	16		**190**		**160**		**210**		**490**	
Cyanide	57-12-5	NA	27	27	2.4	U	2.2	U	2.1	U	0.4	U	0.53	U	2.3	U	3.7		2.9	U	4.8	
Iron	7439-89-6	**20000**	NA	NA	**39000**		**39000**		**31000**		2.1	U	8500	D	**27000**		**26000**		**28000**		**34000**	**B**
Lead	7439-92-1	**31**	63	400	**72**		**75**		**54**		0.35	U	4.5		**48**		**48**		**53**		**80**	
Magnesium	7439-95-4	NA	NA	NA	7700		7800		6200		3.3	U	2700		7700		7500		7400		7100	
Manganese	7439-96-5	**460**	1600	2000	**600**		**610**		**470**		0.17	U	80		300		**520**		280		**510**	**B**
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.2**		**0.22**		**0.23**		0.017	J	0.0071	J	**0.22**		**0.21**		**0.25**		**0.18**	
Nickel	7440-02-0	**20**	30	140	**170**		**170**		**150**		0.22	J	**32**		**120**		**110**		**120**		**180**	
Potassium	7440-09-7	NA	NA	NA	1400		1400		980		880		270		860		860		940		1500	
Selenium	7782-49-2	NA	3.9	36	18	U	18	U	18	U	4.1	U	0.99	U	17	U	17	U	22	U	19	J
Silver	7440-22-4	**1**	2	36	**1.2**	**J**	**1.1**	**J**	**1.1**	**J**	0.084	U	0.56	U	0.4	J	0.55	J	**1**	**J**	**1.6**	**J**
Sodium	7440-23-5	NA	NA	NA	850		730		860		200		160		590		320	J	850		690	
Thallium	7440-28-0	NA	NA	NA	8.1	U	8.3	U	8.2	U	1.9	U	1.1	U	7.7	U	7.8	U	10	U	8.1	U
Vanadium	7440-62-2	NA	NA	NA	70		68		60		0.35	U	12		47		49		51		56	
Zinc	7440-66-6	**120**	109	2200	**250**		**250**		**210**		0.96	U	16		**250**		**270**		**250**		**300**	
Chemistry																						
Solids, Percent	SOLID	NA	NA	NA	16.7		16.3		16.6		67.8		78.8		16.8		17.2		12.8		16.5	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

APPENDIX A – Boring Logs

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD832

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, firm, peat		XRF: Cr= ND, Cu= 62ppm, Ni= 50ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD833

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~2.5-3 ft.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, firm, peat		XRF: Cr= ND, Cu= 36ppm, Ni= 31ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD834

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~2.5-3 ft.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, firm, peat		XRF: Cr= ND, Cu= 65ppm, Ni= 41ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD835

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~2.0 ft.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, soft, firm, peat		XRF: Cr= ND, Cu= 46ppm, Ni= ND
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD836

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(ML) trace Sandy SILT, very dark gray (10YR3/1), wet, soft, organic material (roots, twigs)		XRF: Cr= ND, Cu= 171ppm, Ni= 67ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD837

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~2.5 ft.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SW-SM) Sandy SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (roots, twigs), organic odor		XRF: Cr= ND, Cu= 119ppm, Ni= 72ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD838

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, very soft, organic material (roots, twigs)		XRF: Cr= 79ppm, Cu= 147ppm, Ni= 90ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD839

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SW-SM) f SAND & SILT, very dark gray (10 YR3/1), wet, firm/ medium, organic material (twigs, roots)		XRF: Cr= ND, Cu= 17ppm, Ni= 23ppm

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD840

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SW-SM) Clayey f SAND & SILT, very dark gray (10YR3/1), wet, medium/ firm		XRF: Cr= ND, Cu= 22ppm, Ni= 29ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD842

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/3/15 **COMPLETED** 6/3/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD843

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/3/15 **COMPLETED** 6/3/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD844

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/3/15 **COMPLETED** 6/3/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD845

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/3/15 **COMPLETED** 6/3/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD846

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, very soft, roots		XRF: Cr= ND, Cu= 124ppm, Ni= 73ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD851

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, soft, organic material (leaves, roots), organic odor		XRF: Cr= ND, Cu= 448ppm, Ni= 56ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD852

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) Silty f SAND, very dark grayish brown (10YR3/2), wet, soft		XRF: Cr= ND, Cu= 214ppm, Ni= 84ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD853

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, black (10YR2/1), wet, very soft, leaves, organic odor		XRF: Cr= ND, Cu= 88ppm, Ni= 63ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD854

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) trace Sandy SILT, ML, very dark gray (10YR3/1), wet, soft, organic material (leaves, roots, twigs)		XRF: Cr= 78ppm, Cu= 58ppm, Ni= 47ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD855

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/10/15 **COMPLETED** 3/10/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Very rocky stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(GW) fmc SAND & GRAVEL, very dark gray (10YR 3/1), wet, hard, very rocky		XRF: Cr= 137ppm, Cu= ND, Ni= 21ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD856

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/10/15 **COMPLETED** 3/10/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) f Sandy SILT, very dark gray (10YR3/1), wet, soft, organic material (leaves, twigs)		XRF: Cr= 85ppm, Cu= 47ppm, Ni= 71ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD857

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, black (10YR2/1), wet, very soft, loose organic material (roots, leaves)		XRF: Cr= ND, Cu= 191ppm, Ni= 39ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD858

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Stream depth is ~3.5 ft., very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, very dark gray (10YR3/1), wet, very soft, loose organic material (roots, leaves)		XRF: Cr= 64ppm, Cu= 127ppm, Ni= 43ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD859

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/10/15 **COMPLETED** 3/10/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SW) fmc SAND, dark brown (10YR3/3), wet, medium		XRF: Cr= 130ppm, Cu= ND, Ni= ND
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD860

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/10/15 **COMPLETED** 3/10/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SW) fmc SAND, dark brown (10YR3/3), wet, medium, broken glass bottle debris		XRF: Cr= 204ppm, Cu= ND, Ni= 32ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD861

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/10/15 **COMPLETED** 3/10/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES Very soft stream bed
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) SILT, black (10YR2/1), wet, soft, leaves, organic odor		XRF: Cr= 107ppm, Cu= 19ppm, Ni= 42ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD862

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (ML) Sandy SILT, very dark brown (10YR2/2), wet, soft, roots		XRF: Cr= 114ppm, Cu= 34ppm, Ni= 41ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD863

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/11/15 **COMPLETED** 3/11/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		XRF: Cr= 137ppm, Cu= 16ppm, Ni= 61ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD865

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD866

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD867

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD868

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD869

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (GP) f GRAVEL, poor recovery		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD870

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD871

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD872

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD873

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD874

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD875

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD876

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD877

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD878

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD879

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD880

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD881

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD882

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD883

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD884

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD885

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/3/15 **COMPLETED** 6/3/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (GW) fmc SAND & GRAVEL, GW, very dark grayish brown (10YR3/2), wet, firm, very rocky w/ glass & trash debris		
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD886

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 3/12/15 **COMPLETED** 3/12/15
GROUND ELEVATION _____ **HOLE SIZE** 3 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Grab
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
					0.5 (GW) fmc SAND & GRAVEL, very dark grayish brown (10YR3/2), wet, firm, very rocky w/ glass & trash debris, swift current, ~2.5 ft water depth		XRF: Cr= 84ppm, Cu=ND, Ni= 32ppm
					Bottom of borehole at 0.5 feet.		

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD887

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD888

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
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AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GI

BORING NUMBER BRSD889

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
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DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0							
0.5					(SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

ENVIRONMENTAL BH - GINT STD US.GDT - 7/22/15 15:04 - \\MAHPI-FILE01\GIS_PROJECTS\202315_NEW YORK STATE DEPT OF ENVIRONMENTAL CON\184578_NYSDEC_TC_WA5_MAGNA_RD\GINT FILES\MAGNA METALS GINT FILES\MAGNA METALS_EQUIS_GIN

BORING NUMBER BRSD890

HDR Engineering, Inc.

CLIENT NYSDEC
PROJECT NAME Magna Metals State Superfund Site
PROJECT NUMBER NYSDEC Site # 360003
PROJECT LOCATION Cortlandt, New York
DATE STARTED 6/2/15 **COMPLETED** 6/2/15
GROUND ELEVATION _____ **HOLE SIZE** 6 inch
DRILLING CONTRACTOR HDR
GROUND WATER LEVELS:
DRILLING METHOD Ponar Sampler
AT TIME OF DRILLING ---
LOGGED BY Andrew Watson **CHECKED BY** _____
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	RECOVERY (IN)	GRAPHIC LOG	MATERIAL DESCRIPTION	PID READING (PPM)	REMARKS
0					0.5 (SM) f SAND & SILT, very dark grayish brown (10YR3/2), wet, soft, organic material (leaves, roots)		

Bottom of borehole at 0.5 feet.

con-test® ANALYTICAL LABORATORY
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April 1, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland and Manor, NY
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13C0613

Enclosed are results of analyses for samples received by the laboratory on March 20, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

con-test® ANALYTICAL LABORATORY

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD602-0-0.5	13C0613-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-0-0.5	13C0613-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-1-1.5	13C0613-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-2-2.5	13C0613-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD601-0-0.5	13C0613-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD522-0-0.5	13C0613-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-0-0.5	13C0613-07	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-1-1.5	13C0613-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-2-2.5	13C0613-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-2-2.5-1	13C0613-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD609-0-0.5	13C0613-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD609-1-1.5	13C0613-12	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD609-2-2.5	13C0613-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD520-0-0.5	13C0613-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD520-1-1.5	13C0613-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD520-2-2.5	13C0613-16	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-0-0.5	13C0613-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-1-1.5	13C0613-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-2-2.5	13C0613-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD701-0-0.5	13C0613-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD701-0-0.5-1	13C0613-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-0-0.5	13C0613-22	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-1-1.5	13C0613-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-2-2.5	13C0613-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD725-0-0.5	13C0613-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD722-0-0.5	13C0613-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-0-0.5	13C0613-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-1-1.5	13C0613-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-2-2.5	13C0613-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD604-0-0.5	13C0613-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD612-0-0.5	13C0613-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD620-0-0.5	13C0613-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-0-0.5	13C0613-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-1-1.5	13C0613-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-2-2.5	13C0613-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD524-0-0.5	13C0613-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD524-1-1.5	13C0613-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD524-2-2.5	13C0613-38	Soil		SM 2540G SW-846 6010C SW-846 7471B	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Copper, Iron

13C0613-01[PASD602-0-0.5], 13C0613-19[WSTD521-2-2.5], 13C0613-20[BRSD701-0-0.5], 13C0613-21[BRSD701-0-0.5-1], 13C0613-22[BRSD702-0-0.5], 13C0613-23[BRSD702-1-1.5], 13C0613-24[BRSD702-2-2.5], 13C0613-25[BRSD725-0-0.5], 13C0613-26[BRSD722-0-0.5], 13C0613-27[PASD605-0-0.5], 13C0613-28[PASD605-1-1.5], 13C0613-29[PASD605-2-2.5], 13C0613-30[PASD604-0-0.5], 13C0613-31[PASD612-0-0.5], 13C0613-32[PASD620-0-0.5], 13C0613-33[PASD611-0-0.5], 13C0613-34[PASD611-1-1.5], 13C0613-35[PASD611-2-2.5], 13C0613-36[WTSD524-0-0.5], 13C0613-37[WTSD524-1-1.5], 13C0613-38[WTSD524-2-2.5], B069465-BLK1, B069504-BLK1, B069504-DUP1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0613-31[PASD612-0-0.5], B069504-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13C0613-31[PASD612-0-0.5], B069504-MS1

SW-846 7471B

Qualifications:

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Mercury

13C0613-25[BRSD725-0-0.5], B069484-MS1

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD602-0-0.5 | Sampled: 3/19/2013 09:15

Sample ID: 13C0613-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9900	19	8.4	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Antimony	ND	19	16	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Arsenic	11	19	7.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Barium	280	19	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Beryllium	ND	1.9	0.31	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Cadmium	1.4	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Calcium	26000	58	11	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Chromium	43	3.9	0.97	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Cobalt	9.0	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Copper	92	3.9	3.0	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Iron	11000	19	17	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Lead	6.9	5.8	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Magnesium	6900	58	6.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Manganese	620	3.9	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Mercury	0.071	0.20	0.059	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/21/13 15:48	SAJ
Nickel	160	3.9	0.94	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Potassium	520	780	130	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Selenium	ND	39	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Silver	ND	3.9	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Sodium	580	780	380	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/21/13 17:34	OP
Thallium	ND	19	6.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Vanadium	69	7.8	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP
Zinc	48	7.8	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/21/13 17:34	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD602-0-0.5 | Sampled: 3/19/2013 09:15

Sample ID: 13C0613-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.5		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-0-0.5 | Sampled: 3/19/2013 09:30

Sample ID: 13C0613-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8000	16	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Arsenic	7.4	16	5.6	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:35	OP
Barium	350	16	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Beryllium	ND	1.6	0.25	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Cadmium	1.2	1.6	0.92	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:35	OP
Calcium	19000	47	8.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:40	OP
Chromium	68	3.1	0.78	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Cobalt	6.4	16	0.99	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:35	OP
Copper	64	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Iron	9800	16	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Lead	6.3	4.7	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Magnesium	3600	47	4.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:40	OP
Manganese	410	3.1	0.99	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Mercury	0.097	0.15	0.046	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/21/13 15:50	SAJ
Nickel	180	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Potassium	310	620	110	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 14:40	OP
Selenium	ND	16	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:40	OP
Sodium	470	620	300	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 14:40	OP
Thallium	ND	16	5.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Vanadium	45	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP
Zinc	19	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:35	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-0-0.5 | Sampled: 3/19/2013 09:30

Sample ID: 13C0613-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.8		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-1-1.5 | Sampled: 3/19/2013 09:35

Sample ID: 13C0613-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	19	8.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Antimony	ND	19	15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Arsenic	ND	19	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Barium	300	19	2.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Beryllium	ND	1.9	0.30	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Cadmium	1.2	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:55	OP
Calcium	19000	56	10	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:45	OP
Chromium	46	3.7	0.93	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Cobalt	5.2	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:55	OP
Copper	62	3.7	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Iron	5600	19	16	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Lead	3.0	5.6	2.6	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 18:55	OP
Magnesium	3700	56	5.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:45	OP
Manganese	200	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Mercury	0.067	0.18	0.054	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/21/13 15:52	SAJ
Nickel	160	3.7	0.90	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Potassium	300	740	130	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 14:45	OP
Selenium	ND	19	5.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Silver	ND	3.7	3.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 14:45	OP
Sodium	540	740	360	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 14:45	OP
Thallium	ND	19	6.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Vanadium	28	7.4	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP
Zinc	11	7.4	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 18:55	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-1-1.5 | Sampled: 3/19/2013 09:35

Sample ID: 13C0613-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.4		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-2-2.5 | Sampled: 3/19/2013 09:40

Sample ID: 13C0613-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	16	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Antimony	ND	16	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Arsenic	11	16	5.6	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:00	OP
Barium	320	16	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Beryllium	ND	1.6	0.25	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Cadmium	1.8	1.6	0.92	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Calcium	20000	47	8.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:15	OP
Chromium	43	3.1	0.78	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Cobalt	6.8	16	0.99	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:00	OP
Copper	190	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Iron	6500	16	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Lead	3.8	4.7	2.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:00	OP
Magnesium	4000	47	4.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:15	OP
Manganese	120	3.1	0.99	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Mercury	0.098	0.15	0.046	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/21/13 15:53	SAJ
Nickel	160	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Potassium	260	620	110	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:15	OP
Selenium	ND	16	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:15	OP
Sodium	510	620	300	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:15	OP
Thallium	ND	16	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Vanadium	52	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP
Zinc	12	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:00	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD603-2-2.5 | Sampled: 3/19/2013 09:40

Sample ID: 13C0613-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.9		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD601-0-0.5 | Sampled: 3/19/2013 10:05

Sample ID: 13C0613-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	23000	12	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Antimony	ND	12	9.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Arsenic	ND	12	4.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Barium	400	12	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Beryllium	ND	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Cadmium	1.9	1.2	0.71	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Calcium	9900	36	6.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:21	OP
Chromium	59	2.4	0.60	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Cobalt	27	12	0.76	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Copper	220	2.4	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Iron	29000	12	10	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Lead	51	3.6	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Magnesium	6300	36	3.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:21	OP
Manganese	910	2.4	0.76	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Mercury	0.20	0.12	0.036	mg/Kg dry	1		SW-846 7471B	3/21/13	3/21/13 15:55	SAJ
Nickel	140	2.4	0.58	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Potassium	1400	480	82	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:21	OP
Selenium	ND	12	3.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:21	OP
Sodium	320	480	230	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:21	OP
Thallium	ND	12	4.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Vanadium	47	4.8	0.79	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP
Zinc	200	4.8	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:04	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD601-0-0.5 | Sampled: 3/19/2013 10:05

Sample ID: 13C0613-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.9		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD522-0-0.5 | Sampled: 3/19/2013 10:05

Sample ID: 13C0613-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	9.7	4.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Antimony	ND	9.7	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Arsenic	ND	9.7	3.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Barium	470	9.7	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Beryllium	ND	0.97	0.16	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Cadmium	0.96	0.97	0.57	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:10	OP
Calcium	10000	29	5.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:26	OP
Chromium	53	1.9	0.48	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Cobalt	7.8	9.7	0.62	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:10	OP
Copper	53	1.9	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Iron	11000	9.7	8.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Lead	13	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Magnesium	2900	29	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:26	OP
Manganese	390	1.9	0.62	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Mercury	0.080	0.10	0.031	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:13	SAJ
Nickel	98	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Potassium	730	390	67	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:26	OP
Selenium	ND	9.7	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:26	OP
Sodium	220	390	190	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:26	OP
Thallium	ND	9.7	3.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Vanadium	30	3.9	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP
Zinc	39	3.9	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:10	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD522-0-0.5 | Sampled: 3/19/2013 10:05

Sample ID: 13C0613-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	23.9		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-0-0.5 | Sampled: 3/19/2013 11:25

Sample ID: 13C0613-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	16	6.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Arsenic	6.1	16	5.7	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:15	OP
Barium	430	16	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Cadmium	1.6	1.6	0.94	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Calcium	14000	48	8.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:31	OP
Chromium	88	3.2	0.79	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Cobalt	20	16	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Copper	120	3.2	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Iron	17000	16	14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Lead	38	4.8	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Magnesium	4000	48	5.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:31	OP
Manganese	800	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Mercury	0.20	0.16	0.046	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:15	SAJ
Nickel	180	3.2	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Potassium	450	630	110	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:31	OP
Selenium	ND	16	4.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:31	OP
Sodium	350	630	310	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:31	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Vanadium	48	6.3	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP
Zinc	74	6.3	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:15	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-0-0.5 | Sampled: 3/19/2013 11:25

Sample ID: 13C0613-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.5		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-0-0.5 | Sampled: 3/19/2013 11:25

Sample ID: 13C0613-07

Sample Matrix: Soil

ASTM D2216

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/22/13 0:00	GTE

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-1-1.5 | Sampled: 3/19/2013 11:30

Sample ID: 13C0613-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	15	6.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Arsenic	ND	15	5.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Barium	300	15	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Beryllium	ND	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Cadmium	1.8	1.5	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Calcium	15000	46	8.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:37	OP
Chromium	49	3.1	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Cobalt	12	15	0.98	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:20	OP
Copper	250	3.1	2.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Iron	13000	15	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Lead	4.9	4.6	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Magnesium	4200	46	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:37	OP
Manganese	230	3.1	0.98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Mercury	0.11	0.15	0.045	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:16	SAJ
Nickel	200	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Potassium	220	620	110	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:37	OP
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:37	OP
Sodium	340	620	300	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:37	OP
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Vanadium	57	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP
Zinc	12	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:20	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-1-1.5 | Sampled: 3/19/2013 11:30

Sample ID: 13C0613-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-2-2.5 | Sampled: 3/19/2013 11:35

Sample ID: 13C0613-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6800	18	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Antimony	ND	18	15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Arsenic	7.2	18	6.5	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:26	OP
Barium	360	18	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Beryllium	ND	1.8	0.29	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Cadmium	2.1	1.8	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Calcium	19000	54	9.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:42	OP
Chromium	53	3.6	0.90	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Cobalt	11	18	1.2	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:26	OP
Copper	320	3.6	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Iron	8600	18	15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Lead	6.2	5.4	2.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Magnesium	5500	54	5.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:42	OP
Manganese	180	3.6	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Mercury	0.16	0.18	0.052	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:18	SAJ
Nickel	250	3.6	0.87	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Potassium	300	720	120	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:42	OP
Selenium	ND	18	5.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Silver	ND	3.6	3.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:42	OP
Sodium	ND	720	350	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:42	OP
Thallium	ND	18	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Vanadium	42	7.2	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP
Zinc	17	7.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:26	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-2-2.5 | Sampled: 3/19/2013 11:35

Sample ID: 13C0613-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.8		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-2-2.5-1 | Sampled: 3/19/2013 11:40

Sample ID: 13C0613-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	17	7.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Antimony	ND	17	14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Arsenic	7.8	17	6.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:30	OP
Barium	380	17	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Beryllium	ND	1.7	0.27	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Cadmium	1.9	1.7	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Calcium	19000	51	9.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:47	OP
Chromium	53	3.4	0.85	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Cobalt	10	17	1.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:30	OP
Copper	280	3.4	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Iron	7600	17	14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Lead	6.3	5.1	2.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Magnesium	5400	51	5.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:47	OP
Manganese	190	3.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Mercury	0.12	0.18	0.052	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:20	SAJ
Nickel	240	3.4	0.82	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Potassium	290	680	120	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:47	OP
Selenium	ND	17	5.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Silver	ND	3.4	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:47	OP
Sodium	ND	680	330	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:47	OP
Thallium	ND	17	5.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Vanadium	41	6.8	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP
Zinc	16	6.8	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:30	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD606-2-2.5-1 | Sampled: 3/19/2013 11:40

Sample ID: 13C0613-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-0-0.5 | Sampled: 3/19/2013 13:00

Sample ID: 13C0613-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	12	5.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Antimony	ND	12	9.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Arsenic	6.2	12	4.4	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:35	OP
Barium	470	12	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Beryllium	ND	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Cadmium	1.3	1.2	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Calcium	13000	36	6.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:51	OP
Chromium	54	2.4	0.61	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Cobalt	13	12	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Copper	90	2.4	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Iron	16000	12	10	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Lead	42	3.6	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Magnesium	4400	36	3.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:51	OP
Manganese	370	2.4	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Mercury	0.16	0.13	0.038	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:21	SAJ
Nickel	130	2.4	0.59	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Potassium	620	480	83	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:51	OP
Selenium	ND	12	3.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:51	OP
Sodium	260	480	240	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:51	OP
Thallium	ND	12	4.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Vanadium	46	4.8	0.80	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP
Zinc	62	4.8	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:35	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-0-0.5 | Sampled: 3/19/2013 13:00

Sample ID: 13C0613-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.0		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-1-1.5 | Sampled: 3/19/2013 13:05

Sample ID: 13C0613-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	11	4.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Antimony	ND	11	8.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Arsenic	4.6	11	3.9	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:40	OP
Barium	430	11	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Cadmium	1.3	1.1	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Calcium	14000	33	5.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:57	OP
Chromium	48	2.2	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Cobalt	9.0	11	0.70	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 19:40	OP
Copper	86	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Iron	12000	11	9.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Lead	35	3.3	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Magnesium	3800	33	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:57	OP
Manganese	260	2.2	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Mercury	0.19	0.11	0.033	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:23	SAJ
Nickel	140	2.2	0.53	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Potassium	450	440	75	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:57	OP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 15:57	OP
Sodium	230	440	210	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 15:57	OP
Thallium	ND	11	3.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Vanadium	37	4.4	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP
Zinc	46	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:40	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-1-1.5 | Sampled: 3/19/2013 13:05

Sample ID: 13C0613-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	22.4		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-1-1.5 | Sampled: 3/19/2013 13:05

Sample ID: 13C0613-12

Sample Matrix: Soil

ASTM D2216

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/22/13 0:00	GTE

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-2-2.5 | Sampled: 3/19/2013 13:10

Sample ID: 13C0613-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6000	14	6.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Arsenic	7.5	14	5.2	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:01	OP
Barium	280	14	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Cadmium	1.7	1.4	0.85	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Calcium	14000	43	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:02	OP
Chromium	44	2.9	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Cobalt	9.1	14	0.92	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:01	OP
Copper	150	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Iron	7600	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Lead	3.9	4.3	2.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:01	OP
Magnesium	3600	43	4.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:02	OP
Manganese	130	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Mercury	0.074	0.14	0.042	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:25	SAJ
Nickel	170	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Potassium	290	570	98	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 16:02	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:02	OP
Sodium	ND	570	280	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:02	OP
Thallium	ND	14	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Vanadium	39	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP
Zinc	28	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:01	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD609-2-2.5 | Sampled: 3/19/2013 13:10

Sample ID: 13C0613-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.3		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD520-0-0.5 | Sampled: 3/19/2013 14:45

Sample ID: 13C0613-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	13	5.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Arsenic	ND	13	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Barium	430	13	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Beryllium	ND	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Cadmium	1.8	1.3	0.79	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Calcium	11000	40	7.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Chromium	110	2.7	0.67	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Cobalt	25	13	0.85	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Copper	220	2.7	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Iron	24000	13	11	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Lead	71	4.0	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Magnesium	5400	40	4.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Manganese	680	2.7	0.85	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Mercury	0.19	0.14	0.040	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:30	SAJ
Nickel	220	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Potassium	750	530	92	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Selenium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Silver	ND	2.7	2.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Sodium	620	530	260	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:27	OP
Thallium	ND	13	4.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Vanadium	54	5.3	0.88	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP
Zinc	150	5.3	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:06	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD520-0-0.5 | Sampled: 3/19/2013 14:45

Sample ID: 13C0613-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD520-1-1.5 | Sampled: 3/19/2013 14:50

Sample ID: 13C0613-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	10	4.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Antimony	ND	10	8.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Arsenic	6.0	10	3.6	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:12	OP
Barium	620	10	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Beryllium	ND	1.0	0.16	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Cadmium	1.9	1.0	0.59	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Calcium	18000	30	5.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Chromium	130	2.0	0.50	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Cobalt	25	10	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Copper	190	2.0	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Iron	23000	10	8.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Lead	51	3.0	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Magnesium	4900	30	3.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Manganese	770	2.0	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Mercury	0.22	0.11	0.032	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:32	SAJ
Nickel	290	2.0	0.49	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Potassium	410	400	69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Selenium	ND	10	3.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Silver	ND	2.0	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Sodium	630	400	200	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:33	OP
Thallium	ND	10	3.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Vanadium	53	4.0	0.66	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP
Zinc	76	4.0	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:12	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD520-1-1.5 | Sampled: 3/19/2013 14:50

Sample ID: 13C0613-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	23.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD520-2-2.5 | Sampled: 3/19/2013 14:55

Sample ID: 13C0613-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	11	4.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Antimony	ND	11	8.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Arsenic	6.3	11	4.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:17	OP
Barium	320	11	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Cadmium	1.4	1.1	0.65	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Calcium	12000	33	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:38	OP
Chromium	70	2.2	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Cobalt	23	11	0.70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Copper	370	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Iron	13000	11	9.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Lead	7.9	3.3	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Magnesium	5000	33	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:38	OP
Manganese	230	2.2	0.70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Mercury	0.10	0.12	0.034	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:34	SAJ
Nickel	300	2.2	0.53	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Potassium	890	440	76	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:38	OP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:38	OP
Sodium	520	440	210	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:38	OP
Thallium	ND	11	3.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Vanadium	40	4.4	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP
Zinc	31	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:17	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD520-2-2.5 | Sampled: 3/19/2013 14:55

Sample ID: 13C0613-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.2		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD520-2-2.5 | Sampled: 3/19/2013 14:55

Sample ID: 13C0613-16

Sample Matrix: Soil

ASTM D2216

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/22/13 0:00	GTE

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-0-0.5 | Sampled: 3/19/2013 15:00

Sample ID: 13C0613-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	14	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Arsenic	9.9	14	5.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:22	OP
Barium	450	14	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Beryllium	ND	1.4	0.22	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Cadmium	1.9	1.4	0.82	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Calcium	17000	42	7.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:44	OP
Chromium	110	2.8	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Cobalt	35	14	0.88	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Copper	500	2.8	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Iron	17000	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Lead	87	4.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Magnesium	7700	42	4.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:44	OP
Manganese	700	2.8	0.88	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Mercury	0.24	0.14	0.041	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:35	SAJ
Nickel	250	2.8	0.67	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Potassium	1100	550	95	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:44	OP
Selenium	ND	14	4.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Silver	ND	2.8	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:44	OP
Sodium	580	550	270	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:44	OP
Thallium	ND	14	4.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Vanadium	62	5.5	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP
Zinc	150	5.5	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:22	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-0-0.5 | Sampled: 3/19/2013 15:00

Sample ID: 13C0613-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.6		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-1-1.5 | Sampled: 3/19/2013 15:05

Sample ID: 13C0613-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	15	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Arsenic	12	15	5.6	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:28	OP
Barium	420	15	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Beryllium	ND	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Cadmium	1.4	1.5	0.91	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:28	OP
Calcium	24000	46	8.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:49	OP
Chromium	180	3.1	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Cobalt	19	15	0.99	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Copper	310	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Iron	11000	15	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Lead	40	4.6	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Magnesium	7600	46	4.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:49	OP
Manganese	590	3.1	0.98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Mercury	0.15	0.16	0.046	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:37	SAJ
Nickel	320	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Potassium	690	620	110	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:49	OP
Selenium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:49	OP
Sodium	620	620	300	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 16:49	OP
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Vanadium	60	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP
Zinc	71	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:28	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-1-1.5 | Sampled: 3/19/2013 15:05

Sample ID: 13C0613-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.7		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-2-2.5 | Sampled: 3/19/2013 15:10

Sample ID: 13C0613-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8600	14	6.2	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:01	OP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Arsenic	7.8	14	5.2	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:38	OP
Barium	330	14	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Cadmium	1.1	1.4	0.85	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:38	OP
Calcium	23000	43	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Chromium	220	2.9	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Cobalt	16	14	0.92	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Copper	200	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Iron	8900	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Lead	22	4.3	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Magnesium	6800	43	4.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Manganese	390	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Mercury	0.084	0.15	0.044	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:39	SAJ
Nickel	200	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Potassium	660	570	98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:01	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Sodium	570	570	280	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:01	OP
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Vanadium	82	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP
Zinc	61	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:38	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WSTD521-2-2.5 | Sampled: 3/19/2013 15:10

Sample ID: 13C0613-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.7		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD701-0-0.5 | Sampled: 3/19/2013 15:20

Sample ID: 13C0613-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	11	4.8	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:26	OP
Antimony	ND	11	8.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Arsenic	ND	11	4.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Barium	200	11	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Cadmium	0.85	1.1	0.65	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:43	OP
Calcium	18000	33	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Chromium	32	2.2	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Cobalt	11	11	0.71	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:43	OP
Copper	110	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Iron	14000	11	9.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Lead	37	3.3	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Magnesium	5800	33	3.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Manganese	330	2.2	0.70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Mercury	0.14	0.11	0.033	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:40	SAJ
Nickel	100	2.2	0.54	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Potassium	920	440	76	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:26	OP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Sodium	280	440	220	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:26	OP
Thallium	ND	11	3.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Vanadium	33	4.4	0.73	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP
Zinc	62	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:43	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD701-0-0.5 | Sampled: 3/19/2013 15:20

Sample ID: 13C0613-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.9		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD701-0-0.5-1 | Sampled: 3/19/2013 15:25

Sample ID: 13C0613-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9800	10	4.5	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:31	OP
Antimony	ND	10	8.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Arsenic	ND	10	3.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Barium	260	10	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Beryllium	ND	1.0	0.17	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Cadmium	1.1	1.0	0.62	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Calcium	24000	31	5.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Chromium	36	2.1	0.52	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Cobalt	9.8	10	0.67	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:48	OP
Copper	130	2.1	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Iron	14000	10	8.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Lead	37	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Magnesium	6100	31	3.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Manganese	400	2.1	0.67	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Mercury	0.16	0.10	0.030	mg/Kg dry	1		SW-846 7471B	3/21/13	3/22/13 14:42	SAJ
Nickel	130	2.1	0.51	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Potassium	690	420	72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:31	OP
Selenium	ND	10	3.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Silver	ND	2.1	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Sodium	310	420	200	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:31	OP
Thallium	ND	10	3.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Vanadium	40	4.2	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP
Zinc	57	4.2	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:48	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD701-0-0.5-1 | Sampled: 3/19/2013 15:25

Sample ID: 13C0613-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	23.6		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-0-0.5 | Sampled: 3/19/2013 15:40

Sample ID: 13C0613-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	16	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:37	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Arsenic	ND	16	5.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Barium	310	16	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Cadmium	1.2	1.6	0.95	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:53	OP
Calcium	17000	48	8.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Chromium	45	3.2	0.80	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Cobalt	14	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:53	OP
Copper	120	3.2	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Iron	17000	16	14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Lead	42	4.8	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Magnesium	5100	48	5.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Manganese	590	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Mercury	0.16	0.17	0.051	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:43	SAJ
Nickel	160	3.2	0.78	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Potassium	890	640	110	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:37	OP
Selenium	ND	16	4.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Sodium	480	640	310	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:37	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Vanadium	41	6.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP
Zinc	110	6.4	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:53	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-0-0.5 | Sampled: 3/19/2013 15:40

Sample ID: 13C0613-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.4		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-0-0.5 | Sampled: 3/19/2013 15:40

Sample ID: 13C0613-22

Sample Matrix: Soil

ASTM D2216

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/22/13 0:00	GTE

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-1-1.5 | Sampled: 3/19/2013 15:45

Sample ID: 13C0613-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9600	14	6.2	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:42	OP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Arsenic	ND	14	5.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Barium	290	14	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Cadmium	0.88	1.4	0.84	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:57	OP
Calcium	21000	43	7.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Chromium	40	2.9	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Cobalt	9.1	14	0.91	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 20:57	OP
Copper	70	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Iron	10000	14	12	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Lead	16	4.3	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Magnesium	4300	43	4.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Manganese	480	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Mercury	0.12	0.14	0.043	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:45	SAJ
Nickel	180	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Potassium	490	570	98	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:42	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Sodium	530	570	280	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:42	OP
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Vanadium	29	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP
Zinc	47	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 20:57	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-1-1.5 | Sampled: 3/19/2013 15:45

Sample ID: 13C0613-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-2-2.5 | Sampled: 3/19/2013 15:50

Sample ID: 13C0613-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6800	17	7.5	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:47	OP
Antimony	ND	17	14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Arsenic	ND	17	6.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Barium	210	17	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Beryllium	ND	1.7	0.28	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Cadmium	ND	1.7	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Calcium	25000	52	9.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Chromium	46	3.5	0.87	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Cobalt	4.8	17	1.1	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:02	OP
Copper	93	3.5	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Iron	4800	17	15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Lead	3.0	5.2	2.4	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:02	OP
Magnesium	5400	52	5.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Manganese	190	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Mercury	0.095	0.18	0.052	mg/Kg dry	1	J	SW-846 7471B	3/21/13	3/22/13 14:51	SAJ
Nickel	280	3.5	0.84	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Potassium	400	690	120	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:47	OP
Selenium	ND	17	5.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Silver	ND	3.5	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Sodium	530	690	340	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:47	OP
Thallium	ND	17	5.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Vanadium	23	6.9	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP
Zinc	9.9	6.9	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:02	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD702-2-2.5 | Sampled: 3/19/2013 15:50

Sample ID: 13C0613-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD725-0-0.5 | Sampled: 3/18/2013 09:25

Sample ID: 13C0613-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3700	7.1	3.1	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:52	OP
Antimony	ND	7.1	5.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Arsenic	ND	7.1	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Barium	160	7.1	0.88	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Beryllium	ND	0.71	0.11	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Cadmium	0.75	0.71	0.42	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Calcium	13000	21	3.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Chromium	64	1.4	0.35	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Cobalt	33	7.1	0.45	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Copper	70	1.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Iron	18000	7.1	6.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Lead	16	2.1	0.98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Magnesium	18000	21	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Manganese	530	1.4	0.45	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Mercury	0.058	0.072	0.021	mg/Kg dry	1	MS-07, J	SW-846 7471B	3/21/13	3/22/13 14:52	SAJ
Nickel	110	1.4	0.34	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Potassium	1400	280	49	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:52	OP
Selenium	ND	7.1	2.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Sodium	ND	280	140	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:52	OP
Thallium	ND	7.1	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Vanadium	16	2.8	0.47	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP
Zinc	98	2.8	0.73	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:06	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD725-0-0.5 | Sampled: 3/18/2013 09:25

Sample ID: 13C0613-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	34.2		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD722-0-0.5 | Sampled: 3/18/2013 09:50

Sample ID: 13C0613-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6900	2.9	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 11:57	OP
Antimony	9.2	2.9	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Barium	75	2.9	0.37	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Beryllium	ND	0.29	0.047	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Cadmium	0.38	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Calcium	2200	8.8	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Chromium	160	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Cobalt	61	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Copper	58	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Iron	45000	29	25	mg/Kg dry	10		SW-846 6010C	3/21/13	3/27/13 11:35	OP
Lead	13	0.88	0.41	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Magnesium	39000	88	9.2	mg/Kg dry	10		SW-846 6010C	3/21/13	3/27/13 11:35	OP
Manganese	700	0.59	0.19	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Mercury	0.032	0.031	0.0090	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:02	SAJ
Nickel	220	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Potassium	660	120	20	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 11:57	OP
Selenium	ND	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Sodium	110	120	57	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 11:57	OP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Vanadium	30	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP
Zinc	61	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:32	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: BRSD722-0-0.5 | Sampled: 3/18/2013 09:50

Sample ID: 13C0613-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.4		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-0-0.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	22000	6.3	2.7	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:03	OP
Antimony	ND	6.3	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Arsenic	ND	6.3	2.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Barium	460	6.3	0.79	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Beryllium	0.25	0.63	0.10	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:35	OP
Cadmium	0.62	0.63	0.37	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:35	OP
Calcium	6300	19	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Chromium	62	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Cobalt	13	6.3	0.41	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Copper	94	1.3	0.97	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Iron	12000	6.3	5.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Lead	10	1.9	0.88	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Magnesium	3500	19	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Manganese	190	1.3	0.40	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Mercury	0.076	0.064	0.019	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:04	SAJ
Nickel	96	1.3	0.31	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Potassium	690	250	44	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:03	OP
Selenium	ND	6.3	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Silver	ND	1.3	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Sodium	170	250	120	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 12:03	OP
Thallium	ND	6.3	2.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Vanadium	31	2.5	0.42	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP
Zinc	41	2.5	0.65	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:35	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-0-0.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	38.6		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-1-1.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	26000	5.6	2.4	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:08	OP
Antimony	ND	5.6	4.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Arsenic	ND	5.6	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Barium	620	5.6	0.69	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Beryllium	0.36	0.56	0.090	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:40	OP
Cadmium	0.50	0.56	0.33	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:40	OP
Calcium	5600	17	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Chromium	70	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Cobalt	12	5.6	0.36	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Copper	48	1.1	0.85	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Iron	12000	5.6	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Lead	9.9	1.7	0.77	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Magnesium	3600	17	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Manganese	180	1.1	0.35	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Mercury	0.073	0.055	0.016	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:06	SAJ
Nickel	91	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Potassium	770	220	38	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:08	OP
Selenium	ND	5.6	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Silver	ND	1.1	0.98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Sodium	160	220	110	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 12:08	OP
Thallium	ND	5.6	1.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Vanadium	35	2.2	0.37	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP
Zinc	41	2.2	0.57	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:40	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-1-1.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	44.8		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-2-2.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-29

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	22000	7.9	3.4	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:13	OP
Antimony	ND	7.9	6.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Arsenic	ND	7.9	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Barium	500	7.9	0.98	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Beryllium	0.33	0.79	0.13	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:45	OP
Cadmium	0.97	0.79	0.47	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Calcium	8500	24	4.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Chromium	73	1.6	0.39	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Cobalt	14	7.9	0.50	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Copper	100	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Iron	12000	7.9	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Lead	12	2.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Magnesium	3800	24	2.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Manganese	210	1.6	0.50	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Mercury	0.067	0.077	0.023	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/22/13 15:11	SAJ
Nickel	120	1.6	0.38	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Potassium	710	320	54	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:13	OP
Selenium	ND	7.9	2.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Sodium	180	320	150	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 12:13	OP
Thallium	ND	7.9	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Vanadium	37	3.2	0.52	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP
Zinc	40	3.2	0.81	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:45	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD605-2-2.5 | Sampled: 3/18/2013 15:40

Sample ID: 13C0613-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	31.6		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD604-0-0.5 | Sampled: 3/18/2013 14:30

Sample ID: 13C0613-30

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	3.5	1.5	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:47	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Arsenic	ND	3.5	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Barium	190	3.5	0.44	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Beryllium	ND	0.35	0.057	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Cadmium	0.37	0.35	0.21	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Calcium	6100	11	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Chromium	110	0.70	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Cobalt	29	3.5	0.22	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Copper	89	0.70	0.54	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Iron	20000	3.5	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Lead	9.2	1.1	0.49	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Magnesium	10000	11	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Manganese	310	0.70	0.22	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Mercury	0.056	0.035	0.010	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:13	SAJ
Nickel	88	0.70	0.17	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Potassium	1400	140	24	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:47	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Silver	ND	0.70	0.62	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Sodium	420	140	68	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:47	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Vanadium	44	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP
Zinc	47	1.4	0.36	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:50	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD604-0-0.5 | Sampled: 3/18/2013 14:30

Sample ID: 13C0613-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.6		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD612-0-0.5 | Sampled: 3/18/2013 15:00

Sample ID: 13C0613-31

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8600	4.7	2.0	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	3/21/13	3/25/13 10:35	OP
Antimony	ND	4.7	3.8	mg/Kg dry	1	MS-07	SW-846 6010C	3/21/13	3/22/13 19:56	OP
Arsenic	9.8	4.7	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Barium	120	4.7	0.59	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Beryllium	ND	0.47	0.076	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Cadmium	0.68	0.47	0.28	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Calcium	9700	14	2.5	mg/Kg dry	1	MS-19	SW-846 6010C	3/21/13	3/22/13 19:56	OP
Chromium	94	0.94	0.24	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Cobalt	45	4.7	0.30	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Copper	120	0.94	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Iron	24000	4.7	4.0	mg/Kg dry	1	MS-19	SW-846 6010C	3/21/13	3/22/13 19:56	OP
Lead	19	1.4	0.65	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Magnesium	14000	14	1.5	mg/Kg dry	1	MS-19	SW-846 6010C	3/21/13	3/22/13 19:56	OP
Manganese	550	0.94	0.30	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Mercury	0.060	0.049	0.014	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:15	SAJ
Nickel	120	0.94	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Potassium	1000	190	32	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 10:35	OP
Selenium	ND	4.7	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Silver	ND	0.94	0.83	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Sodium	140	190	92	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 10:35	OP
Thallium	ND	4.7	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Vanadium	35	1.9	0.31	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP
Zinc	120	1.9	0.48	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 19:56	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD612-0-0.5 | Sampled: 3/18/2013 15:00

Sample ID: 13C0613-31

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	50.9		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD620-0-0.5 | Sampled: 3/18/2013 15:25

Sample ID: 13C0613-32

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	3.6	1.6	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:52	OP
Antimony	ND	3.6	2.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Arsenic	9.6	3.6	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Barium	220	3.6	0.45	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Beryllium	ND	0.36	0.058	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Cadmium	ND	0.36	0.21	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Calcium	3700	11	2.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Chromium	210	0.72	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Cobalt	24	3.6	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Copper	100	0.72	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Iron	17000	3.6	3.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Lead	5.8	1.1	0.50	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Magnesium	9700	11	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Manganese	220	0.72	0.23	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Mercury	0.025	0.036	0.011	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/22/13 15:16	SAJ
Nickel	96	0.72	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Potassium	1400	140	25	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:52	OP
Selenium	ND	3.6	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Silver	ND	0.72	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Sodium	150	140	70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:52	OP
Thallium	ND	3.6	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Vanadium	40	1.4	0.24	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP
Zinc	41	1.4	0.37	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:54	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD620-0-0.5 | Sampled: 3/18/2013 15:25

Sample ID: 13C0613-32

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.8		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-0-0.5 | Sampled: 3/19/2013 16:35

Sample ID: 13C0613-33

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	25000	11	4.7	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 12:56	OP
Antimony	ND	11	8.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Arsenic	6.7	11	4.0	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:58	OP
Barium	380	11	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Cadmium	0.83	1.1	0.65	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 21:58	OP
Calcium	9000	33	6.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Chromium	59	2.2	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Cobalt	14	11	0.70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Copper	130	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Iron	19000	11	9.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Lead	92	3.3	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Magnesium	5300	33	3.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Manganese	330	2.2	0.70	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Mercury	0.26	0.12	0.035	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:18	SAJ
Nickel	110	2.2	0.53	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Potassium	930	440	76	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 12:56	OP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Sodium	260	440	210	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 12:56	OP
Thallium	ND	11	3.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Vanadium	60	4.4	0.72	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP
Zinc	84	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 21:58	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-0-0.5 | Sampled: 3/19/2013 16:35

Sample ID: 13C0613-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.1		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-1-1.5 | Sampled: 3/19/2013 16:40

Sample ID: 13C0613-34

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	22000	8.8	3.8	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 13:02	OP
Antimony	ND	8.8	7.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Arsenic	ND	8.8	3.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Barium	530	8.8	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Beryllium	0.39	0.88	0.14	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:02	OP
Cadmium	0.89	0.88	0.52	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Calcium	8100	27	4.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Chromium	62	1.8	0.44	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Cobalt	12	8.8	0.56	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Copper	49	1.8	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Iron	10000	8.8	7.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Lead	10	2.7	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Magnesium	3100	27	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Manganese	160	1.8	0.56	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Mercury	0.11	0.090	0.027	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:20	SAJ
Nickel	120	1.8	0.43	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Potassium	650	350	61	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:02	OP
Selenium	ND	8.8	2.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Sodium	ND	350	170	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:02	OP
Thallium	ND	8.8	2.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Vanadium	32	3.5	0.58	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP
Zinc	26	3.5	0.91	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:02	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-1-1.5 | Sampled: 3/19/2013 16:40

Sample ID: 13C0613-34

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.0		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-2-2.5 | Sampled: 3/19/2013 16:45

Sample ID: 13C0613-35

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	9.5	4.1	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 13:07	OP
Antimony	ND	9.5	7.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Arsenic	ND	9.5	3.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Barium	550	9.5	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Beryllium	0.32	0.95	0.15	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:07	OP
Cadmium	0.85	0.95	0.56	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:07	OP
Calcium	9100	28	5.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Chromium	84	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Cobalt	18	9.5	0.60	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Copper	59	1.9	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Iron	9600	9.5	8.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Lead	6.9	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Magnesium	3400	28	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Manganese	160	1.9	0.60	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Mercury	0.11	0.096	0.028	mg/Kg dry	1		SW-846 7471B	3/22/13	3/22/13 15:21	SAJ
Nickel	180	1.9	0.46	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Potassium	720	380	65	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:07	OP
Selenium	ND	9.5	2.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Sodium	ND	380	180	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:07	OP
Thallium	ND	9.5	3.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Vanadium	39	3.8	0.62	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP
Zinc	24	3.8	0.97	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:07	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: PASD611-2-2.5 | Sampled: 3/19/2013 16:45

Sample ID: 13C0613-35

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	25.3		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-0-0.5 | Sampled: 3/19/2013 16:50

Sample ID: 13C0613-36

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	25000	8.3	3.6	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 13:13	OP
Antimony	ND	8.3	6.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Arsenic	ND	8.3	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Barium	690	8.3	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Beryllium	0.28	0.83	0.13	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:12	OP
Cadmium	0.72	0.83	0.49	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:12	OP
Calcium	7300	25	4.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Chromium	68	1.7	0.42	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Cobalt	14	8.3	0.53	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Copper	34	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Iron	11000	8.3	7.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Lead	8.4	2.5	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Magnesium	3100	25	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Manganese	150	1.7	0.53	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Mercury	0.081	0.088	0.026	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/22/13 15:23	SAJ
Nickel	120	1.7	0.40	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Potassium	710	330	57	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:13	OP
Selenium	ND	8.3	2.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Sodium	170	330	160	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/25/13 13:13	OP
Thallium	ND	8.3	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Vanadium	37	3.3	0.55	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP
Zinc	32	3.3	0.86	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:12	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-0-0.5 | Sampled: 3/19/2013 16:50

Sample ID: 13C0613-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.7		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-1-1.5 | Sampled: 3/19/2013 16:55

Sample ID: 13C0613-37

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	9.2	4.0	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 13:18	OP
Antimony	ND	9.2	7.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Arsenic	ND	9.2	3.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Barium	630	9.2	1.1	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Beryllium	ND	0.92	0.15	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Cadmium	0.73	0.92	0.54	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:38	OP
Calcium	7000	28	5.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Chromium	66	1.8	0.46	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Cobalt	14	9.2	0.59	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Copper	31	1.8	1.4	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Iron	9800	9.2	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Lead	7.0	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Magnesium	3200	28	2.9	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Manganese	140	1.8	0.58	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Mercury	0.069	0.092	0.027	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/22/13 15:25	SAJ
Nickel	120	1.8	0.44	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Potassium	660	370	63	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:18	OP
Selenium	ND	9.2	2.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Sodium	ND	370	180	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:18	OP
Thallium	ND	9.2	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Vanadium	34	3.7	0.60	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP
Zinc	38	3.7	0.95	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:38	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-1-1.5 | Sampled: 3/19/2013 16:55

Sample ID: 13C0613-37

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	26.4		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-2-2.5 | Sampled: 3/19/2013 17:00

Sample ID: 13C0613-38

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	9.7	4.2	mg/Kg dry	1	B-07	SW-846 6010C	3/21/13	3/25/13 13:23	OP
Antimony	ND	9.7	7.8	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Arsenic	ND	9.7	3.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Barium	280	9.7	1.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Beryllium	ND	0.97	0.16	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Cadmium	ND	0.97	0.57	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Calcium	7700	29	5.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Chromium	47	1.9	0.49	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Cobalt	9.3	9.7	0.62	mg/Kg dry	1	J	SW-846 6010C	3/21/13	3/22/13 22:42	OP
Copper	32	1.9	1.5	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Iron	7200	9.7	8.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Lead	4.7	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Magnesium	2500	29	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Manganese	120	1.9	0.62	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Mercury	0.060	0.10	0.031	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/22/13 15:26	SAJ
Nickel	98	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Potassium	400	390	67	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:23	OP
Selenium	ND	9.7	3.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Sodium	ND	390	190	mg/Kg dry	1		SW-846 6010C	3/21/13	3/25/13 13:23	OP
Thallium	ND	9.7	3.2	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Vanadium	29	3.9	0.64	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP
Zinc	28	3.9	1.0	mg/Kg dry	1		SW-846 6010C	3/21/13	3/22/13 22:42	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13C0613

Date Received: 3/20/2013

Field Sample #: WTSD524-2-2.5 | Sampled: 3/19/2013 17:00

Sample ID: 13C0613-38

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	23.8		% Wt	1		SM 2540G	3/20/13	3/21/13 10:12	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13C0613-01 [PASD602-0-0.5]	B069431	03/20/13
13C0613-02 [PASD603-0-0.5]	B069431	03/20/13
13C0613-03 [PASD603-1-1.5]	B069431	03/20/13
13C0613-04 [PASD603-2-2.5]	B069431	03/20/13
13C0613-05 [PASD601-0-0.5]	B069431	03/20/13
13C0613-06 [WTSD522-0-0.5]	B069431	03/20/13
13C0613-07 [PASD606-0-0.5]	B069431	03/20/13
13C0613-08 [PASD606-1-1.5]	B069431	03/20/13
13C0613-09 [PASD606-2-2.5]	B069431	03/20/13
13C0613-10 [PASD606-2-2.5-1]	B069431	03/20/13
13C0613-11 [PASD609-0-0.5]	B069431	03/20/13
13C0613-12 [PASD609-1-1.5]	B069431	03/20/13
13C0613-13 [PASD609-2-2.5]	B069431	03/20/13
13C0613-14 [WTSD520-0-0.5]	B069431	03/20/13
13C0613-15 [WSTD520-1-1.5]	B069431	03/20/13
13C0613-16 [WSTD520-2-2.5]	B069431	03/20/13
13C0613-17 [WSTD521-0-0.5]	B069431	03/20/13
13C0613-18 [WSTD521-1-1.5]	B069431	03/20/13
13C0613-19 [WSTD521-2-2.5]	B069431	03/20/13
13C0613-20 [BRSD701-0-0.5]	B069431	03/20/13
13C0613-21 [BRSD701-0-0.5-1]	B069431	03/20/13
13C0613-22 [BRSD702-0-0.5]	B069431	03/20/13
13C0613-23 [BRSD702-1-1.5]	B069431	03/20/13
13C0613-24 [BRSD702-2-2.5]	B069431	03/20/13
13C0613-25 [BRSD725-0-0.5]	B069431	03/20/13
13C0613-26 [BRSD722-0-0.5]	B069431	03/20/13
13C0613-27 [PASD605-0-0.5]	B069431	03/20/13
13C0613-28 [PASD605-1-1.5]	B069431	03/20/13
13C0613-29 [PASD605-2-2.5]	B069431	03/20/13
13C0613-30 [PASD604-0-0.5]	B069431	03/20/13
13C0613-31 [PASD612-0-0.5]	B069431	03/20/13
13C0613-32 [PASD620-0-0.5]	B069431	03/20/13
13C0613-33 [PASD611-0-0.5]	B069431	03/20/13
13C0613-34 [PASD611-1-1.5]	B069431	03/20/13
13C0613-35 [PASD611-2-2.5]	B069431	03/20/13
13C0613-36 [WTSD524-0-0.5]	B069431	03/20/13
13C0613-37 [WTSD524-1-1.5]	B069431	03/20/13
13C0613-38 [WTSD524-2-2.5]	B069431	03/20/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-01 [PASD602-0-0.5]	B069465	1.03	50.0	03/21/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-19 [WSTD521-2-2.5]	B069504	1.04	50.0	03/21/13
13C0613-20 [BRSD701-0-0.5]	B069504	1.03	50.0	03/21/13
13C0613-21 [BRSD701-0-0.5-1]	B069504	1.01	50.0	03/21/13
13C0613-22 [BRSD702-0-0.5]	B069504	1.08	50.0	03/21/13
13C0613-23 [BRSD702-1-1.5]	B069504	1.02	50.0	03/21/13
13C0613-24 [BRSD702-2-2.5]	B069504	1.02	50.0	03/21/13

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-25 [BRSD725-0-0.5]	B069504	1.03	50.0	03/21/13
13C0613-26 [BRSD722-0-0.5]	B069504	1.07	50.0	03/21/13
13C0613-27 [PASD605-0-0.5]	B069504	1.02	50.0	03/21/13
13C0613-28 [PASD605-1-1.5]	B069504	1.00	50.0	03/21/13
13C0613-29 [PASD605-2-2.5]	B069504	1.00	50.0	03/21/13
13C0613-30 [PASD604-0-0.5]	B069504	1.04	50.0	03/21/13
13C0613-31 [PASD612-0-0.5]	B069504	1.04	50.0	03/21/13
13C0613-32 [PASD620-0-0.5]	B069504	1.00	50.0	03/21/13
13C0613-33 [PASD611-0-0.5]	B069504	1.08	50.0	03/21/13
13C0613-34 [PASD611-1-1.5]	B069504	1.05	50.0	03/21/13
13C0613-35 [PASD611-2-2.5]	B069504	1.05	50.0	03/21/13
13C0613-36 [WTSD524-0-0.5]	B069504	1.08	50.0	03/21/13
13C0613-37 [WTSD524-1-1.5]	B069504	1.03	50.0	03/21/13
13C0613-38 [WTSD524-2-2.5]	B069504	1.08	50.0	03/21/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-02 [PASD603-0-0.5]	B069505	1.02	50.0	03/21/13
13C0613-03 [PASD603-1-1.5]	B069505	1.01	50.0	03/21/13
13C0613-04 [PASD603-2-2.5]	B069505	1.01	50.0	03/21/13
13C0613-05 [PASD601-0-0.5]	B069505	1.05	50.0	03/21/13
13C0613-06 [WTSD522-0-0.5]	B069505	1.08	50.0	03/21/13
13C0613-07 [PASD606-0-0.5]	B069505	1.02	50.0	03/21/13
13C0613-08 [PASD606-1-1.5]	B069505	1.01	50.0	03/21/13
13C0613-09 [PASD606-2-2.5]	B069505	1.01	50.0	03/21/13
13C0613-10 [PASD606-2-2.5-1]	B069505	1.05	50.0	03/21/13
13C0613-11 [PASD609-0-0.5]	B069505	1.09	50.0	03/21/13
13C0613-12 [PASD609-1-1.5]	B069505	1.02	50.0	03/21/13
13C0613-13 [PASD609-2-2.5]	B069505	1.01	50.0	03/21/13
13C0613-14 [WTSD520-0-0.5]	B069505	1.04	50.0	03/21/13
13C0613-15 [WSTD520-1-1.5]	B069505	1.08	50.0	03/21/13
13C0613-16 [WSTD520-2-2.5]	B069505	1.07	50.0	03/21/13
13C0613-17 [WSTD521-0-0.5]	B069505	1.03	50.0	03/21/13
13C0613-18 [WSTD521-1-1.5]	B069505	1.03	50.0	03/21/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-01 [PASD602-0-0.5]	B069477	0.601	50.0	03/21/13
13C0613-02 [PASD603-0-0.5]	B069477	0.612	50.0	03/21/13
13C0613-03 [PASD603-1-1.5]	B069477	0.614	50.0	03/21/13
13C0613-04 [PASD603-2-2.5]	B069477	0.610	50.0	03/21/13
13C0613-05 [PASD601-0-0.5]	B069477	0.617	50.0	03/21/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-06 [WTSD522-0-0.5]	B069484	0.608	50.0	03/21/13
13C0613-07 [PASD606-0-0.5]	B069484	0.617	50.0	03/21/13
13C0613-08 [PASD606-1-1.5]	B069484	0.612	50.0	03/21/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-09 [PASD606-2-2.5]	B069484	0.619	50.0	03/21/13
13C0613-10 [PASD606-2-2.5-1]	B069484	0.606	50.0	03/21/13
13C0613-11 [PASD609-0-0.5]	B069484	0.617	50.0	03/21/13
13C0613-12 [PASD609-1-1.5]	B069484	0.601	50.0	03/21/13
13C0613-13 [PASD609-2-2.5]	B069484	0.612	50.0	03/21/13
13C0613-14 [WTSD520-0-0.5]	B069484	0.607	50.0	03/21/13
13C0613-15 [WSTD520-1-1.5]	B069484	0.605	50.0	03/21/13
13C0613-16 [WSTD520-2-2.5]	B069484	0.613	50.0	03/21/13
13C0613-17 [WSTD521-0-0.5]	B069484	0.615	50.0	03/21/13
13C0613-18 [WSTD521-1-1.5]	B069484	0.616	50.0	03/21/13
13C0613-19 [WSTD521-2-2.5]	B069484	0.601	50.0	03/21/13
13C0613-20 [BRSD701-0-0.5]	B069484	0.615	50.0	03/21/13
13C0613-21 [BRSD701-0-0.5-1]	B069484	0.618	50.0	03/21/13
13C0613-22 [BRSD702-0-0.5]	B069484	0.608	50.0	03/21/13
13C0613-23 [BRSD702-1-1.5]	B069484	0.609	50.0	03/21/13
13C0613-24 [BRSD702-2-2.5]	B069484	0.605	50.0	03/21/13
13C0613-25 [BRSD725-0-0.5]	B069484	0.612	50.0	03/21/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0613-26 [BRSD722-0-0.5]	B069537	0.619	50.0	03/22/13
13C0613-27 [PASD605-0-0.5]	B069537	0.603	50.0	03/22/13
13C0613-28 [PASD605-1-1.5]	B069537	0.613	50.0	03/22/13
13C0613-29 [PASD605-2-2.5]	B069537	0.617	50.0	03/22/13
13C0613-30 [PASD604-0-0.5]	B069537	0.618	50.0	03/22/13
13C0613-31 [PASD612-0-0.5]	B069537	0.605	50.0	03/22/13
13C0613-32 [PASD620-0-0.5]	B069537	0.613	50.0	03/22/13
13C0613-33 [PASD611-0-0.5]	B069537	0.603	50.0	03/22/13
13C0613-34 [PASD611-1-1.5]	B069537	0.615	50.0	03/22/13
13C0613-35 [PASD611-2-2.5]	B069537	0.616	50.0	03/22/13
13C0613-36 [WTSD524-0-0.5]	B069537	0.617	50.0	03/22/13
13C0613-37 [WTSD524-1-1.5]	B069537	0.615	50.0	03/22/13
13C0613-38 [WTSD524-2-2.5]	B069537	0.600	50.0	03/22/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069465 - SW-846 3050B										
Blank (B069465-BLK1)			Prepared & Analyzed: 03/21/13							
Aluminum	2.5	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	4.3	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	0.58	0.50	mg/Kg wet							B-07
Iron	3.4	2.5	mg/Kg wet							B-07
Lead	0.37	0.75	mg/Kg wet							J
Magnesium	2.5	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	79	100	mg/Kg wet							J
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.67	1.0	mg/Kg wet							J
LCS (B069465-BS1)			Prepared & Analyzed: 03/21/13							
Aluminum	7150	5.0	mg/Kg wet	8360		85.5	40.4-159.1			
Antimony	81.9	5.0	mg/Kg wet	92.9		88.2	8.2-191.6			
Arsenic	88.1	5.0	mg/Kg wet	94.5		93.3	82.2-117.5			
Barium	158	5.0	mg/Kg wet	166		95.2	83.1-116.3			
Beryllium	53.5	0.50	mg/Kg wet	52.6		102	83.8-116.2			
Cadmium	57.6	0.50	mg/Kg wet	59.9		96.1	84-115.9			
Calcium	5700	15	mg/Kg wet	6160		92.6	82.3-117.5			
Chromium	65.6	1.0	mg/Kg wet	69.3		94.7	81.4-118.6			
Cobalt	97.2	5.0	mg/Kg wet	101		96.2	83.8-115.8			
Copper	80.6	1.0	mg/Kg wet	78.0		103	83.7-116.2			
Iron	10300	5.0	mg/Kg wet	12800		80.8	50.6-149.2			
Lead	84.2	1.5	mg/Kg wet	91.7		91.8	82.4-117.8			
Magnesium	2730	15	mg/Kg wet	3030		90.1	76.2-123.8			
Manganese	273	1.0	mg/Kg wet	283		96.3	81.6-118			
Nickel	54.6	1.0	mg/Kg wet	56.6		96.4	82.2-117.8			
Potassium	3600	200	mg/Kg wet	3820		94.2	73.6-126.4			
Selenium	132	5.0	mg/Kg wet	159		82.7	79.2-120.8			
Silver	30.7	1.0	mg/Kg wet	33.9		90.6	66.4-133.9			
Sodium	692	200	mg/Kg wet	652		106	73.6-126.2			
Thallium	113	5.0	mg/Kg wet	119		95.3	81.1-119.3			
Vanadium	53.7	2.0	mg/Kg wet	56.3		95.4	72.8-127.2			
Zinc	122	2.0	mg/Kg wet	137		89.2	81-119			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069465 - SW-846 3050B										
LCS Dup (B069465-BSD1)				Prepared & Analyzed: 03/21/13						
Aluminum	7570	5.0	mg/Kg wet	8360		90.5	40.4-159.1	5.68	30	
Antimony	82.9	5.0	mg/Kg wet	92.9		89.2	8.2-191.6	1.19	30	
Arsenic	92.9	5.0	mg/Kg wet	94.5		98.3	82.2-117.5	5.22	30	
Barium	180	5.0	mg/Kg wet	166		108	83.1-116.3	12.9	30	
Beryllium	56.5	0.50	mg/Kg wet	52.6		107	83.8-116.2	5.50	30	
Cadmium	59.3	0.50	mg/Kg wet	59.9		99.1	84-115.9	3.06	30	
Calcium	6070	15	mg/Kg wet	6160		98.6	82.3-117.5	6.31	30	
Chromium	68.9	1.0	mg/Kg wet	69.3		99.5	81.4-118.6	4.88	30	
Cobalt	102	5.0	mg/Kg wet	101		101	83.8-115.8	4.50	30	
Copper	83.7	1.0	mg/Kg wet	78.0		107	83.7-116.2	3.82	30	
Iron	11200	5.0	mg/Kg wet	12800		87.1	50.6-149.2	7.58	30	
Lead	88.5	1.5	mg/Kg wet	91.7		96.6	82.4-117.8	5.02	30	
Magnesium	2890	15	mg/Kg wet	3030		95.5	76.2-123.8	5.78	30	
Manganese	282	1.0	mg/Kg wet	283		99.8	81.6-118	3.57	30	
Nickel	55.9	1.0	mg/Kg wet	56.6		98.8	82.2-117.8	2.44	30	
Potassium	3790	200	mg/Kg wet	3820		99.3	73.6-126.4	5.26	30	
Selenium	138	5.0	mg/Kg wet	159		86.8	79.2-120.8	4.82	30	
Silver	31.5	1.0	mg/Kg wet	33.9		93.0	66.4-133.9	2.59	30	
Sodium	708	200	mg/Kg wet	652		109	73.6-126.2	2.20	30	
Thallium	120	5.0	mg/Kg wet	119		101	81.1-119.3	5.76	30	
Vanadium	57.1	2.0	mg/Kg wet	56.3		101	72.8-127.2	6.12	30	
Zinc	130	2.0	mg/Kg wet	137		95.1	81-119	6.41	30	
MRL Check (B069465-MRL1)				Prepared & Analyzed: 03/21/13						
Lead	0.749	0.69	mg/Kg wet	0.691		108	80-120			
Batch B069477 - SW-846 7471										
Blank (B069477-BLK1)				Prepared & Analyzed: 03/21/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069477-BS1)				Prepared & Analyzed: 03/21/13						
Mercury	4.59	0.33	mg/Kg wet	4.05		113	71.6-128.1			
LCS Dup (B069477-BSD1)				Prepared & Analyzed: 03/21/13						
Mercury	4.97	0.32	mg/Kg wet	4.05		123	71.6-128.1	7.98	30	
Batch B069484 - SW-846 7471										
Blank (B069484-BLK1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Mercury	ND	0.025	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B069484 - SW-846 7471											
LCS (B069484-BS1)				Prepared: 03/21/13 Analyzed: 03/22/13							
Mercury	3.49	0.33	mg/Kg wet	4.05		86.1		71.6-128.1			
LCS Dup (B069484-BSD1)				Prepared: 03/21/13 Analyzed: 03/22/13							
Mercury	4.21	0.33	mg/Kg wet	4.05		104		71.6-128.1	18.8	30	
Duplicate (B069484-DUP1)	**Source: 13C0613-25**			Prepared: 03/21/13 Analyzed: 03/22/13							
Mercury	0.0636	0.072	mg/Kg dry		0.0584				8.44	35	J
Matrix Spike (B069484-MS1)	**Source: 13C0613-25**			Prepared: 03/21/13 Analyzed: 03/22/13							
Mercury	0.410	0.071	mg/Kg dry	0.473	0.0584	**74.2**	*	75-125			MS-07
Batch B069504 - SW-846 3050B											
Blank (B069504-BLK1)				Prepared: 03/21/13 Analyzed: 03/25/13							
Aluminum	18	2.5	mg/Kg wet								B-07
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	1.4	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	2.4	2.5	mg/Kg wet								J
Lead	0.40	0.75	mg/Kg wet								J
Magnesium	1.3	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								
LCS (B069504-BS1)				Prepared: 03/21/13 Analyzed: 03/25/13							
Aluminum	8100	5.0	mg/Kg wet	8360		96.9		40.4-159.1			
Antimony	86.8	5.0	mg/Kg wet	92.9		93.4		8.2-191.6			
Arsenic	96.7	5.0	mg/Kg wet	94.5		102		82.2-117.5			
Barium	172	5.0	mg/Kg wet	166		103		83.1-116.3			
Beryllium	54.6	0.50	mg/Kg wet	52.6		104		83.8-116.2			
Cadmium	61.7	0.50	mg/Kg wet	59.9		103		84-115.9			
Calcium	6330	15	mg/Kg wet	6160		103		82.3-117.5			
Chromium	70.7	1.0	mg/Kg wet	69.3		102		81.4-118.6			
Cobalt	102	5.0	mg/Kg wet	101		101		83.8-115.8			
Copper	79.7	1.0	mg/Kg wet	78.0		102		83.7-116.2			
Iron	11000	5.0	mg/Kg wet	12800		85.6		50.6-149.2			
Lead	103	1.5	mg/Kg wet	91.7		112		82.4-117.8			
Magnesium	3100	15	mg/Kg wet	3030		102		76.2-123.8			
Manganese	272	1.0	mg/Kg wet	283		96.2		81.6-118			
Nickel	57.9	1.0	mg/Kg wet	56.6		102		82.2-117.8			
Potassium	3690	200	mg/Kg wet	3820		96.6		73.6-126.4			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069504 - SW-846 3050B										
LCS (B069504-BS1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Selenium	165	5.0	mg/Kg wet	159		104	79.2-120.8			
Silver	30.3	1.0	mg/Kg wet	33.9		89.4	66.4-133.9			
Sodium	637	200	mg/Kg wet	652		97.8	73.6-126.2			
Thallium	110	5.0	mg/Kg wet	119		92.8	81.1-119.3			
Vanadium	57.1	2.0	mg/Kg wet	56.3		101	72.8-127.2			
Zinc	136	2.0	mg/Kg wet	137		99.5	81-119			
LCS Dup (B069504-BSD1)				Prepared: 03/21/13 Analyzed: 03/25/13						
Aluminum	7850	5.0	mg/Kg wet	8360		93.9	40.4-159.1	3.14	30	
Antimony	82.7	5.0	mg/Kg wet	92.9		89.0	8.2-191.6	4.83	30	
Arsenic	93.2	5.0	mg/Kg wet	94.5		98.6	82.2-117.5	3.67	30	
Barium	162	5.0	mg/Kg wet	166		97.6	83.1-116.3	5.83	30	
Beryllium	52.6	0.50	mg/Kg wet	52.6		100	83.8-116.2	3.78	30	
Cadmium	57.7	0.50	mg/Kg wet	59.9		96.3	84-115.9	6.60	30	
Calcium	6220	15	mg/Kg wet	6160		101	82.3-117.5	1.67	30	
Chromium	67.6	0.99	mg/Kg wet	69.3		97.5	81.4-118.6	4.50	30	
Cobalt	97.1	5.0	mg/Kg wet	101		96.2	83.8-115.8	4.96	30	
Copper	75.7	0.99	mg/Kg wet	78.0		97.1	83.7-116.2	5.08	30	
Iron	10700	5.0	mg/Kg wet	12800		83.4	50.6-149.2	2.60	30	
Lead	84.6	1.5	mg/Kg wet	91.7		92.3	82.4-117.8	19.2	30	
Magnesium	2940	15	mg/Kg wet	3030		97.0	76.2-123.8	5.20	30	
Manganese	263	0.99	mg/Kg wet	283		93.1	81.6-118	3.31	30	
Nickel	55.5	0.99	mg/Kg wet	56.6		98.0	82.2-117.8	4.23	30	
Potassium	3590	200	mg/Kg wet	3820		93.9	73.6-126.4	2.83	30	
Selenium	159	5.0	mg/Kg wet	159		99.8	79.2-120.8	4.22	30	
Silver	28.8	0.99	mg/Kg wet	33.9		85.0	66.4-133.9	5.01	30	
Sodium	615	200	mg/Kg wet	652		94.3	73.6-126.2	3.65	30	
Thallium	106	5.0	mg/Kg wet	119		89.0	81.1-119.3	4.24	30	
Vanadium	54.9	2.0	mg/Kg wet	56.3		97.4	72.8-127.2	4.05	30	
Zinc	131	2.0	mg/Kg wet	137		95.8	81-119	3.85	30	
Duplicate (B069504-DUP1)	**Source: 13C0613-31**			Prepared: 03/21/13 Analyzed: 03/25/13						
Aluminum	9760	4.7	mg/Kg dry		8650			12.1	35	B-07
Antimony	3.95	4.7	mg/Kg dry		ND			NC	35	J
Arsenic	9.64	4.7	mg/Kg dry		9.82			1.83	35	
Barium	117	4.7	mg/Kg dry		117			0.512	35	
Beryllium	ND	0.47	mg/Kg dry		ND			NC	35	
Cadmium	0.666	0.47	mg/Kg dry		0.677			1.67	35	
Calcium	9520	14	mg/Kg dry		9690			1.71	35	
Chromium	94.3	0.95	mg/Kg dry		94.0			0.263	35	
Cobalt	44.1	4.7	mg/Kg dry		44.6			1.08	35	
Copper	126	0.95	mg/Kg dry		125			1.33	35	
Iron	23600	4.7	mg/Kg dry		24000			1.48	35	
Lead	19.1	1.4	mg/Kg dry		18.9			1.13	35	
Magnesium	14000	14	mg/Kg dry		14400			3.05	35	
Manganese	563	0.95	mg/Kg dry		552			1.96	35	
Nickel	118	0.95	mg/Kg dry		120			1.80	35	
Potassium	1200	190	mg/Kg dry		1040			14.1	35	
Selenium	ND	4.7	mg/Kg dry		ND			NC	35	
Silver	ND	0.95	mg/Kg dry		ND			NC	35	
Sodium	128	190	mg/Kg dry		137			7.03	35	J
Thallium	ND	4.7	mg/Kg dry		ND			NC	35	
Vanadium	34.6	1.9	mg/Kg dry		35.3			2.26	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B069504 - SW-846 3050B											
Duplicate (B069504-DUP1)	**Source: 13C0613-31**			Prepared: 03/21/13 Analyzed: 03/22/13							
Zinc	119	1.9	mg/Kg dry		117				1.72	35	
MRL Check (B069504-MRL1)				Prepared: 03/21/13 Analyzed: 03/25/13							
Lead	0.741	0.73	mg/Kg wet	0.728		102		80-120			
Matrix Spike (B069504-MS1)	**Source: 13C0613-31**			Prepared: 03/21/13 Analyzed: 03/25/13							
Aluminum	9230	4.6	mg/Kg dry	183	8650	**317**	*	75-125			MS-19
Antimony	84.1	4.6	mg/Kg dry	183	ND	**45.9**	*	75-125			MS-07
Arsenic	196	4.6	mg/Kg dry	183	9.82	101		75-125			
Barium	303	4.6	mg/Kg dry	183	117	101		75-125			
Beryllium	184	0.46	mg/Kg dry	183	ND	101		75-125			
Cadmium	178	0.46	mg/Kg dry	183	0.677	96.6		75-125			
Calcium	13600	14	mg/Kg dry	183	9690	**2130**	*	75-125			MS-19
Chromium	281	0.92	mg/Kg dry	183	94.0	102		75-125			
Cobalt	221	4.6	mg/Kg dry	183	44.6	96.4		75-125			
Copper	316	0.92	mg/Kg dry	183	125	105		75-125			
Iron	25000	4.6	mg/Kg dry	183	24000	**548**	*	75-125			MS-19
Lead	189	1.4	mg/Kg dry	183	18.9	92.8		75-125			
Magnesium	15000	14	mg/Kg dry	183	14400	**307**	*	75-125			MS-19
Manganese	755	0.92	mg/Kg dry	183	552	111		75-125			
Nickel	299	0.92	mg/Kg dry	183	120	97.5		75-125			
Potassium	2810	180	mg/Kg dry	1830	1040	96.2		75-125			
Selenium	192	4.6	mg/Kg dry	183	ND	105		75-125			
Silver	165	0.92	mg/Kg dry	183	ND	90.2		75-125			
Sodium	332	180	mg/Kg dry	183	137	106		75-125			
Thallium	174	4.6	mg/Kg dry	183	ND	94.8		75-125			
Vanadium	224	1.8	mg/Kg dry	183	35.3	103		75-125			
Zinc	294	1.8	mg/Kg dry	183	117	96.8		75-125			
Batch B069505 - SW-846 3050B											
Blank (B069505-BLK1)				Prepared: 03/21/13 Analyzed: 03/22/13							
Aluminum	ND	2.5	mg/Kg wet								
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	4.9	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	0.45	0.50	mg/Kg wet								J
Iron	ND	2.5	mg/Kg wet								
Lead	ND	0.75	mg/Kg wet								
Magnesium	2.6	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069505 - SW-846 3050B										
Blank (B069505-BLK1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Zinc	0.27	1.0	mg/Kg wet							J
LCS (B069505-BS1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Aluminum	7290	5.0	mg/Kg wet	8360		87.2	40.4-159.1			
Antimony	88.8	5.0	mg/Kg wet	92.9		95.6	8.2-191.6			
Arsenic	94.5	5.0	mg/Kg wet	94.5		100	82.2-117.5			
Barium	167	5.0	mg/Kg wet	166		101	83.1-116.3			
Beryllium	55.5	0.50	mg/Kg wet	52.6		105	83.8-116.2			
Cadmium	60.7	0.50	mg/Kg wet	59.9		101	84-115.9			
Calcium	5910	15	mg/Kg wet	6160		95.9	82.3-117.5			
Chromium	69.3	1.0	mg/Kg wet	69.3		100	81.4-118.6			
Cobalt	102	5.0	mg/Kg wet	101		101	83.8-115.8			
Copper	84.3	1.0	mg/Kg wet	78.0		108	83.7-116.2			
Iron	10900	5.0	mg/Kg wet	12800		84.8	50.6-149.2			
Lead	86.9	1.5	mg/Kg wet	91.7		94.8	82.4-117.8			
Magnesium	2780	15	mg/Kg wet	3030		91.7	76.2-123.8			
Manganese	275	1.0	mg/Kg wet	283		97.2	81.6-118			
Nickel	56.7	1.0	mg/Kg wet	56.6		100	82.2-117.8			
Potassium	3510	200	mg/Kg wet	3820		91.8	73.6-126.4			
Selenium	150	5.0	mg/Kg wet	159		94.4	79.2-120.8			
Silver	31.1	1.0	mg/Kg wet	33.9		91.8	66.4-133.9			
Sodium	614	200	mg/Kg wet	652		94.1	73.6-126.2			
Thallium	119	5.0	mg/Kg wet	119		100	81.1-119.3			
Vanadium	57.0	2.0	mg/Kg wet	56.3		101	72.8-127.2			
Zinc	131	2.0	mg/Kg wet	137		95.4	81-119			
LCS Dup (B069505-BSD1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Aluminum	6960	5.0	mg/Kg wet	8360		83.2	40.4-159.1	4.65	30	
Antimony	84.5	5.0	mg/Kg wet	92.9		91.0	8.2-191.6	5.01	30	
Arsenic	90.1	5.0	mg/Kg wet	94.5		95.3	82.2-117.5	4.76	30	
Barium	156	5.0	mg/Kg wet	166		94.0	83.1-116.3	7.06	30	
Beryllium	54.6	0.50	mg/Kg wet	52.6		104	83.8-116.2	1.50	30	
Cadmium	57.3	0.50	mg/Kg wet	59.9		95.6	84-115.9	5.84	30	
Calcium	5540	15	mg/Kg wet	6160		90.0	82.3-117.5	6.38	30	
Chromium	66.0	1.0	mg/Kg wet	69.3		95.3	81.4-118.6	4.91	30	
Cobalt	96.9	5.0	mg/Kg wet	101		95.9	83.8-115.8	4.85	30	
Copper	79.7	1.0	mg/Kg wet	78.0		102	83.7-116.2	5.68	30	
Iron	10500	5.0	mg/Kg wet	12800		81.9	50.6-149.2	3.51	30	
Lead	83.3	1.5	mg/Kg wet	91.7		90.9	82.4-117.8	4.24	30	
Magnesium	2620	15	mg/Kg wet	3030		86.6	76.2-123.8	5.70	30	
Manganese	270	1.0	mg/Kg wet	283		95.3	81.6-118	2.02	30	
Nickel	53.8	1.0	mg/Kg wet	56.6		95.0	82.2-117.8	5.24	30	
Potassium	3330	200	mg/Kg wet	3820		87.2	73.6-126.4	5.21	30	
Selenium	146	5.0	mg/Kg wet	159		92.0	79.2-120.8	2.54	30	
Silver	29.8	1.0	mg/Kg wet	33.9		87.9	66.4-133.9	4.37	30	
Sodium	582	200	mg/Kg wet	652		89.3	73.6-126.2	5.30	30	
Thallium	112	5.0	mg/Kg wet	119		94.1	81.1-119.3	6.11	30	
Vanadium	55.2	2.0	mg/Kg wet	56.3		98.1	72.8-127.2	3.07	30	
Zinc	125	2.0	mg/Kg wet	137		90.9	81-119	4.78	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069505 - SW-846 3050B										
MRL Check (B069505-MRL1)				Prepared: 03/21/13 Analyzed: 03/22/13						
Lead	0.817	0.70	mg/Kg wet	0.703		116	80-120			
Batch B069537 - SW-846 7471										
Blank (B069537-BLK1)				Prepared & Analyzed: 03/22/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069537-BS1)				Prepared & Analyzed: 03/22/13						
Mercury	4.45	0.33	mg/Kg wet	4.05		110	71.6-128.1			
LCS Dup (B069537-BSD1)				Prepared & Analyzed: 03/22/13						
Mercury	4.60	0.33	mg/Kg wet	4.05		114	71.6-128.1	3.18	30	
Duplicate (B069537-DUP1)		**Source: 13C0613-31**		Prepared & Analyzed: 03/22/13						
Mercury	0.0644	0.048	mg/Kg dry		0.0599			7.26	35	
Matrix Spike (B069537-MS1)		**Source: 13C0613-31**		Prepared & Analyzed: 03/22/13						
Mercury	0.331	0.048	mg/Kg dry	0.322	0.0599	84.3	75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069431 - % Solids										
Duplicate (B069431-DUP3)	**Source: 13C0613-38**			Prepared: 03/20/13 Analyzed: 03/21/13						
% Solids	23.4		% Wt		23.8			1.69	20	
Duplicate (B069431-DUP4)	**Source: 13C0613-20**			Prepared: 03/20/13 Analyzed: 03/21/13						
% Solids	21.2		% Wt		21.9			3.25	20	
Duplicate (B069431-DUP5)	**Source: 13C0613-01**			Prepared: 03/20/13 Analyzed: 03/21/13						
% Solids	13.6		% Wt		12.5			8.43	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

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East longmeadow, MA 01028

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc.
Address: 1 Blue Hill Plaza, 12th Flr
Pearl River, NY 10965
Attention: Amita Patel
Project Location: Cortlandt Manor, NY
Sampled By: AW, MP, SJN

Telephone: 845 735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ☒ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ☒ EXCEL ○ GIS
☒ OTHER EDD (NYSDEC)
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	TOC	Moisture Content
								1	I	A			
								1	I	A			
								1	I	G			
01	PASD602-0-0.5	3/19/13	0915		X	S	U				X		
02	PASD603-0-0.5	3/19/13	0930		X	S	U				X		
03	PASD603-1-1.5	3/19/13	0935		X	S	U				X		
04	PASD603-2-2.5	3/19/13	0940		X	S	U				X		
05	PASD601-0-0.5	3/19/13	1005		X	S	U				X		
06	WTSD522-0-0.5	3/19/13	1005		X	S	U				X		
07	PASD606-0-0.5	3/19/13	1125		X	S	U				X		X
08	PASD606-1-1.5	3/19/13	1130		X	S	U				X	X	
09	PASD606-2-2.5	3/19/13	1135		X	S	U				X		
10	PASD606-2-2.5-1	3/19/13	1140		X	S	U				X		

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
A Walden	3/19/13 1830
Received by: (signature)	Date/Time:
1006	3/20/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Standard
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Floor Project #

Pearl River NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals (Continental Manor, NY)

Sampled By: AW, MP, STN

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: THC Metals	TOC	Moisture Content
								1	1	1			
								I	I	I			
								A	A	G			
11	PASD 609 - 0 - 0.5	3/19/13	1300		X	S	U				X		
12	PASD 609 - 1 - 1.5	3/19/13	1305		X	S	U				X		X
13	PASD 609 - 2 - 2.5	3/19/13	1310		X	S	U				X	X	
14	WTSD 520 - 0 - 0.5	3/19/13	1445		X	S	U				X		
15	WTSD 520 - 1 - 1.5	3/19/13	1450		X	S	U				X	X	
16	WTSD 520 - 2 - 2.5	3/19/13	1455		X	S	U				X	[illegible]	X
17	WTSD 521 - 0 - 0.5	3/19/13	1500		X	S	U				X		
18	WTSD 521 - 1 - 1.5	3/19/13	1505		X	S	U				X		
19	WTSD 521 - 2 - 2.5	3/19/13	1510		X	S	U				X		
20	BRSD 701 - 0 - 0.5	3/19/13	1520		X	S	U				X		

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
AJ Wadden	3/20/13 1550
Received by: (signature) 3.0° 1006	Date/Time: 3/20/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Std
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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East longmeadow, MA 01028

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Fl, Project #
Pearl River, NY 10965

Client PO#

Attention: Amita Patel

Project Location: Magna Metals

Sampled By: AW, MP, SJN

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email:
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER EDD (NYSDEC)
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: TAL Metals	TOC	% Moisture
								1	I	A			
								1	I	A			
								1	I	G			
21	BRSD701-0-0.5-1	3/19/13	1525		X	S	U				X		
22	BRSD702-0-0.5	3/19/13	1540		X	S	U				X		X
23	BRSD702-1-1.5	3/19/13	1545		X	S	U				X		
24	BRSD702-2-2.5	3/19/13	1550		X	S	U				X	X	
25	BRSD725-0-0.5	3/18/13	0925		X	S	U				X		
26	BRSD722-0-0.5	3/18/13	0950		X	S	U				X		
27	PASD605-0-0.5	3/18/13	1540		X	S	U				X		
28	PASD605-1-1.5	3/18/13	1540		X	S	U				X		
29	PASD605-2-2.5	3/18/13	1546		X	S	U				X		
30	PASD604-0-0.5	3/18/13	1430		X	S	U				X		

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa-can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

	Date/Time:
Relinquished by: (signature)	3/19/13 1830
Received by: (signature) 3.0° 1006	3/21/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 72 RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Flr Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals

Sampled By:

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Pg. 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER _____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: TAL Metals	TOC	% Moist.
31	PASD612 - 0 - 0.5	3/18/13	1500		X	S	U	1	I	A	X		
32	PASD620 - 0 - 0.5	3/18/13	1525		X	S	U	1	I	A	X		
33	PASD611 - 0 - 0.5	3/16/13	1635		X	S	U	1	I	A	X		
34	PASD611 - 1 - 1.5	3/16/13	1640		X	S	U	1	I	A	X		
35	PASD611 - 2 - 2.5	3/19/13	1645		X	S	U	1	I	A	X		
36	WTSD524 - 0 - 0.5	3/19/13	1650		X	S	U	1	I	A	X		
37	WTSD524 - 1 - 1.5	3/19/13	1655		X	S	U	1	I	A	X		
38	WTSD524 - 2 - 2.5	3/19/13	1700		X	S	U	1	I	A	X		
				GW									

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Dissolved Metals
○ Field Filtered
○ Lab to Filter

Relinquished by: (signature)	Date/Time: 3/19/13 1830	
Received by: (signature)	Date/Time: 3/20/13 1006	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Std
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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FedEx

802302293730

Ship (P/U) date:
Tues 3/19/2013 7:18 pm
PEA US

Delivered
Signed for by: C.COLLINS

Actual delivery:
Wed 3/20/2013 10:06 am
MA US

2 Piece shipment

Tracking Number or Nickn...	Shipper city, state	Ship (P/U) date	Status	Destination/Recipient cit...	Delivery date
802302293730(master)	PEA, NJ	3/19/2013		, MA	3/20/2013
795769934254	, NJ	3/19/2013		,	3/20/2013

Travel History

Date/Time	Activity	Location
- 3/20/2013 - Wednesday		
10:06 am	Delivered	MA
8:14 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
6:45 am	At local FedEx facility	WINDSOR LOCKS, CT
3:38 am	Departed FedEx location	NEWARK, NJ
- 3/19/2013 - Tuesday		
10:25 pm	Departed FedEx location	NEWARK, NJ
10:09 pm	Arrived at FedEx location	NEWARK, NJ
9:23 pm	Left FedEx origin facility	MAHWAH, NJ
7:18 pm	Picked up	MAHWAH, NJ

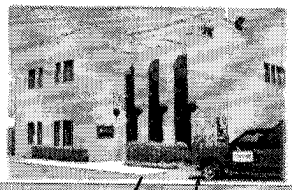
Local Scan Time

Shipment Facts

Tracking number	802302293730	**Service**	FedEx Standard Overnight
Master tracking number	802302293730	**Dimensions**	23x13x12 in.
		Total pieces	2
Delivered To	Shipping/Receiving	**Packaging**	Your Packaging
Shipper reference	NYSDEC-MASAS MOTELS		
Special handling section	Deliver Weekday		

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HDR **RECEIVED BY:** CEC **DATE:** 3/20/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
If not, explain:
3) **Are all the samples in good condition?** (Yes) No
If not, explain:
4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑
Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.0
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No N/A _____
9) **Do all samples have the proper Base pH:** Yes No N/A _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	43
500 mL Amber		4 oz amber/clear jar	4
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

GeoTesting EXPRESS

Client:	Con-Test Analytical Lab				
Project:	13C0613				
Location:	---			Project No:	GTX-300367
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	03/22/13	Checked By:	jdt
Depth :	---	Test Id:	262590		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	13C0613-07	---	Wet, very dark brown silt with organics	648.8
---	13C0613-12	---	Wet, very dark brown silt with organics	391.1
---	13C0613-16	---	Wet, very dark brown silt with organics	308.5
---	13C0613-22	---	Wet, very dark brown silt with sand and organics	457.5

Notes: Temperature of Drying : 110° Celsius

printed 3/27/2013 12:31:49 PM

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 1, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland Manor, NY
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13C0680

Enclosed are results of analyses for samples received by the laboratory on March 22, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0680

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD621- 2-2.5	13C0680-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD621- 2.5-3	13C0680-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 2-2.5	13C0680-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 3-3.5	13C0680-04	Soil		-	GAI-LAP-20-1996/AASHTO
				ASTM D2216	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 4-4.5	13C0680-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 2-2.5	13C0680-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 3-3.5	13C0680-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 4-4.5	13C0680-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 525-0-0.5	13C0680-09	Soil		-	GAI-LAP-20-1996/AASHTO
				ASTM D2216	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD 623-0-0.5	13C0680-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD 623-0-0.5 D	13C0680-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0680

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD 523-0-0.5	13C0680-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 719-0-0.5	13C0680-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 716-0-0.5	13C0680-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 713-0-0.5	13C0680-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 710-0-0.5	13C0680-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 519-0-0.5	13C0680-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD 619-0-0.5	13C0680-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 513-0-0.5	13C0680-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 514-0-0.5	13C0680-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 516-0-0.5	13C0680-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 515-0-0.5	13C0680-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron, Magnesium

13C0680-01[PASD621- 2-2.5], 13C0680-02[PASD621- 2.5-3], 13C0680-03[PASD617- 2-2.5], 13C0680-04[PASD617- 3-3.5], 13C0680-05[PASD617- 4-4.5], 13C0680-06[PASD615- 2-2.5], 13C0680-07[PASD615- 3-3.5], 13C0680-08[PASD615- 4-4.5], 13C0680-09[WTSD 525-0-0.5], 13C0680-10[PASD 623-0-0.5], 13C0680-11[PASD 623-0-0.5 D], 13C0680-12[WTSD 523-0-0.5], 13C0680-13[BRSD 719-0-0.5], 13C0680-14[BRSD 716-0-0.5], 13C0680-15[BRSD 713-0-0.5], 13C0680-16[BRSD 710-0-0.5], 13C0680-17[WTSD 519-0-0.5], 13C0680-18[PASD 619-0-0.5], 13C0680-19[WTSD 513-0-0.5], 13C0680-20[WTSD 514-0-0.5], 13C0680-21[WTSD 516-0-0.5], 13C0680-22[WTSD 515-0-0.5], B069602-BLK1, B069619-BLK1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium, Thallium

13C0680-13[BRSD 719-0-0.5], 13C0680-16[BRSD 710-0-0.5]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD621- 2-2.5 | Sampled: 3/20/2013 11:15

Sample ID: 13C0680-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:23	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Barium	36	2.7	0.34	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Cadmium	0.34	0.27	0.16	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Calcium	3700	8.2	1.5	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Chromium	11	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Cobalt	5.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Copper	16	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Iron	12000	2.7	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:23	OP
Lead	4.3	0.82	0.38	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Magnesium	4600	8.2	0.85	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:23	OP
Manganese	120	0.55	0.17	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Mercury	ND	0.028	0.0082	mg/Kg dry	1		SW-846 7471B	3/26/13	3/27/13 9:54	SAJ
Nickel	12	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Potassium	1100	110	19	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Sodium	98	110	53	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:23	OP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Vanadium	18	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP
Zinc	22	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:23	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD621- 2-2.5 | Sampled: 3/20/2013 11:15

Sample ID: 13C0680-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.8		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD621- 2.5-3 | Sampled: 3/20/2013 11:20

Sample ID: 13C0680-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5300	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:29	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Barium	53	2.8	0.34	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Beryllium	ND	0.28	0.044	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Cadmium	0.29	0.28	0.16	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Calcium	7300	8.3	1.5	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Chromium	13	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Cobalt	5.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Copper	27	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Iron	11000	2.8	2.4	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:29	OP
Lead	3.7	0.83	0.38	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Magnesium	5000	8.3	0.87	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:29	OP
Manganese	150	0.55	0.18	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Mercury	ND	0.027	0.0081	mg/Kg dry	1		SW-846 7471B	3/26/13	3/27/13 9:56	SAJ
Nickel	12	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Sodium	68	110	54	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:29	OP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Vanadium	16	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP
Zinc	21	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:29	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD621- 2.5-3 | Sampled: 3/20/2013 11:20

Sample ID: 13C0680-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.7		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 2-2.5 | Sampled: 3/20/2013 11:30

Sample ID: 13C0680-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	22	9.4	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:34	OP
Antimony	ND	22	18	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Arsenic	ND	22	7.9	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Barium	160	22	2.7	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Beryllium	ND	2.2	0.35	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Cadmium	1.5	2.2	1.3	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:34	OP
Calcium	9200	66	12	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Chromium	32	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Cobalt	24	22	1.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Copper	150	4.4	3.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Iron	27000	22	19	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:34	OP
Lead	7.6	6.6	3.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Magnesium	4500	66	6.8	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:34	OP
Manganese	160	4.4	1.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Mercury	ND	0.22	0.065	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 10:44	SAJ
Nickel	290	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Potassium	870	870	150	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:34	OP
Selenium	ND	22	6.7	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Silver	ND	4.4	3.8	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Sodium	ND	870	430	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Thallium	ND	22	7.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Vanadium	35	8.7	1.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP
Zinc	87	8.7	2.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:34	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 2-2.5 | Sampled: 3/20/2013 11:30

Sample ID: 13C0680-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	11.3		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 3-3.5 | Sampled: 3/20/2013 11:35

Sample ID: 13C0680-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	13	5.5	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:40	OP
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Arsenic	ND	13	4.6	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Barium	130	13	1.6	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Beryllium	ND	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Cadmium	1.3	1.3	0.75	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Calcium	5600	38	6.9	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Chromium	42	2.6	0.64	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Cobalt	24	13	0.82	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Copper	120	2.6	1.9	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Iron	43000	13	11	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:40	OP
Lead	12	3.8	1.8	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Magnesium	6400	38	4.0	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:40	OP
Manganese	200	2.6	0.81	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Mercury	0.044	0.13	0.040	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 10:46	SAJ
Nickel	190	2.6	0.62	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Potassium	1900	510	88	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Selenium	ND	13	3.9	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Silver	ND	2.6	2.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Sodium	ND	510	250	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Thallium	ND	13	4.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Vanadium	36	5.1	0.84	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP
Zinc	91	5.1	1.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:40	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 3-3.5 | Sampled: 3/20/2013 11:35

Sample ID: 13C0680-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.1		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 3-3.5 | Sampled: 3/20/2013 11:35

Sample ID: 13C0680-04

Sample Matrix: Soil

Moisture Content

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/27/13 0:00	GTX

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 4-4.5 | Sampled: 3/20/2013 11:40

Sample ID: 13C0680-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9700	7.4	3.2	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:45	OP
Antimony	ND	7.4	5.9	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Arsenic	ND	7.4	2.7	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Barium	90	7.4	0.92	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Beryllium	ND	0.74	0.12	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Cadmium	0.86	0.74	0.44	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Calcium	3100	22	4.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Chromium	29	1.5	0.37	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Cobalt	16	7.4	0.47	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Copper	63	1.5	1.1	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Iron	29000	7.4	6.3	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:45	OP
Lead	9.6	2.2	1.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Magnesium	5000	22	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:45	OP
Manganese	150	1.5	0.47	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Mercury	0.026	0.073	0.021	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 10:47	SAJ
Nickel	95	1.5	0.36	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Potassium	1600	290	51	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Selenium	ND	7.4	2.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Silver	ND	1.5	1.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Sodium	ND	290	140	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Thallium	ND	7.4	2.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Vanadium	27	2.9	0.48	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP
Zinc	68	2.9	0.76	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:45	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD617- 4-4.5 | Sampled: 3/20/2013 11:40

Sample ID: 13C0680-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	33.5		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 2-2.5 | Sampled: 3/20/2013 11:45

Sample ID: 13C0680-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	22	9.3	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Antimony	ND	22	17	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Arsenic	ND	22	7.8	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Barium	210	22	2.7	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Beryllium	ND	2.2	0.35	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Cadmium	1.3	2.2	1.3	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Calcium	13000	65	12	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Chromium	36	4.3	1.1	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Cobalt	18	22	1.4	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Copper	150	4.3	3.3	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Iron	11000	22	18	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Lead	13	6.5	3.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Magnesium	5000	65	6.8	mg/Kg dry	1	B-07	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Manganese	200	4.3	1.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Mercury	0.072	0.22	0.066	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 10:49	SAJ
Nickel	180	4.3	1.0	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Potassium	550	870	150	mg/Kg dry	1	J	SW-846 6010C	3/23/13	3/25/13 21:51	OP
Selenium	ND	22	6.7	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Silver	ND	4.3	3.8	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Sodium	ND	870	420	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Thallium	ND	22	7.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Vanadium	30	8.7	1.4	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP
Zinc	56	8.7	2.2	mg/Kg dry	1		SW-846 6010C	3/23/13	3/25/13 21:51	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 2-2.5 | Sampled: 3/20/2013 11:45

Sample ID: 13C0680-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	10.9		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 3-3.5 | Sampled: 3/20/2013 11:50

Sample ID: 13C0680-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	16	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:04	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Arsenic	ND	16	5.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Barium	150	16	2.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Cadmium	1.1	1.6	0.95	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:04	OP
Calcium	6800	48	8.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Chromium	32	3.2	0.80	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Cobalt	15	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:04	OP
Copper	86	3.2	2.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Iron	10000	16	14	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 13:13	OP
Lead	6.3	4.8	2.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Magnesium	4500	48	5.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Manganese	120	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Mercury	ND	0.16	0.048	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 10:51	SAJ
Nickel	120	3.2	0.78	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Potassium	880	640	110	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Selenium	ND	16	4.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Sodium	ND	640	310	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Vanadium	19	6.4	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP
Zinc	92	6.4	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:04	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 3-3.5 | Sampled: 3/20/2013 11:50

Sample ID: 13C0680-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.4		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 4-4.5 | Sampled: 3/20/2013 11:55

Sample ID: 13C0680-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	16	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:09	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Arsenic	ND	16	5.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Barium	150	16	2.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Cadmium	1.0	1.6	0.95	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:09	OP
Calcium	8300	48	8.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Chromium	28	3.2	0.81	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Cobalt	12	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:09	OP
Copper	82	3.2	2.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Iron	8600	16	14	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 13:19	OP
Lead	5.1	4.8	2.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Magnesium	4100	48	5.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Manganese	130	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Mercury	0.051	0.17	0.050	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 10:56	SAJ
Nickel	130	3.2	0.78	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Potassium	690	640	110	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Selenium	ND	16	5.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Sodium	ND	640	310	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Vanadium	18	6.4	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP
Zinc	72	6.4	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:09	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD615- 4-4.5 | Sampled: 3/20/2013 11:55

Sample ID: 13C0680-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.8		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 525-0-0.5 | Sampled: 3/21/2013 09:30

Sample ID: 13C0680-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	8.1	3.5	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:15	OP
Antimony	ND	8.1	6.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Arsenic	3.5	8.1	2.9	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:15	OP
Barium	130	8.1	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Beryllium	ND	0.81	0.13	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Cadmium	0.78	0.81	0.48	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:15	OP
Calcium	15000	24	4.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Chromium	38	1.6	0.40	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Cobalt	16	8.1	0.51	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Copper	67	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Iron	13000	8.1	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 13:24	OP
Lead	7.9	2.4	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Magnesium	9800	24	2.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Manganese	530	1.6	0.51	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Mercury	0.061	0.086	0.025	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 10:58	SAJ
Nickel	63	1.6	0.39	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Potassium	1200	320	55	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Selenium	ND	8.1	2.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Sodium	ND	320	160	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Thallium	ND	8.1	2.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Vanadium	16	3.2	0.53	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP
Zinc	69	3.2	0.83	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:15	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 525-0-0.5 | Sampled: 3/21/2013 09:30

Sample ID: 13C0680-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	28.7		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 525-0-0.5 | Sampled: 3/21/2013 09:30

Sample ID: 13C0680-09

Sample Matrix: Soil

Moisture Content

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	Attached			%	1		ASTM D2216		3/27/13 0:00	GTX

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 623-0-0.5 | Sampled: 3/21/2013 10:00

Sample ID: 13C0680-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:20	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Barium	65	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Beryllium	ND	0.31	0.050	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:06	OP
Cadmium	0.98	0.31	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Calcium	2400	9.3	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Chromium	190	0.62	0.16	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Cobalt	92	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Copper	690	0.62	0.47	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Iron	70000	310	270	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:30	OP
Lead	11	0.93	0.43	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Magnesium	82000	930	97	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 13:30	OP
Manganese	920	0.62	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Mercury	0.017	0.031	0.0092	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:00	SAJ
Nickel	640	0.62	0.15	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Potassium	960	120	21	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Sodium	370	120	61	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:06	OP
Vanadium	27	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP
Zinc	51	1.2	0.32	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:20	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 623-0-0.5 | Sampled: 3/21/2013 10:00

Sample ID: 13C0680-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.9		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 623-0-0.5 D | Sampled: 3/21/2013 10:00

Sample ID: 13C0680-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:26	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Barium	61	2.9	0.36	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:11	OP
Cadmium	0.97	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Calcium	2400	8.6	1.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Chromium	170	0.57	0.14	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Cobalt	87	2.9	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Copper	650	0.57	0.44	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Iron	71000	290	240	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:34	OP
Lead	10	0.86	0.39	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Magnesium	81000	860	90	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 13:34	OP
Manganese	870	0.57	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Mercury	0.016	0.030	0.0090	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:01	SAJ
Nickel	720	0.57	0.14	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Potassium	820	110	20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Selenium	ND	2.9	0.88	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Sodium	410	110	56	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Thallium	ND	2.9	0.95	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:11	OP
Vanadium	22	1.1	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP
Zinc	55	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:26	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 623-0-0.5 D | Sampled: 3/21/2013 10:00

Sample ID: 13C0680-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.3		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 523-0-0.5 | Sampled: 3/21/2013 10:45

Sample ID: 13C0680-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9400	4.8	2.1	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:31	OP
Antimony	ND	4.8	3.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Arsenic	6.2	4.8	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Barium	150	4.8	0.60	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Beryllium	ND	0.48	0.078	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:18	OP
Cadmium	1.1	0.48	0.28	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Calcium	12000	14	2.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Chromium	90	0.97	0.24	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Cobalt	37	4.8	0.31	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Copper	130	0.97	0.74	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Iron	24000	4.8	4.1	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 13:39	OP
Lead	17	1.4	0.67	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Magnesium	12000	14	1.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Manganese	430	0.97	0.31	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Mercury	0.061	0.051	0.015	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:03	SAJ
Nickel	110	0.97	0.23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Potassium	1000	190	33	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Selenium	ND	4.8	1.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Silver	ND	0.97	0.85	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Sodium	110	190	94	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:31	OP
Thallium	ND	4.8	1.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Vanadium	35	1.9	0.32	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP
Zinc	190	1.9	0.50	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:31	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 523-0-0.5 | Sampled: 3/21/2013 10:45

Sample ID: 13C0680-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	47.9		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 719-0-0.5 | Sampled: 3/21/2013 11:15

Sample ID: 13C0680-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	2.9	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:37	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Barium	550	2.9	0.36	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Beryllium	ND	1.5	0.23	mg/Kg dry	5	DL-04	SW-846 6010C	3/22/13	3/26/13 13:06	OP
Cadmium	0.65	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Calcium	5800	8.7	1.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Chromium	99	0.58	0.15	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Cobalt	40	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Copper	84	0.58	0.44	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Iron	37000	290	250	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:44	OP
Lead	5.9	0.87	0.40	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Magnesium	22000	870	91	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 13:44	OP
Manganese	390	0.58	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Mercury	0.016	0.031	0.0092	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:04	SAJ
Nickel	92	0.58	0.14	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Potassium	7700	120	20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Sodium	470	120	57	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Vanadium	75	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP
Zinc	37	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:37	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 719-0-0.5 | Sampled: 3/21/2013 11:15

Sample ID: 13C0680-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.0		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 716-0-0.5 | Sampled: 3/21/2013 11:50

Sample ID: 13C0680-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	3.1	1.4	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 19:41	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Barium	62	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Beryllium	ND	0.31	0.050	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:26	OP
Cadmium	0.83	0.31	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Calcium	2200	9.4	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Chromium	170	0.63	0.16	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Cobalt	66	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Copper	69	0.63	0.48	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Iron	61000	310	270	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:49	OP
Lead	14	0.94	0.43	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Magnesium	59000	940	98	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 13:49	OP
Manganese	780	0.63	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Mercury	0.022	0.032	0.0096	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:06	SAJ
Nickel	260	0.63	0.15	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Potassium	690	130	22	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Sodium	110	130	61	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 19:41	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:26	OP
Vanadium	28	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP
Zinc	54	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 19:41	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 716-0-0.5 | Sampled: 3/21/2013 11:50

Sample ID: 13C0680-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	75.7		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 713-0-0.5 | Sampled: 3/21/2013 12:05

Sample ID: 13C0680-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	2.9	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:06	OP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Barium	54	2.9	0.37	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Beryllium	ND	0.29	0.047	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:30	OP
Cadmium	0.55	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Calcium	2100	8.8	1.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Chromium	34	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Cobalt	26	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Copper	63	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Iron	33000	290	250	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:53	OP
Lead	10	0.88	0.41	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Magnesium	10000	8.8	0.92	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Manganese	380	0.59	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Mercury	0.020	0.029	0.0087	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:08	SAJ
Nickel	83	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Selenium	ND	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Sodium	89	120	57	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 20:06	OP
Thallium	ND	2.9	0.98	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Vanadium	25	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP
Zinc	35	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:06	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 713-0-0.5 | Sampled: 3/21/2013 12:05

Sample ID: 13C0680-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.1		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 710-0-0.5 | Sampled: 3/21/2013 12:25

Sample ID: 13C0680-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4000	3.3	1.4	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:12	OP
Antimony	ND	3.3	2.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Barium	61	3.3	0.41	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Beryllium	ND	0.33	0.053	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Cadmium	0.99	0.33	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Calcium	2100	9.8	1.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Chromium	140	0.66	0.16	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Cobalt	70	3.3	0.21	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Copper	72	0.66	0.50	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Iron	63000	330	280	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 13:57	OP
Lead	16	0.98	0.45	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Magnesium	73000	980	100	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 13:57	OP
Manganese	830	0.66	0.21	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Mercury	0.041	0.032	0.0096	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:09	SAJ
Nickel	360	0.66	0.16	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Potassium	400	130	23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Sodium	ND	130	64	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Thallium	ND	6.6	2.2	mg/Kg dry	2	DL-04	SW-846 6010C	3/22/13	3/28/13 10:42	OP
Vanadium	19	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP
Zinc	60	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:12	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: BRSD 710-0-0.5 | Sampled: 3/21/2013 12:25

Sample ID: 13C0680-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	73.4		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 519-0-0.5 | Sampled: 3/21/2013 12:35

Sample ID: 13C0680-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6200	3.9	1.7	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:17	OP
Antimony	ND	3.9	3.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Arsenic	19	3.9	1.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Barium	120	3.9	0.49	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Beryllium	ND	0.39	0.063	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Cadmium	1.6	0.39	0.23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Calcium	4700	12	2.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Chromium	270	0.78	0.20	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Cobalt	64	3.9	0.25	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Copper	110	0.78	0.60	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Iron	52000	390	330	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 14:21	OP
Lead	27	1.2	0.54	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Magnesium	29000	1200	120	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 14:21	OP
Manganese	720	0.78	0.25	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Mercury	0.11	0.041	0.012	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:11	SAJ
Nickel	280	0.78	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Potassium	450	160	27	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Selenium	ND	3.9	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Silver	ND	0.78	0.69	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Sodium	ND	160	76	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Thallium	ND	3.9	1.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Vanadium	33	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP
Zinc	76	1.6	0.40	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:17	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 519-0-0.5 | Sampled: 3/21/2013 12:35

Sample ID: 13C0680-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	61.2		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 619-0-0.5 | Sampled: 3/21/2013 14:05

Sample ID: 13C0680-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8300	6.4	2.7	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:23	OP
Antimony	ND	6.4	5.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Arsenic	100	6.4	2.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Barium	200	6.4	0.79	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Beryllium	ND	0.64	0.10	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:34	OP
Cadmium	3.2	0.64	0.38	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Calcium	7400	19	3.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Chromium	140	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Cobalt	25	6.4	0.41	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Copper	260	1.3	0.97	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Iron	23000	6.4	5.4	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 14:26	OP
Lead	14	1.9	0.88	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Magnesium	7100	19	2.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Manganese	820	1.3	0.40	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Mercury	0.061	0.066	0.019	mg/Kg dry	1	J	SW-846 7471B	3/22/13	3/25/13 11:17	SAJ
Nickel	98	1.3	0.31	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Potassium	1300	250	44	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Selenium	ND	6.4	2.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Silver	ND	1.3	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Sodium	ND	250	120	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Thallium	ND	6.4	2.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Vanadium	41	2.5	0.42	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP
Zinc	78	2.5	0.66	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:23	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: PASD 619-0-0.5 | Sampled: 3/21/2013 14:05

Sample ID: 13C0680-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	37.1		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 513-0-0.5 | Sampled: 3/21/2013 15:15

Sample ID: 13C0680-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	34000	3.8	1.6	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:28	OP
Antimony	ND	3.8	3.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Arsenic	ND	3.8	1.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Barium	500	3.8	0.47	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Beryllium	ND	0.38	0.061	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Cadmium	0.66	0.38	0.22	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Calcium	5000	11	2.0	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Chromium	60	0.75	0.19	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Cobalt	6.6	3.8	0.24	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Copper	77	0.75	0.58	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Iron	10000	3.8	3.2	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 14:31	OP
Lead	13	1.1	0.52	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Magnesium	3700	11	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Manganese	66	0.75	0.24	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Mercury	0.10	0.040	0.012	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:18	SAJ
Nickel	160	0.75	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Potassium	1800	150	26	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Selenium	ND	3.8	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Silver	ND	0.75	0.66	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Sodium	130	150	73	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 20:28	OP
Thallium	ND	3.8	1.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Vanadium	38	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP
Zinc	44	1.5	0.39	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:28	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 513-0-0.5 | Sampled: 3/21/2013 15:15

Sample ID: 13C0680-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	61.1		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 514-0-0.5 | Sampled: 3/21/2013 15:35

Sample ID: 13C0680-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	10	4.5	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:34	OP
Antimony	ND	10	8.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Arsenic	ND	10	3.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Barium	370	10	1.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Beryllium	ND	1.0	0.17	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Cadmium	1.6	1.0	0.61	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Calcium	11000	31	5.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Chromium	120	2.1	0.52	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Cobalt	39	10	0.66	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Copper	150	2.1	1.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Iron	37000	10	8.9	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 14:37	OP
Lead	81	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Magnesium	11000	31	3.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Manganese	560	2.1	0.66	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Mercury	0.20	0.10	0.030	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:20	SAJ
Nickel	230	2.1	0.50	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Potassium	1500	410	71	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Selenium	ND	10	3.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Silver	ND	2.1	1.8	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Sodium	410	410	200	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 20:34	OP
Thallium	ND	10	3.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Vanadium	63	4.1	0.68	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP
Zinc	200	4.1	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:34	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 514-0-0.5 | Sampled: 3/21/2013 15:35

Sample ID: 13C0680-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	24.1		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 516-0-0.5 | Sampled: 3/21/2013 16:05

Sample ID: 13C0680-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	3.6	1.5	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:39	OP
Antimony	ND	3.6	2.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Arsenic	ND	3.6	1.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Barium	65	3.6	0.44	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Beryllium	ND	0.36	0.057	mg/Kg dry	1		SW-846 6010C	3/22/13	3/26/13 12:39	OP
Cadmium	0.75	0.36	0.21	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Calcium	3100	11	1.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Chromium	100	0.71	0.18	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Cobalt	50	3.6	0.23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Copper	66	0.71	0.54	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Iron	52000	360	300	mg/Kg dry	100	B-07	SW-846 6010C	3/22/13	3/26/13 14:42	OP
Lead	11	1.1	0.49	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Magnesium	45000	1100	110	mg/Kg dry	100		SW-846 6010C	3/22/13	3/26/13 14:42	OP
Manganese	580	0.71	0.23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Mercury	0.040	0.037	0.011	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:22	SAJ
Nickel	200	0.71	0.17	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Potassium	540	140	24	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Selenium	ND	3.6	1.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Silver	ND	0.71	0.63	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Sodium	89	140	69	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 20:39	OP
Thallium	ND	3.6	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Vanadium	24	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP
Zinc	58	1.4	0.37	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:39	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 516-0-0.5 | Sampled: 3/21/2013 16:05

Sample ID: 13C0680-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	65.6		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 515-0-0.5 | Sampled: 3/21/2013 15:50

Sample ID: 13C0680-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	9.4	4.1	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/25/13 20:45	OP
Antimony	ND	9.4	7.6	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Arsenic	ND	9.4	3.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Barium	440	9.4	1.2	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Beryllium	ND	0.94	0.15	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Cadmium	1.6	0.94	0.56	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Calcium	10000	28	5.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Chromium	180	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Cobalt	53	9.4	0.60	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Copper	150	1.9	1.4	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Iron	42000	9.4	8.0	mg/Kg dry	1	B-07	SW-846 6010C	3/22/13	3/26/13 14:46	OP
Lead	86	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Magnesium	16000	28	2.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Manganese	620	1.9	0.60	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Mercury	0.23	0.10	0.030	mg/Kg dry	1		SW-846 7471B	3/22/13	3/25/13 11:23	SAJ
Nickel	270	1.9	0.46	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Potassium	1500	380	65	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Selenium	ND	9.4	2.9	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Sodium	280	380	180	mg/Kg dry	1	J	SW-846 6010C	3/22/13	3/25/13 20:45	OP
Thallium	ND	9.4	3.1	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Vanadium	69	3.8	0.62	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP
Zinc	220	3.8	0.97	mg/Kg dry	1		SW-846 6010C	3/22/13	3/25/13 20:45	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland Manor, NY | Sample Description: | Work Order: 13C0680

Date Received: 3/22/2013

Field Sample #: WTSD 515-0-0.5 | Sampled: 3/21/2013 15:50

Sample ID: 13C0680-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	24.9		% Wt	1		SM 2540G	3/23/13	3/24/13 11:37	RH

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13C0680-01 [PASD621- 2-2.5]	B069638	03/23/13
13C0680-02 [PASD621- 2.5-3]	B069638	03/23/13
13C0680-03 [PASD617- 2-2.5]	B069638	03/23/13
13C0680-04 [PASD617- 3-3.5]	B069638	03/23/13
13C0680-05 [PASD617- 4-4.5]	B069638	03/23/13
13C0680-06 [PASD615- 2-2.5]	B069638	03/23/13
13C0680-07 [PASD615- 3-3.5]	B069638	03/23/13
13C0680-08 [PASD615- 4-4.5]	B069638	03/23/13
13C0680-09 [WTSD 525-0-0.5]	B069638	03/23/13
13C0680-10 [PASD 623-0-0.5]	B069638	03/23/13
13C0680-11 [PASD 623-0-0.5 D]	B069638	03/23/13
13C0680-12 [WTSD 523-0-0.5]	B069638	03/23/13
13C0680-13 [BRSD 719-0-0.5]	B069638	03/23/13
13C0680-14 [BRSD 716-0-0.5]	B069638	03/23/13
13C0680-15 [BRSD 713-0-0.5]	B069638	03/23/13
13C0680-16 [BRSD 710-0-0.5]	B069638	03/23/13
13C0680-17 [WTSD 519-0-0.5]	B069638	03/23/13
13C0680-18 [PASD 619-0-0.5]	B069638	03/23/13
13C0680-19 [WTSD 513-0-0.5]	B069638	03/23/13
13C0680-20 [WTSD 514-0-0.5]	B069638	03/23/13
13C0680-21 [WTSD 516-0-0.5]	B069638	03/23/13
13C0680-22 [WTSD 515-0-0.5]	B069638	03/23/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0680-07 [PASD615- 3-3.5]	B069602	1.01	50.0	03/22/13
13C0680-08 [PASD615- 4-4.5]	B069602	1.05	50.0	03/22/13
13C0680-09 [WTSD 525-0-0.5]	B069602	1.08	50.0	03/22/13
13C0680-10 [PASD 623-0-0.5]	B069602	1.01	50.0	03/22/13
13C0680-11 [PASD 623-0-0.5 D]	B069602	1.09	50.0	03/22/13
13C0680-12 [WTSD 523-0-0.5]	B069602	1.08	50.0	03/22/13
13C0680-13 [BRSD 719-0-0.5]	B069602	1.09	50.0	03/22/13
13C0680-14 [BRSD 716-0-0.5]	B069602	1.05	50.0	03/22/13
13C0680-15 [BRSD 713-0-0.5]	B069602	1.02	50.0	03/22/13
13C0680-16 [BRSD 710-0-0.5]	B069602	1.04	50.0	03/22/13
13C0680-17 [WTSD 519-0-0.5]	B069602	1.04	50.0	03/22/13
13C0680-18 [PASD 619-0-0.5]	B069602	1.06	50.0	03/22/13
13C0680-19 [WTSD 513-0-0.5]	B069602	1.08	50.0	03/22/13
13C0680-20 [WTSD 514-0-0.5]	B069602	1.00	50.0	03/22/13
13C0680-21 [WTSD 516-0-0.5]	B069602	1.07	50.0	03/22/13
13C0680-22 [WTSD 515-0-0.5]	B069602	1.07	50.0	03/22/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0680-01 [PASD621- 2-2.5]	B069619	1.03	50.0	03/23/13
13C0680-02 [PASD621- 2.5-3]	B069619	1.02	50.0	03/23/13
13C0680-03 [PASD617- 2-2.5]	B069619	1.01	50.0	03/23/13
13C0680-04 [PASD617- 3-3.5]	B069619	1.08	50.0	03/23/13
13C0680-05 [PASD617- 4-4.5]	B069619	1.01	50.0	03/23/13
13C0680-06 [PASD615- 2-2.5]	B069619	1.06	50.0	03/23/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0680-03 [PASD617- 2-2.5]	B069621	0.608	50.0	03/22/13
13C0680-04 [PASD617- 3-3.5]	B069621	0.618	50.0	03/22/13
13C0680-05 [PASD617- 4-4.5]	B069621	0.618	50.0	03/22/13
13C0680-06 [PASD615- 2-2.5]	B069621	0.615	50.0	03/22/13
13C0680-07 [PASD615- 3-3.5]	B069621	0.607	50.0	03/22/13
13C0680-08 [PASD615- 4-4.5]	B069621	0.603	50.0	03/22/13
13C0680-09 [WTSD 525-0-0.5]	B069621	0.607	50.0	03/22/13
13C0680-10 [PASD 623-0-0.5]	B069621	0.602	50.0	03/22/13
13C0680-11 [PASD 623-0-0.5 D]	B069621	0.615	50.0	03/22/13
13C0680-12 [WTSD 523-0-0.5]	B069621	0.620	50.0	03/22/13
13C0680-13 [BRSD 719-0-0.5]	B069621	0.614	50.0	03/22/13
13C0680-14 [BRSD 716-0-0.5]	B069621	0.614	50.0	03/22/13
13C0680-15 [BRSD 713-0-0.5]	B069621	0.614	50.0	03/22/13
13C0680-16 [BRSD 710-0-0.5]	B069621	0.633	50.0	03/22/13
13C0680-17 [WTSD 519-0-0.5]	B069621	0.602	50.0	03/22/13
13C0680-18 [PASD 619-0-0.5]	B069621	0.617	50.0	03/22/13
13C0680-19 [WTSD 513-0-0.5]	B069621	0.611	50.0	03/22/13
13C0680-20 [WTSD 514-0-0.5]	B069621	0.618	50.0	03/22/13
13C0680-21 [WTSD 516-0-0.5]	B069621	0.619	50.0	03/22/13
13C0680-22 [WTSD 515-0-0.5]	B069621	0.604	50.0	03/22/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0680-01 [PASD621- 2-2.5]	B069745	0.607	50.0	03/26/13
13C0680-02 [PASD621- 2.5-3]	B069745	0.618	50.0	03/26/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069602 - SW-846 3050B										
Blank (B069602-BLK1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Aluminum	8.5	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	3.7	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	13	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	4.0	7.5	mg/Kg wet							J
Manganese	0.29	0.50	mg/Kg wet							J
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B069602-BS1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Aluminum	7370	5.0	mg/Kg wet	8360		88.2	40.4-159.1			
Antimony	82.4	5.0	mg/Kg wet	92.9		88.7	8.2-191.6			
Arsenic	87.9	5.0	mg/Kg wet	94.5		93.0	82.2-117.5			
Barium	155	5.0	mg/Kg wet	166		93.1	83.1-116.3			
Beryllium	52.1	0.50	mg/Kg wet	52.6		99.0	83.8-116.2			
Cadmium	56.8	0.50	mg/Kg wet	59.9		94.8	84-115.9			
Calcium	5500	15	mg/Kg wet	6160		89.3	82.3-117.5			
Chromium	65.8	0.99	mg/Kg wet	69.3		94.9	81.4-118.6			
Cobalt	95.3	5.0	mg/Kg wet	101		94.3	83.8-115.8			
Copper	77.8	0.99	mg/Kg wet	78.0		99.7	83.7-116.2			
Iron	11100	5.0	mg/Kg wet	12800		86.6	50.6-149.2			
Lead	84.5	1.5	mg/Kg wet	91.7		92.2	82.4-117.8			
Magnesium	2720	15	mg/Kg wet	3030		89.7	76.2-123.8			
Manganese	273	0.99	mg/Kg wet	283		96.5	81.6-118			
Nickel	53.8	0.99	mg/Kg wet	56.6		95.1	82.2-117.8			
Potassium	3420	200	mg/Kg wet	3820		89.5	73.6-126.4			
Selenium	131	5.0	mg/Kg wet	159		82.7	79.2-120.8			
Silver	30.2	0.99	mg/Kg wet	33.9		89.2	66.4-133.9			
Sodium	588	200	mg/Kg wet	652		90.1	73.6-126.2			
Thallium	111	5.0	mg/Kg wet	119		93.0	81.1-119.3			
Vanadium	56.1	2.0	mg/Kg wet	56.3		99.7	72.8-127.2			
Zinc	124	2.0	mg/Kg wet	137		90.8	81-119			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069602 - SW-846 3050B										
LCS Dup (B069602-BSD1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Aluminum	7340	5.0	mg/Kg wet	8360		87.8	40.4-159.1	0.487	30	
Antimony	82.0	5.0	mg/Kg wet	92.9		88.3	8.2-191.6	0.502	30	
Arsenic	89.1	5.0	mg/Kg wet	94.5		94.3	82.2-117.5	1.37	30	
Barium	157	5.0	mg/Kg wet	166		94.6	83.1-116.3	1.58	30	
Beryllium	53.2	0.50	mg/Kg wet	52.6		101	83.8-116.2	2.19	30	
Cadmium	57.2	0.50	mg/Kg wet	59.9		95.6	84-115.9	0.808	30	
Calcium	5700	15	mg/Kg wet	6160		92.6	82.3-117.5	3.61	30	
Chromium	66.7	1.0	mg/Kg wet	69.3		96.2	81.4-118.6	1.32	30	
Cobalt	96.9	5.0	mg/Kg wet	101		95.9	83.8-115.8	1.65	30	
Copper	78.9	1.0	mg/Kg wet	78.0		101	83.7-116.2	1.44	30	
Iron	10900	5.0	mg/Kg wet	12800		85.4	50.6-149.2	1.42	30	
Lead	85.1	1.5	mg/Kg wet	91.7		92.9	82.4-117.8	0.752	30	
Magnesium	2710	15	mg/Kg wet	3030		89.4	76.2-123.8	0.328	30	
Manganese	273	1.0	mg/Kg wet	283		96.4	81.6-118	0.107	30	
Nickel	54.6	1.0	mg/Kg wet	56.6		96.5	82.2-117.8	1.47	30	
Potassium	3430	200	mg/Kg wet	3820		89.8	73.6-126.4	0.321	30	
Selenium	135	5.0	mg/Kg wet	159		84.8	79.2-120.8	2.59	30	
Silver	30.5	1.0	mg/Kg wet	33.9		89.8	66.4-133.9	0.773	30	
Sodium	592	200	mg/Kg wet	652		90.8	73.6-126.2	0.741	30	
Thallium	113	5.0	mg/Kg wet	119		94.7	81.1-119.3	1.85	30	
Vanadium	56.3	2.0	mg/Kg wet	56.3		99.9	72.8-127.2	0.246	30	
Zinc	126	2.0	mg/Kg wet	137		91.7	81-119	1.03	30	
MRL Check (B069602-MRL1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Lead	0.735	0.73	mg/Kg wet	0.727		101	80-120			
Batch B069619 - SW-846 3050B										
Blank (B069619-BLK1)				Prepared: 03/23/13 Analyzed: 03/25/13						
Aluminum	8.5	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	4.0	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	19	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	13	7.5	mg/Kg wet							B-07
Manganese	0.29	0.50	mg/Kg wet							J
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069619 - SW-846 3050B										
LCS (B069619-BS1)				Prepared: 03/23/13 Analyzed: 03/25/13						
Aluminum	7570	5.0	mg/Kg wet	8360		90.6	40.4-159.1			
Antimony	95.3	5.0	mg/Kg wet	92.9		103	8.2-191.6			
Arsenic	86.4	5.0	mg/Kg wet	94.5		91.5	82.2-117.5			
Barium	156	5.0	mg/Kg wet	166		94.2	83.1-116.3			
Beryllium	52.3	0.50	mg/Kg wet	52.6		99.5	83.8-116.2			
Cadmium	54.9	0.50	mg/Kg wet	59.9		91.7	84-115.9			
Calcium	5630	15	mg/Kg wet	6160		91.4	82.3-117.5			
Chromium	64.3	1.0	mg/Kg wet	69.3		92.8	81.4-118.6			
Cobalt	93.0	5.0	mg/Kg wet	101		92.1	83.8-115.8			
Copper	76.9	1.0	mg/Kg wet	78.0		98.6	83.7-116.2			
Iron	11100	5.0	mg/Kg wet	12800		86.6	50.6-149.2			
Lead	79.6	1.5	mg/Kg wet	91.7		86.8	82.4-117.8			
Magnesium	2820	15	mg/Kg wet	3030		93.0	76.2-123.8			
Manganese	261	1.0	mg/Kg wet	283		92.3	81.6-118			
Nickel	52.2	1.0	mg/Kg wet	56.6		92.3	82.2-117.8			
Potassium	3430	200	mg/Kg wet	3820		89.7	73.6-126.4			
Selenium	136	5.0	mg/Kg wet	159		85.5	79.2-120.8			
Silver	29.2	1.0	mg/Kg wet	33.9		86.0	66.4-133.9			
Sodium	593	200	mg/Kg wet	652		90.9	73.6-126.2			
Thallium	111	5.0	mg/Kg wet	119		93.1	81.1-119.3			
Vanadium	55.0	2.0	mg/Kg wet	56.3		97.7	72.8-127.2			
Zinc	119	2.0	mg/Kg wet	137		86.9	81-119			
LCS Dup (B069619-BSD1)				Prepared: 03/23/13 Analyzed: 03/25/13						
Aluminum	7490	5.0	mg/Kg wet	8360		89.6	40.4-159.1	1.16	30	
Antimony	96.0	5.0	mg/Kg wet	92.9		103	8.2-191.6	0.781	30	
Arsenic	87.0	5.0	mg/Kg wet	94.5		92.0	82.2-117.5	0.609	30	
Barium	158	5.0	mg/Kg wet	166		95.0	83.1-116.3	0.856	30	
Beryllium	53.1	0.50	mg/Kg wet	52.6		101	83.8-116.2	1.53	30	
Cadmium	56.3	0.50	mg/Kg wet	59.9		94.0	84-115.9	2.46	30	
Calcium	5630	15	mg/Kg wet	6160		91.4	82.3-117.5	0.00561	30	
Chromium	65.8	1.0	mg/Kg wet	69.3		94.9	81.4-118.6	2.23	30	
Cobalt	95.1	5.0	mg/Kg wet	101		94.1	83.8-115.8	2.21	30	
Copper	78.4	1.0	mg/Kg wet	78.0		101	83.7-116.2	2.01	30	
Iron	11300	5.0	mg/Kg wet	12800		88.0	50.6-149.2	1.56	30	
Lead	84.8	1.5	mg/Kg wet	91.7		92.4	82.4-117.8	6.34	30	
Magnesium	2770	15	mg/Kg wet	3030		91.3	76.2-123.8	1.93	30	
Manganese	273	1.0	mg/Kg wet	283		96.6	81.6-118	4.58	30	
Nickel	53.2	1.0	mg/Kg wet	56.6		94.0	82.2-117.8	1.85	30	
Potassium	3420	200	mg/Kg wet	3820		89.6	73.6-126.4	0.110	30	
Selenium	143	5.0	mg/Kg wet	159		90.2	79.2-120.8	5.39	30	
Silver	29.9	1.0	mg/Kg wet	33.9		88.2	66.4-133.9	2.50	30	
Sodium	597	200	mg/Kg wet	652		91.5	73.6-126.2	0.643	30	
Thallium	112	5.0	mg/Kg wet	119		94.1	81.1-119.3	1.08	30	
Vanadium	56.9	2.0	mg/Kg wet	56.3		101	72.8-127.2	3.39	30	
Zinc	122	2.0	mg/Kg wet	137		89.3	81-119	2.74	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069619 - SW-846 3050B										
MRL Check (B069619-MRL1)				Prepared: 03/23/13 Analyzed: 03/25/13						
Lead	0.692	0.72	mg/Kg wet	0.725		95.5	80-120			J
Batch B069621 - SW-846 7471										
Blank (B069621-BLK1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069621-BS1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Mercury	3.62	0.33	mg/Kg wet	4.05		89.3	71.6-128.1			
LCS Dup (B069621-BSD1)				Prepared: 03/22/13 Analyzed: 03/25/13						
Mercury	4.86	0.33	mg/Kg wet	4.05		120	71.6-128.1	29.4	30	
Duplicate (B069621-DUP1)	**Source: 13C0680-03**			Prepared: 03/22/13 Analyzed: 03/25/13						
Mercury	ND	0.22	mg/Kg dry		ND			NC	35	
Matrix Spike (B069621-MS1)	**Source: 13C0680-03**			Prepared: 03/22/13 Analyzed: 03/25/13						
Mercury	1.46	0.22	mg/Kg dry	1.45	ND	100	75-125			
Batch B069745 - SW-846 7471										
Blank (B069745-BLK1)				Prepared: 03/26/13 Analyzed: 03/27/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069745-BS1)				Prepared: 03/26/13 Analyzed: 03/27/13						
Mercury	4.23	0.33	mg/Kg wet	4.05		104	71.6-128.1			
LCS Dup (B069745-BSD1)				Prepared: 03/26/13 Analyzed: 03/27/13						
Mercury	4.33	0.33	mg/Kg wet	4.05		107	71.6-128.1	2.38	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069638 - % Solids										
Duplicate (B069638-DUP3)	**Source: 13C0680-22**			Prepared: 03/23/13 Analyzed: 03/24/13						
% Solids	26.6		% Wt		24.9			6.60	20	
Duplicate (B069638-DUP4)	**Source: 13C0680-01**			Prepared: 03/23/13 Analyzed: 03/24/13						
% Solids	89.6		% Wt		88.8			0.897	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2013
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

CHAIN OF CUSTODY RECORD

13C0680

Rev 04.05.12

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Page 1 of 3

Company Name: HDR Engineering Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plaza, 12th Floor Project #
Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals (Cortlandt Manor, NY)

Sampled By: A. Wadden

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS
☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	*** Container Code	TAL Metals	TOC	Moisture Content
01	PASD621-2-2.5	3/20/13	1115		X	S	U	1	A	G	X		
02	PASD 621 - 2.5-3	3/20/13	1120		X	S	U				X		
03	PASD 617 - 2 - 2.5	3/20/13	1130		X	S	U				X		
04	PASD 617 - 3 - 3.5	3/20/13	1135		X	S	U				X		X
05	PASD 617 - 4 - 4.5	3/20/13	1140		X	S	U				X	X	
06	PASD 615 - 2 - 2.5	3/20/13	1145		X	S	U				X		
07	PASD 615 - 3 - 3.5	3/20/13	1150		X	S	U				X		
08	PASD 615 - 4 - 4.5	3/20/13	1155		X	S	U				X		
09	WTSD 525-0-0.5	3/21/13	0930		X	S	U				X	X	X
10	PASD 623-0-0.5	3/21/13	1060		X	S	U				X		

ANALYSIS REQUESTED

Comments: 3.6/ice

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

*****Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

***Matrix Code:**
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Dissolved Meta
○ Field Filtered
○ Lab to Filter

Relinquished by: (signature)	Date/Time:
Received by: (signature) 3.6	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

13C0680

Rev 04.05.12

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: 1 Blue Hill Plaza, 12th Floor
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Cortlandt Manor NY)
Sampled By:

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	TOC	Moisture Content
~~10~~ 11	~~PASD6~~ PASD623-0-0.5	3/21/13	1000		X	S	U	1	1	A	X		
~~11~~ 12	WTSD523-0-0.5		1045		X	S	U	1	1	A	X		
~~12~~ 13	BRSD719-0-0.5		1115		X	S	U	1	1	A	X		
~~13~~ 14	BRSD716-0-0.5		1150		X	S	U	1	1	A	X		
~~14~~ 15	BRSD713-0-0.5		1205		X	S	U	1	1	A	X		
~~15~~ 16	BRSD710-0-0.5		1225		X	S	U	1	1	A	X		
~~16~~ 17	WTSD519 0-0.5		1235		X	S	U	1	1	A	X		
~~17~~ 18	PASD619 0-0.5		1405		X	S	U	1	1	A	X		
~~18~~ 19	WTSD5[illegible] 0-0.5		1515		X	S	U	1	1	A	X		
~~19~~ 20	WTSDS14 0-0.5		1535		X	S	D	1	1	A	X		

ANALYSIS REQUESTED

Comments: 3.6/1.0

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/21/13 1815
Received by: (signature) 3.6 [signature] 3/22/13	Date/Time: 1000
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

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PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

***Container Code
Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
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www.contestlabs.com

CHAIN OF CUSTODY RECORD

13C0680

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Telephone: 845-735 8300
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Project #
Client PO#
Attention: Amita Patel
Project Location: Magna Metals (Cortandt Manor, NY
Sampled By: MTP/SJN

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER NYS DEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals										
								1	1	1								# of Containers
								1	1	1								** Preservation
								A	A	G								***Container Code
~~20~~ 21	WTSD 516 0-0.5	3/21/13	1605		X	S	U	X										
~~21~~ 22	WTSD 515 0-0.5		1550					X										

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
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P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
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DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments: 3.6/1L

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/21/17 1815
Received by: (signature) 3.6 [signature] 3/22/13	Date/Time: 1004
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
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FedEx.

802639072927

Ship (P/U) date :
Thur 3/21/2013 6:29 pm
PEA US

Delivered
Signed for by: A.ARD

Actual delivery :
Fri 3/22/2013 10:03 a
MA US

Travel History

Date/Time	Activity	Location
- 3/22/2013 - Friday		
10:03 am	Delivered	MA
7:59 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
6:50 am	At local FedEx facility	WINDSOR LOCKS, CT
- 3/21/2013 - Thursday		
10:13 pm	Departed FedEx location	NEWARK, NJ
10:05 pm	Arrived at FedEx location	NEWARK, NJ
9:18 pm	Left FedEx origin facility	MAHWAH, NJ
6:29 pm	Picked up Tendered at FedEx Office	NANUET, NY

Local Scan

Shipment Facts

Tracking number	802639072927	**Service**	FedEx Standard Overnigl
Weight	45 lbs	**Dimensions**	24x14x13 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	45 lbs / 20.4 kgs	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge		

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
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Sample Receipt Checklist

CLIENT NAME: HDR Eng **RECEIVED BY:** WF **DATE:** 3/22/13

1) **Was the chain(s) of custody relinquished and signed?** Yes No No CoC Included

2) **Does the chain agree with the samples?** Yes No
If not, explain:

3) **Are all the samples in good condition?** Yes No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? Yes No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 4-6

5) **Are there Dissolved samples for the lab to filter?** Yes No
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes No
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No N/A _____

9) **Do all samples have the proper Base pH:** Yes No N/A _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	24
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	2
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

GeoTesting EXPRESS

Client:	Con-Test Analytical Lab				
Project:	13C0680				
Location:	---			Project No:	GTX-300378
Boring ID:	---	Sample Type:	---	Tested By:	jek
Sample ID:	---	Test Date:	03/27/13	Checked By:	jdt
Depth :	---	Test Id:	262706		

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	13C0680-04	---	Wet, very dark brown silt	726.7
---	13C0680-09	---	Wet, dark brown silty sand with organics	236.4

Notes: Temperature of Drying : 110° Celsius

printed 3/28/2013 9:51:47 AM

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 10, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna Metals (Cordon Land Manor)
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13C0854

Enclosed are results of analyses for samples received by the laboratory on March 27, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD723-0-0.5	13C0854-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-1-1.5	13C0854-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-2-2.5	13C0854-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-3-3.5	13C0854-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-0-0.5	13C0854-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-1-1.5	13C0854-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-2-2.5	13C0854-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-0-0.5	13C0854-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-1-1.5	13C0854-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-2-2.5	13C0854-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD503-0-0.5	13C0854-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD502-0-0.5	13C0854-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD501-0-0.5	13C0854-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD511-1-1.5	13C0854-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD511-2-2.5	13C0854-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD511-3-3.5	13C0854-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-1-1.5	13C0854-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-2-2.5	13C0854-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-3-3.5	13C0854-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-2-2.5	13C0854-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-3-3.5	13C0854-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-4-4.5	13C0854-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-2-2.5	13C0854-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-3-3.5	13C0854-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-4-4.5	13C0854-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD504-2-2.5	13C0854-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
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Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD504-3-3.5	13C0854-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD504-4-4.5	13C0854-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-2-2.5	13C0854-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-3-3.5	13C0854-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-4-4.5	13C0854-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-2-2.5	13C0854-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-3-3.5	13C0854-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-4-4.5	13C0854-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-1-1.5	13C0854-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-2-2.5	13C0854-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-3-3.5	13C0854-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD509-2-2.5	13C0854-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD518-2-2.5	13C0854-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

con-test® ANALYTICAL LABORATORY

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron

13C0854-21[WTSD508-3-3.5], 13C0854-22[WTSD508-4-4.5], 13C0854-23[WTSD505-2-2.5], 13C0854-24[WTSD505-3-3.5], 13C0854-25[WTSD505-4-4.5], 13C0854-26[WTSD504-2-2.5], 13C0854-27[WTSD504-3-3.5], 13C0854-28[WTSD504-4-4.5], 13C0854-29[WTSD507-2-2.5], 13C0854-30[WTSD507-3-3.5], 13C0854-31[WTSD507-4-4.5], 13C0854-32[WTSD506-2-2.5], 13C0854-33[WTSD506-3-3.5], 13C0854-34[WTSD506-4-4.5], 13C0854-35[WTSD517-1-1.5], 13C0854-36[WTSD517-2-2.5], 13C0854-37[WTSD517-3-3.5], 13C0854-38[WTSD509-2-2.5], 13C0854-39[WTSD518-2-2.5], B069963-BLK1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium

13C0854-19[WTSD510-3-3.5], 13C0854-36[WTSD517-2-2.5]

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0854-09[PASD622-1-1.5], B069915-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13C0854-09[PASD622-1-1.5], B069915-MS1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-0-0.5 Sampled: 3/22/2013 09:00

Sample ID: 13C0854-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	4.4	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Arsenic	ND	4.4	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Barium	100	4.4	0.55	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Beryllium	ND	0.44	0.071	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Cadmium	0.68	0.44	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Calcium	2600	13	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Chromium	71	0.88	0.22	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Cobalt	9.8	4.4	0.28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Copper	53	0.88	0.67	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Iron	24000	4.4	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Lead	12	1.3	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Magnesium	6500	13	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Manganese	100	0.88	0.28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Nickel	47	0.88	0.21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Potassium	970	180	30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Selenium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Silver	ND	0.88	0.77	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Sodium	160	180	86	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 14:32	OP
Thallium	ND	4.4	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Vanadium	32	1.8	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP
Zinc	33	1.8	0.45	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:32	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-0-0.5 Sampled: 3/22/2013 09:00

Sample ID: 13C0854-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	53.6		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-1-1.5 Sampled: 3/22/2013 09:00

Sample ID: 13C0854-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	4.3	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Antimony	ND	4.3	3.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Arsenic	ND	4.3	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Barium	76	4.3	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Beryllium	ND	0.43	0.069	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Cadmium	0.52	0.43	0.25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Calcium	2200	13	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Chromium	55	0.86	0.22	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Cobalt	10	4.3	0.28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Copper	37	0.86	0.66	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Iron	18000	4.3	3.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Lead	7.9	1.3	0.59	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Magnesium	6100	13	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Manganese	98	0.86	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Nickel	54	0.86	0.21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Potassium	1100	170	30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Selenium	ND	4.3	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Silver	ND	0.86	0.76	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Sodium	160	170	84	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 14:57	OP
Thallium	ND	4.3	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Vanadium	31	1.7	0.28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP
Zinc	33	1.7	0.44	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:57	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-1-1.5 Sampled: 3/22/2013 09:00

Sample ID: 13C0854-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	57.5		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-2-2.5 Sampled: 3/22/2013 09:15

Sample ID: 13C0854-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	12	5.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Arsenic	9.7	12	4.4	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:02	OP
Barium	280	12	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Beryllium	ND	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Cadmium	1.2	1.2	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Calcium	15000	37	6.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Chromium	64	2.4	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Cobalt	14	12	0.78	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Copper	50	2.4	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Iron	9200	12	10	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Lead	14	3.7	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Magnesium	11000	37	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Manganese	78	2.4	0.78	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Nickel	120	2.4	0.59	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Potassium	750	490	84	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Silver	ND	2.4	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Sodium	590	490	240	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Vanadium	51	4.9	0.81	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP
Zinc	46	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:02	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-2-2.5 Sampled: 3/22/2013 09:15

Sample ID: 13C0854-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.1		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-3-3.5 Sampled: 3/22/2013 09:15

Sample ID: 13C0854-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	14	6.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Arsenic	9.7	14	5.1	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:08	OP
Barium	180	14	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Cadmium	1.1	1.4	0.83	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:08	OP
Calcium	13000	42	7.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Chromium	37	2.8	0.71	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Cobalt	6.3	14	0.90	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:08	OP
Copper	70	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Iron	6400	14	12	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Lead	2.4	4.2	2.0	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:08	OP
Magnesium	9500	42	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Manganese	120	2.8	0.90	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Nickel	86	2.8	0.68	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Potassium	420	570	97	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:08	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Silver	ND	2.8	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Sodium	590	570	280	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Vanadium	38	5.7	0.93	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP
Zinc	13	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:08	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD723-3-3.5 Sampled: 3/22/2013 09:15

Sample ID: 13C0854-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-0-0.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	7.8	3.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Antimony	ND	7.8	6.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Arsenic	ND	7.8	2.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Barium	87	7.8	0.97	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Beryllium	ND	0.78	0.12	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Cadmium	0.57	0.78	0.46	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:12	OP
Calcium	5400	23	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Chromium	23	1.6	0.39	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Cobalt	5.3	7.8	0.50	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:12	OP
Copper	42	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Iron	11000	7.8	6.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Lead	20	2.3	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Magnesium	2700	23	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Manganese	200	1.6	0.49	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Nickel	39	1.6	0.38	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Potassium	820	310	53	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Selenium	ND	7.8	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Sodium	ND	310	150	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Thallium	ND	7.8	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Vanadium	14	3.1	0.51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP
Zinc	60	3.1	0.80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:12	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-0-0.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	31.5		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-1-1.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	4.0	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Antimony	ND	4.0	3.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Arsenic	ND	4.0	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Barium	71	4.0	0.50	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Beryllium	ND	0.40	0.065	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Cadmium	0.50	0.40	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Calcium	2600	12	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Chromium	23	0.80	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Cobalt	7.4	4.0	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Copper	75	0.80	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Iron	15000	4.0	3.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Lead	9.8	1.2	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Magnesium	3700	12	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Manganese	81	0.80	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Nickel	33	0.80	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Potassium	940	160	28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Selenium	ND	4.0	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Silver	ND	0.80	0.71	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Sodium	120	160	78	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:18	OP
Thallium	ND	4.0	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Vanadium	25	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP
Zinc	38	1.6	0.41	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:18	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-1-1.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	57.4		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-2-2.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6000	7.5	3.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Antimony	ND	7.5	6.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Arsenic	ND	7.5	2.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Barium	77	7.5	0.93	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Beryllium	ND	0.75	0.12	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Cadmium	0.57	0.75	0.44	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:23	OP
Calcium	3900	22	4.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Chromium	22	1.5	0.37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Cobalt	6.2	7.5	0.48	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:23	OP
Copper	34	1.5	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Iron	11000	7.5	6.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Lead	15	2.2	1.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Magnesium	2700	22	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Manganese	55	1.5	0.47	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Nickel	29	1.5	0.36	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Potassium	740	300	51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Selenium	ND	7.5	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Silver	ND	1.5	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Sodium	ND	300	150	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Thallium	ND	7.5	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Vanadium	16	3.0	0.49	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP
Zinc	42	3.0	0.77	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:23	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: BRSD720-2-2.5 Sampled: 3/22/2013 14:30

Sample ID: 13C0854-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	31.7		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-0-0.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	13	5.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Arsenic	ND	13	4.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Barium	110	13	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Beryllium	ND	1.3	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Cadmium	ND	1.3	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Calcium	9400	38	6.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Chromium	16	2.5	0.63	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Cobalt	6.2	13	0.81	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:29	OP
Copper	33	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Iron	8700	13	11	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Lead	9.3	3.8	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Magnesium	3500	38	4.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Manganese	520	2.5	0.80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Nickel	28	2.5	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Potassium	1600	500	87	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Selenium	ND	13	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Sodium	ND	500	250	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Thallium	ND	13	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Vanadium	16	5.0	0.83	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP
Zinc	110	5.0	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:29	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-0-0.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.1		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-1-1.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	5.1	2.2	mg/Kg dry	1	MS-19	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Antimony	ND	5.1	4.1	mg/Kg dry	1	MS-07	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Arsenic	2.6	5.1	1.9	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Barium	93	5.1	0.64	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Beryllium	ND	0.51	0.083	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Cadmium	0.66	0.51	0.30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Calcium	4300	15	2.8	mg/Kg dry	1	MS-19	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Chromium	26	1.0	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Cobalt	7.9	5.1	0.33	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Copper	44	1.0	0.78	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Iron	14000	5.1	4.4	mg/Kg dry	1	MS-19	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Lead	13	1.5	0.71	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Magnesium	3700	15	1.6	mg/Kg dry	1	MS-19	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Manganese	80	1.0	0.33	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Nickel	42	1.0	0.25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Potassium	780	210	35	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Selenium	ND	5.1	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Silver	ND	1.0	0.90	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Sodium	130	210	100	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 14:06	OP
Thallium	ND	5.1	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Vanadium	28	2.1	0.34	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP
Zinc	41	2.1	0.53	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 14:06	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-1-1.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	47.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-2-2.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9900	5.4	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Antimony	ND	5.4	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Arsenic	2.8	5.4	2.0	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:34	OP
Barium	110	5.4	0.67	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Beryllium	ND	0.54	0.087	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Cadmium	0.69	0.54	0.32	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Calcium	5000	16	2.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Chromium	26	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Cobalt	9.7	5.4	0.35	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Copper	49	1.1	0.82	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Iron	17000	5.4	4.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Lead	12	1.6	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Magnesium	5000	16	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Manganese	140	1.1	0.34	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Mercury	0.031	0.054	0.016	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 15:36	SAJ
Nickel	45	1.1	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Potassium	1200	220	37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Selenium	ND	5.4	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Silver	ND	1.1	0.95	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Sodium	160	220	110	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:34	OP
Thallium	ND	5.4	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Vanadium	31	2.2	0.36	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP
Zinc	52	2.2	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:34	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: PASD622-2-2.5 Sampled: 3/22/2013 16:00

Sample ID: 13C0854-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	45.7		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD503-0-0.5 Sampled: 3/22/2013 15:55

Sample ID: 13C0854-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8300	4.2	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Antimony	ND	4.2	3.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Arsenic	ND	4.2	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Barium	100	4.2	0.52	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Beryllium	ND	0.42	0.067	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Cadmium	1.0	0.42	0.25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Calcium	7000	12	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Chromium	80	0.83	0.21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Cobalt	34	4.2	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Copper	61	0.83	0.64	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Iron	26000	4.2	3.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Lead	75	1.2	0.58	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Magnesium	21000	12	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Manganese	1600	0.83	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Mercury	0.066	0.043	0.013	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:38	SAJ
Nickel	150	0.83	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Potassium	470	170	29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Selenium	ND	4.2	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Silver	ND	0.83	0.73	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Sodium	ND	170	81	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Thallium	ND	4.2	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Vanadium	21	1.7	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP
Zinc	170	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:40	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD503-0-0.5 Sampled: 3/22/2013 15:55

Sample ID: 13C0854-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	57.6		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD502-0-0.5 Sampled: 3/22/2013 16:30

Sample ID: 13C0854-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	19	8.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Antimony	ND	19	15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Arsenic	ND	19	6.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Barium	85	19	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Beryllium	ND	1.9	0.30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Cadmium	ND	1.9	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Calcium	4800	57	10	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Chromium	12	3.8	0.94	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Cobalt	7.4	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 15:45	OP
Copper	380	3.8	2.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Iron	8000	19	16	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Lead	18	5.7	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Magnesium	2100	57	5.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Manganese	99	3.8	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Mercury	ND	0.18	0.054	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:39	SAJ
Nickel	190	3.8	0.91	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Potassium	950	760	130	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Selenium	ND	19	5.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Silver	ND	3.8	3.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Sodium	850	760	370	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Thallium	ND	19	6.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Vanadium	10	7.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP
Zinc	130	7.6	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 15:45	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD502-0-0.5 Sampled: 3/22/2013 16:30

Sample ID: 13C0854-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.5		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD501-0-0.5 Sampled: 3/22/2013 16:50

Sample ID: 13C0854-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7200	14	6.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Arsenic	9.1	14	5.2	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:09	OP
Barium	180	14	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Cadmium	1.4	1.4	0.85	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:09	OP
Calcium	11000	43	7.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Chromium	33	2.9	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Cobalt	15	14	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Copper	590	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Iron	14000	14	12	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Lead	76	4.3	2.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Magnesium	4500	43	4.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Manganese	330	2.9	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Mercury	0.19	0.14	0.043	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:41	SAJ
Nickel	250	2.9	0.70	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Potassium	930	580	99	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Sodium	ND	580	280	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Thallium	ND	14	4.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Vanadium	25	5.8	0.95	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP
Zinc	150	5.8	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:09	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD501-0-0.5 Sampled: 3/22/2013 16:50

Sample ID: 13C0854-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.0		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-1-1.5 Sampled: 3/26/2013 16:05

Sample ID: 13C0854-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	5.0	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Antimony	ND	5.0	4.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Arsenic	ND	5.0	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Barium	160	5.0	0.62	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Beryllium	ND	0.50	0.080	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Cadmium	0.69	0.50	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Calcium	3300	15	2.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Chromium	45	0.99	0.25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Cobalt	14	5.0	0.32	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Copper	210	0.99	0.76	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Iron	16000	5.0	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Lead	24	1.5	0.68	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Magnesium	4600	15	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Manganese	140	0.99	0.31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Mercury	0.064	0.052	0.015	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:43	SAJ
Nickel	290	0.99	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Potassium	820	200	34	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Selenium	ND	5.0	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Silver	ND	0.99	0.87	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Sodium	200	200	97	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Thallium	ND	5.0	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Vanadium	33	2.0	0.33	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP
Zinc	210	2.0	0.51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:15	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-1-1.5 Sampled: 3/26/2013 16:05

Sample ID: 13C0854-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	47.2		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-2-2.5 Sampled: 3/26/2013 16:10

Sample ID: 13C0854-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9900	3.0	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Barium	74	3.0	0.37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Beryllium	ND	0.30	0.048	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Cadmium	0.31	0.30	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Calcium	1500	9.0	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Chromium	16	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Cobalt	6.3	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Copper	15	0.60	0.46	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Iron	12000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Lead	8.9	0.90	0.41	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Magnesium	2700	9.0	0.94	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Manganese	71	0.60	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Mercury	0.013	0.030	0.0089	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 15:44	SAJ
Nickel	15	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Potassium	490	120	21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Sodium	110	120	58	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:20	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Vanadium	30	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP
Zinc	39	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:20	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-2-2.5 Sampled: 3/26/2013 16:10

Sample ID: 13C0854-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.1		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-3-3.5 Sampled: 3/26/2013 16:15

Sample ID: 13C0854-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8100	2.8	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Barium	54	2.8	0.34	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Beryllium	ND	0.28	0.045	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Cadmium	0.29	0.28	0.16	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Calcium	1500	8.3	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Chromium	14	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Cobalt	8.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Copper	27	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Iron	9000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Lead	6.8	0.83	0.38	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Magnesium	2800	8.3	0.87	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Manganese	91	0.55	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Mercury	ND	0.028	0.0082	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:46	SAJ
Nickel	13	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Potassium	590	110	19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Sodium	81	110	54	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:26	OP
Thallium	2.0	2.8	0.92	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:26	OP
Vanadium	21	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP
Zinc	34	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:26	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD511-3-3.5 Sampled: 3/26/2013 16:15

Sample ID: 13C0854-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.3		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-1-1.5 Sampled: 3/26/2013 15:50

Sample ID: 13C0854-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	25000	5.2	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Antimony	ND	5.2	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Arsenic	4.1	5.2	1.9	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:31	OP
Barium	540	5.2	0.65	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Beryllium	ND	0.52	0.084	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Cadmium	1.1	0.52	0.31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Calcium	7500	16	2.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Chromium	110	1.0	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Cobalt	43	5.2	0.34	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Copper	790	1.0	0.80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Iron	16000	5.2	4.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Lead	27	1.6	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Magnesium	4200	16	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Manganese	360	1.0	0.33	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Mercury	0.10	0.054	0.016	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:48	SAJ
Nickel	450	1.0	0.25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Potassium	670	210	36	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Selenium	ND	5.2	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Silver	ND	1.0	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Sodium	420	210	100	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Thallium	3.9	5.2	1.7	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:31	OP
Vanadium	41	2.1	0.35	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP
Zinc	97	2.1	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:31	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-1-1.5 Sampled: 3/26/2013 15:50

Sample ID: 13C0854-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	45.1		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-2-2.5 Sampled: 3/26/2013 15:55

Sample ID: 13C0854-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	4.9	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Antimony	ND	4.9	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Arsenic	10	4.9	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Barium	880	4.9	0.60	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Beryllium	3.4	0.49	0.078	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Cadmium	1.3	0.49	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Calcium	16000	15	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Chromium	72	0.97	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Cobalt	8.2	4.9	0.31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Copper	380	0.97	0.74	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Iron	12000	4.9	4.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Lead	27	1.5	0.67	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Magnesium	2700	15	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Manganese	530	0.97	0.31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Mercury	0.11	0.048	0.014	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:53	SAJ
Nickel	140	0.97	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Potassium	390	190	33	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Selenium	ND	4.9	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Silver	ND	0.97	0.85	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Sodium	380	190	95	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Thallium	ND	4.9	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Vanadium	63	1.9	0.32	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP
Zinc	17	1.9	0.50	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:37	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-2-2.5 Sampled: 3/26/2013 15:55

Sample ID: 13C0854-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	51.4		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-3-3.5 Sampled: 3/26/2013 16:00

Sample ID: 13C0854-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Arsenic	1.2	2.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:55	OP
Barium	130	2.9	0.37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Beryllium	ND	0.59	0.094	mg/Kg dry	2	DL-04	SW-846 6010C	3/28/13	4/1/13 12:52	OP
Cadmium	0.31	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Calcium	2300	8.8	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Chromium	15	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Cobalt	4.4	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Copper	44	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Iron	7000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Lead	5.6	0.88	0.41	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Magnesium	2700	8.8	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Manganese	71	0.59	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Mercury	0.026	0.029	0.0087	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 15:55	SAJ
Nickel	24	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Potassium	420	120	20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Sodium	110	120	57	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:55	OP
Thallium	2.8	2.9	0.97	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 16:55	OP
Vanadium	15	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP
Zinc	29	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 16:55	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD510-3-3.5 Sampled: 3/26/2013 16:00

Sample ID: 13C0854-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.6		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-2-2.5 Sampled: 3/26/2013 12:15

Sample ID: 13C0854-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	11	4.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Antimony	ND	11	8.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Arsenic	7.5	11	3.9	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 17:01	OP
Barium	550	11	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Beryllium	ND	1.1	0.17	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Cadmium	1.5	1.1	0.64	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Calcium	15000	32	5.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Chromium	140	2.2	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Cobalt	10	11	0.69	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 17:01	OP
Copper	240	2.2	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Iron	11000	11	9.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Lead	9.8	3.2	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Magnesium	4600	32	3.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Manganese	290	2.2	0.68	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Mercury	0.21	0.11	0.033	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 15:57	SAJ
Nickel	370	2.2	0.52	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Potassium	490	430	74	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Selenium	ND	11	3.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Sodium	660	430	210	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Thallium	3.8	11	3.6	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 17:01	OP
Vanadium	29	4.3	0.71	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP
Zinc	36	4.3	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 17:01	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-2-2.5 Sampled: 3/26/2013 12:15

Sample ID: 13C0854-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	22.5		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-3-3.5 Sampled: 3/26/2013 12:20

Sample ID: 13C0854-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	9.4	4.1	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:08	OP
Antimony	ND	9.4	7.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Arsenic	4.7	9.4	3.4	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:08	OP
Barium	200	9.4	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Beryllium	ND	0.94	0.15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Cadmium	1.2	0.94	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Calcium	7300	28	5.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Chromium	49	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Cobalt	11	9.4	0.60	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Copper	260	1.9	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Iron	9100	9.4	8.1	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:08	OP
Lead	5.5	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Magnesium	3800	28	3.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Manganese	110	1.9	0.60	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Mercury	0.084	0.094	0.028	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 15:58	SAJ
Nickel	290	1.9	0.46	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Potassium	490	380	65	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Selenium	ND	9.4	2.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Sodium	390	380	180	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Thallium	ND	9.4	3.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Vanadium	29	3.8	0.62	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP
Zinc	23	3.8	0.97	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:08	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-3-3.5 Sampled: 3/26/2013 12:20

Sample ID: 13C0854-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	25.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-4-4.5 Sampled: 3/26/2013 12:25

Sample ID: 13C0854-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	11	4.7	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:44	OP
Antimony	ND	11	8.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Arsenic	ND	11	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Barium	170	11	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Cadmium	0.88	1.1	0.64	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:44	OP
Calcium	6000	33	5.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Chromium	42	2.2	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Cobalt	13	11	0.70	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Copper	190	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Iron	13000	11	9.3	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:44	OP
Lead	6.7	3.3	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Magnesium	4000	33	3.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Manganese	130	2.2	0.69	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Mercury	ND	0.11	0.032	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:00	SAJ
Nickel	250	2.2	0.53	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Potassium	530	440	75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Sodium	400	440	210	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:44	OP
Thallium	ND	11	3.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Vanadium	19	4.4	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP
Zinc	56	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:44	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD508-4-4.5 Sampled: 3/26/2013 12:25

Sample ID: 13C0854-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	22.9		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-2-2.5 Sampled: 3/26/2013 13:20

Sample ID: 13C0854-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	12	5.3	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:49	OP
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Arsenic	130	12	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Barium	330	12	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Beryllium	ND	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Cadmium	4.5	1.2	0.73	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Calcium	10000	37	6.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Chromium	1100	2.5	0.62	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Cobalt	17	12	0.79	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Copper	38000	25	19	mg/Kg dry	10		SW-846 6010C	3/28/13	4/1/13 13:49	OP
Iron	16000	12	11	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:49	OP
Lead	95	3.7	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Magnesium	4600	37	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Manganese	280	2.5	0.78	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Mercury	0.32	0.13	0.039	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:02	SAJ
Nickel	910	2.5	0.60	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Potassium	590	490	85	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Silver	5.0	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Sodium	300	490	240	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:49	OP
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Vanadium	40	4.9	0.81	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP
Zinc	910	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:49	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-2-2.5 Sampled: 3/26/2013 13:20

Sample ID: 13C0854-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.9		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-3-3.5 Sampled: 3/26/2013 13:25

Sample ID: 13C0854-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9700	18	7.9	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:55	OP
Antimony	ND	18	15	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Arsenic	51	18	6.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Barium	420	18	2.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Beryllium	ND	1.8	0.30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Cadmium	2.9	1.8	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Calcium	18000	55	10	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Chromium	170	3.7	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Cobalt	15	18	1.2	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:55	OP
Copper	8100	3.7	2.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Iron	9100	18	16	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 18:55	OP
Lead	24	5.5	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Magnesium	4300	55	5.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Manganese	340	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Nickel	1300	3.7	0.89	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Potassium	310	740	130	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:55	OP
Selenium	240	18	5.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Silver	ND	3.7	3.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Sodium	480	740	360	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 18:55	OP
Thallium	ND	18	6.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Vanadium	28	7.4	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP
Zinc	510	7.4	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 18:55	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-3-3.5 Sampled: 3/26/2013 13:25

Sample ID: 13C0854-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.3		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-4-4.5 Sampled: 3/26/2013 13:30

Sample ID: 13C0854-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	20	8.5	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:00	OP
Antimony	ND	20	16	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Arsenic	25	20	7.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Barium	330	20	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Beryllium	ND	2.0	0.32	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Cadmium	2.3	2.0	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Calcium	15000	59	11	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Chromium	150	3.9	0.99	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Cobalt	12	20	1.3	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:00	OP
Copper	3600	3.9	3.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Iron	5900	20	17	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:00	OP
Lead	14	5.9	2.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Magnesium	3700	59	6.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Manganese	190	3.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Mercury	0.19	0.21	0.061	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:05	SAJ
Nickel	820	3.9	0.95	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Potassium	240	790	140	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:00	OP
Selenium	ND	20	6.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Silver	ND	3.9	3.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Sodium	470	790	380	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:00	OP
Thallium	ND	20	6.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Vanadium	32	7.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP
Zinc	160	7.9	2.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:00	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD505-4-4.5 Sampled: 3/26/2013 13:30

Sample ID: 13C0854-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.0		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-2-2.5 Sampled: 3/26/2013 14:00

Sample ID: 13C0854-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	14	6.0	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Arsenic	7.1	14	5.1	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Barium	310	14	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Cadmium	1.3	1.4	0.83	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Calcium	11000	42	7.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Chromium	140	2.8	0.70	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Cobalt	7.4	14	0.90	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Copper	440	2.8	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Iron	8600	14	12	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Lead	11	4.2	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Magnesium	3900	42	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Manganese	130	2.8	0.89	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Mercury	0.082	0.14	0.041	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:07	SAJ
Nickel	350	2.8	0.68	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Potassium	490	560	96	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Selenium	ND	14	4.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Silver	ND	2.8	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Sodium	400	560	270	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:05	OP
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Vanadium	34	5.6	0.92	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP
Zinc	410	5.6	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:05	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-2-2.5 Sampled: 3/26/2013 14:00

Sample ID: 13C0854-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-3-3.5 Sampled: 3/26/2013 14:05

Sample ID: 13C0854-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9700	12	5.2	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Antimony	ND	12	9.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Arsenic	8.5	12	4.4	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Barium	400	12	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Beryllium	ND	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Cadmium	2.3	1.2	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Calcium	14000	36	6.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Chromium	110	2.4	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Cobalt	16	12	0.78	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Copper	570	2.4	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Iron	11000	12	10	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Lead	11	3.6	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Magnesium	3900	36	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Manganese	150	2.4	0.77	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Mercury	0.16	0.13	0.038	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:08	SAJ
Nickel	450	2.4	0.59	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Potassium	290	490	83	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Selenium	ND	12	3.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Sodium	430	490	240	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Thallium	4.3	12	4.0	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:10	OP
Vanadium	34	4.9	0.80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP
Zinc	320	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:10	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-3-3.5 Sampled: 3/26/2013 14:05

Sample ID: 13C0854-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.4		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-4-4.5 Sampled: 3/26/2013 14:10

Sample ID: 13C0854-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3700	13	5.8	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Arsenic	ND	13	4.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Barium	95	13	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Beryllium	ND	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Cadmium	ND	1.3	0.80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Calcium	6100	40	7.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Chromium	42	2.7	0.67	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Cobalt	4.8	13	0.86	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Copper	170	2.7	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Iron	6800	13	12	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Lead	4.0	4.0	1.9	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Magnesium	2400	40	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Manganese	59	2.7	0.86	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Mercury	ND	0.14	0.042	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:14	SAJ
Nickel	140	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Potassium	180	540	93	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Selenium	ND	13	4.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Sodium	300	540	260	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:15	OP
Thallium	ND	13	4.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Vanadium	15	5.4	0.89	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP
Zinc	150	5.4	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:15	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD504-4-4.5 Sampled: 3/26/2013 14:10

Sample ID: 13C0854-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.6		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-2-2.5 Sampled: 3/26/2013 12:40

Sample ID: 13C0854-29

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	8.6	3.7	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:21	OP
Antimony	ND	8.6	6.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Arsenic	35	8.6	3.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Barium	440	8.6	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Beryllium	ND	0.86	0.14	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Cadmium	2.6	0.86	0.51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Calcium	9800	26	4.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Chromium	200	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Cobalt	27	8.6	0.55	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Copper	6400	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Iron	24000	8.6	7.3	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:21	OP
Lead	59	2.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Magnesium	7500	26	2.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Manganese	270	1.7	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Mercury	0.14	0.088	0.026	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:16	SAJ
Nickel	900	1.7	0.41	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Potassium	1100	340	59	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Selenium	92	8.6	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Silver	2.1	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Sodium	780	340	170	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Thallium	ND	8.6	2.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Vanadium	63	3.4	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP
Zinc	280	3.4	0.88	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:21	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-2-2.5 Sampled: 3/26/2013 12:40

Sample ID: 13C0854-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.6		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-3-3.5 Sampled: 3/26/2013 12:45

Sample ID: 13C0854-30

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	9.7	4.2	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:26	OP
Antimony	ND	9.7	7.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Arsenic	4.7	9.7	3.5	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:26	OP
Barium	430	9.7	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Beryllium	ND	0.97	0.16	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Cadmium	1.0	0.97	0.57	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Calcium	9800	29	5.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Chromium	120	1.9	0.48	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Cobalt	18	9.7	0.62	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Copper	360	1.9	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Iron	14000	9.7	8.2	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:26	OP
Lead	9.6	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Magnesium	5200	29	3.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Manganese	200	1.9	0.61	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Mercury	0.050	0.10	0.030	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:26	SAJ
Nickel	440	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Potassium	860	390	66	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Selenium	ND	9.7	3.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Sodium	830	390	190	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Thallium	3.7	9.7	3.2	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:26	OP
Vanadium	39	3.9	0.64	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP
Zinc	44	3.9	1.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:26	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-3-3.5 Sampled: 3/26/2013 12:45

Sample ID: 13C0854-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	24.3		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-4-4.5 Sampled: 3/26/2013 12:50

Sample ID: 13C0854-31

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	12	5.1	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:32	OP
Antimony	ND	12	9.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Arsenic	5.9	12	4.2	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:32	OP
Barium	240	12	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Beryllium	ND	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Cadmium	1.2	1.2	0.70	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Calcium	8400	35	6.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Chromium	50	2.4	0.59	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Cobalt	18	12	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Copper	680	2.4	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Iron	14000	12	10	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:32	OP
Lead	8.0	3.5	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Magnesium	4800	35	3.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Manganese	150	2.4	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Mercury	0.049	0.12	0.037	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:27	SAJ
Nickel	390	2.4	0.57	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Potassium	740	470	81	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Selenium	ND	12	3.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Sodium	630	470	230	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Thallium	ND	12	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Vanadium	34	4.7	0.77	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP
Zinc	58	4.7	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:32	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD507-4-4.5 Sampled: 3/26/2013 12:50

Sample ID: 13C0854-31

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.9		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-2-2.5 Sampled: 3/26/2013 13:40

Sample ID: 13C0854-32

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5800	12	5.4	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Antimony	ND	12	10	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Arsenic	10	12	4.5	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Barium	290	12	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Beryllium	ND	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Cadmium	1.2	1.2	0.73	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Calcium	17000	37	6.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Chromium	32	2.5	0.62	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Cobalt	4.4	12	0.79	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Copper	360	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Iron	4700	12	11	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Lead	3.7	3.7	1.7	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Magnesium	4100	37	3.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Manganese	140	2.5	0.79	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Mercury	0.067	0.13	0.039	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:29	SAJ
Nickel	350	2.5	0.60	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Potassium	260	500	85	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Sodium	370	500	240	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 19:57	OP
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Vanadium	44	5.0	0.82	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP
Zinc	20	5.0	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 19:57	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-2-2.5 Sampled: 3/26/2013 13:40

Sample ID: 13C0854-32

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.5		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-3-3.5 Sampled: 3/26/2013 13:45

Sample ID: 13C0854-33

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5900	11	4.9	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:01	OP
Antimony	ND	11	9.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Arsenic	48	11	4.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Barium	230	11	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Cadmium	2.8	1.1	0.67	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Calcium	14000	34	6.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Chromium	43	2.3	0.57	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Cobalt	35	11	0.73	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Copper	2000	2.3	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Iron	8700	11	9.7	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:01	OP
Lead	15	3.4	1.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Magnesium	3300	34	3.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Manganese	160	2.3	0.72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Mercury	0.13	0.11	0.034	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:35	SAJ
Nickel	3300	2.3	0.55	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Potassium	310	460	78	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:01	OP
Selenium	90	11	3.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Sodium	310	460	220	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:01	OP
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Vanadium	35	4.6	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP
Zinc	240	4.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:01	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-3-3.5 Sampled: 3/26/2013 13:45

Sample ID: 13C0854-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.7		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-4-4.5 Sampled: 3/26/2013 13:50

Sample ID: 13C0854-34

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	8.5	3.7	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:07	OP
Antimony	ND	8.5	6.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Arsenic	9.2	8.5	3.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Barium	120	8.5	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Beryllium	ND	0.85	0.14	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Cadmium	0.87	0.85	0.50	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Calcium	6600	26	4.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Chromium	34	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Cobalt	6.6	8.5	0.54	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:07	OP
Copper	860	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Iron	13000	8.5	7.3	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:07	OP
Lead	17	2.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Magnesium	3000	26	2.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Manganese	130	1.7	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Mercury	0.063	0.088	0.026	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:36	SAJ
Nickel	260	1.7	0.41	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Potassium	770	340	58	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Selenium	ND	8.5	2.6	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Sodium	220	340	170	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:07	OP
Thallium	ND	8.5	2.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Vanadium	25	3.4	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP
Zinc	66	3.4	0.88	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:07	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD506-4-4.5 Sampled: 3/26/2013 13:50

Sample ID: 13C0854-34

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.7		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-1-1.5 Sampled: 3/26/2013 15:30

Sample ID: 13C0854-35

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6900	5.4	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:12	OP
Antimony	ND	5.4	4.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Arsenic	2.2	5.4	2.0	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:12	OP
Barium	210	5.4	0.68	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Beryllium	ND	0.54	0.088	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Cadmium	0.77	0.54	0.32	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Calcium	5900	16	2.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Chromium	67	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Cobalt	27	5.4	0.35	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Copper	73	1.1	0.83	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Iron	14000	5.4	4.6	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:12	OP
Lead	23	1.6	0.75	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Magnesium	5600	16	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Manganese	260	1.1	0.35	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Mercury	0.070	0.054	0.016	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:38	SAJ
Nickel	130	1.1	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Potassium	530	220	37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Selenium	ND	5.4	1.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Silver	ND	1.1	0.96	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Sodium	230	220	110	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Thallium	ND	5.4	1.8	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Vanadium	27	2.2	0.36	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP
Zinc	92	2.2	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:12	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-1-1.5 Sampled: 3/26/2013 15:30

Sample ID: 13C0854-35

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	44.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-2-2.5 Sampled: 3/26/2013 15:35

Sample ID: 13C0854-36

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8700	4.1	1.8	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:18	OP
Antimony	ND	4.1	3.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Arsenic	ND	4.1	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Barium	140	4.1	0.51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Beryllium	ND	0.83	0.13	mg/Kg dry	2	DL-04	SW-846 6010C	3/28/13	4/1/13 12:47	OP
Cadmium	0.58	0.41	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Calcium	3300	12	2.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Chromium	59	0.83	0.21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Cobalt	21	4.1	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Copper	38	0.83	0.63	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Iron	16000	4.1	3.5	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:18	OP
Lead	6.0	1.2	0.57	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Magnesium	6600	12	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Manganese	110	0.83	0.26	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Mercury	ND	0.044	0.013	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:40	SAJ
Nickel	94	0.83	0.20	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Potassium	1100	170	28	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Selenium	ND	4.1	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Silver	ND	0.83	0.73	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Sodium	180	170	80	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Thallium	ND	4.1	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Vanadium	55	1.7	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP
Zinc	44	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:18	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-2-2.5 Sampled: 3/26/2013 15:35

Sample ID: 13C0854-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	55.7		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-3-3.5 Sampled: 3/26/2013 15:40

Sample ID: 13C0854-37

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	3.6	1.5	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:23	OP
Antimony	ND	3.6	2.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Arsenic	ND	3.6	1.3	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Barium	320	3.6	0.44	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Beryllium	ND	0.36	0.057	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Cadmium	0.43	0.36	0.21	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Calcium	2700	11	1.9	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Chromium	96	0.71	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Cobalt	13	3.6	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Copper	57	0.71	0.54	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Iron	9300	3.6	3.0	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:23	OP
Lead	3.5	1.1	0.49	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Magnesium	7300	11	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Manganese	78	0.71	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Mercury	0.014	0.035	0.011	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:41	SAJ
Nickel	86	0.71	0.17	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Potassium	540	140	24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Selenium	ND	3.6	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Silver	ND	0.71	0.63	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Sodium	120	140	70	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:23	OP
Thallium	ND	3.6	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Vanadium	17	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP
Zinc	27	1.4	0.37	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:23	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD517-3-3.5 Sampled: 3/26/2013 15:40

Sample ID: 13C0854-37

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.4		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD509-2-2.5 Sampled: 3/26/2013 14:35

Sample ID: 13C0854-38

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	4.5	2.0	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:29	OP
Antimony	ND	4.5	3.7	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Arsenic	2.0	4.5	1.6	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:29	OP
Barium	280	4.5	0.56	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Beryllium	ND	0.45	0.073	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Cadmium	0.65	0.45	0.27	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Calcium	5200	14	2.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Chromium	78	0.91	0.23	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Cobalt	13	4.5	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Copper	100	0.91	0.69	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Iron	16000	4.5	3.9	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:29	OP
Lead	22	1.4	0.63	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Magnesium	3500	14	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Manganese	450	0.91	0.29	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Mercury	0.078	0.049	0.015	mg/Kg dry	1		SW-846 7471B	3/28/13	3/29/13 16:43	SAJ
Nickel	170	0.91	0.22	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Potassium	670	180	31	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Selenium	ND	4.5	1.4	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Silver	0.84	0.91	0.80	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:29	OP
Sodium	180	180	88	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:29	OP
Thallium	ND	4.5	1.5	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Vanadium	35	1.8	0.30	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP
Zinc	96	1.8	0.47	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:29	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD509-2-2.5 Sampled: 3/26/2013 14:35

Sample ID: 13C0854-38

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	50.9		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD518-2-2.5 Sampled: 3/26/2013 15:20

Sample ID: 13C0854-39

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7000	3.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:34	OP
Antimony	ND	3.7	3.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Arsenic	2.5	3.7	1.3	mg/Kg dry	1	J	SW-846 6010C	3/28/13	3/29/13 20:34	OP
Barium	180	3.7	0.46	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Beryllium	ND	0.37	0.060	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Cadmium	0.38	0.37	0.22	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Calcium	3400	11	2.0	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Chromium	51	0.74	0.19	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Cobalt	7.4	3.7	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Copper	58	0.74	0.57	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Iron	7400	3.7	3.2	mg/Kg dry	1	B-07	SW-846 6010C	3/28/13	3/29/13 20:34	OP
Lead	2.9	1.1	0.51	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Magnesium	3100	11	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Manganese	51	0.74	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Mercury	0.023	0.037	0.011	mg/Kg dry	1	J	SW-846 7471B	3/28/13	3/29/13 16:45	SAJ
Nickel	75	0.74	0.18	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Potassium	460	150	25	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Selenium	ND	3.7	1.1	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Silver	ND	0.74	0.65	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Sodium	200	150	72	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Thallium	ND	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Vanadium	31	1.5	0.24	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP
Zinc	20	1.5	0.38	mg/Kg dry	1		SW-846 6010C	3/28/13	3/29/13 20:34	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0854

Date Received: 3/27/2013

Field Sample #: WTSD518-2-2.5 Sampled: 3/26/2013 15:20

Sample ID: 13C0854-39

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	66.8		% Wt	1		SM 2540G	3/27/13	3/29/13 9:06	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13C0854-01 [BRSD723-0-0.5]	B069863	03/27/13
13C0854-02 [BRSD723-1-1.5]	B069863	03/27/13
13C0854-03 [BRSD723-2-2.5]	B069863	03/27/13
13C0854-04 [BRSD723-3-3.5]	B069863	03/27/13
13C0854-05 [BRSD720-0-0.5]	B069863	03/27/13
13C0854-06 [BRSD720-1-1.5]	B069863	03/27/13
13C0854-07 [BRSD720-2-2.5]	B069863	03/27/13
13C0854-08 [PASD622-0-0.5]	B069863	03/27/13
13C0854-09 [PASD622-1-1.5]	B069863	03/27/13
13C0854-10 [PASD622-2-2.5]	B069863	03/27/13
13C0854-11 [WTSD503-0-0.5]	B069863	03/27/13
13C0854-12 [WTSD502-0-0.5]	B069863	03/27/13
13C0854-13 [WTSD501-0-0.5]	B069863	03/27/13
13C0854-14 [WTSD511-1-1.5]	B069863	03/27/13
13C0854-15 [WTSD511-2-2.5]	B069863	03/27/13
13C0854-16 [WTSD511-3-3.5]	B069863	03/27/13
13C0854-17 [WTSD510-1-1.5]	B069863	03/27/13
13C0854-18 [WTSD510-2-2.5]	B069863	03/27/13
13C0854-19 [WTSD510-3-3.5]	B069863	03/27/13
13C0854-20 [WTSD508-2-2.5]	B069863	03/27/13
13C0854-21 [WTSD508-3-3.5]	B069863	03/27/13
13C0854-22 [WTSD508-4-4.5]	B069863	03/27/13
13C0854-23 [WTSD505-2-2.5]	B069863	03/27/13
13C0854-24 [WTSD505-3-3.5]	B069863	03/27/13
13C0854-25 [WTSD505-4-4.5]	B069863	03/27/13
13C0854-26 [WTSD504-2-2.5]	B069863	03/27/13
13C0854-27 [WTSD504-3-3.5]	B069863	03/27/13
13C0854-28 [WTSD504-4-4.5]	B069863	03/27/13
13C0854-29 [WTSD507-2-2.5]	B069863	03/27/13
13C0854-30 [WTSD507-3-3.5]	B069863	03/27/13
13C0854-31 [WTSD507-4-4.5]	B069863	03/27/13
13C0854-32 [WTSD506-2-2.5]	B069863	03/27/13
13C0854-33 [WTSD506-3-3.5]	B069863	03/27/13
13C0854-34 [WTSD506-4-4.5]	B069863	03/27/13
13C0854-35 [WTSD517-1-1.5]	B069863	03/27/13
13C0854-36 [WTSD517-2-2.5]	B069863	03/27/13
13C0854-37 [WTSD517-3-3.5]	B069863	03/27/13
13C0854-38 [WTSD509-2-2.5]	B069863	03/27/13
13C0854-39 [WTSD518-2-2.5]	B069863	03/27/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-01 [BRSD723-0-0.5]	B069915	1.06	50.0	03/28/13
13C0854-02 [BRSD723-1-1.5]	B069915	1.01	50.0	03/28/13
13C0854-03 [BRSD723-2-2.5]	B069915	1.07	50.0	03/28/13
13C0854-04 [BRSD723-3-3.5]	B069915	1.05	50.0	03/28/13
13C0854-05 [BRSD720-0-0.5]	B069915	1.02	50.0	03/28/13
13C0854-06 [BRSD720-1-1.5]	B069915	1.08	50.0	03/28/13
13C0854-07 [BRSD720-2-2.5]	B069915	1.06	50.0	03/28/13
13C0854-08 [PASD622-0-0.5]	B069915	1.04	50.0	03/28/13
13C0854-09 [PASD622-1-1.5]	B069915	1.02	50.0	03/28/13
13C0854-10 [PASD622-2-2.5]	B069915	1.01	50.0	03/28/13
13C0854-11 [WTSD503-0-0.5]	B069915	1.04	50.0	03/28/13

con-test® ANALYTICAL LABORATORY
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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-12 [WTSD502-0-0.5]	B069915	0.980	50.0	03/28/13
13C0854-13 [WTSD501-0-0.5]	B069915	1.02	50.0	03/28/13
13C0854-14 [WTSD511-1-1.5]	B069915	1.07	50.0	03/28/13
13C0854-15 [WTSD511-2-2.5]	B069915	1.00	50.0	03/28/13
13C0854-16 [WTSD511-3-3.5]	B069915	1.02	50.0	03/28/13
13C0854-17 [WTSD510-1-1.5]	B069915	1.06	50.0	03/28/13
13C0854-18 [WTSD510-2-2.5]	B069915	1.00	50.0	03/28/13
13C0854-19 [WTSD510-3-3.5]	B069915	1.02	50.0	03/28/13
13C0854-20 [WTSD508-2-2.5]	B069915	1.03	50.0	03/28/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-21 [WTSD508-3-3.5]	B069963	1.03	50.0	03/28/13
13C0854-22 [WTSD508-4-4.5]	B069963	1.00	50.0	03/28/13
13C0854-23 [WTSD505-2-2.5]	B069963	1.07	50.0	03/28/13
13C0854-24 [WTSD505-3-3.5]	B069963	1.02	50.0	03/28/13
13C0854-25 [WTSD505-4-4.5]	B069963	1.06	50.0	03/28/13
13C0854-26 [WTSD504-2-2.5]	B069963	1.00	50.0	03/28/13
13C0854-27 [WTSD504-3-3.5]	B069963	1.06	50.0	03/28/13
13C0854-28 [WTSD504-4-4.5]	B069963	1.05	50.0	03/28/13
13C0854-29 [WTSD507-2-2.5]	B069963	1.06	50.0	03/28/13
13C0854-30 [WTSD507-3-3.5]	B069963	1.07	50.0	03/28/13
13C0854-31 [WTSD507-4-4.5]	B069963	1.07	50.0	03/28/13
13C0854-32 [WTSD506-2-2.5]	B069963	1.09	50.0	03/28/13
13C0854-33 [WTSD506-3-3.5]	B069963	1.01	50.0	03/28/13
13C0854-34 [WTSD506-4-4.5]	B069963	1.06	50.0	03/28/13
13C0854-35 [WTSD517-1-1.5]	B069963	1.03	50.0	03/28/13
13C0854-36 [WTSD517-2-2.5]	B069963	1.09	50.0	03/28/13
13C0854-37 [WTSD517-3-3.5]	B069963	1.02	50.0	03/28/13
13C0854-38 [WTSD509-2-2.5]	B069963	1.08	50.0	03/28/13
13C0854-39 [WTSD518-2-2.5]	B069963	1.01	50.0	03/28/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-30 [WTSD507-3-3.5]	B069966	0.604	50.0	03/28/13
13C0854-31 [WTSD507-4-4.5]	B069966	0.608	50.0	03/28/13
13C0854-32 [WTSD506-2-2.5]	B069966	0.619	50.0	03/28/13
13C0854-33 [WTSD506-3-3.5]	B069966	0.606	50.0	03/28/13
13C0854-34 [WTSD506-4-4.5]	B069966	0.615	50.0	03/28/13
13C0854-35 [WTSD517-1-1.5]	B069966	0.617	50.0	03/28/13
13C0854-36 [WTSD517-2-2.5]	B069966	0.610	50.0	03/28/13
13C0854-37 [WTSD517-3-3.5]	B069966	0.618	50.0	03/28/13
13C0854-38 [WTSD509-2-2.5]	B069966	0.601	50.0	03/28/13
13C0854-39 [WTSD518-2-2.5]	B069966	0.609	50.0	03/28/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-10 [PASD622-2-2.5]	B069967	0.604	50.0	03/28/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0854-11 [WTSD503-0-0.5]	B069967	0.613	50.0	03/28/13
13C0854-12 [WTSD502-0-0.5]	B069967	0.604	50.0	03/28/13
13C0854-13 [WTSD501-0-0.5]	B069967	0.610	50.0	03/28/13
13C0854-14 [WTSD511-1-1.5]	B069967	0.616	50.0	03/28/13
13C0854-15 [WTSD511-2-2.5]	B069967	0.602	50.0	03/28/13
13C0854-16 [WTSD511-3-3.5]	B069967	0.615	50.0	03/28/13
13C0854-17 [WTSD510-1-1.5]	B069967	0.611	50.0	03/28/13
13C0854-18 [WTSD510-2-2.5]	B069967	0.605	50.0	03/28/13
13C0854-19 [WTSD510-3-3.5]	B069967	0.609	50.0	03/28/13
13C0854-20 [WTSD508-2-2.5]	B069967	0.603	50.0	03/28/13
13C0854-21 [WTSD508-3-3.5]	B069967	0.617	50.0	03/28/13
13C0854-22 [WTSD508-4-4.5]	B069967	0.603	50.0	03/28/13
13C0854-23 [WTSD505-2-2.5]	B069967	0.604	50.0	03/28/13
13C0854-25 [WTSD505-4-4.5]	B069967	0.610	50.0	03/28/13
13C0854-26 [WTSD504-2-2.5]	B069967	0.602	50.0	03/28/13
13C0854-27 [WTSD504-3-3.5]	B069967	0.609	50.0	03/28/13
13C0854-28 [WTSD504-4-4.5]	B069967	0.603	50.0	03/28/13
13C0854-29 [WTSD507-2-2.5]	B069967	0.614	50.0	03/28/13

con-test® ANALYTICAL LABORATORY
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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069915 - SW-846 3050B										
Blank (B069915-BLK1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	2.8	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.97	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B069915-BS1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	5500	5.0	mg/Kg wet	8360		65.8	40.4-159.1			
Antimony	80.0	5.0	mg/Kg wet	92.9		86.1	8.2-191.6			
Arsenic	88.8	5.0	mg/Kg wet	94.5		93.9	82.2-117.5			
Barium	152	5.0	mg/Kg wet	166		91.6	83.1-116.3			
Beryllium	53.1	0.50	mg/Kg wet	52.6		101	83.8-116.2			
Cadmium	55.5	0.50	mg/Kg wet	59.9		92.7	84-115.9			
Calcium	5640	15	mg/Kg wet	6160		91.6	82.3-117.5			
Chromium	62.4	1.0	mg/Kg wet	69.3		90.0	81.4-118.6			
Cobalt	95.2	5.0	mg/Kg wet	101		94.3	83.8-115.8			
Copper	74.8	1.0	mg/Kg wet	78.0		96.0	83.7-116.2			
Iron	9700	5.0	mg/Kg wet	12800		75.8	50.6-149.2			
Lead	84.2	1.5	mg/Kg wet	91.7		91.8	82.4-117.8			
Magnesium	2440	15	mg/Kg wet	3030		80.5	76.2-123.8			
Manganese	260	1.0	mg/Kg wet	283		92.0	81.6-118			
Nickel	51.9	1.0	mg/Kg wet	56.6		91.7	82.2-117.8			
Potassium	3110	200	mg/Kg wet	3820		81.3	73.6-126.4			
Selenium	142	5.0	mg/Kg wet	159		89.4	79.2-120.8			
Silver	30.4	1.0	mg/Kg wet	33.9		89.7	66.4-133.9			
Sodium	574	200	mg/Kg wet	652		88.1	73.6-126.2			
Thallium	109	5.0	mg/Kg wet	119		91.5	81.1-119.3			
Vanadium	52.1	2.0	mg/Kg wet	56.3		92.5	72.8-127.2			
Zinc	121	2.0	mg/Kg wet	137		88.7	81-119			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069915 - SW-846 3050B										
LCS Dup (B069915-BSD1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	5660	5.0	mg/Kg wet	8360		67.7	40.4-159.1	2.88	30	
Antimony	80.8	5.0	mg/Kg wet	92.9		87.0	8.2-191.6	0.959	30	
Arsenic	90.8	5.0	mg/Kg wet	94.5		96.0	82.2-117.5	2.20	30	
Barium	155	5.0	mg/Kg wet	166		93.5	83.1-116.3	2.04	30	
Beryllium	55.6	0.50	mg/Kg wet	52.6		106	83.8-116.2	4.66	30	
Cadmium	56.8	0.50	mg/Kg wet	59.9		94.8	84-115.9	2.22	30	
Calcium	5760	15	mg/Kg wet	6160		93.6	82.3-117.5	2.13	30	
Chromium	64.5	1.0	mg/Kg wet	69.3		93.1	81.4-118.6	3.39	30	
Cobalt	98.0	5.0	mg/Kg wet	101		97.1	83.8-115.8	2.91	30	
Copper	76.8	1.0	mg/Kg wet	78.0		98.5	83.7-116.2	2.62	30	
Iron	9830	5.0	mg/Kg wet	12800		76.8	50.6-149.2	1.31	30	
Lead	83.7	1.5	mg/Kg wet	91.7		91.3	82.4-117.8	0.565	30	
Magnesium	2500	15	mg/Kg wet	3030		82.6	76.2-123.8	2.50	30	
Manganese	265	1.0	mg/Kg wet	283		93.8	81.6-118	1.98	30	
Nickel	53.6	1.0	mg/Kg wet	56.6		94.6	82.2-117.8	3.15	30	
Potassium	3200	200	mg/Kg wet	3820		83.6	73.6-126.4	2.82	30	
Selenium	143	5.0	mg/Kg wet	159		90.0	79.2-120.8	0.649	30	
Silver	31.7	1.0	mg/Kg wet	33.9		93.5	66.4-133.9	4.22	30	
Sodium	594	200	mg/Kg wet	652		91.0	73.6-126.2	3.28	30	
Thallium	112	5.0	mg/Kg wet	119		94.4	81.1-119.3	3.17	30	
Vanadium	51.9	2.0	mg/Kg wet	56.3		92.2	72.8-127.2	0.235	30	
Zinc	125	2.0	mg/Kg wet	137		91.3	81-119	2.88	30	
Duplicate (B069915-DUP1)		**Source: 13C0854-09**		Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	7190	5.2	mg/Kg dry		7710			6.96	35	
Antimony	ND	5.2	mg/Kg dry		ND			NC	35	
Arsenic	ND	5.2	mg/Kg dry		2.59			NC	35	
Barium	88.9	5.2	mg/Kg dry		93.0			4.51	35	
Beryllium	ND	0.52	mg/Kg dry		ND			NC	35	
Cadmium	0.598	0.52	mg/Kg dry		0.660			9.85	35	
Calcium	3810	16	mg/Kg dry		4250			10.9	35	
Chromium	23.0	1.0	mg/Kg dry		26.2			12.9	35	
Cobalt	6.55	5.2	mg/Kg dry		7.93			19.0	35	
Copper	43.8	1.0	mg/Kg dry		44.2			0.922	35	
Iron	12000	5.2	mg/Kg dry		14200			16.9	35	
Lead	13.5	1.6	mg/Kg dry		12.9			4.40	35	
Magnesium	3240	16	mg/Kg dry		3670			12.6	35	
Manganese	71.6	1.0	mg/Kg dry		80.1			11.2	35	
Nickel	37.4	1.0	mg/Kg dry		42.0			11.8	35	
Potassium	725	210	mg/Kg dry		777			6.90	35	
Selenium	ND	5.2	mg/Kg dry		ND			NC	35	
Silver	ND	1.0	mg/Kg dry		ND			NC	35	
Sodium	111	210	mg/Kg dry		127			13.7	35	J
Thallium	ND	5.2	mg/Kg dry		ND			NC	35	
Vanadium	24.8	2.1	mg/Kg dry		27.8			11.4	35	
Zinc	38.5	2.1	mg/Kg dry		40.7			5.59	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B069915 - SW-846 3050B											
MRL Check (B069915-MRL1)				Prepared: 03/28/13 Analyzed: 03/29/13							
Lead	0.799	0.73	mg/Kg wet	0.731		109		80-120			
Matrix Spike (B069915-MS1)		**Source: 13C0854-09**		Prepared: 03/28/13 Analyzed: 03/29/13							
Aluminum	9380	5.2	mg/Kg dry	207	7710	**809**	*	75-125			MS-19
Antimony	100	5.2	mg/Kg dry	207	ND	**48.4**	*	75-125			MS-07
Arsenic	194	5.2	mg/Kg dry	207	2.59	92.3		75-125			
Barium	299	5.2	mg/Kg dry	207	93.0	99.4		75-125			
Beryllium	217	0.52	mg/Kg dry	207	ND	105		75-125			
Cadmium	190	0.52	mg/Kg dry	207	0.660	91.3		75-125			
Calcium	4400	16	mg/Kg dry	207	4250	**70.4**	*	75-125			MS-19
Chromium	231	1.0	mg/Kg dry	207	26.2	98.7		75-125			
Cobalt	207	5.2	mg/Kg dry	207	7.93	96.2		75-125			
Copper	257	1.0	mg/Kg dry	207	44.2	103		75-125			
Iron	13900	5.2	mg/Kg dry	207	14200	**-134**	*	75-125			MS-19
Lead	203	1.6	mg/Kg dry	207	12.9	91.8		75-125			
Magnesium	3980	16	mg/Kg dry	207	3670	**149**	*	75-125			MS-19
Manganese	287	1.0	mg/Kg dry	207	80.1	100		75-125			
Nickel	242	1.0	mg/Kg dry	207	42.0	96.6		75-125			
Potassium	2730	210	mg/Kg dry	2070	777	94.4		75-125			
Selenium	195	5.2	mg/Kg dry	207	ND	94.1		75-125			
Silver	189	1.0	mg/Kg dry	207	ND	91.3		75-125			
Sodium	332	210	mg/Kg dry	207	127	98.9		75-125			
Thallium	192	5.2	mg/Kg dry	207	ND	92.6		75-125			
Vanadium	233	2.1	mg/Kg dry	207	27.8	99.2		75-125			
Zinc	238	2.1	mg/Kg dry	207	40.7	95.4		75-125			
Batch B069963 - SW-846 3050B											
Blank (B069963-BLK1)				Prepared: 03/28/13 Analyzed: 03/29/13							
Aluminum	4.0	2.5	mg/Kg wet								B-07
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	3.6	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	3.9	2.5	mg/Kg wet								B-07
Lead	ND	0.75	mg/Kg wet								
Magnesium	1.9	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069963 - SW-846 3050B										
LCS (B069963-BS1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	8770	5.0	mg/Kg wet	8360		105	40.4-159.1			
Antimony	90.6	5.0	mg/Kg wet	92.9		97.5	8.2-191.6			
Arsenic	96.1	5.0	mg/Kg wet	94.5		102	82.2-117.5			
Barium	169	5.0	mg/Kg wet	166		102	83.1-116.3			
Beryllium	56.9	0.50	mg/Kg wet	52.6		108	83.8-116.2			
Cadmium	58.9	0.50	mg/Kg wet	59.9		98.3	84-115.9			
Calcium	5970	15	mg/Kg wet	6160		96.9	82.3-117.5			
Chromium	69.8	1.0	mg/Kg wet	69.3		101	81.4-118.6			
Cobalt	102	5.0	mg/Kg wet	101		101	83.8-115.8			
Copper	81.2	1.0	mg/Kg wet	78.0		104	83.7-116.2			
Iron	12100	5.0	mg/Kg wet	12800		94.8	50.6-149.2			
Lead	87.5	1.5	mg/Kg wet	91.7		95.5	82.4-117.8			
Magnesium	2990	15	mg/Kg wet	3030		98.6	76.2-123.8			
Manganese	285	1.0	mg/Kg wet	283		101	81.6-118			
Nickel	55.7	1.0	mg/Kg wet	56.6		98.4	82.2-117.8			
Potassium	3850	200	mg/Kg wet	3820		101	73.6-126.4			
Selenium	151	5.0	mg/Kg wet	159		94.8	79.2-120.8			
Silver	34.0	1.0	mg/Kg wet	33.9		100	66.4-133.9			
Sodium	639	200	mg/Kg wet	652		98.1	73.6-126.2			
Thallium	120	5.0	mg/Kg wet	119		101	81.1-119.3			
Vanadium	59.0	2.0	mg/Kg wet	56.3		105	72.8-127.2			
Zinc	133	2.0	mg/Kg wet	137		97.2	81-119			
LCS Dup (B069963-BSD1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Aluminum	7650	5.0	mg/Kg wet	8360		91.6	40.4-159.1	13.5	30	
Antimony	90.0	5.0	mg/Kg wet	92.9		96.9	8.2-191.6	0.635	30	
Arsenic	92.9	5.0	mg/Kg wet	94.5		98.3	82.2-117.5	3.34	30	
Barium	163	5.0	mg/Kg wet	166		98.3	83.1-116.3	3.27	30	
Beryllium	56.6	0.50	mg/Kg wet	52.6		108	83.8-116.2	0.532	30	
Cadmium	58.3	0.50	mg/Kg wet	59.9		97.4	84-115.9	0.914	30	
Calcium	5950	15	mg/Kg wet	6160		96.6	82.3-117.5	0.322	30	
Chromium	67.8	0.99	mg/Kg wet	69.3		97.8	81.4-118.6	2.87	30	
Cobalt	99.8	5.0	mg/Kg wet	101		98.8	83.8-115.8	1.85	30	
Copper	78.9	0.99	mg/Kg wet	78.0		101	83.7-116.2	2.87	30	
Iron	11500	5.0	mg/Kg wet	12800		90.1	50.6-149.2	5.05	30	
Lead	89.1	1.5	mg/Kg wet	91.7		97.2	82.4-117.8	1.77	30	
Magnesium	2820	15	mg/Kg wet	3030		93.2	76.2-123.8	5.63	30	
Manganese	280	0.99	mg/Kg wet	283		98.9	81.6-118	1.62	30	
Nickel	54.8	0.99	mg/Kg wet	56.6		96.9	82.2-117.8	1.53	30	
Potassium	3600	200	mg/Kg wet	3820		94.2	73.6-126.4	6.59	30	
Selenium	148	5.0	mg/Kg wet	159		93.1	79.2-120.8	1.82	30	
Silver	32.8	0.99	mg/Kg wet	33.9		96.9	66.4-133.9	3.55	30	
Sodium	612	200	mg/Kg wet	652		93.9	73.6-126.2	4.38	30	
Thallium	118	5.0	mg/Kg wet	119		99.0	81.1-119.3	2.11	30	
Vanadium	56.6	2.0	mg/Kg wet	56.3		100	72.8-127.2	4.21	30	
Zinc	130	2.0	mg/Kg wet	137		94.5	81-119	2.77	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069963 - SW-846 3050B										
MRL Check (B069963-MRL1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Lead	0.817	0.74	mg/Kg wet	0.743		110	80-120			
Batch B069966 - SW-846 7471										
Blank (B069966-BLK1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069966-BS1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	4.25	0.33	mg/Kg wet	4.05		105	71.6-128.1			
LCS Dup (B069966-BSD1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	4.18	0.33	mg/Kg wet	4.05		103	71.6-128.1	1.54	30	
Batch B069967 - SW-846 7471										
Blank (B069967-BLK1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B069967-BS1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	4.29	0.33	mg/Kg wet	4.05		106	71.6-128.1			
LCS Dup (B069967-BSD1)				Prepared: 03/28/13 Analyzed: 03/29/13						
Mercury	4.70	0.33	mg/Kg wet	4.05		116	71.6-128.1	9.20	30	
Batch B070056 - SW-846 7471										
Blank (B070056-BLK1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070056-BS1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	4.23	0.33	mg/Kg wet	4.05		104	71.6-128.1			
LCS Dup (B070056-BSD1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	4.28	0.33	mg/Kg wet	4.05		106	71.6-128.1	1.30	30	
Duplicate (B070056-DUP1)		**Source: 13C0854-01**		Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	0.0333	0.046	mg/Kg dry						35	J
Matrix Spike (B070056-MS1)		**Source: 13C0854-01**		Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	0.299	0.046	mg/Kg dry	0.303		98.6	75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B069863 - % Solids										
Duplicate (B069863-DUP1)	**Source: 13C0854-39**			Prepared: 03/27/13 Analyzed: 03/29/13						
% Solids	61.2		% Wt		66.8			8.75	20	
Duplicate (B069863-DUP2)	**Source: 13C0854-26**			Prepared: 03/27/13 Analyzed: 03/29/13						
% Solids	17.5		% Wt		17.8			1.70	20	
Duplicate (B069863-DUP3)	**Source: 13C0854-10**			Prepared: 03/27/13 Analyzed: 03/29/13						
% Solids	40.6		% Wt		45.7			11.8	20	
Duplicate (B069863-DUP4)	**Source: 13C0854-01**			Prepared: 03/27/13 Analyzed: 03/29/13						
% Solids	52.4		% Wt		53.6			2.26	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

CHAIN OF CUSTODY RECORD

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Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13C0854

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY ~~10983~~ 10965
Attention: Amita Patel
Project Location: Morgan Media/Ss(Contamination)
Sampled By: JTP, MTP, STN
Telephone:
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ⊗ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ⊗ PDF ○ EXCEL ○ GIS
○ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cont. Code	TAL Metals	TOC	Moisture Content
01	BRSD723-0-0.5	03/21/13	9:00		X	S	U	X		
02	BRSD723-1-1.5	03/21/13	9:00		X	S	U	X		
03	BRSD723-2-2.5	03/21/13	9:15		X	S	U	X		
04	BRSD723-3-3.5	03/21/13	9:15		X	S	U	X		
05	BRSD 720-0-0.5	3/21/13	1430		X	S	U	X		
06	BRSD 720-1-1.5	"	1430		X	S	U	X		
07	BRSD 720-2-2.5	"	1430		X	S	U	X		
08	PASD 622-0-0.5	"	1600		X	S	U	X		
09	PASD 622 1-1.5	"	1600		X	S	U	X		
10	PASD 622 2-2.5	"	1600		X	S	U	X		

# of Containers: 1 1 1
** Preservation: I I I
***Container Code: A A G

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/26/13 19:00
Received by: (signature) [signature] 6,0	Date/Time: 3/27/13 11:28
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

Rev 04.05.12

13C0854

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Cortandt Manor)
Sampled By: AW/SJN

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@Hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS
☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals
11	WTSD 503-0-0.5	3/22/13	1555		X	S	U	1	I	A	X
12	WTSD 502-0-0.5	↓	1630		X	S	U	1	I	A	X
13	WTSD 501-0-0.5	↓	1650		X	S	U	1	I	A	X
14	WTSP511-1-1.5	3/26/13	1605		X	S	U	1	I	A	X
15	WTSD511-2-2.5	↓	1610		X	S	U	1	I	A	X
16	WTSD511-3-3.5	↓	1615		X	S	U	1	I	A	X
17	WTSD510-1-1.5	↓	1550		X	S	U	1	I	A	X
18	WTSD 510 2-2.5	↓	1555		X	S	U	1	I	A	X
19	WTSD 510 3-3.5	↓	1600		X	S	U	1	I	A	X
20	WTSD 508 2-2.5	↓	1215		X	S	U	1	I	A	X

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	3/26/13 1900
Received by: (signature) 6.0	Date/Time:
	3/27/13 11:25
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

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East longmeadow, MA 01028

Rev 04.05.12

13C0854

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals
Sampled By: SJN AW

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	# of Containers	** Preservation	***Container Code
21	WTSD 508 3-3.5	3/26/13	1220		X	S	U	X			
22	WTSD 508 4-4.5		1225		X	S	U	X			
23	WTSD 505 2-2.5		1320		X	S	U	X			
24	WTSD 505 3-3.5		1325		X	S	U	X			
25	WTSD 505 4-4.5		1330		X	S	U	X			
26	WTSD 504 2-2.5		1400		X	S	U	X			
27	WTSD 504 3-3.5		1405		X	S	U	X			
28	WTSD 504 4-4.5		1410		X	S	U	X			
29	WTSD 507 2-2.5		1240		X	S	U	X			
30	WTSD 507 3-3.5	↓	1245		X	S	U	X			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/26/13 1900
Received by: (signature) [signature] 6.0	Date/Time: 3/27/13 11:25
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 97 of 100 13C0854_1 Contest_Final 04 10 13 0537

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Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13C0854

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Cortandt Manor NY)
Sampled By: SJN AW

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals
31	WTSD 507 4-4.5	3/26/13	1250		X	S	U	X
32	WTSD 506 2-2.5		1340		X	S	U	X
33	WTSD 506 3-3.5		1345		X	S	U	X
34	WTSD 506 4-4.5		1350		X	S	U	X
35	WTSD 517 1-1.5		1530		X	S	U	X
36	WTSD 517 2-2.5		1535		X	S	U	X
37	WTSD 517 3-3.5		1540		X	S	U	X
38	WTSD 509 2-2.5		1435		X	S	U	X
39	WTSD 518 2-2.5		1520		X	S	U	X

# of Containers: 1
** Preservation: 1
***Container Code: A

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/26/13 1900
Received by: (signature) [signature] 6.0	Date/Time: 3/27/13 1128
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
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Detection Limit Requirements
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Connecticut:
Other:

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○ MA State DW Form Required PWSID # _____

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FedEx

802302327228

Ship (P/U) date :
Tues 3/26/2013 7:36 pm
PEA US

Delivered
Signed for by: C.COLLINS

Actual delivery :
Wed 3/27/2013 11:28 am
MA US

Travel History

Date/Time	Activity	Location
- 3/27/2013 - Wednesday		
11:28 am	Delivered	MA
9:07 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
6:56 am	At local FedEx facility	WINDSOR LOCKS, CT
- 3/26/2013 - Tuesday		
10:30 pm	Departed FedEx location	NEWARK, NJ
10:20 pm	Arrived at FedEx location	NEWARK, NJ
9:23 pm	Left FedEx origin facility	MAHWAH, NJ
7:36 pm	Picked up	MAHWAH, NJ

Local Scan Time

Shipment Facts

Tracking number	802302327228	**Service**	FedEx Standard Overnight
Dimensions	23x13x13 in.	**Delivered To**	Receptionist/Front Desk
Total pieces	1	**Shipper reference**	MASAN MURAS NYSOEC
Packaging	Your Packaging	**Special handling section**	Deliver Weekday

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
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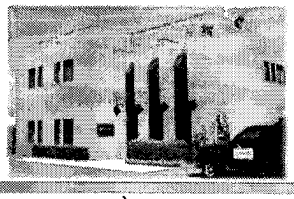

Sample Receipt Checklist

CLIENT NAME: HDR **RECEIVED BY:** SD **DATE:** 3/26/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank _____ Temperature °C by Temp gun 6.0
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19
   Permission to subcontract samples? Yes No
   (Walk-in clients only) if not already approved
   Client Signature: _____
8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers			# of containers
1 Liter Amber			8 oz amber/clear jar	39
500 mL Amber			4 oz amber/clear jar	
250 mL Amber (8oz amber)			2 oz amber/clear jar	
1 Liter Plastic			Air Cassette	
500 mL Plastic			Hg/Hopcalite Tube	
250 mL plastic			Plastic Bag / Ziploc	
40 mL Vial - type listed below			PM 2.5 / PM 10	
Colisure / bacteria bottle			PUF Cartridge	
Dissolved Oxygen bottle			SOC Kit	
Encore			TO-17 Tubes	
Flashpoint bottle			Non-ConTest Container	
Perchlorate Kit			Other glass jar	
Other			Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

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April 16, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna Metals (Cordon Land Manor)
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13C0950

Enclosed are results of analyses for samples received by the laboratory on March 29, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD715-2-2.5	13C0950-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD715-3-3.5	13C0950-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD715-4-4.5	13C0950-03	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-0-0.5	13C0950-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-1-1.5	13C0950-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-2-2.5	13C0950-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-3-3.5	13C0950-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-0-0.5	13C0950-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-1-1.5	13C0950-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-2-2.5	13C0950-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-3-3.5	13C0950-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD712-2-2.5	13C0950-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD712-3-3.5	13C0950-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

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PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD712-4-4.5	13C0950-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-0-0.5	13C0950-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-1-1.5	13C0950-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-2-2.5	13C0950-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-3-3.5	13C0950-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-0-0.5	13C0950-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-1-1.5	13C0950-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-2-2.5	13C0950-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-3-3.5	13C0950-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-2-2.5	13C0950-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-3-3.5	13C0950-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-4-4.5	13C0950-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-2-2.5-1	13C0950-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD616-0-0.5	13C0950-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-1-1.5	13C0950-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-2-2.5	13C0950-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-3-3.5	13C0950-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-0-0.5	13C0950-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-1-1.5	13C0950-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-2-2.5	13C0950-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-3-3.5	13C0950-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-0-0.5	13C0950-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-1-1.5	13C0950-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-2-2.5	13C0950-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-3-3.5	13C0950-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD709-1-1.5	13C0950-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

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PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD708-0-0.5	13C0950-40	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-1-1.5	13C0950-41	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-2-2.5	13C0950-42	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-0-0.5-1	13C0950-43	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-1-1.5	13C0950-44	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-2-2.5	13C0950-45	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-2-2.5-1	13C0950-46	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-2-2.5	13C0950-47	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-3-3.5	13C0950-48	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-4-4.5	13C0950-49	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-0-0.5	13C0950-50	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-1-1.5	13C0950-51	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-2-2.5	13C0950-52	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

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PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD706-3-3.5	13C0950-53	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-3-3.5-1	13C0950-54	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-2-2.5	13C0950-55	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-3-3.5	13C0950-56	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-4-4.5	13C0950-57	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-0-0.5	13C0950-58	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-1-1.5	13C0950-59	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-2-2.5	13C0950-60	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-3-3.5	13C0950-61	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-3-3.5-1	13C0950-62	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-0-0.5	13C0950-63	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-1-1.5	13C0950-64	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-2-2.5	13C0950-65	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD717-3-3.5	13C0950-66	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-2-2.5	13C0950-67	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-3-3.5	13C0950-68	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-4-4.5	13C0950-69	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron

13C0950-20[PASD608-1-1.5], 13C0950-21[PASD608-2-2.5], 13C0950-22[PASD608-3-3.5], 13C0950-23[PASD618-2-2.5], 13C0950-24[PASD618-3-3.5], 13C0950-25[PASD618-4-4.5], 13C0950-26[PASD618-2-2.5-1], 13C0950-27[PASD616-0-0.5], 13C0950-28[PASD616-1-1.5], 13C0950-29[PASD616-2-2.5], 13C0950-30[PASD616-3-3.5], 13C0950-31[PASD610-0-0.5], 13C0950-32[PASD610-1-1.5], 13C0950-33[PASD610-2-2.5], 13C0950-34[PASD610-3-3.5], 13C0950-35[PASD613-0-0.5], 13C0950-36[PASD613-1-1.5], 13C0950-37[PASD613-2-2.5], 13C0950-38[PASD613-3-3.5], 13C0950-39[BRSD709-1-1.5], 13C0950-40[BRSD708-0-0.5], 13C0950-41[BRSD708-1-1.5], 13C0950-42[BRSD708-2-2.5], 13C0950-43[BRSD708-0-0.5-1], 13C0950-44[BRSD707-1-1.5], 13C0950-45[BRSD707-2-2.5], 13C0950-46[BRSD707-2-2.5-1], 13C0950-47[BRSD705-2-2.5], 13C0950-48[BRSD705-3-3.5], 13C0950-49[BRSD705-4-4.5], 13C0950-50[BRSD706-0-0.5], 13C0950-51[BRSD706-1-1.5], 13C0950-52[BRSD706-2-2.5], 13C0950-53[BRSD706-3-3.5], 13C0950-54[BRSD706-3-3.5-1], 13C0950-55[BRSD703-2-2.5], 13C0950-56[BRSD703-3-3.5], 13C0950-57[BRSD703-4-4.5], 13C0950-58[BRSD704-0-0.5], 13C0950-59[BRSD704-1-1.5], B070039-BLK1, B070039-DUP1, B070042-BLK1, B070042-DUP1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium

13C0950-12[BRSD712-2-2.5], 13C0950-13[BRSD712-3-3.5], 13C0950-14[BRSD712-4-4.5], 13C0950-45[BRSD707-2-2.5], 13C0950-46[BRSD707-2-2.5-1], 13C0950-48[BRSD705-3-3.5], 13C0950-49[BRSD705-4-4.5], 13C0950-52[BRSD706-2-2.5], 13C0950-53[BRSD706-3-3.5], 13C0950-54[BRSD706-3-3.5-1], 13C0950-66[BRSD717-3-3.5]

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0950-61[BRSD704-3-3.5], B070044-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13C0950-16[BRSD711-1-1.5], 13C0950-20[PASD608-1-1.5], 13C0950-57[BRSD703-4-4.5], 13C0950-61[BRSD704-3-3.5], B070031-MS1, B070039-MS1, B070042-MS1, B070044-MS1

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-2-2.5 Sampled: 3/27/2013 16:45

Sample ID: 13C0950-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	10	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Antimony	ND	10	8.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Arsenic	47	10	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Barium	110	10	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Beryllium	ND	1.0	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Cadmium	0.88	1.0	0.61	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:38	OP
Calcium	4400	31	5.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Chromium	63	2.1	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Cobalt	21	10	0.66	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Copper	110	2.1	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Iron	24000	10	8.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Lead	8.1	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Magnesium	6800	31	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Manganese	100	2.1	0.66	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 19:45	KSH
Mercury	ND	0.10	0.031	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:00	SAJ
Nickel	200	2.1	0.50	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Potassium	1000	410	71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Selenium	ND	10	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Silver	ND	2.1	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Sodium	330	410	200	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 18:48	KSH
Thallium	ND	10	3.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Vanadium	34	4.1	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP
Zinc	73	4.1	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:38	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-2-2.5 Sampled: 3/27/2013 16:45

Sample ID: 13C0950-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	24.1		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-3-3.5 Sampled: 3/27/2013 16:50

Sample ID: 13C0950-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5900	2.9	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Arsenic	2.5	2.9	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:43	OP
Barium	69	2.9	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Cadmium	0.25	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:43	OP
Calcium	1800	8.7	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Chromium	31	0.58	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Cobalt	9.4	2.9	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Copper	27	0.58	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Iron	12000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Lead	4.9	0.87	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Magnesium	3800	8.7	0.90	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Manganese	90	0.58	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 19:50	KSH
Mercury	ND	0.031	0.0092	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:02	SAJ
Nickel	27	0.58	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Sodium	97	120	56	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 18:54	KSH
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Vanadium	41	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP
Zinc	37	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:43	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-3-3.5 Sampled: 3/27/2013 16:50

Sample ID: 13C0950-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.1		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-4-4.5 Sampled: 3/27/2013 16:55

Sample ID: 13C0950-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	2.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Barium	64	2.7	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Cadmium	0.22	0.27	0.16	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:48	OP
Calcium	7500	8.2	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Chromium	28	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Cobalt	8.4	2.7	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Copper	35	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Iron	17000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Lead	5.1	0.82	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Magnesium	7100	8.2	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Manganese	120	0.55	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 19:55	KSH
Mercury	ND	0.028	0.0083	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:03	SAJ
Nickel	21	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Potassium	1200	110	19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Selenium	ND	2.7	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Sodium	95	110	53	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 18:59	KSH
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Vanadium	30	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP
Zinc	38	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:48	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD715-4-4.5 Sampled: 3/27/2013 16:55

Sample ID: 13C0950-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-0-0.5 Sampled: 3/27/2013 16:55

Sample ID: 13C0950-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	12	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Antimony	ND	12	9.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Arsenic	ND	12	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Barium	270	12	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Beryllium	ND	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Cadmium	0.90	1.2	0.71	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:52	OP
Calcium	15000	36	6.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Chromium	50	2.4	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Cobalt	13	12	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Copper	130	2.4	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Iron	15000	12	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Lead	40	3.6	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Magnesium	4500	36	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Manganese	160	2.4	0.76	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:01	KSH
Mercury	0.087	0.12	0.035	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:09	SAJ
Nickel	140	2.4	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Potassium	660	480	82	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Selenium	ND	12	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Sodium	430	480	230	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:05	KSH
Thallium	ND	12	4.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Vanadium	35	4.8	0.79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP
Zinc	67	4.8	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:52	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-0-0.5 Sampled: 3/27/2013 16:55

Sample ID: 13C0950-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	20.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-1-1.5 Sampled: 3/27/2013 17:00

Sample ID: 13C0950-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	11	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Antimony	ND	11	9.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Barium	270	11	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Cadmium	0.94	1.1	0.67	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:57	OP
Calcium	14000	34	6.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Chromium	51	2.3	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Cobalt	14	11	0.73	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Copper	130	2.3	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Iron	15000	11	9.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Lead	37	3.4	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Magnesium	4100	34	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Manganese	130	2.3	0.72	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:06	KSH
Mercury	0.091	0.12	0.036	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:11	SAJ
Nickel	160	2.3	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Potassium	570	450	78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Selenium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Sodium	390	450	220	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:10	KSH
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Vanadium	44	4.5	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP
Zinc	56	4.5	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:57	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-1-1.5 Sampled: 3/27/2013 17:00

Sample ID: 13C0950-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	20.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-2-2.5 Sampled: 3/27/2013 17:05

Sample ID: 13C0950-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	11	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Antimony	ND	11	9.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Barium	320	11	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Cadmium	1.4	1.1	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Calcium	17000	34	6.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Chromium	87	2.3	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Cobalt	27	11	0.73	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Copper	130	2.3	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Iron	21000	11	9.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Lead	51	3.4	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Magnesium	5800	34	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Manganese	260	2.3	0.72	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:12	KSH
Mercury	0.14	0.12	0.036	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:12	SAJ
Nickel	210	2.3	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Potassium	480	460	78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Selenium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Sodium	340	460	220	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:16	KSH
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Vanadium	65	4.6	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP
Zinc	92	4.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:01	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-2-2.5 Sampled: 3/27/2013 17:05

Sample ID: 13C0950-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	20.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-3-3.5 Sampled: 3/27/2013 17:10

Sample ID: 13C0950-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	12	5.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Arsenic	ND	12	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Barium	280	12	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Beryllium	ND	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Cadmium	1.4	1.2	0.73	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Calcium	22000	37	6.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Chromium	65	2.5	0.61	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Cobalt	16	12	0.78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Copper	140	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Iron	15000	12	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Lead	8.6	3.7	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Magnesium	6200	37	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Manganese	180	2.5	0.78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:17	KSH
Mercury	0.088	0.13	0.039	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:14	SAJ
Nickel	170	2.5	0.59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Potassium	320	490	84	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Sodium	270	490	240	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:21	KSH
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Vanadium	74	4.9	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP
Zinc	27	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:07	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD714-3-3.5 Sampled: 3/27/2013 17:10

Sample ID: 13C0950-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-0-0.5 Sampled: 3/27/2013 17:10

Sample ID: 13C0950-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	6.9	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Antimony	ND	6.9	5.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Arsenic	ND	6.9	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Barium	220	6.9	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Beryllium	ND	0.69	0.11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Cadmium	0.55	0.69	0.40	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:12	OP
Calcium	9300	21	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Chromium	53	1.4	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Cobalt	8.8	6.9	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Copper	67	1.4	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Iron	11000	6.9	5.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Lead	25	2.1	0.95	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Magnesium	3500	21	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Manganese	160	1.4	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:23	KSH
Mercury	0.10	0.071	0.021	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:16	SAJ
Nickel	82	1.4	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Potassium	770	270	47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Selenium	ND	6.9	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Sodium	290	270	130	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:26	KSH
Thallium	ND	6.9	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Vanadium	26	2.7	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP
Zinc	39	2.7	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:12	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-0-0.5 Sampled: 3/27/2013 17:10

Sample ID: 13C0950-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	34.7		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-1-1.5 Sampled: 3/27/2013 17:15

Sample ID: 13C0950-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	12	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Antimony	ND	12	9.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Arsenic	ND	12	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Barium	300	12	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Beryllium	ND	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Cadmium	1.5	1.2	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Calcium	17000	35	6.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Chromium	81	2.4	0.59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Cobalt	35	12	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Copper	91	2.4	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Iron	16000	12	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Lead	63	3.5	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Magnesium	6100	35	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Manganese	200	2.4	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:28	KSH
Mercury	0.10	0.12	0.037	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:17	SAJ
Nickel	280	2.4	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Potassium	450	470	81	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Selenium	ND	12	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Sodium	280	470	230	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:32	KSH
Thallium	ND	12	3.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Vanadium	52	4.7	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP
Zinc	130	4.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:16	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-1-1.5 Sampled: 3/27/2013 17:15

Sample ID: 13C0950-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-2-2.5 Sampled: 3/27/2013 17:20

Sample ID: 13C0950-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	14	6.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Arsenic	ND	14	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Barium	330	14	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Cadmium	1.1	1.4	0.83	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:36	OP
Calcium	23000	42	7.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Chromium	84	2.8	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Cobalt	12	14	0.90	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:36	OP
Copper	71	2.8	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Iron	13000	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Lead	20	4.2	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Magnesium	7100	42	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Manganese	140	2.8	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:34	KSH
Mercury	0.11	0.15	0.043	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:19	SAJ
Nickel	150	2.8	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Potassium	320	560	97	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Selenium	ND	14	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Silver	ND	2.8	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Sodium	ND	560	270	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 19:37	KSH
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Vanadium	48	5.6	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP
Zinc	24	5.6	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:36	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-2-2.5 Sampled: 3/27/2013 17:20

Sample ID: 13C0950-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-3-3.5 Sampled: 3/27/2013 17:25

Sample ID: 13C0950-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	15	6.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Arsenic	ND	15	5.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Barium	250	15	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Beryllium	ND	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Cadmium	1.0	1.5	0.91	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:41	OP
Calcium	19000	46	8.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Chromium	64	3.1	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Cobalt	9.6	15	0.99	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:41	OP
Copper	63	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Iron	8900	15	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Lead	10	4.6	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Magnesium	6000	46	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Manganese	95	3.1	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 20:59	KSH
Mercury	0.11	0.16	0.047	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:20	SAJ
Nickel	120	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Potassium	290	620	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Selenium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Sodium	ND	620	300	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:02	KSH
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Vanadium	57	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP
Zinc	19	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:41	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD614-3-3.5 Sampled: 3/27/2013 17:25

Sample ID: 13C0950-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-2-2.5 Sampled: 3/27/2013 17:30

Sample ID: 13C0950-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6100	2.8	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Barium	68	2.8	0.35	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Beryllium	ND	0.56	0.090	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/3/13 17:19	OP
Cadmium	0.17	0.28	0.16	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:45	OP
Calcium	8600	8.4	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Chromium	16	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Cobalt	9.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Copper	80	0.56	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Iron	15000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Lead	5.1	0.84	0.39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Magnesium	6500	8.4	0.88	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Manganese	160	0.56	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:03	KSH
Mercury	0.077	0.029	0.0087	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:22	SAJ
Nickel	28	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Sodium	93	110	54	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:08	KSH
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Vanadium	17	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP
Zinc	32	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:45	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-2-2.5 Sampled: 3/27/2013 17:30

Sample ID: 13C0950-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-3-3.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Arsenic	1.2	3.0	1.1	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:50	OP
Barium	110	3.0	0.37	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Beryllium	ND	0.60	0.096	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/3/13 17:38	OP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Calcium	4800	8.9	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Chromium	13	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Cobalt	7.7	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Copper	66	0.60	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Iron	11000	3.0	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Lead	4.0	0.89	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Magnesium	4300	8.9	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Manganese	140	0.60	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:08	KSH
Mercury	0.015	0.030	0.0088	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:24	SAJ
Nickel	28	0.60	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Potassium	1500	120	20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Silver	ND	0.60	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Sodium	100	120	58	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:13	KSH
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Vanadium	14	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP
Zinc	27	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:50	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-3-3.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-4-4.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	2.8	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Barium	87	2.8	0.35	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Beryllium	ND	0.56	0.090	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/3/13 17:43	OP
Cadmium	0.21	0.28	0.16	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:55	OP
Calcium	4900	8.4	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Chromium	29	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Cobalt	16	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Copper	230	0.56	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Iron	10000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Lead	4.7	0.84	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Magnesium	4200	8.4	0.87	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Manganese	120	0.56	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:14	KSH
Mercury	0.0099	0.029	0.0085	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:30	SAJ
Nickel	90	0.56	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Potassium	1000	110	19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Sodium	110	110	54	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:19	KSH
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP
Zinc	26	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:55	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD712-4-4.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-0-0.5 Sampled: 3/27/2013 17:30

Sample ID: 13C0950-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	11	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Antimony	ND	11	9.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Barium	210	11	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Cadmium	0.77	1.1	0.66	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 16:59	OP
Calcium	11000	34	6.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Chromium	51	2.3	0.56	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Cobalt	13	11	0.72	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Copper	120	2.3	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Iron	14000	11	9.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Lead	23	3.4	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Magnesium	4800	34	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Manganese	120	2.3	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:19	KSH
Mercury	0.066	0.12	0.035	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:31	SAJ
Nickel	140	2.3	0.54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Potassium	880	450	77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Selenium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Sodium	430	450	220	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:24	KSH
Thallium	ND	11	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Vanadium	32	4.5	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP
Zinc	65	4.5	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 16:59	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-0-0.5 Sampled: 3/27/2013 17:30

Sample ID: 13C0950-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-1-1.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	9.4	4.0	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 17:56	OP
Antimony	ND	9.4	7.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Arsenic	4.4	9.4	3.4	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:00	OP
Barium	190	9.4	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Beryllium	ND	0.94	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:56	OP
Cadmium	0.74	0.94	0.55	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:00	OP
Calcium	9100	28	5.1	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 17:56	OP
Chromium	60	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Cobalt	12	9.4	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Copper	140	1.9	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Iron	15000	9.4	8.0	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 17:56	OP
Lead	15	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Magnesium	4500	28	2.9	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 17:56	OP
Manganese	94	1.9	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 19:19	KSH
Mercury	0.050	0.096	0.029	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:33	SAJ
Nickel	140	1.9	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Potassium	640	380	64	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:56	OP
Selenium	ND	9.4	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Sodium	380	380	180	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:56	OP
Thallium	ND	9.4	3.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Vanadium	32	3.8	0.62	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP
Zinc	50	3.8	0.97	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:00	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-1-1.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	25.1		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-2-2.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8300	9.2	3.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Antimony	ND	9.2	7.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Arsenic	3.8	9.2	3.3	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 17:04	OP
Barium	170	9.2	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Beryllium	ND	0.92	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Cadmium	0.68	0.92	0.54	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 17:04	OP
Calcium	7200	27	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Chromium	55	1.8	0.46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Cobalt	13	9.2	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Copper	130	1.8	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Iron	14000	9.2	7.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Lead	15	2.7	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Magnesium	4700	27	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Manganese	83	1.8	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:25	KSH
Mercury	0.066	0.090	0.027	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:34	SAJ
Nickel	140	1.8	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Potassium	740	370	63	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Selenium	ND	9.2	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Sodium	310	370	180	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:29	KSH
Thallium	ND	9.2	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Vanadium	32	3.7	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP
Zinc	52	3.7	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:04	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-2-2.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	26.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-3-3.5 Sampled: 3/27/2013 17:45

Sample ID: 13C0950-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	9.6	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Antimony	ND	9.6	7.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Arsenic	8.8	9.6	3.5	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 17:09	OP
Barium	440	9.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Beryllium	ND	0.96	0.16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Cadmium	1.3	0.96	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Calcium	22000	29	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Chromium	93	1.9	0.48	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Cobalt	20	9.6	0.62	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Copper	98	1.9	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Iron	15000	9.6	8.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Lead	49	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Magnesium	6900	29	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Manganese	180	1.9	0.61	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:30	KSH
Mercury	0.11	0.10	0.030	mg/Kg dry	1		SW-846 7471B	4/1/13	4/2/13 13:36	SAJ
Nickel	170	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Potassium	510	390	66	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Selenium	ND	9.6	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Sodium	380	390	190	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:35	KSH
Thallium	ND	9.6	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Vanadium	56	3.9	0.63	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP
Zinc	86	3.9	0.99	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:09	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD711-3-3.5 Sampled: 3/27/2013 17:45

Sample ID: 13C0950-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	24.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-0-0.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	9.7	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Antimony	ND	9.7	7.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Arsenic	4.1	9.7	3.5	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 17:14	OP
Barium	320	9.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Beryllium	ND	0.97	0.16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Cadmium	0.93	0.97	0.57	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 17:14	OP
Calcium	15000	29	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Chromium	79	1.9	0.48	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Cobalt	23	9.7	0.62	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Copper	140	1.9	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Iron	19000	9.7	8.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Lead	39	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Magnesium	6000	29	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Manganese	420	1.9	0.61	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 21:36	KSH
Mercury	0.065	0.098	0.029	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:38	SAJ
Nickel	170	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Potassium	990	390	66	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Selenium	ND	9.7	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Silver	ND	1.9	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Sodium	340	390	190	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 20:40	KSH
Thallium	ND	9.7	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Vanadium	52	3.9	0.64	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP
Zinc	86	3.9	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 17:14	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-0-0.5 Sampled: 3/27/2013 17:35

Sample ID: 13C0950-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	25.1		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-1-1.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	8.6	3.7	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Antimony	ND	8.6	7.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Arsenic	4.7	8.6	3.1	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:17	OP
Barium	200	8.6	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Beryllium	ND	0.86	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Cadmium	0.92	0.86	0.51	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Calcium	12000	26	4.7	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Chromium	50	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Cobalt	8.1	8.6	0.55	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:17	OP
Copper	93	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Iron	8200	8.6	7.4	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/2/13 16:17	OP
Lead	16	2.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Magnesium	3600	26	2.7	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Manganese	170	1.7	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Mercury	0.062	0.090	0.027	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 11:59	SAJ
Nickel	87	1.7	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Potassium	450	350	59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Selenium	ND	8.6	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Sodium	250	350	170	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 21:32	KSH
Thallium	ND	8.6	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Vanadium	27	3.5	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP
Zinc	23	3.5	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:17	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-1-1.5 Sampled: 3/27/2013 17:40

Sample ID: 13C0950-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.1		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-2-2.5 Sampled: 3/27/2013 00:00

Sample ID: 13C0950-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4400	16	6.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Arsenic	11	16	5.7	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:22	OP
Barium	300	16	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Beryllium	ND	1.6	0.25	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Cadmium	1.2	1.6	0.93	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:22	OP
Calcium	25000	47	8.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Chromium	60	3.1	0.79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Cobalt	7.9	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:22	OP
Copper	63	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Iron	7700	16	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Lead	8.8	4.7	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Magnesium	6800	47	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Manganese	200	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Mercury	0.052	0.16	0.047	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 13:58	SAJ
Nickel	92	3.1	0.76	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Potassium	570	630	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Selenium	ND	16	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Silver	ND	3.1	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Sodium	ND	630	310	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 21:56	KSH
Thallium	ND	16	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Vanadium	65	6.3	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP
Zinc	20	6.3	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:22	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-2-2.5 Sampled: 3/27/2013 00:00

Sample ID: 13C0950-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-3-3.5 Sampled: 3/27/2013 17:50

Sample ID: 13C0950-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	13	5.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Arsenic	11	13	4.7	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:27	OP
Barium	380	13	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Beryllium	ND	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Cadmium	2.1	1.3	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Calcium	31000	39	7.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Chromium	75	2.6	0.65	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Cobalt	16	13	0.83	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Copper	230	2.6	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Iron	5900	13	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Lead	5.0	3.9	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Magnesium	7400	39	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Manganese	38	2.6	0.82	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Mercury	0.092	0.13	0.040	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:00	SAJ
Nickel	230	2.6	0.63	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Potassium	350	520	89	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Selenium	ND	13	4.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Sodium	ND	520	250	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:02	KSH
Thallium	ND	13	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Vanadium	50	5.2	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP
Zinc	11	5.2	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:27	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD608-3-3.5 Sampled: 3/27/2013 17:50

Sample ID: 13C0950-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-2-2.5 Sampled: 3/28/2013 10:15

Sample ID: 13C0950-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	5.6	2.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Antimony	ND	5.6	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Arsenic	ND	5.6	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Barium	97	5.6	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Beryllium	ND	0.56	0.090	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Cadmium	1.0	0.56	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Calcium	2200	17	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Chromium	24	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Cobalt	13	5.6	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Copper	68	1.1	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Iron	26000	5.6	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Lead	15	1.7	0.78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Magnesium	4600	17	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Manganese	160	1.1	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Mercury	0.025	0.057	0.017	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:02	SAJ
Nickel	45	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Potassium	2200	220	39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Selenium	ND	5.6	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Silver	ND	1.1	0.99	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Sodium	170	220	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:07	KSH
Thallium	ND	5.6	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Vanadium	34	2.2	0.37	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP
Zinc	61	2.2	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:32	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-2-2.5 Sampled: 3/28/2013 10:15

Sample ID: 13C0950-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	43.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-3-3.5 Sampled: 3/28/2013 10:20

Sample ID: 13C0950-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	8.4	3.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Antimony	ND	8.4	6.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Arsenic	ND	8.4	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Barium	440	8.4	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Beryllium	ND	0.84	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Cadmium	1.1	0.84	0.49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Calcium	7300	25	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Chromium	64	1.7	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Cobalt	14	8.4	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Copper	59	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Iron	18000	8.4	7.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Lead	15	2.5	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Magnesium	3500	25	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Manganese	240	1.7	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Mercury	0.074	0.083	0.025	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:03	SAJ
Nickel	110	1.7	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Potassium	910	330	57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Selenium	ND	8.4	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Sodium	190	330	160	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:32	KSH
Thallium	ND	8.4	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Vanadium	38	3.3	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP
Zinc	76	3.3	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:37	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-3-3.5 Sampled: 3/28/2013 10:20

Sample ID: 13C0950-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	29.6		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-4-4.5 Sampled: 3/28/2013 10:25

Sample ID: 13C0950-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	10	4.5	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Antimony	ND	10	8.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Arsenic	6.1	10	3.8	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:43	OP
Barium	230	10	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Beryllium	ND	1.0	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Cadmium	1.2	1.0	0.62	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Calcium	14000	31	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Chromium	37	2.1	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Cobalt	8.9	10	0.67	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:43	OP
Copper	110	2.1	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Iron	10000	10	8.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Lead	6.0	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Magnesium	3500	31	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Manganese	280	2.1	0.66	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Mercury	0.068	0.10	0.030	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:05	SAJ
Nickel	110	2.1	0.51	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Potassium	490	420	72	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Selenium	ND	10	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Silver	ND	2.1	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Sodium	ND	420	200	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:37	KSH
Thallium	ND	10	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Vanadium	43	4.2	0.69	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP
Zinc	22	4.2	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:43	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-4-4.5 Sampled: 3/28/2013 10:25

Sample ID: 13C0950-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	23.6		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-2-2.5-1 Sampled: 3/28/2013 16:00

Sample ID: 13C0950-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	5.7	2.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Antimony	ND	5.7	4.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Arsenic	ND	5.7	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Barium	100	5.7	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Beryllium	ND	0.57	0.091	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Cadmium	0.78	0.57	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Calcium	1700	17	3.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Chromium	24	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Cobalt	11	5.7	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Copper	120	1.1	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Iron	22000	5.7	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Lead	13	1.7	0.78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Magnesium	4900	17	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Manganese	170	1.1	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Mercury	0.028	0.060	0.018	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:11	SAJ
Nickel	41	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Potassium	2100	230	39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Selenium	ND	5.7	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Silver	ND	1.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Sodium	170	230	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:43	KSH
Thallium	ND	5.7	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Vanadium	26	2.3	0.37	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP
Zinc	40	2.3	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:48	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD618-2-2.5-1 Sampled: 3/28/2013 16:00

Sample ID: 13C0950-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	41.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-0-0.5 Sampled: 3/28/2013 10:30

Sample ID: 13C0950-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	13	5.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Arsenic	ND	13	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Barium	240	13	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Beryllium	ND	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Cadmium	1.0	1.3	0.79	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:54	OP
Calcium	15000	40	7.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Chromium	37	2.7	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Cobalt	10	13	0.86	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:54	OP
Copper	90	2.7	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Iron	12000	13	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Lead	29	4.0	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Magnesium	6900	40	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Manganese	340	2.7	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Mercury	0.11	0.14	0.041	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:12	SAJ
Nickel	100	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Potassium	570	540	92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Selenium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Sodium	560	540	260	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:48	KSH
Thallium	ND	13	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Vanadium	28	5.4	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP
Zinc	40	5.4	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:54	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-0-0.5 Sampled: 3/28/2013 10:30

Sample ID: 13C0950-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-1-1.5 Sampled: 3/28/2013 10:35

Sample ID: 13C0950-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	14	6.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Arsenic	ND	14	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Barium	230	14	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Cadmium	1.1	1.4	0.84	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:59	OP
Calcium	14000	43	7.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Chromium	37	2.9	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Cobalt	14	14	0.91	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 16:59	OP
Copper	95	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Iron	15000	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Lead	17	4.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Magnesium	10000	43	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Manganese	170	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Mercury	0.064	0.15	0.043	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:14	SAJ
Nickel	130	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Potassium	350	570	98	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Sodium	540	570	280	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:54	KSH
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Vanadium	28	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP
Zinc	40	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 16:59	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-1-1.5 Sampled: 3/28/2013 10:35

Sample ID: 13C0950-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-2-2.5 Sampled: 3/28/2013 10:40

Sample ID: 13C0950-29

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	14	6.0	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Arsenic	7.9	14	5.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:24	OP
Barium	280	14	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Beryllium	ND	1.4	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Cadmium	1.4	1.4	0.82	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:24	OP
Calcium	16000	42	7.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Chromium	79	2.8	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Cobalt	10	14	0.89	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:24	OP
Copper	81	2.8	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Iron	10000	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Lead	28	4.2	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Magnesium	8300	42	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Manganese	130	2.8	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Mercury	0.11	0.14	0.041	mg/Kg dry	1	J	SW-846 7471B	4/1/13	4/2/13 14:16	SAJ
Nickel	100	2.8	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Potassium	400	560	96	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Selenium	ND	14	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Silver	ND	2.8	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Sodium	430	560	270	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 22:59	KSH
Thallium	ND	14	4.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Vanadium	45	5.6	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP
Zinc	41	5.6	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:24	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-2-2.5 Sampled: 3/28/2013 10:40

Sample ID: 13C0950-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-3-3.5 Sampled: 3/28/2013 10:45

Sample ID: 13C0950-30

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	19	8.0	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Antimony	ND	19	15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Arsenic	ND	19	6.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Barium	240	19	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Beryllium	ND	1.9	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Cadmium	1.5	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:30	OP
Calcium	16000	56	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Chromium	65	3.7	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Cobalt	14	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:30	OP
Copper	130	3.7	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Iron	10000	19	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Lead	18	5.6	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Magnesium	9700	56	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Manganese	93	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Mercury	0.082	0.18	0.054	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:30	SAJ
Nickel	150	3.7	0.90	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Potassium	380	750	130	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Selenium	ND	19	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Silver	ND	3.7	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Sodium	540	750	360	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:05	KSH
Thallium	ND	19	6.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Vanadium	48	7.5	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP
Zinc	38	7.5	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:30	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD616-3-3.5 Sampled: 3/28/2013 10:45

Sample ID: 13C0950-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-0-0.5 Sampled: 3/28/2013 10:50

Sample ID: 13C0950-31

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	16	7.0	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Arsenic	10	16	5.9	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:35	OP
Barium	250	16	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Cadmium	3.2	1.6	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Calcium	23000	49	8.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Chromium	46	3.3	0.82	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Cobalt	16	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:35	OP
Copper	330	3.3	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Iron	12000	16	14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Lead	9.4	4.9	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Magnesium	6200	49	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Manganese	250	3.3	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Mercury	0.11	0.17	0.051	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:31	SAJ
Nickel	210	3.3	0.79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Potassium	280	650	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Selenium	ND	16	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Silver	ND	3.3	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Sodium	340	650	320	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:10	KSH
Thallium	ND	16	5.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Vanadium	71	6.5	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP
Zinc	31	6.5	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:35	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-0-0.5 Sampled: 3/28/2013 10:50

Sample ID: 13C0950-31

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.2		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-1-1.5 Sampled: 3/28/2013 10:55

Sample ID: 13C0950-32

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	18	8.0	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Antimony	ND	18	15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Arsenic	8.3	18	6.7	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:41	OP
Barium	220	18	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Beryllium	ND	1.8	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Cadmium	2.2	1.8	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Calcium	19000	55	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Chromium	40	3.7	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Cobalt	16	18	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:41	OP
Copper	170	3.7	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Iron	14000	18	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Lead	5.7	5.5	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Magnesium	5400	55	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Manganese	120	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Mercury	0.21	0.19	0.057	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 10:37	SAJ
Nickel	190	3.7	0.90	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Potassium	300	740	130	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Selenium	ND	18	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Silver	ND	3.7	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Sodium	ND	740	360	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:16	KSH
Thallium	ND	18	6.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Vanadium	39	7.4	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP
Zinc	23	7.4	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:41	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-1-1.5 Sampled: 3/28/2013 10:55

Sample ID: 13C0950-32

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.7		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-2-2.5 Sampled: 3/28/2013 11:00

Sample ID: 13C0950-33

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3500	18	7.9	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Antimony	ND	18	15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Arsenic	ND	18	6.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Barium	100	18	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Beryllium	ND	1.8	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Cadmium	ND	1.8	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Calcium	9400	55	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Chromium	19	3.7	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Cobalt	6.6	18	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:46	OP
Copper	170	3.7	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Iron	11000	18	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Lead	3.2	5.5	2.5	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:46	OP
Magnesium	3800	55	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Manganese	58	3.7	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Mercury	ND	0.19	0.057	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:35	SAJ
Nickel	130	3.7	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Potassium	240	740	130	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Selenium	ND	18	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Silver	ND	3.7	3.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Sodium	ND	740	360	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:21	KSH
Thallium	ND	18	6.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Vanadium	13	7.4	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP
Zinc	12	7.4	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:46	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-2-2.5 Sampled: 3/28/2013 11:00

Sample ID: 13C0950-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-3-3.5 Sampled: 3/28/2013 11:05

Sample ID: 13C0950-34

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	18	7.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Antimony	ND	18	14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Arsenic	ND	18	6.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Barium	190	18	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Beryllium	ND	1.8	0.28	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Cadmium	1.2	1.8	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:52	OP
Calcium	14000	53	9.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Chromium	52	3.5	0.88	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Cobalt	17	18	1.1	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:52	OP
Copper	160	3.5	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Iron	14000	18	15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Lead	9.4	5.3	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Magnesium	6000	53	5.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Manganese	160	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Mercury	ND	0.18	0.052	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:41	SAJ
Nickel	230	3.5	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Potassium	650	700	120	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Selenium	ND	18	5.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Silver	ND	3.5	3.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Sodium	ND	700	340	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:46	KSH
Thallium	ND	18	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Vanadium	26	7.0	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP
Zinc	42	7.0	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:52	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD610-3-3.5 Sampled: 3/28/2013 11:05

Sample ID: 13C0950-34

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-0-0.5 Sampled: 3/28/2013 11:10

Sample ID: 13C0950-35

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	15	6.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 17:57	OP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Arsenic	7.5	15	5.4	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:57	OP
Barium	330	15	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Beryllium	ND	1.5	0.24	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Cadmium	1.3	1.5	0.88	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:57	OP
Calcium	16000	45	8.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Chromium	43	3.0	0.75	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Cobalt	11	15	0.95	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 17:57	OP
Copper	99	3.0	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Iron	14000	15	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Lead	30	4.5	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Magnesium	4900	45	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Manganese	950	3.0	0.95	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Mercury	0.15	0.15	0.044	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:42	SAJ
Nickel	130	3.0	0.72	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Potassium	710	600	100	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Selenium	ND	15	4.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Silver	ND	3.0	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Sodium	390	600	290	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 23:51	OP
Thallium	ND	15	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Vanadium	39	6.0	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP
Zinc	74	6.0	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 17:57	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-0-0.5 Sampled: 3/28/2013 11:10

Sample ID: 13C0950-35

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-1-1.5 Sampled: 3/28/2013 11:15

Sample ID: 13C0950-36

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5100	20	8.7	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 18:02	OP
Antimony	ND	20	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Arsenic	ND	20	7.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Barium	250	20	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Beryllium	ND	2.0	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Cadmium	1.3	2.0	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:02	OP
Calcium	18000	61	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Chromium	40	4.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Cobalt	8.1	20	1.3	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:02	OP
Copper	150	4.1	3.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Iron	7800	20	17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Lead	6.8	6.1	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Magnesium	5400	61	6.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Manganese	300	4.1	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Mercury	0.080	0.20	0.059	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:44	SAJ
Nickel	160	4.1	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Potassium	370	810	140	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:02	OP
Selenium	ND	20	6.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Silver	ND	4.1	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Sodium	ND	810	400	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 23:57	OP
Thallium	ND	20	6.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Vanadium	46	8.1	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP
Zinc	26	8.1	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:02	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-1-1.5 Sampled: 3/28/2013 11:15

Sample ID: 13C0950-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-2-2.5 Sampled: 3/28/2013 11:20

Sample ID: 13C0950-37

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	16	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Arsenic	8.3	16	5.8	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Barium	350	16	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Cadmium	1.2	1.6	0.95	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Calcium	22000	48	8.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Chromium	38	3.2	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Cobalt	4.8	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Copper	120	3.2	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Iron	5100	16	14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Lead	3.9	4.8	2.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Magnesium	6000	48	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Manganese	240	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Mercury	0.057	0.17	0.050	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:45	SAJ
Nickel	150	3.2	0.78	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Potassium	310	650	110	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:07	OP
Selenium	ND	16	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Sodium	ND	650	310	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 0:01	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Vanadium	40	6.5	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP
Zinc	20	6.5	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:07	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-2-2.5 Sampled: 3/28/2013 11:20

Sample ID: 13C0950-37

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	14.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-3-3.5 Sampled: 3/28/2013 11:25

Sample ID: 13C0950-38

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4100	19	8.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 18:11	OP
Antimony	ND	19	15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Arsenic	ND	19	6.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Barium	270	19	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Beryllium	ND	1.9	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Cadmium	1.2	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:11	OP
Calcium	19000	57	10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Chromium	34	3.8	0.95	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Cobalt	8.1	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:11	OP
Copper	110	3.8	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Iron	8300	19	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Lead	4.2	5.7	2.6	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:11	OP
Magnesium	5600	57	5.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Manganese	210	3.8	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Mercury	0.060	0.19	0.056	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:47	SAJ
Nickel	170	3.8	0.92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Potassium	280	760	130	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 18:11	OP
Selenium	ND	19	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Silver	ND	3.8	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Sodium	ND	760	370	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 0:06	OP
Thallium	ND	19	6.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Vanadium	39	7.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP
Zinc	22	7.6	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 18:11	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: PASD613-3-3.5 Sampled: 3/28/2013 11:25

Sample ID: 13C0950-38

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	13.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD709-1-1.5 Sampled: 3/28/2013 15:00

Sample ID: 13C0950-39

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	6.7	2.9	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/3/13 15:16	OP
Antimony	ND	6.7	5.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Arsenic	6.7	6.7	2.4	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/3/13 15:16	OP
Barium	200	6.7	0.84	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Beryllium	ND	0.67	0.11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Cadmium	1.3	0.67	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Calcium	6100	20	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Chromium	130	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Cobalt	30	6.7	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Copper	850	1.3	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Iron	23000	6.7	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Lead	27	2.0	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Magnesium	11000	20	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Manganese	330	1.3	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Mercury	0.094	0.069	0.020	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:49	SAJ
Nickel	260	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Potassium	2700	270	46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Selenium	ND	6.7	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Silver	ND	1.3	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Sodium	470	270	130	mg/Kg dry	1		SW-846 6010C	3/29/13	4/5/13 9:43	OP
Thallium	ND	6.7	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Vanadium	32	2.7	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP
Zinc	240	2.7	0.69	mg/Kg dry	1		SW-846 6010C	3/29/13	4/3/13 15:16	OP

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD709-1-1.5 Sampled: 3/28/2013 15:00

Sample ID: 13C0950-39

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	35.6		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-0-0.5 Sampled: 3/28/2013 15:05

Sample ID: 13C0950-40

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6400	7.1	3.1	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Antimony	ND	7.1	5.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Arsenic	ND	7.1	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Barium	170	7.1	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Beryllium	ND	0.71	0.11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Cadmium	0.94	0.71	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Calcium	8000	21	3.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Chromium	73	1.4	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Cobalt	21	7.1	0.46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Copper	71	1.4	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Iron	17000	7.1	6.1	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Lead	18	2.1	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Magnesium	5800	21	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Manganese	500	1.4	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Mercury	0.089	0.075	0.022	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:50	SAJ
Nickel	99	1.4	0.35	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Potassium	1000	290	49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Selenium	ND	7.1	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Silver	ND	1.4	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Sodium	300	290	140	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Thallium	ND	7.1	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Vanadium	24	2.9	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH
Zinc	54	2.9	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:46	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-0-0.5 Sampled: 3/28/2013 15:05

Sample ID: 13C0950-40

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	33.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-1-1.5 Sampled: 3/28/2013 15:10

Sample ID: 13C0950-41

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	6.7	2.9	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Antimony	ND	6.7	5.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Arsenic	ND	6.7	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Barium	310	6.7	0.84	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Beryllium	ND	0.67	0.11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Cadmium	1.1	0.67	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Calcium	6000	20	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Chromium	190	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Cobalt	28	6.7	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Copper	160	1.3	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Iron	26000	6.7	5.7	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Lead	25	2.0	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Magnesium	8100	20	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Manganese	270	1.3	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Mercury	0.087	0.070	0.021	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:52	SAJ
Nickel	210	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Potassium	790	270	46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Selenium	ND	6.7	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Silver	ND	1.3	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Sodium	490	270	130	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Thallium	ND	6.7	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Vanadium	43	2.7	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH
Zinc	49	2.7	0.69	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:51	KSH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-1-1.5 Sampled: 3/28/2013 15:10

Sample ID: 13C0950-41

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	35.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-2-2.5 Sampled: 3/28/2013 15:15

Sample ID: 13C0950-42

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8600	7.9	3.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Antimony	8.5	7.9	6.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Arsenic	7.3	7.9	2.9	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Barium	470	7.9	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Beryllium	ND	0.79	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Cadmium	1.7	0.79	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Calcium	12000	24	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Chromium	130	1.6	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Cobalt	42	7.9	0.50	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Copper	210	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Iron	16000	7.9	6.7	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Lead	9.3	2.4	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Magnesium	5000	24	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Manganese	360	1.6	0.50	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Mercury	0.072	0.082	0.024	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 13:54	SAJ
Nickel	330	1.6	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Potassium	850	320	54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Selenium	ND	7.9	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Sodium	560	320	150	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Thallium	ND	7.9	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Vanadium	47	3.2	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH
Zinc	52	3.2	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:16	KSH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-2-2.5 Sampled: 3/28/2013 15:15

Sample ID: 13C0950-42

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	29.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-0-0.5-1 Sampled: 3/28/2013 16:05

Sample ID: 13C0950-43

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	5.3	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Antimony	4.9	5.3	4.3	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Arsenic	ND	5.3	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Barium	160	5.3	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Beryllium	ND	0.53	0.086	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Cadmium	0.86	0.53	0.32	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Calcium	6100	16	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Chromium	120	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Cobalt	26	5.3	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Copper	71	1.1	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Iron	18000	5.3	4.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Lead	17	1.6	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Magnesium	8600	16	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Manganese	380	1.1	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Mercury	0.088	0.056	0.017	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 13:55	SAJ
Nickel	110	1.1	0.26	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Potassium	1200	210	37	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Selenium	ND	5.3	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Silver	ND	1.1	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Sodium	310	210	100	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Thallium	ND	5.3	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Vanadium	28	2.1	0.35	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH
Zinc	75	2.1	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:22	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD708-0-0.5-1 Sampled: 3/28/2013 16:05

Sample ID: 13C0950-43

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	43.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-1-1.5 Sampled: 3/28/2013 15:20

Sample ID: 13C0950-44

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Barium	76	3.1	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Beryllium	ND	0.31	0.049	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Cadmium	0.29	0.31	0.18	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Calcium	2200	9.2	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Chromium	25	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Cobalt	5.3	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Copper	31	0.61	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Iron	10000	3.1	2.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Lead	4.4	0.92	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Magnesium	2900	9.2	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Manganese	63	0.61	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Mercury	0.011	0.030	0.0089	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 14:01	SAJ
Nickel	20	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Potassium	1000	120	21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Sodium	160	120	59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Vanadium	18	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH
Zinc	24	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:27	KSH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-1-1.5 Sampled: 3/28/2013 15:20

Sample ID: 13C0950-44

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-2-2.5 Sampled: 3/28/2013 15:25

Sample ID: 13C0950-45

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Barium	70	2.7	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Beryllium	ND	0.54	0.087	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 19:53	OP
Cadmium	0.30	0.27	0.16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Calcium	2200	8.1	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Chromium	18	0.54	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Cobalt	5.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Copper	17	0.54	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Iron	12000	2.7	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Lead	4.0	0.81	0.37	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Magnesium	3100	8.1	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Manganese	79	0.54	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Mercury	ND	0.029	0.0085	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 14:03	SAJ
Nickel	17	0.54	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Potassium	950	110	19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Sodium	170	110	53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Vanadium	15	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH
Zinc	25	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:32	KSH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-2-2.5 Sampled: 3/28/2013 15:25

Sample ID: 13C0950-45

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-2-2.5-1 Sampled: 3/28/2013 16:10

Sample ID: 13C0950-46

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6100	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Barium	82	2.9	0.36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Beryllium	ND	0.58	0.093	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 19:58	OP
Cadmium	0.32	0.29	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Calcium	2000	8.7	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Chromium	20	0.58	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Cobalt	6.7	2.9	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Copper	24	0.58	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Iron	13000	2.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Lead	5.0	0.87	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Magnesium	3300	8.7	0.91	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Manganese	90	0.58	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Mercury	ND	0.028	0.0084	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 14:05	SAJ
Nickel	16	0.58	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Potassium	1500	120	20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Sodium	130	120	56	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Vanadium	18	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH
Zinc	28	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:38	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD707-2-2.5-1 Sampled: 3/28/2013 16:10

Sample ID: 13C0950-46

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-2-2.5 Sampled: 3/28/2013 15:30

Sample ID: 13C0950-47

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	6.5	2.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Antimony	ND	6.5	5.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Arsenic	7.0	6.5	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Barium	200	6.5	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Beryllium	ND	0.65	0.10	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Cadmium	1.2	0.65	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Calcium	5500	19	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Chromium	140	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Cobalt	16	6.5	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Copper	1400	1.3	0.99	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Iron	19000	6.5	5.5	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Lead	29	1.9	0.90	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Magnesium	4900	19	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Manganese	390	1.3	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Mercury	0.11	0.066	0.020	mg/Kg dry	1		SW-846 7471B	3/30/13	4/1/13 14:06	SAJ
Nickel	290	1.3	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Potassium	1000	260	45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Selenium	42	6.5	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Silver	ND	1.3	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Sodium	500	260	130	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Thallium	ND	6.5	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Vanadium	28	2.6	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH
Zinc	610	2.6	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:43	KSH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-2-2.5 Sampled: 3/28/2013 15:30

Sample ID: 13C0950-47

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	37.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-3-3.5 Sampled: 3/28/2013 15:35

Sample ID: 13C0950-48

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5800	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Barium	45	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Beryllium	ND	0.62	0.10	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 20:28	OP
Cadmium	0.33	0.31	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Calcium	2200	9.3	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Chromium	17	0.62	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Cobalt	6.6	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Copper	64	0.62	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Iron	11000	3.1	2.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Lead	4.2	0.93	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Magnesium	3400	9.3	0.97	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Manganese	100	0.62	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Mercury	0.011	0.032	0.0095	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 14:08	SAJ
Nickel	26	0.62	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Potassium	1000	120	21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Silver	ND	0.62	0.54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Sodium	150	120	60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Vanadium	18	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH
Zinc	49	1.2	0.32	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:49	KSH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-3-3.5 Sampled: 3/28/2013 15:35

Sample ID: 13C0950-48

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	77.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-4-4.5 Sampled: 3/28/2013 15:40

Sample ID: 13C0950-49

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5800	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Barium	41	3.1	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Beryllium	ND	0.61	0.099	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 20:33	OP
Cadmium	0.32	0.31	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Calcium	1900	9.2	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Chromium	16	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Cobalt	6.4	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Copper	84	0.61	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Iron	11000	3.1	2.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Lead	5.3	0.92	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Magnesium	3500	9.2	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Manganese	96	0.61	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Mercury	0.011	0.031	0.0091	mg/Kg dry	1	J	SW-846 7471B	3/30/13	4/1/13 14:10	SAJ
Nickel	29	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Potassium	930	120	21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Selenium	ND	3.1	0.95	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Sodium	130	120	60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Vanadium	17	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH
Zinc	46	1.2	0.32	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 12:54	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD705-4-4.5 Sampled: 3/28/2013 15:40

Sample ID: 13C0950-49

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-0-0.5 Sampled: 3/28/2013 15:45

Sample ID: 13C0950-50

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7000	7.9	3.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Antimony	ND	7.9	6.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Arsenic	4.3	7.9	2.8	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Barium	260	7.9	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Beryllium	ND	0.79	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Cadmium	0.66	0.79	0.47	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Calcium	13000	24	4.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Chromium	61	1.6	0.39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Cobalt	6.0	7.9	0.50	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Copper	140	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Iron	6600	7.9	6.7	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Lead	6.8	2.4	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Magnesium	3300	24	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Manganese	130	1.6	0.50	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Mercury	0.094	0.083	0.025	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:25	SAJ
Nickel	170	1.6	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Potassium	480	320	54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Selenium	ND	7.9	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Sodium	580	320	150	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Thallium	ND	7.9	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Vanadium	23	3.2	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH
Zinc	27	3.2	0.81	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:00	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-0-0.5 Sampled: 3/28/2013 15:45

Sample ID: 13C0950-50

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	29.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-1-1.5 Sampled: 3/28/2013 15:50

Sample ID: 13C0950-51

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	5.2	2.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Antimony	ND	5.2	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Arsenic	3.3	5.2	1.9	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Barium	190	5.2	0.64	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Beryllium	ND	0.52	0.083	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Cadmium	0.67	0.52	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Calcium	5600	16	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Chromium	38	1.0	0.26	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Cobalt	11	5.2	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Copper	100	1.0	0.79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Iron	5200	5.2	4.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Lead	3.7	1.6	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Magnesium	3000	16	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Manganese	64	1.0	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Mercury	0.031	0.053	0.016	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:27	SAJ
Nickel	150	1.0	0.25	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Potassium	480	210	36	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Selenium	ND	5.2	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Silver	ND	1.0	0.91	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Sodium	320	210	100	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Thallium	ND	5.2	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Vanadium	17	2.1	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH
Zinc	27	2.1	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:05	KSH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-1-1.5 Sampled: 3/28/2013 15:50

Sample ID: 13C0950-51

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	47.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-2-2.5 Sampled: 3/28/2013 15:55

Sample ID: 13C0950-52

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	3.3	1.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Antimony	ND	3.3	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Barium	68	3.3	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Beryllium	ND	0.66	0.11	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 20:38	OP
Cadmium	0.45	0.33	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Calcium	2900	9.9	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Chromium	20	0.66	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Cobalt	9.1	3.3	0.21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Copper	28	0.66	0.50	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Iron	14000	3.3	2.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Lead	6.5	0.99	0.46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Magnesium	4400	9.9	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Manganese	110	0.66	0.21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Mercury	0.011	0.033	0.0097	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:29	SAJ
Nickel	37	0.66	0.16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Potassium	1200	130	23	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Sodium	220	130	64	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Vanadium	26	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH
Zinc	47	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:10	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-2-2.5 Sampled: 3/28/2013 15:55

Sample ID: 13C0950-52

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	75.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-3-3.5 Sampled: 3/28/2013 16:00

Sample ID: 13C0950-53

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8000	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Antimony	2.5	3.0	2.4	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Barium	54	3.0	0.38	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Beryllium	ND	0.60	0.097	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 20:43	OP
Cadmium	0.47	0.30	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Calcium	2700	9.0	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Chromium	19	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Cobalt	9.2	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Copper	27	0.60	0.46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Iron	15000	3.0	2.6	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Lead	7.3	0.90	0.42	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Magnesium	4500	9.0	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Manganese	130	0.60	0.19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Mercury	ND	0.030	0.0089	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:30	SAJ
Nickel	26	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Potassium	1400	120	21	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Sodium	180	120	59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Vanadium	25	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH
Zinc	44	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:35	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-3-3.5 Sampled: 3/28/2013 16:00

Sample ID: 13C0950-53

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-3-3.5-1 Sampled: 3/28/2013 16:15

Sample ID: 13C0950-54

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Barium	54	2.8	0.35	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Beryllium	ND	0.56	0.090	mg/Kg dry	2	DL-04	SW-846 6010C	3/29/13	4/8/13 20:47	OP
Cadmium	0.40	0.28	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Calcium	2500	8.4	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Chromium	17	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Cobalt	8.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Copper	25	0.56	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Iron	14000	2.8	2.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Lead	6.4	0.84	0.39	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Magnesium	4200	8.4	0.88	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Manganese	120	0.56	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Mercury	ND	0.030	0.0087	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:32	SAJ
Nickel	24	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Sodium	180	110	55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Vanadium	24	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH
Zinc	41	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:41	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD706-3-3.5-1 Sampled: 3/28/2013 16:15

Sample ID: 13C0950-54

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-2-2.5 Sampled: 3/28/2013 16:05

Sample ID: 13C0950-55

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	13	5.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Arsenic	ND	13	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Barium	110	13	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Beryllium	ND	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Cadmium	0.98	1.3	0.79	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Calcium	4700	40	7.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Chromium	30	2.7	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Cobalt	6.9	13	0.86	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Copper	580	2.7	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Iron	7500	13	11	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Lead	11	4.0	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Magnesium	2300	40	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Manganese	220	2.7	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Mercury	0.16	0.14	0.042	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:34	SAJ
Nickel	180	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Potassium	480	540	92	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Selenium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Sodium	670	540	260	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Thallium	ND	13	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Vanadium	14	5.4	0.88	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH
Zinc	66	5.4	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:46	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-2-2.5 Sampled: 3/28/2013 16:05

Sample ID: 13C0950-55

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-3-3.5 Sampled: 3/28/2013 16:10

Sample ID: 13C0950-56

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	15	6.5	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Arsenic	6.8	15	5.5	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Barium	270	15	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Beryllium	ND	1.5	0.24	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Cadmium	1.5	1.5	0.90	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Calcium	9300	46	8.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Chromium	78	3.0	0.76	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Cobalt	21	15	0.97	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Copper	1200	3.0	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Iron	18000	15	13	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Lead	24	4.6	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Magnesium	6000	46	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Manganese	370	3.0	0.97	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Mercury	0.097	0.16	0.048	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:35	SAJ
Nickel	390	3.0	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Potassium	1200	610	100	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Silver	ND	3.0	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Sodium	840	610	300	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Thallium	ND	15	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Vanadium	31	6.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH
Zinc	170	6.1	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:52	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-3-3.5 Sampled: 3/28/2013 16:10

Sample ID: 13C0950-56

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-4-4.5 Sampled: 3/28/2013 16:15

Sample ID: 13C0950-57

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	14	5.8	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Arsenic	ND	14	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Barium	160	14	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Beryllium	ND	1.4	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Cadmium	1.3	1.4	0.80	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Calcium	6600	41	7.3	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Chromium	42	2.7	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Cobalt	15	14	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Copper	270	2.7	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Iron	13000	14	12	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Lead	8.0	4.1	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Magnesium	4300	41	4.2	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Manganese	140	2.7	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Mercury	0.056	0.14	0.042	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 10:39	SAJ
Nickel	230	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Potassium	910	540	93	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Selenium	ND	14	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Sodium	550	540	260	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Thallium	ND	14	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Vanadium	20	5.4	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH
Zinc	83	5.4	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 11:40	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD703-4-4.5 Sampled: 3/28/2013 16:15

Sample ID: 13C0950-57

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.8		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-0-0.5 Sampled: 3/28/2013 16:20

Sample ID: 13C0950-58

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	13	5.8	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Arsenic	ND	13	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Barium	420	13	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Beryllium	ND	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Cadmium	1.1	1.3	0.80	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Calcium	13000	40	7.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Chromium	72	2.7	0.67	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Cobalt	9.8	13	0.86	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Copper	300	2.7	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Iron	10000	13	12	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Lead	12	4.0	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Magnesium	4400	40	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Manganese	380	2.7	0.86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Mercury	0.15	0.13	0.040	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:43	SAJ
Nickel	230	2.7	0.65	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Potassium	1200	540	92	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Selenium	ND	13	4.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Sodium	1100	540	260	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Thallium	ND	13	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Vanadium	22	5.4	0.89	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH
Zinc	78	5.4	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 13:56	KSH

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-0-0.5 Sampled: 3/28/2013 16:20

Sample ID: 13C0950-58

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	18.2		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-1-1.5 Sampled: 3/28/2013 16:25

Sample ID: 13C0950-59

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	13	5.4	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Antimony	11	13	10	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Arsenic	9.9	13	4.5	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Barium	1000	13	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Beryllium	0.27	1.3	0.20	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Cadmium	2.1	1.3	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Calcium	33000	38	6.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Chromium	76	2.5	0.63	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Cobalt	9.1	13	0.80	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Copper	460	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Iron	13000	13	11	mg/Kg dry	1	B-07	SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Lead	14	3.8	1.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Magnesium	6200	38	3.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Manganese	650	2.5	0.79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Mercury	0.13	0.13	0.038	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:44	SAJ
Nickel	350	2.5	0.61	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Potassium	660	500	86	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Selenium	ND	13	3.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Sodium	1300	500	240	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Thallium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Vanadium	27	5.0	0.82	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH
Zinc	69	5.0	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:01	KSH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-1-1.5 Sampled: 3/28/2013 16:25

Sample ID: 13C0950-59

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	19.6		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-2-2.5 Sampled: 3/28/2013 16:30

Sample ID: 13C0950-60

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	14	6.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Arsenic	9.4	14	5.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 12:52	OP
Barium	440	14	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Cadmium	1.8	1.4	0.84	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Calcium	20000	43	7.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Chromium	58	2.9	0.71	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Cobalt	13	14	0.91	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 12:52	OP
Copper	300	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Iron	7600	14	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Lead	8.0	4.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Magnesium	5000	43	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Manganese	400	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Mercury	0.097	0.14	0.042	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:46	SAJ
Nickel	330	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Potassium	450	570	98	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 12:52	OP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Sodium	880	570	280	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Vanadium	36	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP
Zinc	46	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:52	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-2-2.5 Sampled: 3/28/2013 16:30

Sample ID: 13C0950-60

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	17.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-3-3.5 Sampled: 3/28/2013 16:35

Sample ID: 13C0950-61

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	11	4.6	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 11:17	OP
Antimony	ND	11	8.6	mg/Kg dry	1	MS-07	SW-846 6010C	3/29/13	4/1/13 11:17	OP
Arsenic	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Barium	190	11	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Beryllium	ND	1.1	0.17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Cadmium	0.86	1.1	0.63	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 11:17	OP
Calcium	7900	32	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Chromium	47	2.1	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Cobalt	17	11	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Copper	160	2.1	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Iron	11000	11	9.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Lead	5.6	3.2	1.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Magnesium	5400	32	3.3	mg/Kg dry	1	MS-19	SW-846 6010C	3/29/13	4/1/13 11:17	OP
Manganese	110	2.1	0.68	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Mercury	0.039	0.11	0.033	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:48	SAJ
Nickel	230	2.1	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Potassium	910	430	73	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Selenium	ND	11	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Silver	ND	2.1	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Sodium	280	430	210	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 11:17	OP
Thallium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Vanadium	28	4.3	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP
Zinc	49	4.3	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 11:17	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-3-3.5 Sampled: 3/28/2013 16:35

Sample ID: 13C0950-61

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	21.9		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-3-3.5-1 Sampled: 3/28/2013 16:20

Sample ID: 13C0950-62

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	9.2	4.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Antimony	ND	9.2	7.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Arsenic	ND	9.2	3.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Barium	170	9.2	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Beryllium	ND	0.92	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Cadmium	0.69	0.92	0.54	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 12:57	OP
Calcium	6500	28	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Chromium	48	1.8	0.46	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Cobalt	16	9.2	0.59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Copper	120	1.8	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Iron	11000	9.2	7.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Lead	4.9	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Magnesium	5200	28	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Manganese	96	1.8	0.58	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Mercury	0.035	0.093	0.027	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:49	SAJ
Nickel	210	1.8	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Potassium	690	370	63	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Selenium	ND	9.2	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Sodium	270	370	180	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 12:57	OP
Thallium	ND	9.2	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Vanadium	26	3.7	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP
Zinc	43	3.7	0.95	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 12:57	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD704-3-3.5-1 Sampled: 3/28/2013 16:20

Sample ID: 13C0950-62

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	26.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-0-0.5 Sampled: 3/27/2013 12:35

Sample ID: 13C0950-63

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6400	11	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Antimony	ND	11	9.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Barium	170	11	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Beryllium	ND	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Cadmium	0.79	1.1	0.68	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 13:02	OP
Calcium	13000	34	6.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Chromium	48	2.3	0.57	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Cobalt	11	11	0.73	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 13:02	OP
Copper	69	2.3	1.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Iron	13000	11	9.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Lead	24	3.4	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Magnesium	5100	34	3.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Manganese	390	2.3	0.73	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Mercury	0.079	0.12	0.037	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:51	SAJ
Nickel	77	2.3	0.56	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Potassium	1100	460	79	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Selenium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Sodium	390	460	220	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 13:02	OP
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Vanadium	26	4.6	0.76	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP
Zinc	64	4.6	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:02	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-0-0.5 Sampled: 3/27/2013 12:35

Sample ID: 13C0950-63

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	20.0		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-1-1.5 Sampled: 3/27/2013 12:40

Sample ID: 13C0950-64

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	9.3	4.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Antimony	ND	9.3	7.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Arsenic	ND	9.3	3.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Barium	300	9.3	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Beryllium	ND	0.93	0.15	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Cadmium	1.5	0.93	0.55	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Calcium	11000	28	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Chromium	210	1.9	0.47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Cobalt	48	9.3	0.60	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Copper	140	1.9	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Iron	33000	9.3	8.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Lead	45	2.8	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Magnesium	15000	28	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Manganese	260	1.9	0.59	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Mercury	0.12	0.094	0.028	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:53	SAJ
Nickel	230	1.9	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Potassium	680	370	64	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Selenium	ND	9.3	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Silver	ND	1.9	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Sodium	390	370	180	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Thallium	ND	9.3	3.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Vanadium	68	3.7	0.61	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP
Zinc	93	3.7	0.96	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 13:08	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-1-1.5 Sampled: 3/27/2013 12:40

Sample ID: 13C0950-64

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	26.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-2-2.5 Sampled: 3/27/2013 12:45

Sample ID: 13C0950-65

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	8.2	3.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Antimony	7.2	8.2	6.6	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/2/13 14:11	OP
Arsenic	ND	8.2	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Barium	310	8.2	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Beryllium	ND	0.82	0.13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Cadmium	1.7	0.82	0.49	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Calcium	9100	25	4.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Chromium	250	1.6	0.41	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Cobalt	52	8.2	0.53	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Copper	91	1.6	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Iron	44000	8.2	7.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Lead	73	2.5	1.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Magnesium	10000	25	2.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Manganese	360	1.6	0.52	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Mercury	0.12	0.088	0.026	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:54	SAJ
Nickel	210	1.6	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Potassium	560	330	56	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Selenium	ND	8.2	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 16:58	OP
Sodium	280	330	160	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 16:58	OP
Thallium	ND	8.2	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Vanadium	71	3.3	0.54	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP
Zinc	110	3.3	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:11	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-2-2.5 Sampled: 3/27/2013 12:45

Sample ID: 13C0950-65

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	28.5		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-3-3.5 Sampled: 3/27/2013 12:50

Sample ID: 13C0950-66

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	24000	6.8	2.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Antimony	6.9	6.8	5.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Arsenic	ND	6.8	2.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Barium	300	6.8	0.85	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Beryllium	ND	3.4	0.55	mg/Kg dry	5	DL-04	SW-846 6010C	3/29/13	4/2/13 15:06	OP
Cadmium	1.9	0.68	0.40	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Calcium	7100	20	3.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Chromium	400	1.4	0.34	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Cobalt	150	6.8	0.44	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Copper	210	1.4	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Iron	73000	34	29	mg/Kg dry	5		SW-846 6010C	3/29/13	4/2/13 15:06	OP
Lead	89	2.0	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Magnesium	28000	20	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Manganese	440	1.4	0.43	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Mercury	0.045	0.071	0.021	mg/Kg dry	1	J	SW-846 7471B	3/29/13	4/1/13 14:56	SAJ
Nickel	470	1.4	0.33	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Potassium	1700	270	47	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Selenium	ND	6.8	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Sodium	370	270	130	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:47	OP
Thallium	ND	6.8	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Vanadium	89	2.7	0.45	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP
Zinc	180	2.7	0.70	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:17	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD717-3-3.5 Sampled: 3/27/2013 12:50

Sample ID: 13C0950-66

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	35.3		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-2-2.5 Sampled: 3/27/2013 12:55

Sample ID: 13C0950-67

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6000	15	6.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Arsenic	ND	15	5.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Barium	120	15	1.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Beryllium	ND	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Cadmium	1.0	1.5	0.90	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:53	OP
Calcium	5700	46	8.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Chromium	38	3.1	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Cobalt	13	15	0.98	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:53	OP
Copper	120	3.1	2.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Iron	11000	15	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Lead	5.0	4.6	2.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Magnesium	4500	46	4.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Manganese	97	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Mercury	ND	0.16	0.046	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 14:57	SAJ
Nickel	150	3.1	0.74	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Potassium	650	610	110	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Sodium	ND	610	300	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:53	OP
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Vanadium	14	6.1	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP
Zinc	67	6.1	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:22	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-2-2.5 Sampled: 3/27/2013 12:55

Sample ID: 13C0950-67

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.6		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-3-3.5 Sampled: 3/27/2013 13:00

Sample ID: 13C0950-68

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	16	6.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Arsenic	ND	16	5.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Barium	120	16	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Beryllium	ND	1.6	0.26	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Cadmium	ND	1.6	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Calcium	5600	48	8.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Chromium	50	3.2	0.80	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Cobalt	5.4	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:14	OP
Copper	38	3.2	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Iron	17000	16	14	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Lead	5.6	4.8	2.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Magnesium	4800	48	5.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Manganese	96	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Mercury	ND	0.16	0.048	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 15:03	SAJ
Nickel	69	3.2	0.77	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Potassium	650	640	110	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Selenium	ND	16	4.9	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Sodium	ND	640	310	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:14	OP
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Vanadium	16	6.4	1.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP
Zinc	63	6.4	1.6	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:28	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-3-3.5 Sampled: 3/27/2013 13:00

Sample ID: 13C0950-68

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	15.2		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-4-4.5 Sampled: 3/27/2013 13:05

Sample ID: 13C0950-69

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	20	8.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Antimony	ND	20	16	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Arsenic	ND	20	7.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Barium	130	20	2.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Beryllium	ND	2.0	0.31	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Cadmium	1.2	2.0	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:20	OP
Calcium	6300	59	11	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Chromium	36	3.9	0.98	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Cobalt	16	20	1.2	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:20	OP
Copper	110	3.9	3.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Iron	19000	20	17	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Lead	6.5	5.9	2.7	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Magnesium	4400	59	6.1	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Manganese	100	3.9	1.2	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Mercury	ND	0.20	0.058	mg/Kg dry	1		SW-846 7471B	3/29/13	4/1/13 15:05	SAJ
Nickel	270	3.9	0.94	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Potassium	640	780	130	mg/Kg dry	1	J	SW-846 6010C	3/29/13	4/1/13 17:20	OP
Selenium	ND	20	6.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Silver	ND	3.9	3.4	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Sodium	ND	780	380	mg/Kg dry	1		SW-846 6010C	3/29/13	4/1/13 17:20	OP
Thallium	ND	20	6.5	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Vanadium	19	7.8	1.3	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP
Zinc	66	7.8	2.0	mg/Kg dry	1		SW-846 6010C	3/29/13	4/2/13 14:53	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals (Cordon Land Man Sample Description: Work Order: 13C0950

Date Received: 3/29/2013

Field Sample #: BRSD718-4-4.5 Sampled: 3/27/2013 13:05

Sample ID: 13C0950-69

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	12.4		% Wt	1		SM 2540G	4/2/13	4/3/13 18:26	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13C0950-01 [BRSD715-2-2.5]	B070216	04/02/13
13C0950-02 [BRSD715-3-3.5]	B070216	04/02/13
13C0950-03 [BRSD715-4-4.5]	B070216	04/02/13
13C0950-04 [BRSD714-0-0.5]	B070216	04/02/13
13C0950-05 [BRSD714-1-1.5]	B070216	04/02/13
13C0950-06 [BRSD714-2-2.5]	B070216	04/02/13
13C0950-07 [BRSD714-3-3.5]	B070216	04/02/13
13C0950-08 [PASD614-0-0.5]	B070216	04/02/13
13C0950-09 [PASD614-1-1.5]	B070216	04/02/13
13C0950-10 [PASD614-2-2.5]	B070216	04/02/13
13C0950-11 [PASD614-3-3.5]	B070216	04/02/13
13C0950-12 [BRSD712-2-2.5]	B070216	04/02/13
13C0950-13 [BRSD712-3-3.5]	B070216	04/02/13
13C0950-14 [BRSD712-4-4.5]	B070216	04/02/13
13C0950-15 [BRSD711-0-0.5]	B070216	04/02/13
13C0950-16 [BRSD711-1-1.5]	B070216	04/02/13
13C0950-17 [BRSD711-2-2.5]	B070216	04/02/13
13C0950-18 [BRSD711-3-3.5]	B070216	04/02/13
13C0950-19 [PASD608-0-0.5]	B070216	04/02/13
13C0950-20 [PASD608-1-1.5]	B070216	04/02/13
13C0950-21 [PASD608-2-2.5]	B070216	04/02/13
13C0950-22 [PASD608-3-3.5]	B070216	04/02/13
13C0950-23 [PASD618-2-2.5]	B070216	04/02/13
13C0950-24 [PASD618-3-3.5]	B070216	04/02/13
13C0950-25 [PASD618-4-4.5]	B070216	04/02/13
13C0950-26 [PASD618-2-2.5-1]	B070216	04/02/13
13C0950-27 [PASD616-0-0.5]	B070216	04/02/13
13C0950-28 [PASD616-1-1.5]	B070216	04/02/13
13C0950-29 [PASD616-2-2.5]	B070216	04/02/13
13C0950-30 [PASD616-3-3.5]	B070216	04/02/13
13C0950-31 [PASD610-0-0.5]	B070216	04/02/13
13C0950-32 [PASD610-1-1.5]	B070216	04/02/13
13C0950-33 [PASD610-2-2.5]	B070216	04/02/13
13C0950-34 [PASD610-3-3.5]	B070216	04/02/13
13C0950-35 [PASD613-0-0.5]	B070216	04/02/13
13C0950-36 [PASD613-1-1.5]	B070216	04/02/13
13C0950-37 [PASD613-2-2.5]	B070216	04/02/13
13C0950-38 [PASD613-3-3.5]	B070216	04/02/13
13C0950-39 [BRSD709-1-1.5]	B070216	04/02/13
13C0950-40 [BRSD708-0-0.5]	B070216	04/02/13
13C0950-41 [BRSD708-1-1.5]	B070216	04/02/13
13C0950-42 [BRSD708-2-2.5]	B070216	04/02/13
13C0950-43 [BRSD708-0-0.5-1]	B070216	04/02/13
13C0950-44 [BRSD707-1-1.5]	B070216	04/02/13
13C0950-45 [BRSD707-2-2.5]	B070216	04/02/13
13C0950-46 [BRSD707-2-2.5-1]	B070216	04/02/13
13C0950-47 [BRSD705-2-2.5]	B070216	04/02/13
13C0950-48 [BRSD705-3-3.5]	B070216	04/02/13
13C0950-49 [BRSD705-4-4.5]	B070216	04/02/13
13C0950-50 [BRSD706-0-0.5]	B070216	04/02/13
13C0950-51 [BRSD706-1-1.5]	B070216	04/02/13
13C0950-52 [BRSD706-2-2.5]	B070216	04/02/13
13C0950-53 [BRSD706-3-3.5]	B070216	04/02/13
13C0950-54 [BRSD706-3-3.5-1]	B070216	04/02/13
13C0950-55 [BRSD703-2-2.5]	B070216	04/02/13

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13C0950-56 [BRSD703-3-3.5]	B070216	04/02/13
13C0950-57 [BRSD703-4-4.5]	B070216	04/02/13
13C0950-58 [BRSD704-0-0.5]	B070216	04/02/13
13C0950-59 [BRSD704-1-1.5]	B070216	04/02/13
13C0950-60 [BRSD704-2-2.5]	B070216	04/02/13
13C0950-61 [BRSD704-3-3.5]	B070216	04/02/13
13C0950-62 [BRSD704-3-3.5-1]	B070216	04/02/13
13C0950-63 [BRSD717-0-0.5]	B070216	04/02/13
13C0950-64 [BRSD717-1-1.5]	B070216	04/02/13
13C0950-65 [BRSD717-2-2.5]	B070216	04/02/13
13C0950-66 [BRSD717-3-3.5]	B070216	04/02/13
13C0950-67 [BRSD718-2-2.5]	B070216	04/02/13
13C0950-68 [BRSD718-3-3.5]	B070216	04/02/13
13C0950-69 [BRSD718-4-4.5]	B070216	04/02/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-01 [BRSD715-2-2.5]	B070031	1.00	50.0	03/29/13
13C0950-02 [BRSD715-3-3.5]	B070031	1.08	50.0	03/29/13
13C0950-03 [BRSD715-4-4.5]	B070031	1.04	50.0	03/29/13
13C0950-04 [BRSD714-0-0.5]	B070031	1.02	50.0	03/29/13
13C0950-05 [BRSD714-1-1.5]	B070031	1.08	50.0	03/29/13
13C0950-06 [BRSD714-2-2.5]	B070031	1.08	50.0	03/29/13
13C0950-07 [BRSD714-3-3.5]	B070031	1.08	50.0	03/29/13
13C0950-08 [PASD614-0-0.5]	B070031	1.05	50.0	03/29/13
13C0950-09 [PASD614-1-1.5]	B070031	1.07	50.0	03/29/13
13C0950-10 [PASD614-2-2.5]	B070031	1.06	50.0	03/29/13
13C0950-11 [PASD614-3-3.5]	B070031	1.06	50.0	03/29/13
13C0950-12 [BRSD712-2-2.5]	B070031	1.05	50.0	03/29/13
13C0950-13 [BRSD712-3-3.5]	B070031	1.01	50.0	03/29/13
13C0950-14 [BRSD712-4-4.5]	B070031	1.04	50.0	03/29/13
13C0950-15 [BRSD711-0-0.5]	B070031	1.06	50.0	03/29/13
13C0950-16 [BRSD711-1-1.5]	B070031	1.06	50.0	03/29/13
13C0950-17 [BRSD711-2-2.5]	B070031	1.02	50.0	03/29/13
13C0950-18 [BRSD711-3-3.5]	B070031	1.07	50.0	03/29/13
13C0950-19 [PASD608-0-0.5]	B070031	1.03	50.0	03/29/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-20 [PASD608-1-1.5]	B070039	1.07	50.0	03/29/13
13C0950-21 [PASD608-2-2.5]	B070039	1.03	50.0	03/29/13
13C0950-22 [PASD608-3-3.5]	B070039	1.05	50.0	03/29/13
13C0950-23 [PASD618-2-2.5]	B070039	1.03	50.0	03/29/13
13C0950-24 [PASD618-3-3.5]	B070039	1.01	50.0	03/29/13
13C0950-25 [PASD618-4-4.5]	B070039	1.01	50.0	03/29/13
13C0950-26 [PASD618-2-2.5-1]	B070039	1.08	50.0	03/29/13
13C0950-27 [PASD616-0-0.5]	B070039	1.04	50.0	03/29/13
13C0950-28 [PASD616-1-1.5]	B070039	1.03	50.0	03/29/13
13C0950-29 [PASD616-2-2.5]	B070039	1.00	50.0	03/29/13
13C0950-30 [PASD616-3-3.5]	B070039	1.00	50.0	03/29/13
13C0950-31 [PASD610-0-0.5]	B070039	1.08	50.0	03/29/13

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-32 [PASD610-1-1.5]	B070039	1.06	50.0	03/29/13
13C0950-33 [PASD610-2-2.5]	B070039	1.06	50.0	03/29/13
13C0950-34 [PASD610-3-3.5]	B070039	1.02	50.0	03/29/13
13C0950-35 [PASD613-0-0.5]	B070039	1.01	50.0	03/29/13
13C0950-36 [PASD613-1-1.5]	B070039	1.00	50.0	03/29/13
13C0950-37 [PASD613-2-2.5]	B070039	1.07	50.0	03/29/13
13C0950-38 [PASD613-3-3.5]	B070039	1.01	50.0	03/29/13
13C0950-39 [BRSD709-1-1.5]	B070039	1.04	50.0	03/29/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-40 [BRSD708-0-0.5]	B070042	1.05	50.0	03/29/13
13C0950-41 [BRSD708-1-1.5]	B070042	1.05	50.0	03/29/13
13C0950-42 [BRSD708-2-2.5]	B070042	1.06	50.0	03/29/13
13C0950-43 [BRSD708-0-0.5-1]	B070042	1.07	50.0	03/29/13
13C0950-44 [BRSD707-1-1.5]	B070042	1.01	50.0	03/29/13
13C0950-45 [BRSD707-2-2.5]	B070042	1.07	50.0	03/29/13
13C0950-46 [BRSD707-2-2.5-1]	B070042	1.00	50.0	03/29/13
13C0950-47 [BRSD705-2-2.5]	B070042	1.03	50.0	03/29/13
13C0950-48 [BRSD705-3-3.5]	B070042	1.04	50.0	03/29/13
13C0950-49 [BRSD705-4-4.5]	B070042	1.03	50.0	03/29/13
13C0950-50 [BRSD706-0-0.5]	B070042	1.06	50.0	03/29/13
13C0950-51 [BRSD706-1-1.5]	B070042	1.02	50.0	03/29/13
13C0950-52 [BRSD706-2-2.5]	B070042	1.01	50.0	03/29/13
13C0950-53 [BRSD706-3-3.5]	B070042	1.01	50.0	03/29/13
13C0950-54 [BRSD706-3-3.5-1]	B070042	1.07	50.0	03/29/13
13C0950-55 [BRSD703-2-2.5]	B070042	1.08	50.0	03/29/13
13C0950-56 [BRSD703-3-3.5]	B070042	1.06	50.0	03/29/13
13C0950-57 [BRSD703-4-4.5]	B070042	1.04	50.0	03/29/13
13C0950-58 [BRSD704-0-0.5]	B070042	1.02	50.0	03/29/13
13C0950-59 [BRSD704-1-1.5]	B070042	1.02	50.0	03/29/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-60 [BRSD704-2-2.5]	B070044	1.01	50.0	03/29/13
13C0950-61 [BRSD704-3-3.5]	B070044	1.07	50.0	03/29/13
13C0950-62 [BRSD704-3-3.5-1]	B070044	1.03	50.0	03/29/13
13C0950-63 [BRSD717-0-0.5]	B070044	1.09	50.0	03/29/13
13C0950-64 [BRSD717-1-1.5]	B070044	1.02	50.0	03/29/13
13C0950-65 [BRSD717-2-2.5]	B070044	1.07	50.0	03/29/13
13C0950-66 [BRSD717-3-3.5]	B070044	1.04	50.0	03/29/13
13C0950-67 [BRSD718-2-2.5]	B070044	1.05	50.0	03/29/13
13C0950-68 [BRSD718-3-3.5]	B070044	1.03	50.0	03/29/13
13C0950-69 [BRSD718-4-4.5]	B070044	1.03	50.0	03/29/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-50 [BRSD706-0-0.5]	B070058	0.603	50.0	03/29/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-51 [BRSD706-1-1.5]	B070058	0.602	50.0	03/29/13
13C0950-52 [BRSD706-2-2.5]	B070058	0.613	50.0	03/29/13
13C0950-53 [BRSD706-3-3.5]	B070058	0.610	50.0	03/29/13
13C0950-54 [BRSD706-3-3.5-1]	B070058	0.610	50.0	03/29/13
13C0950-55 [BRSD703-2-2.5]	B070058	0.612	50.0	03/29/13
13C0950-56 [BRSD703-3-3.5]	B070058	0.600	50.0	03/29/13
13C0950-58 [BRSD704-0-0.5]	B070058	0.617	50.0	03/29/13
13C0950-59 [BRSD704-1-1.5]	B070058	0.601	50.0	03/29/13
13C0950-60 [BRSD704-2-2.5]	B070058	0.604	50.0	03/29/13
13C0950-61 [BRSD704-3-3.5]	B070058	0.610	50.0	03/29/13
13C0950-62 [BRSD704-3-3.5-1]	B070058	0.609	50.0	03/29/13
13C0950-63 [BRSD717-0-0.5]	B070058	0.605	50.0	03/29/13
13C0950-64 [BRSD717-1-1.5]	B070058	0.604	50.0	03/29/13
13C0950-65 [BRSD717-2-2.5]	B070058	0.601	50.0	03/29/13
13C0950-66 [BRSD717-3-3.5]	B070058	0.602	50.0	03/29/13
13C0950-67 [BRSD718-2-2.5]	B070058	0.612	50.0	03/29/13
13C0950-68 [BRSD718-3-3.5]	B070058	0.615	50.0	03/29/13
13C0950-69 [BRSD718-4-4.5]	B070058	0.615	50.0	03/29/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-30 [PASD616-3-3.5]	B070066	0.612	50.0	03/30/13
13C0950-31 [PASD610-0-0.5]	B070066	0.611	50.0	03/30/13
13C0950-33 [PASD610-2-2.5]	B070066	0.604	50.0	03/30/13
13C0950-34 [PASD610-3-3.5]	B070066	0.614	50.0	03/30/13
13C0950-35 [PASD613-0-0.5]	B070066	0.614	50.0	03/30/13
13C0950-36 [PASD613-1-1.5]	B070066	0.607	50.0	03/30/13
13C0950-37 [PASD613-2-2.5]	B070066	0.607	50.0	03/30/13
13C0950-38 [PASD613-3-3.5]	B070066	0.612	50.0	03/30/13
13C0950-39 [BRSD709-1-1.5]	B070066	0.611	50.0	03/30/13
13C0950-40 [BRSD708-0-0.5]	B070066	0.601	50.0	03/30/13
13C0950-41 [BRSD708-1-1.5]	B070066	0.605	50.0	03/30/13
13C0950-42 [BRSD708-2-2.5]	B070066	0.613	50.0	03/30/13
13C0950-43 [BRSD708-0-0.5-1]	B070066	0.612	50.0	03/30/13
13C0950-44 [BRSD707-1-1.5]	B070066	0.614	50.0	03/30/13
13C0950-45 [BRSD707-2-2.5]	B070066	0.604	50.0	03/30/13
13C0950-46 [BRSD707-2-2.5-1]	B070066	0.618	50.0	03/30/13
13C0950-47 [BRSD705-2-2.5]	B070066	0.609	50.0	03/30/13
13C0950-48 [BRSD705-3-3.5]	B070066	0.606	50.0	03/30/13
13C0950-49 [BRSD705-4-4.5]	B070066	0.618	50.0	03/30/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-01 [BRSD715-2-2.5]	B070093	0.600	50.0	04/01/13
13C0950-02 [BRSD715-3-3.5]	B070093	0.606	50.0	04/01/13
13C0950-03 [BRSD715-4-4.5]	B070093	0.609	50.0	04/01/13
13C0950-04 [BRSD714-0-0.5]	B070093	0.618	50.0	04/01/13
13C0950-05 [BRSD714-1-1.5]	B070093	0.610	50.0	04/01/13
13C0950-06 [BRSD714-2-2.5]	B070093	0.615	50.0	04/01/13
13C0950-07 [BRSD714-3-3.5]	B070093	0.609	50.0	04/01/13
13C0950-08 [PASD614-0-0.5]	B070093	0.612	50.0	04/01/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-09 [PASD614-1-1.5]	B070093	0.608	50.0	04/01/13
13C0950-10 [PASD614-2-2.5]	B070093	0.615	50.0	04/01/13
13C0950-11 [PASD614-3-3.5]	B070093	0.613	50.0	04/01/13
13C0950-12 [BRSD712-2-2.5]	B070093	0.603	50.0	04/01/13
13C0950-13 [BRSD712-3-3.5]	B070093	0.607	50.0	04/01/13
13C0950-14 [BRSD712-4-4.5]	B070093	0.611	50.0	04/01/13
13C0950-15 [BRSD711-0-0.5]	B070093	0.610	50.0	04/01/13
13C0950-16 [BRSD711-1-1.5]	B070093	0.620	50.0	04/01/13
13C0950-17 [BRSD711-2-2.5]	B070093	0.619	50.0	04/01/13
13C0950-18 [BRSD711-3-3.5]	B070093	0.606	50.0	04/01/13
13C0950-19 [PASD608-0-0.5]	B070093	0.610	50.0	04/01/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-21 [PASD608-2-2.5]	B070103	0.619	50.0	04/01/13
13C0950-22 [PASD608-3-3.5]	B070103	0.610	50.0	04/01/13
13C0950-23 [PASD618-2-2.5]	B070103	0.612	50.0	04/01/13
13C0950-24 [PASD618-3-3.5]	B070103	0.611	50.0	04/01/13
13C0950-25 [PASD618-4-4.5]	B070103	0.619	50.0	04/01/13
13C0950-26 [PASD618-2-2.5-1]	B070103	0.610	50.0	04/01/13
13C0950-27 [PASD616-0-0.5]	B070103	0.605	50.0	04/01/13
13C0950-28 [PASD616-1-1.5]	B070103	0.612	50.0	04/01/13
13C0950-29 [PASD616-2-2.5]	B070103	0.606	50.0	04/01/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-32RE1 [PASD610-1-1.5]	B070195	0.609	50.0	04/02/13
13C0950-57RE1 [BRSD703-4-4.5]	B070195	0.600	50.0	04/02/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13C0950-20RE1 [PASD608-1-1.5]	B070235	0.617	50.0	04/02/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070031 - SW-846 3050B										
Blank (B070031-BLK1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	1.7	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.95	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B070031-BS1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7690	5.0	mg/Kg wet	8360		92.0	40.4-159.1			
Antimony	67.1	5.0	mg/Kg wet	92.9		72.2	8.2-191.6			
Arsenic	95.6	5.0	mg/Kg wet	94.5		101	82.2-117.5			
Barium	173	5.0	mg/Kg wet	166		104	83.1-116.3			
Beryllium	53.0	0.50	mg/Kg wet	52.6		101	83.8-116.2			
Cadmium	55.7	0.50	mg/Kg wet	59.9		93.0	84-115.9			
Calcium	6070	15	mg/Kg wet	6160		98.5	82.3-117.5			
Chromium	70.1	0.99	mg/Kg wet	69.3		101	81.4-118.6			
Cobalt	99.9	5.0	mg/Kg wet	101		99.0	83.8-115.8			
Copper	77.8	0.99	mg/Kg wet	78.0		99.7	83.7-116.2			
Iron	11300	5.0	mg/Kg wet	12800		88.2	50.6-149.2			
Lead	90.8	1.5	mg/Kg wet	91.7		99.0	82.4-117.8			
Magnesium	3030	15	mg/Kg wet	3030		100	76.2-123.8			
Manganese	261	0.99	mg/Kg wet	283		92.3	81.6-118			
Nickel	58.1	0.99	mg/Kg wet	56.6		103	82.2-117.8			
Potassium	3870	200	mg/Kg wet	3820		101	73.6-126.4			
Selenium	161	5.0	mg/Kg wet	159		101	79.2-120.8			
Silver	30.7	0.99	mg/Kg wet	33.9		90.5	66.4-133.9			
Sodium	647	200	mg/Kg wet	652		99.2	73.6-126.2			
Thallium	104	5.0	mg/Kg wet	119		87.7	81.1-119.3			
Vanadium	58.3	2.0	mg/Kg wet	56.3		104	72.8-127.2			
Zinc	137	2.0	mg/Kg wet	137		100	81-119			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070031 - SW-846 3050B										
LCS Dup (B070031-BSD1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7610	5.0	mg/Kg wet	8360		91.0	40.4-159.1	1.08	30	
Antimony	65.6	5.0	mg/Kg wet	92.9		70.6	8.2-191.6	2.20	30	
Arsenic	94.6	5.0	mg/Kg wet	94.5		100	82.2-117.5	1.00	30	
Barium	166	5.0	mg/Kg wet	166		100	83.1-116.3	3.85	30	
Beryllium	53.3	0.50	mg/Kg wet	52.6		101	83.8-116.2	0.700	30	
Cadmium	56.4	0.50	mg/Kg wet	59.9		94.2	84-115.9	1.25	30	
Calcium	6190	15	mg/Kg wet	6160		100	82.3-117.5	1.92	30	
Chromium	71.1	0.99	mg/Kg wet	69.3		103	81.4-118.6	1.42	30	
Cobalt	100	5.0	mg/Kg wet	101		99.2	83.8-115.8	0.266	30	
Copper	78.5	0.99	mg/Kg wet	78.0		101	83.7-116.2	0.946	30	
Iron	11500	5.0	mg/Kg wet	12800		89.8	50.6-149.2	1.76	30	
Lead	89.8	1.5	mg/Kg wet	91.7		97.9	82.4-117.8	1.13	30	
Magnesium	3020	15	mg/Kg wet	3030		99.8	76.2-123.8	0.337	30	
Manganese	262	0.99	mg/Kg wet	283		92.4	81.6-118	0.0762	30	
Nickel	58.4	0.99	mg/Kg wet	56.6		103	82.2-117.8	0.460	30	
Potassium	3850	200	mg/Kg wet	3820		101	73.6-126.4	0.383	30	
Selenium	160	5.0	mg/Kg wet	159		101	79.2-120.8	0.523	30	
Silver	31.0	0.99	mg/Kg wet	33.9		91.5	66.4-133.9	1.05	30	
Sodium	651	200	mg/Kg wet	652		99.8	73.6-126.2	0.618	30	
Thallium	105	5.0	mg/Kg wet	119		87.8	81.1-119.3	0.0879	30	
Vanadium	59.3	2.0	mg/Kg wet	56.3		105	72.8-127.2	1.81	30	
Zinc	137	2.0	mg/Kg wet	137		100	81-119	0.0779	30	
Duplicate (B070031-DUP1)		**Source: 13C0950-16**		Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7150	9.3	mg/Kg dry		7590			6.01	35	
Antimony	ND	9.3	mg/Kg dry		ND			NC	35	
Arsenic	3.41	9.3	mg/Kg dry		4.44			26.4	35	J
Barium	183	9.3	mg/Kg dry		191			4.31	35	
Beryllium	ND	0.93	mg/Kg dry		ND			NC	35	
Cadmium	0.709	0.93	mg/Kg dry		0.740			4.25	35	J
Calcium	8730	28	mg/Kg dry		9120			4.44	35	
Chromium	53.3	1.9	mg/Kg dry		60.0			11.9	35	
Cobalt	11.4	9.3	mg/Kg dry		12.0			5.03	35	
Copper	137	1.9	mg/Kg dry		142			3.03	35	
Iron	14900	9.3	mg/Kg dry		15200			2.08	35	
Lead	14.9	2.8	mg/Kg dry		15.3			2.17	35	
Magnesium	4200	28	mg/Kg dry		4490			6.84	35	
Manganese	89.1	1.9	mg/Kg dry		94.0			5.37	35	
Nickel	138	1.9	mg/Kg dry		144			3.90	35	
Potassium	642	370	mg/Kg dry		640			0.439	35	
Selenium	ND	9.3	mg/Kg dry		ND			NC	35	
Silver	ND	1.9	mg/Kg dry		ND			NC	35	
Sodium	341	370	mg/Kg dry		382			11.4	35	J
Thallium	ND	9.3	mg/Kg dry		ND			NC	35	
Vanadium	29.8	3.7	mg/Kg dry		32.3			7.89	35	
Zinc	49.5	3.7	mg/Kg dry		50.4			1.91	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B070031 - SW-846 3050B											
MRL Check (B070031-MRL1)				Prepared: 03/29/13 Analyzed: 04/03/13							
Lead	0.839	0.71	mg/Kg wet	0.710		118		80-120			
Matrix Spike (B070031-MS1)		**Source: 13C0950-16**		Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	8470	9.6	mg/Kg dry	382	7590	**231**	*	75-125			MS-19
Antimony	304	9.6	mg/Kg dry	382	ND	79.4		75-125			
Arsenic	396	9.6	mg/Kg dry	382	4.44	102		75-125			
Barium	583	9.6	mg/Kg dry	382	191	103		75-125			
Beryllium	381	0.96	mg/Kg dry	382	ND	99.7		75-125			
Cadmium	365	0.96	mg/Kg dry	382	0.740	95.2		75-125			
Calcium	9120	29	mg/Kg dry	382	9120	**-1.54**	*	75-125			MS-19
Chromium	465	1.9	mg/Kg dry	382	60.0	106		75-125			
Cobalt	402	9.6	mg/Kg dry	382	12.0	102		75-125			
Copper	545	1.9	mg/Kg dry	382	142	105		75-125			
Iron	14100	9.6	mg/Kg dry	382	15200	**-288**	*	75-125			MS-19
Lead	408	2.9	mg/Kg dry	382	15.3	103		75-125			
Magnesium	5120	29	mg/Kg dry	382	4490	**162**	*	75-125			MS-19
Manganese	456	1.9	mg/Kg dry	382	94.0	94.6		75-125			
Nickel	550	1.9	mg/Kg dry	382	144	106		75-125			
Potassium	4430	380	mg/Kg dry	3820	640	99.1		75-125			
Selenium	401	9.6	mg/Kg dry	382	ND	105		75-125			
Silver	354	1.9	mg/Kg dry	382	ND	92.6		75-125			
Sodium	727	380	mg/Kg dry	382	382	90.2		75-125			
Thallium	347	9.6	mg/Kg dry	382	ND	90.8		75-125			
Vanadium	438	3.8	mg/Kg dry	382	32.3	106		75-125			
Zinc	442	3.8	mg/Kg dry	382	50.4	102		75-125			
Batch B070039 - SW-846 3050B											
Blank (B070039-BLK1)				Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	3.6	2.5	mg/Kg wet								B-07
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	5.0	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	ND	0.75	mg/Kg wet								
Magnesium	2.3	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070039 - SW-846 3050B										
LCS (B070039-BS1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7200	5.0	mg/Kg wet	8360		86.2	40.4-159.1			
Antimony	69.6	5.0	mg/Kg wet	92.9		74.9	8.2-191.6			
Arsenic	90.0	5.0	mg/Kg wet	94.5		95.3	82.2-117.5			
Barium	161	5.0	mg/Kg wet	166		96.8	83.1-116.3			
Beryllium	52.2	0.50	mg/Kg wet	52.6		99.3	83.8-116.2			
Cadmium	59.3	0.50	mg/Kg wet	59.9		98.9	84-115.9			
Calcium	6090	15	mg/Kg wet	6160		98.8	82.3-117.5			
Chromium	66.8	0.99	mg/Kg wet	69.3		96.4	81.4-118.6			
Cobalt	96.8	5.0	mg/Kg wet	101		95.8	83.8-115.8			
Copper	78.1	0.99	mg/Kg wet	78.0		100	83.7-116.2			
Iron	11200	5.0	mg/Kg wet	12800		87.1	50.6-149.2			
Lead	83.4	1.5	mg/Kg wet	91.7		91.0	82.4-117.8			
Magnesium	2680	15	mg/Kg wet	3030		88.4	76.2-123.8			
Manganese	273	0.99	mg/Kg wet	283		96.6	81.6-118			
Nickel	55.1	0.99	mg/Kg wet	56.6		97.3	82.2-117.8			
Potassium	3560	200	mg/Kg wet	3820		93.2	73.6-126.4			
Selenium	155	5.0	mg/Kg wet	159		97.4	79.2-120.8			
Silver	30.2	0.99	mg/Kg wet	33.9		89.2	66.4-133.9			
Sodium	648	200	mg/Kg wet	652		99.4	73.6-126.2			
Thallium	112	5.0	mg/Kg wet	119		94.3	81.1-119.3			
Vanadium	56.4	2.0	mg/Kg wet	56.3		100	72.8-127.2			
Zinc	127	2.0	mg/Kg wet	137		93.0	81-119			
LCS Dup (B070039-BSD1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7160	5.0	mg/Kg wet	8360		85.7	40.4-159.1	0.536	30	
Antimony	70.6	5.0	mg/Kg wet	92.9		76.0	8.2-191.6	1.38	30	
Arsenic	91.4	5.0	mg/Kg wet	94.5		96.8	82.2-117.5	1.56	30	
Barium	171	5.0	mg/Kg wet	166		103	83.1-116.3	6.44	30	
Beryllium	51.1	0.50	mg/Kg wet	52.6		97.2	83.8-116.2	2.11	30	
Cadmium	57.8	0.50	mg/Kg wet	59.9		96.5	84-115.9	2.50	30	
Calcium	5930	15	mg/Kg wet	6160		96.3	82.3-117.5	2.54	30	
Chromium	66.6	1.0	mg/Kg wet	69.3		96.0	81.4-118.6	0.395	30	
Cobalt	96.6	5.0	mg/Kg wet	101		95.7	83.8-115.8	0.158	30	
Copper	77.8	1.0	mg/Kg wet	78.0		99.7	83.7-116.2	0.386	30	
Iron	11600	5.0	mg/Kg wet	12800		90.7	50.6-149.2	4.00	30	
Lead	86.2	1.5	mg/Kg wet	91.7		94.0	82.4-117.8	3.21	30	
Magnesium	2660	15	mg/Kg wet	3030		87.9	76.2-123.8	0.659	30	
Manganese	271	1.0	mg/Kg wet	283		95.8	81.6-118	0.840	30	
Nickel	54.1	1.0	mg/Kg wet	56.6		95.5	82.2-117.8	1.89	30	
Potassium	3560	200	mg/Kg wet	3820		93.2	73.6-126.4	0.0262	30	
Selenium	153	5.0	mg/Kg wet	159		96.2	79.2-120.8	1.15	30	
Silver	30.0	1.0	mg/Kg wet	33.9		88.4	66.4-133.9	0.906	30	
Sodium	635	200	mg/Kg wet	652		97.4	73.6-126.2	2.00	30	
Thallium	113	5.0	mg/Kg wet	119		95.3	81.1-119.3	0.995	30	
Vanadium	56.8	2.0	mg/Kg wet	56.3		101	72.8-127.2	0.619	30	
Zinc	134	2.0	mg/Kg wet	137		97.8	81-119	4.96	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B070039 - SW-846 3050B											
Duplicate (B070039-DUP1)		**Source: 13C0950-20**		Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	5330	9.1	mg/Kg dry		4950				7.26	35	B-07
Antimony	ND	9.1	mg/Kg dry		ND				NC	35	
Arsenic	5.09	9.1	mg/Kg dry		4.67				8.66	35	J
Barium	210	9.1	mg/Kg dry		201				4.14	35	
Beryllium	ND	0.91	mg/Kg dry		ND				NC	35	
Cadmium	1.12	0.91	mg/Kg dry		0.924				18.9	35	
Calcium	12900	27	mg/Kg dry		12000				7.19	35	
Chromium	54.4	1.8	mg/Kg dry		50.1				8.34	35	
Cobalt	9.98	9.1	mg/Kg dry		8.15				20.2	35	
Copper	108	1.8	mg/Kg dry		92.6				15.1	35	
Iron	9230	9.1	mg/Kg dry		8240				11.4	35	
Lead	18.7	2.7	mg/Kg dry		16.0				15.1	35	
Magnesium	3890	27	mg/Kg dry		3560				8.69	35	
Manganese	163	1.8	mg/Kg dry		166				2.00	35	
Nickel	103	1.8	mg/Kg dry		86.6				17.2	35	
Potassium	467	360	mg/Kg dry		446				4.65	35	
Selenium	ND	9.1	mg/Kg dry		ND				NC	35	
Silver	ND	1.8	mg/Kg dry		ND				NC	35	
Sodium	269	360	mg/Kg dry		252				6.67	35	J
Thallium	ND	9.1	mg/Kg dry		ND				NC	35	
Vanadium	30.1	3.6	mg/Kg dry		26.9				11.4	35	
Zinc	25.7	3.6	mg/Kg dry		23.5				9.22	35	
MRL Check (B070039-MRL1)				Prepared: 03/29/13 Analyzed: 04/02/13							
Lead	0.780	0.72	mg/Kg wet	0.722		108		80-120			
Matrix Spike (B070039-MS1)		**Source: 13C0950-20**		Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	6890	9.1	mg/Kg dry	365	4950	**530**	*	75-125			MS-19
Antimony	288	9.1	mg/Kg dry	365	ND	78.9		75-125			
Arsenic	358	9.1	mg/Kg dry	365	4.67	96.8		75-125			
Barium	571	9.1	mg/Kg dry	365	201	101		75-125			
Beryllium	366	0.91	mg/Kg dry	365	ND	100		75-125			
Cadmium	345	0.91	mg/Kg dry	365	0.924	94.3		75-125			
Calcium	14000	27	mg/Kg dry	365	12000	**526**	*	75-125			MS-19
Chromium	415	1.8	mg/Kg dry	365	50.1	99.9		75-125			
Cobalt	362	9.1	mg/Kg dry	365	8.15	97.0		75-125			
Copper	463	1.8	mg/Kg dry	365	92.6	101		75-125			
Iron	10300	9.1	mg/Kg dry	365	8240	**555**	*	75-125			MS-19
Lead	356	2.7	mg/Kg dry	365	16.0	93.0		75-125			
Magnesium	4780	27	mg/Kg dry	365	3560	**334**	*	75-125			MS-19
Manganese	545	1.8	mg/Kg dry	365	166	104		75-125			
Nickel	454	1.8	mg/Kg dry	365	86.6	101		75-125			
Potassium	4070	370	mg/Kg dry	3650	446	99.2		75-125			
Selenium	367	9.1	mg/Kg dry	365	ND	101		75-125			
Silver	324	1.8	mg/Kg dry	365	ND	88.8		75-125			
Sodium	659	370	mg/Kg dry	365	252	111		75-125			
Thallium	341	9.1	mg/Kg dry	365	ND	93.5		75-125			
Vanadium	399	3.7	mg/Kg dry	365	26.9	102		75-125			
Zinc	375	3.7	mg/Kg dry	365	23.5	96.4		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070042 - SW-846 3050B										
Blank (B070042-BLK1)				Prepared: 03/29/13 Analyzed: 04/02/13						
Aluminum	4.2	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	4.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	2.6	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	4.3	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B070042-BS1)				Prepared: 03/29/13 Analyzed: 04/02/13						
Aluminum	8170	5.0	mg/Kg wet	8360		97.7	40.4-159.1			
Antimony	79.1	5.0	mg/Kg wet	92.9		85.1	8.2-191.6			
Arsenic	98.0	5.0	mg/Kg wet	94.5		104	82.2-117.5			
Barium	173	5.0	mg/Kg wet	166		104	83.1-116.3			
Beryllium	57.2	0.50	mg/Kg wet	52.6		109	83.8-116.2			
Cadmium	62.2	0.50	mg/Kg wet	59.9		104	84-115.9			
Calcium	6190	15	mg/Kg wet	6160		100	82.3-117.5			
Chromium	72.4	1.0	mg/Kg wet	69.3		105	81.4-118.6			
Cobalt	105	5.0	mg/Kg wet	101		104	83.8-115.8			
Copper	83.5	1.0	mg/Kg wet	78.0		107	83.7-116.2			
Iron	12200	5.0	mg/Kg wet	12800		95.2	50.6-149.2			
Lead	90.1	1.5	mg/Kg wet	91.7		98.2	82.4-117.8			
Magnesium	3030	15	mg/Kg wet	3030		99.9	76.2-123.8			
Manganese	289	1.0	mg/Kg wet	283		102	81.6-118			
Nickel	57.8	1.0	mg/Kg wet	56.6		102	82.2-117.8			
Potassium	3960	200	mg/Kg wet	3820		104	73.6-126.4			
Selenium	166	5.0	mg/Kg wet	159		104	79.2-120.8			
Silver	32.2	1.0	mg/Kg wet	33.9		95.1	66.4-133.9			
Sodium	702	200	mg/Kg wet	652		108	73.6-126.2			
Thallium	121	5.0	mg/Kg wet	119		102	81.1-119.3			
Vanadium	60.8	2.0	mg/Kg wet	56.3		108	72.8-127.2			
Zinc	140	2.0	mg/Kg wet	137		102	81-119			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070042 - SW-846 3050B										
LCS Dup (B070042-BSD1)				Prepared: 03/29/13 Analyzed: 04/02/13						
Aluminum	8070	5.0	mg/Kg wet	8360		96.5	40.4-159.1	1.27	30	
Antimony	80.2	5.0	mg/Kg wet	92.9		86.3	8.2-191.6	1.35	30	
Arsenic	98.0	5.0	mg/Kg wet	94.5		104	82.2-117.5	0.0157	30	
Barium	175	5.0	mg/Kg wet	166		105	83.1-116.3	0.694	30	
Beryllium	56.8	0.50	mg/Kg wet	52.6		108	83.8-116.2	0.673	30	
Cadmium	64.1	0.50	mg/Kg wet	59.9		107	84-115.9	3.01	30	
Calcium	6240	15	mg/Kg wet	6160		101	82.3-117.5	0.852	30	
Chromium	72.0	1.0	mg/Kg wet	69.3		104	81.4-118.6	0.615	30	
Cobalt	105	5.0	mg/Kg wet	101		104	83.8-115.8	0.605	30	
Copper	84.5	1.0	mg/Kg wet	78.0		108	83.7-116.2	1.20	30	
Iron	12100	5.0	mg/Kg wet	12800		94.5	50.6-149.2	0.748	30	
Lead	90.7	1.5	mg/Kg wet	91.7		99.0	82.4-117.8	0.751	30	
Magnesium	2970	15	mg/Kg wet	3030		98.1	76.2-123.8	1.85	30	
Manganese	300	1.0	mg/Kg wet	283		106	81.6-118	3.68	30	
Nickel	58.9	1.0	mg/Kg wet	56.6		104	82.2-117.8	1.94	30	
Potassium	3930	200	mg/Kg wet	3820		103	73.6-126.4	0.650	30	
Selenium	170	5.0	mg/Kg wet	159		107	79.2-120.8	2.59	30	
Silver	33.2	1.0	mg/Kg wet	33.9		98.1	66.4-133.9	3.13	30	
Sodium	712	200	mg/Kg wet	652		109	73.6-126.2	1.47	30	
Thallium	121	5.0	mg/Kg wet	119		102	81.1-119.3	0.471	30	
Vanadium	60.5	2.0	mg/Kg wet	56.3		107	72.8-127.2	0.474	30	
Zinc	141	2.0	mg/Kg wet	137		103	81-119	0.412	30	
Duplicate (B070042-DUP1)		**Source: 13C0950-57**		Prepared: 03/29/13 Analyzed: 04/02/13						
Aluminum	8380	14	mg/Kg dry		8230			1.70	35	B-07
Antimony	ND	14	mg/Kg dry		ND			NC	35	
Arsenic	ND	14	mg/Kg dry		ND			NC	35	
Barium	156	14	mg/Kg dry		158			0.898	35	
Beryllium	ND	1.4	mg/Kg dry		ND			NC	35	
Cadmium	1.53	1.4	mg/Kg dry		1.26			19.1	35	
Calcium	6700	41	mg/Kg dry		6630			1.03	35	
Chromium	43.0	2.7	mg/Kg dry		42.3			1.67	35	
Cobalt	15.4	14	mg/Kg dry		15.0			2.83	35	
Copper	264	2.7	mg/Kg dry		265			0.294	35	
Iron	12700	14	mg/Kg dry		12800			0.172	35	B-07
Lead	8.58	4.1	mg/Kg dry		7.99			7.16	35	
Magnesium	4320	41	mg/Kg dry		4270			1.02	35	
Manganese	145	2.7	mg/Kg dry		141			2.90	35	
Nickel	231	2.7	mg/Kg dry		230			0.338	35	
Potassium	942	550	mg/Kg dry		914			3.06	35	
Selenium	ND	14	mg/Kg dry		ND			NC	35	
Silver	ND	2.7	mg/Kg dry		ND			NC	35	
Sodium	551	550	mg/Kg dry		545			1.03	35	
Thallium	ND	14	mg/Kg dry		ND			NC	35	
Vanadium	19.9	5.5	mg/Kg dry		20.3			2.10	35	
Zinc	80.7	5.5	mg/Kg dry		82.8			2.54	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B070042 - SW-846 3050B											
MRL Check (B070042-MRL1)				Prepared: 03/29/13 Analyzed: 04/02/13							
Lead	0.836	0.74	mg/Kg wet	0.735		114		80-120			
Matrix Spike (B070042-MS1)		**Source: 13C0950-57**		Prepared: 03/29/13 Analyzed: 04/02/13							
Aluminum	10500	13	mg/Kg dry	525	8230	**439**	*	75-125			MS-19
Antimony	395	13	mg/Kg dry	525	ND	75.1		75-125			
Arsenic	538	13	mg/Kg dry	525	ND	102		75-125			
Barium	710	13	mg/Kg dry	525	158	105		75-125			
Beryllium	564	1.3	mg/Kg dry	525	ND	107		75-125			
Cadmium	524	1.3	mg/Kg dry	525	1.26	99.5		75-125			
Calcium	7410	39	mg/Kg dry	525	6630	**149**	*	75-125			MS-19
Chromium	603	2.6	mg/Kg dry	525	42.3	107		75-125			
Cobalt	557	13	mg/Kg dry	525	15.0	103		75-125			
Copper	834	2.6	mg/Kg dry	525	265	108		75-125			
Iron	13800	13	mg/Kg dry	525	12800	**188**	*	75-125			MS-19
Lead	526	3.9	mg/Kg dry	525	7.99	98.6		75-125			
Magnesium	4960	39	mg/Kg dry	525	4270	**131**	*	75-125			MS-19
Manganese	688	2.6	mg/Kg dry	525	141	104		75-125			
Nickel	775	2.6	mg/Kg dry	525	230	104		75-125			
Potassium	6350	530	mg/Kg dry	5250	914	103		75-125			
Selenium	541	13	mg/Kg dry	525	ND	103		75-125			
Silver	495	2.6	mg/Kg dry	525	ND	94.3		75-125			
Sodium	1130	530	mg/Kg dry	525	545	110		75-125			
Thallium	521	13	mg/Kg dry	525	ND	99.2		75-125			
Vanadium	588	5.3	mg/Kg dry	525	20.3	108		75-125			
Zinc	627	5.3	mg/Kg dry	525	82.8	104		75-125			
Batch B070044 - SW-846 3050B											
Blank (B070044-BLK1)				Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	1.5	2.5	mg/Kg wet								J
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	ND	7.5	mg/Kg wet								
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	ND	0.75	mg/Kg wet								
Magnesium	0.78	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070044 - SW-846 3050B										
LCS (B070044-BS1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7460	5.0	mg/Kg wet	8360		89.2	40.4-159.1			
Antimony	77.3	5.0	mg/Kg wet	92.9		83.2	8.2-191.6			
Arsenic	93.1	5.0	mg/Kg wet	94.5		98.5	82.2-117.5			
Barium	163	5.0	mg/Kg wet	166		98.2	83.1-116.3			
Beryllium	54.0	0.50	mg/Kg wet	52.6		103	83.8-116.2			
Cadmium	58.5	0.50	mg/Kg wet	59.9		97.7	84-115.9			
Calcium	6590	15	mg/Kg wet	6160		107	82.3-117.5			
Chromium	67.3	0.99	mg/Kg wet	69.3		97.1	81.4-118.6			
Cobalt	98.3	5.0	mg/Kg wet	101		97.3	83.8-115.8			
Copper	78.3	0.99	mg/Kg wet	78.0		100	83.7-116.2			
Iron	11100	5.0	mg/Kg wet	12800		87.0	50.6-149.2			
Lead	85.9	1.5	mg/Kg wet	91.7		93.6	82.4-117.8			
Magnesium	3040	15	mg/Kg wet	3030		100	76.2-123.8			
Manganese	268	0.99	mg/Kg wet	283		94.7	81.6-118			
Nickel	54.1	0.99	mg/Kg wet	56.6		95.6	82.2-117.8			
Potassium	3900	200	mg/Kg wet	3820		102	73.6-126.4			
Selenium	157	5.0	mg/Kg wet	159		99.0	79.2-120.8			
Silver	31.5	0.99	mg/Kg wet	33.9		92.9	66.4-133.9			
Sodium	674	200	mg/Kg wet	652		103	73.6-126.2			
Thallium	116	5.0	mg/Kg wet	119		97.7	81.1-119.3			
Vanadium	57.5	2.0	mg/Kg wet	56.3		102	72.8-127.2			
Zinc	132	2.0	mg/Kg wet	137		96.0	81-119			
LCS Dup (B070044-BSD1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Aluminum	7150	5.0	mg/Kg wet	8360		85.5	40.4-159.1	4.18	30	
Antimony	80.9	5.0	mg/Kg wet	92.9		87.1	8.2-191.6	4.51	30	
Arsenic	90.0	5.0	mg/Kg wet	94.5		95.2	82.2-117.5	3.36	30	
Barium	157	5.0	mg/Kg wet	166		94.6	83.1-116.3	3.73	30	
Beryllium	53.7	0.50	mg/Kg wet	52.6		102	83.8-116.2	0.575	30	
Cadmium	58.3	0.50	mg/Kg wet	59.9		97.4	84-115.9	0.331	30	
Calcium	6080	15	mg/Kg wet	6160		98.7	82.3-117.5	8.06	30	
Chromium	65.4	1.0	mg/Kg wet	69.3		94.4	81.4-118.6	2.74	30	
Cobalt	96.0	5.0	mg/Kg wet	101		95.0	83.8-115.8	2.38	30	
Copper	76.9	1.0	mg/Kg wet	78.0		98.6	83.7-116.2	1.82	30	
Iron	10700	5.0	mg/Kg wet	12800		83.6	50.6-149.2	3.99	30	
Lead	82.3	1.5	mg/Kg wet	91.7		89.7	82.4-117.8	4.27	30	
Magnesium	2920	15	mg/Kg wet	3030		96.2	76.2-123.8	4.03	30	
Manganese	260	1.0	mg/Kg wet	283		91.7	81.6-118	3.24	30	
Nickel	54.1	1.0	mg/Kg wet	56.6		95.5	82.2-117.8	0.0783	30	
Potassium	3760	200	mg/Kg wet	3820		98.4	73.6-126.4	3.64	30	
Selenium	154	5.0	mg/Kg wet	159		97.0	79.2-120.8	2.08	30	
Silver	31.3	1.0	mg/Kg wet	33.9		92.2	66.4-133.9	0.799	30	
Sodium	663	200	mg/Kg wet	652		102	73.6-126.2	1.58	30	
Thallium	111	5.0	mg/Kg wet	119		93.2	81.1-119.3	4.72	30	
Vanadium	55.5	2.0	mg/Kg wet	56.3		98.5	72.8-127.2	3.62	30	
Zinc	131	2.0	mg/Kg wet	137		95.4	81-119	0.592	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B070044 - SW-846 3050B											
Duplicate (B070044-DUP1)		**Source: 13C0950-61**		Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	10300	11	mg/Kg dry		10900				5.20	35	
Antimony	ND	11	mg/Kg dry		ND				NC	35	
Arsenic	ND	11	mg/Kg dry		ND				NC	35	
Barium	178	11	mg/Kg dry		192				7.64	35	
Beryllium	ND	1.1	mg/Kg dry		ND				NC	35	
Cadmium	0.845	1.1	mg/Kg dry		0.860				1.79	35	J
Calcium	7310	32	mg/Kg dry		7870				7.37	35	
Chromium	42.4	2.1	mg/Kg dry		47.0				10.4	35	
Cobalt	15.5	11	mg/Kg dry		17.3				10.6	35	
Copper	157	2.1	mg/Kg dry		160				2.11	35	
Iron	10200	11	mg/Kg dry		10800				5.59	35	
Lead	5.72	3.2	mg/Kg dry		5.63				1.57	35	
Magnesium	5070	32	mg/Kg dry		5450				7.16	35	
Manganese	111	2.1	mg/Kg dry		113				1.80	35	
Nickel	203	2.1	mg/Kg dry		235				14.6	35	
Potassium	857	430	mg/Kg dry		908				5.75	35	
Selenium	ND	11	mg/Kg dry		ND				NC	35	
Silver	ND	2.1	mg/Kg dry		ND				NC	35	
Sodium	258	430	mg/Kg dry		276				6.63	35	J
Thallium	ND	11	mg/Kg dry		ND				NC	35	
Vanadium	26.9	4.3	mg/Kg dry		27.9				3.84	35	
Zinc	50.8	4.3	mg/Kg dry		49.2				3.34	35	
MRL Check (B070044-MRL1)				Prepared: 03/29/13 Analyzed: 04/01/13							
Lead	0.730	0.75	mg/Kg wet	0.749		97.4		80-120			J
Matrix Spike (B070044-MS1)		**Source: 13C0950-61**		Prepared: 03/29/13 Analyzed: 04/01/13							
Aluminum	12700	11	mg/Kg dry	446	10900	**415**	*	75-125			MS-19
Antimony	275	11	mg/Kg dry	446	ND	**61.6**	*	75-125			MS-07
Arsenic	433	11	mg/Kg dry	446	ND	97.0		75-125			
Barium	627	11	mg/Kg dry	446	192	97.4		75-125			
Beryllium	467	1.1	mg/Kg dry	446	ND	105		75-125			
Cadmium	425	1.1	mg/Kg dry	446	0.860	95.1		75-125			
Calcium	8250	33	mg/Kg dry	446	7870	86.5		75-125			
Chromium	498	2.2	mg/Kg dry	446	47.0	101		75-125			
Cobalt	454	11	mg/Kg dry	446	17.3	97.9		75-125			
Copper	623	2.2	mg/Kg dry	446	160	104		75-125			
Iron	11300	11	mg/Kg dry	446	10800	107		75-125			
Lead	424	3.3	mg/Kg dry	446	5.63	93.8		75-125			
Magnesium	5700	33	mg/Kg dry	446	5450	**55.7**	*	75-125			MS-19
Manganese	555	2.2	mg/Kg dry	446	113	99.0		75-125			
Nickel	642	2.2	mg/Kg dry	446	235	91.2		75-125			
Potassium	5540	450	mg/Kg dry	4460	908	104		75-125			
Selenium	440	11	mg/Kg dry	446	ND	98.6		75-125			
Silver	414	2.2	mg/Kg dry	446	ND	92.7		75-125			
Sodium	765	450	mg/Kg dry	446	276	110		75-125			
Thallium	426	11	mg/Kg dry	446	ND	95.4		75-125			
Vanadium	490	4.5	mg/Kg dry	446	27.9	104		75-125			
Zinc	487	4.5	mg/Kg dry	446	49.2	98.2		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070058 - SW-846 7471										
Blank (B070058-BLK1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070058-BS1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	4.61	0.33	mg/Kg wet	4.05		114	71.6-128.1			
LCS Dup (B070058-BSD1)				Prepared: 03/29/13 Analyzed: 04/01/13						
Mercury	4.09	0.33	mg/Kg wet	4.05		101	71.6-128.1	12.0	30	
Batch B070066 - SW-846 7471										
Blank (B070066-BLK1)				Prepared: 03/30/13 Analyzed: 04/01/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070066-BS1)				Prepared: 03/30/13 Analyzed: 04/01/13						
Mercury	4.32	0.33	mg/Kg wet	4.05		107	71.6-128.1			
LCS Dup (B070066-BSD1)				Prepared: 03/30/13 Analyzed: 04/01/13						
Mercury	4.00	0.33	mg/Kg wet	4.05		98.8	71.6-128.1	7.68	30	
Batch B070093 - SW-846 7471										
Blank (B070093-BLK1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070093-BS1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	3.94	0.33	mg/Kg wet	4.05		97.3	71.6-128.1			
LCS Dup (B070093-BSD1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	3.85	0.33	mg/Kg wet	4.05		95.0	71.6-128.1	2.32	30	
Batch B070103 - SW-846 7471										
Blank (B070103-BLK1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070103-BS1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	3.86	0.33	mg/Kg wet	4.05		95.4	71.6-128.1			
LCS Dup (B070103-BSD1)				Prepared: 04/01/13 Analyzed: 04/02/13						
Mercury	3.59	0.33	mg/Kg wet	4.05		88.7	71.6-128.1	7.31	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070235 - SW-846 7471										
Blank (B070235-BLK1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070235-BS1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	3.16	0.33	mg/Kg wet	4.05		78.1	71.6-128.1			
LCS Dup (B070235-BSD1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	3.71	0.33	mg/Kg wet	4.05		91.5	71.6-128.1	15.8	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070216 - % Solids										
Duplicate (B070216-DUP1)	**Source: 13C0950-60**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	15.8		% Wt		17.4			9.64	20	
Duplicate (B070216-DUP2)	**Source: 13C0950-50**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	24.9		% Wt		29.9			18.2	20	
Duplicate (B070216-DUP3)	**Source: 13C0950-40**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	30.6		% Wt		33.5			9.05	20	
Duplicate (B070216-DUP4)	**Source: 13C0950-30**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	13.2		% Wt		13.4			1.50	20	
Duplicate (B070216-DUP5)	**Source: 13C0950-20**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	23.6		% Wt		27.1			13.8	20	
Duplicate (B070216-DUP6)	**Source: 13C0950-10**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	19.7		% Wt		16.8			15.9	20	
Duplicate (B070216-DUP7)	**Source: 13C0950-01**			Prepared: 04/02/13 Analyzed: 04/03/13						
% Solids	22.7		% Wt		24.1			5.98	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

CHAIN OF CUSTODY RECORD

13C0950

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Flr. Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Mega Metals (Cortlandt Manor, NY)

Sampled By: AW, KH

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: APatel@HDRINC.com
Format: ☒ PDF ☒ EXCEL ○ GIS
☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: TAL Metals	TOC	Moisture Content
								1	I	A			
								1	I	A			
								1	H	G			
01	BRSD715-2-2.5	3/27/13	1645		X	S	U				X	X	
02	BRSD715-3-3.5		1650		X	S	U				X		
03	BRSD715-4-4.5		1655		X	S	U				X		X
04	BRSD714-0-0.5		1655		X	S	U				X		
05	BRSD714-1-1.5		1700		X	S	U				X		
06	BRSD714-2-2.5		1705		X	S	U				X		
07	BRSD714-3-3.5		1710		X	S	U				X		
08 (NY) (PA)	BRSD614-0-0.5		1710		X	S	U				X		
09 (NY) (PA)	BRSD614-1-1.5		1715		X	S	U				X		
10 (NY) (PA)	BRSD614-2-2.5		1720		X	S	U				X		

Comments: PASD614...

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Dissolved Metals
○ Field Filtered
○ Lab to Filter

Relinquished by: (signature)	Date/Time: 3/28/13 1630	
Received by: (signature)	Date/Time: 3/29/13 1018	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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www.contestlabs.com

CHAIN OF CUSTODY RECORD

13C0950

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR Engineering, Inc.
Address: 1 Blue Hill Plz, 12th Fl.
Pearl River, NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Cortlandt Manor, NY)
Sampled By: Alo, KH

Telephone: 845 735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals										
								1	1	1								
								I	I	I								
								A	A	G								
11	PASD614 - 3-3.5	3/27/13	1725		X	S	U	X										
12	BRSD712 - 2-2.5		1730		X	S	U	X										
13	BRSD712 - 3-3.5		1735		X	S	U	X										
14	BRSD712 - 4-4.5		1740		X	S	U	X										
15	BRSD711 - 0-0.5		1730		X	S	U	X										
16	BRSD711 - 1-1.5		1735		X	S	U	X										
17	BRSD711 - 2-2.5		1740		X	S	U	X										
18	BRSD711 - 3-3.5		1745		X	S	U	X										
19	PASD608 - 0-0.5		1735		X	S	U	X										
20	PASD608 - 1-1.5		1740		X	S	U	X										

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	3/28/13 1800
Received by: (signature) 5-8 [signature] 1018	Date/Time: 10/29/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
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NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

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East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

13C0950

Rev 04.05.12

Company Name: HDR Engineering, Inc. Telephone: 845 733-5570

Address: 1 Blue Hill Plz, 12th Floor Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Megan Metals

Sampled By: MC, KH

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER_____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	# of Containers	** Preservation	***Container Code
21	PASD608 - 2-2.5	7/27/13	1745		X	S	U	X			
22	PASD608 - 3.3.5	↓	1750		X	S	U	X			
23	PASD618 - 2-2.5	7/28/13	1015		X	S	U	X			
24	PASD618 - 3-3.5		1020		X	S	U	X			
25	PASD618 - 4-4.5		1025		X	S	U	X			
26	PASD618 - 2-2.5-1		1600		X	S	U	X			
27	PASD616 - 0-0.5		1030		X	S	U	X			
28	PASD616 - 1-1.5		1035		X	S	U	X			
29	PASD616 - 2-2.5		1040		X	S	U	X			
30	PASD616 - 3-3.5	↓	1045		X	S	U	X			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	7/28/13 1800
Received by: (signature) [signature] 1018	Date/Time: 10/29/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

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CHAIN OF CUSTODY RECORD

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East longmeadow, MA 01028

Page 4 of 7

13C0950

Rev 04.05.12

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Flr. Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Cortlandt Manor, NY (Magna Metals)

Sampled By: AW, KH

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL metals
31	PASD 610 - 0 - 0.5	3/20/13	1050		X	S	U	1	I	A	X
32	PASD 610 - 1 - 1.5		1055		X	S	U	1	I	A	X
33	PASD 610 - 2 - 2.5		1100		X	S	U	1	I	A	X
34	PASD 610 - 3 - 3.5		1105		X	S	U	1	I	A	X
35	PASD 613 - 0 - 0.5		1110		X	S	U	1	I	A	X
36	PASD 613 - 1 - 1.5		1115		X	S	U	1	I	A	X
37	PASD 613 - 2 - 2.5		1120		X	S	U	1	I	A	X
38	PASD 613 - 3 - 3.5		1125		X	S	U	1	I	A	X
39	BRSD709 - 1 - 1.5		1300		X	S	U	1	I	A	X
40	BRSD708 - 0 - 0.5		1505		X	S	U	1	I	A	X

ANALYSIS REQUESTED

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 3/20/13 1830	
Received by: (signature)	Date/Time: 3/21/13 1018	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

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www.contestlabs.com
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East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

13C0950

Rev 04.05.12

Company Name: HDR Engineering, Inc. Telephone: 845 735 8300

Address: 1 Blue Hill Plz 12th Fl. Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals (Cortlandt Manor, NY)

Sampled By: MW, KH

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER _____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	ANALYSIS REQUESTED: TAL Metals
41	BRSD 708 - 1-1.5	3/28/13	1510		X	S	U	1	I	A	X
42	BRSD 708 - 2-2.5		1515		X	S	U	1	I	A	X
43	BRSD 708 - 0-0.5-1		1605		X	S	U	1	I	A	X
44	BRSD 707 - 1-1.5		1520		X	S	U	1	I	A	X
45	BRSD 707 - 2-2.5		1525		X	S	U	1	I	A	X
46	BRSD 707 - 2-2.5-1		1610		X	S	U	1	I	A	X
47	BRSD 705 - 2-2.5		1530		X	S	U	1	I	A	X
48	BRSD 705 - 3-3.5		1535		X	S	U	1	I	A	X
49	BRSD 705 - 4-4.5		1540		X	S	U	1	I	A	X
50	BRSD 706 - 0-0.5		1545		X	S	U	1	I	A	X

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	3/28/13 1530
Received by: (signature)	Date/Time:
	10/29/13 1618
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☑ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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13C0950
Rev 04.05.12

Company Name: HDR Engineering, Inc. Telephone: 845 735 8300
Address: 1 Blue Hill Plz, 12th Flr. Project #
Pearl River, NY 10965 Client PO#
Attention: Amita Patel
Project Location: Magna Metals (Cortlandt Manor, NY)
Sampled By: AW, KH

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER _____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	TOC	% Moisture
								1	1	A			
								1	1	A			
								1	1	G			
51	BRSD706-1-1.5	3/28/13	1550		G	S	U		I		X		
52	BRSD706-2-2.5	↓	1555		X	S	U		I		X		
53	BRSD706-3-3.5		1600		X	S	U		I		X		
54	BRSD706-3-3.5-1		1605		X	S	U		I		X		
55	BRSD703-2-2.5		1605		X	S	U		I		X		
56	BRSD703-3-3.5		1610		X	S	U		I		X		
57	BRSD703-4-4.5		1615		X	S	U		I		X		
58	BRSD704-0-0.5		1620		X	S	U		I		X		X
59	BRSD704-1-1.5		1625		X	S	U		I		X		
60	BRSD704-2-2.5	↓	1630		X	S	U		I		X	X	

ANALYSIS REQUESTED

***Container Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

	Date/Time:
Relinquished by: (signature)	3/29/13 1530
Received by: (signature)	3/29/13 1618
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☑ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

Page 173 of 176 13C0950_1 Contest_Final 04 16 13 1813 04/16/13 18:17:34

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

13C0950

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: 1 Blue Hill Plz, 12th Flr. Pearl River, NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Cortlandt Manor, NY)
Sampled By: AW, KH

Telephone: 845 735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Page 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS ○ OTHER ○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals										
61	BRSD704-3-3.5	3/28/13	1635		X	S	U	X										
62	BRSD704-3-3.5-1	↓	1620		X	S	U	X										
63	BRSD717-0-0.5	3/27/13	1235		X	S	U	X										
64	BRSD717-1-1.5	↓	1240		X	S	U	X										
65	BRSD717-2-2.5		1245		X	S	U	X										
66	BRSD717-3-3.5		1250		X	S	U	X										
67	BRSD718-2-2.5		1255		X	S	U	X										
68	BRSD718-3-3.5		1300		X	S	U	X										
69	BRSD718-4-4.5	↓	1305		X	S	U	X										

gw

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfat
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Relinquished by: (signature) [signature]	Date/Time: 3/28/13 1530	
Received by: (signature) [signature] 5.8 1018	Date/Time: 3/29/13	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
nelac

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

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FedEx.

802302327949

Ship (P/U) date :
Thur 3/28/2013 6:56 pm
PEA US

Delivered
Signed for by: A.ARD

Actual delivery :
Fri 3/29/2013 10:18 am
MA US

2 Piece shipment

Let us tell you when your shipment arrives. Sign up for delivery notifications

Travel History

Date/Time	Activity	Location
- 3/29/2013 - Friday		
10:18 am	Delivered	MA
8:02 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
6:57 am	At local FedEx facility	WINDSOR LOCKS, CT
- 3/28/2013 - Thursday		
10:28 pm	Departed FedEx location	NEWARK, NJ
10:05 pm	Arrived at FedEx location	NEWARK, NJ
9:05 pm	Left FedEx origin facility	MAHWAH, NJ
6:56 pm	Picked up	MAHWAH, NJ

Local Scan Time

Shipment Facts

Tracking number	802302327949	**Service**	FedEx Standard Overnight
Master tracking number	802302327949	**Dimensions**	24x14x14 in.
Delivered To	Shipping/Receiving	**Total pieces**	2
Shipper reference	MANA METALS	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge		

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East Longmeadow, MA. 01028
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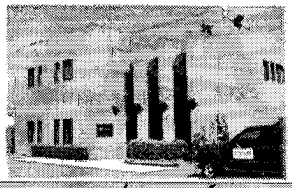

Sample Receipt Checklist

CLIENT NAME: HDR **RECEIVED BY:** WK **DATE:** 3/28/13

1) Was the chain(s) of custody relinquished and signed? (Yes) No No CoC Included

2) Does the chain agree with the samples? (Yes) No

If not, explain:

3) Are all the samples in good condition? (Yes) No

If not, explain:

4) How were the samples received:

On Ice [X] Direct from Sampling [ ] Ambient [ ] In Cooler(s) [X]

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 5.8

5) Are there Dissolved samples for the lab to filter? Yes (No)

Who was notified _____ Date _____ Time _____

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes (No)

Who was notified _____ Date _____ Time _____

7) Location where samples are stored: 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) Do all samples have the proper Acid pH: Yes No (N/A) _____

9) Do all samples have the proper Base pH: Yes No (N/A) _____

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	71
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	2
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

con-test®
ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 16, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland and Manor, NY
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13D0007

Enclosed are results of analyses for samples received by the laboratory on April 1, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13D0007

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD606-1-1.5	13D0007-01	Soil		SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
PASD609-2-2.5	13D0007-02	Soil		SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
WSTD520-1-1.5	13D0007-03	Soil		SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
BRSD702-2-2.5	13D0007-04	Soil		SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional

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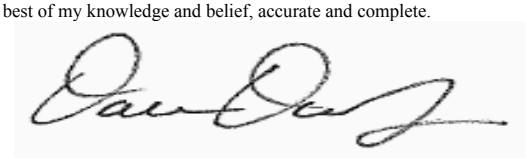
CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Sample Description: Work Order:

Date Received:

Field Sample #:

Sample ID: Start Date/Time:

Sample Matrix: Stop Date/Time:

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst

Analyte	Results	Units	Response	RT	DF	CAS #	Method	Date Prepared	Date/Time Analyzed	Analyst

Surrogates	% Recovery	Recovery Limits	Flag

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications

No certified Analyses included in this Report

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

13D0007

CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
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www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Rev. 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plaza, 12th Flr Project #

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Cortlandt Manor, NY

Sampled By: ACW, MP, SJN

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ☒ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ☒ EXCEL ○ GIS ☒ OTHER EDD (NYSDEC)
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc. Code	TAL Metals	TOC	Moisture Content										# of Containers
								I	I	I										** Preservation
								A	A	G										***Container Code
01	PASD602-0-0.5	3/19/13	0915		X	S	U	X												
02	PASD603-0-0.5	3/19/13	0930		X	S	U	X												
03	PASD603-1-1.5	3/19/13	0935		X	S	U	X												
04	PASD603-2-2.5	3/19/13	0940		X	S	U	X												
05	PASD601-0-0.5	3/19/13	1005		X	S	U	X												
06	WTSD522-0-0.5	3/19/13	1005		X	S	U	X												
07	PASD606-0-0.5	3/19/13	1125		X	S	U	X		X										
08	PASD606-1-1.5	3/19/13	1130		X	S	U	X	X											
09	PASD606-2-2.5	3/19/13	1135		X	S	U	X												
10	PASD606-2-2.5-1	3/19/13	1140		X	S	U	X												

01

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments: Please Pub TOC on its own W.O. *due to longer TAT Time per client.*

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
A Walden	3/19/13 1830
Received by: (signature)	Date/Time:
3.0° 100b	3/20/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Standard

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

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Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

1300613

Company Name: HDR Engineering, Inc.
Address: 1 Blue Hill Plz, 12th Floor
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals (Continental Manor, NY)
Sampled By: MW, MP, STN

Telephone: 845 735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	*** Container Code	ANALYSIS REQUESTED: THC Metals	TOC	Moisture Content
11	PASD 609 - 0 - 0.5	3/19/13	1300		X	S	U	1	I	A	X		
12	PASD 609 - 1 - 1.5	3/19/13	1305		X	S	U	1	I	A	X		X
13	PASD 609 - 2 - 2.5	3/19/13	1310		X	S	U	1	I	A	X	X	
14	WTSD 520 - 0 - 0.5	3/19/13	1445		X	S	U	1	I	A	X		
15	WTSD 520 - 1 - 1.5	3/19/13	1450		X	S	U	1	I	A	X	X	
16	WTSD 520 - 2 - 2.5	3/19/13	1455		X	S	U	1	I	A	X	[illegible]	X
17	WTSD 521 - 0 - 0.5	3/19/13	1500		X	S	U	1	I	A	X		
18	WTSD 521 - 1 - 1.5	3/19/13	1505		X	S	U	1	I	A	X		
19	WTSD 521 - 2 - 2.5	3/19/13	1510		X	S	U	1	I	A	X		
20	BRSD 701 - 0 - 0.5	3/19/13	1520		X	S	U	1	I	A	X		

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Relinquished by: (signature)		Date/Time: 3/20/13 1650
Received by: (signature)	3.0°	Date/Time: 3/20/13 1006
Relinquished by: (signature)		Date/Time:
Received by: (signature)		Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Std
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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East longmeadow, MA 01028

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Fl, Pearl River, NY 10965 Project #

Client PO#

Attention: Amita Patel

Project Location: Magnet Molds

Sampled By: AW, MP, SJN

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email:
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER EDD (NYSDEC)
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Cons Code	TAL Metals	TOC	% Moisture	# of Containers	** Preservation	***Container Code
21	BRSD701-0-0.5-1	3/19/13	1525		X	S	U	X			1	I	A
22	BRSD702-0-0.5	3/19/13	1540		X	S	U	X		X	1	I	A
23	BRSD702-1-1.5	3/19/13	1545		X	S	U	X			1	I	A
24	BRSD702-2-2.5	3/19/13	1550		X	S	U	X	X		1	I	A
25	BRSD725-0-0.5	3/18/13	0925		X	S	U	X			1	I	A
26	BRSD722-0-0.5	3/18/13	0950		X	S	U	X			1	I	A
27	PASD605-0-0.5	3/18/13	1540		X	S	U	X			1	I	A
28	PASD605-1-1.5	3/18/13	1540		X	S	U	X			1	I	A
29	PASD605-2-2.5	3/18/13	1540		X	S	U	X			1	I	A
30	PASD604-0-0.5	3/18/13	1430		X	S	U	X			1	I	A

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
Sl = sludge
O = other_____

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Relinquished by: (signature)	Date/Time:
[signature]	3/19/13 1830
Received by: (signature) 3.0 1006	Date/Time: 3/20/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other Std.
RUSH †
☐ †24-Hr ☐ 48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP?
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NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

Rev 04.05.12

13C0613

Company Name: HDR Engineering, Inc. Telephone: 845 735-8300

Address: 1 Blue Hill Plz, 12th Flr Project #
Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals

Sampled By:

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # See Pg. 1
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code
31	PASD612 - 0 - 0.5	3/18/13	1500		X	S	U
32	PASD620 - 0 - 0.5	3/18/13	1525		X	S	U
33	PASD611 - 0 - 0.5	3/19/13	1635		X	S	U
34	PASD611 - 1 - 1.5	3/19/13	1640		X	S	U
35	PASD611 - 2 - 2.5	3/19/13	1645		X	S	U
36	WTSD524 - 0 - 0.5	3/19/13	1650		X	S	U
37	WTSD524 - 1 - 1.5	3/19/13	1655		X	S	U
38	WTSD524 - 2 - 2.5	3/19/13	1700		X	S	U

# of Containers	1	1	1								
** Preservation	I	I	I								
***Container Code	A	A	G								
ANALYSIS REQUESTED	TAL Metals	TDC	% Moisture								
	X										
	X										
	X										
	X										
	X										
	X										
	X										
	X										

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other _____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other _____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 3/19/13 1520
Received by: (signature) 3.0 1006	Date/Time: 3/20/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other Std
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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FedEx.

802302293730

Ship (P/U) date:
Tues 3/19/2013 7:18 pm
PEA US

Delivered
Signed for by: C.COLLINS

Actual delivery:
Wed 3/20/2013 10:06 am
MA US

2 Piece shipment

Tracking Number or Mast...	Ship (P/U) City, St/P...	Ship (P/U) date	Status	Destination/Exception cit...	Delivery date
802302293730(master)	PEA, NJ	3/19/2013		, MA	3/20/2013
795769934254	, NJ	3/19/2013			3/20/2013

Travel History

Date/Time	Activity	Location
- 3/20/2013 - Wednesday		
10:06 am	Delivered	MA
8:14 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
6:45 am	At local FedEx facility	WINDSOR LOCKS, CT
3:38 am	Departed FedEx location	NEWARK, NJ
- 3/19/2013 - Tuesday		
10:25 pm	Departed FedEx location	NEWARK, NJ
10:09 pm	Arrived at FedEx location	NEWARK, NJ
9:23 pm	Left FedEx origin facility	MAHWAH, NJ
7:18 pm	Picked up	MAHWAH, NJ

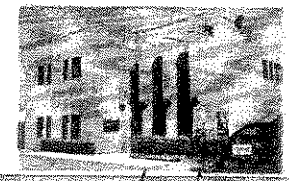
Local Scan Time

Shipment Facts

Tracking number	802302293730	**Service**	FedEx Standard Overnight
Master tracking number	802302293730	**Dimensions**	23x13x12 in.
		Total pieces	2
Delivered To	Shipping/Receiving	**Packaging**	Your Packaging
Shipper reference	NYSDEC-MASAS MOTELS		
Special handling section	Deliver Weekday		

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: CEC DATE: 3/20/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.0
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature:

8) **Do all samples have the proper Acid pH:** Yes No N/A _____
9) **Do all samples have the proper Base pH:** Yes No N/A _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No N/A

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	43
500 mL Amber		4 oz amber/clear jar	4
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

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April 03, 2013 Service Request No: R1301889

Ms. Laurie Kopyscinski
Contest Laboratory
39 Spruce Street
East Longmeadow, MA 01028

Laboratory Results for: 13C0613

Dear Ms. Kopyscinski:

Enclosed are the results of the sample(s) submitted to our laboratory on March 22, 2013. For your reference, these analyses have been assigned our service request number **R1301889**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Karen Bunker
Project Manager

ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623 PHONE 585-288-5380 | FAX 585-288-8475
ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

02021

SDG NARRATIVE

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Client:	Con-test Analytical Laboratory	**Service Request No.:**	R1301889
Project:	13C0613	**Date Received:**	3/22/13
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS/Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS. Raw data is included in the report deliverables.

Sample Receipt

Four samples were received for analysis at ALS/Columbia Analytical Services on 3/22/13. The samples were received in good condition and consistent with the accompanying chain of custody forms. The samples were stored in a refrigerator between 1°C and 6°C upon receipt at the laboratory.

Inorganic Parameters

The samples were analyzed for TOC by EPA Lloyd Kahn and % Solids. Approved method references appear on report forms. Data is reported on a dry weight basis.

The Initial Calibration (ICAL), Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) criteria were met for all samples.

Batch QC is included in the report.. The Laboratory Control Sample (LCS) recovery was within acceptance limits.

All Method Blanks were free of contamination.

The samples were run within the appropriate holding times for the methods.

No analytical or QC problems were encountered during analysis.

Approved by Karen Burdee **Date** 4/3/13

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CAS ASP/CLP Batching Form/Login Sheet

Client Proj #:	Batch Complete: Yes	Date Revised:
Submission: R1301889	Diskette Requested: No	Date Due: 4/12/13
Client: Con-test Analytical Laboratory	Date: 3/22/13	Protocol: MCAWW
Client Rep: KBUNKER	Custody Seal: Present/Absent:	Shipping No.:
Project: 13C0613	Chain of Custody: Present/Absent:	SDG #:

CAS Job #	Client/EPA ID	Matrix	Requested Parameters	Date Sampled	Date Received	pH (Solids)	% Solids	Remarks Sample Condition
R1301889-001	13C0613-08	Soil	160.3 Modified, EPA LKahn 7-27-1988	3/19/13	3/22/13			
R1301889-002	13C0613-13	Soil	160.3 Modified, EPA LKahn 7-27-1988	3/19/13	3/22/13			
R1301889-003	13C0613-15	Soil	160.3 Modified, EPA LKahn 7-27-1988	3/19/13	3/22/13			
R1301889-004	13C0613-24	Soil	160.3 Modified, EPA LKahn 7-27-1988	3/19/13	3/22/13			

1555

Folder Comments:

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REPORT QUALIFIERS

U	Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
J	Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).
B	Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
E	Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
E	Organics- Concentration has exceeded the calibration range for that specific analysis.
D	Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
*	Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
H	Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
#	Spike was diluted out.
+	Correlation coefficient for MSA is <0.995.
N	Inorganics- Matrix spike recovery was outside laboratory limits.
N	Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
S	Concentration has been determined using Method of Standard Additions (MSA).
W	Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
P	Concentration >40% (25% for CLP) difference between the two GC columns.
C	Confirmed by GC/MS
Q	DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).
X	See Case Narrative for discussion.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

NELAP Accredited	Maine ID #NY0032	New Hampshire ID # 294100 A/B
Connecticut ID # PH0556	Nebraska Accredited	
Delaware Accredited	Nevada ID # NY-00032	North Carolina #676
DoD ELAP #65817	New Jersey ID # NY004	Pennsylvania ID# 68-786
Florida ID # E87674	New York ID # 10145	Rhode Island ID # 158
Illinois ID #200047		Virginia #460167

[1] Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to http://alsglobal.com/environmental/laboratories/rochester-environmental-lab.aspx

CHAINS OF CUSTODY

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SUBCONTRACT ORDER

Con-Test Analytical Laboratory

13C0613

Subcontract lab must notify Con-Test Analytical Lab of any MCL exceedance within 24-hours of obtaining valid data.

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R1301889 5
Contest Laboratory
13C0613

SENDING LABORATORY:

Con-Test Analytical Laboratory
39 Spruce Street
East Longmeadow, MA 01028
Phone: 413.525.2332
Fax: 413.525.6405
Project Manager: Paula E. Blakeborough

RECEIVING LABORATORY:

Columbia Analytical Services, Inc. - Rochester, NY
1565 Jefferson Road Building 300, Suite 360
Rochester, NY 14623
Phone :800-695-7222
Fax: 585-288-8475

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 13C0613-08	**Soil**	**Sampled:03/19/13 11:30**	-001	
Total Organic Carbon	03/27/13 12:00	04/02/13 11:30		Sub To Columbia Analytical, Rochester, NY
Containers Supplied:				
8 oz amber glass jar (B)				
Sample ID: 13C0613-13	**Soil**	**Sampled:03/19/13 13:10**	-002	
Total Organic Carbon	03/27/13 12:00	04/02/13 13:10		Sub to Columbia Analytical in Rochester, NY
Containers Supplied:				
8 oz amber glass jar (B)				
Sample ID: 13C0613-15	**Soil**	**Sampled:03/19/13 14:50**	-003	
Total Organic Carbon	03/27/13 12:00	04/02/13 14:50		Sub to Columbia Analytical in Rochester, NY
Containers Supplied:				
8 oz amber glass jar (B)				
Sample ID: 13C0613-24	**Soil**	**Sampled:03/19/13 15:50**	-004	
Total Organic Carbon	03/27/13 12:00	04/02/13 15:50		Sub To Columbia Analytical Lab in Rochester, NY
Containers Supplied:				
8 oz amber glass jar (B)				

R1301869

Released By	Date	Received By	Date
	3/21/13 1700		3/22/13 0935
Released By	Date	Received By	Date

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Cooler Receipt and Preservation Check Form

Project/Client Con-Test Folder Number R1301889

Cooler received on 3/22/13 by: (DW) **COURIER:** ALS UPS (FEDEX) VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO
2.	Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO
4.	Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles?	YES	NO (N/A)
5.	Were **Ice** or **Ice packs** present?	(YES)	NO
6.	Where did the bottles originate?	DW 3/22/13 (ALS/ROC), (CLIENT)	

7. Soil VOA samples received as:	Bulk Jar	Encore	TerraCore	Lab5035set	N/A
8. Temperature of cooler(s) upon receipt:	4.1				
Is the temperature within 0° - 6° C?:	(Y) N	Y N	Y N	Y N	Y N

If No, Explain Below Date/Time Temperatures Taken: 3/22/13 1056

Thermometer ID: IR (GUN#3) / IR GUN#4 Reading From: Temp Blank / (Sample) Bottle

If out of Temperature, note packing/ice condition &Client Approval to Run Samples:

All Samples held in storage location 2-ovz by (DW) on 3/22/13 at 10:57

5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: KB 3/22/13

Cooler Breakdown: Date: 3/22/13 Time: 1211 by: DW

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact	Canisters Pressurized	Tedlar® Bags Inflated (N/A)

Explain any discrepancies:

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO_3								
≤2	H_2SO_4								
<4	$NaHSO_4$								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	$Na_2S_2O_3$	-	-						
	Zn Aceta	-	-						
	HCl	*	*						

*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: Client

Other Comments:

PC Secondary Review: KB 4/3/13

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS ENVIRONMENTAL

Chain of Custody Report

Client: Contest Laboratory
Project: 13C0613

Service Request: R1301889

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
R1301889-001.02					
	160.3 Modified, EPA LKahn 7-27-1988				
		3/22/13	1206	SMO / KMAESTRO	
		3/22/13	1207	R-002 / KMAESTRO	
		3/22/13	1238	In Lab / ASIMMONS	
		3/22/13	1507	R-002 / BBAXTER	
		3/25/13	0857	In Lab / BKALKMAN	
		3/25/13	0903	R-002 / BBAXTER	
R1301889-002.02					
	160.3 Modified, EPA LKahn 7-27-1988				
		3/22/13	1206	SMO / KMAESTRO	
		3/22/13	1207	R-002 / KMAESTRO	
		3/22/13	1238	In Lab / ASIMMONS	
		3/22/13	1507	R-002 / BBAXTER	
		3/25/13	0857	In Lab / BKALKMAN	
		3/25/13	0903	R-002 / BBAXTER	
R1301889-003.02					
	160.3 Modified, EPA LKahn 7-27-1988				
		3/22/13	1206	SMO / KMAESTRO	
		3/22/13	1207	R-002 / KMAESTRO	
		3/22/13	1238	In Lab / ASIMMONS	
		3/22/13	1507	R-002 / BBAXTER	
		3/25/13	0857	In Lab / BKALKMAN	
		3/25/13	0902	R-002 / BBAXTER	
R1301889-004.02					
	160.3 Modified, EPA LKahn 7-27-1988				
		3/22/13	1206	SMO / KMAESTRO	
		3/22/13	1207	R-002 / KMAESTRO	
		3/22/13	1238	In Lab / ASIMMONS	
		3/22/13	1507	R-002 / BBAXTER	
		3/25/13	0857	In Lab / BKALKMAN	
		3/25/13	0903	R-002 / BBAXTER	

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GENERAL CHEMISTRY DATA

Client: Con-test Analytical Laboratory
Project: 13C0613
Sample Matrix: Soil

Sample Name: 13C0613-08
Lab Code: R1301889-001

Service Request: R1301889
Date Collected: 3/19/13 1130
Date Received: 3/22/13

Basis: As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Solids, Total	160.3 Modified	**16.8**		Percent	1.0	1	NA	3/22/13 13:26	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1130
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-08		
Lab Code:	R1301889-001	**Basis:**	Dry, per Metho

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	**493000**		mg/Kg	30000	1	NA	3/25/13 12:40	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1310
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-13		
Lab Code:	R1301889-002	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Solids, Total	160.3 Modified	**33.3**		Percent	1.0	1	NA	3/22/13 13:26	

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ALS ENVIRONMENTAL

Analytical Report

Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1310
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-13		
Lab Code:	R1301889-002	**Basis:**	Dry, per Metho

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	**351000**		mg/Kg	30000	1	NA	3/25/13 12:40	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1450
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-15		
Lab Code:	R1301889-003	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Solids, Total	160.3 Modified	**30.0**		Percent	1.0	1	NA	3/22/13 13:26	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1450
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-15		
Lab Code:	R1301889-003	**Basis:**	Dry, per Metho

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Not
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	**479000**		mg/Kg	30000	1	NA	3/25/13 12:40	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1550
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-24		
Lab Code:	R1301889-004	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Solids, Total	160.3 Modified	**24.7**		Percent	1.0	1	NA	3/22/13 13:26	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	3/19/13 1550
Sample Matrix:	Soil	**Date Received:**	3/22/13
Sample Name:	13C0613-24		
Lab Code:	R1301889-004	**Basis:**	Dry, per Metho

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Not
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	**445000**		mg/Kg	30000	1	NA	3/25/13 12:40	

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Client:	Con-test Analytical Laboratory	**Service Request:**	R1301889
Project:	13C0613	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank		
Lab Code:	R1301889-MB	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Solids, Total	160.3 Modified	1.0	U	Percent	1.0	1	NA	3/22/13 13:26	

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Client: Con-test Analytical Laboratory
Project: 13C0613
Sample Matrix: Soil

Service Request: R1301889
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: R1301889-MB

Basis: Dry, per Metho

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	No
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	300	U	mg/Kg	300	1	NA	3/25/13 12:40	

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QA/QC Report

Client: Con-test Analytical Laboratory
Project: 13C0613
Sample Matrix: Soil

Service Request: R1301889
Date Analyzed: 3/25/13

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/Kg
Basis: Dry, per Metho

Analyte Name	Method	Lab Control Sample R1301889-LCS Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1720	2000	86	84 - 113

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Client: Con-test Analytical Laboratory **Service Request:** R1301889
Project: 13C0613

Continuing Calibration Verification (CCV) Summary
Carbon, Total Organic (TOC)

Analytical Method: EPA LKahn 7-27-1988 **Units:** ppm

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	333775	RQ1302787-01	3/25/13 12:40	4000	3920	98	85 - 115
CCV2	333775	RQ1302787-07	3/25/13 12:40	4000	3950	99	85 - 115

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Client: Con-test Analytical Laboratory
Project: 13C0613

Service Request: R1301889

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic (TOC)

Analytical Method: EPA LKahn 7-27-1988

Units: mg/Kg

	Analysis Lot	Lab Code	Date Analyzed	MRL	Result	Q
CCB1	333775	RQ1302787-02	3/25/13 12:40	300	300	U
CCB2	333775	RQ1302787-08	3/25/13 12:40	300	300	U

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Analytical Results Summary

Instrument Name: R-Balance-01 **Analyst:** ASIMMONS **Analysis Lot:** 333557 **Method/Testcode:** 160.3 Modified/TS

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1302725-01	Solids, Total	MB		Soil	0.00 Percent		1.0 Percent U	1		1.0			3/22/13 13:26	N	IV
R1301641-015	Solids, Total	N/A		Soil	87.43 Percent		87.4 Percent	1		1.0			3/22/13 13:26	N	IV
RQ1302725-02	Solids, Total	DUP	R1301641-015	Soil	84.89 Percent		84.9 Percent	1		1.0		3	3/22/13 13:26	N	IV
R1301889-001	Solids, Total	N/A		Soil	16.84 Percent		16.8 Percent	1		1.0			3/22/13 13:26	N	IV
R1301889-002	Solids, Total	N/A		Soil	33.33 Percent		33.3 Percent	1		1.0			3/22/13 13:26	N	IV
R1301889-003	Solids, Total	N/A		Soil	29.97 Percent		30.0 Percent	1		1.0			3/22/13 13:26	N	IV
R1301889-004	Solids, Total	N/A		Soil	24.71 Percent		24.7 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-012	Solids, Total	N/A		Soil	84.62 Percent		84.6 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-013	Solids, Total	N/A		Soil	76.25 Percent		76.3 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-016	Solids, Total	N/A		Soil	87.21 Percent		87.2 Percent	1		1.0			3/22/13 13:26	Y	IV
RQ1302725-03	Solids, Total	DUP	R1301802-016	Soil	87.81 Percent		87.8 Percent	1		1.0		<1	3/22/13 13:26	N	IV
R1301802-017	Solids, Total	N/A		Soil	79.07 Percent		79.1 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-018	Solids, Total	N/A		Soil	77.08 Percent		77.1 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-019	Solids, Total	N/A		Soil	79.91 Percent		79.9 Percent	1		1.0			3/22/13 13:26	N	IV
R1301802-020	Solids, Total	N/A		Soil	82.31 Percent		82.3 Percent	1		1.0			3/22/13 13:26	N	IV

R1889
R1802
2 copies

Reviewed & Approved
By: CK
Date: 3/26/13

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

COLUMBIA ANALYTICAL SERVICES, INC.

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Analyte: % Volatile Solids
Method: SM20 2540G
Analytes: Dry Weight % Solid
Method : EPA-600 160.3

Analyst: AS Date: 3/22/13
Pipet: NA Time: 13:26
Thermolyne F48025-6048000 Muffle Furnace
Balance ID R-BALANCE-01 **Oven ID** 2
Class 1 Weight Initial: 10.00 Final: 10.00

% Volatile Solids:
% VS = (A - D) / (A - B) * 100

% Solids:
% Solid = (A - B) / (C - B) * 100

Where: A = wgt (g) of dried residue + dish
B = wgt (g) of tared dish
C = wgt (g) of wet sample + dish
D = wgt (g) of residue + dish after ign. @550 C.

	Misc.	Order #	Dish ID	Before Ignition / Wet Weight (g)		After Ignition / Dry Weight (g)		% Volatile Solids	% Solids
1		MB	76	C)		Dry wgt (A):	1.3300		1.00
				B)	1.3300	550 wgt (D):			
2		R1301641-015	77	C)	11.9000	Dry wgt (A):	10.5700		87.43
				B)	1.3200	550 wgt (D):			
3		R1301641-015 DUP	78	C)	11.8500	Dry wgt (A):	10.2600		84.89
				B)	1.3300	550 wgt (D):			
4		R1301889-001	79	C)	12.0100	Dry wgt (A):	3.1200		16.84
				B)	1.3200	550 wgt (D):			
5		R1301889-002	80	C)	11.9700	Dry wgt (A):	4.8700		33.33
				B)	1.3200	550 wgt (D):			
6		R1301889-003	81	C)	11.5400	Dry wgt (A):	4.3900		29.97
				B)	1.3300	550 wgt (D):			
7		R1301889-004	82	C)	11.6600	Dry wgt (A):	3.8900		24.71
				B)	1.3400	550 wgt (D):			
8		R1301802-012	83	C)	11.5900	Dry wgt (A):	10.0100		84.62
				B)	1.3200	550 wgt (D):			
9		R1301802-013	84	C)	11.7300	Dry wgt (A):	9.2600		76.25
				B)	1.3300	550 wgt (D):			
10		R1301802-016	85	C)	11.6500	Dry wgt (A):	10.3300		87.21
				B)	1.3300	550 wgt (D):			
11		R1301802-016 DUP	86	C)	11.9000	Dry wgt (A):	10.6100		87.81
				B)	1.3200	550 wgt (D):			
12		R1301802-017	87	C)	12.0700	Dry wgt (A):	9.8200		79.07
				B)	1.3200	550 wgt (D):			
13		R1301802-018	88	C)	11.7900	Dry wgt (A):	9.3900		77.08
				B)	1.3200	550 wgt (D):			
14		R1301802-019	89	C)	11.8700	Dry wgt (A):	9.7500		79.91
				B)	1.3200	550 wgt (D):			
15		R1301802-020	90	C)	11.9000	Dry wgt (A):	10.0300		82.31
				B)	1.3300	550 wgt (D):			

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Columbia Analytical Services
1 Mustard St., Rochester, NY 14608-0859

General Chemistry Analytical Run Cover Sheet

Analyst: AS Date: 03/22/13

Analysis: % Solids Instrument: American Scientific Toploading Balance

Quality Control:

	Log Book #	Log Book Date	Log Book Page #	Stock Sol (m/Ls)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:							
b) I/CCV Preparation:							
c) LCS Preparation:							
d) Matrix Spike Prep.:							

Instrument log filled in? (Y)(N)

Comments:

Production (optional):

	Start Time	End Time	Total (minutes)
Preparation Time :			
Analytical Time:			
Finish Time:			

# of Samples (including Mtx QC): _____
Repeats due to Sample: _____
Repeats due to Error: _____

p:\L\123\greg\forms\cover\dwps.xls

Analytical Results Summary

Instrument Name: R-TOC-02 **Analyst:** BKALKMAN **Analysis Lot:** 333775 **Method/Testcode:** EPA LKahn 7-27-1988/Kahn TOC

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1302787-01	Carbon, Total Organic (TOC)	CCV		Soil	3924.00 ppm	100 mg	3920 ppm	1					3/25/13 12:40	N	IV
RQ1302787-02	Carbon, Total Organic (TOC)	CCB		Soil	23.88 µg/g	100 mg	300 mg/Kg U	1	60	300			3/25/13 12:40	N	IV
RQ1302787-03	Carbon, Total Organic (TOC)	MB		Soil	23.88 µg/g	100 mg	300 mg/Kg U	1	60	300			3/25/13 12:40	N	IV
RQ1302787-04	Carbon, Total Organic (TOC)	LCS		Soil	1723.00 µg/g	100 mg	1720 mg/Kg	1	60	300	86		3/25/13 12:40	N	IV
R1301889-001	Carbon, Total Organic (TOC)	N/A		Soil	493100.00 µg/g	1 mg	493000 mg/Kg	1	6000	30000			3/25/13 12:40	N	IV
R1301889-002	Carbon, Total Organic (TOC)	N/A		Soil	351400.00 µg/g	1 mg	351000 mg/Kg	1	6000	30000			3/25/13 12:40	N	IV
R1301889-003	Carbon, Total Organic (TOC)	N/A		Soil	479100.00 µg/g	1 mg	479000 mg/Kg	1	6000	30000			3/25/13 12:40	N	IV
R1301889-004	Carbon, Total Organic (TOC)	N/A		Soil	445100.00 µg/g	1 mg	445000 mg/Kg	1	6000	30000			3/25/13 12:40	N	IV
RQ1302787-05	Carbon, Total Organic (TOC)	DUP	R1301889-002	Soil	349100.00 µg/g	1.4 mg	349000 mg/Kg	1	4000	21000		<1	3/25/13 12:40	N	IV
RQ1302787-06	Carbon, Total Organic (TOC)	MS	R1301889-002	Soil	575300.00 µg/g	1 mg	575000 mg/Kg	1	6000	30000	112		3/25/13 12:40	N	IV
RQ1302787-07	Carbon, Total Organic (TOC)	CCV		Soil	3948.00 ppm	100 mg	3950 ppm	1					3/25/13 12:40	N	IV
RQ1302787-08	Carbon, Total Organic (TOC)	CCB		Soil	21.26 µg/g	100 mg	300 mg/Kg U	1	60	300			3/25/13 12:40	N	IV

1 copy
R1301889 (Tier IV)

Reviewed & Approved
By:
Date: 3/27/13

12555

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

COLUMBIA ANALYTICAL SERVICES, INC.

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Analysis: TOC Soils Analysis
Method: EPA Lloyd Kahn 1988
Analysis: TC Soils Analysis
Method: EPA Lloyd Kahn Modified
TOC#2 Dohrman DC190

Analyst: B. Kalkman
Pipet ID: FERB
Date: 03/25/13
Time: 12:40
Balance ID: AG 204

Curve Date: 09/24/12 Corr Coeff.: 1.0000
With 1 point calibration

Position #	Misc.	Order #	Sample Amt. (mg)	Result (ug/g)	Comments
1	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
2	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
3	TV= 4000	ICV	100.0	4027	100.7%
4		ICB	100.0	13.26	
5	TV= 2000	LCS	100.0	1919	96.0%
6	Curve Check	300	100.0	292.4	97.5%
7	Curve Check	500	100.0	461.2	92.2%
8	Curve Check	800	100.0	716.9	89.6%
9	Curve Check	1000	100.0	939.2	93.9%
10	Curve Check	3000	100.0	2975	99.2%
11	Curve Check	5000	100.0	4968	99.4%
12	Curve Check	8000	100.0	7858	98.2%
13	TV= 4000	CCV	100.0	3924	98.1%
14		CCB	100.0	23.88	
15	TV= 2000	LCS	100.0	1723	86.2%
16		R1301889-001	1.7	735200	Rep. w/. Less Mass
17		R1301889-001	1.0	493100	
18		R1301889-002	1.0	351400	
19		R1301889-003	1.0	479100	
20		R1301889-004	1.0	445100	
21		R1301889-002 DUP	1.4	349100	
22		R1301889-002 SPK	1.3	733400	Rep. w/. Less Mass
23		R1301889-002 SPK	1.1	735900	Rep. w/. Less Mass
24		R1301889-002 SPK	1.0	575300	112.0%
25		CCV	100.0	3948	
26		CCB	100.0	21.26	
27	TV=200	MDL 1	100.0	174.4	
28	TV=200	MDL 2	100.0	165.5	
29	TV=200	MDL 3	100.0	176.4	
30	TV=200	MDL 4	100.0	178.6	
31	TV=200	MDL 5	100.0	168.1	
32	TV=200	MDL 6	100.0	169.8	
33	TV=200	MDL 7	100.0	170.5	
34	TV=100	MDL V	100.0	91.55	
35		CCV	100.0	3988	
36		CCB	100.0	33.17	

"Time Out Error": Baseline did not return after ignition to within 0.250 mV of the pre-ignition baseline.
Note: For TOC, 1:1 HNO3 added to remove inorganic carbon. This is not done for TC analysis.
TIC = TC - TOC

Template-TOCLK-r0 1/4/13

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3/25/13

TOC-LK

BKalkman

```
Sample ID#            -4000- CCV *
Sample mass (mg) =  100.
 1. TC    = 3924. ug/g
13:06:22 Mon Mar 25, 2013
Sample ID#            -0-    CCB
Sample mass (mg) =  100.
 1. TC    = 23.88 ug/g
13:11:29 Mon Mar 25, 2013
Sample ID#            -2000- LCS
Sample mass (mg) =  100.
 1. TC    = 1723. ug/g
13:31:17 Mon Mar 25, 2013
Sample ID#            1889-001
Sample mass (mg) =  1.7
 1. TC    = 735200. ug/g
13:38:30 Mon Mar 25, 2013
Sample ID#            1889-001
Sample mass (mg) =  1.
 1. TC    = 493100. ug/g
14:07:37 Mon Mar 25, 2013
Sample ID#            1889-002
Sample mass (mg) =  1.
 1. TC    = 351400. ug/g
14:15:06 Mon Mar 25, 2013
Sample ID#            1889-003
Sample mass (mg) =  1.
 1. TC    = 479100. ug/g
14:22:14 Mon Mar 25, 2013
Sample ID#            1889-004
Sample mass (mg) =  1.
 1. TC    = 445100. ug/g
14:29:03 Mon Mar 25, 2013
Sample ID#            1889-00~~4~~2 SSK 3/25/13  Dup
Sample mass (mg) =  1.4
 1. TC    = 349100. ug/g
14:36:03 Mon Mar 25, 2013
Sample ID#            1889-002 SPK
Sample mass (mg) =  1.3
 1. TC    = 733400. ug/g
14:44:08 Mon Mar 25, 2013
Sample ID#            1889-002 SPK
Sample mass (mg) =  1.1
 1. TC    = 735900. ug/g
15:06:18 Mon Mar 25, 2013
Sample ID#            1889-002 SPK
Sample mass (mg) =  1.
 1. TC    = 575300. ug/g
15:13:35 Mon Mar 25, 2013
Sample ID#            -4000 CCV *
Sample mass (mg) =  100.
 1. TC    = 3948. ug/g
15:21:10 Mon Mar 25, 2013
Sample ID#            -0-    CCB
Sample mass (mg) =  100.
 1. TC    = 21.26 ug/g
15:26:03 Mon Mar 25, 2013
```

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```
Sample ID#              -1-
Sample mass (mg) =  100.
 1. TC    = 174.4 ug/g
15:32:19 Mon Mar 25, 2013
Sample ID#              -2-
Sample mass (mg) =  100.
 1. TC    = 165.5 ug/g
15:38:45 Mon Mar 25, 2013
Sample ID#              -3-
Sample mass (mg) =  100.
 1. TC    = 176.4 ug/g
15:46:51 Mon Mar 25, 2013
Sample ID#              -4-
Sample mass (mg) =  100.
 1. TC    = 178.6 ug/g
15:53:37 Mon Mar 25, 2013
Sample ID#              -5-
Sample mass (mg) =  100.
 1. TC    = 168.1 ug/g
15:59:46 Mon Mar 25, 2013
Sample ID#              -6-
Sample mass (mg) =  100.
 1. TC    = 169.8 ug/g
16:05:57 Mon Mar 25, 2013
Sample ID#              -7-
Sample mass (mg) =  100.
 1. TC    = 170.5 ug/g
16:12:51 Mon Mar 25, 2013
Sample ID#              -8-
Sample mass (mg) =  100.
 1. TC    = 91.55 ug/g
16:19:31 Mon Mar 25, 2013
Sample ID#            -4000-
Sample mass (mg) =  100.
 1. TC    = 3988. ug/g
16:27:37 Mon Mar 25, 2013
Sample ID#              -0-
Sample mass (mg) =  100.
 1. TC    = 33.17 ug/g
16:35:10 Mon Mar 25, 2013
```

MDL 1
MDL 2
MDL 3
MDL 4
MDL 5
MDL 6
MDL 7
MDL V
CCV
CCB

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Columbia Analytical Services
Now part of the ALS Group
1565 Jefferson Rd., Rochester NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: _____ Date: 3/25/13

Analysis: TOC Soils by L. Kahn Method (EPA 1988)

Instrument: Dohrmann DC-190
with Boat Module and range extender

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (uLs)	Stock Sol (mg/L)	Final Vol (mg)	True Value (ug/g)
a) Calibration Std						
& Calibration Checks:	WC86043E, 09/24/12	WC86040B, 1/3/12				
b.) ICV Prep:	WC86043F, 09/24/12	WC86040A, 12/29/11	40	1000	100	4000
CCV Prep:		WC86044G, 11/12/12				
c) LCS Preparation:	WC86043G, 09/24/12	WC86045A, 01/22/13	20	10000	100	2000
d) Matrix Spike Prep.:	WC86043H, 09/24/12	WC86045A, 01/22/13	20	10000	See data sheet	
Curve Date:	9/24/2012					

Comments:

High Level: Linear Range is from 300 to 8000 ug/g based on 100 mg of sample, or 3000 to 80,000 ug/g based on 10 mg of sample, or 30,000 to 800,000 ug/g based on 1 mg of sample.

Samples are dried prior to weighing the sample aliquot. The results are therefore already as dry weight, and so are not corrected using the dry weight percent solid result.

p:\l\1\g\forms\coversht\allcover.xls TOC-Soils

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analysis: TOC Soils Analysis
Method: EPA Lloyd Kahn 1988
Analysis: TC Soils Analysis
Method: EPA Lloyd Kahn Modified
TOC#2 Dohrman DC190

Analyst: C. Woods
Pipet ID: Harry
Date: 09/24/12
Time: 15:30
Balance ID: AG-204

Curve Date: 09/24/12 Corr Coeff.: 1.0000
With 1 point calibration

Position #	Misc.	Order #	Sample Amt. (mg)	Result (ug/g)	Comments
1	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
2	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
3	TV= 4000	ICV	100.0	4027	100.7%
4		ICB	100.0	13.26	
5	TV= 2000	LCS	100.0	1919	96.0%
6	Curve Check	300	100.0	292.4	97.5%
7	Curve Check	500	100.0	461.2	92.2%
8	Curve Check	800	100.0	716.9	89.6%
9	Curve Check	1000	100.0	939.2	93.9%
10	Curve Check	3000	100.0	2975	99.2%
11	Curve Check	5000	100.0	4968	99.4%
12	Curve Check	8000	100.0	7858	98.2%

"Time Out Error": Baseline did not return after ignition to within 0.250 mV of the pre-ignition baseline.
Note: For TOC analysis, samples are treated with 1:1 HNO3 to remove any inorganic carbon. This is not done for TC analysis.
TIC = TC - TOC

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TOC-LK
Calibration 09/24/12
Analyst: CWoods
Pipets: Harry, Old Blue

Operating Parameters

```
nalysis set-up      1
TC   Analysis
Boat mode
ample size          50.
alibration factor    1.
ystem blank          0.
td. concentration =10000.
ample ID#            1
1. TC    = 4658. mg/l
2. TC    = 4662. mg/l
AVG  TC    = 4660. +/- 2.828     % std dev: 0.061
2:48:52 Mon Sep 24, 2012
alibration update:
alibration factor  2.146
ystem blank          0.
ample ID#           -4000-   ICV
ample mass (mg) =   100.
1. TC    = 4027. ug/g
3:13:45 Mon Sep 24, 2012
ample ID#           -0-      ICB
ample mass (mg) =   100.
l. TC    = 13.26 ug/g
3:27:48 Mon Sep 24, 2012
ample ID#           -2000-   LCS
mple mass (mg) =    100.
.. TC    = 1919. ug/g
3:47:05 Mon Sep 24, 2012
mple ID#            -300-    300 CAL CHECK
mple mass (mg) =    100.
. TC    = 292.4 ug/g
:08:12 Mon Sep 24, 2012
mple ID#            -500-    500 CAL CHECK
mple mass (mg) =    100.
. TC    = 461.2 ug/g
:25:42 Mon Sep 24, 2012
mple ID#            -800-    800 CAL CHECK
mple mass (mg) =    100.
. TC    = 716.9 ug/g
:40:59 Mon Sep 24, 2012
mple ID#            -1000-   1000 CAL CHECK
mple mass (mg) =    100.
. TC    = 939.2 ug/g
:51:35 Mon Sep 24, 2012
mple ID#            -3000-   3000 CAL CHECK
mple mass (mg) =    100.
. TC    = 2975. ug/g
:59:42 Mon Sep 24, 2012
mple ID#            -5000-   5000 CAL CHECK
mple mass (mg) =    100.
. TC    = 4968. ug/g
:12:23 Mon Sep 24, 2012
mple ID#            -8000-   8000 CAL CHECK
mple mass (mg) =    100.
 TC    = 7858. ug/g
20:27 Mon Sep 24, 2012
```

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09/24/12
TOC-LK
Analyst: CWoods
Pipets: Harry

```
Sample ID#              -4000-      CCV
Sample mass (mg) =  100.
1. TC    = 3932. ug/g
5:36:57 Mon Sep 24, 2012
Sample ID#              -0-         CCB
Sample mass (mg) =  100.
1. TC    = 58.66 ug/g
5:46:49 Mon Sep 24, 2012
Sample ID#              -2000-      LCS
Sample mass (mg) =  100.
1. TC    = 1926. ug/g
6:02:47 Mon Sep 24, 2012
Sample ID#              6183-001
ample mass (mg) =  87.6
1. TC    = 3122. ug/g
6:54:37 Mon Sep 24, 2012
ample ID#               6183-002    → >LR, Repeat
ample mass (mg) =  76.2
1. TC    = 14420. ug/g
7:03:20 Mon Sep 24, 2012
ample ID#               6183-003
ample mass (mg) =  100.
1. TC    = 872.1 ug/g
7:14:04 Mon Sep 24, 2012
ample ID#               6183-004
ample mass (mg) =  100.
1. TC    = 1310. ug/g
7:22:12 Mon Sep 24, 2012
ample ID#               6183-002
ample mass (mg) =  14.7
1. TC    = 14050. ug/g
7:29:21 Mon Sep 24, 2012
ample ID#               6183-005
ample mass (mg) =  53.3
1. TC    = 3209. ug/g
7:52:32 Mon Sep 24, 2012
ample ID#               6183-006
ample mass (mg) =  27.5
l. TC    = 3263. ug/g
3:03:15 Mon Sep 24, 2012
ample ID#               6183-006    DUP
ample mass (mg) =  31.4
l. TC    = 2908. ug/g
3:10:27 Mon Sep 24, 2012
ample ID#               6183-006    SPK
ample mass (mg) =  28.3
.. TC    = 8026. ug/g
3:21:13 Mon Sep 24, 2012
ample ID#               -4000-      CCV
ample mass (mg) =  100.
. TC    = 3889. ug/g
8:36:04 Mon Sep 24, 2012
ample ID#               -0-         CCB
ample mass (mg) =  100.
. TC    = 0.197 ug/g
:42:18 Mon Sep 24, 2012
```

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9/5/12 (A) TIC CALIBRATION STANDARDS - Fresh per calibration

Bulk

STD #	Conc'n (mg/L)	mL's 1000 ppm std (WC86041F)	Final Volume
1	0.00	0.00	100
2	1.00	0.10	100
3	5.00	0.50	100
4	10.00	1.00	100
5	30.00	3.00	100

(B) TIC LCS - Dilute 1mL 1000 ppm STD stock (WC86041F) to 100mL w/ UPDI in a volumetric flask. prepare fresh per run. TV=10.0 ppm

(C) TIC MATRIX SPIKE - Add 0.42 mL STD stock (WC86041F) to 42mL sample in vial. TV=10.0 ppm

(D) TIC ICV/CCV - Dilute 3.00 mL Ref Stock (WC86040B) to 200mL w/ UPDI in volumetric flask. Prepare fresh per run. TV=15.0 ppm.

Bulk, CMW 9/24/12 (E) TOC CALIBRATION STANDARDS BY LLOYD KAHN

Conc'n µg/L	µL 10000 ppm STD (WC86040B)
8000	80.0
5000	50.0
3000	30.0
1000	100.0
*800	80.0
500	50.0
300	30.0

*800 loss ion but not required

1/10 of WC86040B

(F) ICV/ICB - Analyze 40 µL of 10,000 ppm Reference (WC86040A) TV=4000 µg/g

(G) LCS - Analyze 20 µL of 10,000 ppm Standard (WC86040B) TV=2000 µg/g

(H) Matrix Spike - Add 20 µL of 10,000 ppm Standard (WC86040B) to sample and Analyze TV=(20 µL)(10000 ppm) / x g sample

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12/29/11 BWK (A) TOC Soils Reference Stock (10,000 ppm)

5.52 g KHP (WC85062C), previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL w/. UPDI in vol. flask. Store @ RT in Amber glass Exp 10/25/12.

1/3/12 BWK (B) TOC Soils Standard Stock (10,000 ppm)

5.52 g KHP (WC85169C), previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL w/. UPDI in vol flask. Store @ RT in Amber glass. Exp 1 yr. 1/3/13.

2/9/12 BWK (C) TIC 1000ppm Standard Stock

Dissolve 1.7648 g Na_2CO_3 (WC76294G) in 200 mL volumetric Flask. Bring to volume w/. DI. Store in Amber Glass. Exp 6/20/12.

(D) TIC 1000ppm Reference Stock

Dissolve 1.7648 g Na_2CO_3 (WC10306BG) in 200 mL volumetric Flask. Bring to volume w/. DI. Store in Amber Glass. Exp 2/9/13.

3/9/12 BWK (E) TOC 1000ppm Standard Stock

Dissolve 2.128 g KHP(WC85169C) previously dried @ 104°C for 2 hours to 1000 mL w/. UPDI volumetrically. Store @ RT in Amber Glass Exp 3/9/13

(F) TOC 1000ppm Reference Stock

Dissolve 2.128 g KHP(WC85062C) previously dried @ 104°C for 2 hours to 1000 mL w/. UPDI volumetrically. Store @ RT in Amber Glass Exp 10/25/12

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5/14/15

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10/26/12 (A) TOC 1000 ppm Reference Stock

BWK Dissolve 2.128 g KHP (WC103287F) previously dried @ 104°C for 2 hours to 1L w/ UPDI volumetrically. Store @ RT in Amber Glass. Exp 10/26/13

10/31/12 (B) TIC 1000 ppm Reference Stock

BWK Dissolve 1.7648 g Na_2CO_3 (WC112055C) in 200 mL volumetric flask. Bring to volume w/ DI. Store in Amber Glass. Exp 1 yr, 10/31/12.

(C) TIC CALIBRATION STANDARDS - FRESH PER CALIBRATION

STD #	CONC'N (mg/L)	mL'S 1000 ppm STD (WC86041F)	FINAL VOLUME (mL)
1	0.00	0.0	100
2	1.00	0.1	100
3	5.00	0.5	100
4	10.00	1.0	100
5	30.00	3.0	100

(D) TIC LCS - Dilute 1 mL 1000 ppm STD stock (WC86041F) to 100 mL volumetrically w/ UPDI prepare fresh per run. TV = 10.0 ppm

(E) TIC MATRIX SPIKE - Add 0.42 mL STD STOCK (WC86041F) to 42 mL sample in vial. TV = 10.0 ppm

(F) TIC ICV/CCV - Dilute 3.0 mL REF STOCK (WC86044B) to 200 mL volumetrically w/ UPDI. prepare fresh per run. TV = 15.0 ppm.

11/12/12 (G) TOC SOILS REFERENCE STOCK (10,000 ppm)

BWK 5.32 g KHP (WC103287F) previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL's w/ UPDI in vol flask. Store @ RT in Amber Glass. Exp 11/12/13

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SD 11/7/12

Signed Date Signed Date

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1/22/13 Blk (A) TOC SOILS STANDARD STOCK (10,000 ppm)

5.32g KHP (WC851696) previously dried @ 104°C for 2 hours and stored in dessicator → 250mL volumetrically w/. UPDI. Store @ RT in Amber Glass. Exp 6/24/13

2/13/13 Blk (B) TOC HIGH LEVEL CALIBRATION STANDARDS FOR OI 1010 - Fresh per calibration

STD #	CONC'N (mg/L)	mL 1000 ppm STD (WC860406E)	FINAL VOL. (mL) w/. UPDI
1	0.00	0.00	100
2	1.00	0.10	100
3	5.00	0.50	100
4	10.00	1.00	100
5	30.00	3.00	100

(C) TOC HIGH LEVEL LCS - TV=10.0ppm. prepare fresh per run. Add 1.0mL of 1000ppm Standard Stock (WC860406E) to a 100mL vol. flask. Dilute to vol. w/. DI.

(D) TOC HIGH LEVEL MATRIX SPIKE - TV=10.0 ppm. Add 0.42mL of 1000 ppm Standard stock (WC860406E) to ~~a 100mL flask~~ 4/15/13 4.2mL of sample in a vial.

(E) TOC HIGH LEVEL ICV/CCV - TV=15.0 ppm. prepare fresh per run. Add 3.0mL of 1000ppm reference Stock (WC86044A) to a 200mL vol. flask. Dilute to vol. w/. DI.

Blk 3/6/13 (F) TOC 1000 ppm STANDARD STOCK

Dissolve 2.128g KHP (WC851696) previously dried @ 104°C for 2 hours to 1000mL w/. DI Volumetrically store @ RT in Amber bottle. Exp 6/24/13

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CALIBRATION EQUATIONS

The following equations are used in the DC-190 system.

The equation for determining a calibrated result:

$$Y = (Fx - b) / V$$

Where:

- y = Concentration (calibrated) of sample
- x = NDIR peak with background subtracted. Normally invisible to the user. The displayed value, y, may be made to equal x by setting F, b, and V to the appropriate values (1, 0, and 1, respectively)
- F = "Calibration Factor". This is the slope of the linear fit line
- b = Intercept. This is an internal parameter which is invisible to the user
- SB = "System" Blank = b/V
- V = Sample volume (or mass)

To correct the Calculated Result when entering an incorrect Sample mass

$$\text{Actual Result} = \frac{(\text{Result from Instrument}) \times (\text{Incorrect mass})}{\text{Actual Mass}}$$

The quantities F and SB are the ones displayed on the calibration menu and are the ones which can be edited directly.

The Calibration Factor and Blank are calculated by:

$$F_n - F_o (C_s/Y_s)$$

$$b_n = b_o (Fn/F_o)$$

Where:

- C_s = Concentration of the standard
- o = Old value
- n = New value
- s = Value of Standard

Linear Ranges for TOC soil, L.Kahn Method
Based on 300 to 8000 ug/g linear range using 100 mg of std

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
100	300	8000
99	303	8081
98	306	8163
97	309	8247
96	313	8333
95	316	8421
94	319	8511
93	323	8602
92	326	8696
91	330	8791
90	333	8889
89	337	8989
88	341	9091
87	345	9195
86	349	9302
85	353	9412
84	357	9524
83	361	9639
82	366	9756
81	370	9877
80	375	10000
79	380	10127
78	385	10256
77	390	10390
76	395	10526
75	400	10667
74	405	10811
73	411	10959
72	417	11111
71	423	11268
70	429	11429
69	435	11594
68	441	11765
67	448	11940
66	455	12121
65	462	12308
64	469	12500
63	476	12698
62	484	12903
61	492	13115
60	500	13333
59	508	13559
58	517	13793
57	526	14035
56	536	14286
55	545	14545
54	556	14815

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
53	566	15094
52	577	15385
51	588	15686
50	600	16000
49	612	16327
48	625	16667
47	638	17021
46	652	17391
45	667	17778
44	682	18182
43	698	18605
42	714	19048
41	732	19512
40	750	20000
39	769	20513
38	789	21053
37	811	21622
36	833	22222
35	857	22857
34	882	23529
33	909	24242
32	938	25000
31	968	25806
30	1000	26667
29	1034	27586
28	1071	28571
27	1111	29630
26	1154	30769
25	1200	32000
24	1250	33333
23	1304	34783
22	1364	36364
21	1429	38095
20	1500	40000
19	1579	42105
18	1667	44444
17	1765	47059
16	1875	50000
15	2000	53333
14.9	2013	53691
14.8	2027	54054
14.7	2041	54422
14.6	2055	54795
14.5	2069	55172
14.4	2083	55556
14.3	2098	55944
14.2	2113	56338

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
14.1	2128	56738
14	2143	57143
13.9	2158	57554
13.8	2174	57971
13.7	2190	58394
13.6	2206	58824
13.5	2222	59259
13.4	2239	59701
13.3	2256	60150
13.2	2273	60606
13.1	2290	61069
13	2308	61538
12.9	2326	62016
12.8	2344	62500
12.7	2362	62992
12.6	2381	63492
12.5	2400	64000
12.4	2419	64516
12.3	2439	65041
12.2	2459	65574
12.1	2479	66116
12	2500	66667
11.9	2521	67227
11.8	2542	67797
11.7	2564	68376
11.6	2586	68966
11.5	2609	69565
11.4	2632	70175
11.3	2655	70796
11.2	2679	71429
11.1	2703	72072
11	2727	72727
10.9	2752	73394
10.8	2778	74074
10.7	2804	74766
10.6	2830	75472
10.5	2857	76190
10.4	2885	76923
10.3	2913	77670
10.2	2941	78431
10.1	2970	79208
10	3000	80000
9.9	3030	80808
9.8	3061	81633
9.7	3093	82474
9.6	3125	83333
9.5	3158	84211

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
9.4	3191	85106
9.3	3226	86022
9.2	3261	86957
9.1	3297	87912
9	3333	88889
8.9	3371	89888
8.8	3409	90909
8.7	3448	91954
8.6	3488	93023
8.5	3529	94118
8.4	3571	95238
8.3	3614	96386
8.2	3659	97561
8.1	3704	98765
8	3750	100000
7.9	3797	101266
7.8	3846	102564
7.7	3896	103896
7.6	3947	105263
7.5	4000	106667
7.4	4054	108108
7.3	4110	109589
7.2	4167	111111
7.1	4225	112676
7	4286	114286
6.9	4348	115942
6.8	4412	117647
6.7	4478	119403
6.6	4545	121212
6.5	4615	123077
6.4	4687	125000
6.3	4762	126984
6.2	4839	129032
6.1	4918	131148
6	5000	133333
5.9	5085	135593
5.8	5172	137931
5.7	5263	140351
5.6	5357	142857
5.5	5455	145455
5.4	5556	148148
5.3	5660	150943
5.2	5769	153846
5.1	5882	156863
5	6000	160000

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
4.9	6122	163265
4.8	6250	166667
4.7	6383	170213
4.6	6522	173913
4.5	6667	177778
4.4	6818	181818
4.3	6977	186047
4.2	7143	190476
4.1	7317	195122
4	7500	200000
3.9	7692	205128
3.8	7895	210526
3.7	8108	216216
3.6	8333	222222
3.5	8571	228571
3.4	8824	235294
3.3	9091	242424
3.2	9375	250000
3.1	9677	258065
3	10000	266667
2.9	10345	275862
2.8	10714	285714
2.7	11111	296296
2.6	11538	307692
2.5	12000	320000
2.4	12500	333333
2.3	13043	347826
2.2	13636	363636
2.1	14286	380952
2	15000	400000
1.9	15789	421053
1.8	16667	444444
1.7	17647	470588
1.6	18750	500000
1.5	20000	533333
1.4	21429	571429
1.3	23077	615385
1.2	25000	666667
1.1	27273	727273
1	30000	800000

con-test®
ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 16, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland and Manor, NY
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13D0085

Enclosed are results of analyses for samples received by the laboratory on April 2, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13D0085

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD512-1-1.5	13D0085-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-2-2.5	13D0085-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-3-3.5	13D0085-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-3-3.5-1	13D0085-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-4-4.5	13D0085-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-1-1.5	13D0085-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-2-2.5	13D0085-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-3-3.5	13D0085-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-4-4.5	13D0085-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-2-2.5	13D0085-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-3-3.5	13D0085-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-3-3.5-1	13D0085-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-4-4.5	13D0085-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Calcium, Iron

13D0085-01[WTSD512-1-1.5], 13D0085-02[WTSD512-2-2.5], 13D0085-03[WTSD512-3-3.5], 13D0085-04[WTSD512-3-3.5-1], 13D0085-05[WTSD512-4-4.5], 13D0085-06[PASD607-1-1.5], 13D0085-07[PASD607-2-2.5], 13D0085-08[PASD607-3-3.5], 13D0085-09[PASD607-4-4.5], 13D0085-10[BRSD721-2-2.5], B070276-BLK1, 13D0085-11[BRSD721-3-3.5], 13D0085-12[BRSD721-3-3.5-1], 13D0085-13[BRSD721-4-4.5], B070242-BLK1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY Sample Description: Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-1-1.5 Sampled: 3/29/2013 10:00

Sample ID: 13D0085-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	8.7	3.7	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Antimony	ND	8.7	7.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Arsenic	9.5	8.7	3.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Barium	550	8.7	1.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Beryllium	ND	0.87	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Cadmium	2.8	0.87	0.51	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Calcium	13000	26	4.7	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/8/13 10:35	OP
Chromium	110	1.7	0.43	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Cobalt	23	8.7	0.55	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Copper	340	1.7	1.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Iron	12000	8.7	7.4	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Lead	16	2.6	1.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Magnesium	5500	26	2.7	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Manganese	170	1.7	0.55	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 19:36	OP
Mercury	0.069	0.087	0.026	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 12:08	SAJ
Nickel	410	1.7	0.42	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Potassium	1200	350	59	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 19:36	OP
Selenium	17	8.7	2.7	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Sodium	730	350	170	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Thallium	5.5	8.7	2.9	mg/Kg dry	1	J	SW-846 6010C	4/3/13	4/5/13 19:36	OP
Vanadium	64	3.5	0.57	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP
Zinc	73	3.5	0.89	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:35	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-1-1.5 | Sampled: 3/29/2013 10:00

Sample ID: 13D0085-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	28.7		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-2-2.5 | Sampled: 3/29/2013 10:05

Sample ID: 13D0085-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6900	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Arsenic	1.1	2.9	1.0	mg/Kg dry	1	J	SW-846 6010C	4/3/13	4/3/13 20:26	OP
Barium	81	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Calcium	1800	8.6	1.6	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/3/13 20:26	OP
Chromium	22	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Cobalt	8.8	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Copper	28	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Iron	10000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:39	OP
Lead	5.3	0.86	0.40	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Magnesium	3100	8.6	0.90	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Manganese	73	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 19:42	OP
Mercury	ND	0.031	0.0092	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:10	SAJ
Nickel	31	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Potassium	1000	120	20	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 19:42	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Sodium	170	120	56	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Thallium	ND	2.9	0.95	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 19:42	OP
Vanadium	26	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP
Zinc	40	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:26	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-2-2.5 | Sampled: 3/29/2013 10:05

Sample ID: 13D0085-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.7		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-3-3.5 | Sampled: 3/29/2013 10:10

Sample ID: 13D0085-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4700	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Barium	65	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Calcium	1700	8.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/3/13 20:31	OP
Chromium	15	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Cobalt	4.1	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Copper	12	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Iron	7500	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:44	OP
Lead	3.0	0.87	0.40	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Magnesium	2300	8.7	0.90	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Manganese	53	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:07	OP
Mercury	ND	0.029	0.0085	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:16	SAJ
Nickel	11	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Potassium	870	120	20	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:07	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Sodium	150	120	56	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:07	OP
Vanadium	10	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP
Zinc	23	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:31	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-3-3.5 | Sampled: 3/29/2013 10:10

Sample ID: 13D0085-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-3-3.5-1 | Sampled: 3/29/2013 16:00

Sample ID: 13D0085-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Barium	52	2.6	0.33	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Calcium	1400	7.9	1.4	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/3/13 20:36	OP
Chromium	13	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Cobalt	3.9	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Copper	12	0.52	0.40	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Iron	6600	2.6	2.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:49	OP
Lead	2.9	0.79	0.36	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Magnesium	2000	7.9	0.82	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Manganese	52	0.52	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:12	OP
Mercury	ND	0.028	0.0083	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:17	SAJ
Nickel	11	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Potassium	710	100	18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:12	OP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Sodium	110	100	51	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:12	OP
Vanadium	9.3	1.0	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP
Zinc	21	1.0	0.27	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:36	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY Sample Description: Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-3-3.5-1 Sampled: 3/29/2013 16:00

Sample ID: 13D0085-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.2		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-4-4.5 | Sampled: 3/29/2013 10:15

Sample ID: 13D0085-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4800	2.7	1.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Barium	76	2.7	0.33	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Calcium	1800	8.1	1.5	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/3/13 20:40	OP
Chromium	15	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Cobalt	9.1	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Copper	26	0.54	0.41	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Iron	9400	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 10:54	OP
Lead	3.8	0.81	0.37	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Magnesium	2500	8.1	0.84	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Manganese	88	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:18	OP
Mercury	ND	0.028	0.0084	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:19	SAJ
Nickel	21	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Potassium	830	110	18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:18	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Sodium	140	110	52	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:18	OP
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP
Zinc	27	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 20:40	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: WTSD512-4-4.5 | Sampled: 3/29/2013 10:15

Sample ID: 13D0085-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.3		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-1-1.5 | Sampled: 3/29/2013 10:30

Sample ID: 13D0085-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	15	6.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Arsenic	ND	15	5.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Barium	210	15	1.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Beryllium	ND	1.5	0.23	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Cadmium	ND	1.5	0.86	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Calcium	9000	44	7.9	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/5/13 20:23	OP
Chromium	49	2.9	0.73	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Cobalt	30	15	0.93	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Copper	2600	2.9	2.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Iron	17000	15	12	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 11:19	OP
Lead	26	4.4	2.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Magnesium	4800	44	4.6	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Manganese	690	2.9	0.92	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:23	OP
Mercury	0.12	0.15	0.044	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 12:21	SAJ
Nickel	370	2.9	0.70	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Potassium	1100	580	100	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:23	OP
Selenium	64	15	4.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Silver	ND	2.9	2.6	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Sodium	630	580	280	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Thallium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:23	OP
Vanadium	26	5.8	0.96	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP
Zinc	76	5.8	1.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:04	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-1-1.5 | Sampled: 3/29/2013 10:30

Sample ID: 13D0085-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	16.5		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-2-2.5 | Sampled: 3/29/2013 10:35

Sample ID: 13D0085-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5300	9.1	3.9	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Antimony	ND	9.1	7.4	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Arsenic	ND	9.1	3.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Barium	170	9.1	1.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Beryllium	ND	0.91	0.15	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Cadmium	ND	0.91	0.54	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Calcium	9000	27	4.9	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/5/13 20:29	OP
Chromium	47	1.8	0.46	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Cobalt	16	9.1	0.58	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Copper	1100	1.8	1.4	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Iron	10000	9.1	7.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 11:24	OP
Lead	14	2.7	1.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Magnesium	4200	27	2.9	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Manganese	320	1.8	0.58	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:29	OP
Mercury	0.051	0.089	0.026	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 12:22	SAJ
Nickel	180	1.8	0.44	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Potassium	650	370	63	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:29	OP
Selenium	23	9.1	2.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Sodium	410	370	180	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Thallium	ND	9.1	3.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:29	OP
Vanadium	21	3.7	0.60	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP
Zinc	42	3.7	0.94	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:09	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-2-2.5 | Sampled: 3/29/2013 10:35

Sample ID: 13D0085-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	27.6		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-3-3.5 | Sampled: 3/29/2013 10:40

Sample ID: 13D0085-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	5.8	2.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Antimony	ND	5.8	4.7	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Arsenic	ND	5.8	2.1	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Barium	91	5.8	0.72	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Beryllium	ND	0.58	0.093	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Cadmium	ND	0.58	0.34	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Calcium	4900	17	3.1	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/5/13 20:34	OP
Chromium	23	1.2	0.29	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Cobalt	9.3	5.8	0.37	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Copper	510	1.2	0.88	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Iron	9100	5.8	4.9	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 11:29	OP
Lead	7.4	1.7	0.80	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Magnesium	3000	17	1.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Manganese	170	1.2	0.37	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:34	OP
Mercury	0.050	0.057	0.017	mg/Kg dry	1	J	SW-846 7471B	4/2/13	4/3/13 12:24	SAJ
Nickel	80	1.2	0.28	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Potassium	1000	230	40	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:34	OP
Selenium	ND	5.8	1.8	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Silver	ND	1.2	1.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Sodium	250	230	110	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Thallium	ND	5.8	1.9	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:34	OP
Vanadium	15	2.3	0.38	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP
Zinc	29	2.3	0.60	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:14	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-3-3.5 | Sampled: 3/29/2013 10:40

Sample ID: 13D0085-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	43.3		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-4-4.5 | Sampled: 3/29/2013 10:45

Sample ID: 13D0085-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4100	2.7	1.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Arsenic	1.3	2.7	0.99	mg/Kg dry	1	J	SW-846 6010C	4/3/13	4/3/13 21:19	OP
Barium	43	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Calcium	3500	8.2	1.5	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/5/13 20:39	OP
Chromium	8.5	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Cobalt	7.4	2.7	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Copper	33	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Iron	11000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 11:34	OP
Lead	4.2	0.82	0.38	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Magnesium	3500	8.2	0.86	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Manganese	210	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:39	OP
Mercury	ND	0.029	0.0086	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:26	SAJ
Nickel	17	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Potassium	1000	110	19	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:39	OP
Selenium	ND	2.7	0.85	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Sodium	120	110	53	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:39	OP
Vanadium	15	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP
Zinc	22	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:19	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: PASD607-4-4.5 | Sampled: 3/29/2013 10:45

Sample ID: 13D0085-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.1		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-2-2.5 | Sampled: 3/29/2013 10:50

Sample ID: 13D0085-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Antimony	ND	3.0	2.5	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Arsenic	1.4	3.0	1.1	mg/Kg dry	1	J	SW-846 6010C	4/3/13	4/3/13 21:23	OP
Barium	32	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Beryllium	ND	0.30	0.049	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Calcium	2500	9.1	1.6	mg/Kg dry	1	B-07	SW-846 6010C	4/3/13	4/5/13 20:45	OP
Chromium	15	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Cobalt	7.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Copper	22	0.61	0.46	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Iron	13000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	4/3/13	4/8/13 11:38	OP
Lead	2.9	0.91	0.42	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Magnesium	3900	9.1	0.95	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Manganese	82	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:45	OP
Mercury	ND	0.030	0.0089	mg/Kg dry	1		SW-846 7471B	4/2/13	4/3/13 12:27	SAJ
Nickel	23	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Potassium	960	120	21	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:45	OP
Selenium	ND	3.0	0.94	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Sodium	140	120	59	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/3/13	4/5/13 20:45	OP
Vanadium	15	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP
Zinc	23	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/3/13	4/3/13 21:23	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-2-2.5 | Sampled: 3/29/2013 10:50

Sample ID: 13D0085-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.7		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-3-3.5 | Sampled: 3/29/2013 10:55

Sample ID: 13D0085-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Arsenic	ND	2.8	0.99	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Barium	42	2.8	0.34	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Beryllium	ND	0.28	0.044	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:03	OP
Cadmium	0.38	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Calcium	4500	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Chromium	15	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Cobalt	7.5	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Copper	22	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:03	OP
Iron	14000	2.8	2.4	mg/Kg dry	1	B-07	SW-846 6010C	4/2/13	4/4/13 17:03	OP
Lead	5.7	0.83	0.38	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Magnesium	6000	8.3	0.86	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Manganese	130	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Mercury	ND	0.029	0.0087	mg/Kg dry	1		SW-846 7471B	4/4/13	4/4/13 15:00	SAJ
Nickel	20	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:03	OP
Sodium	200	110	54	mg/Kg dry	1		SW-846 6010C	4/2/13	4/9/13 10:25	OP
Thallium	ND	2.8	0.91	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Vanadium	21	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP
Zinc	35	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:53	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-3-3.5 | Sampled: 3/29/2013 10:55

Sample ID: 13D0085-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.4		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-3-3.5-1 | Sampled: 3/29/2013 16:05

Sample ID: 13D0085-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	2.7	1.2	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Arsenic	1.0	2.7	0.97	mg/Kg dry	1	J	SW-846 6010C	4/2/13	4/3/13 20:58	OP
Barium	31	2.7	0.33	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:08	OP
Cadmium	0.32	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Calcium	3900	8.0	1.5	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Chromium	11	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Cobalt	6.3	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Copper	17	0.54	0.41	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:08	OP
Iron	12000	2.7	2.3	mg/Kg dry	1	B-07	SW-846 6010C	4/2/13	4/4/13 17:08	OP
Lead	4.0	0.80	0.37	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Magnesium	4400	8.0	0.84	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Manganese	110	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Mercury	ND	0.029	0.0085	mg/Kg dry	1		SW-846 7471B	4/5/13	4/5/13 13:36	SAJ
Nickel	14	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Potassium	980	110	18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:08	OP
Sodium	240	110	52	mg/Kg dry	1		SW-846 6010C	4/2/13	4/9/13 10:31	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Vanadium	15	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP
Zinc	33	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 20:58	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-3-3.5-1 | Sampled: 3/29/2013 16:05

Sample ID: 13D0085-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.0		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-4-4.5 | Sampled: 3/29/2013 11:10

Sample ID: 13D0085-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Barium	52	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Beryllium	ND	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:28	OP
Cadmium	0.47	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Calcium	3900	8.7	1.6	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Chromium	14	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Cobalt	8.1	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Copper	24	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:28	OP
Iron	15000	2.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	4/2/13	4/4/13 17:28	OP
Lead	6.7	0.87	0.40	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Magnesium	5700	8.7	0.91	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Manganese	190	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Mercury	0.0092	0.029	0.0087	mg/Kg dry	1	J	SW-846 7471B	4/5/13	4/5/13 13:37	SAJ
Nickel	18	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Potassium	1500	120	20	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/2/13	4/4/13 17:28	OP
Sodium	250	120	56	mg/Kg dry	1		SW-846 6010C	4/2/13	4/9/13 11:07	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Vanadium	23	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP
Zinc	44	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/2/13	4/3/13 21:04	OP

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Project Location: Cortland and Manor, NY | Sample Description: | Work Order: 13D0085

Date Received: 4/2/2013

Field Sample #: BRSD721-4-4.5 | Sampled: 3/29/2013 11:10

Sample ID: 13D0085-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.1		% Wt	1		SM 2540G	4/2/13	4/3/13 15:23	EW

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13D0085-01 [WTSD512-1-1.5]	B070240	04/02/13
13D0085-02 [WTSD512-2-2.5]	B070240	04/02/13
13D0085-03 [WTSD512-3-3.5]	B070240	04/02/13
13D0085-04 [WTSD512-3-3.5-1]	B070240	04/02/13
13D0085-05 [WTSD512-4-4.5]	B070240	04/02/13
13D0085-06 [PASD607-1-1.5]	B070240	04/02/13
13D0085-07 [PASD607-2-2.5]	B070240	04/02/13
13D0085-08 [PASD607-3-3.5]	B070240	04/02/13
13D0085-09 [PASD607-4-4.5]	B070240	04/02/13
13D0085-10 [BRSD721-2-2.5]	B070240	04/02/13
13D0085-11 [BRSD721-3-3.5]	B070240	04/02/13
13D0085-12 [BRSD721-3-3.5-1]	B070240	04/02/13
13D0085-13 [BRSD721-4-4.5]	B070240	04/02/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13D0085-11 [BRSD721-3-3.5]	B070242	1.06	50.0	04/02/13
13D0085-12 [BRSD721-3-3.5-1]	B070242	1.08	50.0	04/02/13
13D0085-13 [BRSD721-4-4.5]	B070242	1.02	50.0	04/02/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13D0085-01 [WTSD512-1-1.5]	B070276	1.01	50.0	04/03/13
13D0085-02 [WTSD512-2-2.5]	B070276	1.09	50.0	04/03/13
13D0085-03 [WTSD512-3-3.5]	B070276	1.00	50.0	04/03/13
13D0085-04 [WTSD512-3-3.5-1]	B070276	1.08	50.0	04/03/13
13D0085-05 [WTSD512-4-4.5]	B070276	1.07	50.0	04/03/13
13D0085-06 [PASD607-1-1.5]	B070276	1.04	50.0	04/03/13
13D0085-07 [PASD607-2-2.5]	B070276	0.992	50.0	04/03/13
13D0085-08 [PASD607-3-3.5]	B070276	0.998	50.0	04/03/13
13D0085-09 [PASD607-4-4.5]	B070276	1.08	50.0	04/03/13
13D0085-10 [BRSD721-2-2.5]	B070276	1.02	50.0	04/03/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13D0085-01 [WTSD512-1-1.5]	B070235	0.601	50.0	04/02/13
13D0085-02 [WTSD512-2-2.5]	B070235	0.606	50.0	04/02/13
13D0085-03 [WTSD512-3-3.5]	B070235	0.604	50.0	04/02/13
13D0085-04 [WTSD512-3-3.5-1]	B070235	0.609	50.0	04/02/13
13D0085-05 [WTSD512-4-4.5]	B070235	0.607	50.0	04/02/13
13D0085-06 [PASD607-1-1.5]	B070235	0.614	50.0	04/02/13
13D0085-07 [PASD607-2-2.5]	B070235	0.613	50.0	04/02/13
13D0085-08 [PASD607-3-3.5]	B070235	0.608	50.0	04/02/13
13D0085-09 [PASD607-4-4.5]	B070235	0.612	50.0	04/02/13
13D0085-10 [BRSD721-2-2.5]	B070235	0.620	50.0	04/02/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13D0085-11 [BRSD721-3-3.5]	B070361	0.601	50.0	04/04/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13D0085-12 [BRSD721-3-3.5-1]	B070435	0.609	50.0	04/05/13
13D0085-13 [BRSD721-4-4.5]	B070435	0.601	50.0	04/05/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070235 - SW-846 7471										
Blank (B070235-BLK1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070235-BS1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	3.16	0.33	mg/Kg wet	4.05		78.1	71.6-128.1			
LCS Dup (B070235-BSD1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Mercury	3.71	0.33	mg/Kg wet	4.05		91.5	71.6-128.1	15.8	30	
Batch B070242 - SW-846 3050B										
Blank (B070242-BLK1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	3.1	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B070242-BS1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Aluminum	7750	5.0	mg/Kg wet	8360		92.7	40.4-159.1			
Antimony	93.7	5.0	mg/Kg wet	92.9		101	8.2-191.6			
Arsenic	96.9	5.0	mg/Kg wet	94.5		103	82.2-117.5			
Barium	169	5.0	mg/Kg wet	166		102	83.1-116.3			
Beryllium	56.1	0.50	mg/Kg wet	52.6		107	83.8-116.2			
Cadmium	61.6	0.50	mg/Kg wet	59.9		103	84-115.9			
Calcium	6230	15	mg/Kg wet	6160		101	82.3-117.5			
Chromium	70.2	1.0	mg/Kg wet	69.3		101	81.4-118.6			
Cobalt	104	5.0	mg/Kg wet	101		103	83.8-115.8			
Copper	83.2	1.0	mg/Kg wet	78.0		107	83.7-116.2			
Iron	11400	5.0	mg/Kg wet	12800		89.2	50.6-149.2			
Lead	89.3	1.5	mg/Kg wet	91.7		97.4	82.4-117.8			
Magnesium	3080	15	mg/Kg wet	3030		102	76.2-123.8			
Manganese	279	1.0	mg/Kg wet	283		98.6	81.6-118			
Nickel	57.2	1.0	mg/Kg wet	56.6		101	82.2-117.8			
Potassium	4020	200	mg/Kg wet	3820		105	73.6-126.4			
Selenium	157	5.0	mg/Kg wet	159		98.9	79.2-120.8			
Silver	33.7	1.0	mg/Kg wet	33.9		99.3	66.4-133.9			
Sodium	799	200	mg/Kg wet	652		123	73.6-126.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070242 - SW-846 3050B										
LCS (B070242-BS1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Thallium	119	5.0	mg/Kg wet	119		99.6	81.1-119.3			
Vanadium	59.5	2.0	mg/Kg wet	56.3		106	72.8-127.2			
Zinc	139	2.0	mg/Kg wet	137		102	81-119			
LCS Dup (B070242-BSD1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Aluminum	7660	5.0	mg/Kg wet	8360		91.6	40.4-159.1	1.22	30	
Antimony	91.3	5.0	mg/Kg wet	92.9		98.3	8.2-191.6	2.56	30	
Arsenic	97.4	5.0	mg/Kg wet	94.5		103	82.2-117.5	0.509	30	
Barium	172	5.0	mg/Kg wet	166		104	83.1-116.3	1.75	30	
Beryllium	56.8	0.50	mg/Kg wet	52.6		108	83.8-116.2	1.35	30	
Cadmium	62.4	0.50	mg/Kg wet	59.9		104	84-115.9	1.32	30	
Calcium	6300	15	mg/Kg wet	6160		102	82.3-117.5	1.07	30	
Chromium	71.1	1.0	mg/Kg wet	69.3		103	81.4-118.6	1.28	30	
Cobalt	105	5.0	mg/Kg wet	101		104	83.8-115.8	1.06	30	
Copper	82.9	1.0	mg/Kg wet	78.0		106	83.7-116.2	0.452	30	
Iron	11600	5.0	mg/Kg wet	12800		90.5	50.6-149.2	1.39	30	
Lead	89.5	1.5	mg/Kg wet	91.7		97.6	82.4-117.8	0.207	30	
Magnesium	3060	15	mg/Kg wet	3030		101	76.2-123.8	0.683	30	
Manganese	283	1.0	mg/Kg wet	283		100	81.6-118	1.51	30	
Nickel	57.5	1.0	mg/Kg wet	56.6		102	82.2-117.8	0.472	30	
Potassium	3980	200	mg/Kg wet	3820		104	73.6-126.4	1.14	30	
Selenium	162	5.0	mg/Kg wet	159		102	79.2-120.8	2.80	30	
Silver	34.3	1.0	mg/Kg wet	33.9		101	66.4-133.9	1.84	30	
Sodium	800	200	mg/Kg wet	652		123	73.6-126.2	0.149	30	
Thallium	119	5.0	mg/Kg wet	119		99.7	81.1-119.3	0.157	30	
Vanadium	59.7	2.0	mg/Kg wet	56.3		106	72.8-127.2	0.266	30	
Zinc	140	2.0	mg/Kg wet	137		102	81-119	0.340	30	
MRL Check (B070242-MRL1)				Prepared: 04/02/13 Analyzed: 04/03/13						
Lead	0.808	0.73	mg/Kg wet	0.731		110	80-120			
Batch B070276 - SW-846 3050B										
Blank (B070276-BLK1)				Prepared & Analyzed: 04/03/13						
Aluminum	1.7	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	14	7.5	mg/Kg wet							B-07
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	0.67	0.75	mg/Kg wet							J
Magnesium	3.3	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070276 - SW-846 3050B										
Blank (B070276-BLK1)				Prepared: 04/03/13 Analyzed: 04/05/13						
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.72	1.0	mg/Kg wet							J
LCS (B070276-BS1)				Prepared & Analyzed: 04/03/13						
Aluminum	6350	5.0	mg/Kg wet	8360		76.0	40.4-159.1			
Antimony	74.1	5.0	mg/Kg wet	92.9		79.8	8.2-191.6			
Arsenic	92.6	5.0	mg/Kg wet	94.5		98.0	82.2-117.5			
Barium	166	5.0	mg/Kg wet	166		100	83.1-116.3			
Beryllium	57.1	0.50	mg/Kg wet	52.6		108	83.8-116.2			
Cadmium	54.5	0.50	mg/Kg wet	59.9		90.9	84-115.9			
Calcium	6250	15	mg/Kg wet	6160		101	82.3-117.5			
Chromium	67.2	1.0	mg/Kg wet	69.3		96.9	81.4-118.6			
Cobalt	97.7	5.0	mg/Kg wet	101		96.7	83.8-115.8			
Copper	78.2	1.0	mg/Kg wet	78.0		100	83.7-116.2			
Iron	11000	5.0	mg/Kg wet	12800		85.9	50.6-149.2			
Lead	88.3	1.5	mg/Kg wet	91.7		96.3	82.4-117.8			
Magnesium	2680	15	mg/Kg wet	3030		88.4	76.2-123.8			
Manganese	278	1.0	mg/Kg wet	283		98.3	81.6-118			
Nickel	57.7	1.0	mg/Kg wet	56.6		102	82.2-117.8			
Potassium	3720	200	mg/Kg wet	3820		97.4	73.6-126.4			
Selenium	156	5.0	mg/Kg wet	159		98.3	79.2-120.8			
Silver	29.9	1.0	mg/Kg wet	33.9		88.2	66.4-133.9			
Sodium	717	200	mg/Kg wet	652		110	73.6-126.2			
Thallium	111	5.0	mg/Kg wet	119		93.6	81.1-119.3			
Vanadium	55.4	2.0	mg/Kg wet	56.3		98.4	72.8-127.2			
Zinc	131	2.0	mg/Kg wet	137		95.4	81-119			
LCS Dup (B070276-BSD1)				Prepared & Analyzed: 04/03/13						
Aluminum	6300	5.0	mg/Kg wet	8360		75.4	40.4-159.1	0.791	30	
Antimony	73.8	5.0	mg/Kg wet	92.9		79.5	8.2-191.6	0.406	30	
Arsenic	89.4	5.0	mg/Kg wet	94.5		94.6	82.2-117.5	3.50	30	
Barium	163	5.0	mg/Kg wet	166		98.0	83.1-116.3	2.17	30	
Beryllium	55.8	0.50	mg/Kg wet	52.6		106	83.8-116.2	2.32	30	
Cadmium	53.5	0.50	mg/Kg wet	59.9		89.3	84-115.9	1.84	30	
Calcium	5910	15	mg/Kg wet	6160		95.9	82.3-117.5	5.64	30	
Chromium	66.3	1.0	mg/Kg wet	69.3		95.7	81.4-118.6	1.26	30	
Cobalt	96.5	5.0	mg/Kg wet	101		95.6	83.8-115.8	1.18	30	
Copper	77.8	1.0	mg/Kg wet	78.0		99.7	83.7-116.2	0.476	30	
Iron	10200	5.0	mg/Kg wet	12800		80.1	50.6-149.2	7.00	30	
Lead	85.6	1.5	mg/Kg wet	91.7		93.4	82.4-117.8	3.08	30	
Magnesium	2650	15	mg/Kg wet	3030		87.6	76.2-123.8	0.882	30	
Manganese	266	1.0	mg/Kg wet	283		93.9	81.6-118	4.53	30	
Nickel	57.4	1.0	mg/Kg wet	56.6		101	82.2-117.8	0.512	30	
Potassium	3640	200	mg/Kg wet	3820		95.4	73.6-126.4	2.05	30	
Selenium	149	5.0	mg/Kg wet	159		93.8	79.2-120.8	4.73	30	
Silver	29.4	1.0	mg/Kg wet	33.9		86.7	66.4-133.9	1.76	30	
Sodium	700	200	mg/Kg wet	652		107	73.6-126.2	2.33	30	
Thallium	109	5.0	mg/Kg wet	119		91.7	81.1-119.3	2.09	30	
Vanadium	52.6	2.0	mg/Kg wet	56.3		93.4	72.8-127.2	5.14	30	
Zinc	128	2.0	mg/Kg wet	137		93.2	81-119	2.31	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B070276 - SW-846 3050B										
MRL Check (B070276-MRL1)				Prepared: 04/03/13 Analyzed: 04/05/13						
Lead	0.653	0.71	mg/Kg wet	0.714		91.4	80-120			J
Batch B070361 - SW-846 7471										
Blank (B070361-BLK1)				Prepared & Analyzed: 04/04/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070361-BS1)				Prepared & Analyzed: 04/04/13						
Mercury	4.36	0.33	mg/Kg wet	4.05		108	71.6-128.1			
LCS Dup (B070361-BSD1)				Prepared & Analyzed: 04/04/13						
Mercury	4.33	0.33	mg/Kg wet	4.05		107	71.6-128.1	0.618	30	
Batch B070435 - SW-846 7471										
Blank (B070435-BLK1)				Prepared & Analyzed: 04/05/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B070435-BS1)				Prepared & Analyzed: 04/05/13						
Mercury	4.03	0.33	mg/Kg wet	4.05		99.4	71.6-128.1			
LCS Dup (B070435-BSD1)				Prepared & Analyzed: 04/05/13						
Mercury	5.12	0.33	mg/Kg wet	4.05		126	71.6-128.1	23.9	30	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2013
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

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Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

13D0085

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR Engineering Inc
Address: 1 Blue Hill Plz, 12TH Flr
Pearl River, NY 10965
Attention: Amita Patel
Project Location: Magna Metals
Sampled By: AW, KH

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☑ EMAIL ○ WEBSITE
Fax #
Email: APATEL@HDRINC.com
Format: ☑ PDF ☑ EXCEL ○ GIS
☑ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	# of Containers	** Preservation	***Container Code
1	WTSD512-1-1.5	3/29/13	10:00		X	S	✓	X			
2	WTSD512-2-2.5		10:05		X	S	U	X			
3	WTSD512-3-3.5		10:10		X	S	U	X			
4	WTSD512-3-3.5-1		1600		X	S	U	X			
5	WTSD512-4-4.5		10:15		X	S	U	X			
6	PASD607-1-1.5		10:30		X	S	U	X			
7	PASD607-2-2.5		10:35		X	S	U	X			
8	PASD607-3-3.5		10:40		X	S	U	X			
9	PASD607-4-4.5		10:45		X	S	U	X			
10	BRSD721-2-2.5	↓	1050		X	S	U	X			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Kathleen Hanson	3/29/13 1500
Received by: (signature)	Date/Time:
HDR LAB (Paul A. Moccia)	3/29/13 1500
Relinquished by: (signature)	Date/Time:
Paul A. Moccia / KH 1600	4/1/13
Received by: (signature)	Date/Time:
Will Cannon 4-4 4/2/13	1317

Turnaround ††
☐ 7-Day
☑ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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CHAIN OF CUSTODY RECORD

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13D0085

Rev 04.05.12

Company Name: HDR Engineering Inc
Address: 1 Blue Hill Plaza 12th Flr
Pearl River NY 10965
Attention: Amita Patel
Project Location: Magna Metals
Sampled By: AW, KH

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ⊘EMAIL ○WEBSITE
Fax #
Email: APATEL@HDRINC.com
Format: ⊘PDF ⊘EXCEL ○GIS
⊘OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	1	I	A	TAL METALS	# of Containers	** Preservation	***Container Code
11	BRSD721-3-3.5	3/29/13	10:55		x	S	U				x	2		
12	BRSD721-3-3.5-1	↓	16:05		x	S	U				x	2		
13	BRSD721-4-4.5	↓	11:00		x	S	U				x	2		

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	3/29/13 1500
Received by: (signature) HDR LAB (Paul A. Moccia)	Date/Time: 3/29/13 1500
Relinquished by: (signature) Paul A. Moccia HH 1600	Date/Time: 4/1/13
Received by: (signature) 4.4	Date/Time: 4/2/13 1317

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

*****Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other _____

***Matrix Code:**
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other _____

Dissolved Metals
○ Field Filtered
○ Lab to Filter

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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United States

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1Z98A37E2210013622

Updated: 4/2/2013
1:17 P.M. Eastern Time

Delivered

Delivered On:
Tuesday, 04/02/2013, at 10:10 AM

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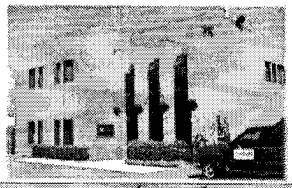

Sample Receipt Checklist

CLIENT NAME: HDR Eng **RECEIVED BY:** WF **DATE:** 4/2/13

1) **Was the chain(s) of custody relinquished and signed?** **Yes** No **No CoC Included**

2) **Does the chain agree with the samples?** **Yes** No
If not, explain:

3) **Are all the samples in good condition?** **Yes** No
If not, explain:

4) **How were the samples received:**
On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☐

Were the samples received in Temperature Compliance of (2-6°C)? **Yes** No **N/A**

Temperature °C by Temp blank _____ Temperature °C by Temp gun 4.4

5) **Are there Dissolved samples for the lab to filter?** **Yes** **No**
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** **Yes** **No**
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** **Yes** **No** **N/A** _____

9) **Do all samples have the proper Base pH:** **Yes** **No** **N/A** _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** **Yes** **No** **N/A**

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	13
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

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May 31, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna Metals
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 13E0068

Enclosed are results of analyses for samples received by the laboratory on May 2, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0068

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD736-0-0.5	13E0068-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD737-0-0.5	13E0068-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD738-0-0.5	13E0068-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD739-0-0.5	13E0068-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD740-0-0.5	13E0068-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD741-0-0.5	13E0068-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD742-0-0.5	13E0068-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD743-0-0.5	13E0068-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD744-0-0.5	13E0068-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD745-0-0.5	13E0068-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD746-0-0.5	13E0068-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD747-0-0.5	13E0068-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD748-0-0.5	13E0068-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0068

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD749-0-0.5	13E0068-14	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
				SW-846 6010C	
				SW-846 7471B	
BRSD750-0-0.5	13E0068-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD751-0-0.5	13E0068-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD752-0-0.5	13E0068-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD752-0-0.5D	13E0068-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD753-0-0.5	13E0068-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD754-0-0.5	13E0068-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD755-0-0.5	13E0068-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD756-0-0.5	13E0068-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD757-0-0.5	13E0068-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD758-0-0.5	13E0068-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD759-0-0.5	13E0068-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium, Manganese, Zinc

13E0068-06[BRSD741-0-0.5], 13E0068-07[BRSD742-0-0.5], 13E0068-08[BRSD743-0-0.5], 13E0068-09[BRSD744-0-0.5], 13E0068-10[BRSD745-0-0.5], 13E0068-11[BRSD746-0-0.5], 13E0068-12[BRSD747-0-0.5], 13E0068-13[BRSD748-0-0.5], 13E0068-14[BRSD749-0-0.5], 13E0068-15[BRSD750-0-0.5], 13E0068-16[BRSD751-0-0.5], 13E0068-17[BRSD752-0-0.5], 13E0068-18[BRSD752-0-0.5D], 13E0068-19[BRSD753-0-0.5], 13E0068-20[BRSD754-0-0.5], 13E0068-21[BRSD755-0-0.5], 13E0068-22[BRSD756-0-0.5], 13E0068-23[BRSD757-0-0.5], 13E0068-24[BRSD758-0-0.5], 13E0068-25[BRSD759-0-0.5], B072284-BLK1, B072284-DUP1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Selenium, Silver

13E0068-01[BRSD736-0-0.5], 13E0068-03[BRSD738-0-0.5]

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Copper

B072284-BS1

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be biased on the high side.

Analyte & Samples(s) Qualified:

Lead

13E0068-06[BRSD741-0-0.5], 13E0068-07[BRSD742-0-0.5], 13E0068-08[BRSD743-0-0.5], 13E0068-09[BRSD744-0-0.5], 13E0068-10[BRSD745-0-0.5], 13E0068-11[BRSD746-0-0.5], 13E0068-12[BRSD747-0-0.5], 13E0068-13[BRSD748-0-0.5], 13E0068-14[BRSD749-0-0.5], 13E0068-15[BRSD750-0-0.5], 13E0068-16[BRSD751-0-0.5], 13E0068-17[BRSD752-0-0.5], 13E0068-18[BRSD752-0-0.5D], 13E0068-19[BRSD753-0-0.5], 13E0068-20[BRSD754-0-0.5], 13E0068-21[BRSD755-0-0.5], 13E0068-22[BRSD756-0-0.5], 13E0068-23[BRSD757-0-0.5], 13E0068-24[BRSD758-0-0.5], 13E0068-25[BRSD759-0-0.5], B072284-DUP1, B072284-MRL1, S004181-CRL1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony, Copper, Manganese, Nickel

13E0068-15[BRSD750-0-0.5], B072284-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13E0068-15[BRSD750-0-0.5], B072284-MS1

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Copper, Lead, Nickel

B072284-DUP1, 13E0068-15[BRSD750-0-0.5]

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD736-0-0.5 | Sampled: 4/30/2013 14:40

Sample ID: 13E0068-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9700	4.7	2.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Antimony	ND	4.7	3.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Arsenic	4.1	4.7	1.7	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 18:46	OP
Barium	110	4.7	0.58	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Beryllium	ND	0.47	0.075	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Cadmium	ND	0.47	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Calcium	4200	14	2.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Chromium	150	0.94	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Cobalt	53	4.7	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Copper	970	0.94	0.71	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 15:30	OP
Iron	43000	9.4	8.0	mg/Kg dry	2		SW-846 6010C	5/2/13	5/7/13 12:13	OP
Lead	35	1.4	0.65	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Magnesium	28000	14	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Manganese	970	0.94	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Mercury	0.070	0.050	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:38	SAJ
Nickel	290	0.94	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Potassium	550	190	32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:31	OP
Selenium	ND	9.4	2.9	mg/Kg dry	2	DL-04	SW-846 6010C	5/2/13	5/7/13 12:13	OP
Silver	ND	0.94	0.82	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Sodium	130	190	91	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/8/13 14:31	OP
Thallium	ND	4.7	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Vanadium	33	1.9	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP
Zinc	130	1.9	0.48	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:46	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD736-0-0.5 | Sampled: 4/30/2013 14:40

Sample ID: 13E0068-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	49.6			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD737-0-0.5 | Sampled: 4/30/2013 16:55

Sample ID: 13E0068-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1500	3.0	1.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Barium	36	3.0	0.37	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Beryllium	ND	0.30	0.048	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Calcium	810	9.0	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Chromium	68	0.60	0.15	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Cobalt	16	3.0	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Copper	63	0.60	0.46	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 15:35	OP
Iron	17000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:37	OP
Lead	3.4	0.90	0.41	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Magnesium	14000	9.0	0.94	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Manganese	540	0.60	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Mercury	ND	0.030	0.0088	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:40	SAJ
Nickel	81	0.60	0.15	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Potassium	160	120	21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:37	OP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Sodium	ND	120	58	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:37	OP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Vanadium	13	1.2	0.20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP
Zinc	36	1.2	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:51	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD737-0-0.5 | Sampled: 4/30/2013 16:55

Sample ID: 13E0068-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.1			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD738-0-0.5 | Sampled: 4/30/2013 14:25

Sample ID: 13E0068-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	2.9	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Barium	37	2.9	0.36	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Calcium	1400	8.7	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Chromium	100	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Cobalt	31	2.9	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Copper	270	0.58	0.44	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 15:40	OP
Iron	34000	5.8	4.9	mg/Kg dry	2		SW-846 6010C	5/2/13	5/7/13 12:18	OP
Lead	7.5	0.87	0.40	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Magnesium	32000	17	1.8	mg/Kg dry	2		SW-846 6010C	5/2/13	5/7/13 12:18	OP
Manganese	360	0.58	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Mercury	0.018	0.030	0.0088	mg/Kg dry	1	J	SW-846 7471B	5/3/13	5/3/13 13:42	SAJ
Nickel	210	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Potassium	320	120	20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:42	OP
Selenium	ND	5.8	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	5/2/13	5/7/13 12:18	OP
Silver	ND	1.2	1.0	mg/Kg dry	2	DL-04	SW-846 6010C	5/2/13	5/7/13 12:18	OP
Sodium	ND	120	56	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:42	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Vanadium	13	1.2	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP
Zinc	35	1.2	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 18:55	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD738-0-0.5 | Sampled: 4/30/2013 14:25

Sample ID: 13E0068-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.3			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD739-0-0.5 | Sampled: 4/30/2013 14:10

Sample ID: 13E0068-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	4.8	2.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Antimony	6.1	4.8	3.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Arsenic	5.4	4.8	1.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Barium	150	4.8	0.59	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Beryllium	ND	0.48	0.077	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Cadmium	ND	0.48	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Calcium	3100	14	2.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Chromium	170	0.95	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Cobalt	57	4.8	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Copper	1300	0.95	0.73	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 15:44	OP
Iron	34000	4.8	4.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:48	OP
Lead	30	1.4	0.66	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Magnesium	28000	14	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Manganese	370	0.95	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Mercury	0.12	0.050	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:43	SAJ
Nickel	360	0.95	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Potassium	680	190	33	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:48	OP
Selenium	ND	4.8	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Silver	ND	0.95	0.84	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Sodium	120	190	93	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/8/13 14:48	OP
Thallium	ND	4.8	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Vanadium	39	1.9	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP
Zinc	180	1.9	0.49	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:00	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD739-0-0.5 | Sampled: 4/30/2013 14:10

Sample ID: 13E0068-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	49.1			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD740-0-0.5 | Sampled: 4/30/2013 16:35

Sample ID: 13E0068-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1800	2.8	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Barium	34	2.8	0.35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Beryllium	ND	0.28	0.045	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Calcium	720	8.3	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Chromium	45	0.56	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Cobalt	14	2.8	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Copper	51	0.56	0.42	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 15:49	OP
Iron	13000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:53	OP
Lead	2.9	0.83	0.38	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Magnesium	13000	8.3	0.87	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Manganese	290	0.56	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Mercury	ND	0.030	0.0089	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:45	SAJ
Nickel	71	0.56	0.13	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Potassium	150	110	19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:53	OP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Sodium	ND	110	54	mg/Kg dry	1		SW-846 6010C	5/2/13	5/8/13 14:53	OP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Vanadium	7.7	1.1	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP
Zinc	35	1.1	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 19:05	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD740-0-0.5 | Sampled: 4/30/2013 16:35

Sample ID: 13E0068-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.0			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD741-0-0.5 | Sampled: 4/30/2013 14:05

Sample ID: 13E0068-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	4.4	1.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:26	OP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Arsenic	1.6	4.4	1.6	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 16:57	OP
Barium	100	4.4	0.55	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Beryllium	ND	0.44	0.071	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Cadmium	0.70	0.44	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Calcium	2400	13	2.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:26	OP
Chromium	91	0.88	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Cobalt	29	4.4	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Copper	180	0.88	0.67	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 16:57	OP
Iron	23000	4.4	3.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:26	OP
Lead	15	1.3	0.61	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 16:57	OP
Magnesium	16000	13	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:26	OP
Manganese	300	0.88	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Mercury	0.039	0.046	0.014	mg/Kg dry	1	J	SW-846 7471B	5/3/13	5/3/13 13:46	SAJ
Nickel	140	0.88	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Potassium	380	180	30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Selenium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Silver	ND	0.88	0.77	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Sodium	87	180	85	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 22:26	OP
Thallium	ND	4.4	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Vanadium	21	1.8	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:26	OP
Zinc	94	1.8	0.45	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:26	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD741-0-0.5 | Sampled: 4/30/2013 14:05

Sample ID: 13E0068-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	53.9			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD742-0-0.5 | Sampled: 4/30/2013 11:50

Sample ID: 13E0068-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	3.9	1.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:51	OP
Antimony	ND	3.9	3.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Arsenic	2.1	3.9	1.4	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 17:18	OP
Barium	110	3.9	0.49	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Beryllium	ND	0.39	0.063	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Cadmium	0.72	0.39	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Calcium	2800	12	2.1	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:51	OP
Chromium	84	0.79	0.20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Cobalt	31	3.9	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Copper	170	0.79	0.60	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:18	OP
Iron	23000	3.9	3.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:51	OP
Lead	14	1.2	0.54	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:18	OP
Magnesium	15000	12	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:51	OP
Manganese	1200	0.79	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Mercury	0.042	0.042	0.012	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:48	SAJ
Nickel	140	0.79	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Potassium	320	160	27	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Selenium	ND	3.9	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Silver	ND	0.79	0.69	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Sodium	81	160	77	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 22:51	OP
Thallium	ND	3.9	1.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Vanadium	22	1.6	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:51	OP
Zinc	89	1.6	0.41	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:51	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD742-0-0.5 | Sampled: 4/30/2013 11:50

Sample ID: 13E0068-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	59.5			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD743-0-0.5 | Sampled: 4/30/2013 16:15

Sample ID: 13E0068-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1800	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:57	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:23	OP
Barium	47	2.9	0.36	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Beryllium	ND	0.29	0.047	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Cadmium	0.39	0.29	0.17	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Calcium	890	8.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:57	OP
Chromium	51	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Cobalt	14	2.9	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Copper	90	0.58	0.44	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:23	OP
Iron	18000	2.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:57	OP
Lead	3.8	0.87	0.40	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:23	OP
Magnesium	14000	8.7	0.91	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:57	OP
Manganese	450	0.58	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Mercury	ND	0.030	0.0090	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:50	SAJ
Nickel	100	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Potassium	180	120	20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Sodium	63	120	56	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 22:57	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Vanadium	12	1.2	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:57	OP
Zinc	33	1.2	0.30	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:57	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD743-0-0.5 | Sampled: 4/30/2013 16:15

Sample ID: 13E0068-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.5			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD744-0-0.5 | Sampled: 4/30/2013 11:45

Sample ID: 13E0068-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	4.9	2.1	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:02	OP
Antimony	ND	4.9	4.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Arsenic	4.4	4.9	1.8	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 17:28	OP
Barium	170	4.9	0.61	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Beryllium	ND	0.49	0.079	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Cadmium	1.2	0.49	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Calcium	4100	15	2.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:02	OP
Chromium	140	0.98	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Cobalt	38	4.9	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Copper	240	0.98	0.75	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:28	OP
Iron	31000	4.9	4.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:02	OP
Lead	38	1.5	0.68	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:28	OP
Magnesium	9700	15	1.5	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:02	OP
Manganese	970	0.98	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Mercury	0.16	0.051	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 13:51	SAJ
Nickel	160	0.98	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Potassium	600	200	34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Selenium	ND	4.9	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Silver	ND	0.98	0.86	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Sodium	120	200	96	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:02	OP
Thallium	ND	4.9	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Vanadium	53	2.0	0.32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:02	OP
Zinc	93	2.0	0.51	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:02	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD744-0-0.5 | Sampled: 4/30/2013 11:45

Sample ID: 13E0068-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	48.9			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD745-0-0.5 | Sampled: 4/30/2013 11:30

Sample ID: 13E0068-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2500	3.3	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:08	OP
Antimony	ND	3.3	2.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:32	OP
Barium	44	3.3	0.41	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Beryllium	ND	0.33	0.053	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Cadmium	0.31	0.33	0.20	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:08	OP
Calcium	920	9.9	1.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:08	OP
Chromium	57	0.66	0.17	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Cobalt	15	3.3	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Copper	67	0.66	0.51	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:32	OP
Iron	14000	3.3	2.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:08	OP
Lead	4.8	0.99	0.46	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:32	OP
Magnesium	10000	9.9	1.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:08	OP
Manganese	350	0.66	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Mercury	0.013	0.034	0.010	mg/Kg dry	1	J	SW-846 7471B	5/3/13	5/3/13 14:02	SAJ
Nickel	77	0.66	0.16	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Potassium	190	130	23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Sodium	ND	130	65	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Vanadium	12	1.3	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:08	OP
Zinc	40	1.3	0.34	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:08	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD745-0-0.5 | Sampled: 4/30/2013 11:30

Sample ID: 13E0068-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.2			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD746-0-0.5 | Sampled: 4/30/2013 16:00

Sample ID: 13E0068-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1800	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:13	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:37	OP
Barium	37	2.7	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Cadmium	0.35	0.27	0.16	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Calcium	750	8.2	1.5	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:13	OP
Chromium	50	0.55	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Cobalt	15	2.7	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Copper	66	0.55	0.42	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:37	OP
Iron	16000	2.7	2.3	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:13	OP
Lead	4.2	0.82	0.38	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:37	OP
Magnesium	14000	8.2	0.86	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:13	OP
Manganese	260	0.55	0.17	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Mercury	ND	0.029	0.0086	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:03	SAJ
Nickel	94	0.55	0.13	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Potassium	160	110	19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Selenium	ND	2.7	0.85	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Sodium	57	110	54	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:13	OP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Vanadium	9.7	1.1	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:13	OP
Zinc	35	1.1	0.28	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:13	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD746-0-0.5 | Sampled: 4/30/2013 16:00

Sample ID: 13E0068-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.2			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD747-0-0.5 | Sampled: 4/30/2013 11:35

Sample ID: 13E0068-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	5.1	2.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:19	OP
Antimony	ND	5.1	4.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Arsenic	5.5	5.1	1.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:42	OP
Barium	180	5.1	0.63	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Beryllium	ND	0.51	0.082	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Cadmium	1.1	0.51	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Calcium	4500	15	2.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:19	OP
Chromium	120	1.0	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Cobalt	40	5.1	0.32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Copper	180	1.0	0.78	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:42	OP
Iron	31000	5.1	4.3	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:19	OP
Lead	35	1.5	0.70	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:42	OP
Magnesium	13000	15	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:19	OP
Manganese	1900	1.0	0.32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Mercury	0.083	0.052	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:05	SAJ
Nickel	160	1.0	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Potassium	600	200	35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Selenium	ND	5.1	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Silver	ND	1.0	0.89	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Sodium	110	200	99	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:19	OP
Thallium	ND	5.1	1.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Vanadium	44	2.0	0.33	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:19	OP
Zinc	120	2.0	0.52	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:19	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD747-0-0.5 | Sampled: 4/30/2013 11:35

Sample ID: 13E0068-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	48.0			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD748-0-0.5 | Sampled: 4/30/2013 10:30

Sample ID: 13E0068-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	5.0	2.1	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:24	OP
Antimony	ND	5.0	4.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Arsenic	4.5	5.0	1.8	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 17:47	OP
Barium	150	5.0	0.62	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Beryllium	ND	0.50	0.080	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Cadmium	0.89	0.50	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Calcium	3400	15	2.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:24	OP
Chromium	100	0.99	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Cobalt	37	5.0	0.32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Copper	190	0.99	0.76	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:47	OP
Iron	27000	5.0	4.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:24	OP
Lead	25	1.5	0.68	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:47	OP
Magnesium	13000	15	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:24	OP
Manganese	1000	0.99	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Mercury	0.096	0.050	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:07	SAJ
Nickel	160	0.99	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Potassium	530	200	34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Selenium	ND	5.0	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Silver	ND	0.99	0.87	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Sodium	100	200	96	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:24	OP
Thallium	ND	5.0	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Vanadium	33	2.0	0.33	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:24	OP
Zinc	120	2.0	0.51	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:24	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD748-0-0.5 | Sampled: 4/30/2013 10:30

Sample ID: 13E0068-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	49.5			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD749-0-0.5 | Sampled: 4/30/2013 15:10

Sample ID: 13E0068-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2400	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:30	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:52	OP
Barium	48	3.0	0.37	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Beryllium	ND	0.30	0.048	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Cadmium	0.43	0.30	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Calcium	940	8.9	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:30	OP
Chromium	70	0.59	0.15	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Cobalt	23	3.0	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Copper	130	0.59	0.45	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:52	OP
Iron	27000	30	25	mg/Kg dry	10	B-07	SW-846 6010C	5/2/13	5/7/13 15:46	OP
Lead	4.9	0.89	0.41	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:52	OP
Magnesium	33000	89	9.3	mg/Kg dry	10	B-07	SW-846 6010C	5/2/13	5/9/13 14:07	OP
Manganese	280	0.59	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Mercury	0.011	0.032	0.0095	mg/Kg dry	1	J	SW-846 7471B	5/3/13	5/3/13 14:08	SAJ
Nickel	150	0.59	0.14	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Potassium	210	120	20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Sodium	ND	120	58	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Vanadium	12	1.2	0.20	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:30	OP
Zinc	49	1.2	0.31	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:30	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD749-0-0.5 | Sampled: 4/30/2013 15:10

Sample ID: 13E0068-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	77.3			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD749-0-0.5 | Sampled: 4/30/2013 15:10

Sample ID: 13E0068-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Total Organic Carbon	Attached			mg/Kg	1		SM 5310B		5/7/13 0:00	ALS

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD749-0-0.5 | Sampled: 4/30/2013 15:10

Sample ID: 13E0068-14

Sample Matrix: Soil

Moisture Content

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	26.9			%	1		ASTM D2216		5/7/13 0:00	GEO

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD750-0-0.5 | Sampled: 4/30/2013 10:35

Sample ID: 13E0068-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	4.1	1.8	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Antimony	ND	4.1	3.3	mg/Kg dry	1	MS-07	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Arsenic	1.8	4.1	1.5	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 16:33	OP
Barium	120	4.1	0.51	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Beryllium	ND	0.41	0.066	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Cadmium	0.75	0.41	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Calcium	2200	12	2.2	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Chromium	95	0.83	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Cobalt	29	4.1	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Copper	240	0.83	0.63	mg/Kg dry	1	MS-07	SW-846 6010C	5/2/13	5/7/13 16:33	OP
Iron	24000	4.1	3.5	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Lead	16	1.2	0.57	mg/Kg dry	1	M-10, R-02	SW-846 6010C	5/2/13	5/7/13 16:33	OP
Magnesium	13000	12	1.3	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Manganese	560	0.83	0.26	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Mercury	0.055	0.041	0.012	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:10	SAJ
Nickel	180	0.83	0.20	mg/Kg dry	1	MS-07, R-02	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Potassium	450	170	28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Selenium	ND	4.1	1.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Silver	ND	0.83	0.73	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Sodium	110	170	80	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 22:00	OP
Thallium	ND	4.1	1.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Vanadium	25	1.7	0.27	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 22:00	OP
Zinc	110	1.7	0.43	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 22:00	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD750-0-0.5 | Sampled: 4/30/2013 10:35

Sample ID: 13E0068-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	60.2			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD751-0-0.5 | Sampled: 4/30/2013 10:37

Sample ID: 13E0068-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9100	5.2	2.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:35	OP
Antimony	ND	5.2	4.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Arsenic	3.9	5.2	1.9	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 17:56	OP
Barium	180	5.2	0.64	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Beryllium	ND	0.52	0.083	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Cadmium	0.97	0.52	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Calcium	4600	15	2.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:35	OP
Chromium	110	1.0	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Cobalt	35	5.2	0.33	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Copper	170	1.0	0.79	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 17:56	OP
Iron	28000	5.2	4.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:35	OP
Lead	28	1.5	0.71	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 17:56	OP
Magnesium	12000	15	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:35	OP
Manganese	2000	1.0	0.33	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Mercury	0.12	0.052	0.015	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:12	SAJ
Nickel	150	1.0	0.25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Potassium	460	210	35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Selenium	ND	5.2	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Silver	ND	1.0	0.91	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Sodium	160	210	100	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/6/13 23:35	OP
Thallium	ND	5.2	1.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Vanadium	37	2.1	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:35	OP
Zinc	110	2.1	0.53	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:35	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD751-0-0.5 | Sampled: 4/30/2013 10:37

Sample ID: 13E0068-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	47.6			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD752-0-0.5 | Sampled: 4/30/2013 15:40

Sample ID: 13E0068-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	4.5	2.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:41	OP
Antimony	ND	4.5	3.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Arsenic	4.6	4.5	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:01	OP
Barium	240	4.5	0.57	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Beryllium	ND	0.45	0.073	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Cadmium	0.72	0.45	0.27	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Calcium	3000	14	2.5	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:41	OP
Chromium	140	0.91	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Cobalt	32	4.5	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Copper	55	0.91	0.69	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:01	OP
Iron	23000	4.5	3.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:41	OP
Lead	17	1.4	0.63	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:01	OP
Magnesium	4400	14	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:41	OP
Manganese	370	0.91	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Mercury	0.11	0.047	0.014	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:13	SAJ
Nickel	110	0.91	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Potassium	480	180	31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Selenium	ND	4.5	1.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Silver	ND	0.91	0.80	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Sodium	190	180	88	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Thallium	ND	4.5	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Vanadium	59	1.8	0.30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/6/13 23:41	OP
Zinc	47	1.8	0.47	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/6/13 23:41	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD752-0-0.5 | Sampled: 4/30/2013 15:40

Sample ID: 13E0068-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	53.3			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD752-0-0.5D | Sampled: 4/30/2013 15:40

Sample ID: 13E0068-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	4.4	1.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:06	OP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Arsenic	9.4	4.4	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:22	OP
Barium	210	4.4	0.55	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Beryllium	ND	0.44	0.071	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Cadmium	1.3	0.44	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Calcium	3400	13	2.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:06	OP
Chromium	130	0.88	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Cobalt	42	4.4	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Copper	73	0.88	0.67	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:22	OP
Iron	52000	44	38	mg/Kg dry	10	B-07	SW-846 6010C	5/2/13	5/7/13 15:51	OP
Lead	23	1.3	0.61	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:22	OP
Magnesium	5000	13	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:06	OP
Manganese	600	0.88	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Mercury	0.11	0.045	0.013	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:15	SAJ
Nickel	130	0.88	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Potassium	470	180	30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Selenium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Silver	ND	0.88	0.77	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Sodium	190	180	86	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Thallium	ND	4.4	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Vanadium	69	1.8	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:06	OP
Zinc	62	1.8	0.45	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:06	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD752-0-0.5D | Sampled: 4/30/2013 15:40

Sample ID: 13E0068-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	54.8			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD753-0-0.5 | Sampled: 4/30/2013 10:50

Sample ID: 13E0068-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	3.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:12	OP
Antimony	ND	3.7	3.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Arsenic	3.0	3.7	1.3	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:27	OP
Barium	98	3.7	0.46	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Beryllium	ND	0.37	0.060	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Cadmium	0.59	0.37	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Calcium	2500	11	2.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:12	OP
Chromium	75	0.74	0.19	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Cobalt	24	3.7	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Copper	110	0.74	0.57	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:27	OP
Iron	21000	3.7	3.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:12	OP
Lead	12	1.1	0.51	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:27	OP
Magnesium	13000	11	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:12	OP
Manganese	1100	0.74	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Mercury	0.046	0.039	0.011	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:17	SAJ
Nickel	110	0.74	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Potassium	350	150	25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Selenium	ND	3.7	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Silver	ND	0.74	0.65	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Sodium	120	150	72	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:12	OP
Thallium	ND	3.7	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Vanadium	21	1.5	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:12	OP
Zinc	73	1.5	0.38	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:12	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD753-0-0.5 | Sampled: 4/30/2013 10:50

Sample ID: 13E0068-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	63.0			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD754-0-0.5 | Sampled: 4/30/2013 10:55

Sample ID: 13E0068-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	4.4	1.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:17	OP
Antimony	ND	4.4	3.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Arsenic	3.3	4.4	1.6	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:32	OP
Barium	150	4.4	0.55	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Beryllium	ND	0.44	0.071	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Cadmium	0.80	0.44	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Calcium	3200	13	2.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:17	OP
Chromium	89	0.89	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Cobalt	32	4.4	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Copper	150	0.89	0.68	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:32	OP
Iron	27000	4.4	3.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:17	OP
Lead	16	1.3	0.61	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:32	OP
Magnesium	15000	13	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:17	OP
Manganese	2200	0.89	0.28	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Mercury	0.072	0.045	0.013	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:32	SAJ
Nickel	140	0.89	0.21	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Potassium	420	180	30	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Selenium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Silver	ND	0.89	0.78	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Sodium	140	180	86	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:17	OP
Thallium	ND	4.4	1.5	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Vanadium	28	1.8	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:17	OP
Zinc	96	1.8	0.46	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:17	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD754-0-0.5 | Sampled: 4/30/2013 10:55

Sample ID: 13E0068-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	54.3			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD755-0-0.5 | Sampled: 4/30/2013 15:50

Sample ID: 13E0068-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	3.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:23	OP
Antimony	ND	3.7	3.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Arsenic	2.9	3.7	1.3	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:36	OP
Barium	130	3.7	0.46	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Beryllium	ND	0.37	0.059	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Cadmium	0.55	0.37	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Calcium	2000	11	2.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:23	OP
Chromium	88	0.74	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Cobalt	17	3.7	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Copper	36	0.74	0.56	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:36	OP
Iron	17000	3.7	3.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:23	OP
Lead	12	1.1	0.51	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:36	OP
Magnesium	3800	11	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:23	OP
Manganese	500	0.74	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Mercury	0.039	0.038	0.011	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:34	SAJ
Nickel	66	0.74	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Potassium	300	150	25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Selenium	ND	3.7	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Silver	ND	0.74	0.65	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Sodium	110	150	72	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:23	OP
Thallium	ND	3.7	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Vanadium	42	1.5	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:23	OP
Zinc	39	1.5	0.38	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:23	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD755-0-0.5 | Sampled: 4/30/2013 15:50

Sample ID: 13E0068-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	64.7			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD756-0-0.5 | Sampled: 4/30/2013 11:00

Sample ID: 13E0068-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	5.3	2.3	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:28	OP
Antimony	ND	5.3	4.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Arsenic	5.6	5.3	1.9	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:41	OP
Barium	200	5.3	0.66	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Beryllium	ND	0.53	0.085	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Cadmium	1.3	0.53	0.31	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Calcium	3400	16	2.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:28	OP
Chromium	170	1.1	0.27	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Cobalt	41	5.3	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Copper	190	1.1	0.81	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:41	OP
Iron	48000	53	45	mg/Kg dry	10	B-07	SW-846 6010C	5/2/13	5/7/13 15:56	OP
Lead	43	1.6	0.73	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:41	OP
Magnesium	9600	16	1.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:28	OP
Manganese	1200	1.1	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Mercury	0.16	0.054	0.016	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:35	SAJ
Nickel	180	1.1	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Potassium	620	210	36	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Selenium	ND	5.3	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Silver	ND	1.1	0.93	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Sodium	120	210	100	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:28	OP
Thallium	ND	5.3	1.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Vanadium	67	2.1	0.35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:28	OP
Zinc	110	2.1	0.55	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:28	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD756-0-0.5 | Sampled: 4/30/2013 11:00

Sample ID: 13E0068-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	46.3			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD757-0-0.5 | Sampled: 4/30/2013 09:55

Sample ID: 13E0068-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6800	5.4	2.3	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:34	OP
Antimony	ND	5.4	4.3	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Arsenic	5.1	5.4	1.9	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:46	OP
Barium	130	5.4	0.67	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Beryllium	ND	0.54	0.086	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Cadmium	0.79	0.54	0.32	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Calcium	8700	16	2.9	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:34	OP
Chromium	85	1.1	0.27	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Cobalt	28	5.4	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Copper	160	1.1	0.82	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:46	OP
Iron	27000	5.4	4.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:34	OP
Lead	16	1.6	0.74	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:46	OP
Magnesium	17000	16	1.7	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:34	OP
Manganese	900	1.1	0.34	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Mercury	0.058	0.054	0.016	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:37	SAJ
Nickel	150	1.1	0.26	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Potassium	440	210	37	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Selenium	ND	5.4	1.6	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Silver	ND	1.1	0.94	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Sodium	170	210	100	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:34	OP
Thallium	ND	5.4	1.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Vanadium	28	2.1	0.35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:34	OP
Zinc	110	2.1	0.55	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:34	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD757-0-0.5 | Sampled: 4/30/2013 09:55

Sample ID: 13E0068-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	45.6			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD758-0-0.5 | Sampled: 4/30/2013 09:40

Sample ID: 13E0068-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	3.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:39	OP
Antimony	ND	3.7	3.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Arsenic	3.1	3.7	1.3	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:51	OP
Barium	54	3.7	0.46	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Beryllium	ND	0.37	0.059	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Cadmium	0.47	0.37	0.22	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Calcium	5800	11	2.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:39	OP
Chromium	64	0.73	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Cobalt	16	3.7	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Copper	92	0.73	0.56	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:51	OP
Iron	20000	3.7	3.1	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:39	OP
Lead	5.4	1.1	0.51	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:51	OP
Magnesium	14000	11	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:39	OP
Manganese	430	0.73	0.23	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Mercury	0.019	0.037	0.011	mg/Kg dry	1	J	SW-846 7471B	5/3/13	5/3/13 14:43	SAJ
Nickel	110	0.73	0.18	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Potassium	310	150	25	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Selenium	ND	3.7	1.1	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Silver	ND	0.73	0.65	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Sodium	95	150	72	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:39	OP
Thallium	ND	3.7	1.2	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Vanadium	16	1.5	0.24	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:39	OP
Zinc	52	1.5	0.38	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:39	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD758-0-0.5 | Sampled: 4/30/2013 09:40

Sample ID: 13E0068-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	67.2			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD759-0-0.5 | Sampled: 4/30/2013 10:05

Sample ID: 13E0068-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7200	5.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:45	OP
Antimony	ND	5.9	4.7	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Arsenic	4.1	5.9	2.1	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 18:56	OP
Barium	220	5.9	0.73	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Beryllium	ND	0.59	0.095	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Cadmium	0.85	0.59	0.35	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Calcium	4600	18	3.2	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:45	OP
Chromium	74	1.2	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Cobalt	28	5.9	0.38	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Copper	110	1.2	0.90	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 18:56	OP
Iron	26000	5.9	5.0	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:45	OP
Lead	18	1.8	0.81	mg/Kg dry	1	M-10	SW-846 6010C	5/2/13	5/7/13 18:56	OP
Magnesium	11000	18	1.8	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:45	OP
Manganese	3600	1.2	0.37	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Mercury	0.073	0.062	0.018	mg/Kg dry	1		SW-846 7471B	5/3/13	5/3/13 14:44	SAJ
Nickel	130	1.2	0.29	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Potassium	490	240	40	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Selenium	ND	5.9	1.8	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Silver	ND	1.2	1.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Sodium	180	240	110	mg/Kg dry	1	J	SW-846 6010C	5/2/13	5/7/13 0:45	OP
Thallium	ND	5.9	2.0	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Vanadium	28	2.4	0.39	mg/Kg dry	1		SW-846 6010C	5/2/13	5/7/13 0:45	OP
Zinc	120	2.4	0.61	mg/Kg dry	1	B-07	SW-846 6010C	5/2/13	5/7/13 0:45	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0068

Date Received: 5/2/2013

Field Sample #: BRSD759-0-0.5 | Sampled: 4/30/2013 10:05

Sample ID: 13E0068-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	39.8			% Wt	1		SM 2540G	5/8/13	5/9/13 9:42	WAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13E0068-01 [BRSD736-0-0.5]	B072551	05/08/13
13E0068-02 [BRSD737-0-0.5]	B072551	05/08/13
13E0068-03 [BRSD738-0-0.5]	B072551	05/08/13
13E0068-04 [BRSD739-0-0.5]	B072551	05/08/13
13E0068-05 [BRSD740-0-0.5]	B072551	05/08/13
13E0068-06 [BRSD741-0-0.5]	B072551	05/08/13
13E0068-07 [BRSD742-0-0.5]	B072551	05/08/13
13E0068-08 [BRSD743-0-0.5]	B072551	05/08/13
13E0068-09 [BRSD744-0-0.5]	B072551	05/08/13
13E0068-10 [BRSD745-0-0.5]	B072551	05/08/13
13E0068-11 [BRSD746-0-0.5]	B072551	05/08/13
13E0068-12 [BRSD747-0-0.5]	B072551	05/08/13
13E0068-13 [BRSD748-0-0.5]	B072551	05/08/13
13E0068-14 [BRSD749-0-0.5]	B072551	05/08/13
13E0068-15 [BRSD750-0-0.5]	B072551	05/08/13
13E0068-16 [BRSD751-0-0.5]	B072551	05/08/13
13E0068-17 [BRSD752-0-0.5]	B072551	05/08/13
13E0068-18 [BRSD752-0-0.5D]	B072551	05/08/13
13E0068-19 [BRSD753-0-0.5]	B072551	05/08/13
13E0068-20 [BRSD754-0-0.5]	B072551	05/08/13
13E0068-21 [BRSD755-0-0.5]	B072551	05/08/13
13E0068-22 [BRSD756-0-0.5]	B072551	05/08/13
13E0068-23 [BRSD757-0-0.5]	B072551	05/08/13
13E0068-24 [BRSD758-0-0.5]	B072551	05/08/13
13E0068-25 [BRSD759-0-0.5]	B072551	05/08/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0068-06 [BRSD741-0-0.5]	B072284	1.06	50.0	05/02/13
13E0068-07 [BRSD742-0-0.5]	B072284	1.07	50.0	05/02/13
13E0068-08 [BRSD743-0-0.5]	B072284	1.07	50.0	05/02/13
13E0068-09 [BRSD744-0-0.5]	B072284	1.04	50.0	05/02/13
13E0068-10 [BRSD745-0-0.5]	B072284	1.06	50.0	05/02/13
13E0068-11 [BRSD746-0-0.5]	B072284	1.08	50.0	05/02/13
13E0068-12 [BRSD747-0-0.5]	B072284	1.02	50.0	05/02/13
13E0068-13 [BRSD748-0-0.5]	B072284	1.02	50.0	05/02/13
13E0068-14 [BRSD749-0-0.5]	B072284	1.09	50.0	05/02/13
13E0068-15 [BRSD750-0-0.5]	B072284	1.01	50.0	05/02/13
13E0068-16 [BRSD751-0-0.5]	B072284	1.02	50.0	05/02/13
13E0068-17 [BRSD752-0-0.5]	B072284	1.03	50.0	05/02/13
13E0068-18 [BRSD752-0-0.5D]	B072284	1.04	50.0	05/02/13
13E0068-19 [BRSD753-0-0.5]	B072284	1.07	50.0	05/02/13
13E0068-20 [BRSD754-0-0.5]	B072284	1.04	50.0	05/02/13
13E0068-21 [BRSD755-0-0.5]	B072284	1.04	50.0	05/02/13
13E0068-22 [BRSD756-0-0.5]	B072284	1.02	50.0	05/02/13
13E0068-23 [BRSD757-0-0.5]	B072284	1.02	50.0	05/02/13
13E0068-24 [BRSD758-0-0.5]	B072284	1.01	50.0	05/02/13
13E0068-25 [BRSD759-0-0.5]	B072284	1.07	50.0	05/02/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0068-01 [BRSD736-0-0.5]	B072292	1.08	50.0	05/02/13
13E0068-02 [BRSD737-0-0.5]	B072292	1.00	50.0	05/02/13
13E0068-03 [BRSD738-0-0.5]	B072292	1.03	50.0	05/02/13
13E0068-04 [BRSD739-0-0.5]	B072292	1.07	50.0	05/02/13
13E0068-05 [BRSD740-0-0.5]	B072292	1.09	50.0	05/02/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0068-01 [BRSD736-0-0.5]	B072298	0.606	50.0	05/03/13
13E0068-02 [BRSD737-0-0.5]	B072298	0.604	50.0	05/03/13
13E0068-03 [BRSD738-0-0.5]	B072298	0.601	50.0	05/03/13
13E0068-04 [BRSD739-0-0.5]	B072298	0.608	50.0	05/03/13
13E0068-05 [BRSD740-0-0.5]	B072298	0.604	50.0	05/03/13
13E0068-06 [BRSD741-0-0.5]	B072298	0.605	50.0	05/03/13
13E0068-07 [BRSD742-0-0.5]	B072298	0.604	50.0	05/03/13
13E0068-08 [BRSD743-0-0.5]	B072298	0.615	50.0	05/03/13
13E0068-09 [BRSD744-0-0.5]	B072298	0.603	50.0	05/03/13
13E0068-10 [BRSD745-0-0.5]	B072298	0.619	50.0	05/03/13
13E0068-11 [BRSD746-0-0.5]	B072298	0.611	50.0	05/03/13
13E0068-12 [BRSD747-0-0.5]	B072298	0.603	50.0	05/03/13
13E0068-13 [BRSD748-0-0.5]	B072298	0.604	50.0	05/03/13
13E0068-14 [BRSD749-0-0.5]	B072298	0.602	50.0	05/03/13
13E0068-15 [BRSD750-0-0.5]	B072298	0.610	50.0	05/03/13
13E0068-16 [BRSD751-0-0.5]	B072298	0.606	50.0	05/03/13
13E0068-17 [BRSD752-0-0.5]	B072298	0.602	50.0	05/03/13
13E0068-18 [BRSD752-0-0.5D]	B072298	0.610	50.0	05/03/13
13E0068-19 [BRSD753-0-0.5]	B072298	0.616	50.0	05/03/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0068-20 [BRSD754-0-0.5]	B072320	0.608	50.0	05/03/13
13E0068-21 [BRSD755-0-0.5]	B072320	0.611	50.0	05/03/13
13E0068-22 [BRSD756-0-0.5]	B072320	0.605	50.0	05/03/13
13E0068-23 [BRSD757-0-0.5]	B072320	0.605	50.0	05/03/13
13E0068-24 [BRSD758-0-0.5]	B072320	0.600	50.0	05/03/13
13E0068-25 [BRSD759-0-0.5]	B072320	0.612	50.0	05/03/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B072284 - SW-846 3050B											
Blank (B072284-BLK1)				Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	10	2.5	mg/Kg wet								B-07
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	0.15	0.25	mg/Kg wet								J
Calcium	12	7.5	mg/Kg wet								B-07
Chromium	0.14	0.50	mg/Kg wet								J
Cobalt	0.16	2.5	mg/Kg wet								J
Copper	ND	0.50	mg/Kg wet								
Iron	6.7	2.5	mg/Kg wet								B-07
Lead	ND	0.75	mg/Kg wet								
Magnesium	8.8	7.5	mg/Kg wet								B-07
Manganese	ND	0.50	mg/Kg wet								
Nickel	0.18	0.50	mg/Kg wet								J
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	1.8	1.0	mg/Kg wet								B-07
LCS (B072284-BS1)				Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	7450	5.0	mg/Kg wet	9060		82.2		46.1-153.4			
Antimony	100	5.0	mg/Kg wet	106		94.5		8.2-218.9			
Arsenic	185	5.0	mg/Kg wet	182		102		83-117.6			
Barium	139	5.0	mg/Kg wet	143		97.0		83.2-117.5			
Beryllium	98.9	0.50	mg/Kg wet	98.3		101		83.9-116			
Cadmium	62.1	0.50	mg/Kg wet	60.4		103		83.1-116.9			
Calcium	5560	15	mg/Kg wet	6040		92.1		83.1-116.7			
Chromium	125	1.0	mg/Kg wet	125		100		81.6-117.6			
Cobalt	161	5.0	mg/Kg wet	163		98.5		84.7-115.3			
Copper	98.8	1.0	mg/Kg wet	80.1		**123**	*	83.8-116.1			L-07
Iron	10900	5.0	mg/Kg wet	12900		84.3		50.8-149.6			
Lead	128	1.5	mg/Kg wet	136		94.1		82.4-117.8			
Magnesium	2360	15	mg/Kg wet	2640		89.3		75.4-124.2			
Manganese	266	1.0	mg/Kg wet	279		95.3		82.8-117.5			
Nickel	125	1.0	mg/Kg wet	128		98.0		84.4-115.6			
Potassium	2480	200	mg/Kg wet	2820		88.0		72.7-127.3			
Selenium	80.4	5.0	mg/Kg wet	85.9		93.7		80-120			
Silver	57.9	1.0	mg/Kg wet	61.3		94.4		66.2-133.8			
Sodium	408	200	mg/Kg wet	439		93.0		73.8-126.2			
Thallium	142	5.0	mg/Kg wet	144		98.3		81.2-118.8			
Vanadium	106	2.0	mg/Kg wet	104		102		75.5-124			
Zinc	195	2.0	mg/Kg wet	204		95.5		81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B072284 - SW-846 3050B											
LCS Dup (B072284-BSD1)				Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	7300	5.0	mg/Kg wet	9060		80.5	46.1-153.4	2.07		30	
Antimony	95.2	5.0	mg/Kg wet	106		89.8	8.2-218.9	5.08		30	
Arsenic	178	5.0	mg/Kg wet	182		97.7	83-117.6	4.25		30	
Barium	136	5.0	mg/Kg wet	143		95.1	83.2-117.5	2.02		30	
Beryllium	97.5	0.50	mg/Kg wet	98.3		99.1	83.9-116	1.42		30	
Cadmium	60.4	0.50	mg/Kg wet	60.4		100	83.1-116.9	2.80		30	
Calcium	5480	15	mg/Kg wet	6040		90.7	83.1-116.7	1.58		30	
Chromium	121	0.99	mg/Kg wet	125		96.9	81.6-117.6	3.35		30	
Cobalt	155	5.0	mg/Kg wet	163		95.3	84.7-115.3	3.30		30	
Copper	92.6	0.99	mg/Kg wet	80.1		116	83.8-116.1	6.45		30	
Iron	10900	5.0	mg/Kg wet	12900		84.4	50.8-149.6	0.0846		30	
Lead	124	1.5	mg/Kg wet	136		91.2	82.4-117.8	3.03		30	
Magnesium	2310	15	mg/Kg wet	2640		87.4	75.4-124.2	2.15		30	
Manganese	261	0.99	mg/Kg wet	279		93.7	82.8-117.5	1.67		30	
Nickel	121	0.99	mg/Kg wet	128		94.6	84.4-115.6	3.47		30	
Potassium	2430	200	mg/Kg wet	2820		86.3	72.7-127.3	1.99		30	
Selenium	78.6	5.0	mg/Kg wet	85.9		91.5	80-120	2.34		30	
Silver	55.4	0.99	mg/Kg wet	61.3		90.4	66.2-133.8	4.34		30	
Sodium	400	200	mg/Kg wet	439		91.0	73.8-126.2	2.12		30	
Thallium	136	5.0	mg/Kg wet	144		94.5	81.2-118.8	3.95		30	
Vanadium	102	2.0	mg/Kg wet	104		97.9	75.5-124	3.86		30	
Zinc	188	2.0	mg/Kg wet	204		92.2	81.9-117.6	3.48		30	
Duplicate (B072284-DUP1)		**Source: 13E0068-15**		Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	5520	3.8	mg/Kg dry		6290			13.0		35	B-07
Antimony	ND	3.8	mg/Kg dry		ND			NC		35	
Arsenic	ND	3.8	mg/Kg dry		1.80			NC		35	
Barium	106	3.8	mg/Kg dry		121			13.1		35	
Beryllium	ND	0.38	mg/Kg dry		ND			NC		35	
Cadmium	0.640	0.38	mg/Kg dry		0.749			15.7		35	
Calcium	1720	12	mg/Kg dry		2150			22.4		35	B-07
Chromium	77.7	0.77	mg/Kg dry		95.2			20.2		35	
Cobalt	24.4	3.8	mg/Kg dry		29.4			18.5		35	
Copper	120	0.77	mg/Kg dry		238			**66.1**	*	35	R-02
Iron	20800	3.8	mg/Kg dry		24200			15.0		35	B-07
Lead	14.0	1.2	mg/Kg dry		15.6			10.6		35	M-10
Magnesium	11700	12	mg/Kg dry		13000			10.4		35	B-07
Manganese	470	0.77	mg/Kg dry		556			16.8		35	
Nickel	109	0.77	mg/Kg dry		182			**50.1**	*	35	R-02
Potassium	352	150	mg/Kg dry		452			24.9		35	
Selenium	ND	3.8	mg/Kg dry		ND			NC		35	
Silver	ND	0.77	mg/Kg dry		ND			NC		35	
Sodium	92.8	150	mg/Kg dry		110			16.6		35	J
Thallium	ND	3.8	mg/Kg dry		ND			NC		35	
Vanadium	21.1	1.5	mg/Kg dry		25.4			18.5		35	
Zinc	92.9	1.5	mg/Kg dry		108			15.0		35	B-07

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B072284 - SW-846 3050B											
MRL Check (B072284-MRL1)				Prepared: 05/02/13 Analyzed: 05/07/13							
Lead	1.65	0.73	mg/Kg wet	0.727		**228**	*	80-120			M-10
Matrix Spike (B072284-MS1)		**Source: 13E0068-15**		Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	7850	4.1	mg/Kg dry	163	6290	**953**	*	75-125			MS-19
Antimony	53.9	4.1	mg/Kg dry	163	ND	**33.0**	*	75-125			MS-07
Arsenic	161	4.1	mg/Kg dry	163	1.80	97.4		75-125			
Barium	287	4.1	mg/Kg dry	163	121	101		75-125			
Beryllium	164	0.41	mg/Kg dry	163	ND	100		75-125			
Cadmium	155	0.41	mg/Kg dry	163	0.749	94.8		75-125			
Calcium	2650	12	mg/Kg dry	163	2150	**302**	*	75-125			MS-19
Chromium	252	0.82	mg/Kg dry	163	95.2	96.3		75-125			
Cobalt	179	4.1	mg/Kg dry	163	29.4	91.8		75-125			
Copper	315	0.82	mg/Kg dry	163	238	**46.8**	*	75-125			MS-07
Iron	22700	4.1	mg/Kg dry	163	24200	**-904**	*	75-125			MS-19
Lead	164	1.2	mg/Kg dry	163	15.6	91.2		75-125			
Magnesium	12500	12	mg/Kg dry	163	13000	**-311**	*	75-125			MS-19
Manganese	639	0.82	mg/Kg dry	163	556	**50.7**	*	75-125			MS-07
Nickel	273	0.82	mg/Kg dry	163	182	**55.4**	*	75-125			MS-07
Potassium	2000	160	mg/Kg dry	1630	452	95.2		75-125			
Selenium	144	4.1	mg/Kg dry	163	ND	88.4		75-125			
Silver	152	0.82	mg/Kg dry	163	ND	93.3		75-125			
Sodium	310	160	mg/Kg dry	163	110	123		75-125			
Thallium	151	4.1	mg/Kg dry	163	ND	92.6		75-125			
Vanadium	190	1.6	mg/Kg dry	163	25.4	101		75-125			
Zinc	254	1.6	mg/Kg dry	163	108	89.8		75-125			
Batch B072292 - SW-846 3050B											
Blank (B072292-BLK1)				Prepared: 05/02/13 Analyzed: 05/06/13							
Aluminum	ND	2.5	mg/Kg wet								
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	2.4	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	ND	0.75	mg/Kg wet								
Magnesium	1.9	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	0.16	0.50	mg/Kg wet								J
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	0.79	1.0	mg/Kg wet								J

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072292 - SW-846 3050B										
LCS (B072292-BS1)				Prepared: 05/02/13 Analyzed: 05/06/13						
Aluminum	7350	5.0	mg/Kg wet	9060		81.1	46.1-153.4			
Antimony	80.5	5.0	mg/Kg wet	106		76.0	8.2-218.9			
Arsenic	176	5.0	mg/Kg wet	182		96.5	83-117.6			
Barium	138	5.0	mg/Kg wet	143		96.5	83.2-117.5			
Beryllium	100	0.50	mg/Kg wet	98.3		102	83.9-116			
Cadmium	60.5	0.50	mg/Kg wet	60.4		100	83.1-116.9			
Calcium	5960	15	mg/Kg wet	6040		98.7	83.1-116.7			
Chromium	123	0.99	mg/Kg wet	125		98.0	81.6-117.6			
Cobalt	158	5.0	mg/Kg wet	163		97.2	84.7-115.3			
Copper	88.0	0.99	mg/Kg wet	80.1		110	83.8-116.1			
Iron	11000	5.0	mg/Kg wet	12900		85.5	50.8-149.6			
Lead	123	1.5	mg/Kg wet	136		90.3	82.4-117.8			
Magnesium	2510	15	mg/Kg wet	2640		95.1	75.4-124.2			
Manganese	276	0.99	mg/Kg wet	279		99.0	82.8-117.5			
Nickel	122	0.99	mg/Kg wet	128		95.6	84.4-115.6			
Potassium	2390	200	mg/Kg wet	2820		84.9	72.7-127.3			
Selenium	73.3	5.0	mg/Kg wet	85.9		85.3	80-120			
Silver	56.9	0.99	mg/Kg wet	61.3		92.8	66.2-133.8			
Sodium	385	200	mg/Kg wet	439		87.7	73.8-126.2			
Thallium	135	5.0	mg/Kg wet	144		93.9	81.2-118.8			
Vanadium	103	2.0	mg/Kg wet	104		98.6	75.5-124			
Zinc	180	2.0	mg/Kg wet	204		88.2	81.9-117.6			
LCS Dup (B072292-BSD1)				Prepared: 05/02/13 Analyzed: 05/06/13						
Aluminum	7310	5.0	mg/Kg wet	9060		80.7	46.1-153.4	0.502	30	
Antimony	83.4	5.0	mg/Kg wet	106		78.7	8.2-218.9	3.46	30	
Arsenic	180	5.0	mg/Kg wet	182		99.0	83-117.6	2.59	30	
Barium	142	5.0	mg/Kg wet	143		99.3	83.2-117.5	2.87	30	
Beryllium	101	0.50	mg/Kg wet	98.3		103	83.9-116	1.04	30	
Cadmium	62.9	0.50	mg/Kg wet	60.4		104	83.1-116.9	3.93	30	
Calcium	6020	15	mg/Kg wet	6040		99.7	83.1-116.7	1.06	30	
Chromium	126	1.0	mg/Kg wet	125		101	81.6-117.6	2.91	30	
Cobalt	163	5.0	mg/Kg wet	163		99.9	84.7-115.3	2.78	30	
Copper	87.2	1.0	mg/Kg wet	80.1		109	83.8-116.1	0.989	30	
Iron	11300	5.0	mg/Kg wet	12900		87.6	50.8-149.6	2.39	30	
Lead	125	1.5	mg/Kg wet	136		92.2	82.4-117.8	2.06	30	
Magnesium	2490	15	mg/Kg wet	2640		94.4	75.4-124.2	0.753	30	
Manganese	280	1.0	mg/Kg wet	279		100	82.8-117.5	1.30	30	
Nickel	127	1.0	mg/Kg wet	128		99.4	84.4-115.6	3.87	30	
Potassium	2450	200	mg/Kg wet	2820		86.8	72.7-127.3	2.23	30	
Selenium	72.9	5.0	mg/Kg wet	85.9		84.9	80-120	0.520	30	
Silver	57.8	1.0	mg/Kg wet	61.3		94.4	66.2-133.8	1.62	30	
Sodium	390	200	mg/Kg wet	439		88.8	73.8-126.2	1.25	30	
Thallium	138	5.0	mg/Kg wet	144		96.1	81.2-118.8	2.35	30	
Vanadium	106	2.0	mg/Kg wet	104		102	75.5-124	3.09	30	
Zinc	188	2.0	mg/Kg wet	204		92.1	81.9-117.6	4.26	30	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072292 - SW-846 3050B										
MRL Check (B072292-MRL1)				Prepared: 05/02/13 Analyzed: 05/06/13						
Lead	0.624	0.74	mg/Kg wet	0.739		84.4	80-120			J
Batch B072298 - SW-846 7471										
Blank (B072298-BLK1)				Prepared & Analyzed: 05/03/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B072298-BS1)				Prepared & Analyzed: 05/03/13						
Mercury	3.51	0.33	mg/Kg wet	4.05		86.7	71.6-128.1			
LCS Dup (B072298-BSD1)				Prepared & Analyzed: 05/03/13						
Mercury	4.59	0.33	mg/Kg wet	4.05		113	71.6-128.1	26.7	30	
Duplicate (B072298-DUP1)	**Source: 13E0068-15**			Prepared & Analyzed: 05/03/13						
Mercury	0.0471	0.042	mg/Kg dry		0.0555			16.3	35	
Matrix Spike (B072298-MS1)	**Source: 13E0068-15**			Prepared & Analyzed: 05/03/13						
Mercury	0.297	0.041	mg/Kg dry	0.276	0.0555	87.8	75-125			
Batch B072320 - SW-846 7471										
Blank (B072320-BLK1)				Prepared & Analyzed: 05/03/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B072320-BS1)				Prepared & Analyzed: 05/03/13						
Mercury	4.34	0.32	mg/Kg wet	4.05		107	71.6-128.1			
LCS Dup (B072320-BSD1)				Prepared & Analyzed: 05/03/13						
Mercury	4.41	0.32	mg/Kg wet	4.05		109	71.6-128.1	1.52	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072551 - % Solids										
Duplicate (B072551-DUP4)	**Source: 13E0068-01**		Prepared: 05/08/13 Analyzed: 05/09/13							
% Solids	47.1		% Wt		49.6			5.17	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
M-10	The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be biased on the high side.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
T-06	Samples were received directly from sampling in the field on ice.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
EPA 245.1 in Water	
Mercury	CT,MA,NH,RI,NY,NC,ME,VA
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 6010C in Water	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 7471B in Product/Solid	
Mercury	CT,NH,NY,ME,NC,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

CHAIN OF CUSTODY RECORD

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39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13E0068

Company Name: HDR Engineering INC
Address: 1 Blue Hill Plaza
Pearl River, NY 10965
Attention: Amita Patel
Project Location: Magna Metals
Sampled By: JP, DL

Telephone: 845-735-8300
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: APatel@HDRINC.com
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	I	H	A	# of Containers	** Preservation	***Container Code	TAL Metals
01	BRSD736-0-0.5	4/30/13	2:40pm		X	S	U							X
02	BRSD737-0-0.5		4:55pm		X	S	U							X
03	BRSD738-0-0.5		2:25pm		X	S	U							X
04	BRSD739-0-0.5		2:10pm		X	S	U							X
05	BRSD740-0-0.5		4:35pm		X	S	U							X
06	BRSD741-0-0.5		2:05pm		X	S	U							X
07	BRSD742-0-0.5		11:50am		X	S	U							X
08	BRSD743-0-0.5		4:15pm		X	S	U							X
09	BRSD744-0-0.5		11:45am		X	S	U							X
10	BRSD745-0-0.5	↓	11:30am		X	S	U							X

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Dan Lindley	4/30/13 1830
Received by: (signature) Paul A. Moccia	Date/Time: 4/30/13 1830
Relinquished by: (signature) Paul A. Moccia	Date/Time: 5/1/13 1145
Received by: (signature) 2.1°c Rebecca Faust	Date/Time: 5/2/13 9:52

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

13E0068

Company Name: HDR Engineering Inc. Telephone: 845-735-8300

Address: 1 Blue Hill Plaza Project # 184578

Pearl River, NY 10965 Client PO#

Attention: Amita Patel

Project Location: Magna Metals

Sampled By: JP, DL

DATA DELIVERY (check all that apply)
O FAX ☒EMAIL O WEBSITE
Fax #
Email: APatel@HDRINC.com
Format: ☒PDF ☒EXCEL O GIS ☒OTHER NYSDEC EDD
O "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
O yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Moisture Content	TOC
11	BRSD746-0-0.5	4/30/13	4:00pm		X	S	U				X		
12	BRSD747-0-0.5		11:35AM		X	S	U				X		
13	BRSD748-0-0.5		10:30AM		X	S	U				X		
14	BRSD749-0-0.5		3:10pm		X	S	U				X	X	X
15	BRSD750-0-0.5		10:35AM		X	S	U				X		
16	BRSD751-0-0.5		10:37AM		X	S	U				X		
17	BRSD752-0-0.5		3:40pm		X	S	U				X		
18	BRSD752-0-0.5D		3:40pm		X	S	U				X		
19	BRSD753-0-0.5		10:50AM		X	S	U				X		
20	BRSD754-0-0.5	↓	10:55AM		X	S	U				X		

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature) 2.1°C	Date/Time:

Turnaround ††	
☐	7-Day
☒	10-Day
☐	Other ____
RUSH †	
☐ †24-Hr ☐ †48-Hr	
☐ †72-Hr ☐ †4-Day	
† Require lab approval	

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
O MCP Form Required
O RCP Form Required
O MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

***Container Code
Dissolved Metals
O Field Filtered
O Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

13E0068

Company Name: HDR Engineering Inc
Telephone: 845-735-8300
Address: 1 Blue Hill Plaza
Project # 184578
Pearl River, NY 10965
Client PO#
Attention: Amita Patel
Project Location: Magna Metals
Sampled By: JP, DL

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: APatel@HDRINC.com
Format: ☒ PDF ☒ EXCEL ○ GIS ☒ OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code
21	BRSD755-0-0.5	4/30/13	3:50 PM		X	S	U	X		
22	BRSD756-0-0.5	↓	11:00AM		X	S	U	X		
23	BRSD757-0-0.5	↓	9:55AM		X	S	U	X		
24	BRSD758-0-0.5	↓	9:40AM		X	S	U	X		
25	BRSD759-0-0.5	↓	10:05AM		X	S	U	X		

ANALYSIS REQUESTED
TAL Metals

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	4/30/13 1830
Received by: (signature) [signature]	4/30/13 1836
Relinquished by: (signature) [signature]	5/1/13 1145
Received by: (signature) [signature] 2.1°C	5/2/13 9AM

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
ACCREDITED IN ACCORDANCE WITH nelac
NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

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FedEx

803011480290

Ship (P/U) date :
Wed 5/01/2013 12:31 pm
PEA US

Delivered
Signed for by: C.COLLINS

Actual delivery :
Thur 5/02/2013 9:50 am
MA US

Travel History

Date/Time	Activity	Location
- 5/02/2013 - Thursday		
9:50 am	Delivered	MA
8:12 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
7:10 am	At local FedEx facility	WINDSOR LOCKS, CT
3:15 am	Departed FedEx location	NEWARK, NJ
- 5/01/2013 - Wednesday		
2:31 pm	Picked up	MAHWAH, NJ
12:31 pm	Picked up Tendered at FedEx Office	NANUET, NY

Local Scan Time

Shipment Facts

Tracking number	803011480290	**Service**	FedEx Standard Overnight
Weight	67 lbs	**Dimensions**	24x14x14 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	67 lbs / 30.4 kgs	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge		

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

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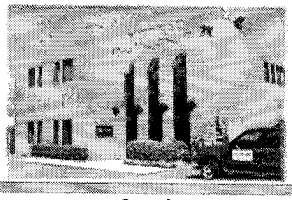

Sample Receipt Checklist

CLIENT NAME: HDR Engineering, Inc. **RECEIVED BY:** BLF **DATE:** 5/8/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 2.1 °C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	26
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	2
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

GeoTesting EXPRESS

Client:	Con-Test Analytical Lab				
Project:	13E0068				
Location:	---			Project No:	GTX-300514
Boring ID:	---	Sample Type:	jar	Tested By:	jek
Sample ID:	13E0068-14	Test Date:	05/07/13	Checked By:	jdt
Depth :	---	Test Id:	264946		
Test Comment:	---				
Sample Description:	Moist, very dark brown silty sand				
Sample Comment:	---				

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	13E0068-14	---	Moist, very dark brown silty sand	26.9

Notes: Temperature of Drying : 110º Celsius

printed 5/8/2013 1:44:46 PM

May 22, 2013 Service Request No: R1303115

Ms. Paula Blakeborough
Contest Laboratory
39 Spruce Street
East Longmeadow, MA 01028

Laboratory Results for: 13E0068

Dear Ms. Blakeborough:

Enclosed are the results of the sample(s) submitted to our laboratory on May 3, 2013. For your reference, these analyses have been assigned our service request number **R1303115**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Karen for:

Karen Bunker
Project Manager

ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623 PHONE 585-288-5380 | FAX 585-288-8475
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00001

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SDG NARRATIVE

Client:	Con-test Analytical Laboratory	**Service Request No.:**	R1303115
Project:	13E0068	**Date Received:**	5/3/13
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS. This report contains analytical results for samples designated for Tier IV data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS. Raw data is included in the report deliverables.

Sample Receipt

One sample was received for analysis at ALS on 5/3/13. The samples were received in good condition and consistent with the accompanying chain of custody forms. The samples were stored in a refrigerator between 1°C and 6°C upon receipt at the laboratory.

Inorganic Parameters

The sample was analyzed for TOC by EPA Lloyd Kahn and % Solids. Approved method references appear on report forms. Data is reported on a dry weight basis.

The Initial Calibration (ICAL), Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) criteria were met for all samples.

Batch QC is included in the report.. The Laboratory Control Sample (LCS) recovery was within acceptance limits.

All Method Blanks were free of contamination.

No analytical or QC problems were encountered during analysis.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the details contained above Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Approved by N Porter **Date** 5/22/13

00003

ALS ASP/CLP Batching Form/Login Sheet

Client Proj #:	Batch Complete: Yes	Date Revised:
Submission: R1303115	Diskette Requested: No	Date Due: 5/24/13
Client: Con-test Analytical Laboratory	Date: 5/3/13	Protocol: MCAWW
Client Rep: KBUNKER	Custody Seal: Present/Absent:	Shipping No.:
Project: 13E0068	Chain of Custody: Present/Absent:	SDG #:

CAS Job #	Client/EPA ID	Matrix	Requested Parameters	Date Sampled	Date Received	pH (Solids)	% Solids	Remarks Sample Condition
R1303115-001	13E0068-14	Soil	160.3 Modified, EPA LKahn 7-27-1988	4/30/13	5/3/13			

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ORIGINAL

Folder Comments:

ALS Environmental

REPORT QUALIFIERS

U	Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
J	Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).
B	Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
E	Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
E	Organics- Concentration has exceeded the calibration range for that specific analysis.
D	Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
*	Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
H	Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
#	Spike was diluted out.
+	Correlation coefficient for MSA is <0.995.
N	Inorganics- Matrix spike recovery was outside laboratory limits.
N	Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
S	Concentration has been determined using Method of Standard Additions (MSA).
W	Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
P	Concentration >40% (25% for CLP) difference between the two GC columns.
C	Confirmed by GC/MS
Q	DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).
X	See Case Narrative for discussion.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

NELAP Accredited	Maine ID #NY0032	New Hampshire ID # 294100 A/B
Connecticut ID # PH0556	Nebraska Accredited	
Delaware Accredited	Nevada ID # NY-00032	North Carolina #676
DoD ELAP #65817	New Jersey ID # NY004	Pennsylvania ID# 68-786
Florida ID # E87674	New York ID # 10145	Rhode Island ID # 158
Illinois ID #200047		Virginia #460167

[1] Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to http://alsglobal.com/environmental/laboratories/rochester-environmental-lab.aspx

CHAINS OF CUSTODY

SUBCONTRACT ORDER

Con-Test Analytical Laboratory

13E0068

Subcontract lab must notify Con-Test Anal
Lab of any MCL exceedance within 24-hou
obtaining valid data.

SENDING LABORATORY:

Con-Test Analytical Laboratory
39 Spruce Street
East Longmeadow, MA 01028
Phone: 413.525.2332
Fax: 413.525.6405
Project Manager: Paula E. Blakeborough

RECEIVING LABORATORY:

Columbia Analytical Services, Inc. - Rochester, NY
1565 Jefferson Road Building 300, Suite 360
Rochester, NY 14623
Phone :800-695-7222
Fax: 585-288-8475

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 13E0068-14	**Soil**	**Sampled:04/30/13 15:10**	[redacted]	
Total Organic Carbon	05/09/13 12:00	05/14/13 15:10		Sub to Columbia Analytical in Rochester, NY
Containers Supplied:				
2 oz clear glass (C)				

R1303115 5
Contest Laboratory
13E0068

R1303115

Released By	Date	Received By	Date
Released By	Date	Received By	Date

5/3/13 1315

Cooler Receipt and Preservation Check Form

Project/Client Contest Folder Number R1302115

Cooler received on 5/3/13 by: [illegible] COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1. Were custody seals on outside of cooler? YES (NO)
2. Were custody papers properly filled out (ink, signed, etc.)? YES (NO)
3. Did all bottles arrive in good condition (unbroken)? (YES) NO
4. Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles? YES NO (N/A)
5. Were **Ice** or **Ice packs** present? (YES) NO
6. Where did the bottles originate? ALS/ROC, (CLIENT)
7. Soil VOA samples received as: Bulk Jar Encore TerraCore Lab5035set (N/A)
8. Temperature of cooler(s) upon receipt: 4.3°

Is the temperature within 0° - 6° C?: (Y) N Y N Y N Y N Y N

If No, Explain Below Date/Time Temperatures Taken: 5/3/13 1315

Thermometer ID: IR GUN#3 / (IR GUN#4) Reading From: Temp Blank / (Sample Bottle)

If out of Temperature, note packing/ice condition &Client Approval to Run Samples:

All Samples held in storage location R-002 by [illegible] on 5/3/13 at 1315

5035 samples placed in storage location _____ by _____ on _____ at _____

PC Secondary Review: [illegible] 5/3/13

Cooler Breakdown: Date: 5/4/13 Time: 0840 by: [illegible]

1. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
2. Did all bottle labels and tags agree with custody papers? (YES) NO
3. Were correct containers used for the tests indicated? (YES) NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies:

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO_3								
≤2	H_2SO_4								
<4	$NaHSO_4$								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	$Na_2S_2O_3$	-	-						
	Zn Aceta	-	-						
	HCl	*	*						

*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: _____

Bottle lot numbers: Client

Other Comments:

PC Secondary Review: [illegible]

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS ENVIRONMENTAL

Chain of Custody Report

Client: Contest Laboratory
Project: 13E0068

Service Request: R1303115

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
R1303115-001.01					
	160.3 Modified, EPA LKahn 7-27-1988				
		5/6/13	0834	SMO / ROCHESTER SMO	
		5/6/13	0835	R-002 / ROCHESTER SMO	
		5/6/13	1518	In Lab / BKALKMAN	
		5/6/13	2059	R-002 / ASIMMONS	
		5/7/13	0833	In Lab / BBAXTER	
		5/7/13	1242	R-002 / BBAXTER	

GENERAL CHEMISTRY DATA

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303115
Project:	13E0068	**Date Collected:**	4/30/13 1510
Sample Matrix:	Soil	**Date Received:**	5/ 3/13
Sample Name:	13E0068-14		
Lab Code:	R1303115-001	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	80.5		Percent	1.0	1	NA	5/7/13 09:00	

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303115
Project:	13E0068	**Date Collected:**	4/30/13 1510
Sample Matrix:	Soil	**Date Received:**	5/ 3/13
Sample Name:	13E0068-14		
Lab Code:	R1303115-001	**Basis:**	Dry, per Method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	3300		mg/Kg	1700	1	NA	5/7/13 09:15	

ALS ENVIRONMENTAL

Analytical Report

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303115
Project:	13E0068	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank		
Lab Code:	R1303115-MB	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0	U	Percent	1.0	1	NA	5/7/13 09:00	

ALS ENVIRONMENTAL

Analytical Report

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303115
Project:	13E0068	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank		
Lab Code:	R1303115-MB	**Basis:**	Dry, per Method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	300	U	mg/Kg	300	1	NA	5/7/13 09:15	

ALS ENVIRONMENTAL

QA/QC Report

Client: Con-test Analytical Laboratory
Project: 13E0068
Sample Matrix: Soil

Service Request: R1303115
Date Analyzed: 5/ 7/13

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/Kg
Basis: Dry, per Method

Analyte Name	Method	Lab Control Sample R1303115-LCS Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1940	2000	97	84 - 113

Results flagged with an asterisk (*) indicate values outside control criteria.
Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Con-test Analytical Laboratory **Service Request:** R1303115
Project: 13E0068

Continuing Calibration Verification (CCV) Summary
Carbon, Total Organic (TOC)

Analytical Method: EPA LKahn 7-27-1988 **Units:** ppm

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	339492	RQ1304829-01	5/7/13 09:15	4000	4010	100	85 - 115
CCV2	339492	RQ1304829-05	5/7/13 09:15	4000	4090	102	85 - 115
CCV3	339492	RQ1304829-09	5/7/13 09:15	4000	4120	103	85 - 115

Client: Con-test Analytical Laboratory **Service Request:** R1303115
Project: 13E0068

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic (TOC)

Analytical Method: EPA LKahn 7-27-1988 **Units:** mg/Kg

	Analysis Lot	Lab Code	Date Analyzed	MRL	Result	Q
CCB1	339492	RQ1304829-02	5/7/13 09:15	300	300	U
CCB2	339492	RQ1304829-06	5/7/13 09:15	300	300	U
CCB3	339492	RQ1304829-10	5/7/13 09:15	300	300	U

Analytical Results Summary

Instrument Name: R-TOC-02 Analyst: BKALKMAN Analysis Lot: 339492 Method/Testcode: EPA LKahn 7-27-1988/Kahn TOC

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1304829-01	Carbon, Total Organic (TOC)	CCV		Soil	4008.00 ppm	100 mg	4010 ppm	1					5/7/13 09:15	N	II
RQ1304829-02	Carbon, Total Organic (TOC)	CCB		Soil	32.95 µg/g	100 mg	300 mg/Kg U	1	60	300			5/7/13 09:15	N	II
RQ1304829-03	Carbon, Total Organic (TOC)	MB		Soil	32.95 µg/g	100 mg	300 mg/Kg U	1	60	300			5/7/13 09:15	N	II
RQ1304829-04	Carbon, Total Organic (TOC)	LCS		Soil	1937.00 µg/g	100 mg	1940 mg/Kg	1	60	300	97		5/7/13 09:15	N	II
R1302816-001	Carbon, Total Organic (TOC)	N/A		Soil	19440.00 µg/g	9.2 mg	19400 mg/Kg	1	600	3300			5/7/13 09:15	N	II
R1302816-002	Carbon, Total Organic (TOC)	N/A		Soil	12700.00 µg/g	10.1 mg	12700 mg/Kg	1	600	3000			5/7/13 09:15	N	II
R1302816-003	Carbon, Total Organic (TOC)	N/A		Soil	8595.00 µg/g	14.2 mg	8600 mg/Kg	1	400	2100			5/7/13 09:15	N	II
R1302816-004	Carbon, Total Organic (TOC)	N/A		Soil	10470.00 µg/g	11.6 mg	10500 mg/Kg	1	500	2600			5/7/13 09:15	N	II
R1302935-001	Carbon, Total Organic (TOC)	N/A		Soil	7053.00 µg/g	17.7 mg	7100 mg/Kg	1	300	1700			5/7/13 09:15	N	II
R1302951-005	Carbon, Total Organic (TOC)	N/A		Soil	2365.00 µg/g	23.4 mg	2400 mg/Kg	1	300	1300			5/7/13 09:15	N	II
R1302951-006	Carbon, Total Organic (TOC)	N/A		Soil	9744.00 µg/g	9.5 mg	9700 mg/Kg	1	600	3200			5/7/13 09:15	N	II
RQ1304829-05	Carbon, Total Organic (TOC)	CCV		Soil	4086.00 ppm	100 mg	4090 ppm	1					5/7/13 09:15	N	II
RQ1304829-06	Carbon, Total Organic (TOC)	CCB		Soil	29.39 µg/g	100 mg	300 mg/Kg U	1	60	300			5/7/13 09:15	N	II
R1302935-002	Carbon, Total Organic (TOC)	N/A		Soil	740.30 µg/g	72.6 mg	740 mg/Kg	1	80	410			5/7/13 09:15	N	II
RQ1304829-07	Carbon, Total Organic (TOC)	DUP	R1302935-002	Soil	590.10 µg/g	86.3 mg	590 mg/Kg	1	60	350		23	5/7/13 09:15	N	II
RQ1304829-08	Carbon, Total Organic (TOC)	MS	R1302935-002	Soil	2617.00 µg/g	94 mg	2620 mg/Kg	1	60	320	88		5/7/13 09:15	N	II
R1302935-003	Carbon, Total Organic (TOC)	N/A		Soil	1157.00 µg/g	37.6 mg	1160 mg/Kg	1	140	800			5/7/13 09:15	N	II
R1303115-001	Carbon, Total Organic (TOC)	N/A		Soil	3250.00 µg/g	18 mg	3300 mg/Kg	1	300	1700			5/7/13 09:15	N	IV
R1303112-001	Carbon, Total Organic (TOC)	N/A		Soil	23080.00 µg/g	6.3 mg	23100 mg/Kg	1	900	4800			5/7/13 09:15	N	II
RQ1304829-09	Carbon, Total Organic (TOC)	CCV		Soil	4122.00 ppm	100 mg	4120 ppm	1					5/7/13 09:15	N	II
RQ1304829-10	Carbon, Total Organic (TOC)	CCB		Soil	31.40 µg/g	100 mg	300 mg/Kg U	1	60	300			5/7/13 09:15	N	II

R3115
1 copy

Reviewed & Approved
By: CK
Date: 5/9/13

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 5/9/13 9:56

Results Summary

00018

Analysis: TOC Soils Analysis
Method: EPA Lloyd Kahn 1988
Analysis: TC Soils Analysis
Method: EPA Lloyd Kahn Modified
TOC#2 Dohrman DC190

Analyst: B. Kalkman
Pipet ID: FERB
Date: 05/07/13
Time: 9:15
Balance ID: AG 204

Curve Date: 09/24/12 Corr Coeff.: 1.0000
With 1 point calibration

Position #	Misc.	Order #	Sample Amt. (mg)	Result (ug/g)	Comments
1	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
2	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
3	TV= 4000	ICV	100.0	4027	100.7%
4		ICB	100.0	13.26	
5	TV= 2000	LCS	100.0	1919	96.0%
6	Curve Check	300	100.0	292.4	97.5%
7	Curve Check	500	100.0	461.2	92.2%
8	Curve Check	800	100.0	716.9	89.6%
9	Curve Check	1000	100.0	939.2	93.9%
10	Curve Check	3000	100.0	2975	99.2%
11	Curve Check	5000	100.0	4968	99.4%
12	Curve Check	8000	100.0	7858	98.2%
13	TV= 4000	CCV	100.0	4008	100.2%
14		CCB	100.0	32.95	
15	TV= 2000	LCS	100.0	1937	96.9%
16		R1302816-001	9.2	19440	
17		R1302816-002	10.1	12700	
18		R1302816-003	14.2	8595	
19		R1302816-004	11.6	10470	
20		R1302935-001	17.7	7053	
21		R1302935-002	36.4	709.3	Rep. w/. More Mass
22		R1302935-003	16.4	1384	Rep. w/. More Mass
23		R1302951-005	23.4	2365	
24		R1302951-006	9.5	9744	
25	TV= 4000	CCV	100.0	4086	
26		CCB	100.0	29.39	
27		R1302935-002	72.6	740.3	
28		R1302935-002 DUP	86.3	590.1	
29		R1302935-002 SPK	94.0	2617	88.2%
30		R1302935-003	37.6	1157	
31		R1303115-001	18.0	3250	
32		R1303112-001	6.3	23080	TOC
33		R1303112-001	2.1	116300	TC
34		R1303112-001 DUP	1.8	124800	TC
35		R1303112-001 SPK	2.0	237500	TC (123%)
36	TV= 4000	CCV	100.0	4122	
37		CCB	100.0	31.4	

"Time Out Error": Baseline did not return after ignition to within 0.250 mV of the pre-ignition baseline.
Note: For TOC, 1:1 HNO3 added to remove inorganic carbon. This is not done for TC analysis.
TIC = TC - TOC

Template-TOCLK-r0 1/4/13

Sample ID# -4000- CCV
Sample mass (mg) = 100.
1. TC = 4008. ug/g
9:33:19 Tue May 7, 2013
Sample ID# -0- ccb
Sample mass (mg) = 100.
1. TC = 32.95 ug/g
9:41:24 Tue May 7, 2013
Sample ID# -2000- LCS
Sample mass (mg) = 100.
1. TC = 1937. ug/g
9:55:00 Tue May 7, 2013
Sample ID# 816-001
Sample mass (mg) = 9.2
1. TC = 19440. ug/g
10:01:58 Tue May 7, 2013
Sample ID# 2816-002
Sample mass (mg) = 10.1
1. TC = 12700. ug/g
10:09:18 Tue May 7, 2013
Sample ID# 2816-003
Sample mass (mg) = 14.2
1. TC = 8595. ug/g
10:16:00 Tue May 7, 2013
Sample ID# 2816-004
Sample mass (mg) = 11.6
1. TC = 10470. ug/g
10:23:21 Tue May 7, 2013
Sample ID# 2935-001
Sample mass (mg) = 17.7
1. TC = 7053. ug/g
10:30:00 Tue May 7, 2013
Sample ID# 2935-002 Rep. wt. more mass
Sample mass (mg) = 36.4
1. TC = 709.3 ug/g
10:36:38 Tue May 7, 2013
Sample ID# 2935-003 rep. wt. more mass
Sample mass (mg) = 16.4
1. TC = 1384. ug/g
10:42:55 Tue May 7, 2013
Sample ID# 2951-005
Sample mass (mg) = 23.4
1. TC = 2365. ug/g
10:52:06 Tue May 7, 2013
Sample ID# 2951-006
Sample mass (mg) = 9.5
1. TC = 9744. ug/g
10:58:01 Tue May 7, 2013

Sample ID# -4000- CCV
Sample mass (mg) = 100.
1. TC = 4086. ug/g
11:05:07 Tue May 7, 2013
Sample ID# -0- CCB
Sample mass (mg) = 100.
1. TC = 29.39 ug/g
11:10:43 Tue May 7, 2013
Sample ID# 2935-002
Sample mass (mg) = 72.6
1. TC = 740.3 ug/g
11:16:57 Tue May 7, 2013
Sample ID# 2935-002 DUP
Sample mass (mg) = 86.3
1. TC = 590.1 ug/g
11:24:49 Tue May 7, 2013
Sample ID# 2935-002 DID NOT INJECT
Sample mass (mg) = 94.
1. TC = 0.828 ug/g
11:28:33 Tue May 7, 2013
Sample ID# 2935-002 SPK
Sample mass (mg) = 94.
1. TC = 2617. ug/g
11:35:01 Tue May 7, 2013
Sample ID# 2935-003
Sample mass (mg) = 37.6
1. TC = 1157. ug/g
11:41:31 Tue May 7, 2013
Sample ID# 3115-001
Sample mass (mg) = 18.
1. TC = 3250. ug/g
12:11:11 Tue May 7, 2013
Sample ID# 3112-001 TOC
Sample mass (mg) = 6.3
1. TC = 23080. ug/g
12:17:29 Tue May 7, 2013
Sample ID# 3112-001 TC
Sample mass (mg) = 2.1
1. TC = 116300. ug/g
12:24:06 Tue May 7, 2013
Sample ID# 3112-001 TC DUP
Sample mass (mg) = 1.8
1. TC = 124800. ug/g
12:30:36 Tue May 7, 2013
Sample ID# 3112-001 TC SPK
Sample mass (mg) = 2.
1. TC = 237500. ug/g
12:37:44 Tue May 7, 2013
Sample ID# -4000- CCV
Sample mass (mg) = 100.
1. TC = 4122. ug/g
12:45:05 Tue May 7, 2013
Sample ID# -0- CCB
Sample mass (mg) = 100.
1. TC = 31.4 ug/g
12:51:16 Tue May 7, 2013

Columbia Analytical Services
Now part of the ALS Group
1565 Jefferson Rd., Rochester NY 14623

General Chemistry Analytical Run Cover Sheet

Analyst: _____ Date: 5/7/13

Analysis: TOC Soils by L. Kahn Method (EPA 1988) Instrument: Dohrmann DC-190 with Boat Module and range extender

Quality Control:

	Same as Log#, Date,	Stocks Prep. Log#, Date,	Stock Sol (uLs)	Stock Sol (mg/L)	Final Vol (mg)	True Value (ug/g)
a) Calibration Std						
& Calibration Checks:	WC86043E, 09/24/12	WC86040B, 1/3/12				
b.) ICV Prep:	WC86043F, 09/24/12	WC86040A, 12/29/11	40	1000	100	4000
CCV Prep:		WC86044G, 11/12/12				
c) LCS Preparation:	WC86043G, 09/24/12	WC86045A, 01/22/13	20	10000	100	2000
d) Matrix Spike Prep.:	WC86043H, 09/24/12	WC86045A, 01/22/13	20	10000	See data sheet	
Curve Date:	9/24/2012					

Comments:

High Level: Linear Range is from 300 to 8000 ug/g based on 100 mg of sample, or 3000 to 80,000 ug/g based on 10 mg of sample, or 30,000 to 800,000 ug/g based on 1 mg of sample.

Samples are dried prior to weighing the sample aliquot. The results are therefore already as dry weight, and so are not corrected using the dry weight percent solid result.

p:\l\1\g\forms\coversht\allcover.xls TOC-Soils

Analysis: TOC Soils Analysis Analyst: C. Woods
Method: EPA Lloyd Kahn 1988 Pipet ID: Harry
Analysis: TC Soils Analysis Date: 09/24/12
Method: EPA Lloyd Kahn Modified Time: 15:30
TOC#2 Dohrman DC190 Balance ID: AG-204

Curve Date: 09/24/12 Corr Coeff.: 1.0000
With 1 point calibration

Position #	Misc.	Order #	Sample Amt. (mg)	Result (ug/g)	Comments
1	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
2	Std: 50 uL of 10,000 ppm Std.		Calibration	Source: WC86040B	
3	TV= 4000	ICV	100.0	4027	100.7%
4		ICB	100.0	13.26	
5	TV= 2000	LCS	100.0	1919	96.0%
6	Curve Check	300	100.0	292.4	97.5%
7	Curve Check	500	100.0	461.2	92.2%
8	Curve Check	800	100.0	716.9	89.6%
9	Curve Check	1000	100.0	939.2	93.9%
10	Curve Check	3000	100.0	2975	99.2%
11	Curve Check	5000	100.0	4968	99.4%
12	Curve Check	8000	100.0	7858	98.2%

"Time Out Error": Baseline did not return after ignition to within 0.250 mV of the pre-ignition baseline.
Note: For TOC analysis, samples are treated with 1:1 HNO3 to remove any inorganic carbon. This is not done for TC analysis.
TIC = TC - TOC

TOC-LK
Calibration 09/24/12
Analyst: CWoods
Pipets: Harry, OIBlue

Operating Parameters

```
nalysis set-up      1
TC   Analysis
Boat mode
ample size          50.
alibration factor    1.
ystem blank          0.
td. concentration =10000.
ample ID#           1
1. TC   = 4658. mg/l
2. TC   = 4662. mg/l
AVG  TC   = 4660. +/- 2.828    % std dev: 0.061
2:48:52 Mon Sep 24, 2012
alibration update:
alibration factor  2.146
ystem blank          0.
ample ID#          -4000-   ICV
ample mass (mg) =  100.
.. TC   = 4027. ug/g
3:13:45 Mon Sep 24, 2012
ample ID#          -0-      ICB
ample mass (mg) =  100.
.. TC   = 13.26 ug/g
3:27:48 Mon Sep 24, 2012
ample ID#          -2000-   LCS
ample mass (mg) =  100.
. TC   = 1919. ug/g
1:47:05 Mon Sep 24, 2012
ample ID#          -300-    300 Cal CHECK
ample mass (mg) =  100.
. TC   = 292.4 ug/g
:08:12 Mon Sep 24, 2012
ample ID#          -500-    500 CAL CHECK
mple mass (mg) =  100.
. TC   = 461.2 ug/g
:25:42 Mon Sep 24, 2012
mple ID#           -800-    800 CAL CHECK
mple mass (mg) =  100.
. TC   = 716.9 ug/g
:40:59 Mon Sep 24, 2012
mple ID#           -1000-   1000 CAL CHECK
mple mass (mg) =  100.
. TC   = 939.2 ug/g
:51:35 Mon Sep 24, 2012
mple ID#           -3000-   3000 CAL CHECK
mple mass (mg) =  100.
. TC   = 2975. ug/g
:59:42 Mon Sep 24, 2012
mple ID#           -5000-   5000 CAL CHECK
nple mass (mg) =  100.
. TC   = 4968. ug/g
:12:23 Mon Sep 24, 2012
nple ID#           -8000-   8000 CAL CHECK
nple mass (mg) =  100.
. TC   = 7858. ug/g
:20:27 Mon Sep 24, 2012
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00024

09/24/12
TOC-LK
Analyst: CWoods
Pipets: Harry

```
ample ID#            -4000-   CCV
ample mass (mg) =    100.
1. TC    = 3932. ug/g
5:36:57 Mon Sep 24, 2012
ample ID#            -0-      CCB
ample mass (mg) =    100.
1. TC    = 58.66 ug/g
5:46:49 Mon Sep 24, 2012
ample ID#            -2000-   LCS
ample mass (mg) =    100.
1. TC    = 1926. ug/g
6:02:47 Mon Sep 24, 2012
ample ID#            6183-001
ample mass (mg) =    87.6
1. TC    = 3122. ug/g
6:54:37 Mon Sep 24, 2012
ample ID#            6183-002  → >LR, Repeat
ample mass (mg) =    76.2
1. TC    = 14420. ug/g
7:03:20 Mon Sep 24, 2012
ample ID#            6183-003
ample mass (mg) =    100.
1. TC    = 872.1 ug/g
7:14:04 Mon Sep 24, 2012
ample ID#            6183-004
ample mass (mg) =    100.
1. TC    = 1310. ug/g
7:22:12 Mon Sep 24, 2012
ample ID#            6183-002
ample mass (mg) =    14.7
l. TC    = 14050. ug/g
7:29:21 Mon Sep 24, 2012
ample ID#            6183-005
ample mass (mg) =    53.3
l. TC    = 3209. ug/g
7:52:32 Mon Sep 24, 2012
ample ID#            6183-006
ample mass (mg) =    27.5
.. TC    = 3263. ug/g
8:03:15 Mon Sep 24, 2012
ample ID#            6183-006  DUP
ample mass (mg) =    31.4
.. TC    = 2908. ug/g
8:10:27 Mon Sep 24, 2012
ample ID#            6183-006  SPK
ample mass (mg) =    28.3
. TC     = 8026. ug/g
8:21:13 Mon Sep 24, 2012
ample ID#            -4000-    CCV
mple mass (mg) =     100.
. TC     = 3889. ug/g
8:36:04 Mon Sep 24, 2012
mple ID#             -0-       CCB
mple mass (mg) =     100.
. TC     = 0.197 ug/g
8:42:18 Mon Sep 24, 2012
```

9/5/12 (A) TIC CALIBRATION STANDARDS - Fresh per calibration

STD #	Concn (mg/L)	mL's 1000 ppm Std (WC860441F)	Final Volume
1	0.00	0.00	100
2	1.00	0.10	100
3	5.00	0.50	100
4	10.00	1.00	100
5	30.00	3.00	100

(B) TIC LCS - Dilute 1mL 1000 ppm STD stock (WC860441F) to 100mL w/ UPDE in a volumetric flask. prepare fresh per run. TV=10.0 ppm

(C) TIC MATRIX SPIKE - Add 0.42 mL STD Stock (WC860441F) to 4mL sample in vial. TV=10.0 ppm

(D) TIC ICV/CCV - Dilute 3.00 mL Ref Stock (WC860405) to 200mL w/ UPDE in volumetric flask. Prepare Fresh per run. TV=15.0 ppm.

Back up 9/24/12 (E) TOC CALIBRATION STANDARDS BY LLOYD KAHN

Concn mg/L	mL 10000 ppm STD (WC860408)
8000	80.0
5000	50.0
3000	30.0
1000	100.0
*800 (not required)	80.0
500	50.0
300	30.0

} 1/10 of WC860408

(F) ICV/ICB - Analyze 40 mL of 10,000 ppm Reference (WC860407A) TV=4000 mg/L

(G) LCS - Analyze 20 mL of 10,000 ppm Standard (WC860408) TV=2000 mg/L

(H) Matrix Spike - Add 20 mL of 10,000 ppm Standard (WC860408) to sample and Analyze TV=(20mL)(10000ppm)/(x g sample)

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

12/29/11 (A) TOC Soils Reference Stock (10,000 ppm)
BWK 5.32 g KHP (WC8506ZC), previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL w/ UPDI in vol. Flask. Store @ RT in Amber glass Exp 10/25/12

1/3/12 (B) TOC Soils Standard Stock (10,000 ppm)
BWK 5.32 g KHP (WC8516PC), previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL w/ UPDI in vol flask. Store @ RT in Amber glass. Exp 1 yr. 1/3/13

2/9/12 (C) TIC 1000ppm Standard Stock
BWK Dissolve 1.7648 g Na_2CO_3 (WC762946) in 200 mL volumetric Flask. Bring to volume w/ DI. Store in Amber Glass. Exp 6/20/12

(D) TIC 1000ppm Reference Stock
Dissolve 1.7648 g Na_2CO_3 (WC1030686) in 200 mL volumetric Flask Bring to volume w/ DI Store in Amber Glass. Exp 2/9/13.

3/9/12 (E) TOC 1000ppm Standard Stock
BWK Dissolve 2.128 g KHP(WC8516PC) previously dried @ 104°C for 2 hours to 1000 mL w/ UPDI volumetrically. Store @ RT in Amber Glass Exp 3/9/13

(F) TOC 1000ppm Reference Stock
Dissolve 2.128 g KHP(WC8506ZC) previously dried @ 104°C for 2 hours to 1000 mL w/ UPDI volumetrically. Store @ RT in Amber Glass Exp 10/25/12

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Read and Understood By

SD 1/4/13

Signed Date Signed Date

10/26/12 (A) TOC 1000 ppm Reference Stock

Dissolve 2.128 g KHP (WC103287F) previously dried @ 104°C for 2 hours to 1L w/ UPDI volumetrically. Store @ RT in Amber Glass. Exp 10/26/13

10/31/12 (B) TIC 1000 ppm Reference Stock

Dissolve 1.7648 g Na_2CO_3 (WC112055C) in 200 mL volumetric flask. Bring to volume w/ DI. Store in Amber Glass. Exp 1 yr, 10/31/12.

(C) TIC CALIBRATION STANDARDS - FRESH PER CALIBRATION

STD #	CONC'N (mg/L)	mLS 1000 ppm STD (WC86041F)	FINAL VOLUME (mL)
1	0.00	0.0	100
2	1.00	0.1	100
3	5.00	0.5	100
4	10.00	1.0	100
5	30.00	3.0	100

(D) TIC LCS - Dilute 1 mL 1000 ppm STD stock (WC86041F) to 100 mL volumetrically w/ UPDI prepare fresh per run. TV = 10.0 ppm

(E) TIC MATRIX SPIKE - Add 0.42 mL STD stock (WC86041F) to 42 mL sample in vial. TV = 10.0 ppm

(F) TIC ICV/CCV - Dilute 3.0 mL REF STOCK (WC86044B) to 200 mL volumetrically w/ UPDI, prepare fresh per run. TV = 15.0 ppm.

11/12/12 (G) TOC SOILS REFERENCE STOCK (10,000 ppm)

5.32 g KHP (WC103287F) previously dried @ 104°C for 2 hours and stored in dessicator → 250 mLS w/ UPDI in rt flask. Store @ RT in Amber Glass. Exp 11/12/13

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Read and Understood By

SD 11/7/12

Signed Date Signed Date

1/22/13 (A) TOC SOILS STANDARD STOCK (10,000 ppm)
BWK
5.32 g KHP (WC85169C) previously dried @ 104°C for 2 hours and stored in dessicator → 250 mL volumetrically w/ UPDI. Store @ RT in Amber Glass. Exp 6/24/13

2/13/13 (B) TOC HIGH LEVEL CALIBRATION STANDARDS FOR OI 1010 - Fresh per calibration
BWK

STD #	CONC'N (mg/L)	mL 1000 ppm STD (WC86040E)	FINAL VOL (mL) w/ UPDI
1	0.00	0.00	100
2	1.00	0.10	100
3	5.00	0.50	100
4	10.00	1.00	100
5	30.00	3.00	100

(C) TOC HIGH LEVEL LCS - TV=10.0 ppm. prepare fresh per run. Add 1.0 mL of 1000 ppm Standard Stock (WC86040E) to a 100 mL vol. flask. Dilute to vol. w/. DI.

(D) TOC HIGH LEVEL MATRIX SPIKE - TV=10.0 ppm. Add 0.42 mL of 1000 ppm Standard Stock (WC86040E) to ~~a 100 mL~~ 2/15/13 42 mL of sample in a vial.

(E) TOC HIGH LEVEL ICV/CCV - TV=15.0 ppm. prepare fresh per run. Add 3.0 mL of 1000 ppm Reference Stock (WC86044A) to a 200 mL vol. flask. Dilute to vol. w/. DI.

BWK (F) TOC 1000 ppm STANDARD STOCK
3/11/13
Dissolve 2.128 g KHP (WC85169C) previously dried @ 104°C for 2 hours to 1000 mL w/. DI volumetrically. Store @ RT in Amber Glass. Exp 6/24/13

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

CALIBRATION EQUATIONS

The following equations are used in the DC-190 system.

The equation for determining a calibrated result:

$$Y = (Fx - b) / V$$

Where:

y	=	Concentration (calibrated) of sample
x	=	NDIR peak with background subtracted. Normally invisible to the user. The displayed value, y, may be made to equal x by setting F, b, and V to the appropriate values (1, 0, and 1, respectively)
F	=	"Calibration Factor". This is the slope of the linear fit line
b	=	Intercept. This is an internal parameter which is invisible to the user
SB	=	"System" Blank = b/V
V	=	Sample volume (or mass)

To correct the Calculated Result when entering an incorrect Sample mass

$$\text{real result} = \frac{(\text{Result from Instrument}) \times (\text{Incorrect mass})}{\text{Actual Mass}}$$

The quantities F and SB are the ones displayed on the calibration menu and are the ones which can be edited directly.

The Calibration Factor and Blank are calculated by:

$$F_n = F_o (C_s/Y_s)$$

$$b_n = b_o (Fn/F_o)$$

Where:

C_s	=	Concentration of the standard
o	=	Old value
n	=	New value
s	=	Value of Standard

Linear Ranges for TOC soil, L.Kahn Method
Based on 300 to 8000 ug/g linear range using 100 mg of std

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
100	300	8000
99	303	8081
98	306	8163
97	309	8247
96	313	8333
95	316	8421
94	319	8511
93	323	8602
92	326	8696
91	330	8791
90	333	8889
89	337	8989
88	341	9091
87	345	9195
86	349	9302
85	353	9412
84	357	9524
83	361	9639
82	366	9756
81	370	9877
80	375	10000
79	380	10127
78	385	10256
77	390	10390
76	395	10526
75	400	10667
74	405	10811
73	411	10959
72	417	11111
71	423	11268
70	429	11429
69	435	11594
68	441	11765
67	448	11940
66	455	12121
65	462	12308
64	469	12500
63	476	12698
62	484	12903
61	492	13115
60	500	13333
59	508	13559
58	517	13793
57	526	14035
56	536	14286
55	545	14545
54	556	14815

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
53	566	15094
52	577	15385
51	588	15686
50	600	16000
49	612	16327
48	625	16667
47	638	17021
46	652	17391
45	667	17778
44	682	18182
43	698	18605
42	714	19048
41	732	19512
40	750	20000
39	769	20513
38	789	21053
37	811	21622
36	833	22222
35	857	22857
34	882	23529
33	909	24242
32	938	25000
31	968	25806
30	1000	26667
29	1034	27586
28	1071	28571
27	1111	29630
26	1154	30769
25	1200	32000
24	1250	33333
23	1304	34783
22	1364	36364
21	1429	38095
20	1500	40000
19	1579	42105
18	1667	44444
17	1765	47059
16	1875	50000
15	2000	53333
14.9	2013	53691
14.8	2027	54054
14.7	2041	54422
14.6	2055	54795
14.5	2069	55172
14.4	2083	55556
14.3	2098	55944
14.2	2113	56338

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
14.1	2128	56738
14	2143	57143
13.9	2158	57554
13.8	2174	57971
13.7	2190	58394
13.6	2206	58824
13.5	2222	59259
13.4	2239	59701
13.3	2256	60150
13.2	2273	60606
13.1	2290	61069
13	2308	61538
12.9	2326	62016
12.8	2344	62500
12.7	2362	62992
12.6	2381	63492
12.5	2400	64000
12.4	2419	64516
12.3	2439	65041
12.2	2459	65574
12.1	2479	66116
12	2500	66667
11.9	2521	67227
11.8	2542	67797
11.7	2564	68376
11.6	2586	68966
11.5	2609	69565
11.4	2632	70175
11.3	2655	70796
11.2	2679	71429
11.1	2703	72072
11	2727	72727
10.9	2752	73394
10.8	2778	74074
10.7	2804	74766
10.6	2830	75472
10.5	2857	76190
10.4	2885	76923
10.3	2913	77670
10.2	2941	78431
10.1	2970	79208
10	3000	80000
9.9	3030	80808
9.8	3061	81633
9.7	3093	82474
9.6	3125	83333
9.5	3158	84211

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
9.4	3191	85106
9.3	3226	86022
9.2	3261	86957
9.1	3297	87912
9	3333	88889
8.9	3371	89888
8.8	3409	90909
8.7	3448	91954
8.6	3488	93023
8.5	3529	94118
8.4	3571	95238
8.3	3614	96386
8.2	3659	97561
8.1	3704	98765
8	3750	100000
7.9	3797	101266
7.8	3846	102564
7.7	3896	103896
7.6	3947	105263
7.5	4000	106667
7.4	4054	108108
7.3	4110	109589
7.2	4167	111111
7.1	4225	112676
7	4286	114286
6.9	4348	115942
6.8	4412	117647
6.7	4478	119403
6.6	4545	121212
6.5	4615	123077
6.4	4687	125000
6.3	4762	126984
6.2	4839	129032
6.1	4918	131148
6	5000	133333
5.9	5085	135593
5.8	5172	137931
5.7	5263	140351
5.6	5357	142857
5.5	5455	145455
5.4	5556	148148
5.3	5660	150943
5.2	5769	153846
5.1	5882	156863
5	6000	160000

Sample Weight (mg)	Low End, PQL (ug/g)	High End, upper limit (ug/g)
4.9	6122	163265
4.8	6250	166667
4.7	6383	170213
4.6	6522	173913
4.5	6667	177778
4.4	6818	181818
4.3	6977	186047
4.2	7143	190476
4.1	7317	195122
4	7500	200000
3.9	7692	205128
3.8	7895	210526
3.7	8108	216216
3.6	8333	222222
3.5	8571	228571
3.4	8824	235294
3.3	9091	242424
3.2	9375	250000
3.1	9677	258065
3	10000	266667
2.9	10345	275862
2.8	10714	285714
2.7	11111	296296
2.6	11538	307692
2.5	12000	320000
2.4	12500	333333
2.3	13043	347826
2.2	13636	363636
2.1	14286	380952
2	15000	400000
1.9	15789	421053
1.8	16667	444444
1.7	17647	470588
1.6	18750	500000
1.5	20000	533333
1.4	21429	571429
1.3	23077	615385
1.2	25000	666667
1.1	27273	727273
1	30000	800000

000234

Analytical Results Summary

Instrument Name: R-Balance-01 Analyst: BBAXTER Analysis Lot: 339421 Method/Testcode: 160.3 Modified/TS

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	POL	% Rec	% RSD	Date Analyzed	QC?	Tier
RQ1304809-01	Solids, Total	MB		Soil	0.00 Percent		1.0 Percent U	1		1.0			5/7/13 09:00	N	II
R1303125-001	Solids, Total	N/A		Soil	17.58 Percent		17.6 Percent	1		1.0			5/7/13 09:00	N	II
R1303129-001	Solids, Total	N/A		Soil	84.15 Percent		84.2 Percent	1		1.0			5/7/13 09:00	N	II
RQ1304809-02	Solids, Total	DUP	R1303129-001	Soil	84.89 Percent		84.9 Percent	1		1.0		<1	5/7/13 09:00	N	II
R1303051-001	Solids, Total	N/A		Soil	77.76 Percent		77.8 Percent	1		1.0			5/7/13 09:00	N	I
R1303104-001	Solids, Total	N/A		Solid	39.51 Percent		39.5 Percent	1		1.0			5/7/13 09:00	N	II
R1303115-001	Solids, Total	N/A		Soil	80.50 Percent		80.5 Percent	1		1.0			5/7/13 09:00	N	IV
RQ1304809-03	Solids, Total	DUP	R1303115-001	Soil	81.35 Percent		81.3 Percent	1		1.0		1	5/7/13 09:00	N	IV
R1303118-001	Solids, Total	N/A		Soil	73.97 Percent		74.0 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-002	Solids, Total	N/A		Soil	70.81 Percent		70.8 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-003	Solids, Total	N/A		Soil	70.42 Percent		70.4 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-004	Solids, Total	N/A		Soil	81.12 Percent		81.1 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-005	Solids, Total	N/A		Soil	78.44 Percent		78.4 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-006	Solids, Total	N/A		Soil	71.93 Percent		71.9 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-007	Solids, Total	N/A		Soil	75.93 Percent		75.9 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-008	Solids, Total	N/A		Soil	73.34 Percent		73.3 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-009	Solids, Total	N/A		Soil	69.72 Percent		69.7 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-010	Solids, Total	N/A		Soil	79.13 Percent		79.1 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-011	Solids, Total	N/A		Soil	82.28 Percent		82.3 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-012	Solids, Total	N/A		Soil	68.68 Percent		68.7 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-013	Solids, Total	N/A		Soil	69.84 Percent		69.8 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-014	Solids, Total	N/A		Soil	77.65 Percent		77.6 Percent	1		1.0			5/7/13 09:00	N	II
R1303118-015	Solids, Total	N/A		Soil	73.34 Percent		73.3 Percent	1		1.0			5/7/13 09:00	N	II

R3115
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Reviewed & Approved
By: CK
Date: 5/13/13

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Page 107 of 111 13E0068_1 Contest_Final 05 31 13 1630

00032

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analyte: % Volatile Solids
Method: SM20 2540G
Analytes: Dry Weight % Solid
Method : EPA-600 160.3

Analyst: BAB Date: 5/7/13
Pipet: NA Time: 9:00
Thermolyne F48025-6048000 Muffle Furnace
Balance ID: R-BALANCE-01 Oven ID: 2
Class 1 Weight Initial: 10.00 Final: 10.00

% Volatile Solids:

% VS = (A - D) / (A - B) * 100

% Solids:

% Solid = (A - B) / (C - B) * 100

Where: A = wgt (g) of dried residue + dish
B = wgt (g) of tared dish
C = wgt (g) of wet sample + dish
D = wgt (g) of residue + dish after ign. @550 C.

	Misc.	Order #	Dish ID	Before Ignition / Wet Weight (g)		After Ignition / Dry Weight (g)		% Volatile Solids	% Solids
1		MB	85	C)		Dry wgt (A)	1.3200		100
				B)	1.3200	550 wgt (D)			
2		R1303125-001	86	C)	11.7200	Dry wgt (A)	3.1400		17.58
				B)	1.3100	550 wgt (D)			
3		R1303129-001	87	C)	11.6500	Dry wgt (A)	10.0100		84.15
				B)	1.3000	550 wgt (D)			
4		R1303129-001 DUP	88	C)	11.5700	Dry wgt (A)	10.0200		84.89
				B)	1.3100	550 wgt (D)			
5		R1303051-001	89	C)	11.3800	Dry wgt (A)	9.1400		77.76
				B)	1.3100	550 wgt (D)			
6		R1303104-001	90	C)	11.5100	Dry wgt (A)	5.3400		39.51
				B)	1.3100	550 wgt (D)			
7		R1303115-001	91	C)	11.6200	Dry wgt (A)	9.6100		80.50
				B)	1.3100	550 wgt (D)			
8		R1303115-001 DUP	92	C)	11.5600	Dry wgt (A)	9.6500		81.35
				B)	1.3200	550 wgt (D)			
9		R1303118-001	93	C)	11.4900	Dry wgt (A)	8.8400		73.97
				B)	1.3100	550 wgt (D)			
10		R1303118-002	95	C)	11.6200	Dry wgt (A)	8.6100		70.81
				B)	1.3100	550 wgt (D)			
11		R1303118-003	47	C)	11.5200	Dry wgt (A)	8.5000		70.42
				B)	1.3100	550 wgt (D)			
12		R1303118-004	48	C)	11.8500	Dry wgt (A)	9.8600		81.12
				B)	1.3100	550 wgt (D)			
13		R1303118-005	49	C)	11.4200	Dry wgt (A)	9.2400		78.44
				B)	1.3100	550 wgt (D)			
14		R1303118-006	50	C)	11.8200	Dry wgt (A)	8.8700		71.93
				B)	1.3100	550 wgt (D)			
15		R1303118-007	51	C)	11.5000	Dry wgt (A)	9.0500		75.93
				B)	1.3200	550 wgt (D)			
16		R1303118-008	52	C)	11.5600	Dry wgt (A)	8.8300		73.34
				B)	1.3200	550 wgt (D)			
17		R1303118-009	53	C)	11.6800	Dry wgt (A)	8.5400		69.72
				B)	1.3100	550 wgt (D)			
18		R1303118-010	54	C)	11.3800	Dry wgt (A)	9.2800		79.13
				B)	1.3200	550 wgt (D)			
19		R1303118-011	55	C)	11.6400	Dry wgt (A)	9.8100		82.28
				B)	1.3100	550 wgt (D)			
20		R1303118-012	56	C)	11.9100	Dry wgt (A)	8.5900		68.68
				B)	1.3100	550 wgt (D)			

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Template-%VolatileSolids-r0 1/4/13

COLUMBIA ANALYTICAL SERVICES, INC.
Now part of the ALS Group

Analyte: % Volatile Solids
Method: SM20 2540G
Analytes: Dry Weight % Solid
Method : EPA-600 160.3

Analyst: BAB Date: 5/7/13
Pipet: NA Time: 9:00
Thermolyne F48025-6048000 Muffle Furnace
Balance ID R-BALANCE-01 Oven ID 2
Class 1 Weight Initial: 10.00 Final: 10.00

% Volatile Solids:
% VS = (A - D) / (A - B) * 100

% Solids:
% Solid = (A - B) / (C - B) * 100

Where: A = wgt (g) of dried residue + dish
B = wgt (g) of tared dish
C = wgt (g) of wet sample + dish
D = wgt (g) of residue + dish after ign. @550 C.

	Misc.	Order #	Dish ID	Before Ignition / Wet Weight (g)		After Ignition / Dry Weight (g)		% Volatile Solids	% Solids
21		R1303118-013	57	C)	11.4900	Dry wgt (A)	8.4200		69.84
				B)	1.3100	550 wgt (D)			
22		R1303118-014	58	C)	11.6100	Dry wgt (A)	9.3100		77.65
				B)	1.3200	550 wgt (D)			
23		R1303118-015	59	C)	11.8600	Dry wgt (A)	9.0500		73.34
				B)	1.3200	550 wgt (D)			
24		MB	60	C)		Dry wgt (A)	1.3100		1.00
				B)	1.3000	550 wgt (D)			
25		R1303118-016	61	C)	11.5000	Dry wgt (A)	9.4000		79.41
				B)	1.3000	550 wgt (D)			
26		R1303118-016 DUP	62	C)	11.8100	Dry wgt (A)	9.5800		78.78
				B)	1.3000	550 wgt (D)			
27		R1303118-017	63	C)	11.8000	Dry wgt (A)	9.2700		75.90
				B)	1.3000	550 wgt (D)			
28		R1303118-018	64	C)	11.3800	Dry wgt (A)	8.7200		73.58
				B)	1.3100	550 wgt (D)			
29		R1303118-019	65	C)	11.6600	Dry wgt (A)	9.2200		76.43
				B)	1.3100	550 wgt (D)			
30		R1303118-020	66	C)	11.5300	Dry wgt (A)	9.1500		76.67
				B)	1.3300	550 wgt (D)			
31		R1303118-021	67	C)	11.9900	Dry wgt (A)	7.4900		57.79
				B)	1.3300	550 wgt (D)			
32		R1303118-022	68	C)	11.8100	Dry wgt (A)	9.5400		78.34
				B)	1.3300	550 wgt (D)			
33		R1303118-023	69	C)	11.4700	Dry wgt (A)	8.7400		73.13
				B)	1.3100	550 wgt (D)			
34		R1303118-024	70	C)	11.5200	Dry wgt (A)	8.8300		73.65
				B)	1.3100	550 wgt (D)			
35		R1303118-025	71	C)	11.3800	Dry wgt (A)	8.1800		68.22
				B)	1.3100	550 wgt (D)			
36		R1303118-026	72	C)	11.3700	Dry wgt (A)	8.1800		68.26
				B)	1.3200	550 wgt (D)			
37		R1303118-027	73	C)	11.5800	Dry wgt (A)	8.4500		69.49
				B)	1.3200	550 wgt (D)			
38		R1303118-028	74	C)	11.4800	Dry wgt (A)	9.3700		79.23
				B)	1.3200	550 wgt (D)			
39		R1303118-029	75	C)	11.9000	Dry wgt (A)	7.9400		62.61
				B)	1.3100	550 wgt (D)			
40		R1303118-030	76	C)	11.5600	Dry wgt (A)	8.5600		70.73
				B)	1.3100	550 wgt (D)			

Analyte: % Volatile Solids
Method: SM20 2540G
Analytes: Dry Weight % Solid
Method : EPA-600 160.3

Analyst: BAB Date: 5/7/13
Pipet: NA Time: 9:00
Thermolyne F48025-6048000 Muffle Furnace
Balance ID R-BALANCE-01 Oven ID 2
Class 1 Weight Initial: 10.00 Final: 10.00

% Volatile Solids:
% VS = (A - D) / (A - B) * 100

% Solids:
% Solid = (A - B) / (C - B) * 100

Where: A = wgt (g) of dried residue + dish
B = wgt (g) of tared dish
C = wgt (g) of wet sample + dish
D = wgt (g) of residue + dish after ign. @550 C.

	Misc.	Order #	Dish ID	Before Ignition / Wet Weight (g)		After Ignition / Dry Weight (g)		% Volatile Solids	% Solids
41		R1303118-031	77	C)	11.8800	Dry wgt (A):	10.3600		85.61
				B)	1.3200	550 wgt (D):			
42		R1303118-032	78	C)	11.6800	Dry wgt (A):	9.4000		77.97
				B)	1.3300	550 wgt (D):			
43		R1303118-033	79	C)	11.4000	Dry wgt (A):	8.6300		72.52
				B)	1.3200	550 wgt (D):			
44		R1303118-033 DUP	80	C)	11.6100	Dry wgt (A):	8.8600		73.25
				B)	1.3300	550 wgt (D):			
45				C)		Dry wgt (A):			
				B)		550 wgt (D):			
46				C)		Dry wgt (A):			
				B)		550 wgt (D):			
47				C)		Dry wgt (A):			
				B)		550 wgt (D):			
48				C)		Dry wgt (A):			
				B)		550 wgt (D):			
49				C)		Dry wgt (A):			
				B)		550 wgt (D):			
50				C)		Dry wgt (A):			
				B)		550 wgt (D):			
51				C)		Dry wgt (A):			
				B)		550 wgt (D):			
52				C)		Dry wgt (A):			
				B)		550 wgt (D):			
53				C)		Dry wgt (A):			
				B)		550 wgt (D):			
54				C)		Dry wgt (A):			
				B)		550 wgt (D):			
55				C)		Dry wgt (A):			
				B)		550 wgt (D):			
56				C)		Dry wgt (A):			
				B)		550 wgt (D):			
57				C)		Dry wgt (A):			
				B)		550 wgt (D):			
58				C)		Dry wgt (A):			
				B)		550 wgt (D):			
59				C)		Dry wgt (A):			
				B)		550 wgt (D):			
60				C)		Dry wgt (A):			
				B)		550 wgt (D):			

Bab 5/7/13

Columbia Analytical Services
1 Mustard St., Rochester, NY 14608-0859

General Chemistry Analytical Run Cover Sheet

Analyst: Bab Date: 5/7/13

Analysis: % Solids Instrument: American Scientific Toploading Balance

Quality Control:

	Log Book #	Log Book Date	Log Book Page #	Stock Sol (mLs)	Stock Sol (mg/L)	Final Vol (mLs)	True Value (mg/L)
a) Standards Prep.:							
b) ICCV Preparation:							
c) LCS Preparation:							
d) Matrix Spike Prep.:							

Instrument log filled in? (Y) (N)

Comments:

Production (optional):

	Start Time	End Time	Total (minutes)
Preparation Time :			
Analytical Time:			
Finish Time:			

# of Samples (including Mtx QC): _____
Repeats due to Sample: _____
Repeats due to Error: _____

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con-test®
ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

May 31, 2013

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna Metals
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13E0231

Enclosed are results of analyses for samples received by the laboratory on May 8, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paula E. Blakeborough
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0231

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BSSB816-0-0.5	13E0231-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB820-0-0.5	13E0231-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB819-0-0.5	13E0231-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB821-0-0.5	13E0231-04	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
				SW-846 6010C	
				SW-846 7471B	
BSSB807-0-0.5	13E0231-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB807-0-0.5D	13E0231-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB805-0-0.5	13E0231-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB806-0-0.5	13E0231-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB804-0-0.5	13E0231-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB808-0-0.5	13E0231-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB809-0-0.5	13E0231-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB810-0-0.5	13E0231-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0231

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BSSB811-0-0.5	13E0231-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB812-0-0.5	13E0231-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were "Not Detected" even though CCB value was above the reporting limit.

Analyte & Samples(s) Qualified:

Silver

13E0231-01[BSSB816-0-0.5], S004223-CCB8

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13E0231-01[BSSB816-0-0.5], 13E0231-02[BSSB820-0-0.5], 13E0231-03[BSSB819-0-0.5], 13E0231-04[BSSB821-0-0.5], 13E0231-05[BSSB807-0-0.5], 13E0231-06[BSSB807-0-0.5D], 13E0231-07[BSSB805-0-0.5], 13E0231-08[BSSB806-0-0.5], 13E0231-09[BSSB804-0-0.5], 13E0231-10[BSSB808-0-0.5], 13E0231-11[BSSB809-0-0.5], 13E0231-12[BSSB810-0-0.5], 13E0231-13[BSSB811-0-0.5], 13E0231-14[BSSB812-0-0.5], B072699-BLK1, B072736-BLK1, B072776-BLK1

Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were >10x the level in the calibration blank.

Analyte & Samples(s) Qualified:

Iron

13E0231-05[BSSB807-0-0.5], 13E0231-06[BSSB807-0-0.5D], 13E0231-07[BSSB805-0-0.5], S004217-CCV8

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB816-0-0.5 | Sampled: 5/7/2013 09:20

Sample ID: 13E0231-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	5/10/13	5/13/13 23:50	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Barium	54	3.1	0.38	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Beryllium	ND	0.31	0.049	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Cadmium	0.39	0.31	0.18	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Calcium	1500	9.2	1.7	mg/Kg dry	1		SW-846 6010C	5/10/13	5/14/13 11:07	OP
Chromium	8.6	0.61	0.15	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 18:17	OP
Cobalt	4.2	3.1	0.20	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Copper	5.4	0.61	0.47	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Iron	9400	3.1	2.6	mg/Kg dry	1	B-07	SW-846 6010C	5/10/13	5/13/13 23:50	OP
Lead	6.0	0.92	0.42	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 18:17	OP
Magnesium	2100	9.2	0.96	mg/Kg dry	1		SW-846 6010C	5/10/13	5/14/13 11:02	OP
Manganese	990	0.61	0.19	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Mercury	0.0080	0.030	0.0020	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:39	SAJ
Nickel	12	0.61	0.15	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Potassium	600	120	21	mg/Kg dry	1		SW-846 6010C	5/10/13	5/14/13 11:02	OP
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Silver	ND	0.61	0.54	mg/Kg dry	1	B-06	SW-846 6010C	5/10/13	5/13/13 23:50	OP
Sodium	110	120	59	mg/Kg dry	1	J	SW-846 6010C	5/10/13	5/14/13 11:02	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Vanadium	12	1.2	0.20	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP
Zinc	33	1.2	0.31	mg/Kg dry	1		SW-846 6010C	5/10/13	5/13/13 23:50	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB816-0-0.5 | Sampled: 5/7/2013 09:20

Sample ID: 13E0231-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.0			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB820-0-0.5 | Sampled: 5/7/2013 09:40

Sample ID: 13E0231-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8800	3.2	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:46	OP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Barium	200	3.2	0.40	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Beryllium	ND	0.32	0.052	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Cadmium	ND	0.32	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Calcium	2500	9.7	1.7	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:09	OP
Chromium	16	0.65	0.16	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Cobalt	11	3.2	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Copper	18	0.65	0.49	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Iron	15000	3.2	2.8	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:46	OP
Lead	7.2	0.97	0.45	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Magnesium	5600	9.7	1.0	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:09	OP
Manganese	550	0.65	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Mercury	0.018	0.033	0.0021	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:40	SAJ
Nickel	14	0.65	0.16	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Potassium	2100	130	22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:09	OP
Selenium	ND	3.2	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:09	OP
Silver	ND	0.65	0.57	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:09	OP
Sodium	240	130	63	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:09	OP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Vanadium	42	1.3	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:46	OP
Zinc	33	1.3	0.33	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:09	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB820-0-0.5 | Sampled: 5/7/2013 09:40

Sample ID: 13E0231-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	73.2			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB819-0-0.5 | Sampled: 5/7/2013 09:50

Sample ID: 13E0231-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	5.2	2.2	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:51	OP
Antimony	ND	5.2	4.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Arsenic	ND	5.2	1.9	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Barium	130	5.2	0.65	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Beryllium	0.69	0.52	0.084	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Cadmium	ND	0.52	0.31	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Calcium	3900	16	2.8	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:14	OP
Chromium	23	1.0	0.26	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Cobalt	9.5	5.2	0.33	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Copper	27	1.0	0.80	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Iron	17000	5.2	4.5	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:51	OP
Lead	38	1.6	0.72	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Magnesium	4300	16	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:14	OP
Manganese	280	1.0	0.33	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Mercury	0.11	0.055	0.0035	mg/Kg dry	1		SW-846 7471B	5/10/13	5/13/13 12:42	SAJ
Nickel	17	1.0	0.25	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Potassium	1100	210	36	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:14	OP
Selenium	ND	5.2	1.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:14	OP
Silver	ND	1.0	0.92	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:14	OP
Sodium	280	210	100	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:14	OP
Thallium	ND	5.2	1.7	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Vanadium	34	2.1	0.34	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:51	OP
Zinc	120	2.1	0.54	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:14	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB819-0-0.5 | Sampled: 5/7/2013 09:50

Sample ID: 13E0231-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	44.6			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB821-0-0.5 | Sampled: 5/7/2013 10:05

Sample ID: 13E0231-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3600	3.5	1.5	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:56	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Arsenic	ND	3.5	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Barium	27	3.5	0.44	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Beryllium	ND	0.35	0.057	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Cadmium	ND	0.35	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Calcium	1200	11	1.9	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:19	OP
Chromium	4.5	0.70	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Cobalt	2.5	3.5	0.23	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 23:56	OP
Copper	4.1	0.70	0.54	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Iron	5600	3.5	3.0	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 23:56	OP
Lead	3.4	1.1	0.49	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Magnesium	1300	11	1.1	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:19	OP
Manganese	140	0.70	0.22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Mercury	0.0064	0.036	0.0023	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:44	SAJ
Nickel	4.1	0.70	0.17	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Potassium	330	140	24	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:19	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:19	OP
Silver	ND	0.70	0.62	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:19	OP
Sodium	140	140	69	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 20:19	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Vanadium	8.4	1.4	0.23	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 23:56	OP
Zinc	38	1.4	0.36	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:19	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB821-0-0.5 | Sampled: 5/7/2013 10:05

Sample ID: 13E0231-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.7			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB821-0-0.5 | Sampled: 5/7/2013 10:05

Sample ID: 13E0231-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Total Organic Carbon	Attached			mg/Kg	1		SM 5310B		5/20/13 0:00	ALS

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB821-0-0.5 | Sampled: 5/7/2013 10:05

Sample ID: 13E0231-04

Sample Matrix: Soil

Moisture Content

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Moisture Content	29.2			%	1		ASTM D2216		5/20/13 0:00	GEO

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB807-0-0.5 | Sampled: 5/7/2013 10:50

Sample ID: 13E0231-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	3.9	1.7	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/11/13 0:17	OP
Antimony	ND	3.9	3.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Arsenic	2.2	3.9	1.4	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/11/13 0:17	OP
Barium	120	3.9	0.49	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Beryllium	0.61	0.39	0.063	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Cadmium	ND	0.39	0.23	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Calcium	2600	12	2.1	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:25	OP
Chromium	35	0.79	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Cobalt	10	3.9	0.25	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Copper	10	0.79	0.60	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Iron	15000	3.9	3.4	mg/Kg dry	1	B-07, Z-01	SW-846 6010C	5/9/13	5/11/13 0:17	OP
Lead	28	1.2	0.54	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Magnesium	3300	12	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:25	OP
Manganese	280	0.79	0.25	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Mercury	0.093	0.042	0.0027	mg/Kg dry	1		SW-846 7471B	5/10/13	5/13/13 12:45	SAJ
Nickel	26	0.79	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Potassium	520	160	27	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:25	OP
Selenium	ND	3.9	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:25	OP
Silver	ND	0.79	0.69	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:25	OP
Sodium	ND	160	77	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:25	OP
Thallium	ND	3.9	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Vanadium	35	1.6	0.26	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:17	OP
Zinc	42	1.6	0.41	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:25	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB807-0-0.5 | Sampled: 5/7/2013 10:50

Sample ID: 13E0231-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	58.6			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB807-0-0.5D | Sampled: 5/7/2013 10:50

Sample ID: 13E0231-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	4.2	1.8	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/11/13 0:22	OP
Antimony	ND	4.2	3.4	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Arsenic	2.4	4.2	1.5	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/11/13 0:22	OP
Barium	120	4.2	0.52	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Beryllium	0.58	0.42	0.067	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Cadmium	ND	0.42	0.25	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Calcium	2900	13	2.3	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:30	OP
Chromium	34	0.83	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Cobalt	10	4.2	0.27	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Copper	10	0.83	0.64	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Iron	15000	4.2	3.6	mg/Kg dry	1	Z-01, B-07	SW-846 6010C	5/9/13	5/11/13 0:22	OP
Lead	29	1.3	0.58	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Magnesium	3200	13	1.3	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:30	OP
Manganese	330	0.83	0.26	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Mercury	0.091	0.042	0.0027	mg/Kg dry	1		SW-846 7471B	5/10/13	5/13/13 12:47	SAJ
Nickel	25	0.83	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Potassium	530	170	29	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:30	OP
Selenium	ND	4.2	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:30	OP
Silver	ND	0.83	0.73	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:30	OP
Sodium	ND	170	81	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:30	OP
Thallium	ND	4.2	1.4	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Vanadium	35	1.7	0.27	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:22	OP
Zinc	41	1.7	0.43	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:30	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB807-0-0.5D | Sampled: 5/7/2013 10:50

Sample ID: 13E0231-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	58.5			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB805-0-0.5 | Sampled: 5/7/2013 10:55

Sample ID: 13E0231-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2500	3.5	1.5	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/11/13 0:27	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Arsenic	ND	3.5	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Barium	44	3.5	0.44	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Beryllium	ND	0.35	0.056	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Cadmium	ND	0.35	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Calcium	990	11	1.9	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:36	OP
Chromium	7.7	0.70	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Cobalt	4.2	3.5	0.22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Copper	4.4	0.70	0.54	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Iron	4900	3.5	3.0	mg/Kg dry	1	B-07, Z-01	SW-846 6010C	5/9/13	5/11/13 0:27	OP
Lead	2.2	1.1	0.48	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Magnesium	2200	11	1.1	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:36	OP
Manganese	120	0.70	0.22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Mercury	0.0081	0.035	0.0023	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:48	SAJ
Nickel	15	0.70	0.17	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Potassium	240	140	24	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:36	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:36	OP
Silver	ND	0.70	0.62	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:36	OP
Sodium	72	140	68	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 20:36	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Vanadium	6.2	1.4	0.23	mg/Kg dry	1		SW-846 6010C	5/9/13	5/11/13 0:27	OP
Zinc	18	1.4	0.36	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:36	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB805-0-0.5 | Sampled: 5/7/2013 10:55

Sample ID: 13E0231-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	69.6			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB806-0-0.5 | Sampled: 5/7/2013 11:00

Sample ID: 13E0231-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3000	3.7	1.6	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:46	OP
Antimony	ND	3.7	3.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Arsenic	ND	3.7	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Barium	44	3.7	0.46	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Beryllium	0.15	0.37	0.060	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 20:46	OP
Cadmium	ND	0.37	0.22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Calcium	930	11	2.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Chromium	10	0.75	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Cobalt	4.3	3.7	0.24	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Copper	4.9	0.75	0.57	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Iron	5500	3.7	3.2	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:14	OP
Lead	3.0	1.1	0.51	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Magnesium	2000	11	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Manganese	110	0.75	0.24	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Mercury	0.012	0.037	0.0024	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:50	SAJ
Nickel	15	0.75	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Potassium	240	150	26	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Selenium	ND	3.7	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Silver	ND	0.75	0.66	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Sodium	ND	150	73	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP
Thallium	ND	3.7	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Vanadium	6.9	1.5	0.25	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:46	OP
Zinc	21	1.5	0.38	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:14	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB806-0-0.5 | Sampled: 5/7/2013 11:00

Sample ID: 13E0231-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	66.2			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB804-0-0.5 | Sampled: 5/7/2013 11:15

Sample ID: 13E0231-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	8.4	3.6	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:50	OP
Antimony	ND	8.4	6.7	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Arsenic	ND	8.4	3.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Barium	210	8.4	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Beryllium	0.67	0.84	0.13	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 20:50	OP
Cadmium	ND	0.84	0.49	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Calcium	4500	25	4.5	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP
Chromium	41	1.7	0.42	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Cobalt	18	8.4	0.53	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Copper	35	1.7	1.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Iron	18000	8.4	7.1	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:20	OP
Lead	24	2.5	1.2	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Magnesium	5500	25	2.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP
Manganese	190	1.7	0.53	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Mercury	0.13	0.084	0.0054	mg/Kg dry	1		SW-846 7471B	5/10/13	5/13/13 12:52	SAJ
Nickel	70	1.7	0.40	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Potassium	1100	330	57	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP
Selenium	ND	8.4	2.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP
Sodium	280	330	160	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 21:20	OP
Thallium	ND	8.4	2.8	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Vanadium	36	3.3	0.55	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:50	OP
Zinc	130	3.3	0.86	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:20	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB804-0-0.5 | Sampled: 5/7/2013 11:15

Sample ID: 13E0231-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	29.5			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB808-0-0.5 | Sampled: 5/7/2013 11:40

Sample ID: 13E0231-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 20:55	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Barium	140	3.0	0.38	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Beryllium	0.30	0.30	0.049	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 20:55	OP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Calcium	1300	9.1	1.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP
Chromium	28	0.61	0.15	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Cobalt	7.5	3.0	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Copper	7.8	0.61	0.46	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Iron	9200	3.0	2.6	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:25	OP
Lead	3.1	0.91	0.42	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Magnesium	5100	9.1	0.95	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP
Manganese	140	0.61	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Mercury	0.027	0.030	0.0019	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:53	SAJ
Nickel	38	0.61	0.15	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Potassium	380	120	21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP
Selenium	ND	3.0	0.94	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP
Sodium	86	120	59	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 21:25	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Vanadium	14	1.2	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 20:55	OP
Zinc	25	1.2	0.31	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:25	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB808-0-0.5 | Sampled: 5/7/2013 11:40

Sample ID: 13E0231-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.6			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB809-0-0.5 | Sampled: 5/7/2013 11:45

Sample ID: 13E0231-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2600	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:00	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Barium	29	3.1	0.39	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Beryllium	ND	0.31	0.050	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Calcium	930	9.4	1.7	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Chromium	30	0.62	0.16	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Cobalt	14	3.1	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Copper	7.3	0.62	0.48	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Iron	17000	3.1	2.7	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:31	OP
Lead	1.7	0.94	0.43	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Magnesium	15000	9.4	0.98	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Manganese	220	0.62	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Mercury	0.0032	0.031	0.0020	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 12:59	SAJ
Nickel	110	0.62	0.15	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Potassium	250	120	21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Sodium	ND	120	61	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Vanadium	6.1	1.2	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:00	OP
Zinc	25	1.2	0.32	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:31	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB809-0-0.5 | Sampled: 5/7/2013 11:45

Sample ID: 13E0231-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.7			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB810-0-0.5 | Sampled: 5/7/2013 11:50

Sample ID: 13E0231-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	3.1	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:05	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Barium	45	3.1	0.39	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Beryllium	ND	0.31	0.050	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Cadmium	ND	0.31	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Calcium	1000	9.4	1.7	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Chromium	16	0.63	0.16	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Cobalt	9.9	3.1	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Copper	8.4	0.63	0.48	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Iron	11000	3.1	2.7	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:36	OP
Lead	2.7	0.94	0.43	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Magnesium	7200	9.4	0.98	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Manganese	470	0.63	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Mercury	0.0067	0.032	0.0021	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 13:01	SAJ
Nickel	40	0.63	0.15	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Potassium	300	130	22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Sodium	ND	130	61	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Vanadium	8.6	1.3	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:05	OP
Zinc	22	1.3	0.32	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:36	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB810-0-0.5 | Sampled: 5/7/2013 11:50

Sample ID: 13E0231-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	76.3			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB811-0-0.5 | Sampled: 5/7/2013 12:00

Sample ID: 13E0231-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3000	3.2	1.4	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:10	OP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Arsenic	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Barium	35	3.2	0.40	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Beryllium	ND	0.32	0.051	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Cadmium	ND	0.32	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Calcium	1000	9.5	1.7	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP
Chromium	8.5	0.64	0.16	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Cobalt	5.6	3.2	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Copper	4.1	0.64	0.48	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Iron	8900	3.2	2.7	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:42	OP
Lead	2.0	0.95	0.44	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Magnesium	4700	9.5	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP
Manganese	160	0.64	0.20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Mercury	ND	0.033	0.0021	mg/Kg dry	1		SW-846 7471B	5/10/13	5/13/13 13:02	SAJ
Nickel	30	0.64	0.15	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Potassium	360	130	22	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP
Selenium	ND	3.2	0.98	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP
Sodium	62	130	62	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 21:42	OP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Vanadium	7.8	1.3	0.21	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:10	OP
Zinc	17	1.3	0.33	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:42	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB811-0-0.5 | Sampled: 5/7/2013 12:00

Sample ID: 13E0231-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	74.5			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB812-0-0.5 | Sampled: 5/7/2013 12:05

Sample ID: 13E0231-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3800	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:15	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Barium	56	2.9	0.36	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Beryllium	0.17	0.29	0.046	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 21:15	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Calcium	1200	8.6	1.6	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP
Chromium	7.2	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Cobalt	3.5	2.9	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Copper	6.6	0.58	0.44	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Iron	6700	2.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	5/9/13	5/10/13 21:47	OP
Lead	3.7	0.86	0.40	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Magnesium	1700	8.6	0.90	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP
Manganese	93	0.58	0.18	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Mercury	0.0055	0.031	0.0020	mg/Kg dry	1	J	SW-846 7471B	5/10/13	5/13/13 13:04	SAJ
Nickel	8.8	0.58	0.14	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Potassium	490	120	20	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP
Sodium	58	120	56	mg/Kg dry	1	J	SW-846 6010C	5/9/13	5/10/13 21:47	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Vanadium	8.8	1.2	0.19	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:15	OP
Zinc	21	1.2	0.30	mg/Kg dry	1		SW-846 6010C	5/9/13	5/10/13 21:47	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13E0231

Date Received: 5/8/2013

Field Sample #: BSSB812-0-0.5 | Sampled: 5/7/2013 12:05

Sample ID: 13E0231-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.0			% Wt	1		SM 2540G	5/10/13	5/13/13 8:35	CWB

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13E0231-01 [BSSB816-0-0.5]	B072796	05/10/13
13E0231-02 [BSSB820-0-0.5]	B072796	05/10/13
13E0231-03 [BSSB819-0-0.5]	B072796	05/10/13
13E0231-04 [BSSB821-0-0.5]	B072796	05/10/13
13E0231-05 [BSSB807-0-0.5]	B072796	05/10/13
13E0231-06 [BSSB807-0-0.5D]	B072796	05/10/13
13E0231-07 [BSSB805-0-0.5]	B072796	05/10/13
13E0231-08 [BSSB806-0-0.5]	B072796	05/10/13
13E0231-09 [BSSB804-0-0.5]	B072796	05/10/13
13E0231-10 [BSSB808-0-0.5]	B072796	05/10/13
13E0231-11 [BSSB809-0-0.5]	B072796	05/10/13
13E0231-12 [BSSB810-0-0.5]	B072796	05/10/13
13E0231-13 [BSSB811-0-0.5]	B072796	05/10/13
13E0231-14 [BSSB812-0-0.5]	B072796	05/10/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0231-08 [BSSB806-0-0.5]	B072699	1.01	50.0	05/09/13
13E0231-09 [BSSB804-0-0.5]	B072699	1.01	50.0	05/09/13
13E0231-10 [BSSB808-0-0.5]	B072699	1.02	50.0	05/09/13
13E0231-11 [BSSB809-0-0.5]	B072699	1.00	50.0	05/09/13
13E0231-12 [BSSB810-0-0.5]	B072699	1.04	50.0	05/09/13
13E0231-13 [BSSB811-0-0.5]	B072699	1.06	50.0	05/09/13
13E0231-14 [BSSB812-0-0.5]	B072699	1.07	50.0	05/09/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0231-02 [BSSB820-0-0.5]	B072736	1.06	50.0	05/09/13
13E0231-03 [BSSB819-0-0.5]	B072736	1.07	50.0	05/09/13
13E0231-04 [BSSB821-0-0.5]	B072736	1.03	50.0	05/09/13
13E0231-05 [BSSB807-0-0.5]	B072736	1.08	50.0	05/09/13
13E0231-06 [BSSB807-0-0.5D]	B072736	1.02	50.0	05/09/13
13E0231-07 [BSSB805-0-0.5]	B072736	1.02	50.0	05/09/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0231-01 [BSSB816-0-0.5]	B072776	1.01	50.0	05/10/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0231-01 [BSSB816-0-0.5]	B072801	0.608	50.0	05/10/13
13E0231-02 [BSSB820-0-0.5]	B072801	0.614	50.0	05/10/13
13E0231-03 [BSSB819-0-0.5]	B072801	0.609	50.0	05/10/13
13E0231-04 [BSSB821-0-0.5]	B072801	0.602	50.0	05/10/13
13E0231-05 [BSSB807-0-0.5]	B072801	0.605	50.0	05/10/13
13E0231-06 [BSSB807-0-0.5D]	B072801	0.617	50.0	05/10/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13E0231-07 [BSSB805-0-0.5]	B072801	0.611	50.0	05/10/13
13E0231-08 [BSSB806-0-0.5]	B072801	0.613	50.0	05/10/13
13E0231-09 [BSSB804-0-0.5]	B072801	0.603	50.0	05/10/13
13E0231-10 [BSSB808-0-0.5]	B072801	0.614	50.0	05/10/13
13E0231-11 [BSSB809-0-0.5]	B072801	0.602	50.0	05/10/13
13E0231-12 [BSSB810-0-0.5]	B072801	0.609	50.0	05/10/13
13E0231-13 [BSSB811-0-0.5]	B072801	0.613	50.0	05/10/13
13E0231-14 [BSSB812-0-0.5]	B072801	0.607	50.0	05/10/13

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072699 - SW-846 3050B										
Blank (B072699-BLK1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	3.2	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	3.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	12	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	3.2	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	0.14	0.50	mg/Kg wet							J
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B072699-BS1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	7370	5.0	mg/Kg wet	9060		81.4	46.1-153.4			
Antimony	72.3	5.0	mg/Kg wet	106		68.3	8.2-218.9			
Arsenic	173	5.0	mg/Kg wet	182		95.0	83-117.6			
Barium	137	5.0	mg/Kg wet	143		96.1	83.2-117.5			
Beryllium	101	0.50	mg/Kg wet	98.3		103	83.9-116			
Cadmium	57.6	0.50	mg/Kg wet	60.4		95.4	83.1-116.9			
Calcium	6040	15	mg/Kg wet	6040		100	83.1-116.7			
Chromium	128	1.0	mg/Kg wet	125		102	81.6-117.6			
Cobalt	152	5.0	mg/Kg wet	163		93.5	84.7-115.3			
Copper	78.7	1.0	mg/Kg wet	80.1		98.2	83.8-116.1			
Iron	10700	5.0	mg/Kg wet	12900		82.8	50.8-149.6			
Lead	117	1.5	mg/Kg wet	136		86.3	82.4-117.8			
Magnesium	2450	15	mg/Kg wet	2640		92.8	75.4-124.2			
Manganese	255	1.0	mg/Kg wet	279		91.4	82.8-117.5			
Nickel	119	1.0	mg/Kg wet	128		92.6	84.4-115.6			
Potassium	2600	200	mg/Kg wet	2820		92.1	72.7-127.3			
Selenium	81.5	5.0	mg/Kg wet	85.9		94.8	80-120			
Silver	57.4	1.0	mg/Kg wet	61.3		93.7	66.2-133.8			
Sodium	417	200	mg/Kg wet	439		95.0	73.8-126.2			
Thallium	124	5.0	mg/Kg wet	144		86.0	81.2-118.8			
Vanadium	107	2.0	mg/Kg wet	104		103	75.5-124			
Zinc	174	2.0	mg/Kg wet	204		85.5	81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072699 - SW-846 3050B										
LCS Dup (B072699-BSD1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	7190	5.0	mg/Kg wet	9060		79.4	46.1-153.4	2.44	30	
Antimony	74.6	5.0	mg/Kg wet	106		70.4	8.2-218.9	3.04	30	
Arsenic	176	5.0	mg/Kg wet	182		97.0	83-117.6	2.00	30	
Barium	141	5.0	mg/Kg wet	143		98.8	83.2-117.5	2.70	30	
Beryllium	104	0.50	mg/Kg wet	98.3		105	83.9-116	2.27	30	
Cadmium	60.1	0.50	mg/Kg wet	60.4		99.5	83.1-116.9	4.21	30	
Calcium	6070	15	mg/Kg wet	6040		100	83.1-116.7	0.395	30	
Chromium	134	0.99	mg/Kg wet	125		107	81.6-117.6	4.61	30	
Cobalt	159	5.0	mg/Kg wet	163		97.7	84.7-115.3	4.32	30	
Copper	82.5	0.99	mg/Kg wet	80.1		103	83.8-116.1	4.70	30	
Iron	10800	5.0	mg/Kg wet	12900		84.1	50.8-149.6	1.59	30	
Lead	122	1.5	mg/Kg wet	136		89.7	82.4-117.8	3.83	30	
Magnesium	2460	15	mg/Kg wet	2640		93.3	75.4-124.2	0.510	30	
Manganese	260	0.99	mg/Kg wet	279		93.1	82.8-117.5	1.87	30	
Nickel	125	0.99	mg/Kg wet	128		98.0	84.4-115.6	5.70	30	
Potassium	2600	200	mg/Kg wet	2820		92.1	72.7-127.3	0.0517	30	
Selenium	83.4	5.0	mg/Kg wet	85.9		97.1	80-120	2.37	30	
Silver	58.9	0.99	mg/Kg wet	61.3		96.0	66.2-133.8	2.47	30	
Sodium	430	200	mg/Kg wet	439		98.0	73.8-126.2	3.09	30	
Thallium	127	5.0	mg/Kg wet	144		88.1	81.2-118.8	2.46	30	
Vanadium	111	2.0	mg/Kg wet	104		106	75.5-124	3.33	30	
Zinc	180	2.0	mg/Kg wet	204		88.3	81.9-117.6	3.20	30	
MRL Check (B072699-MRL1)				Prepared: 05/09/13 Analyzed: 05/13/13						
Lead	0.727	0.74	mg/Kg wet	0.739		98.4	80-120			J
Batch B072736 - SW-846 3050B										
Blank (B072736-BLK1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	6.3	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	12	7.5	mg/Kg wet							B-07
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	11	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	9.5	7.5	mg/Kg wet							B-07
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072736 - SW-846 3050B										
LCS (B072736-BS1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	7930	5.0	mg/Kg wet	9060		87.6	46.1-153.4			
Antimony	80.0	5.0	mg/Kg wet	106		75.5	8.2-218.9			
Arsenic	178	5.0	mg/Kg wet	182		98.0	83-117.6			
Barium	140	5.0	mg/Kg wet	143		97.6	83.2-117.5			
Beryllium	103	0.50	mg/Kg wet	98.3		105	83.9-116			
Cadmium	59.3	0.50	mg/Kg wet	60.4		98.2	83.1-116.9			
Calcium	6390	15	mg/Kg wet	6040		106	83.1-116.7			
Chromium	131	1.0	mg/Kg wet	125		105	81.6-117.6			
Cobalt	156	5.0	mg/Kg wet	163		95.8	84.7-115.3			
Copper	81.5	1.0	mg/Kg wet	80.1		102	83.8-116.1			
Iron	11300	5.0	mg/Kg wet	12900		87.2	50.8-149.6			
Lead	123	1.5	mg/Kg wet	136		90.5	82.4-117.8			
Magnesium	2610	15	mg/Kg wet	2640		98.7	75.4-124.2			
Manganese	269	1.0	mg/Kg wet	279		96.4	82.8-117.5			
Nickel	122	1.0	mg/Kg wet	128		95.4	84.4-115.6			
Potassium	2760	200	mg/Kg wet	2820		97.8	72.7-127.3			
Selenium	84.6	5.0	mg/Kg wet	85.9		98.5	80-120			
Silver	59.4	1.0	mg/Kg wet	61.3		97.0	66.2-133.8			
Sodium	456	200	mg/Kg wet	439		104	73.8-126.2			
Thallium	129	5.0	mg/Kg wet	144		89.9	81.2-118.8			
Vanadium	111	2.0	mg/Kg wet	104		106	75.5-124			
Zinc	208	2.0	mg/Kg wet	204		102	81.9-117.6			
LCS Dup (B072736-BSD1)				Prepared: 05/09/13 Analyzed: 05/10/13						
Aluminum	7780	5.0	mg/Kg wet	9060		85.9	46.1-153.4	1.93	30	
Antimony	75.8	5.0	mg/Kg wet	106		71.6	8.2-218.9	5.34	30	
Arsenic	178	5.0	mg/Kg wet	182		97.6	83-117.6	0.381	30	
Barium	141	5.0	mg/Kg wet	143		98.3	83.2-117.5	0.637	30	
Beryllium	103	0.50	mg/Kg wet	98.3		104	83.9-116	0.763	30	
Cadmium	58.6	0.50	mg/Kg wet	60.4		96.9	83.1-116.9	1.31	30	
Calcium	6220	15	mg/Kg wet	6040		103	83.1-116.7	2.79	30	
Chromium	131	1.0	mg/Kg wet	125		105	81.6-117.6	0.292	30	
Cobalt	156	5.0	mg/Kg wet	163		95.4	84.7-115.3	0.412	30	
Copper	80.8	1.0	mg/Kg wet	80.1		101	83.8-116.1	0.873	30	
Iron	11000	5.0	mg/Kg wet	12900		85.0	50.8-149.6	2.58	30	
Lead	128	1.5	mg/Kg wet	136		94.3	82.4-117.8	4.20	30	
Magnesium	2560	15	mg/Kg wet	2640		97.0	75.4-124.2	1.73	30	
Manganese	262	1.0	mg/Kg wet	279		93.9	82.8-117.5	2.71	30	
Nickel	122	1.0	mg/Kg wet	128		95.2	84.4-115.6	0.241	30	
Potassium	2710	200	mg/Kg wet	2820		96.1	72.7-127.3	1.76	30	
Selenium	84.5	5.0	mg/Kg wet	85.9		98.4	80-120	0.115	30	
Silver	59.0	1.0	mg/Kg wet	61.3		96.2	66.2-133.8	0.776	30	
Sodium	441	200	mg/Kg wet	439		100	73.8-126.2	3.40	30	
Thallium	128	5.0	mg/Kg wet	144		89.1	81.2-118.8	0.894	30	
Vanadium	110	2.0	mg/Kg wet	104		105	75.5-124	1.03	30	
Zinc	204	2.0	mg/Kg wet	204		100	81.9-117.6	1.91	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072736 - SW-846 3050B										
MRL Check (B072736-MRL1)				Prepared: 05/09/13 Analyzed: 05/13/13						
Lead	0.685	0.69	mg/Kg wet	0.689		99.5	80-120			J
Batch B072776 - SW-846 3050B										
Blank (B072776-BLK1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Aluminum	9.5	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	5.8	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	5.9	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B072776-BS1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Aluminum	7800	5.0	mg/Kg wet	9060		86.1	46.1-153.4			
Antimony	67.6	5.0	mg/Kg wet	106		63.7	8.2-218.9			
Arsenic	194	5.0	mg/Kg wet	182		106	83-117.6			
Barium	149	5.0	mg/Kg wet	143		104	83.2-117.5			
Beryllium	109	0.50	mg/Kg wet	98.3		111	83.9-116			
Cadmium	65.9	0.50	mg/Kg wet	60.4		109	83.1-116.9			
Calcium	6440	15	mg/Kg wet	6040		107	83.1-116.7			
Chromium	141	1.0	mg/Kg wet	125		113	81.6-117.6			
Cobalt	170	5.0	mg/Kg wet	163		104	84.7-115.3			
Copper	85.7	1.0	mg/Kg wet	80.1		107	83.8-116.1			
Iron	11000	5.0	mg/Kg wet	12900		85.5	50.8-149.6			
Lead	142	1.5	mg/Kg wet	136		104	82.4-117.8			
Magnesium	2640	15	mg/Kg wet	2640		100	75.4-124.2			
Manganese	282	1.0	mg/Kg wet	279		101	82.8-117.5			
Nickel	132	1.0	mg/Kg wet	128		103	84.4-115.6			
Potassium	2870	200	mg/Kg wet	2820		102	72.7-127.3			
Selenium	93.2	5.0	mg/Kg wet	85.9		109	80-120			
Silver	62.6	1.0	mg/Kg wet	61.3		102	66.2-133.8			
Sodium	466	200	mg/Kg wet	439		106	73.8-126.2			
Thallium	148	5.0	mg/Kg wet	144		103	81.2-118.8			
Vanadium	109	2.0	mg/Kg wet	104		105	75.5-124			
Zinc	205	2.0	mg/Kg wet	204		100	81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072776 - SW-846 3050B										
LCS Dup (B072776-BSD1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Aluminum	6950	5.0	mg/Kg wet	9060		76.7	46.1-153.4	11.6	30	
Antimony	70.7	5.0	mg/Kg wet	106		66.7	8.2-218.9	4.61	30	
Arsenic	186	5.0	mg/Kg wet	182		102	83-117.6	4.07	30	
Barium	138	5.0	mg/Kg wet	143		96.8	83.2-117.5	7.07	30	
Beryllium	103	0.50	mg/Kg wet	98.3		105	83.9-116	5.37	30	
Cadmium	63.4	0.50	mg/Kg wet	60.4		105	83.1-116.9	3.76	30	
Calcium	6080	15	mg/Kg wet	6040		101	83.1-116.7	5.88	30	
Chromium	134	0.99	mg/Kg wet	125		107	81.6-117.6	5.19	30	
Cobalt	164	5.0	mg/Kg wet	163		101	84.7-115.3	3.53	30	
Copper	82.2	0.99	mg/Kg wet	80.1		103	83.8-116.1	4.15	30	
Iron	10100	5.0	mg/Kg wet	12900		78.6	50.8-149.6	8.39	30	
Lead	134	1.5	mg/Kg wet	136		98.6	82.4-117.8	5.42	30	
Magnesium	2460	15	mg/Kg wet	2640		93.0	75.4-124.2	7.32	30	
Manganese	259	0.99	mg/Kg wet	279		93.0	82.8-117.5	8.18	30	
Nickel	128	0.99	mg/Kg wet	128		100	84.4-115.6	3.09	30	
Potassium	2680	200	mg/Kg wet	2820		94.9	72.7-127.3	6.80	30	
Selenium	90.7	5.0	mg/Kg wet	85.9		106	80-120	2.72	30	
Silver	59.3	0.99	mg/Kg wet	61.3		96.7	66.2-133.8	5.42	30	
Sodium	444	200	mg/Kg wet	439		101	73.8-126.2	4.86	30	
Thallium	140	5.0	mg/Kg wet	144		97.5	81.2-118.8	5.11	30	
Vanadium	105	2.0	mg/Kg wet	104		101	75.5-124	4.35	30	
Zinc	199	2.0	mg/Kg wet	204		97.7	81.9-117.6	2.64	30	
MRL Check (B072776-MRL1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Lead	0.803	0.71	mg/Kg wet	0.708		113	80-120			
Batch B072801 - SW-846 7471										
Blank (B072801-BLK1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B072801-BS1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Mercury	4.10	0.33	mg/Kg wet	4.05		101	71.6-128.1			
LCS Dup (B072801-BSD1)				Prepared: 05/10/13 Analyzed: 05/13/13						
Mercury	4.38	0.33	mg/Kg wet	4.05		108	71.6-128.1	6.42	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B072796 - % Solids										
Duplicate (B072796-DUP6)	**Source: 13E0231-01**		Prepared: 05/10/13 Analyzed: 05/13/13							
% Solids	81.1		% Wt		81.0			0.123	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
B-06	Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were "Not Detected" even though CCB value was above the reporting limit.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
Z-01	Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were >10x the level in the calibration blank.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA
Antimony	CT,NH,NY,NC,ME,VA
Arsenic	CT,NH,NY,ME,NC,VA
Barium	CT,NH,NY,ME,NC,VA
Beryllium	CT,NH,NY,ME,NC,VA
Cadmium	CT,NH,NY,ME,NC,VA
Calcium	CT,NH,NY,ME,NC,VA
Chromium	CT,NH,NY,ME,NC,VA
Cobalt	CT,NH,NY,ME,NC,VA
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,AIHA,ME,NC,VA
Magnesium	CT,NH,NY,ME,NC,VA
Manganese	CT,NH,NY,ME,NC,VA
Nickel	CT,NH,NY,ME,NC,VA
Potassium	CT,NH,NY,ME,NC,VA
Selenium	CT,NH,NY,ME,NC,VA
Silver	CT,NH,NY,ME,NC,VA
Sodium	CT,NH,NY,ME,NC,VA
Thallium	CT,NH,NY,ME,NC,VA
Vanadium	CT,NH,NY,ME,NC,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 6010C in Water	
Copper	CT,NH,NY,ME,NC,VA
Iron	CT,NH,NY,ME,NC,VA
Lead	CT,NH,NY,NC,ME,VA
Zinc	CT,NH,NY,ME,NC,VA
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2013
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2013
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2013
FL	Florida Department of Health	E871027 NELAP	06/30/2013
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2013
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2012

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Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13E0231

Company Name: HDR Engineering, Inc. Telephone: 845 735-8510

Address: 1 Blue Hill Plz, 12th Flr
Pearl River, NY 10965 Project #

Client PO#

Attention: Amita Patel

Project Location: Magna Metals - Cortlandt, NY

Sampled By: AW, DL

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ◉ PDF ○ EXCEL ○ GIS
○ OTHER EDP (NYSDEC)
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	*** Container Code	ANALYSIS REQUESTED: TAL Metals	TOC	Moisture Content
								1	1	1			
								A	A	G			
01	BSSB816-0-0.5	5/7/13	0920		X	S	U	1			X		
02	BSSB820-0-0.5	5/7/13	0940		X	S	U	1			X		
03	BSSB819-0-0.5	5/7/13	0950		X	S	U	1			X		
04	BSSB821-0-0.5	5/7/13	1005		X	S	U	1			X	X	X
05	BSSB807-0-0.5	5/7/13	1050		X	S	U	1			X		
06	BSSB807-0-0.5D	5/7/13	1050		X	S	U	1			X		
07	BSSB805-0-0.5	5/7/13	1055		X	S	U	1			X		
08	BSSB806-0-0.5	5/7/13	1100		X	S	U	1			X		
09	BSSB804-0-0.5	5/7/13	1105		X	S	U	1			X		
10	BSSB808-0-0.5	5/7/13	1140										

Comments: BSSB808-0-0.5 – TAL METALS

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other _____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other _____

Relinquished by: (signature)	Date/Time:
C Wadden	5/7/13 1400
Received by: (signature)	Date/Time:
[signature] 5/8/13 3.3C	10:05
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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CHAIN OF CUSTODY RECORD

39 Spruce Street
East longmeadow, MA 01028

Rev 04.05.12

13E0231

Company Name: HDR Engineering Inc.
Telephone: 845 735 8300
Address: 1 Blue Hill Plz, 125 Flr
Pearl River, NY 10965
Project #
Client PO#
Attention: Amita Patel
Project Location: Magna Metals - Cortlandt, NY
Sampled By: AW, JL

DATA DELIVERY (check all that apply)
○ FAX ☒ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ☒ PDF ☒ EXCEL ○ GIS
○ OTHER EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals
11	BSSB809-0-0.5	5/7/13	1145		X	S	U	X
12	BSSB810-0-0.5	5/7/13	1150		X	S	U	X
13	BSSB811-0-0.5	5/7/13	1200		X	S	U	X
14	BSSB812-0-0.5	5/7/13	1205		X	S	U	X
				aqW				

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	5/7/13 1400
Received by: (signature) 7.3	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☒ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

FedEx

873860735010

Ship (P/U) date :
Tues 5/07/2013 2:40 pm
PEARL RIVER, NY US

Delivered
Signed for by: C.COLLINS

Actual delivery :
Wed 5/08/2013 10:05 am
MA US

Travel History

Date/Time	Activity	Location
- 5/08/2013 - Wednesday		
10:05 am	Delivered	MA
8:26 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
7:15 am	At local FedEx facility	WINDSOR LOCKS, CT
- 5/07/2013 - Tuesday		
10:03 pm	Departed FedEx location	NEWARK, NJ
9:53 pm	Arrived at FedEx location	NEWARK, NJ
9:00 pm	Left FedEx origin facility	MAHWAH, NJ
2:40 pm	Picked up	MAHWAH, NJ

Local Scan Time

Shipment Facts

Tracking number	873860735010	**Service**	FedEx Standard Overnight
Weight	66 lbs	**Dimensions**	21x15x15 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	66 lbs / 29.9 kgs	**Shipper reference**	184578
Packaging	Your Packaging	**Special handling section**	Deliver Weekday

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY

Sample Receipt Checklist

CLIENT NAME: HDR Engineering Inc. RECEIVED BY: JMH DATE: 5/2/13

1) **Was the chain(s) of custody relinquished and signed?** Yes No No CoC Included

2) **Does the chain agree with the samples?** Yes No
If not, explain:

3) **Are all the samples in good condition?** Yes No
If not, explain:

4) **How were the samples received:**

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.3°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)

Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)

Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	15
500 mL Amber		4 oz amber/clear jar	
250 mL Amber (8oz amber)		2 oz amber/clear jar	1
1 Liter Plastic		Air Cassette	
500 mL Plastic		Hg/Hopcalite Tube	
250 mL plastic		Plastic Bag / Ziploc	
40 mL Vial - type listed below		PM 2.5 / PM 10	
Colisure / bacteria bottle		PUF Cartridge	
Dissolved Oxygen bottle		SOC Kit	
Encore		TO-17 Tubes	
Flashpoint bottle		Non-ConTest Container	
Perchlorate Kit		Other glass jar	
Other		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

GeoTesting EXPRESS

Client:	Con-Test Analytical Lab				
Project:	13E0231				
Location:	---			Project No:	GTX-300533
Boring ID:	---	Sample Type:	jar	Tested By:	jek
Sample ID:	13E0231-04	Test Date:	05/20/13	Checked By:	jdt
Depth :	---	Test Id:	265322		
Test Comment:	---				
Sample Description:	Moist, brown silty sand				
Sample Comment:	---				

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	13E0231-04	---	Moist, brown silty sand	29.2

Notes: Temperature of Drying : 110º Celsius

printed 5/20/2013 9:47:47 AM

GeoTesting EXPRESS

Client:	Con-Test Analytical Lab				
Project:	13E0231				
Location:	---			Project No:	GTX-300533
Boring ID:	---	Sample Type:	jar	Tested By:	jek
Sample ID:	13E0231-04	Test Date:	05/20/13	Checked By:	jdt
Depth :	---	Test Id:	265322		
Test Comment:	---				
Sample Description:	Moist, brown silty sand				
Sample Comment:	---				

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
---	13E0231-04	---	Moist, brown silty sand	29.2

Notes: Temperature of Drying : 110° Celsius

printed 5/20/2013 9:47:47 AM

May 28, 2013 Service Request No: R1303236

Ms. Paula Blakeborough
Contest Laboratory
39 Spruce Street
East Longmeadow, MA 01028

Laboratory Results for: 13E0231

Dear Ms. Blakeborough:

Enclosed are the results of the sample(s) submitted to our laboratory on May 9, 2013. For your reference, these analyses have been assigned our service request number **R1303236.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7471. You may also contact me via email at Karen.Bunker@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Karen Bunker
Project Manager

ADDRESS 1565 Jefferson Rd, Building 300, Suite 360, Rochester, NY 14623 PHONE 585-288-5380 | FAX 585-288-8475
ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

00001

Page 52 of 61 13E0231_2 Contest_Final 05 31 13 1703 05/31/13 17:06:26

CASE NARRATIVE

This report contains analytical results for the following samples:
Service Request Number: R1303236

Lab ID	Client ID
R1303236-001	13E0231-04

All samples were received in good condition unless otherwise noted on the cooler receipt and preservation check form located at the end of this report.

All samples were preserved in accordance with approved analytical methods.

All samples have been analyzed by the approved methods cited on the analytical results pages.

All holding times and associated QC were within limits.

No analytical or QC problems were encountered.

All sampling activities performed by ALS personnel have been in accordance with "ALS Field Procedures and Measurements Manual" or by client specifications.

ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% (25% for CLP) difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

NELAP Accredited	Maine ID #NY0032	New Hampshire ID # 294100 A/B
Connecticut ID # PH0556	Nebraska Accredited	
Delaware Accredited	Nevada ID # NY-00032	North Carolina #676
DoD ELAP #65817	New Jersey ID # NY004	Pennsylvania ID# 68-786
Florida ID # E87674	New York ID # 10145	Rhode Island ID # 158
Illinois ID #200047		Virginia #460167

[1] Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the laboratory case narrative provided. For a specific list of accredited analytes, refer to http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads/North-America-Downloads

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303236
Project:	13E0231	**Date Collected:**	5/ 7/13 1005
Sample Matrix:	Soil	**Date Received:**	5/ 9/13
Sample Name:	13E0231-04		
Lab Code:	R1303236-001	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	76.2		Percent	1.0	1	NA	5/10/13 13:35	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303236
Project:	13E0231	**Date Collected:**	5/ 7/13 1005
Sample Matrix:	Soil	**Date Received:**	5/ 9/13
Sample Name:	13E0231-04		
Lab Code:	R1303236-001	**Basis:**	Dry, per Method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	5200		mg/Kg	1400	1	NA	5/20/13 13:00	

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303236
Project:	13E0231	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank		
Lab Code:	R1303236-MB	**Basis:**	As Received

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Solids, Total	160.3 Modified	1.0	U	Percent	1.0	1	NA	5/10/13 13:35	

Client:	Con-test Analytical Laboratory	**Service Request:**	R1303236
Project:	13E0231	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank		
Lab Code:	R1303236-MB	**Basis:**	Dry, per Method

General Chemistry Parameters

Analyte Name	Method	Result	Q	Units	MRL	Dilution Factor	Date Extracted	Date Analyzed	Note
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	300	U	mg/Kg	300	1	NA	5/20/13 13:00	

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: Con-test Analytical Laboratory
Project: 13E0231
Sample Matrix: Soil

Service Request: R1303236
Date Analyzed: 5/20/13

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/Kg
Basis: Dry, per Method

Analyte Name	Method	Lab Control Sample R1303236-LCS Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic (TOC)	EPA LKahn 7-27-1988	1810	2000	90	84 - 113

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

SUBCONTRACT ORDER *Subcontract lab must notify Con-Test Analytical Lab of any MCL exceedance within 24-hours of obtaining valid data.*

Con-Test Analytical Laboratory

13E0231

SENDING LABORATORY:	RECEIVING LABORATORY:
Con-Test Analytical Laboratory	Columbia Analytical Services, Inc. - Rochester, NY
39 Spruce Street	1565 Jefferson Road Building 300, Suite 360
East Longmeadow, MA 01028	Rochester, NY 14623
Phone: 413.525.2332	Phone :800-695-7222
Fax: 413.525.6405	Fax: 585-288-8475
Project Manager: Paula E. Blakeborough	

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 13E0231-04	**Soil**	**Sampled:05/07/13 10:05**	-60V	
Total Organic Carbon	05/15/13 12:00	05/21/13 10:05		Sub to Columbia Analytical in Rochester, NY
Containers Supplied:				
8 oz amber glass jar (B)				

R1303236 5

Contest Laboratory
13E0231

Released By	Date	Received By	Date
			5-9-13 9:25
Released By	Date	Received By	Date

Cooler Receipt and Preservation Check Form

Project/Client Contest Labs Folder Number B13-3236

Cooler received on 5-9-13 by: ME COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	YES	(NO)			
2.	Were custody papers properly filled out (ink, signed, etc.)?	YES	(NO)			
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO			
4.	Did VOA vials, Alkalinity, or Sulfide have significant* air bubbles?	YES	NO	(N/A)		
5.	Were Ice or Ice packs present?	(YES)	NO			
6.	Where did the bottles originate?	ALS/ROC, (CLIENT)				
7.	Soil VOA samples received as:	Bulk Jar	Encore	TerraCore	Lab5035set	(N/A)
8.	Temperature of cooler(s) upon receipt:	6.0				
	Is the temperature within 0° - 6° C?:	(Y) N	Y N	Y N	Y N	Y N

If No, Explain Below Date/Time Temperatures Taken: 5-9-13 @ 9:32

Thermometer ID: (IR GUN#3) / IR GUN#4 Reading From: Temp Blank / (Sample Bottle)

If out of Temperature, note packing/ice condition &Client Approval to Run Samples:

All Samples held in storage location R-002 by ME on 5-9-13 at 9:35

5035 samples placed in storage location ____ by ____ on ____ at ____

PC Secondary Review: KB 5/10/13

Cooler Breakdown: Date: 5/9/13 Time: 2006 by: RD

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

Explain any discrepancies:

pH	Reagent	YES	NO	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	NaOH								
≤2	HNO_3								
≤2	H_2SO_4								
<4	$NaHSO_4$								
Residual Chlorine (-)	For TCN Phenol and 522			If present, contact PM to add ascorbic acid Or sodium sulfite (522)					
	$Na_2S_2O_3$	-	-						
	Zn Aceta	-	-						
	HCl	*	*						

*Not to be tested before analysis – pH tested and recorded by VOAs or GenChem on a separate worksheet

Yes = All samples OK

No = Samples were preserved at lab as listed

PM OK to Adjust: ____

Bottle lot numbers: Client

Other Comments:

PC Secondary Review: KB 5/8/13

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

Data Validation Services

120 Cobble Creek Road P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
harry@frontiernet.net

August 26, 2013

Amita Patel
HDR Engineering, Inc.
One Blue Hill Plaza
Pearl River, NY 10965

RE: Validation of the Magna Metals Site Analytical Data Packages
Data Usability Summary Report (DUSR)
con-test SDG Nos. 13C0613, 13C0680, 13C0854, 13C0950, 13D0006, 13D0007, 13D0085, 13D0650, 13E0068, and 13E0231

Dear Ms. Patel:

Review has been completed for the data packages noted above, generated by con-test Analytical Laboratory, that pertain to samples collected between 03/10/13 and 05/07/13 at the Magna Metals site.

Two hundred and eighteen soil samples and two field duplicates were processed for Target Analyte List (TAL) metals by USEPA SW846 methods 6010B and 7471. Eleven of these were also processed for Total Organic Carbon (TOC) by the Lloyd Kahn method by ALS laboratory, and nine of these are also processed for total moisture by ASTM method D2216 by GeoTesting Express. Validation of the TOC and percent moisture data was not required.

The data packages submitted contain full deliverables for validation, but this DUSR is generated from review of the summary form information, with full validation review of sample raw data, and limited review of associated QC raw data. The reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOP HW-2, the USEPA CLP National Functional Guidelines for Inorganic Data Review, the specific laboratory methodologies, and professional judgment. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Matrix Spike (MS) Recoveries/Duplicate (DUP) Correlations
* Field Duplicate Correlations
* Preparation and Calibration Blanks
* Laboratory Control Samples (LCSs)
* Calibration and Low Level Standards
* Instrument IDLs
* Sample Result Verification

The data review includes evaluation of the specific items noted in The NYS DER-10 Appendix B section 2.0 (c). The items listed above that show deficiencies are discussed within the text of this narrative. The laboratory QC forms illustrating the excursions can be found within the laboratory data packages.

In summary, the metals sample results are usable either as reported, or with qualification as estimated. The following items of concern are noted:

- Insufficient project QC samples were submitted, with seven pairs of MS/DUP and two field duplicates processed. Although batch QC (non-project MS/DUP) was processed by the laboratory, the results of the batch QC were not provided in the data packages. The project sample MS, DUP, and field duplicate evaluations exhibit very good accuracy, precision, and representativeness. Therefore, only project QC results have been utilized, and they have been associated with the project samples as noted in the analytical section below.
- The laboratory failed to process the ICP serial dilution evaluations. Therefore, the potential suppression matrix effects on the analyses have not been determined.
- Many of the samples exhibit solids content below 30%, and due to potential for a non-homogenous matrix, the results of those samples have been qualified as estimated in value.

Copies of the client sample identifications and the laboratory case narrative are attached to this text, and should be reviewed in conjunction with this report. Also included with the submission is client EDD, with validation edits/qualifiers applied in red.

Chain-of-Custody

The following custody variances were noted:

- the down-arrow is missing from the collection date entered on two of the three custodies for samples reported in SDG 13C0680
- there appears to be a transcription error on the laboratory receive date on the custody form pg 5 of 7 reported in SDG 13C0950
- the laboratory receipt entries were not present on the custody form page 2 of 2 reported in SDG 13E0231
- there are no relinquish entries present on the custody form for the inter-laboratory transfer for the TOC analyses reported in SDG 13E0231

Blind Duplicate Evaluation

The blind field duplicates were collected at locations BRSD752-0-0.5 and BSSB807-0-0.5. Correlations were within validation guidelines of 50%RPD or ±2XCRDL, with the exception of that for iron (77%RPD) in BRSD752-0-0.5, the results for which are qualified as estimated in the parent sample and its duplicate.

TAL Metals Analyses by EPA 6010B and 7470/7471

Matrix spikes and laboratory duplicate evaluations were performed for ICP elements on PASD612-0-0.5, PASD622-1-1.5, PASD608-1-1.5, BRSD703-4-4.5, BRSD704-3-3.5, BRSD711-1-1.5, and BRSD750-0-0.5, and for mercury on BRSD612-0-0.5, BRSD725-0-0.5, PASD617-2-2.5, BRSD-723-0-0.5, and BRSD750-0-0.5.

The ICP MS/DUPs of PASD608-1-1.5, BRSD703-4-4.5, and BRSD711-1-1.5, and all of the mercury matrix spikes show recoveries and correlations within recommended ranges.

The MSs of PASD612-0-0.5, PASD622-1-1.5, and BRSD704-3-3.5 show outlying recoveries for antimony (46% to 62%). Results for that element have been qualified as estimated in the samples reported in SDGs 13C0613, 13C0680, 13C0854, and 13D0085, and nine of the samples reported in SDG 13C0950.

The MS and DUP of BRSD750-0-0.5 produced the following outlying recoveries and correlations (%RPD), and results for the listed elements are qualified as estimated in the samples reported in SDGs 13E0068 and 13E0231:

Element	%Recoveries	%RPD
Antimony	33	
Copper	47	66
Manganese	51	
Nickel	55	50

Due to an elevated recovery (228%) in the associated low reporting level concentration standard, the result for lead in BRSD745-0-0.5 is qualified as estimated in value.

Copper produced a non-compliant elevated recovery (123%) in the LCS associated with twenty of the samples reported in SDG 13E0068. The results for this compound in the samples reported in that SDG have been qualified as estimated in value.

The required ICP serial dilution determinations, which evaluate the effect of sample matrix interferences, were not performed by the laboratory. Therefore, the effect of the matrices on analyte recovery from the samples is not therefore fully known.

Some of the instrument calibration blanks report responses above the reporting limits, but associated sample results are more than tenfold higher than the associated samples, and reported results are unaffected.

Metals analysis sequence logs do not show the analysis dates or times. Dilution factors are not available on the metals analysis sequence summaries or the raw sequence log.

ICP Linear Range and Inter Element Correction Factors summaries were not included in the data packages, but were provided upon request.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Att: Validation Qualifier Definitions
Sample Identifications and Laboratory Case Narratives

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs and LABORATORY CASE NARRATIVES

con-test®
ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

REPORT DATE: 4/1/2013

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD602-0-0.5	13C0613-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-0-0.5	13C0613-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-1-1.5	13C0613-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD603-2-2.5	13C0613-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD601-0-0.5	13C0613-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD522-0-0.5	13C0613-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-0-0.5	13C0613-07	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-1-1.5	13C0613-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-2-2.5	13C0613-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD606-2-2.5-1	13C0613-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD609-0-0.5	13C0613-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD609-1-1.5	13C0613-12	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD609-2-2.5	13C0613-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD520-0-0.5	13C0613-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD520-1-1.5	13C0613-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD520-2-2.5	13C0613-16	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-0-0.5	13C0613-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-1-1.5	13C0613-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WSTD521-2-2.5	13C0613-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD701-0-0.5	13C0613-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD701-0-0.5-1	13C0613-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-0-0.5	13C0613-22	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-1-1.5	13C0613-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD702-2-2.5	13C0613-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD725-0-0.5	13C0613-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD722-0-0.5	13C0613-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-0-0.5	13C0613-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-1-1.5	13C0613-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD605-2-2.5	13C0613-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD604-0-0.5	13C0613-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD612-0-0.5	13C0613-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD620-0-0.5	13C0613-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-0-0.5	13C0613-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-1-1.5	13C0613-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD611-2-2.5	13C0613-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD524-0-0.5	13C0613-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD524-1-1.5	13C0613-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0613

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD524-2-2.5	13C0613-38	Soil		SM 2540G SW-846 6010C SW-846 7471B	

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REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0680

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD621- 2-2.5	13C0680-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD621- 2.5-3	13C0680-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 2-2.5	13C0680-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 3-3.5	13C0680-04	Soil		-	GAI-LAP-20-1996/AASHTO
				ASTM D2216	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD617- 4-4.5	13C0680-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 2-2.5	13C0680-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 3-3.5	13C0680-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD615- 4-4.5	13C0680-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 525-0-0.5	13C0680-09	Soil		-	GAI-LAP-20-1996/AASHTO
				ASTM D2216	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD 623-0-0.5	13C0680-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/1/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0680

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD 523-0-0.5	13C0680-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 719-0-0.5	13C0680-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 716-0-0.5	13C0680-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 713-0-0.5	13C0680-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD 710-0-0.5	13C0680-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 519-0-0.5	13C0680-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD 619-0-0.5	13C0680-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 513-0-0.5	13C0680-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 514-0-0.5	13C0680-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 516-0-0.5	13C0680-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD 515-0-0.5	13C0680-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD723-0-0.5	13C0854-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-1-1.5	13C0854-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-2-2.5	13C0854-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD723-3-3.5	13C0854-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-0-0.5	13C0854-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-1-1.5	13C0854-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD720-2-2.5	13C0854-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-0-0.5	13C0854-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-1-1.5	13C0854-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD622-2-2.5	13C0854-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD503-0-0.5	13C0854-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD502-0-0.5	13C0854-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD501-0-0.5	13C0854-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD511-1-1.5	13C0854-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD511-2-2.5	13C0854-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD511-3-3.5	13C0854-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-1-1.5	13C0854-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-2-2.5	13C0854-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD510-3-3.5	13C0854-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-2-2.5	13C0854-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-3-3.5	13C0854-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD508-4-4.5	13C0854-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-2-2.5	13C0854-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-3-3.5	13C0854-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD505-4-4.5	13C0854-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD504-2-2.5	13C0854-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/10/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0854

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD504-3-3.5	13C0854-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD504-4-4.5	13C0854-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-2-2.5	13C0854-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-3-3.5	13C0854-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD507-4-4.5	13C0854-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-2-2.5	13C0854-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-3-3.5	13C0854-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD506-4-4.5	13C0854-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-1-1.5	13C0854-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-2-2.5	13C0854-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD517-3-3.5	13C0854-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD509-2-2.5	13C0854-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD518-2-2.5	13C0854-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD715-2-2.5	13C0950-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD715-3-3.5	13C0950-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD715-4-4.5	13C0950-03	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-0-0.5	13C0950-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-1-1.5	13C0950-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-2-2.5	13C0950-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD714-3-3.5	13C0950-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-0-0.5	13C0950-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-1-1.5	13C0950-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-2-2.5	13C0950-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD614-3-3.5	13C0950-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD712-2-2.5	13C0950-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD712-3-3.5	13C0950-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD712-4-4.5	13C0950-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-0-0.5	13C0950-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-1-1.5	13C0950-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-2-2.5	13C0950-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD711-3-3.5	13C0950-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-0-0.5	13C0950-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-1-1.5	13C0950-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-2-2.5	13C0950-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD608-3-3.5	13C0950-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-2-2.5	13C0950-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-3-3.5	13C0950-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-4-4.5	13C0950-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD618-2-2.5-1	13C0950-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASD616-0-0.5	13C0950-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-1-1.5	13C0950-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-2-2.5	13C0950-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD616-3-3.5	13C0950-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-0-0.5	13C0950-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-1-1.5	13C0950-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-2-2.5	13C0950-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD610-3-3.5	13C0950-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-0-0.5	13C0950-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-1-1.5	13C0950-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-2-2.5	13C0950-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD613-3-3.5	13C0950-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD709-1-1.5	13C0950-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD708-0-0.5	13C0950-40	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-1-1.5	13C0950-41	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-2-2.5	13C0950-42	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD708-0-0.5-1	13C0950-43	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-1-1.5	13C0950-44	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-2-2.5	13C0950-45	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD707-2-2.5-1	13C0950-46	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-2-2.5	13C0950-47	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-3-3.5	13C0950-48	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD705-4-4.5	13C0950-49	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-0-0.5	13C0950-50	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-1-1.5	13C0950-51	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-2-2.5	13C0950-52	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/16/2013

HDR, Inc.
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Albany, NY 12211
ATTN: Amita Patel

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD706-3-3.5	13C0950-53	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD706-3-3.5-1	13C0950-54	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-2-2.5	13C0950-55	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-3-3.5	13C0950-56	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD703-4-4.5	13C0950-57	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-0-0.5	13C0950-58	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-1-1.5	13C0950-59	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-2-2.5	13C0950-60	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-3-3.5	13C0950-61	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD704-3-3.5-1	13C0950-62	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-0-0.5	13C0950-63	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-1-1.5	13C0950-64	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD717-2-2.5	13C0950-65	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 4/16/2013

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PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13C0950

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals (Cordon Land Manor)

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD717-3-3.5	13C0950-66	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-2-2.5	13C0950-67	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-3-3.5	13C0950-68	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD718-4-4.5	13C0950-69	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 4/16/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13D0085

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland and Manor, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSD512-1-1.5	13D0085-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-2-2.5	13D0085-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-3-3.5	13D0085-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-3-3.5-1	13D0085-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
WTSD512-4-4.5	13D0085-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-1-1.5	13D0085-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-2-2.5	13D0085-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-3-3.5	13D0085-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
PASD607-4-4.5	13D0085-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-2-2.5	13D0085-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-3-3.5	13D0085-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-3-3.5-1	13D0085-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD721-4-4.5	13D0085-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 5/31/2013

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ATTN: Amita Patel

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0068

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD736-0-0.5	13E0068-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD737-0-0.5	13E0068-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD738-0-0.5	13E0068-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD739-0-0.5	13E0068-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD740-0-0.5	13E0068-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD741-0-0.5	13E0068-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD742-0-0.5	13E0068-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD743-0-0.5	13E0068-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD744-0-0.5	13E0068-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD745-0-0.5	13E0068-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD746-0-0.5	13E0068-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD747-0-0.5	13E0068-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD748-0-0.5	13E0068-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 5/31/2013

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PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0068

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD749-0-0.5	13E0068-14	Soil		-	GAI-LAP-20-1996/AASH TO
				SM 2540G	
				SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
				SW-846 6010C	
				SW-846 7471B	
BRSD750-0-0.5	13E0068-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD751-0-0.5	13E0068-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD752-0-0.5	13E0068-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD752-0-0.5D	13E0068-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD753-0-0.5	13E0068-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD754-0-0.5	13E0068-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD755-0-0.5	13E0068-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD756-0-0.5	13E0068-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD757-0-0.5	13E0068-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD758-0-0.5	13E0068-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BRSD759-0-0.5	13E0068-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0231

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BSSB816-0-0.5	13E0231-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB820-0-0.5	13E0231-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB819-0-0.5	13E0231-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB821-0-0.5	13E0231-04	Soil		-	GAI-LAP-20-1996/AASHTO
				SM 2540G	
				SM 5310B	MA M-NY032/NY10145 NELAP/ + Additional
				SW-846 6010C	
				SW-846 7471B	
BSSB807-0-0.5	13E0231-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB807-0-0.5D	13E0231-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB805-0-0.5	13E0231-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB806-0-0.5	13E0231-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB804-0-0.5	13E0231-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB808-0-0.5	13E0231-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB809-0-0.5	13E0231-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB810-0-0.5	13E0231-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Amita Patel

REPORT DATE: 5/31/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13E0231

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BSSB811-0-0.5	13E0231-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
BSSB812-0-0.5	13E0231-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Copper, Iron

13C0613-01[PASD602-0-0.5], 13C0613-19[WSTD521-2-2.5], 13C0613-20[BRSD701-0-0.5], 13C0613-21[BRSD701-0-0.5-1], 13C0613-22[BRSD702-0-0.5], 13C0613-23[BRSD702-1-1.5], 13C0613-24[BRSD702-2-2.5], 13C0613-25[BRSD725-0-0.5], 13C0613-26[BRSD722-0-0.5], 13C0613-27[PASD605-0-0.5], 13C0613-28[PASD605-1-1.5], 13C0613-29[PASD605-2-2.5], 13C0613-30[PASD604-0-0.5], 13C0613-31[PASD612-0-0.5], 13C0613-32[PASD620-0-0.5], 13C0613-33[PASD611-0-0.5], 13C0613-34[PASD611-1-1.5], 13C0613-35[PASD611-2-2.5], 13C0613-36[WTSD524-0-0.5], 13C0613-37[WTSD524-1-1.5], 13C0613-38[WTSD524-2-2.5], B069465-BLK1, B069504-BLK1, B069504-DUP1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0613-31[PASD612-0-0.5], B069504-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13C0613-31[PASD612-0-0.5], B069504-MS1

SW-846 7471B

Qualifications:

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Mercury

13C0613-25[BRSD725-0-0.5], B069484-MS1

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron, Magnesium

13C0680-01[PASD621- 2-2.5], 13C0680-02[PASD621- 2.5-3], 13C0680-03[PASD617- 2-2.5], 13C0680-04[PASD617- 3-3.5], 13C0680-05[PASD617- 4-4.5], 13C0680-06[PASD615- 2-2.5], 13C0680-07[PASD615- 3-3.5], 13C0680-08[PASD615- 4-4.5], 13C0680-09[WTSD 525-0-0.5], 13C0680-10[PASD 623-0-0.5], 13C0680-11[PASD 623-0-0.5 D], 13C0680-12[WTSD 523-0-0.5], 13C0680-13[BRSD 719-0-0.5], 13C0680-14[BRSD 716-0-0.5], 13C0680-15[BRSD 713-0-0.5], 13C0680-16[BRSD 710-0-0.5], 13C0680-17[WTSD 519-0-0.5], 13C0680-18[PASD 619-0-0.5], 13C0680-19[WTSD 513-0-0.5], 13C0680-20[WTSD 514-0-0.5], 13C0680-21[WTSD 516-0-0.5], 13C0680-22[WTSD 515-0-0.5], B069602-BLK1, B069619-BLK1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium, Thallium

13C0680-13[BRSD 719-0-0.5], 13C0680-16[BRSD 710-0-0.5]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Michael A. Erickson
Laboratory Director

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron

13C0854-21[WTSD508-3-3.5], 13C0854-22[WTSD508-4-4.5], 13C0854-23[WTSD505-2-2.5], 13C0854-24[WTSD505-3-3.5], 13C0854-25[WTSD505-4-4.5], 13C0854-26[WTSD504-2-2.5], 13C0854-27[WTSD504-3-3.5], 13C0854-28[WTSD504-4-4.5], 13C0854-29[WTSD507-2-2.5], 13C0854-30[WTSD507-3-3.5], 13C0854-31[WTSD507-4-4.5], 13C0854-32[WTSD506-2-2.5], 13C0854-33[WTSD506-3-3.5], 13C0854-34[WTSD506-4-4.5], 13C0854-35[WTSD517-1-1.5], 13C0854-36[WTSD517-2-2.5], 13C0854-37[WTSD517-3-3.5], 13C0854-38[WTSD509-2-2.5], 13C0854-39[WTSD518-2-2.5], B069963-BLK1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium

13C0854-19[WTSD510-3-3.5], 13C0854-36[WTSD517-2-2.5]

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0854-09[PASD622-1-1.5], B069915-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Maguesium

13C0854-09[PASD622-1-1.5], B069915-MS1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Michael A. Erickson
Laboratory Director

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

con-test®
ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Iron

13C0950-20[PASD608-1-1.5], 13C0950-21[PASD608-2-2.5], 13C0950-22[PASD608-3-3.5], 13C0950-23[PASD618-2-2.5], 13C0950-24[PASD618-3-3.5], 13C0950-25[PASD618-4-4.5], 13C0950-26[PASD618-2-2.5-1], 13C0950-27[PASD616-0-0.5], 13C0950-28[PASD616-1-1.5], 13C0950-29[PASD616-2-2.5], 13C0950-30[PASD616-3-3.5], 13C0950-31[PASD610-0-0.5], 13C0950-32[PASD610-1-1.5], 13C0950-33[PASD610-2-2.5], 13C0950-34[PASD610-3-3.5], 13C0950-35[PASD613-0-0.5], 13C0950-36[PASD613-1-1.5], 13C0950-37[PASD613-2-2.5], 13C0950-38[PASD613-3-3.5], 13C0950-39[BRSD709-1-1.5], 13C0950-40[BRSD708-0-0.5], 13C0950-41[BRSD708-1-1.5], 13C0950-42[BRSD708-2-2.5], 13C0950-43[BRSD708-0-0.5-1], 13C0950-44[BRSD707-1-1.5], 13C0950-45[BRSD707-2-2.5], 13C0950-46[BRSD707-2-2.5-1], 13C0950-47[BRSD705-2-2.5], 13C0950-48[BRSD705-3-3.5], 13C0950-49[BRSD705-4-4.5], 13C0950-50[BRSD706-0-0.5], 13C0950-51[BRSD706-1-1.5], 13C0950-52[BRSD706-2-2.5], 13C0950-53[BRSD706-3-3.5], 13C0950-54[BRSD706-3-3.5-1], 13C0950-55[BRSD703-2-2.5], 13C0950-56[BRSD703-3-3.5], 13C0950-57[BRSD703-4-4.5], 13C0950-58[BRSD704-0-0.5], 13C0950-59[BRSD704-1-1.5], B070039-BLK1, B070039-DUP1, B070042-BLK1, B070042-DUP1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Beryllium

13C0950-12[BRSD712-2-2.5], 13C0950-13[BRSD712-3-3.5], 13C0950-14[BRSD712-4-4.5], 13C0950-45[BRSD707-2-2.5], 13C0950-46[BRSD707-2-2.5-1], 13C0950-48[BRSD705-3-3.5], 13C0950-49[BRSD705-4-4.5], 13C0950-52[BRSD706-2-2.5], 13C0950-53[BRSD706-3-3.5], 13C0950-54[BRSD706-3-3.5-1], 13C0950-66[BRSD717-3-3.5]

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13C0950-61[BRSD704-3-3.5], B070044-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13C0950-16[BRSD711-1-1.5], 13C0950-20[PASD608-1-1.5], 13C0950-57[BRSD703-4-4.5], 13C0950-61[BRSD704-3-3.5], B070031-MS1, B070039-MS1, B070042-MS1, B070044-MS1

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

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I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Michael A. Erickson
Laboratory Director

con-test®
ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Calcium, Iron

13D0085-01[WTSD512-1-1.5], 13D0085-02[WTSD512-2-2.5], 13D0085-03[WTSD512-3-3.5], 13D0085-04[WTSD512-3-3.5-1], 13D0085-05[WTSD512-4-4.5], 13D0085-06[PASD607-1-1.5], 13D0085-07[PASD607-2-2.5], 13D0085-08[PASD607-3-3.5], 13D0085-09[PASD607-4-4.5], 13D0085-10[BRSD721-2-2.5], B070276-BLK1, 13D0085-11[BRSD721-3-3.5], 13D0085-12[BRSD721-3-3.5-1], 13D0085-13[BRSD721-4-4.5], B070242-BLK1

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I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium, Manganese, Zinc

13E0068-06[BRSD741-0-0.5], 13E0068-07[BRSD742-0-0.5], 13E0068-08[BRSD743-0-0.5], 13E0068-09[BRSD744-0-0.5], 13E0068-10[BRSD745-0-0.5], 13E0068-11[BRSD746-0-0.5], 13E0068-12[BRSD747-0-0.5], 13E0068-13[BRSD748-0-0.5], 13E0068-14[BRSD749-0-0.5], 13E0068-15[BRSD750-0-0.5], 13E0068-16[BRSD751-0-0.5], 13E0068-17[BRSD752-0-0.5], 13E0068-18[BRSD752-0-0.5D], 13E0068-19[BRSD753-0-0.5], 13E0068-20[BRSD754-0-0.5], 13E0068-21[BRSD755-0-0.5], 13E0068-22[BRSD756-0-0.5], 13E0068-23[BRSD757-0-0.5], 13E0068-24[BRSD758-0-0.5], 13E0068-25[BRSD759-0-0.5], B072284-BLK1, B072284-DUP1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Selenium, Silver

13E0068-01[BRSD736-0-0.5], 13E0068-03[BRSD738-0-0.5]

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Copper

B072284-BS1

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be biased on the high side.

Analyte & Samples(s) Qualified:

Lead

13E0068-06[BRSD741-0-0.5], 13E0068-07[BRSD742-0-0.5], 13E0068-08[BRSD743-0-0.5], 13E0068-09[BRSD744-0-0.5], 13E0068-10[BRSD745-0-0.5], 13E0068-11[BRSD746-0-0.5], 13E0068-12[BRSD747-0-0.5], 13E0068-13[BRSD748-0-0.5], 13E0068-14[BRSD749-0-0.5], 13E0068-15[BRSD750-0-0.5], 13E0068-16[BRSD751-0-0.5], 13E0068-17[BRSD752-0-0.5], 13E0068-18[BRSD752-0-0.5D], 13E0068-19[BRSD753-0-0.5], 13E0068-20[BRSD754-0-0.5], 13E0068-21[BRSD755-0-0.5], 13E0068-22[BRSD756-0-0.5], 13E0068-23[BRSD757-0-0.5], 13E0068-24[BRSD758-0-0.5], 13E0068-25[BRSD759-0-0.5], B072284-DUP1, B072284-MRL1, S004181-CRL1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony, Copper, Manganese, Nickel

13E0068-15[BRSD750-0-0.5], B072284-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13E0068-15[BRSD750-0-0.5], B072284-MS1

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Copper, Lead, Nickel

B072284-DUP1, 13E0068-15[BRSD750-0-0.5]

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were "Not Detected" even though CCB value was above the reporting limit.

Analyte & Samples(s) Qualified:

Silver

13E0231-01[BSSB816-0-0.5], S004223-CCB8

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13E0231-01[BSSB816-0-0.5], 13E0231-02[BSSB820-0-0.5], 13E0231-03[BSSB819-0-0.5], 13E0231-04[BSSB821-0-0.5], 13E0231-05[BSSB807-0-0.5], 13E0231-06[BSSB807-0-0.5D], 13E0231-07[BSSB805-0-0.5], 13E0231-08[BSSB806-0-0.5], 13E0231-09[BSSB804-0-0.5], 13E0231-10[BSSB808-0-0.5], 13E0231-11[BSSB809-0-0.5], 13E0231-12[BSSB810-0-0.5], 13E0231-13[BSSB811-0-0.5], 13E0231-14[BSSB812-0-0.5], B072699-BLK1, B072736-BLK1, B072776-BLK1

Continuing calibration blank did not meet method specified criteria. Data is not affected since all associated samples were >10x the level in the calibration blank.

Analyte & Samples(s) Qualified:

Iron

13E0231-05[BSSB807-0-0.5], 13E0231-06[BSSB807-0-0.5D], 13E0231-07[BSSB805-0-0.5], S004217-CCV8

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Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

November 14, 2013

Jiss Philip
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13K0181

Enclosed are results of analyses for samples received by the laboratory on November 6, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/14/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0181

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BDSB401- 1-1.5	13K0181-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB402- 1-1.5	13K0181-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-1	13K0181-03	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
BDSB405- 1-1.5	13K0181-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB405- 6-6.5	13K0181-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB403- 1-1.5	13K0181-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB404- 1-1.5	13K0181-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB406- 1-1.5	13K0181-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB406D- 1.1.5	13K0181-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
RASB305- 0-0.5	13K0181-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB304- 0-0.5	13K0181-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/14/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0181

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
RASB304- 4-4.5	13K0181-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB302- 0-0.5	13K0181-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB303- 1-1.5	13K0181-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB301- 0-0.5	13K0181-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Selenium

13K0181-14[RASB303- 1-1.5], 13K0181-15[RASB301- 0-0.5]

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13K0181-04[BDSB405- 1-1.5], B084653-MS1

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Sodium

13K0181-04[BDSB405- 1-1.5], B084653-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium, Zinc

13K0181-04[BDSB405- 1-1.5], B084653-MS1

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Copper, Iron

13K0181-04[BDSB405- 1-1.5], B084653-DUP1

Duplicate relative percent difference (RPD) is a less useful indicator of sample precision for sample results that are <5 times the reporting limit (RL).

Analyte & Samples(s) Qualified:

Arsenic, Beryllium

13K0181-04[BDSB405- 1-1.5], B084653-DUP1

SW-846 8260C

Qualifications:

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Hexachlorobutadiene

B084861-BS1

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:

1,2-Dibromo-3-chloropropane (DBCP), Bromoform, Bromomethane, tert-Butyl Alcohol (TBA), trans-1,4-Dichloro-2-butene, Vinyl Chloride

13K0181-03[FB-1], B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Acrylonitrile

13K0181-01[BDSB401- 1-1.5], 13K0181-02[BDSB402- 1-1.5], 13K0181-04[BDSB405- 1-1.5], 13K0181-05[BDSB405- 6-6.5], 13K0181-06[BDSB403- 1-1.5], 13K0181-07[BDSB404- 1-1.5], 13K0181-08[BDSB406- 1-1.5], 13K0181-09[BDSB406D- 1.1.5], B084614-BLK1, B084614-BS1, B084614-BSD1

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Acrylonitrile, tert-Butyl Alcohol (TBA), Tetrahydrofuran

13K0181-01[BDSB401- 1-1.5], 13K0181-02[BDSB402- 1-1.5], 13K0181-03[FB-1], 13K0181-04[BDSB405- 1-1.5], 13K0181-05[BDSB405- 6-6.5], 13K0181-06[BDSB403- 1-1.5], 13K0181-07[BDSB404- 1-1.5], 13K0181-08[BDSB406- 1-1.5], 13K0181-09[BDSB406D- 1.1.5], B084614-BLK1, B084614-BS1, B084614-BSD1, B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Bromomethane, Chloromethane

B084614-BS1, B084614-BSD1, B084861-BS1, B084861-BSD1, S004934-CCV1

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I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB401- 1-1.5 | Sampled: 11/5/2013 08:00

Sample ID: 13K0181-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Acrylonitrile	ND	0.0064	0.0027	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 10:59	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Benzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Bromobenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Bromodichloromethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 10:59	MFF
n-Butylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
tert-Butylbenzene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Carbon Disulfide	ND	0.0064	0.0035	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Carbon Tetrachloride	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Chlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Chlorodibromomethane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Chloroform	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Chloromethane	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
2-Chlorotoluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
4-Chlorotoluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Dibromomethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1-Dichloroethane	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,3-Dichloropropane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
2,2-Dichloropropane	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1-Dichloropropene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB401- 1-1.5 | Sampled: 11/5/2013 08:00

Sample ID: 13K0181-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,4-Dioxane	ND	0.11	0.062	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Ethylbenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
2-Hexanone (MBK)	ND	0.021	0.012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Methylene Chloride	ND	0.021	0.0076	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Naphthalene	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
n-Propylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Styrene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Toluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Trichloroethylene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
m+p Xylene	ND	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF
o-Xylene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 10:59	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/7/13 10:59
Toluene-d8	97.1	70-130		11/7/13 10:59
4-Bromofluorobenzene	103	70-130		11/7/13 10:59

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB401- 1-1.5 | Sampled: 11/5/2013 08:00

Sample ID: 13K0181-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Barium	420	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 11:53	OP
Cadmium	0.40	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Calcium	23000	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Chromium	69	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Cobalt	22	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Copper	52	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Iron	17000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Lead	21	0.81	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 11:53	OP
Magnesium	12000	8.1	0.85	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 11:53	OP
Manganese	200	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Mercury	0.041	0.027	0.0017	mg/Kg dry	1		SW-846 7471B	11/8/13	11/11/13 12:26	SAJ
Nickel	71	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Potassium	9200	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 11:53	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Sodium	1300	110	53	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 19:16	OP
Thallium	4.6	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Vanadium	72	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP
Zinc	430	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:03	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB401- 1-1.5 | Sampled: 11/5/2013 08:00

Sample ID: 13K0181-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.2		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB402- 1-1.5 | Sampled: 11/5/2013 08:15

Sample ID: 13K0181-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.028	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Acrylonitrile	ND	0.0072	0.0030	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Benzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Bromobenzene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Bromochloromethane	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Bromodichloromethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Bromoform	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
2-Butanone (MEK)	ND	0.048	0.021	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
tert-Butyl Alcohol (TBA)	ND	0.048	0.025	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
n-Butylbenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
sec-Butylbenzene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
tert-Butylbenzene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Carbon Disulfide	ND	0.0072	0.0039	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Carbon Tetrachloride	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Chlorobenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Chlorodibromomethane	ND	0.0012	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Chloroethane	ND	0.024	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Chloroform	ND	0.0048	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
2-Chlorotoluene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
4-Chlorotoluene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Dibromomethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2-Dichlorobenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,3-Dichlorobenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,4-Dichlorobenzene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
trans-1,4-Dichloro-2-butene	ND	0.0048	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.024	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1-Dichloroethane	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2-Dichloroethane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1-Dichloroethylene	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
cis-1,2-Dichloroethylene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
trans-1,2-Dichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2-Dichloropropane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,3-Dichloropropane	ND	0.0012	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
2,2-Dichloropropane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1-Dichloropropene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
trans-1,3-Dichloropropene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Diethyl Ether	ND	0.024	0.0021	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB402- 1-1.5 | Sampled: 11/5/2013 08:15

Sample ID: 13K0181-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,4-Dioxane	ND	0.12	0.069	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Ethylbenzene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Hexachlorobutadiene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
2-Hexanone (MBK)	ND	0.024	0.013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Isopropylbenzene (Cumene)	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0048	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Methylene Chloride	0.010	0.024	0.0085	mg/Kg dry	1	J	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.024	0.0091	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Naphthalene	ND	0.0048	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
n-Propylbenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Styrene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1,1,2-Tetrachloroethane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Tetrachloroethylene	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Toluene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2,3-Trichlorobenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2,4-Trichlorobenzene	ND	0.0048	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,3,5-Trichlorobenzene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1,1-Trichloroethane	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1,2-Trichloroethane	ND	0.0024	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Trichloroethylene	0.0016	0.0024	0.0011	mg/Kg dry	1	J	SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2,3-Trichloropropane	ND	0.0024	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,2,4-Trimethylbenzene	ND	0.0024	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
1,3,5-Trimethylbenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
m+p Xylene	ND	0.0048	0.0020	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF
o-Xylene	ND	0.0024	0.00083	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	109	70-130		11/7/13 11:26
Toluene-d8	99.1	70-130		11/7/13 11:26
4-Bromofluorobenzene	101	70-130		11/7/13 11:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB402- 1-1.5 | Sampled: 11/5/2013 08:15

Sample ID: 13K0181-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Barium	89	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Beryllium	0.79	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:17	OP
Cadmium	0.37	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Calcium	1300	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Chromium	18	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Cobalt	8.8	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Copper	20	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Iron	16000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Lead	6.0	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:17	OP
Magnesium	4200	7.9	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:17	OP
Manganese	210	0.52	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Mercury	0.0094	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:28	SAJ
Nickel	17	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Potassium	560	100	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:17	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Sodium	310	100	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 19:20	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Vanadium	39	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP
Zinc	32	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:08	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB402- 1-1.5 | Sampled: 11/5/2013 08:15

Sample ID: 13K0181-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.2		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: FB-1 | Sampled: 11/5/2013 09:05

Sample ID: 13K0181-03

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	4.7	50	4.7	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Acrylonitrile	ND	5.0	0.58	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Bromobenzene	ND	1.0	0.044	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Bromodichloromethane	ND	0.50	0.088	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Bromoform	ND	1.0	0.21	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Bromomethane	ND	2.0	0.94	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
2-Butanone (MEK)	ND	20	2.4	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
tert-Butyl Alcohol (TBA)	ND	20	2.2	µg/L	1	R-05, V-16	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
n-Butylbenzene	ND	1.0	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
sec-Butylbenzene	ND	1.0	0.084	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
tert-Butylbenzene	ND	1.0	0.096	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Carbon Disulfide	ND	4.0	1.0	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Carbon Tetrachloride	ND	5.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Chlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Chlorodibromomethane	ND	0.50	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Chloroethane	ND	2.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Chloroform	ND	2.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
2-Chlorotoluene	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
4-Chlorotoluene	ND	1.0	0.074	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	0.34	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Dibromomethane	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2-Dichlorobenzene	ND	1.0	0.076	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,3-Dichlorobenzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,4-Dichlorobenzene	ND	1.0	0.046	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
trans-1,4-Dichloro-2-butene	ND	2.0	0.12	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2-Dichloropropane	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,3-Dichloropropane	ND	0.50	0.099	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
2,2-Dichloropropane	ND	1.0	0.072	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1-Dichloropropene	ND	2.0	0.13	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
cis-1,3-Dichloropropene	ND	0.50	0.062	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
trans-1,3-Dichloropropene	ND	0.50	0.056	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Diethyl Ether	0.33	2.0	0.22	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 13:23	EEH

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: FB-1 | Sampled: 11/5/2013 09:05

Sample ID: 13K0181-03

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Ethylbenzene	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
2-Hexanone (MBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Isopropylbenzene (Cumene)	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Methylene Chloride	ND	5.0	3.2	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
n-Propylbenzene	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Styrene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1,2,2-Tetrachloroethane	ND	0.50	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Tetrachloroethylene	ND	1.0	0.080	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Tetrahydrofuran	ND	10	1.1	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Toluene	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2,3-Trichlorobenzene	ND	5.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2,4-Trichlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,3,5-Trichlorobenzene	ND	1.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Trichloroethylene	ND	1.0	0.077	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2,3-Trichloropropane	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
Vinyl Chloride	ND	2.0	0.13	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 13:23	EEH
m+p Xylene	ND	2.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH
o-Xylene	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 13:23	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	102	70-130		11/13/13 13:23
Toluene-d8	100	70-130		11/13/13 13:23
4-Bromofluorobenzene	98.3	70-130		11/13/13 13:23

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: FB-1 | Sampled: 11/5/2013 09:05

Sample ID: 13K0181-03

Sample Matrix: Field Blank

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Antimony	ND	0.050	0.030	mg/L	1		SW-846 6010C	11/9/13	11/13/13 12:47	OP
Arsenic	ND	0.010	0.0086	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Barium	ND	0.050	0.015	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Beryllium	ND	0.0040	0.0010	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Cadmium	ND	0.0040	0.0018	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Calcium	ND	0.15	0.088	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Chromium	ND	0.010	0.0034	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Cobalt	ND	0.050	0.0075	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Copper	ND	0.010	0.0050	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Iron	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Lead	ND	0.010	0.0027	mg/L	1		SW-846 6010C	11/9/13	11/13/13 12:47	OP
Magnesium	ND	0.15	0.037	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Manganese	ND	0.010	0.0020	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Mercury	ND	0.00010	0.000048	mg/L	1		SW-846 7470A	11/7/13	11/7/13 13:04	SAJ
Nickel	ND	0.010	0.0017	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Potassium	ND	2.0	0.46	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Selenium	ND	0.050	0.016	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Silver	ND	0.0050	0.0040	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Sodium	ND	2.0	1.9	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Thallium	ND	0.050	0.020	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Vanadium	ND	0.010	0.0040	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP
Zinc	ND	0.020	0.0071	mg/L	1		SW-846 6010C	11/9/13	11/12/13 22:05	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 1-1.5 | Sampled: 11/5/2013 09:30

Sample ID: 13K0181-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Acrylonitrile	ND	0.0064	0.0027	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 11:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Benzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Bromobenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Bromodichloromethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
2-Butanone (MEK)	ND	0.042	0.019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
tert-Butyl Alcohol (TBA)	ND	0.042	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 11:53	MFF
n-Butylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
tert-Butylbenzene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Carbon Disulfide	ND	0.0064	0.0035	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Carbon Tetrachloride	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Chlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Chlorodibromomethane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Chloroform	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Chloromethane	ND	0.011	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
2-Chlorotoluene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
4-Chlorotoluene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Dibromomethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
trans-1,4-Dichloro-2-butene	ND	0.0042	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1-Dichloroethane	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1-Dichloroethylene	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,3-Dichloropropane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
2,2-Dichloropropane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1-Dichloropropene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 1-1.5 | Sampled: 11/5/2013 09:30

Sample ID: 13K0181-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,4-Dioxane	ND	0.11	0.061	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Ethylbenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
2-Hexanone (MBK)	ND	0.021	0.012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0042	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Methylene Chloride	0.0081	0.021	0.0075	mg/Kg dry	1	J	SW-846 8260C	11/7/13	11/7/13 11:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0081	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Naphthalene	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
n-Propylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Styrene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Tetrahydrofuran	ND	0.011	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Toluene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2,4-Trichlorobenzene	ND	0.0042	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Trichloroethylene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00095	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
m+p Xylene	ND	0.0042	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF
o-Xylene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 11:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/7/13 11:53
Toluene-d8	95.9	70-130		11/7/13 11:53
4-Bromofluorobenzene	99.9	70-130		11/7/13 11:53

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 1-1.5 | Sampled: 11/5/2013 09:30

Sample ID: 13K0181-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	2.6	1.1	mg/Kg dry	1	MS-19	SW-846 6010C	11/7/13	11/8/13 22:18	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1	MS-07	SW-846 6010C	11/7/13	11/8/13 22:18	OP
Arsenic	1.8	2.6	0.95	mg/Kg dry	1	R-04, J	SW-846 6010C	11/7/13	11/8/13 22:18	OP
Barium	40	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Beryllium	0.62	0.26	0.042	mg/Kg dry	1	R-04	SW-846 6010C	11/7/13	11/8/13 11:31	OP
Cadmium	0.76	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Calcium	1900	7.9	1.4	mg/Kg dry	1	MS-19	SW-846 6010C	11/7/13	11/8/13 22:18	OP
Chromium	9.3	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Cobalt	5.5	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Copper	1200	0.53	0.40	mg/Kg dry	1	R-02	SW-846 6010C	11/7/13	11/8/13 22:18	OP
Iron	22000	2.6	2.2	mg/Kg dry	1	MS-19, R-02	SW-846 6010C	11/7/13	11/8/13 11:31	OP
Lead	39	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 11:31	OP
Magnesium	3000	7.9	0.82	mg/Kg dry	1	MS-19	SW-846 6010C	11/7/13	11/8/13 11:31	OP
Manganese	180	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Mercury	0.019	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:29	SAJ
Nickel	11	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Potassium	1300	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Selenium	220	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/12/13	11/14/13 13:12	OP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Sodium	76	110	51	mg/Kg dry	1	MS-11, J	SW-846 6010C	11/7/13	11/13/13 18:54	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Vanadium	17	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 22:18	OP
Zinc	480	1.1	0.27	mg/Kg dry	1	MS-19	SW-846 6010C	11/7/13	11/8/13 22:18	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 1-1.5 | Sampled: 11/5/2013 09:30

Sample ID: 13K0181-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.4		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 6-6.5 | Sampled: 11/5/2013 11:00

Sample ID: 13K0181-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.091	0.021	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Acrylonitrile	ND	0.0054	0.0023	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 12:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00091	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Benzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Bromobenzene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Bromochloromethane	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Bromodichloromethane	ND	0.0018	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Bromoform	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Bromomethane	ND	0.0091	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
2-Butanone (MEK)	ND	0.036	0.016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
tert-Butyl Alcohol (TBA)	ND	0.036	0.019	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 12:20	MFF
n-Butylbenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
sec-Butylbenzene	ND	0.0018	0.00091	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
tert-Butylbenzene	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00091	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Carbon Disulfide	ND	0.0054	0.0030	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Carbon Tetrachloride	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Chlorobenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Chlorodibromomethane	ND	0.00091	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Chloroethane	ND	0.018	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Chloroform	ND	0.0036	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Chloromethane	ND	0.0091	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
2-Chlorotoluene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
4-Chlorotoluene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0036	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2-Dibromoethane (EDB)	ND	0.00091	0.00091	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Dibromomethane	ND	0.0018	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2-Dichlorobenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,3-Dichlorobenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,4-Dichlorobenzene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.0036	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.018	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1-Dichloroethane	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2-Dichloroethane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1-Dichloroethylene	ND	0.0036	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
cis-1,2-Dichloroethylene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
trans-1,2-Dichloroethylene	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2-Dichloropropane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,3-Dichloropropane	ND	0.00091	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
2,2-Dichloropropane	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1-Dichloropropene	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
cis-1,3-Dichloropropene	ND	0.00091	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
trans-1,3-Dichloropropene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Diethyl Ether	ND	0.018	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 6-6.5 | Sampled: 11/5/2013 11:00

Sample ID: 13K0181-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00091	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,4-Dioxane	ND	0.091	0.052	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Ethylbenzene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Hexachlorobutadiene	ND	0.0018	0.00091	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
2-Hexanone (MBK)	ND	0.018	0.0099	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Isopropylbenzene (Cumene)	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0036	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Methylene Chloride	ND	0.018	0.0064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.018	0.0069	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Naphthalene	ND	0.0036	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
n-Propylbenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Styrene	ND	0.0018	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.00091	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Tetrachloroethylene	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Tetrahydrofuran	ND	0.0091	0.0020	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Toluene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2,3-Trichlorobenzene	ND	0.0018	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2,4-Trichlorobenzene	ND	0.0036	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,3,5-Trichlorobenzene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1,1-Trichloroethane	ND	0.0018	0.00091	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1,2-Trichloroethane	ND	0.0018	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Trichloroethylene	ND	0.0018	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0091	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2,3-Trichloropropane	ND	0.0018	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0091	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,2,4-Trimethylbenzene	ND	0.0018	0.00073	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
1,3,5-Trimethylbenzene	ND	0.0018	0.00054	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
Vinyl Chloride	ND	0.0091	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
m+p Xylene	ND	0.0036	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF
o-Xylene	ND	0.0018	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:20	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/7/13 12:20
Toluene-d8	99.6	70-130		11/7/13 12:20
4-Bromofluorobenzene	102	70-130		11/7/13 12:20

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 6-6.5 | Sampled: 11/5/2013 11:00

Sample ID: 13K0181-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Barium	77	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Beryllium	0.51	0.28	0.045	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:21	OP
Cadmium	0.36	0.28	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Calcium	1600	8.4	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Chromium	20	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Cobalt	8.5	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Copper	520	0.56	0.43	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Iron	16000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Lead	12	0.84	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:21	OP
Magnesium	4400	8.4	0.88	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:21	OP
Manganese	260	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Mercury	0.015	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:31	SAJ
Nickel	22	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:21	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Sodium	230	110	55	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 19:24	OP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Vanadium	30	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP
Zinc	42	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:12	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB405- 6-6.5 | Sampled: 11/5/2013 11:00

Sample ID: 13K0181-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB403- 1-1.5 | Sampled: 11/5/2013 11:20

Sample ID: 13K0181-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Acrylonitrile	ND	0.0067	0.0028	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 12:47	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Benzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Bromobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Bromochloromethane	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Bromodichloromethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Bromoform	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 12:47	MFF
n-Butylbenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
tert-Butylbenzene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Carbon Disulfide	ND	0.0067	0.0037	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Carbon Tetrachloride	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Chlorobenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Chlorodibromomethane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Chloroethane	ND	0.022	0.0017	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Chloroform	ND	0.0045	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
2-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
4-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Dibromomethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1-Dichloroethane	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2-Dichloroethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2-Dichloropropane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,3-Dichloropropane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
2,2-Dichloropropane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1-Dichloropropene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB403- 1-1.5 | Sampled: 11/5/2013 11:20

Sample ID: 13K0181-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Ethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Methylene Chloride	0.0092	0.022	0.0080	mg/Kg dry	1	J	SW-846 8260C	11/7/13	11/7/13 12:47	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0085	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Naphthalene	ND	0.0045	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
n-Propylbenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Styrene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Tetrachloroethylene	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Toluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Trichloroethylene	0.040	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF
o-Xylene	ND	0.0022	0.00079	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 12:47	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	108	70-130		11/7/13 12:47
Toluene-d8	98.4	70-130		11/7/13 12:47
4-Bromofluorobenzene	100	70-130		11/7/13 12:47

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB403- 1-1.5 | Sampled: 11/5/2013 11:20

Sample ID: 13K0181-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Arsenic	7.3	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Barium	75	3.0	0.37	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Beryllium	ND	0.30	0.048	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:25	OP
Cadmium	0.61	0.30	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Calcium	2100	9.0	1.6	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Chromium	15	0.60	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Cobalt	7.6	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Copper	61	0.60	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Iron	15000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Lead	13	0.90	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:25	OP
Magnesium	3400	9.0	0.94	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:25	OP
Manganese	200	0.60	0.19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Mercury	0.050	0.032	0.0020	mg/Kg dry	1		SW-846 7471B	11/8/13	11/11/13 12:45	SAJ
Nickel	14	0.60	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Potassium	580	120	21	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 12:25	OP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Sodium	170	120	58	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 19:50	OP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Vanadium	31	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP
Zinc	34	1.2	0.31	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:18	OP

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Field Sample #: BDSB403- 1-1.5 | Sampled: 11/5/2013 11:20

Sample ID: 13K0181-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.2		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB404- 1-1.5 | Sampled: 11/5/2013 11:35

Sample ID: 13K0181-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Acrylonitrile	ND	0.0065	0.0027	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 13:14	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Benzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Bromobenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Bromodichloromethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 13:14	MFF
n-Butylbenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
tert-Butylbenzene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Carbon Disulfide	ND	0.0065	0.0036	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Carbon Tetrachloride	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Chlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Chlorodibromomethane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Chloroform	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Chloromethane	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
2-Chlorotoluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
4-Chlorotoluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Dibromomethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1-Dichloroethane	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,3-Dichloropropane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
2,2-Dichloropropane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1-Dichloropropene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Diethyl Ether	ND	0.022	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF

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Date Received: 11/6/2013

Field Sample #: BDSB404- 1-1.5 | Sampled: 11/5/2013 11:35

Sample ID: 13K0181-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,4-Dioxane	ND	0.11	0.062	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Ethylbenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Methylene Chloride	ND	0.022	0.0077	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Naphthalene	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
n-Propylbenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Styrene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Toluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Trichloroethylene	0.0053	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
m+p Xylene	ND	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF
o-Xylene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:14	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/7/13 13:14
Toluene-d8	98.2	70-130		11/7/13 13:14
4-Bromofluorobenzene	101	70-130		11/7/13 13:14

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB404- 1-1.5 | Sampled: 11/5/2013 11:35

Sample ID: 13K0181-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	2.9	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Arsenic	110	2.9	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Barium	60	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Beryllium	ND	0.29	0.047	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:22	OP
Cadmium	1.6	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Calcium	1600	8.7	1.6	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Chromium	23	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Cobalt	8.2	2.9	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Copper	2900	0.58	0.44	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Iron	15000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Lead	14	0.87	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:22	OP
Magnesium	3300	8.7	0.91	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:22	OP
Manganese	220	0.58	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Mercury	0.0055	0.031	0.0020	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:46	SAJ
Nickel	1000	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:22	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Sodium	190	120	56	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 19:55	OP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Vanadium	24	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP
Zinc	890	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:23	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB404- 1-1.5 | Sampled: 11/5/2013 11:35

Sample ID: 13K0181-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.4		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406- 1-1.5 | Sampled: 11/5/2013 11:45

Sample ID: 13K0181-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Acrylonitrile	ND	0.0062	0.0026	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 13:41	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Benzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Bromobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Bromochloromethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Bromodichloromethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Bromoform	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Bromomethane	ND	0.010	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
2-Butanone (MEK)	ND	0.041	0.018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
tert-Butyl Alcohol (TBA)	ND	0.041	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 13:41	MFF
n-Butylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
sec-Butylbenzene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
tert-Butylbenzene	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Carbon Disulfide	ND	0.0062	0.0034	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Carbon Tetrachloride	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Chlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Chlorodibromomethane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Chloroethane	ND	0.021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Chloroform	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Chloromethane	ND	0.010	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
2-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
4-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Dibromomethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
trans-1,4-Dichloro-2-butene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1-Dichloroethane	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2-Dichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1-Dichloroethylene	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2-Dichloropropane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,3-Dichloropropane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
2,2-Dichloropropane	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1-Dichloropropene	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406- 1-1.5 | Sampled: 11/5/2013 11:45

Sample ID: 13K0181-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,4-Dioxane	ND	0.10	0.059	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Ethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Hexachlorobutadiene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0041	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Methylene Chloride	0.0097	0.021	0.0073	mg/Kg dry	1	J	SW-846 8260C	11/7/13	11/7/13 13:41	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0078	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Naphthalene	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
n-Propylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Styrene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Tetrachloroethylene	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Tetrahydrofuran	ND	0.010	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Toluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2,4-Trichlorobenzene	ND	0.0041	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Trichloroethylene	ND	0.0021	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00093	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
m+p Xylene	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF
o-Xylene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 13:41	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/7/13 13:41
Toluene-d8	99.2	70-130		11/7/13 13:41
4-Bromofluorobenzene	101	70-130		11/7/13 13:41

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406- 1-1.5 | Sampled: 11/5/2013 11:45

Sample ID: 13K0181-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6200	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Arsenic	1.4	2.7	0.99	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 23:29	OP
Barium	31	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:26	OP
Cadmium	0.36	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Calcium	2900	8.2	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Chromium	11	0.55	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Cobalt	7.0	2.7	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Copper	24	0.55	0.42	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Iron	14000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Lead	5.0	0.82	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:26	OP
Magnesium	3200	8.2	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:26	OP
Manganese	300	0.55	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Mercury	0.0032	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:48	SAJ
Nickel	11	0.55	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:26	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Sodium	100	110	53	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/13/13 19:59	OP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Vanadium	18	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP
Zinc	32	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:29	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406- 1-1.5 | Sampled: 11/5/2013 11:45

Sample ID: 13K0181-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.8		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406D- 1.1.5 | Sampled: 11/5/2013 11:50

Sample ID: 13K0181-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Acrylonitrile	ND	0.0064	0.0027	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 14:08	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Benzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Bromobenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Bromodichloromethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 14:08	MFF
n-Butylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
tert-Butylbenzene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Carbon Disulfide	ND	0.0064	0.0035	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Carbon Tetrachloride	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Chlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Chlorodibromomethane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Chloroform	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Chloromethane	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
2-Chlorotoluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
4-Chlorotoluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Dibromomethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1-Dichloroethane	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,3-Dichloropropane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
2,2-Dichloropropane	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1-Dichloropropene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406D- 1.1.5 | Sampled: 11/5/2013 11:50

Sample ID: 13K0181-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,4-Dioxane	ND	0.11	0.062	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Ethylbenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
2-Hexanone (MBK)	ND	0.021	0.012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Methylene Chloride	ND	0.021	0.0076	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0082	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Naphthalene	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
n-Propylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Styrene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Toluene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Trichloroethylene	ND	0.0021	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00086	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
m+p Xylene	ND	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF
o-Xylene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/7/13	11/7/13 14:08	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	108	70-130		11/7/13 14:08
Toluene-d8	98.5	70-130		11/7/13 14:08
4-Bromofluorobenzene	102	70-130		11/7/13 14:08

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406D- 1.1.5 | Sampled: 11/5/2013 11:50

Sample ID: 13K0181-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	2.7	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Antimony	ND	2.7	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Arsenic	ND	2.7	0.96	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Barium	33	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:31	OP
Cadmium	0.34	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Calcium	2800	8.0	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Chromium	10	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Cobalt	6.9	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Copper	22	0.53	0.41	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Iron	14000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Lead	5.3	0.80	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:31	OP
Magnesium	3200	8.0	0.84	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:31	OP
Manganese	360	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Mercury	0.0029	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/8/13	11/11/13 12:50	SAJ
Nickel	11	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Potassium	1100	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:31	OP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Sodium	100	110	52	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/13/13 20:03	OP
Thallium	ND	2.7	0.88	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Vanadium	18	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP
Zinc	35	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:34	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: BDSB406D- 1.1.5 | Sampled: 11/5/2013 11:50

Sample ID: 13K0181-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.4		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB305- 0-0.5 | Sampled: 11/5/2013 13:00

Sample ID: 13K0181-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.4	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Antimony	ND	2.4	1.9	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Arsenic	1.2	2.4	0.87	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 23:40	OP
Barium	41	2.4	0.30	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Beryllium	ND	0.24	0.039	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Cadmium	0.57	0.24	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Calcium	20000	7.2	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Chromium	11	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Cobalt	7.1	2.4	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Copper	30	0.48	0.37	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Iron	19000	2.4	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:36	OP
Lead	30	0.72	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:36	OP
Magnesium	13000	7.2	0.75	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:36	OP
Manganese	600	0.48	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Mercury	0.024	0.026	0.0016	mg/Kg dry	1	J	SW-846 7471B	11/7/13	11/8/13 10:28	SAJ
Nickel	17	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Potassium	800	96	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Selenium	ND	2.4	0.74	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:36	OP
Silver	ND	0.48	0.42	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Sodium	73	96	47	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/13/13 20:08	OP
Thallium	ND	2.4	0.80	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Vanadium	19	0.96	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP
Zinc	130	0.96	0.25	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:40	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB305- 0-0.5 | Sampled: 11/5/2013 13:00

Sample ID: 13K0181-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	95.5		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB304- 0-0.5 | Sampled: 11/5/2013 13:30

Sample ID: 13K0181-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Arsenic	1.5	2.5	0.88	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 23:45	OP
Barium	60	2.5	0.31	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Beryllium	ND	0.25	0.039	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Cadmium	0.45	0.25	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Calcium	2300	7.4	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Chromium	14	0.49	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Cobalt	7.6	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Copper	26	0.49	0.37	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Iron	15000	2.5	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Lead	14	0.74	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Magnesium	3800	7.4	0.77	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Manganese	270	0.49	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Mercury	0.020	0.026	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/7/13	11/8/13 10:30	SAJ
Nickel	15	0.49	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Potassium	590	98	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Selenium	ND	2.5	0.76	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Silver	ND	0.49	0.43	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Sodium	84	98	48	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/13/13 20:12	OP
Thallium	ND	2.5	0.81	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Vanadium	26	0.98	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP
Zinc	280	0.98	0.25	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 23:45	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB304- 0-0.5 | Sampled: 11/5/2013 13:30

Sample ID: 13K0181-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.7		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB304- 4-4.5 | Sampled: 11/5/2013 13:40

Sample ID: 13K0181-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Antimony	2.5	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Arsenic	ND	2.5	0.90	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Barium	230	2.5	0.31	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Beryllium	0.31	0.25	0.040	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:45	OP
Cadmium	0.21	0.25	0.15	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/9/13 0:10	OP
Calcium	4800	7.5	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Chromium	45	0.50	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Cobalt	24	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Copper	78	0.50	0.38	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Iron	12000	2.5	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Lead	1.8	0.75	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:45	OP
Magnesium	5400	7.5	0.78	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:45	OP
Manganese	110	0.50	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Mercury	ND	0.025	0.0016	mg/Kg dry	1		SW-846 7471B	11/7/13	11/8/13 10:31	SAJ
Nickel	75	0.50	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Potassium	2400	99	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Selenium	ND	2.5	0.77	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:45	OP
Silver	ND	0.50	0.44	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Sodium	330	99	48	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:16	OP
Thallium	1.3	2.5	0.82	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/9/13 0:10	OP
Vanadium	30	0.99	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP
Zinc	12	0.99	0.26	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:10	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB304- 4-4.5 | Sampled: 11/5/2013 13:40

Sample ID: 13K0181-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.7		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB302- 0-0.5 | Sampled: 11/5/2013 14:05

Sample ID: 13K0181-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Barium	66	2.8	0.34	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Beryllium	ND	0.28	0.044	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Cadmium	0.45	0.28	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Calcium	840	8.3	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Chromium	25	0.55	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Cobalt	14	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Copper	37	0.55	0.42	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Iron	19000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Lead	6.1	0.83	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Magnesium	4900	8.3	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Manganese	140	0.55	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Mercury	0.050	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/7/13	11/8/13 10:33	SAJ
Nickel	42	0.55	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Potassium	600	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Sodium	94	110	54	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/13/13 20:20	OP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Vanadium	48	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP
Zinc	65	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:15	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB302- 0-0.5 | Sampled: 11/5/2013 14:05

Sample ID: 13K0181-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.2		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB303- 1-1.5 | Sampled: 11/5/2013 14:30

Sample ID: 13K0181-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	29000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Barium	410	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:14	OP
Cadmium	0.69	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Calcium	2900	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Chromium	37	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Cobalt	36	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Copper	56	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Iron	60000	260	230	mg/Kg dry	100		SW-846 6010C	11/7/13	11/14/13 10:57	OP
Lead	9.9	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:14	OP
Magnesium	10000	7.9	0.83	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:14	OP
Manganese	420	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Mercury	0.053	0.027	0.0017	mg/Kg dry	1		SW-846 7471B	11/7/13	11/8/13 10:35	SAJ
Nickel	52	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Potassium	5600	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Selenium	ND	13	4.1	mg/Kg dry	5	DL-04	SW-846 6010C	11/7/13	11/14/13 10:52	OP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Sodium	780	110	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:24	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Vanadium	110	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP
Zinc	72	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:20	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB303- 1-1.5 | Sampled: 11/5/2013 14:30

Sample ID: 13K0181-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.6		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB301- 0-0.5 | Sampled: 11/5/2013 14:45

Sample ID: 13K0181-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	30000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Barium	350	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:18	OP
Cadmium	0.60	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Calcium	2800	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Chromium	68	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Cobalt	27	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Copper	74	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Iron	31000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:18	OP
Lead	14	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:18	OP
Magnesium	9800	7.9	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:18	OP
Manganese	220	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Mercury	0.044	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/7/13	11/8/13 10:36	SAJ
Nickel	59	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Potassium	4400	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Selenium	ND	5.3	1.6	mg/Kg dry	2	DL-04	SW-846 6010C	11/7/13	11/13/13 21:11	OP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Sodium	580	110	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:28	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Vanadium	97	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP
Zinc	66	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/9/13 0:24	OP

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Project Location: Cortland | Sample Description: | Work Order: 13K0181

Date Received: 11/6/2013

Field Sample #: RASB301- 0-0.5 | Sampled: 11/5/2013 14:45

Sample ID: 13K0181-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.2		% Wt	1		SM 2540G	11/12/13	11/13/13 14:15	MXG

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13K0181-01 [BDSB401- 1-1.5]	B084934	11/12/13
13K0181-02 [BDSB402- 1-1.5]	B084934	11/12/13
13K0181-04 [BDSB405- 1-1.5]	B084934	11/12/13
13K0181-05 [BDSB405- 6-6.5]	B084934	11/12/13
13K0181-06 [BDSB403- 1-1.5]	B084934	11/12/13
13K0181-07 [BDSB404- 1-1.5]	B084934	11/12/13
13K0181-08 [BDSB406- 1-1.5]	B084934	11/12/13
13K0181-09 [BDSB406D- 1.1.5]	B084934	11/12/13
13K0181-10 [RASB305- 0-0.5]	B084934	11/12/13
13K0181-11 [RASB304- 0-0.5]	B084934	11/12/13
13K0181-12 [RASB304- 4-4.5]	B084934	11/12/13
13K0181-13 [RASB302- 0-0.5]	B084934	11/12/13
13K0181-14 [RASB303- 1-1.5]	B084934	11/12/13
13K0181-15 [RASB301- 0-0.5]	B084934	11/12/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0181-01 [BDSB401- 1-1.5]	B084653	1.02	50.0	11/07/13
13K0181-02 [BDSB402- 1-1.5]	B084653	1.07	50.0	11/07/13
13K0181-04 [BDSB405- 1-1.5]	B084653	1.03	50.0	11/07/13
13K0181-05 [BDSB405- 6-6.5]	B084653	1.00	50.0	11/07/13
13K0181-06 [BDSB403- 1-1.5]	B084653	1.07	50.0	11/07/13
13K0181-07 [BDSB404- 1-1.5]	B084653	1.06	50.0	11/07/13
13K0181-08 [BDSB406- 1-1.5]	B084653	1.02	50.0	11/07/13
13K0181-09 [BDSB406D- 1.1.5]	B084653	1.03	50.0	11/07/13
13K0181-10 [RASB305- 0-0.5]	B084653	1.09	50.0	11/07/13
13K0181-11 [RASB304- 0-0.5]	B084653	1.08	50.0	11/07/13
13K0181-12 [RASB304- 4-4.5]	B084653	1.02	50.0	11/07/13
13K0181-13 [RASB302- 0-0.5]	B084653	1.00	50.0	11/07/13
13K0181-14 [RASB303- 1-1.5]	B084653	1.02	50.0	11/07/13
13K0181-15 [RASB301- 0-0.5]	B084653	1.05	50.0	11/07/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0181-04RE1 [BDSB405- 1-1.5]	B084964	1.01	50.0	11/12/13

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0181-03 [FB-1]	B084805	50.0	50.0	11/09/13

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0181-03 [FB-1]	B084603	6.00	6.00	11/07/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0181-10 [RASB305- 0-0.5]	B084671	0.611	50.0	11/07/13
13K0181-11 [RASB304- 0-0.5]	B084671	0.608	50.0	11/07/13
13K0181-12 [RASB304- 4-4.5]	B084671	0.602	50.0	11/07/13
13K0181-13 [RASB302- 0-0.5]	B084671	0.602	50.0	11/07/13
13K0181-14 [RASB303- 1-1.5]	B084671	0.610	50.0	11/07/13
13K0181-15 [RASB301- 0-0.5]	B084671	0.602	50.0	11/07/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0181-01 [BDSB401- 1-1.5]	B084766	0.608	50.0	11/08/13
13K0181-02 [BDSB402- 1-1.5]	B084766	0.604	50.0	11/08/13
13K0181-04 [BDSB405- 1-1.5]	B084766	0.603	50.0	11/08/13
13K0181-05 [BDSB405- 6-6.5]	B084766	0.603	50.0	11/08/13
13K0181-06 [BDSB403- 1-1.5]	B084766	0.609	50.0	11/08/13
13K0181-07 [BDSB404- 1-1.5]	B084766	0.601	50.0	11/08/13
13K0181-08 [BDSB406- 1-1.5]	B084766	0.604	50.0	11/08/13
13K0181-09 [BDSB406D- 1.1.5]	B084766	0.608	50.0	11/08/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0181-01 [BDSB401- 1-1.5]	B084614	5.10	10.0	11/07/13
13K0181-02 [BDSB402- 1-1.5]	B084614	4.70	10.0	11/07/13
13K0181-04 [BDSB405- 1-1.5]	B084614	5.10	10.0	11/07/13
13K0181-05 [BDSB405- 6-6.5]	B084614	6.20	10.0	11/07/13
13K0181-06 [BDSB403- 1-1.5]	B084614	5.70	10.0	11/07/13
13K0181-07 [BDSB404- 1-1.5]	B084614	5.70	10.0	11/07/13
13K0181-08 [BDSB406- 1-1.5]	B084614	5.40	10.0	11/07/13
13K0181-09 [BDSB406D- 1.1.5]	B084614	5.10	10.0	11/07/13

Prep Method: SW-846 5030B-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0181-03 [FB-1]	B084861	5	5.00	11/11/13

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084614 - SW-846 5035										
Blank (B084614-BLK1)				Prepared & Analyzed: 11/07/13						
Acetone	ND	0.10	mg/Kg wet							
Acrylonitrile	ND	0.0060	mg/Kg wet							V-05, V-16
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							V-16
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.020	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-16, V-05
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084614 - SW-846 5035											
Blank (B084614-BLK1)			Prepared & Analyzed: 11/07/13								
Methylene Chloride	ND	0.020	mg/Kg wet								
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet								
Naphthalene	ND	0.0040	mg/Kg wet								
n-Propylbenzene	ND	0.0020	mg/Kg wet								
Styrene	ND	0.0020	mg/Kg wet								
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								
Tetrachloroethylene	ND	0.0020	mg/Kg wet								
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-16	
Toluene	ND	0.0020	mg/Kg wet								
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet								
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								
Trichloroethylene	ND	0.0020	mg/Kg wet								
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet								
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								
Vinyl Chloride	ND	0.010	mg/Kg wet								
m+p Xylene	ND	0.0040	mg/Kg wet								
o-Xylene	ND	0.0020	mg/Kg wet								
Surrogate: 1,2-Dichloroethane-d4	*0.0508*		mg/Kg wet	0.0500		102	70-130				
Surrogate: Toluene-d8	*0.0490*		mg/Kg wet	0.0500		98.0	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0504*		mg/Kg wet	0.0500		101	70-130				
LCS (B084614-BS1)			Prepared & Analyzed: 11/07/13								
Acetone	0.210	0.10	mg/Kg wet	0.200		105	70-160				†
Acrylonitrile	0.0176	0.0060	mg/Kg wet	0.0200		88.2	70-130			V-05, V-16	
tert-Amyl Methyl Ether (TAME)	0.0190	0.0010	mg/Kg wet	0.0200		95.1	70-130				
Benzene	0.0187	0.0020	mg/Kg wet	0.0200		93.5	70-130				
Bromobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.4	70-130				
Bromochloromethane	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130				
Bromodichloromethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
Bromoform	0.0186	0.0020	mg/Kg wet	0.0200		93.0	70-130				
Bromomethane	0.0179	0.010	mg/Kg wet	0.0200		89.6	40-130			V-20	†
2-Butanone (MEK)	0.182	0.040	mg/Kg wet	0.200		90.8	70-160				†
tert-Butyl Alcohol (TBA)	0.150	0.040	mg/Kg wet	0.200		75.0	40-130			V-16	†
n-Butylbenzene	0.0211	0.0020	mg/Kg wet	0.0200		105	70-130				
sec-Butylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		101	70-130				
tert-Butylbenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.4	70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0193	0.0010	mg/Kg wet	0.0200		96.7	70-130				
Carbon Disulfide	0.0205	0.0060	mg/Kg wet	0.0200		102	70-130				
Carbon Tetrachloride	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130				
Chlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		96.9	70-130				
Chlorodibromomethane	0.0203	0.0010	mg/Kg wet	0.0200		101	70-130				
Chloroethane	0.0205	0.020	mg/Kg wet	0.0200		102	70-130				
Chloroform	0.0209	0.0040	mg/Kg wet	0.0200		104	70-130				
Chloromethane	0.0147	0.010	mg/Kg wet	0.0200		73.3	70-130				
2-Chlorotoluene	0.0195	0.0020	mg/Kg wet	0.0200		97.3	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084614 - SW-846 5035											
LCS (B084614-BS1)				Prepared & Analyzed: 11/07/13							
4-Chlorotoluene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0168	0.0040	mg/Kg wet	0.0200		84.0	70-130				
1,2-Dibromoethane (EDB)	0.0202	0.0010	mg/Kg wet	0.0200		101	70-130				
Dibromomethane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
1,2-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.6	70-130				
1,3-Dichlorobenzene	0.0189	0.0020	mg/Kg wet	0.0200		94.6	70-130				
1,4-Dichlorobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.5	70-130				
trans-1,4-Dichloro-2-butene	0.0183	0.0040	mg/Kg wet	0.0200		91.5	70-130				
Dichlorodifluoromethane (Freon 12)	0.0146	0.020	mg/Kg wet	0.0200		72.8	40-160			J	†
1,1-Dichloroethane	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
1,2-Dichloroethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130				
1,1-Dichloroethylene	0.0228	0.0040	mg/Kg wet	0.0200		114	70-130				
cis-1,2-Dichloroethylene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
trans-1,2-Dichloroethylene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
1,2-Dichloropropane	0.0188	0.0020	mg/Kg wet	0.0200		93.9	70-130				
1,3-Dichloropropane	0.0202	0.0010	mg/Kg wet	0.0200		101	70-130				
2,2-Dichloropropane	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
1,1-Dichloropropene	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130				
cis-1,3-Dichloropropene	0.0190	0.0010	mg/Kg wet	0.0200		95.0	70-130				
trans-1,3-Dichloropropene	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130				
Diethyl Ether	0.0199	0.020	mg/Kg wet	0.0200		99.4	70-130			J	
Diisopropyl Ether (DIPE)	0.0197	0.0010	mg/Kg wet	0.0200		98.3	70-130				
1,4-Dioxane	0.159	0.10	mg/Kg wet	0.200		79.6	40-160			V-05, V-16	†
Ethylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
Hexachlorobutadiene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-160				
2-Hexanone (MBK)	0.182	0.020	mg/Kg wet	0.200		91.0	70-160				†
Isopropylbenzene (Cumene)	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
p-Isopropyltoluene (p-Cymene)	0.0197	0.0020	mg/Kg wet	0.0200		98.4	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0205	0.0040	mg/Kg wet	0.0200		103	70-130				
Methylene Chloride	0.0213	0.020	mg/Kg wet	0.0200		107	40-160				†
4-Methyl-2-pentanone (MIBK)	0.173	0.020	mg/Kg wet	0.200		86.7	70-160				†
Naphthalene	0.0170	0.0040	mg/Kg wet	0.0200		85.0	40-130				†
n-Propylbenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130				
Styrene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
1,1,1,2-Tetrachloroethane	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
1,1,2,2-Tetrachloroethane	0.0193	0.0010	mg/Kg wet	0.0200		96.5	70-130				
Tetrachloroethylene	0.0213	0.0020	mg/Kg wet	0.0200		107	70-130				
Tetrahydrofuran	0.0175	0.010	mg/Kg wet	0.0200		87.7	70-130			V-16	
Toluene	0.0200	0.0020	mg/Kg wet	0.0200		99.9	70-130				
1,2,3-Trichlorobenzene	0.0188	0.0020	mg/Kg wet	0.0200		94.1	70-130				
1,2,4-Trichlorobenzene	0.0198	0.0040	mg/Kg wet	0.0200		99.2	70-130				
1,3,5-Trichlorobenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130				
1,1,1-Trichloroethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
1,1,2-Trichloroethane	0.0190	0.0020	mg/Kg wet	0.0200		94.8	70-130				
Trichloroethylene	0.0194	0.0020	mg/Kg wet	0.0200		97.1	70-130				
Trichlorofluoromethane (Freon 11)	0.0227	0.010	mg/Kg wet	0.0200		113	70-130				
1,2,3-Trichloropropane	0.0185	0.0020	mg/Kg wet	0.0200		92.4	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0234	0.010	mg/Kg wet	0.0200		117	70-130				
1,2,4-Trimethylbenzene	0.0198	0.0020	mg/Kg wet	0.0200		98.8	70-130				
1,3,5-Trimethylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
Vinyl Chloride	0.0159	0.010	mg/Kg wet	0.0200		79.6	40-130				†

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084614 - SW-846 5035											
LCS (B084614-BS1)				Prepared & Analyzed: 11/07/13							
m+p Xylene	0.0400	0.0040	mg/Kg wet	0.0400		100	70-130				
o-Xylene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0504*		mg/Kg wet	0.0500		101	70-130				
Surrogate: Toluene-d8	*0.0497*		mg/Kg wet	0.0500		99.4	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0506*		mg/Kg wet	0.0500		101	70-130				
LCS Dup (B084614-BSD1)				Prepared & Analyzed: 11/07/13							
Acetone	0.188	0.10	mg/Kg wet	0.200		93.9	70-160	11.1	25		†
Acrylonitrile	0.0176	0.0060	mg/Kg wet	0.0200		88.2	70-130	0.00	25	V-05, V-16	
tert-Amyl Methyl Ether (TAME)	0.0200	0.0010	mg/Kg wet	0.0200		99.9	70-130	4.92	25		
Benzene	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130	5.21	25		
Bromobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.5	70-130	5.37	25		
Bromochloromethane	0.0216	0.0020	mg/Kg wet	0.0200		108	70-130	5.23	25		
Bromodichloromethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	0.576	25		
Bromoform	0.0191	0.0020	mg/Kg wet	0.0200		95.4	70-130	2.55	25		
Bromomethane	0.0208	0.010	mg/Kg wet	0.0200		104	40-130	15.1	25	V-20	†
2-Butanone (MEK)	0.182	0.040	mg/Kg wet	0.200		90.8	70-160	0.0110	25		†
tert-Butyl Alcohol (TBA)	0.160	0.040	mg/Kg wet	0.200		80.1	40-130	6.60	25	V-16	†
n-Butylbenzene	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	0.945	25		
sec-Butylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	2.94	25		
tert-Butylbenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.4	70-160	2.07	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0199	0.0010	mg/Kg wet	0.0200		99.3	70-130	2.65	25		
Carbon Disulfide	0.0203	0.0060	mg/Kg wet	0.0200		102	70-130	0.588	25		
Carbon Tetrachloride	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130	2.92	25		
Chlorobenzene	0.0200	0.0020	mg/Kg wet	0.0200		99.9	70-130	3.05	25		
Chlorodibromomethane	0.0202	0.0010	mg/Kg wet	0.0200		101	70-130	0.297	25		
Chloroethane	0.0221	0.020	mg/Kg wet	0.0200		110	70-130	7.71	25		
Chloroform	0.0216	0.0040	mg/Kg wet	0.0200		108	70-130	3.57	25		
Chloromethane	0.0147	0.010	mg/Kg wet	0.0200		73.4	70-130	0.136	25		
2-Chlorotoluene	0.0199	0.0020	mg/Kg wet	0.0200		99.4	70-130	2.14	25		
4-Chlorotoluene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	3.43	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0177	0.0040	mg/Kg wet	0.0200		88.3	70-130	4.99	25		
1,2-Dibromoethane (EDB)	0.0208	0.0010	mg/Kg wet	0.0200		104	70-130	2.93	25		
Dibromomethane	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	2.80	25		
1,2-Dichlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130	3.92	25		
1,3-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.7	70-130	3.22	25		
1,4-Dichlorobenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.4	70-130	0.938	25		
trans-1,4-Dichloro-2-butene	0.0196	0.0040	mg/Kg wet	0.0200		98.2	70-130	7.06	25		
Dichlorodifluoromethane (Freon 12)	0.0144	0.020	mg/Kg wet	0.0200		72.0	40-160	1.10	25	J	†
1,1-Dichloroethane	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	2.66	25		
1,2-Dichloroethane	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130	2.83	25		
1,1-Dichloroethylene	0.0232	0.0040	mg/Kg wet	0.0200		116	70-130	1.39	25		
cis-1,2-Dichloroethylene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	4.28	25		
trans-1,2-Dichloroethylene	0.0211	0.0020	mg/Kg wet	0.0200		105	70-130	3.28	25		
1,2-Dichloropropane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.47	25		
1,3-Dichloropropane	0.0214	0.0010	mg/Kg wet	0.0200		107	70-130	5.76	25		
2,2-Dichloropropane	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	1.97	25		
1,1-Dichloropropene	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130	4.77	25		
cis-1,3-Dichloropropene	0.0192	0.0010	mg/Kg wet	0.0200		95.8	70-130	0.839	25		
trans-1,3-Dichloropropene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	4.92	25		
Diethyl Ether	0.0199	0.020	mg/Kg wet	0.0200		99.7	70-130	0.301	25	J	
Diisopropyl Ether (DIPE)	0.0203	0.0010	mg/Kg wet	0.0200		102	70-130	3.40	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084614 - SW-846 5035											
LCS Dup (B084614-BSD1)				Prepared & Analyzed: 11/07/13							
1,4-Dioxane	0.157	0.10	mg/Kg wet	0.200		78.4	40-160	1.52	50	V-16, V-05	† ‡
Ethylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	3.04	25		
Hexachlorobutadiene	0.0226	0.0020	mg/Kg wet	0.0200		113	70-160	0.712	25		
2-Hexanone (MBK)	0.181	0.020	mg/Kg wet	0.200		90.7	70-160	0.319	25		†
Isopropylbenzene (Cumene)	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	2.73	25		
p-Isopropyltoluene (p-Cymene)	0.0198	0.0020	mg/Kg wet	0.0200		99.0	70-130	0.608	25		
Methyl tert-Butyl Ether (MTBE)	0.0216	0.0040	mg/Kg wet	0.0200		108	70-130	5.13	25		
Methylene Chloride	0.0223	0.020	mg/Kg wet	0.0200		112	40-160	4.67	25		†
4-Methyl-2-pentanone (MIBK)	0.185	0.020	mg/Kg wet	0.200		92.4	70-160	6.33	25		†
Naphthalene	0.0169	0.0040	mg/Kg wet	0.0200		84.5	40-130	0.590	25		†
n-Propylbenzene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	3.55	25		
Styrene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	2.07	25		
1,1,1,2-Tetrachloroethane	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	1.57	25		
1,1,2,2-Tetrachloroethane	0.0210	0.0010	mg/Kg wet	0.0200		105	70-130	8.53	25		
Tetrachloroethylene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	0.564	25		
Tetrahydrofuran	0.0172	0.010	mg/Kg wet	0.0200		86.1	70-130	1.84	25	V-16	
Toluene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	3.06	25		
1,2,3-Trichlorobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.4	70-130	1.82	25		
1,2,4-Trichlorobenzene	0.0193	0.0040	mg/Kg wet	0.0200		96.3	70-130	2.97	25		
1,3,5-Trichlorobenzene	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	3.93	25		
1,1,1-Trichloroethane	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130	3.50	25		
1,1,2-Trichloroethane	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130	5.64	25		
Trichloroethylene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130	3.44	25		
Trichlorofluoromethane (Freon 11)	0.0231	0.010	mg/Kg wet	0.0200		116	70-130	1.92	25		
1,2,3-Trichloropropane	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130	9.58	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0238	0.010	mg/Kg wet	0.0200		119	70-130	1.61	25		
1,2,4-Trimethylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130	1.51	25		
1,3,5-Trimethylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	3.13	25		
Vinyl Chloride	0.0159	0.010	mg/Kg wet	0.0200		79.4	40-130	0.252	25		†
m+p Xylene	0.0414	0.0040	mg/Kg wet	0.0400		104	70-130	3.44	25		
o-Xylene	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130	2.47	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0507*		mg/Kg wet	0.0500		101	70-130				
Surrogate: Toluene-d8	*0.0499*		mg/Kg wet	0.0500		99.8	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0516*		mg/Kg wet	0.0500		103	70-130				
Batch B084861 - SW-846 5030B											
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	ND	50	µg/L								
Acrylonitrile	ND	5.0	µg/L								
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L								
Benzene	ND	1.0	µg/L								
Bromobenzene	ND	1.0	µg/L								
Bromochloromethane	ND	1.0	µg/L								
Bromodichloromethane	ND	0.50	µg/L								
Bromoform	ND	1.0	µg/L							R-05	
Bromomethane	ND	2.0	µg/L							R-05	
2-Butanone (MEK)	ND	20	µg/L								
tert-Butyl Alcohol (TBA)	ND	20	µg/L							R-05, V-16	
n-Butylbenzene	ND	1.0	µg/L								
sec-Butylbenzene	ND	1.0	µg/L								
tert-Butylbenzene	ND	1.0	µg/L								

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084861 - SW-846 5030B										
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13						
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	4.0	µg/L							
Carbon Tetrachloride	ND	5.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							R-05
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L							R-05
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Diethyl Ether	ND	2.0	µg/L							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L							
1,4-Dioxane	ND	50	µg/L							V-16
Ethylbenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	0.50	µg/L							
2-Hexanone (MBK)	ND	10	µg/L							
Isopropylbenzene (Cumene)	ND	1.0	µg/L							
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
Methylene Chloride	ND	5.0	µg/L							
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L							
Naphthalene	ND	2.0	µg/L							
n-Propylbenzene	ND	1.0	µg/L							
Styrene	ND	1.0	µg/L							
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L							
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L							
Tetrachloroethylene	ND	1.0	µg/L							
Tetrahydrofuran	ND	10	µg/L							
Toluene	ND	1.0	µg/L							
1,2,3-Trichlorobenzene	ND	5.0	µg/L							
1,2,4-Trichlorobenzene	ND	1.0	µg/L							
1,3,5-Trichlorobenzene	ND	1.0	µg/L							
1,1,1-Trichloroethane	ND	1.0	µg/L							

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13							
1,1,2-Trichloroethane	ND	1.0	µg/L								
Trichloroethylene	ND	1.0	µg/L								
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L								
1,2,3-Trichloropropane	ND	2.0	µg/L								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L								
1,2,4-Trimethylbenzene	ND	1.0	µg/L								
1,3,5-Trimethylbenzene	ND	1.0	µg/L								
Vinyl Chloride	ND	2.0	µg/L							R-05	
m+p Xylene	ND	2.0	µg/L								
o-Xylene	ND	1.0	µg/L								
Surrogate: 1,2-Dichloroethane-d4	*25.3*		µg/L	25.0		101	70-130				
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130				
Surrogate: 4-Bromofluorobenzene	*25.4*		µg/L	25.0		102	70-130				
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	90.7	50	µg/L	100		90.7	70-160				†
Acrylonitrile	10.9	5.0	µg/L	10.0		109	70-130				
tert-Amyl Methyl Ether (TAME)	11.1	0.50	µg/L	10.0		111	70-130				
Benzene	11.4	1.0	µg/L	10.0		114	70-130				
Bromobenzene	10.8	1.0	µg/L	10.0		108	70-130				
Bromochloromethane	11.8	1.0	µg/L	10.0		118	70-130				
Bromodichloromethane	10.4	0.50	µg/L	10.0		104	70-130				
Bromoform	9.61	1.0	µg/L	10.0		96.1	70-130			R-05	
Bromomethane	5.70	2.0	µg/L	10.0		57.0	40-160			R-05, V-20	†
2-Butanone (MEK)	101	20	µg/L	100		101	40-160				†
tert-Butyl Alcohol (TBA)	80.0	20	µg/L	100		80.0	40-160			R-05, V-16	†
n-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
sec-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
tert-Butylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
tert-Butyl Ethyl Ether (TBEE)	11.7	0.50	µg/L	10.0		117	70-130				
Carbon Disulfide	12.9	4.0	µg/L	10.0		129	70-130				
Carbon Tetrachloride	9.26	5.0	µg/L	10.0		92.6	70-130				
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130				
Chlorodibromomethane	9.84	0.50	µg/L	10.0		98.4	70-130				
Chloroethane	12.8	2.0	µg/L	10.0		128	70-130				
Chloroform	10.8	2.0	µg/L	10.0		108	70-130				
Chloromethane	11.6	2.0	µg/L	10.0		116	40-160			V-20	†
2-Chlorotoluene	11.2	1.0	µg/L	10.0		112	70-130				
4-Chlorotoluene	11.0	1.0	µg/L	10.0		110	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	9.41	5.0	µg/L	10.0		94.1	70-130			R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130				
Dibromomethane	10.2	1.0	µg/L	10.0		102	70-130				
1,2-Dichlorobenzene	11.6	1.0	µg/L	10.0		116	70-130				
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117	70-130				
1,4-Dichlorobenzene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,4-Dichloro-2-butene	7.28	2.0	µg/L	10.0		72.8	70-130			R-05	
Dichlorodifluoromethane (Freon 12)	6.29	2.0	µg/L	10.0		62.9	40-160				†
1,1-Dichloroethane	11.6	1.0	µg/L	10.0		116	70-130				
1,2-Dichloroethane	9.31	1.0	µg/L	10.0		93.1	70-130				
1,1-Dichloroethylene	11.1	1.0	µg/L	10.0		111	70-130				
cis-1,2-Dichloroethylene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,2-Dichloroethylene	11.3	1.0	µg/L	10.0		113	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13								
1,2-Dichloropropane	10.7	1.0	µg/L	10.0		107		70-130				
1,3-Dichloropropane	11.7	0.50	µg/L	10.0		117		70-130				
2,2-Dichloropropane	9.92	1.0	µg/L	10.0		99.2		40-130				†
1,1-Dichloropropene	11.4	2.0	µg/L	10.0		114		70-130				
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105		70-130				
trans-1,3-Dichloropropene	10.8	0.50	µg/L	10.0		108		70-130				
Diethyl Ether	10.3	2.0	µg/L	10.0		103		70-130				
Diisopropyl Ether (DIPE)	13.0	0.50	µg/L	10.0		130		70-130				
1,4-Dioxane	65.1	50	µg/L	100		65.1		40-130			V-16	†
Ethylbenzene	11.2	1.0	µg/L	10.0		112		70-130				
Hexachlorobutadiene	13.7	0.50	µg/L	10.0		**137**	*	70-130			L-07	
2-Hexanone (MBK)	95.4	10	µg/L	100		95.4		70-160				†
Isopropylbenzene (Cumene)	10.7	1.0	µg/L	10.0		107		70-130				
p-Isopropyltoluene (p-Cymene)	11.3	1.0	µg/L	10.0		113		70-130				
Methyl tert-Butyl Ether (MTBE)	11.5	1.0	µg/L	10.0		115		70-130				
Methylene Chloride	11.3	5.0	µg/L	10.0		113		70-130				
4-Methyl-2-pentanone (MIBK)	102	10	µg/L	100		102		70-160				†
Naphthalene	11.6	2.0	µg/L	10.0		116		40-130				†
n-Propylbenzene	11.0	1.0	µg/L	10.0		110		70-130				
Styrene	10.9	1.0	µg/L	10.0		109		70-130				
1,1,1,2-Tetrachloroethane	9.98	1.0	µg/L	10.0		99.8		70-130				
1,1,2,2-Tetrachloroethane	11.4	0.50	µg/L	10.0		114		70-130				
Tetrachloroethylene	11.2	1.0	µg/L	10.0		112		70-130				
Tetrahydrofuran	9.37	10	µg/L	10.0		93.7		70-130			J	
Toluene	10.8	1.0	µg/L	10.0		108		70-130				
1,2,3-Trichlorobenzene	12.2	5.0	µg/L	10.0		122		70-130				
1,2,4-Trichlorobenzene	12.4	1.0	µg/L	10.0		124		70-130				
1,3,5-Trichlorobenzene	12.7	1.0	µg/L	10.0		127		70-130				
1,1,1-Trichloroethane	9.17	1.0	µg/L	10.0		91.7		70-130				
1,1,2-Trichloroethane	10.3	1.0	µg/L	10.0		103		70-130				
Trichloroethylene	9.51	1.0	µg/L	10.0		95.1		70-130				
Trichlorofluoromethane (Freon 11)	9.36	2.0	µg/L	10.0		93.6		70-130				
1,2,3-Trichloropropane	11.1	2.0	µg/L	10.0		111		70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	11.3	1.0	µg/L	10.0		113		70-130				
1,2,4-Trimethylbenzene	10.9	1.0	µg/L	10.0		109		70-130				
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101		70-130				
Vinyl Chloride	9.74	2.0	µg/L	10.0		97.4		40-160			R-05	†
m+p Xylene	21.8	2.0	µg/L	20.0		109		70-130				
o-Xylene	10.9	1.0	µg/L	10.0		109		70-130				
Surrogate: 1,2-Dichloroethane-d4	*24.0*		µg/L	25.0		95.9		70-130				
Surrogate: Toluene-d8	*24.7*		µg/L	25.0		98.8		70-130				
Surrogate: 4-Bromofluorobenzene	*24.2*		µg/L	25.0		96.9		70-130				

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13								
Acetone	107	50	µg/L	100		107	70-160	16.7		25		†
Acrylonitrile	10.5	5.0	µg/L	10.0		105	70-130	3.36		25		
tert-Amyl Methyl Ether (TAME)	10.0	0.50	µg/L	10.0		100	70-130	9.67		25		
Benzene	9.82	1.0	µg/L	10.0		98.2	70-130	14.7		25		
Bromobenzene	10.3	1.0	µg/L	10.0		103	70-130	4.94		25		
Bromochloromethane	10.1	1.0	µg/L	10.0		101	70-130	15.4		25		
Bromodichloromethane	11.2	0.50	µg/L	10.0		112	70-130	7.97		25		
Bromoform	12.4	1.0	µg/L	10.0		124	70-130	**25.2**	*	25	R-05	
Bromomethane	9.01	2.0	µg/L	10.0		90.1	40-160	**45.0**	*	25	R-05, V-20	†
2-Butanone (MEK)	115	20	µg/L	100		115	40-160	13.2		25		†
tert-Butyl Alcohol (TBA)	111	20	µg/L	100		111	40-160	**32.3**	*	25	R-05, V-16	†
n-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	9.68		25		
sec-Butylbenzene	10.4	1.0	µg/L	10.0		104	70-130	9.82		25		
tert-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	8.47		25		
tert-Butyl Ethyl Ether (TBEE)	10.5	0.50	µg/L	10.0		105	70-130	10.9		25		
Carbon Disulfide	10.9	4.0	µg/L	10.0		109	70-130	16.2		25		
Carbon Tetrachloride	11.0	5.0	µg/L	10.0		110	70-130	16.9		25		
Chlorobenzene	10.3	1.0	µg/L	10.0		103	70-130	7.32		25		
Chlorodibromomethane	11.6	0.50	µg/L	10.0		116	70-130	16.5		25		
Chloroethane	11.4	2.0	µg/L	10.0		114	70-130	12.2		25		
Chloroform	10.5	2.0	µg/L	10.0		105	70-130	3.28		25		
Chloromethane	9.82	2.0	µg/L	10.0		98.2	40-160	17.0		25	V-20	†
2-Chlorotoluene	10.1	1.0	µg/L	10.0		101	70-130	10.3		25		
4-Chlorotoluene	10.2	1.0	µg/L	10.0		102	70-130	7.43		25		
1,2-Dibromo-3-chloropropane (DBCP)	12.4	5.0	µg/L	10.0		124	70-130	**27.7**	*	25	R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130	0.274		25		
Dibromomethane	10.8	1.0	µg/L	10.0		108	70-130	5.05		25		
1,2-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	12.3		25		
1,3-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	14.0		25		
1,4-Dichlorobenzene	10.7	1.0	µg/L	10.0		107	70-130	7.19		25		
trans-1,4-Dichloro-2-butene	9.44	2.0	µg/L	10.0		94.4	70-130	**25.8**	*	25	R-05	
Dichlorodifluoromethane (Freon 12)	6.69	2.0	µg/L	10.0		66.9	40-160	6.16		25		†
1,1-Dichloroethane	10.5	1.0	µg/L	10.0		105	70-130	10.3		25		
1,2-Dichloroethane	11.2	1.0	µg/L	10.0		112	70-130	18.7		25		
1,1-Dichloroethylene	10.1	1.0	µg/L	10.0		101	70-130	9.14		25		
cis-1,2-Dichloroethylene	10.6	1.0	µg/L	10.0		106	70-130	7.88		25		
trans-1,2-Dichloroethylene	10.5	1.0	µg/L	10.0		105	70-130	7.31		25		
1,2-Dichloropropane	10.4	1.0	µg/L	10.0		104	70-130	3.41		25		
1,3-Dichloropropane	11.0	0.50	µg/L	10.0		110	70-130	6.00		25		
2,2-Dichloropropane	11.1	1.0	µg/L	10.0		111	40-130	11.6		25		†
1,1-Dichloropropene	10.8	2.0	µg/L	10.0		108	70-130	5.67		25		
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130	0.476		25		
trans-1,3-Dichloropropene	11.6	0.50	µg/L	10.0		116	70-130	7.67		25		
Diethyl Ether	8.79	2.0	µg/L	10.0		87.9	70-130	15.4		25		
Diisopropyl Ether (DIPE)	10.4	0.50	µg/L	10.0		104	70-130	21.5		25		
1,4-Dioxane	88.1	50	µg/L	100		88.1	40-130	30.0		50	V-16	† ‡
Ethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	10.1		25		
Hexachlorobutadiene	11.2	0.50	µg/L	10.0		112	70-130	19.9		25		
2-Hexanone (MBK)	108	10	µg/L	100		108	70-160	12.7		25		†
Isopropylbenzene (Cumene)	10.2	1.0	µg/L	10.0		102	70-130	5.08		25		
p-Isopropyltoluene (p-Cymene)	10.4	1.0	µg/L	10.0		104	70-130	7.65		25		
Methyl tert-Butyl Ether (MTBE)	11.0	1.0	µg/L	10.0		110	70-130	4.36		25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13								
Methylene Chloride	12.9	5.0	µg/L	10.0		129	70-130	13.3		25		
4-Methyl-2-pentanone (MIBK)	108	10	µg/L	100		108	70-160	6.11		25		†
Naphthalene	11.3	2.0	µg/L	10.0		113	40-130	2.62		25		†
n-Propylbenzene	10.7	1.0	µg/L	10.0		107	70-130	2.31		25		
Styrene	10.6	1.0	µg/L	10.0		106	70-130	2.51		25		
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116	70-130	15.3		25		
1,1,2,2-Tetrachloroethane	11.1	0.50	µg/L	10.0		111	70-130	2.59		25		
Tetrachloroethylene	10.8	1.0	µg/L	10.0		108	70-130	3.99		25		
Tetrahydrofuran	9.87	10	µg/L	10.0		98.7	70-130	5.20		25	J	
Toluene	10.1	1.0	µg/L	10.0		101	70-130	6.80		25		
1,2,3-Trichlorobenzene	11.0	5.0	µg/L	10.0		110	70-130	10.4		25		
1,2,4-Trichlorobenzene	10.8	1.0	µg/L	10.0		108	70-130	13.4		25		
1,3,5-Trichlorobenzene	9.89	1.0	µg/L	10.0		98.9	70-130	25.0		25		
1,1,1-Trichloroethane	10.5	1.0	µg/L	10.0		105	70-130	13.5		25		
1,1,2-Trichloroethane	10.7	1.0	µg/L	10.0		107	70-130	3.61		25		
Trichloroethylene	10.2	1.0	µg/L	10.0		102	70-130	6.61		25		
Trichlorofluoromethane (Freon 11)	10.0	2.0	µg/L	10.0		100	70-130	6.71		25		
1,2,3-Trichloropropane	10.9	2.0	µg/L	10.0		109	70-130	1.81		25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	10.4	1.0	µg/L	10.0		104	70-130	8.50		25		
1,2,4-Trimethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	5.96		25		
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130	0.495		25		
Vinyl Chloride	7.50	2.0	µg/L	10.0		75.0	40-160	**26.0**	*	25	R-05	†
m+p Xylene	20.8	2.0	µg/L	20.0		104	70-130	4.50		25		
o-Xylene	10.4	1.0	µg/L	10.0		104	70-130	4.71		25		
Surrogate: 1,2-Dichloroethane-d4	*25.1*		µg/L	25.0		100	70-130					
Surrogate: Toluene-d8	*24.8*		µg/L	25.0		99.1	70-130					
Surrogate: 4-Bromofluorobenzene	*24.6*		µg/L	25.0		98.5	70-130					

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084603 - SW-846 7470A Prep										
Blank (B084603-BLK1)				Prepared & Analyzed: 11/07/13						
Mercury	ND	0.00010	mg/L							
LCS (B084603-BS1)				Prepared & Analyzed: 11/07/13						
Mercury	0.00196	0.00010	mg/L	0.00200		98.0	80-120			
LCS Dup (B084603-BSD1)				Prepared & Analyzed: 11/07/13						
Mercury	0.00203	0.00010	mg/L	0.00200		101	80-120	3.28	20	
Batch B084653 - SW-846 3050B										
Blank (B084653-BLK1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	1.5	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.82	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.50	1.0	mg/Kg wet							J
LCS (B084653-BS1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	8400	5.0	mg/Kg wet	8840		95.0	46.1-153.4			
Antimony	96.8	5.0	mg/Kg wet	88.2		110	8.2-218.9			
Arsenic	110	5.0	mg/Kg wet	99.6		110	83-117.6			
Barium	307	5.0	mg/Kg wet	310		99.1	83.2-117.5			
Beryllium	75.5	0.50	mg/Kg wet	72.3		104	83.9-116			
Cadmium	173	0.50	mg/Kg wet	182		94.9	83.1-116.9			
Calcium	6840	15	mg/Kg wet	6790		101	83.1-116.7			
Chromium	134	1.0	mg/Kg wet	136		98.9	81.6-117.6			
Cobalt	124	5.0	mg/Kg wet	128		97.2	84.7-115.3			
Copper	110	1.0	mg/Kg wet	102		107	83.8-116.1			
Iron	11600	5.0	mg/Kg wet	12600		91.8	50.8-149.6			
Lead	116	1.5	mg/Kg wet	115		101	82.4-117.8			
Magnesium	3070	15	mg/Kg wet	3010		102	75.4-124.2			
Manganese	326	1.0	mg/Kg wet	323		101	82.8-117.5			
Nickel	144	1.0	mg/Kg wet	153		94.2	84.4-115.6			
Potassium	2850	200	mg/Kg wet	2840		100	72.7-127.3			
Selenium	147	5.0	mg/Kg wet	150		97.8	80-120			
Silver	37.7	1.0	mg/Kg wet	40.4		93.3	66.2-133.8			
Sodium	2920	200	mg/Kg wet	2760		106	73.8-126.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B084653 - SW-846 3050B											
LCS (B084653-BS1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Thallium	170	5.0	mg/Kg wet	174		97.6	81.2-118.8				
Vanadium	100	2.0	mg/Kg wet	97.6		102	75.5-124				
Zinc	163	2.0	mg/Kg wet	161		102	81.9-117.6				
LCS Dup (B084653-BSD1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Aluminum	8860	5.0	mg/Kg wet	8840		100	46.1-153.4	5.38		30	
Antimony	94.4	5.0	mg/Kg wet	88.2		107	8.2-218.9	2.43		30	
Arsenic	109	5.0	mg/Kg wet	99.6		109	83-117.6	0.833		30	
Barium	300	5.0	mg/Kg wet	310		96.9	83.2-117.5	2.25		30	
Beryllium	74.9	0.50	mg/Kg wet	72.3		104	83.9-116	0.781		30	
Cadmium	172	0.50	mg/Kg wet	182		94.4	83.1-116.9	0.586		30	
Calcium	6760	15	mg/Kg wet	6790		99.6	83.1-116.7	1.08		30	
Chromium	134	1.0	mg/Kg wet	136		98.7	81.6-117.6	0.144		30	
Cobalt	125	5.0	mg/Kg wet	128		97.4	84.7-115.3	0.201		30	
Copper	109	1.0	mg/Kg wet	102		107	83.8-116.1	0.483		30	
Iron	12000	5.0	mg/Kg wet	12600		95.2	50.8-149.6	3.66		30	
Lead	115	1.5	mg/Kg wet	115		100	82.4-117.8	0.508		30	
Magnesium	3110	15	mg/Kg wet	3010		103	75.4-124.2	1.27		30	
Manganese	326	1.0	mg/Kg wet	323		101	82.8-117.5	0.0246		30	
Nickel	143	1.0	mg/Kg wet	153		93.7	84.4-115.6	0.537		30	
Potassium	2900	200	mg/Kg wet	2840		102	72.7-127.3	1.83		30	
Selenium	145	5.0	mg/Kg wet	150		96.3	80-120	1.53		30	
Silver	38.4	1.0	mg/Kg wet	40.4		95.1	66.2-133.8	1.88		30	
Sodium	2910	200	mg/Kg wet	2760		105	73.8-126.2	0.408		30	
Thallium	171	5.0	mg/Kg wet	174		98.4	81.2-118.8	0.879		30	
Vanadium	102	2.0	mg/Kg wet	97.6		104	75.5-124	1.55		30	
Zinc	166	2.0	mg/Kg wet	161		103	81.9-117.6	1.39		30	
Duplicate (B084653-DUP1)	**Source: 13K0181-04**			Prepared: 11/07/13 Analyzed: 11/08/13							
Aluminum	6130	2.7	mg/Kg dry		6310			2.79		35	
Antimony	ND	2.7	mg/Kg dry		ND			NC		35	
Arsenic	1.02	2.7	mg/Kg dry		1.83			**56.3**	*	35	R-04, J
Barium	52.0	2.7	mg/Kg dry		39.7			26.8		35	
Beryllium	0.354	0.27	mg/Kg dry		0.616			**54.1**	*	35	R-04
Cadmium	0.955	0.27	mg/Kg dry		0.755			23.3		35	
Calcium	1850	8.1	mg/Kg dry		1870			1.09		35	
Chromium	9.22	0.54	mg/Kg dry		9.33			1.15		35	
Cobalt	4.92	2.7	mg/Kg dry		5.52			11.4		35	
Copper	1840	0.54	mg/Kg dry		1200			**42.2**	*	35	R-02
Iron	13800	2.7	mg/Kg dry		22200			**46.7**	*	35	R-02
Lead	48.2	0.81	mg/Kg dry		39.2			20.6		35	
Magnesium	2880	8.1	mg/Kg dry		3000			3.89		35	
Manganese	179	0.54	mg/Kg dry		182			1.68		35	
Nickel	10.1	0.54	mg/Kg dry		10.8			7.56		35	
Potassium	1120	110	mg/Kg dry		1270			12.4		35	
Silver	ND	0.54	mg/Kg dry		ND			NC		35	
Sodium	78.9	110	mg/Kg dry		75.7			4.09		35	J
Thallium	ND	2.7	mg/Kg dry		ND			NC		35	
Vanadium	16.3	1.1	mg/Kg dry		17.1			4.49		35	
Zinc	519	1.1	mg/Kg dry		480			7.89		35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084653 - SW-846 3050B											
MRL Check (B084653-MRL1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Lead	0.795	0.74	mg/Kg wet	0.742		107		80-120			
Matrix Spike (B084653-MS1)		**Source: 13K0181-04**		Prepared: 11/07/13 Analyzed: 11/08/13							
Aluminum	6560	2.6	mg/Kg dry	106	6310	**239**	*	75-125			MS-19
Antimony	62.1	2.6	mg/Kg dry	106	ND	**58.8**	*	75-125			MS-07
Arsenic	110	2.6	mg/Kg dry	106	1.83	103		75-125			
Barium	143	2.6	mg/Kg dry	106	39.7	97.9		75-125			
Beryllium	106	0.26	mg/Kg dry	106	0.616	99.6		75-125			
Cadmium	101	0.26	mg/Kg dry	106	0.755	94.5		75-125			
Calcium	2040	7.9	mg/Kg dry	106	1870	**160**	*	75-125			MS-19
Chromium	112	0.53	mg/Kg dry	106	9.33	97.0		75-125			
Cobalt	105	2.6	mg/Kg dry	106	5.52	93.9		75-125			
Copper	1300	0.53	mg/Kg dry	106	1200	91.2		75-125			
Iron	14400	2.6	mg/Kg dry	106	22200	**-7340**	*	75-125			MS-19
Lead	138	0.79	mg/Kg dry	106	39.2	93.9		75-125			
Magnesium	3200	7.9	mg/Kg dry	106	3000	**196**	*	75-125			MS-19
Manganese	282	0.53	mg/Kg dry	106	182	94.8		75-125			
Nickel	106	0.53	mg/Kg dry	106	10.8	89.8		75-125			
Potassium	2180	110	mg/Kg dry	1060	1270	85.6		75-125			
Silver	100	0.53	mg/Kg dry	106	ND	94.7		75-125			
Sodium	212	110	mg/Kg dry	106	75.7	**129**	*	75-125			MS-11
Thallium	97.9	2.6	mg/Kg dry	106	ND	92.7		75-125			
Vanadium	122	1.1	mg/Kg dry	106	17.1	99.1		75-125			
Zinc	545	1.1	mg/Kg dry	106	480	**62.0**	*	75-125			MS-19
Batch B084671 - SW-846 7471											
Blank (B084671-BLK1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Mercury	ND	0.025	mg/Kg wet								
LCS (B084671-BS1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Mercury	3.83	0.33	mg/Kg wet	4.05		94.5		71.6-128.1			
LCS Dup (B084671-BSD1)				Prepared: 11/07/13 Analyzed: 11/08/13							
Mercury	4.19	0.33	mg/Kg wet	4.05		103		71.6-128.1	9.12	30	
Duplicate (B084671-DUP1)		**Source: 13K0181-10**		Prepared: 11/07/13 Analyzed: 11/08/13							
Mercury	0.0219	0.025	mg/Kg dry		0.0237				7.85	35	J
Matrix Spike (B084671-MS1)		**Source: 13K0181-10**		Prepared: 11/07/13 Analyzed: 11/08/13							
Mercury	0.187	0.025	mg/Kg dry	0.170	0.0237	95.9		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084766 - SW-846 7471										
Blank (B084766-BLK1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B084766-BS1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	4.26	0.33	mg/Kg wet	4.05		105	71.6-128.1			
LCS Dup (B084766-BSD1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	3.72	0.33	mg/Kg wet	4.05		91.8	71.6-128.1	13.5	30	
Batch B084805 - SW-846 3005A										
Blank (B084805-BLK1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	ND	0.050	mg/L							
Antimony	ND	0.050	mg/L							
Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0040	mg/L							
Cadmium	ND	0.0040	mg/L							
Calcium	ND	0.15	mg/L							
Chromium	ND	0.010	mg/L							
Cobalt	ND	0.050	mg/L							
Copper	ND	0.010	mg/L							
Iron	ND	0.050	mg/L							
Lead	ND	0.010	mg/L							
Magnesium	ND	0.15	mg/L							
Manganese	ND	0.010	mg/L							
Nickel	ND	0.010	mg/L							
Potassium	ND	2.0	mg/L							
Selenium	ND	0.050	mg/L							
Silver	ND	0.0050	mg/L							
Sodium	ND	2.0	mg/L							
Thallium	ND	0.050	mg/L							
Vanadium	ND	0.010	mg/L							
Zinc	ND	0.020	mg/L							
LCS (B084805-BS1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Silver	0.482	0.0050	mg/L	0.500		96.5	80-120			
LCS (B084805-BS2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	2.02	0.050	mg/L	2.00		101	80-120			
Antimony	2.06	0.050	mg/L	2.00		103	80-120			
Arsenic	1.98	0.010	mg/L	2.00		98.8	80-120			
Barium	1.99	0.050	mg/L	2.00		99.4	80-120			
Beryllium	2.01	0.0040	mg/L	2.00		100	80-120			
Cadmium	2.03	0.0040	mg/L	2.00		102	80-120			
Calcium	2.01	0.15	mg/L	2.00		100	80-120			
Chromium	2.02	0.010	mg/L	2.00		101	80-120			
Cobalt	2.01	0.050	mg/L	2.00		100	80-120			
Copper	2.02	0.010	mg/L	2.00		101	80-120			
Iron	2.02	0.050	mg/L	2.00		101	80-120			
Lead	1.84	0.010	mg/L	2.00		92.1	80-120			
Magnesium	2.08	0.15	mg/L	2.00		104	80-120			
Manganese	2.01	0.010	mg/L	2.00		101	80-120			
Nickel	1.97	0.010	mg/L	2.00		98.5	80-120			
Potassium	19.7	2.0	mg/L	20.0		98.7	80-120			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084805 - SW-846 3005A										
LCS (B084805-BS2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Selenium	2.08	0.050	mg/L	2.00		104	80-120			
Sodium	1.65	2.0	mg/L	2.00		82.7	80-120			J
Thallium	1.96	0.050	mg/L	2.00		98.2	80-120			
Vanadium	1.96	0.010	mg/L	2.00		98.1	80-120			
Zinc	1.98	0.020	mg/L	2.00		98.8	80-120			
LCS Dup (B084805-BSD1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Silver	0.482	0.0050	mg/L	0.500		96.3	80-120	0.109	20	
LCS Dup (B084805-BSD2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	2.00	0.050	mg/L	2.00		99.9	80-120	1.35	20	
Antimony	2.17	0.050	mg/L	2.00		108	80-120	5.13	20	
Arsenic	1.95	0.010	mg/L	2.00		97.6	80-120	1.18	20	
Barium	1.97	0.050	mg/L	2.00		98.5	80-120	0.892	20	
Beryllium	1.99	0.0040	mg/L	2.00		99.6	80-120	0.657	20	
Cadmium	2.00	0.0040	mg/L	2.00		99.9	80-120	1.62	20	
Calcium	2.00	0.15	mg/L	2.00		100	80-120	0.134	20	
Chromium	1.98	0.010	mg/L	2.00		99.2	80-120	1.79	20	
Cobalt	1.97	0.050	mg/L	2.00		98.6	80-120	1.71	20	
Copper	1.98	0.010	mg/L	2.00		99.2	80-120	1.97	20	
Iron	2.00	0.050	mg/L	2.00		100	80-120	0.770	20	
Lead	1.95	0.010	mg/L	2.00		97.4	80-120	5.54	20	
Magnesium	2.06	0.15	mg/L	2.00		103	80-120	0.862	20	
Manganese	1.99	0.010	mg/L	2.00		99.6	80-120	1.02	20	
Nickel	1.94	0.010	mg/L	2.00		96.9	80-120	1.57	20	
Potassium	19.6	2.0	mg/L	20.0		97.8	80-120	0.943	20	
Selenium	2.07	0.050	mg/L	2.00		103	80-120	0.697	20	
Sodium	1.73	2.0	mg/L	2.00		86.5	80-120	4.41	20	J
Thallium	1.93	0.050	mg/L	2.00		96.3	80-120	2.00	20	
Vanadium	1.94	0.010	mg/L	2.00		97.2	80-120	0.844	20	
Zinc	1.94	0.020	mg/L	2.00		97.1	80-120	1.74	20	
Batch B084964 - SW-846 3050B										
Blank (B084964-BLK1)				Prepared: 11/12/13 Analyzed: 11/14/13						
Selenium	ND	2.5	mg/Kg wet							
LCS (B084964-BS1)				Prepared: 11/12/13 Analyzed: 11/14/13						
Selenium	146	5.0	mg/Kg wet	150		97.5	80-120			
LCS Dup (B084964-BSD1)				Prepared: 11/12/13 Analyzed: 11/14/13						
Selenium	153	5.0	mg/Kg wet	150		102	80-120	4.22	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084964 - SW-846 3050B										
Duplicate (B084964-DUP1)	**Source: 13K0181-04RE1**			Prepared: 11/12/13 Analyzed: 11/14/13						
Selenium	234	2.6	mg/Kg dry		224			4.55	35	
Matrix Spike (B084964-MS1)	**Source: 13K0181-04RE1**			Prepared: 11/12/13 Analyzed: 11/14/13						
Selenium	253	2.7	mg/Kg dry	26.7	224	107	75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084934 - % Solids										
Duplicate (B084934-DUP1)	**Source: 13K0181-14**			Prepared: 11/12/13 Analyzed: 11/13/13						
% Solids	91.8		% Wt		92.6			0.868	20	
Duplicate (B084934-DUP2)	**Source: 13K0181-15**			Prepared: 11/12/13 Analyzed: 11/13/13						
% Solids	91.2		% Wt		90.2			1.10	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-11	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
R-04	Duplicate relative percent difference (RPD) is a less useful indicator of sample precision for sample results that are <5 times the reporting limit (RL).
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-16	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 6010C in Water	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,ME,NC,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,RI
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,NC,ME,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7470A in Water	

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 8260C in Product/Solid	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Product/Solid	
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
1,2-Dichloroethane-d4	VA
Toluene-d8	VA
4-Bromofluorobenzene	VA
Pentafluorobenzene	VA
1,4-Difluorobenzene	VA
Chlorobenzene-d5	VA
1,4-Dichlorobenzene-d4	VA
SW-846 8260C in Soil	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
1,4-Dioxane	NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8260C in Water	
Acetone	CT,NY,ME,NH,VA,NJ
Acrylonitrile	CT,NY,ME,NH,VA,NJ
tert-Amyl Methyl Ether (TAME)	NY,ME,NH,VA,NJ
Benzene	CT,NY,ME,NH,VA,NJ
Bromochloromethane	NY,ME,NH,VA,NJ
Bromodichloromethane	CT,NY,ME,NH,VA,NJ
Bromoform	CT,NY,ME,NH,VA,NJ
Bromomethane	CT,NY,ME,NH,VA,NJ
2-Butanone (MEK)	CT,NY,ME,NH,VA,NJ
tert-Butyl Alcohol (TBA)	NY,ME,NH,VA,NJ
n-Butylbenzene	NY,ME,VA,NJ
sec-Butylbenzene	NY,ME,VA,NJ
tert-Butylbenzene	NY,ME,VA,NJ
tert-Butyl Ethyl Ether (TBEE)	NY,ME,NH,VA,NJ
Carbon Disulfide	CT,NY,ME,NH,VA,NJ
Carbon Tetrachloride	CT,NY,ME,NH,VA,NJ
Chlorobenzene	CT,NY,ME,NH,VA,NJ
Chlorodibromomethane	CT,NY,ME,NH,VA,NJ
Chloroethane	CT,NY,ME,NH,VA,NJ
Chloroform	CT,NY,ME,NH,VA,NJ
Chloromethane	CT,NY,ME,NH,VA,NJ
2-Chlorotoluene	NY,ME,NH,VA,NJ
4-Chlorotoluene	NY,ME,NH,VA,NJ
Dibromomethane	NY,ME,NH,VA,NJ
1,2-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,4-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
trans-1,4-Dichloro-2-butene	NY,ME,NH,VA,NJ
Dichlorodifluoromethane (Freon 12)	NY,ME,NH,VA,NJ
1,1-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,2-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,1-Dichloroethylene	CT,NY,ME,NH,VA,NJ
cis-1,2-Dichloroethylene	NY,ME,NJ
trans-1,2-Dichloroethylene	CT,NY,ME,NH,VA,NJ
1,2-Dichloropropane	CT,NY,ME,NH,VA,NJ
1,3-Dichloropropane	NY,ME,VA,NJ
2,2-Dichloropropane	NY,ME,NH,VA,NJ
1,1-Dichloropropene	NY,ME,NH,VA,NJ
cis-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
trans-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
Diisopropyl Ether (DIPE)	NY,ME,NH,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Water	
Ethylbenzene	CT,NY,ME,NH,VA,NJ
Hexachlorobutadiene	CT,NY,ME,NH,VA,NJ
2-Hexanone (MBK)	CT,NY,ME,NH,VA,NJ
Isopropylbenzene (Cumene)	NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	CT,NY,ME,NH,VA,NJ
Methyl tert-Butyl Ether (MTBE)	CT,NY,ME,NH,VA,NJ
Methylene Chloride	CT,NY,ME,NH,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NY,ME,NH,VA,NJ
Naphthalene	NY,ME,NH,VA,NJ
n-Propylbenzene	CT,NY,ME,NH,VA,NJ
Styrene	CT,NY,ME,NH,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
Tetrachloroethylene	CT,NY,ME,NH,VA,NJ
Toluene	CT,NY,ME,NH,VA,NJ
1,2,3-Trichlorobenzene	NY,ME,NH,VA,NJ
1,2,4-Trichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NY,ME,NH,VA,NJ
1,1,2-Trichloroethane	CT,NY,ME,NH,VA,NJ
Trichloroethylene	CT,NY,ME,NH,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NY,ME,NH,VA,NJ
1,2,3-Trichloropropane	NY,ME,NH,VA,NJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	NY,VA,NJ
1,2,4-Trimethylbenzene	NY,ME,VA,NJ
1,3,5-Trimethylbenzene	NY,ME,VA,NJ
Vinyl Chloride	CT,NY,ME,NH,VA,NJ
m+p Xylene	CT,NY,ME,NH,VA
o-Xylene	CT,NY,ME,NH,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

13K0181

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: 1 Blue hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: Cortlandt
Sampled By: MVP

Telephone: 845 735-3300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax # 845 735-7466
Email: Jiss.Philip@HDRINC.com
Format: ○ PDF ○ EXCEL ○ GIS ☑ OTHER NYSE DD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	VOCs	TAL Metals	% Solids
01	BDSB401-1-1.5	11.5.13	~~11.5.13~~ 0800		X	S		3	1	1
02	BDSB402-1-1.5	11.5.13	0815		X	S		3	1	1
03	FB-1	11.5.13	0905		X	W		3	1	
04	BDSB405-1-1.5	11.5.13	0930		X	S		3	1	1
05	BDSB405-6-6.5	11.5.13	1100		X	S		3	1	1
06	BDSB403-1-1.5	11.5.13	1120		X	S		3	1	1
07	BDSB404-1-1.5	11.5.13	1135		X	S		3	1	1
08	BDSB406-1-1.5	11.5.13	1145		X	S		3	1	1
09	BDSB406D-1-1.5	11.5.13	1150		X	S		3	1	1
10	RASB305-0-0.5	11.5.13	1300		X	S			1	

# of Containers	21	10	9
** Preservation	WE	A/N	A
***Container Code	V/G	A/P	A

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: CK w/ Amita Patel @ HDR re: NYSEDD 845 735 8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	11.5.13 1630
Received by: (signature) Kenneth Butz	Date/Time: 3.5 11/6/13 1009
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other STD

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

13K0181

Rev 04.05.12

Company Name: HDR
Telephone: 845 735 8300
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Project #
Client PO#
Attention: Jiss Philip
Project Location: MAGNA Metals
Sampled By: MVP

DATA DELIVERY (check all that apply)
○ FAX ⊘ EMAIL ○ WEBSITE
Fax #
Email: Jiss.Philip@HDRinc.com
Format: ○ PDF ○ EXCEL ○ GIS ⊘ OTHER NYSEDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL metals	# of Containers	** Preservation	***Container Code
11	RASB304-0-0.5	11.5.13	1330		X	S		1			
12	RASB 304-4-4.5	11.5.13	1340		X	S		1			
13	RASB302-0-0.5	11.5.13	1405		X	S		1			
14	RASD 303-1-1.5	11.5.13	1420		X	S		1			
15	RASB301-0-0.5	11.5.13	1445		X	S		1			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments: CK w/ Amita Patel @ HDR re: NYSEDD Format 845 735 8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	11.5.13 1630
Received by: (signature)	Date/Time:
3.5°	11/6/13 1009
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ‡
☐ 7-Day
☐ 10-Day
☒ Other STD
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

‡ TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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United States

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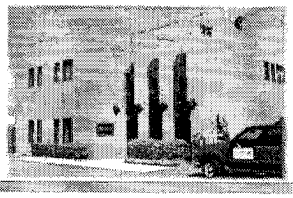
con-test ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: KOB HRT HDR RECEIVED BY: KOB DATE: 11-6-13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** ~~Yes~~ (No)
If not, explain: See Lab comments

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 3.5°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** (Yes) No ~~N/A~~ KOB _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	22
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic	1	SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below	3	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore	24	Other	

Laboratory Comments:

40 mL vials: # HCl 3 # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: ICOB **Date/Time:** 11-6-13 1009

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

November 15, 2013

Jiss Philip
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland - Magna
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13K0259

Enclosed are results of analyses for samples received by the laboratory on November 7, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/15/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0259

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland - Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB113 0-0.5	13K0259-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB113 9-9.5	13K0259-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-2	13K0259-03	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
LPSB111 0-0.5	13K0259-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB111 6.5-7	13K0259-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB110 0-0.5	13K0259-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB110 5.5-6	13K0259-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB108 0-0.5	13K0259-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB108 4.5-5	13K0259-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB109 0-0.5	13K0259-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/15/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0259

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland - Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB109 9-9.5	13K0259-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB109 14-14.5	13K0259-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 0-0.5	13K0259-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 10-10.5	13K0259-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 13.5-14	13K0259-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SW-846 6010C

Qualifications:

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Selenium

13K0259-02[LPSB113 9-9.5]

SW-846 8260C

Qualifications:

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

Acetone

13K0259-01[LPSB113 0-0.5], 13K0259-02[LPSB113 9-9.5], 13K0259-04[LPSB111 0-0.5], 13K0259-05[LPSB111 6.5-7], 13K0259-06[LPSB110 0-0.5], 13K0259-07[LPSB110 5.5-6], 13K0259-08[LPSB108 0-0.5], 13K0259-09[LPSB108 4.5-5], 13K0259-10[LPSB109 0-0.5], 13K0259-11[LPSB109 9-9.5], 13K0259-12[LPSB109 14-14.5], 13K0259-13[LPSB107 0-0.5], B084721-BLK1, B084721-BS1, B084721-BSD1, B084721-MS1

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Acetone, Hexachlorobutadiene

B084846-BS1, B084861-BS1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Chlorotoluene, 4-Chlorotoluene, Bromobenzene, Chlorobenzene, Hexachlorobutadiene, Isopropylbenzene (Cumene), Naphthalene, n-Butylbenzene, n-Propylbenzene, p-Isopropyltoluene (p-Cymene), sec-Butylbenzene, tert-Butylbenzene

13K0259-01[LPSB113 0-0.5], B084721-MS1

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Acetone

13K0259-01[LPSB113 0-0.5], B084721-MS1

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:

1,2-Dibromo-3-chloropropane (DBCP), Bromoform, Bromomethane, tert-Butyl Alcohol (TBA), trans-1,4-Dichloro-2-butene, Vinyl Chloride

13K0259-03[FB-2], B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Tetrahydrofuran

13K0259-01[LPSB113 0-0.5], 13K0259-02[LPSB113 9-9.5], 13K0259-04[LPSB111 0-0.5], 13K0259-05[LPSB111 6.5-7], 13K0259-06[LPSB110 0-0.5], 13K0259-07[LPSB110 5.5-6], 13K0259-08[LPSB108 0-0.5], 13K0259-09[LPSB108 4.5-5], 13K0259-10[LPSB109 0-0.5], 13K0259-11[LPSB109 9-9.5], 13K0259-12[LPSB109 14-14.5], 13K0259-13[LPSB107 0-0.5], 13K0259-14[LPSB107 10-10.5], 13K0259-15[LPSB107 13.5-14], B084721-BLK1, B084721-BS1, B084721-BSD1, B084721-MS1, B084846-BLK1, B084846-BS1, B084846-BSD1

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Acrylonitrile, tert-Butyl Alcohol (TBA), Tetrahydrofuran

13K0259-01[LPSB113 0-0.5], 13K0259-02[LPSB113 9-9.5], 13K0259-03[FB-2], 13K0259-04[LPSB111 0-0.5], 13K0259-05[LPSB111 6.5-7], 13K0259-06[LPSB110 0-0.5], 13K0259-07[LPSB110 5.5-6], 13K0259-08[LPSB108 0-0.5], 13K0259-09[LPSB108 4.5-5], 13K0259-10[LPSB109 0-0.5], 13K0259-11[LPSB109 9-9.5], 13K0259-12[LPSB109 14-14.5], 13K0259-13[LPSB107 0-0.5], 13K0259-14[LPSB107 10-10.5], 13K0259-15[LPSB107 13.5-14], B084721-BLK1, B084721-BS1, B084721-BSD1, B084721-MS1, B084846-BLK1, B084846-BS1, B084846-BSD1, B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Acetone, Bromomethane, Chloromethane

B084721-BS1, B084721-BSD1, B084846-BS1, B084846-BSD1, B084861-BS1, B084861-BSD1, S004934-CCV1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 0-0.5 | Sampled: 11/6/2013 07:15

Sample ID: 13K0259-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1	L-04, MS-08	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Acrylonitrile	ND	0.0063	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Benzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Bromobenzene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Bromodichloromethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Bromomethane	ND	0.010	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
2-Butanone (MEK)	ND	0.042	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
tert-Butyl Alcohol (TBA)	ND	0.042	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
n-Butylbenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
sec-Butylbenzene	ND	0.0021	0.0010	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
tert-Butylbenzene	ND	0.0021	0.00094	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Carbon Disulfide	ND	0.0063	0.0034	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Carbon Tetrachloride	ND	0.0021	0.00083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Chlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Chlorodibromomethane	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Chloroform	ND	0.0042	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Chloromethane	ND	0.010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
2-Chlorotoluene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
4-Chlorotoluene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0042	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Dibromomethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
trans-1,4-Dichloro-2-butene	ND	0.0042	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1-Dichloroethane	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1-Dichloroethylene	ND	0.0042	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,3-Dichloropropane	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
2,2-Dichloropropane	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1-Dichloropropene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 0-0.5 | Sampled: 11/6/2013 07:15

Sample ID: 13K0259-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,4-Dioxane	ND	0.10	0.060	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Ethylbenzene	ND	0.0021	0.00083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Hexachlorobutadiene	ND	0.0021	0.0010	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0042	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Methylene Chloride	ND	0.021	0.0074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Naphthalene	ND	0.0042	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
n-Propylbenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Styrene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Tetrahydrofuran	ND	0.010	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Toluene	ND	0.0021	0.00083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00063	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2,4-Trichlorobenzene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Trichloroethylene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00083	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00063	mg/Kg dry	1	MS-07	SW-846 8260C	11/8/13	11/8/13 10:38	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
m+p Xylene	ND	0.0042	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF
o-Xylene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 10:38	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/8/13 10:38
Toluene-d8	98.6	70-130		11/8/13 10:38
4-Bromofluorobenzene	100	70-130		11/8/13 10:38

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 0-0.5 | Sampled: 11/6/2013 07:15

Sample ID: 13K0259-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7200	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Arsenic	3.2	2.7	0.99	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Barium	40	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:28	OP
Cadmium	0.48	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Calcium	1900	8.2	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Chromium	14	0.55	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Cobalt	4.4	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Copper	66	0.55	0.42	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:28	OP
Iron	10000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Lead	16	0.82	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:28	OP
Magnesium	2200	8.2	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Manganese	100	0.55	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Mercury	0.016	0.029	0.0019	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:28	SAJ
Nickel	13	0.55	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Potassium	550	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:28	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Sodium	100	110	53	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/14/13 15:51	OP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Vanadium	19	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:04	OP
Zinc	68	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:28	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 0-0.5 | Sampled: 11/6/2013 07:15

Sample ID: 13K0259-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.1		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 9-9.5 | Sampled: 11/6/2013 08:15

Sample ID: 13K0259-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Acrylonitrile	ND	0.0061	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 11:05	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Benzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Bromobenzene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Bromochloromethane	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Bromodichloromethane	ND	0.0020	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Bromoform	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Bromomethane	ND	0.010	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
2-Butanone (MEK)	ND	0.040	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
tert-Butyl Alcohol (TBA)	ND	0.040	0.021	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 11:05	MFF
n-Butylbenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
sec-Butylbenzene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
tert-Butylbenzene	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Carbon Disulfide	ND	0.0061	0.0033	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Carbon Tetrachloride	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Chlorobenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Chlorodibromomethane	ND	0.0010	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Chloroethane	ND	0.020	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Chloroform	ND	0.0040	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Chloromethane	ND	0.010	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
2-Chlorotoluene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
4-Chlorotoluene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Dibromomethane	ND	0.0020	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2-Dichlorobenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,3-Dichlorobenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,4-Dichlorobenzene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
trans-1,4-Dichloro-2-butene	ND	0.0040	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1-Dichloroethane	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2-Dichloroethane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1-Dichloroethylene	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
cis-1,2-Dichloroethylene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
trans-1,2-Dichloroethylene	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2-Dichloropropane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,3-Dichloropropane	ND	0.0010	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
2,2-Dichloropropane	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1-Dichloropropene	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
trans-1,3-Dichloropropene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Diethyl Ether	ND	0.020	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 9-9.5 | Sampled: 11/6/2013 08:15

Sample ID: 13K0259-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,4-Dioxane	ND	0.10	0.058	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Ethylbenzene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Hexachlorobutadiene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
2-Hexanone (MBK)	ND	0.020	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Isopropylbenzene (Cumene)	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Methylene Chloride	ND	0.020	0.0072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.020	0.0077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Naphthalene	ND	0.0040	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
n-Propylbenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Styrene	ND	0.0020	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1,1,2-Tetrachloroethane	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Tetrachloroethylene	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Tetrahydrofuran	ND	0.010	0.0022	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Toluene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2,3-Trichlorobenzene	ND	0.0020	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2,4-Trichlorobenzene	ND	0.0040	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,3,5-Trichlorobenzene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1,1-Trichloroethane	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1,2-Trichloroethane	ND	0.0020	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Trichloroethylene	ND	0.0020	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2,3-Trichloropropane	ND	0.0020	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,2,4-Trimethylbenzene	ND	0.0020	0.00081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
1,3,5-Trimethylbenzene	ND	0.0020	0.00061	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
m+p Xylene	ND	0.0040	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF
o-Xylene	ND	0.0020	0.00071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 11:05	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/8/13 11:05
Toluene-d8	100	70-130		11/8/13 11:05
4-Bromofluorobenzene	100	70-130		11/8/13 11:05

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 9-9.5 | Sampled: 11/6/2013 08:15

Sample ID: 13K0259-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:57	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Arsenic	25	2.6	0.94	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:57	OP
Barium	62	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Beryllium	0.64	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Cadmium	1.1	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Calcium	3900	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:57	OP
Chromium	130	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Cobalt	56	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Copper	520	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Iron	58000	260	220	mg/Kg dry	100		SW-846 6010C	11/7/13	11/14/13 10:06	OP
Lead	6.5	0.78	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Magnesium	40000	78	8.1	mg/Kg dry	10		SW-846 6010C	11/7/13	11/14/13 12:58	OP
Manganese	500	0.52	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Mercury	ND	0.026	0.0017	mg/Kg dry	1		SW-846 7471B	11/9/13	11/11/13 13:29	SAJ
Nickel	83	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Potassium	410	100	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 12:54	OP
Selenium	ND	13	4.0	mg/Kg dry	5	DL-04	SW-846 6010C	11/7/13	11/14/13 10:15	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Sodium	1200	100	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:57	OP
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/13/13 20:57	OP
Vanadium	74	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP
Zinc	41	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:46	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB113 9-9.5 | Sampled: 11/6/2013 08:15

Sample ID: 13K0259-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.5		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: FB-2 | Sampled: 11/6/2013 08:50

Sample ID: 13K0259-03

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	8.4	50	4.7	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Acrylonitrile	ND	5.0	0.58	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Bromobenzene	ND	1.0	0.044	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Bromodichloromethane	ND	0.50	0.088	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Bromoform	ND	1.0	0.21	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Bromomethane	ND	2.0	0.94	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
2-Butanone (MEK)	ND	20	2.4	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
tert-Butyl Alcohol (TBA)	ND	20	2.2	µg/L	1	R-05, V-16	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
n-Butylbenzene	ND	1.0	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
sec-Butylbenzene	ND	1.0	0.084	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
tert-Butylbenzene	ND	1.0	0.096	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Carbon Disulfide	ND	4.0	1.0	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Carbon Tetrachloride	ND	5.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Chlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Chlorodibromomethane	ND	0.50	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Chloroethane	ND	2.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Chloroform	ND	2.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
2-Chlorotoluene	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
4-Chlorotoluene	ND	1.0	0.074	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	0.34	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Dibromomethane	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2-Dichlorobenzene	ND	1.0	0.076	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,3-Dichlorobenzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,4-Dichlorobenzene	ND	1.0	0.046	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
trans-1,4-Dichloro-2-butene	ND	2.0	0.12	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2-Dichloropropane	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,3-Dichloropropane	ND	0.50	0.099	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
2,2-Dichloropropane	ND	1.0	0.072	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1-Dichloropropene	ND	2.0	0.13	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
cis-1,3-Dichloropropene	ND	0.50	0.062	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
trans-1,3-Dichloropropene	ND	0.50	0.056	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Diethyl Ether	0.32	2.0	0.22	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 16:54	EEH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: FB-2 | Sampled: 11/6/2013 08:50

Sample ID: 13K0259-03

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Ethylbenzene	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
2-Hexanone (MBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Isopropylbenzene (Cumene)	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Methylene Chloride	ND	5.0	3.2	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
n-Propylbenzene	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Styrene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1,2,2-Tetrachloroethane	ND	0.50	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Tetrachloroethylene	ND	1.0	0.080	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Tetrahydrofuran	ND	10	1.1	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Toluene	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2,3-Trichlorobenzene	ND	5.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2,4-Trichlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,3,5-Trichlorobenzene	ND	1.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Trichloroethylene	ND	1.0	0.077	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2,3-Trichloropropane	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
Vinyl Chloride	ND	2.0	0.13	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 16:54	EEH
m+p Xylene	ND	2.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH
o-Xylene	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 16:54	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/13/13 16:54
Toluene-d8	104	70-130		11/13/13 16:54
4-Bromofluorobenzene	101	70-130		11/13/13 16:54

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: FB-2 | Sampled: 11/6/2013 08:50

Sample ID: 13K0259-03

Sample Matrix: Field Blank

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Antimony	ND	0.050	0.030	mg/L	1		SW-846 6010C	11/9/13	11/13/13 12:52	OP
Arsenic	ND	0.010	0.0086	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Barium	ND	0.050	0.015	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Beryllium	ND	0.0040	0.0010	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Cadmium	ND	0.0040	0.0018	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Calcium	0.095	0.15	0.088	mg/L	1	J	SW-846 6010C	11/9/13	11/13/13 0:01	OP
Chromium	ND	0.010	0.0034	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Cobalt	ND	0.050	0.0075	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Copper	ND	0.010	0.0050	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Iron	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Lead	ND	0.010	0.0027	mg/L	1		SW-846 6010C	11/9/13	11/13/13 12:52	OP
Magnesium	ND	0.15	0.037	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Manganese	ND	0.010	0.0020	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Mercury	ND	0.00010	0.000048	mg/L	1		SW-846 7470A	11/8/13	11/8/13 11:17	SAJ
Nickel	ND	0.010	0.0017	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Potassium	ND	2.0	0.46	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Selenium	ND	0.050	0.016	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Silver	ND	0.0050	0.0040	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Sodium	ND	2.0	1.9	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Thallium	ND	0.050	0.020	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Vanadium	ND	0.010	0.0040	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP
Zinc	ND	0.020	0.0071	mg/L	1		SW-846 6010C	11/9/13	11/13/13 0:01	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 0-0.5 | Sampled: 11/6/2013 09:00

Sample ID: 13K0259-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.027	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Acrylonitrile	ND	0.0070	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:26	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Benzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Bromobenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Bromodichloromethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
2-Butanone (MEK)	ND	0.047	0.020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
tert-Butyl Alcohol (TBA)	ND	0.047	0.024	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:26	MFF
n-Butylbenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
sec-Butylbenzene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
tert-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Carbon Disulfide	ND	0.0070	0.0039	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Carbon Tetrachloride	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Chlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Chlorodibromomethane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Chloroethane	ND	0.023	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Chloroform	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
2-Chlorotoluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
4-Chlorotoluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Dibromomethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
trans-1,4-Dichloro-2-butene	ND	0.0047	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1-Dichloroethane	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1-Dichloroethylene	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,3-Dichloropropane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
2,2-Dichloropropane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1-Dichloropropene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 0-0.5 | Sampled: 11/6/2013 09:00

Sample ID: 13K0259-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,4-Dioxane	ND	0.12	0.067	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Ethylbenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Hexachlorobutadiene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
2-Hexanone (MBK)	ND	0.023	0.013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0047	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Methylene Chloride	ND	0.023	0.0083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0089	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Naphthalene	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
n-Propylbenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Styrene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Toluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2,4-Trichlorobenzene	ND	0.0047	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Trichloroethylene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
m+p Xylene	ND	0.0047	0.0020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF
o-Xylene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		11/8/13 12:26
Toluene-d8	99.1	70-130		11/8/13 12:26
4-Bromofluorobenzene	99.0	70-130		11/8/13 12:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 0-0.5 | Sampled: 11/6/2013 09:00

Sample ID: 13K0259-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Barium	68	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Beryllium	ND	0.28	0.045	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:33	OP
Cadmium	0.36	0.28	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Calcium	1500	8.4	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Chromium	16	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Cobalt	6.6	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Copper	69	0.56	0.43	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:33	OP
Iron	12000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Lead	16	0.84	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:33	OP
Magnesium	2800	8.4	0.88	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Manganese	220	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Mercury	0.021	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:31	SAJ
Nickel	16	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Potassium	800	110	19	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:33	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Sodium	110	110	55	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/14/13 15:56	OP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Vanadium	21	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:10	OP
Zinc	86	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:33	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 0-0.5 | Sampled: 11/6/2013 09:00

Sample ID: 13K0259-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.2		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 6.5-7 | Sampled: 11/6/2013 09:40

Sample ID: 13K0259-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Acrylonitrile	ND	0.0065	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Benzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Bromobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Bromodichloromethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:53	MFF
n-Butylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
tert-Butylbenzene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Carbon Disulfide	ND	0.0065	0.0036	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Carbon Tetrachloride	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Chlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Chlorodibromomethane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Chloroform	ND	0.0043	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Chloromethane	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
2-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
4-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Dibromomethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1-Dichloroethane	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,3-Dichloropropane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
2,2-Dichloropropane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1-Dichloropropene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Diethyl Ether	ND	0.022	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 6.5-7 | Sampled: 11/6/2013 09:40

Sample ID: 13K0259-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,4-Dioxane	ND	0.11	0.062	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Ethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Methylene Chloride	ND	0.022	0.0077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Naphthalene	ND	0.0043	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
n-Propylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Styrene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Toluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Trichloroethylene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
m+p Xylene	ND	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF
o-Xylene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 12:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	106	70-130		11/8/13 12:53
Toluene-d8	99.2	70-130		11/8/13 12:53
4-Bromofluorobenzene	100	70-130		11/8/13 12:53

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 6.5-7 | Sampled: 11/6/2013 09:40

Sample ID: 13K0259-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Barium	110	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP
Cadmium	0.32	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Calcium	2700	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Chromium	230	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Cobalt	39	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Copper	44	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP
Iron	28000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP
Lead	4.0	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP
Magnesium	13000	7.9	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Manganese	370	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Mercury	ND	0.026	0.0017	mg/Kg dry	1		SW-846 7471B	11/9/13	11/11/13 13:33	SAJ
Nickel	66	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Potassium	1400	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Sodium	330	110	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 16:01	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Vanadium	45	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:15	OP
Zinc	23	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:38	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB111 6.5-7 | Sampled: 11/6/2013 09:40

Sample ID: 13K0259-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.3		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 0-0.5 | Sampled: 11/6/2013 10:10

Sample ID: 13K0259-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Acrylonitrile	ND	0.0062	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Benzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Bromobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Bromochloromethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Bromodichloromethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Bromoform	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Bromomethane	ND	0.010	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
2-Butanone (MEK)	ND	0.041	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
tert-Butyl Alcohol (TBA)	ND	0.041	0.021	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:20	MFF
n-Butylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
sec-Butylbenzene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
tert-Butylbenzene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Carbon Disulfide	ND	0.0062	0.0034	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Carbon Tetrachloride	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Chlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Chlorodibromomethane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Chloroethane	ND	0.021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Chloroform	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Chloromethane	ND	0.010	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
2-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
4-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Dibromomethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1-Dichloroethane	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2-Dichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1-Dichloroethylene	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2-Dichloropropane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,3-Dichloropropane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
2,2-Dichloropropane	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1-Dichloropropene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Diethyl Ether	ND	0.021	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 0-0.5 | Sampled: 11/6/2013 10:10

Sample ID: 13K0259-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,4-Dioxane	ND	0.10	0.059	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Ethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Hexachlorobutadiene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0041	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Methylene Chloride	ND	0.021	0.0073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0078	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Naphthalene	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
n-Propylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Styrene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Tetrachloroethylene	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Tetrahydrofuran	ND	0.010	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Toluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2,4-Trichlorobenzene	ND	0.0041	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Trichloroethylene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00092	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
m+p Xylene	ND	0.0041	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF
o-Xylene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:20	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/8/13 13:20
Toluene-d8	99.8	70-130		11/8/13 13:20
4-Bromofluorobenzene	101	70-130		11/8/13 13:20

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 0-0.5 | Sampled: 11/6/2013 10:10

Sample ID: 13K0259-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Arsenic	1.2	2.7	0.97	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 17:20	OP
Barium	100	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:42	OP
Cadmium	0.54	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Calcium	2000	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Chromium	12	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Cobalt	8.3	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Copper	520	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:42	OP
Iron	13000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Lead	40	0.81	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:42	OP
Magnesium	3200	8.1	0.84	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Manganese	230	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Mercury	0.024	0.027	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:38	SAJ
Nickel	19	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Potassium	1300	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:42	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Sodium	150	110	52	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 16:05	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Vanadium	27	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:20	OP
Zinc	160	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:42	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 0-0.5 | Sampled: 11/6/2013 10:10

Sample ID: 13K0259-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.3		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 5.5-6 | Sampled: 11/6/2013 10:40

Sample ID: 13K0259-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.027	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Acrylonitrile	ND	0.0068	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:47	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Benzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Bromobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Bromodichloromethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.024	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:47	MFF
n-Butylbenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
sec-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Carbon Disulfide	ND	0.0068	0.0037	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Carbon Tetrachloride	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Chlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Chlorodibromomethane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Chloroform	ND	0.0045	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
2-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
4-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Dibromomethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1-Dichloroethane	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,3-Dichloropropane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Diethyl Ether	ND	0.023	0.0020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 5.5-6 | Sampled: 11/6/2013 10:40

Sample ID: 13K0259-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Ethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Hexachlorobutadiene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
2-Hexanone (MBK)	ND	0.023	0.012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Methylene Chloride	ND	0.023	0.0081	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0086	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Naphthalene	ND	0.0045	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
n-Propylbenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Styrene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Toluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF
o-Xylene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 13:47	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/8/13 13:47
Toluene-d8	101	70-130		11/8/13 13:47
4-Bromofluorobenzene	100	70-130		11/8/13 13:47

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 5.5-6 | Sampled: 11/6/2013 10:40

Sample ID: 13K0259-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	90000	270	110	mg/Kg dry	100		SW-846 6010C	11/7/13	11/15/13 10:56	OP
Antimony	ND	2.7	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Arsenic	2.8	2.7	0.96	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Barium	120	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Beryllium	1.2	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:47	OP
Cadmium	0.49	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Calcium	25000	8.0	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Chromium	9.0	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Cobalt	23	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Copper	240	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:47	OP
Iron	15000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Lead	3.8	0.80	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:47	OP
Magnesium	4900	8.0	0.83	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Manganese	150	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Mercury	ND	0.026	0.0017	mg/Kg dry	1		SW-846 7471B	11/9/13	11/11/13 13:40	SAJ
Nickel	44	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Potassium	1100	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:47	OP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Sodium	4800	110	52	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 16:09	OP
Thallium	ND	2.7	0.88	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Vanadium	59	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:24	OP
Zinc	39	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:47	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB110 5.5-6 | Sampled: 11/6/2013 10:40

Sample ID: 13K0259-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.7		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 0-0.5 | Sampled: 11/6/2013 11:15

Sample ID: 13K0259-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.027	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Acrylonitrile	ND	0.0070	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:14	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Benzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Bromobenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Bromodichloromethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
2-Butanone (MEK)	ND	0.047	0.020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
tert-Butyl Alcohol (TBA)	ND	0.047	0.024	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:14	MFF
n-Butylbenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
sec-Butylbenzene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
tert-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Carbon Disulfide	ND	0.0070	0.0039	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Carbon Tetrachloride	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Chlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Chlorodibromomethane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Chloroethane	ND	0.023	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Chloroform	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
2-Chlorotoluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
4-Chlorotoluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Dibromomethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
trans-1,4-Dichloro-2-butene	ND	0.0047	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1-Dichloroethane	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1-Dichloroethylene	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,3-Dichloropropane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
2,2-Dichloropropane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1-Dichloropropene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 0-0.5 | Sampled: 11/6/2013 11:15

Sample ID: 13K0259-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,4-Dioxane	ND	0.12	0.067	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Ethylbenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Hexachlorobutadiene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
2-Hexanone (MBK)	ND	0.023	0.013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0047	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Methylene Chloride	ND	0.023	0.0083	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0089	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Naphthalene	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
n-Propylbenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Styrene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Toluene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2,4-Trichlorobenzene	ND	0.0047	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Trichloroethylene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
m+p Xylene	ND	0.0047	0.0020	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF
o-Xylene	ND	0.0023	0.00082	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:14	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/8/13 14:14
Toluene-d8	98.4	70-130		11/8/13 14:14
4-Bromofluorobenzene	97.2	70-130		11/8/13 14:14

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 0-0.5 | Sampled: 11/6/2013 11:15

Sample ID: 13K0259-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Arsenic	ND	2.5	0.90	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Barium	48	2.5	0.31	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Beryllium	ND	0.25	0.040	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:51	OP
Cadmium	0.34	0.25	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Calcium	1700	7.5	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Chromium	7.6	0.50	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Cobalt	4.8	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Copper	25	0.50	0.38	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:51	OP
Iron	10000	2.5	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Lead	10	0.75	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:51	OP
Magnesium	2100	7.5	0.78	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Manganese	330	0.50	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Mercury	0.022	0.026	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:42	SAJ
Nickel	8.2	0.50	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Potassium	850	100	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Selenium	ND	2.5	0.77	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:51	OP
Silver	ND	0.50	0.44	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Sodium	97	100	49	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/14/13 16:40	OP
Thallium	0.91	2.5	0.83	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 17:30	OP
Vanadium	17	1.0	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:30	OP
Zinc	590	1.0	0.26	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:51	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 0-0.5 | Sampled: 11/6/2013 11:15

Sample ID: 13K0259-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.8		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 4.5-5 | Sampled: 11/6/2013 11:30

Sample ID: 13K0259-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.15	0.035	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Acrylonitrile	ND	0.0090	0.0037	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:41	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0015	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Benzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Bromobenzene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Bromochloromethane	ND	0.0030	0.0021	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Bromodichloromethane	ND	0.0030	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Bromoform	ND	0.0030	0.0021	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Bromomethane	ND	0.015	0.0025	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
2-Butanone (MEK)	ND	0.060	0.026	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
tert-Butyl Alcohol (TBA)	ND	0.060	0.031	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:41	MFF
n-Butylbenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
sec-Butylbenzene	ND	0.0030	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
tert-Butylbenzene	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0015	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Carbon Disulfide	ND	0.0090	0.0049	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Carbon Tetrachloride	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Chlorobenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Chlorodibromomethane	ND	0.0015	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Chloroethane	ND	0.030	0.0022	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Chloroform	ND	0.0060	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Chloromethane	ND	0.015	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
2-Chlorotoluene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
4-Chlorotoluene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0060	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2-Dibromoethane (EDB)	ND	0.0015	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Dibromomethane	ND	0.0030	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2-Dichlorobenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,3-Dichlorobenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,4-Dichlorobenzene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
trans-1,4-Dichloro-2-butene	ND	0.0060	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.030	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1-Dichloroethane	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2-Dichloroethane	ND	0.0030	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1-Dichloroethylene	ND	0.0060	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
cis-1,2-Dichloroethylene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
trans-1,2-Dichloroethylene	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2-Dichloropropane	ND	0.0030	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,3-Dichloropropane	ND	0.0015	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
2,2-Dichloropropane	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1-Dichloropropene	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
cis-1,3-Dichloropropene	ND	0.0015	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
trans-1,3-Dichloropropene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Diethyl Ether	ND	0.030	0.0027	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 4.5-5 | Sampled: 11/6/2013 11:30

Sample ID: 13K0259-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0015	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,4-Dioxane	ND	0.15	0.086	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Ethylbenzene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Hexachlorobutadiene	ND	0.0030	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
2-Hexanone (MBK)	ND	0.030	0.016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Isopropylbenzene (Cumene)	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0060	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Methylene Chloride	ND	0.030	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.030	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Naphthalene	ND	0.0060	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
n-Propylbenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Styrene	ND	0.0030	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1,1,2-Tetrachloroethane	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1,2,2-Tetrachloroethane	ND	0.0015	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Tetrachloroethylene	ND	0.0030	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Tetrahydrofuran	ND	0.015	0.0033	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Toluene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2,3-Trichlorobenzene	ND	0.0030	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2,4-Trichlorobenzene	ND	0.0060	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,3,5-Trichlorobenzene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1,1-Trichloroethane	ND	0.0030	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1,2-Trichloroethane	ND	0.0030	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Trichloroethylene	ND	0.0030	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Trichlorofluoromethane (Freon 11)	ND	0.015	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2,3-Trichloropropane	ND	0.0030	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.015	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,2,4-Trimethylbenzene	ND	0.0030	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
1,3,5-Trimethylbenzene	ND	0.0030	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
Vinyl Chloride	ND	0.015	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
m+p Xylene	ND	0.0060	0.0025	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF
o-Xylene	ND	0.0030	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 14:41	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	111	70-130		11/8/13 14:41
Toluene-d8	98.4	70-130		11/8/13 14:41
4-Bromofluorobenzene	99.6	70-130		11/8/13 14:41

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 4.5-5 | Sampled: 11/6/2013 11:30

Sample ID: 13K0259-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.7	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Antimony	ND	2.7	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Arsenic	ND	2.7	0.96	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Barium	310	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP
Cadmium	0.46	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Calcium	4300	8.0	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Chromium	9.9	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Cobalt	16	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Copper	43	0.53	0.41	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP
Iron	21000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP
Lead	6.7	0.80	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP
Magnesium	5600	8.0	0.83	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Manganese	260	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Mercury	0.0071	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:43	SAJ
Nickel	11	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Potassium	3600	110	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Sodium	670	110	52	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 16:44	OP
Thallium	ND	2.7	0.88	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Vanadium	55	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:35	OP
Zinc	120	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 20:56	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB108 4.5-5 | Sampled: 11/6/2013 11:30

Sample ID: 13K0259-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.9		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 0-0.5 | Sampled: 11/6/2013 12:00

Sample ID: 13K0259-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Acrylonitrile	ND	0.0063	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:08	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Benzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Bromobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Bromodichloromethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Bromomethane	ND	0.010	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
2-Butanone (MEK)	ND	0.042	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
tert-Butyl Alcohol (TBA)	ND	0.042	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:08	MFF
n-Butylbenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
sec-Butylbenzene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
tert-Butylbenzene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Carbon Disulfide	ND	0.0063	0.0034	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Carbon Tetrachloride	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Chlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Chlorodibromomethane	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Chloroform	ND	0.0042	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Chloromethane	ND	0.010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
2-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
4-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0042	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Dibromomethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
trans-1,4-Dichloro-2-butene	ND	0.0042	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1-Dichloroethane	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1-Dichloroethylene	ND	0.0042	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,3-Dichloropropane	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
2,2-Dichloropropane	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1-Dichloropropene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 0-0.5 | Sampled: 11/6/2013 12:00

Sample ID: 13K0259-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,4-Dioxane	ND	0.10	0.060	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Ethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Hexachlorobutadiene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0042	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Methylene Chloride	ND	0.021	0.0074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0079	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Naphthalene	ND	0.0042	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
n-Propylbenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Styrene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Tetrahydrofuran	ND	0.010	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Toluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2,4-Trichlorobenzene	ND	0.0042	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Trichloroethylene	ND	0.0021	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00094	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
m+p Xylene	ND	0.0042	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF
o-Xylene	ND	0.0021	0.00073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:08	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	106	70-130		11/8/13 15:08
Toluene-d8	98.9	70-130		11/8/13 15:08
4-Bromofluorobenzene	102	70-130		11/8/13 15:08

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 0-0.5 | Sampled: 11/6/2013 12:00

Sample ID: 13K0259-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8500	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Arsenic	ND	2.6	0.94	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Barium	45	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:01	OP
Cadmium	0.31	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Calcium	1400	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Chromium	9.0	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Cobalt	4.8	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Copper	29	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:01	OP
Iron	11000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Lead	7.3	0.78	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:01	OP
Magnesium	2300	7.8	0.81	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Manganese	170	0.52	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Mercury	0.013	0.026	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:45	SAJ
Nickel	8.7	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Potassium	770	100	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:01	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Sodium	91	100	50	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/14/13 16:48	OP
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Vanadium	18	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 17:40	OP
Zinc	68	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:01	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 0-0.5 | Sampled: 11/6/2013 12:00

Sample ID: 13K0259-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.8		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 9-9.5 | Sampled: 11/6/2013 13:35

Sample ID: 13K0259-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.096	0.023	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Acrylonitrile	ND	0.0058	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Benzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Bromobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Bromochloromethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Bromodichloromethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Bromoform	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Bromomethane	ND	0.0096	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
2-Butanone (MEK)	ND	0.039	0.017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
tert-Butyl Alcohol (TBA)	ND	0.039	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:35	MFF
n-Butylbenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
sec-Butylbenzene	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
tert-Butylbenzene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00096	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Carbon Disulfide	ND	0.0058	0.0032	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Carbon Tetrachloride	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Chlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Chlorodibromomethane	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Chloroethane	ND	0.019	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Chloroform	ND	0.0039	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Chloromethane	ND	0.0096	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
2-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
4-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2-Dibromoethane (EDB)	ND	0.00096	0.00096	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Dibromomethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
trans-1,4-Dichloro-2-butene	ND	0.0039	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1-Dichloroethane	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2-Dichloroethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1-Dichloroethylene	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2-Dichloropropane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,3-Dichloropropane	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
2,2-Dichloropropane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1-Dichloropropene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
cis-1,3-Dichloropropene	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 9-9.5 | Sampled: 11/6/2013 13:35

Sample ID: 13K0259-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00096	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,4-Dioxane	ND	0.096	0.055	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Ethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Hexachlorobutadiene	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
2-Hexanone (MBK)	ND	0.019	0.010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0039	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Methylene Chloride	ND	0.019	0.0068	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0073	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Naphthalene	ND	0.0039	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
n-Propylbenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Styrene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.00096	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Tetrachloroethylene	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Tetrahydrofuran	ND	0.0096	0.0021	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Toluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2,4-Trichlorobenzene	ND	0.0039	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Trichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0096	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0096	0.00087	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
Vinyl Chloride	ND	0.0096	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
m+p Xylene	ND	0.0039	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF
o-Xylene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 15:35	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	108	70-130		11/8/13 15:35
Toluene-d8	102	70-130		11/8/13 15:35
4-Bromofluorobenzene	102	70-130		11/8/13 15:35

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 9-9.5 | Sampled: 11/6/2013 13:35

Sample ID: 13K0259-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	2.4	1.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Antimony	ND	2.4	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Arsenic	ND	2.4	0.87	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Barium	36	2.4	0.30	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Beryllium	ND	0.24	0.039	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:21	OP
Cadmium	0.30	0.24	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Calcium	1500	7.3	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Chromium	5.1	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Cobalt	4.0	2.4	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Copper	29	0.48	0.37	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:21	OP
Iron	8200	2.4	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Lead	2.8	0.73	0.14	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:21	OP
Magnesium	1800	7.3	0.76	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Manganese	160	0.48	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Mercury	ND	0.025	0.0016	mg/Kg dry	1		SW-846 7471B	11/9/13	11/11/13 13:47	SAJ
Nickel	6.5	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Potassium	740	97	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Selenium	ND	2.4	0.75	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:21	OP
Silver	ND	0.48	0.43	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Sodium	87	97	47	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/14/13 16:53	OP
Thallium	1.7	2.4	0.80	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 18:05	OP
Vanadium	12	0.97	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:05	OP
Zinc	19	0.97	0.25	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:21	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 9-9.5 | Sampled: 11/6/2013 13:35

Sample ID: 13K0259-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	98.0		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 14-14.5 | Sampled: 11/6/2013 13:55

Sample ID: 13K0259-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.023	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Acrylonitrile	ND	0.0060	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:02	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Benzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Bromobenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Bromochloromethane	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Bromodichloromethane	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Bromoform	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Bromomethane	ND	0.010	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
2-Butanone (MEK)	ND	0.040	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
tert-Butyl Alcohol (TBA)	ND	0.040	0.021	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:02	MFF
n-Butylbenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
sec-Butylbenzene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
tert-Butylbenzene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Carbon Disulfide	ND	0.0060	0.0033	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Carbon Tetrachloride	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Chlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Chlorodibromomethane	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Chloroethane	ND	0.020	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Chloroform	ND	0.0040	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Chloromethane	ND	0.010	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
2-Chlorotoluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
4-Chlorotoluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Dibromomethane	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2-Dichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,3-Dichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,4-Dichlorobenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
trans-1,4-Dichloro-2-butene	ND	0.0040	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1-Dichloroethane	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2-Dichloroethane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1-Dichloroethylene	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
cis-1,2-Dichloroethylene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
trans-1,2-Dichloroethylene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2-Dichloropropane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,3-Dichloropropane	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
2,2-Dichloropropane	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1-Dichloropropene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
trans-1,3-Dichloropropene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Diethyl Ether	ND	0.020	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 14-14.5 | Sampled: 11/6/2013 13:55

Sample ID: 13K0259-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,4-Dioxane	ND	0.10	0.058	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Ethylbenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Hexachlorobutadiene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
2-Hexanone (MBK)	ND	0.020	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Isopropylbenzene (Cumene)	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Methylene Chloride	ND	0.020	0.0071	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.020	0.0076	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Naphthalene	ND	0.0040	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
n-Propylbenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Styrene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1,1,2-Tetrachloroethane	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Tetrachloroethylene	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Tetrahydrofuran	ND	0.010	0.0022	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Toluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2,3-Trichlorobenzene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2,4-Trichlorobenzene	ND	0.0040	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,3,5-Trichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1,1-Trichloroethane	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1,2-Trichloroethane	ND	0.0020	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Trichloroethylene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2,3-Trichloropropane	ND	0.0020	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00090	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,2,4-Trimethylbenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
1,3,5-Trimethylbenzene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
m+p Xylene	ND	0.0040	0.0017	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF
o-Xylene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:02	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	103	70-130		11/8/13 16:02
Toluene-d8	99.9	70-130		11/8/13 16:02
4-Bromofluorobenzene	101	70-130		11/8/13 16:02

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 14-14.5 | Sampled: 11/6/2013 13:55

Sample ID: 13K0259-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3700	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Arsenic	9.8	2.6	0.92	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Barium	28	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Beryllium	ND	0.26	0.041	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Cadmium	0.43	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Calcium	1400	7.7	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Chromium	5.6	0.51	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Cobalt	5.6	2.6	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Copper	69	0.51	0.39	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:25	OP
Iron	7300	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Lead	3.1	0.77	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:25	OP
Magnesium	1300	7.7	0.80	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Manganese	170	0.51	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Mercury	ND	0.026	0.0017	mg/Kg dry	1		SW-846 7471B	11/9/13	11/11/13 13:48	SAJ
Nickel	20	0.51	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Potassium	570	100	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Selenium	ND	2.6	0.79	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:25	OP
Silver	ND	0.51	0.45	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Sodium	150	100	50	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 16:58	OP
Thallium	ND	2.6	0.85	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Vanadium	11	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:10	OP
Zinc	17	1.0	0.26	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:25	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB109 14-14.5 | Sampled: 11/6/2013 13:55

Sample ID: 13K0259-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	94.3		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 0-0.5 | Sampled: 11/6/2013 14:30

Sample ID: 13K0259-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1	L-04	SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Acrylonitrile	ND	0.0063	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:29	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Benzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Bromobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Bromodichloromethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
2-Butanone (MEK)	ND	0.042	0.018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
tert-Butyl Alcohol (TBA)	ND	0.042	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:29	MFF
n-Butylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
tert-Butylbenzene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Carbon Disulfide	ND	0.0063	0.0035	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Carbon Tetrachloride	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Chlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Chlorodibromomethane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Chloroform	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Chloromethane	ND	0.011	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
2-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
4-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Dibromomethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
trans-1,4-Dichloro-2-butene	ND	0.0042	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1-Dichloroethane	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1-Dichloroethylene	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,3-Dichloropropane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
2,2-Dichloropropane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1-Dichloropropene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 0-0.5 | Sampled: 11/6/2013 14:30

Sample ID: 13K0259-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,4-Dioxane	ND	0.11	0.061	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Ethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0042	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Methylene Chloride	ND	0.021	0.0075	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0080	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Naphthalene	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
n-Propylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Styrene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Tetrahydrofuran	ND	0.011	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Toluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2,4-Trichlorobenzene	ND	0.0042	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Trichloroethylene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00095	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
m+p Xylene	ND	0.0042	0.0018	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF
o-Xylene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/8/13	11/8/13 16:29	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/8/13 16:29
Toluene-d8	97.6	70-130		11/8/13 16:29
4-Bromofluorobenzene	101	70-130		11/8/13 16:29

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 0-0.5 | Sampled: 11/6/2013 14:30

Sample ID: 13K0259-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8300	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Arsenic	1.1	2.6	0.94	mg/Kg dry	1	J	SW-846 6010C	11/7/13	11/8/13 18:16	OP
Barium	48	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:30	OP
Cadmium	0.32	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Calcium	1800	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Chromium	11	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Cobalt	7.0	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Copper	23	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:30	OP
Iron	11000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Lead	5.1	0.78	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:30	OP
Magnesium	2500	7.8	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Manganese	240	0.52	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Mercury	0.013	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/9/13	11/11/13 13:50	SAJ
Nickel	11	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Potassium	890	100	18	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:30	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Sodium	180	100	51	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 17:03	OP
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Vanadium	18	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:16	OP
Zinc	32	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:30	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 0-0.5 | Sampled: 11/6/2013 14:30

Sample ID: 13K0259-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.1		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 10-10.5 | Sampled: 11/6/2013 15:00

Sample ID: 13K0259-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.028	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Acrylonitrile	ND	0.0072	0.0030	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 10:11	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Benzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Bromobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Bromochloromethane	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Bromodichloromethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Bromoform	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
2-Butanone (MEK)	ND	0.048	0.021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
tert-Butyl Alcohol (TBA)	ND	0.048	0.025	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 10:11	MFF
n-Butylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
sec-Butylbenzene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
tert-Butylbenzene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Carbon Disulfide	ND	0.0072	0.0039	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Carbon Tetrachloride	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Chlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Chlorodibromomethane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Chloroethane	ND	0.024	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Chloroform	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
2-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
4-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Dibromomethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,3-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,4-Dichlorobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
trans-1,4-Dichloro-2-butene	ND	0.0048	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1-Dichloroethane	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2-Dichloroethane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1-Dichloroethylene	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
cis-1,2-Dichloroethylene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
trans-1,2-Dichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2-Dichloropropane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,3-Dichloropropane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
2,2-Dichloropropane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1-Dichloropropene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
trans-1,3-Dichloropropene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Diethyl Ether	ND	0.024	0.0022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 10-10.5 | Sampled: 11/6/2013 15:00

Sample ID: 13K0259-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,4-Dioxane	ND	0.12	0.069	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Ethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Hexachlorobutadiene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
2-Hexanone (MBK)	ND	0.024	0.013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Isopropylbenzene (Cumene)	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0048	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Methylene Chloride	ND	0.024	0.0085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.024	0.0091	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Naphthalene	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
n-Propylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Styrene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1,1,2-Tetrachloroethane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Tetrachloroethylene	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Toluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2,3-Trichlorobenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2,4-Trichlorobenzene	ND	0.0048	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,3,5-Trichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1,1-Trichloroethane	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1,2-Trichloroethane	ND	0.0024	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Trichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2,3-Trichloropropane	ND	0.0024	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,2,4-Trimethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
1,3,5-Trimethylbenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
m+p Xylene	ND	0.0048	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF
o-Xylene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:11	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/11/13 10:11
Toluene-d8	96.7	70-130		11/11/13 10:11
4-Bromofluorobenzene	100	70-130		11/11/13 10:11

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 10-10.5 | Sampled: 11/6/2013 15:00

Sample ID: 13K0259-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6400	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Arsenic	3.4	2.5	0.89	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Barium	57	2.5	0.31	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Beryllium	ND	0.25	0.040	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:35	OP
Cadmium	0.31	0.25	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Calcium	2100	7.4	1.3	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Chromium	7.1	0.49	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Cobalt	4.2	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Copper	47	0.49	0.38	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:35	OP
Iron	8700	2.5	2.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Lead	4.0	0.74	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:35	OP
Magnesium	1900	7.4	0.77	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Manganese	150	0.49	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Mercury	ND	0.025	0.0016	mg/Kg dry	1		SW-846 7471B	11/8/13	11/11/13 12:51	SAJ
Nickel	10	0.49	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Potassium	810	99	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Selenium	ND	2.5	0.76	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:35	OP
Silver	ND	0.49	0.43	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Sodium	300	99	48	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 17:08	OP
Thallium	ND	2.5	0.82	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Vanadium	15	0.99	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:21	OP
Zinc	31	0.99	0.25	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:35	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 10-10.5 | Sampled: 11/6/2013 15:00

Sample ID: 13K0259-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	95.1		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 13.5-14 | Sampled: 11/6/2013 15:20

Sample ID: 13K0259-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.092	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Acrylonitrile	ND	0.0055	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 10:38	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Benzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Bromobenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Bromochloromethane	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Bromodichloromethane	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Bromoform	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Bromomethane	ND	0.0092	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
2-Butanone (MEK)	ND	0.037	0.016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
tert-Butyl Alcohol (TBA)	ND	0.037	0.019	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 10:38	MFF
n-Butylbenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
sec-Butylbenzene	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
tert-Butylbenzene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00092	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Carbon Disulfide	ND	0.0055	0.0030	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Carbon Tetrachloride	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Chlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Chlorodibromomethane	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Chloroethane	ND	0.018	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Chloroform	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Chloromethane	ND	0.0092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
2-Chlorotoluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
4-Chlorotoluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2-Dibromoethane (EDB)	ND	0.00092	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Dibromomethane	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2-Dichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,3-Dichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,4-Dichlorobenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
trans-1,4-Dichloro-2-butene	ND	0.0037	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1-Dichloroethane	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2-Dichloroethane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1-Dichloroethylene	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
cis-1,2-Dichloroethylene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
trans-1,2-Dichloroethylene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2-Dichloropropane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,3-Dichloropropane	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
2,2-Dichloropropane	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1-Dichloropropene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
cis-1,3-Dichloropropene	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
trans-1,3-Dichloropropene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Diethyl Ether	ND	0.018	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 13.5-14 | Sampled: 11/6/2013 15:20

Sample ID: 13K0259-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00092	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,4-Dioxane	ND	0.092	0.053	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Ethylbenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Hexachlorobutadiene	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
2-Hexanone (MBK)	ND	0.018	0.010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Isopropylbenzene (Cumene)	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0037	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Methylene Chloride	ND	0.018	0.0066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.018	0.0070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Naphthalene	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
n-Propylbenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Styrene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1,1,2-Tetrachloroethane	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1,2,2-Tetrachloroethane	ND	0.00092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Tetrachloroethylene	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Tetrahydrofuran	ND	0.0092	0.0020	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Toluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2,3-Trichlorobenzene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2,4-Trichlorobenzene	ND	0.0037	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,3,5-Trichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1,1-Trichloroethane	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1,2-Trichloroethane	ND	0.0018	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Trichloroethylene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0092	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2,3-Trichloropropane	ND	0.0018	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,2,4-Trimethylbenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
1,3,5-Trimethylbenzene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
Vinyl Chloride	ND	0.0092	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
m+p Xylene	ND	0.0037	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF
o-Xylene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 10:38	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/11/13 10:38
Toluene-d8	98.6	70-130		11/11/13 10:38
4-Bromofluorobenzene	99.9	70-130		11/11/13 10:38

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 13.5-14 | Sampled: 11/6/2013 15:20

Sample ID: 13K0259-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Arsenic	13	2.5	0.92	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Barium	37	2.5	0.32	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Beryllium	ND	0.25	0.041	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Cadmium	0.51	0.25	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Calcium	1900	7.6	1.4	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Chromium	9.3	0.51	0.13	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Cobalt	3.1	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Copper	87	0.51	0.39	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:40	OP
Iron	7600	2.5	2.2	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Lead	2.8	0.76	0.15	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:40	OP
Magnesium	1100	7.6	0.80	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Manganese	180	0.51	0.16	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Mercury	ND	0.027	0.0017	mg/Kg dry	1		SW-846 7471B	11/8/13	11/11/13 12:57	SAJ
Nickel	24	0.51	0.12	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Potassium	520	100	17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Selenium	ND	2.5	0.78	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:40	OP
Silver	ND	0.51	0.45	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Sodium	130	100	50	mg/Kg dry	1		SW-846 6010C	11/7/13	11/14/13 17:12	OP
Thallium	ND	2.5	0.84	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Vanadium	13	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 18:27	OP
Zinc	26	1.0	0.26	mg/Kg dry	1		SW-846 6010C	11/7/13	11/8/13 21:40	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland - Magna | Sample Description: | Work Order: 13K0259

Date Received: 11/7/2013

Field Sample #: LPSB107 13.5-14 | Sampled: 11/6/2013 15:20

Sample ID: 13K0259-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.7		% Wt	1		SM 2540G	11/13/13	11/13/13 18:09	RH

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13K0259-01 [LPSB113 0-0.5]	B085036	11/13/13
13K0259-02 [LPSB113 9-9.5]	B085036	11/13/13
13K0259-04 [LPSB111 0-0.5]	B085036	11/13/13
13K0259-05 [LPSB111 6.5-7]	B085036	11/13/13
13K0259-06 [LPSB110 0-0.5]	B085036	11/13/13
13K0259-07 [LPSB110 5.5-6]	B085036	11/13/13
13K0259-08 [LPSB108 0-0.5]	B085036	11/13/13
13K0259-09 [LPSB108 4.5-5]	B085036	11/13/13
13K0259-10 [LPSB109 0-0.5]	B085036	11/13/13
13K0259-11 [LPSB109 9-9.5]	B085036	11/13/13
13K0259-12 [LPSB109 14-14.5]	B085036	11/13/13
13K0259-13 [LPSB107 0-0.5]	B085036	11/13/13
13K0259-14 [LPSB107 10-10.5]	B085036	11/13/13
13K0259-15 [LPSB107 13.5-14]	B085036	11/13/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-02 [LPSB113 9-9.5]	B084653	1.03	50.0	11/07/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-01 [LPSB113 0-0.5]	B084670	1.09	50.0	11/07/13
13K0259-04 [LPSB111 0-0.5]	B084670	1.02	50.0	11/07/13
13K0259-05 [LPSB111 6.5-7]	B084670	1.01	50.0	11/07/13
13K0259-06 [LPSB110 0-0.5]	B084670	1.03	50.0	11/07/13
13K0259-07 [LPSB110 5.5-6]	B084670	1.01	50.0	11/07/13
13K0259-08 [LPSB108 0-0.5]	B084670	1.08	50.0	11/07/13
13K0259-09 [LPSB108 4.5-5]	B084670	1.01	50.0	11/07/13
13K0259-10 [LPSB109 0-0.5]	B084670	1.03	50.0	11/07/13
13K0259-11 [LPSB109 9-9.5]	B084670	1.05	50.0	11/07/13
13K0259-12 [LPSB109 14-14.5]	B084670	1.04	50.0	11/07/13
13K0259-13 [LPSB107 0-0.5]	B084670	1.03	50.0	11/07/13
13K0259-14 [LPSB107 10-10.5]	B084670	1.07	50.0	11/07/13
13K0259-15 [LPSB107 13.5-14]	B084670	1.07	50.0	11/07/13

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0259-03 [FB-2]	B084805	50.0	50.0	11/09/13

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0259-03 [FB-2]	B084685	6.00	6.00	11/08/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-14 [LPSB107 10-10.5]	B084766	0.619	50.0	11/08/13
13K0259-15 [LPSB107 13.5-14]	B084766	0.615	50.0	11/08/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-01 [LPSB113 0-0.5]	B084779	0.606	50.0	11/09/13
13K0259-02 [LPSB113 9-9.5]	B084779	0.610	50.0	11/09/13
13K0259-04 [LPSB111 0-0.5]	B084779	0.608	50.0	11/09/13
13K0259-05 [LPSB111 6.5-7]	B084779	0.615	50.0	11/09/13
13K0259-06 [LPSB110 0-0.5]	B084779	0.604	50.0	11/09/13
13K0259-07 [LPSB110 5.5-6]	B084779	0.610	50.0	11/09/13
13K0259-08 [LPSB108 0-0.5]	B084779	0.619	50.0	11/09/13
13K0259-09 [LPSB108 4.5-5]	B084779	0.604	50.0	11/09/13
13K0259-10 [LPSB109 0-0.5]	B084779	0.610	50.0	11/09/13
13K0259-11 [LPSB109 9-9.5]	B084779	0.609	50.0	11/09/13
13K0259-12 [LPSB109 14-14.5]	B084779	0.608	50.0	11/09/13
13K0259-13 [LPSB107 0-0.5]	B084779	0.606	50.0	11/09/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-01 [LPSB113 0-0.5]	B084721	5.70	10.0	11/08/13
13K0259-02 [LPSB113 9-9.5]	B084721	5.30	10.0	11/08/13
13K0259-04 [LPSB111 0-0.5]	B084721	4.90	10.0	11/08/13
13K0259-05 [LPSB111 6.5-7]	B084721	4.90	10.0	11/08/13
13K0259-06 [LPSB110 0-0.5]	B084721	5.40	10.0	11/08/13
13K0259-07 [LPSB110 5.5-6]	B084721	4.70	10.0	11/08/13
13K0259-08 [LPSB108 0-0.5]	B084721	4.60	10.0	11/08/13
13K0259-09 [LPSB108 4.5-5]	B084721	3.60	10.0	11/08/13
13K0259-10 [LPSB109 0-0.5]	B084721	5.10	10.0	11/08/13
13K0259-11 [LPSB109 9-9.5]	B084721	5.30	10.0	11/08/13
13K0259-12 [LPSB109 14-14.5]	B084721	5.30	10.0	11/08/13
13K0259-13 [LPSB107 0-0.5]	B084721	5.10	10.0	11/08/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0259-14 [LPSB107 10-10.5]	B084846	4.40	10.0	11/11/13
13K0259-15 [LPSB107 13.5-14]	B084846	5.90	10.0	11/11/13

Prep Method: SW-846 5030B-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0259-03 [FB-2]	B084861	5	5.00	11/11/13

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084721 - SW-846 5035										
Blank (B084721-BLK1)				Prepared & Analyzed: 11/08/13						
Acetone	ND	0.10	mg/Kg wet							L-04
Acrylonitrile	ND	0.0060	mg/Kg wet							V-16
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							V-16
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.020	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-05, V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084721 - SW-846 5035												
Blank (B084721-BLK1)				Prepared & Analyzed: 11/08/13								
Methylene Chloride	ND	0.020	mg/Kg wet									
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet									
Naphthalene	ND	0.0040	mg/Kg wet									
n-Propylbenzene	ND	0.0020	mg/Kg wet									
Styrene	ND	0.0020	mg/Kg wet									
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet									
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet									
Tetrachloroethylene	ND	0.0020	mg/Kg wet									
Tetrahydrofuran	ND	0.010	mg/Kg wet								V-16	
Toluene	ND	0.0020	mg/Kg wet									
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet									
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet									
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet									
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet									
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet									
Trichloroethylene	ND	0.0020	mg/Kg wet									
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet									
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet									
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet									
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet									
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet									
Vinyl Chloride	ND	0.010	mg/Kg wet									
m+p Xylene	ND	0.0040	mg/Kg wet									
o-Xylene	ND	0.0020	mg/Kg wet									
Surrogate: 1,2-Dichloroethane-d4	*0.0506*		mg/Kg wet	0.0500		101		70-130				
Surrogate: Toluene-d8	*0.0505*		mg/Kg wet	0.0500		101		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0495*		mg/Kg wet	0.0500		99.0		70-130				
LCS (B084721-BS1)				Prepared & Analyzed: 11/08/13								
Acetone	0.126	0.10	mg/Kg wet	0.200		**63.1**	*	70-160			L-04, V-20	†
Acrylonitrile	0.0159	0.0060	mg/Kg wet	0.0200		79.4		70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0194	0.0010	mg/Kg wet	0.0200		97.0		70-130				
Benzene	0.0183	0.0020	mg/Kg wet	0.0200		91.5		70-130				
Bromobenzene	0.0184	0.0020	mg/Kg wet	0.0200		91.8		70-130				
Bromochloromethane	0.0203	0.0020	mg/Kg wet	0.0200		102		70-130				
Bromodichloromethane	0.0201	0.0020	mg/Kg wet	0.0200		100		70-130				
Bromoform	0.0182	0.0020	mg/Kg wet	0.0200		91.2		70-130				
Bromomethane	0.0174	0.010	mg/Kg wet	0.0200		87.2		40-130			V-20	†
2-Butanone (MEK)	0.154	0.040	mg/Kg wet	0.200		76.8		70-160				†
tert-Butyl Alcohol (TBA)	0.163	0.040	mg/Kg wet	0.200		81.7		40-130			V-16	†
n-Butylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104		70-130				
sec-Butylbenzene	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130				
tert-Butylbenzene	0.0188	0.0020	mg/Kg wet	0.0200		94.2		70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0196	0.0010	mg/Kg wet	0.0200		97.9		70-130				
Carbon Disulfide	0.0203	0.0060	mg/Kg wet	0.0200		102		70-130				
Carbon Tetrachloride	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130				
Chlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		94.8		70-130				
Chlorodibromomethane	0.0197	0.0010	mg/Kg wet	0.0200		98.4		70-130				
Chloroethane	0.0209	0.020	mg/Kg wet	0.0200		104		70-130				
Chloroform	0.0201	0.0040	mg/Kg wet	0.0200		100		70-130				
Chloromethane	0.0181	0.010	mg/Kg wet	0.0200		90.5		70-130				
2-Chlorotoluene	0.0189	0.0020	mg/Kg wet	0.0200		94.7		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084721 - SW-846 5035											
LCS (B084721-BS1)				Prepared & Analyzed: 11/08/13							
4-Chlorotoluene	0.0199	0.0020	mg/Kg wet	0.0200		99.4	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0172	0.0040	mg/Kg wet	0.0200		86.0	70-130				
1,2-Dibromoethane (EDB)	0.0201	0.0010	mg/Kg wet	0.0200		101	70-130				
Dibromomethane	0.0198	0.0020	mg/Kg wet	0.0200		98.8	70-130				
1,2-Dichlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		97.2	70-130				
1,3-Dichlorobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.6	70-130				
1,4-Dichlorobenzene	0.0189	0.0020	mg/Kg wet	0.0200		94.4	70-130				
trans-1,4-Dichloro-2-butene	0.0190	0.0040	mg/Kg wet	0.0200		95.0	70-130				
Dichlorodifluoromethane (Freon 12)	0.0193	0.020	mg/Kg wet	0.0200		96.7	40-160			J	†
1,1-Dichloroethane	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130				
1,2-Dichloroethane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
1,1-Dichloroethylene	0.0215	0.0040	mg/Kg wet	0.0200		107	70-130				
cis-1,2-Dichloroethylene	0.0196	0.0020	mg/Kg wet	0.0200		97.8	70-130				
trans-1,2-Dichloroethylene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
1,2-Dichloropropane	0.0187	0.0020	mg/Kg wet	0.0200		93.5	70-130				
1,3-Dichloropropane	0.0198	0.0010	mg/Kg wet	0.0200		99.1	70-130				
2,2-Dichloropropane	0.0194	0.0020	mg/Kg wet	0.0200		97.1	70-130				
1,1-Dichloropropene	0.0201	0.0020	mg/Kg wet	0.0200		100	70-130				
cis-1,3-Dichloropropene	0.0185	0.0010	mg/Kg wet	0.0200		92.3	70-130				
trans-1,3-Dichloropropene	0.0197	0.0020	mg/Kg wet	0.0200		98.7	70-130				
Diethyl Ether	0.0188	0.020	mg/Kg wet	0.0200		94.2	70-130			J	
Diisopropyl Ether (DIPE)	0.0199	0.0010	mg/Kg wet	0.0200		99.4	70-130				
1,4-Dioxane	0.119	0.10	mg/Kg wet	0.200		59.7	40-160			V-05, V-16	†
Ethylbenzene	0.0193	0.0020	mg/Kg wet	0.0200		96.7	70-130				
Hexachlorobutadiene	0.0228	0.0020	mg/Kg wet	0.0200		114	70-160				
2-Hexanone (MBK)	0.177	0.020	mg/Kg wet	0.200		88.4	70-160				†
Isopropylbenzene (Cumene)	0.0199	0.0020	mg/Kg wet	0.0200		99.5	70-130				
p-Isopropyltoluene (p-Cymene)	0.0196	0.0020	mg/Kg wet	0.0200		97.8	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0203	0.0040	mg/Kg wet	0.0200		102	70-130				
Methylene Chloride	0.0209	0.020	mg/Kg wet	0.0200		105	40-160				†
4-Methyl-2-pentanone (MIBK)	0.185	0.020	mg/Kg wet	0.200		92.3	70-160				†
Naphthalene	0.0171	0.0040	mg/Kg wet	0.0200		85.5	40-130				†
n-Propylbenzene	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130				
Styrene	0.0196	0.0020	mg/Kg wet	0.0200		98.0	70-130				
1,1,1,2-Tetrachloroethane	0.0196	0.0020	mg/Kg wet	0.0200		97.9	70-130				
1,1,2,2-Tetrachloroethane	0.0191	0.0010	mg/Kg wet	0.0200		95.6	70-130				
Tetrachloroethylene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
Tetrahydrofuran	0.0161	0.010	mg/Kg wet	0.0200		80.4	70-130			V-16	
Toluene	0.0193	0.0020	mg/Kg wet	0.0200		96.5	70-130				
1,2,3-Trichlorobenzene	0.0186	0.0020	mg/Kg wet	0.0200		92.9	70-130				
1,2,4-Trichlorobenzene	0.0194	0.0040	mg/Kg wet	0.0200		96.9	70-130				
1,3,5-Trichlorobenzene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
1,1,1-Trichloroethane	0.0197	0.0020	mg/Kg wet	0.0200		98.6	70-130				
1,1,2-Trichloroethane	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130				
Trichloroethylene	0.0184	0.0020	mg/Kg wet	0.0200		92.2	70-130				
Trichlorofluoromethane (Freon 11)	0.0211	0.010	mg/Kg wet	0.0200		106	70-130				
1,2,3-Trichloropropane	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0217	0.010	mg/Kg wet	0.0200		108	70-130				
1,2,4-Trimethylbenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.6	70-130				
1,3,5-Trimethylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.4	70-130				
Vinyl Chloride	0.0181	0.010	mg/Kg wet	0.0200		90.6	40-130				†

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084721 - SW-846 5035												
LCS (B084721-BS1)				Prepared & Analyzed: 11/08/13								
m+p Xylene	0.0392	0.0040	mg/Kg wet	0.0400		97.9		70-130				
o-Xylene	0.0197	0.0020	mg/Kg wet	0.0200		98.5		70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0502*		mg/Kg wet	0.0500		100		70-130				
Surrogate: Toluene-d8	*0.0494*		mg/Kg wet	0.0500		98.8		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0510*		mg/Kg wet	0.0500		102		70-130				
LCS Dup (B084721-BSD1)				Prepared & Analyzed: 11/08/13								
Acetone	0.130	0.10	mg/Kg wet	0.200		**64.9**	*	70-160	2.73	25	L-04, V-20	†
Acrylonitrile	0.0166	0.0060	mg/Kg wet	0.0200		83.0		70-130	4.43	25	V-16	
tert-Amyl Methyl Ether (TAME)	0.0202	0.0010	mg/Kg wet	0.0200		101		70-130	4.14	25		
Benzene	0.0185	0.0020	mg/Kg wet	0.0200		92.6		70-130	1.19	25		
Bromobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.5		70-130	3.95	25		
Bromochloromethane	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130	4.71	25		
Bromodichloromethane	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	2.65	25		
Bromoform	0.0182	0.0020	mg/Kg wet	0.0200		91.2		70-130	0.00	25		
Bromomethane	0.0180	0.010	mg/Kg wet	0.0200		89.8		40-130	2.94	25	V-20	†
2-Butanone (MEK)	0.163	0.040	mg/Kg wet	0.200		81.6		70-160	6.08	25		†
tert-Butyl Alcohol (TBA)	0.174	0.040	mg/Kg wet	0.200		86.8		40-130	6.12	25	V-16	†
n-Butylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104		70-130	0.0965	25		
sec-Butylbenzene	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130	0.300	25		
tert-Butylbenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.7		70-160	1.58	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0202	0.0010	mg/Kg wet	0.0200		101		70-130	3.22	25		
Carbon Disulfide	0.0204	0.0060	mg/Kg wet	0.0200		102		70-130	0.491	25		
Carbon Tetrachloride	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130	1.19	25		
Chlorobenzene	0.0192	0.0020	mg/Kg wet	0.0200		95.9		70-130	1.15	25		
Chlorodibromomethane	0.0200	0.0010	mg/Kg wet	0.0200		99.8		70-130	1.41	25		
Chloroethane	0.0206	0.020	mg/Kg wet	0.0200		103		70-130	1.35	25		
Chloroform	0.0206	0.0040	mg/Kg wet	0.0200		103		70-130	2.36	25		
Chloromethane	0.0183	0.010	mg/Kg wet	0.0200		91.4		70-130	0.990	25		
2-Chlorotoluene	0.0192	0.0020	mg/Kg wet	0.0200		96.2		70-130	1.57	25		
4-Chlorotoluene	0.0205	0.0020	mg/Kg wet	0.0200		102		70-130	2.88	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0173	0.0040	mg/Kg wet	0.0200		86.7		70-130	0.811	25		
1,2-Dibromoethane (EDB)	0.0204	0.0010	mg/Kg wet	0.0200		102		70-130	1.28	25		
Dibromomethane	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	4.26	25		
1,2-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.5		70-130	0.308	25		
1,3-Dichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.1		70-130	0.524	25		
1,4-Dichlorobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.4		70-130	1.05	25		
trans-1,4-Dichloro-2-butene	0.0194	0.0040	mg/Kg wet	0.0200		96.8		70-130	1.88	25		
Dichlorodifluoromethane (Freon 12)	0.0194	0.020	mg/Kg wet	0.0200		97.1		40-160	0.413	25	J	†
1,1-Dichloroethane	0.0198	0.0020	mg/Kg wet	0.0200		98.8		70-130	0.304	25		
1,2-Dichloroethane	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130	2.89	25		
1,1-Dichloroethylene	0.0222	0.0040	mg/Kg wet	0.0200		111		70-130	3.39	25		
cis-1,2-Dichloroethylene	0.0205	0.0020	mg/Kg wet	0.0200		102		70-130	4.69	25		
trans-1,2-Dichloroethylene	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130	3.89	25		
1,2-Dichloropropane	0.0197	0.0020	mg/Kg wet	0.0200		98.5		70-130	5.21	25		
1,3-Dichloropropane	0.0206	0.0010	mg/Kg wet	0.0200		103		70-130	3.86	25		
2,2-Dichloropropane	0.0195	0.0020	mg/Kg wet	0.0200		97.3		70-130	0.206	25		
1,1-Dichloropropene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130	6.28	25		
cis-1,3-Dichloropropene	0.0191	0.0010	mg/Kg wet	0.0200		95.3		70-130	3.20	25		
trans-1,3-Dichloropropene	0.0207	0.0020	mg/Kg wet	0.0200		103		70-130	4.55	25		
Diethyl Ether	0.0212	0.020	mg/Kg wet	0.0200		106		70-130	11.8	25		
Diisopropyl Ether (DIPE)	0.0208	0.0010	mg/Kg wet	0.0200		104		70-130	4.52	25		

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084721 - SW-846 5035												
LCS Dup (B084721-BSD1)				Prepared & Analyzed: 11/08/13								
1,4-Dioxane	0.154	0.10	mg/Kg wet	0.200		77.2		40-160	25.5	50	V-05, V-16	† ‡
Ethylbenzene	0.0198	0.0020	mg/Kg wet	0.0200		98.8		70-130	2.15	25		
Hexachlorobutadiene	0.0217	0.0020	mg/Kg wet	0.0200		109		70-160	4.85	25		
2-Hexanone (MBK)	0.185	0.020	mg/Kg wet	0.200		92.3		70-160	4.37	25		†
Isopropylbenzene (Cumene)	0.0198	0.0020	mg/Kg wet	0.0200		99.2		70-130	0.302	25		
p-Isopropyltoluene (p-Cymene)	0.0194	0.0020	mg/Kg wet	0.0200		97.2		70-130	0.615	25		
Methyl tert-Butyl Ether (MTBE)	0.0217	0.0040	mg/Kg wet	0.0200		108		70-130	6.57	25		
Methylene Chloride	0.0222	0.020	mg/Kg wet	0.0200		111		40-160	5.85	25		†
4-Methyl-2-pentanone (MIBK)	0.195	0.020	mg/Kg wet	0.200		97.6		70-160	5.52	25		†
Naphthalene	0.0173	0.0040	mg/Kg wet	0.0200		86.6		40-130	1.28	25		†
n-Propylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		103		70-130	1.76	25		
Styrene	0.0196	0.0020	mg/Kg wet	0.0200		98.2		70-130	0.204	25		
1,1,1,2-Tetrachloroethane	0.0198	0.0020	mg/Kg wet	0.0200		98.8		70-130	0.915	25		
1,1,2,2-Tetrachloroethane	0.0200	0.0010	mg/Kg wet	0.0200		100		70-130	4.50	25		
Tetrachloroethylene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	2.95	25		
Tetrahydrofuran	0.0186	0.010	mg/Kg wet	0.0200		93.2		70-130	14.7	25	V-16	
Toluene	0.0197	0.0020	mg/Kg wet	0.0200		98.6		70-130	2.15	25		
1,2,3-Trichlorobenzene	0.0188	0.0020	mg/Kg wet	0.0200		93.9		70-130	1.07	25		
1,2,4-Trichlorobenzene	0.0196	0.0040	mg/Kg wet	0.0200		98.2		70-130	1.33	25		
1,3,5-Trichlorobenzene	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	5.12	25		
1,1,1-Trichloroethane	0.0205	0.0020	mg/Kg wet	0.0200		102		70-130	3.88	25		
1,1,2-Trichloroethane	0.0199	0.0020	mg/Kg wet	0.0200		99.4		70-130	0.201	25		
Trichloroethylene	0.0192	0.0020	mg/Kg wet	0.0200		96.0		70-130	4.04	25		
Trichlorofluoromethane (Freon 11)	0.0211	0.010	mg/Kg wet	0.0200		105		70-130	0.284	25		
1,2,3-Trichloropropane	0.0201	0.0020	mg/Kg wet	0.0200		101		70-130	1.97	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0218	0.010	mg/Kg wet	0.0200		109		70-130	0.460	25		
1,2,4-Trimethylbenzene	0.0198	0.0020	mg/Kg wet	0.0200		98.9		70-130	0.304	25		
1,3,5-Trimethylbenzene	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130	0.802	25		
Vinyl Chloride	0.0180	0.010	mg/Kg wet	0.0200		90.1		40-130	0.553	25		†
m+p Xylene	0.0401	0.0040	mg/Kg wet	0.0400		100		70-130	2.27	25		
o-Xylene	0.0200	0.0020	mg/Kg wet	0.0200		99.9		70-130	1.41	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0509*		mg/Kg wet	0.0500		102		70-130				
Surrogate: Toluene-d8	*0.0501*		mg/Kg wet	0.0500		100		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0508*		mg/Kg wet	0.0500		102		70-130				
Matrix Spike (B084721-MS1)		**Source: 13K0259-01**		Prepared & Analyzed: 11/08/13								
Acetone	0.148	0.11	mg/Kg dry	0.220	ND	**67.2**	*	70-130			L-04, MS-08	
Acrylonitrile	0.0158	0.0066	mg/Kg dry	0.0220	ND	71.7		70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0181	0.0011	mg/Kg dry	0.0220	ND	82.4		70-130				
Benzene	0.0163	0.0022	mg/Kg dry	0.0220	ND	74.0		70-130				
Bromobenzene	0.0149	0.0022	mg/Kg dry	0.0220	ND	**67.6**	*	70-130			MS-07	
Bromochloromethane	0.0188	0.0022	mg/Kg dry	0.0220	ND	85.4		70-130				
Bromodichloromethane	0.0187	0.0022	mg/Kg dry	0.0220	ND	84.8		70-130				
Bromoform	0.0160	0.0022	mg/Kg dry	0.0220	ND	72.5		70-130				
Bromomethane	0.0170	0.011	mg/Kg dry	0.0220	ND	77.3		70-130				
2-Butanone (MEK)	0.167	0.044	mg/Kg dry	0.220	ND	75.9		70-130				
tert-Butyl Alcohol (TBA)	0.194	0.044	mg/Kg dry	0.220	ND	87.9		70-130			V-16	
n-Butylbenzene	0.0136	0.0022	mg/Kg dry	0.0220	ND	**61.7**	*	70-130			MS-07	
sec-Butylbenzene	0.0132	0.0022	mg/Kg dry	0.0220	ND	**59.9**	*	70-130			MS-07	
tert-Butylbenzene	0.0141	0.0022	mg/Kg dry	0.0220	ND	**64.2**	*	70-130			MS-07	
tert-Butyl Ethyl Ether (TBEE)	0.0183	0.0011	mg/Kg dry	0.0220	ND	83.1		70-130				
Carbon Disulfide	0.0179	0.0066	mg/Kg dry	0.0220	ND	81.1		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084721 - SW-846 5035											
Matrix Spike (B084721-MS1)		**Source: 13K0259-01**		Prepared & Analyzed: 11/08/13							
Carbon Tetrachloride	0.0171	0.0022	mg/Kg dry	0.0220	ND	77.7		70-130			
Chlorobenzene	0.0153	0.0022	mg/Kg dry	0.0220	ND	**69.5**	*	70-130			MS-07
Chlorodibromomethane	0.0181	0.0011	mg/Kg dry	0.0220	ND	82.1		70-130			
Chloroethane	0.0196	0.022	mg/Kg dry	0.0220	ND	89.1		70-130			J
Chloroform	0.0187	0.0044	mg/Kg dry	0.0220	ND	84.9		70-130			
Chloromethane	0.0160	0.011	mg/Kg dry	0.0220	ND	72.8		70-130			
2-Chlorotoluene	0.0144	0.0022	mg/Kg dry	0.0220	ND	**65.2**	*	70-130			MS-07
4-Chlorotoluene	0.0149	0.0022	mg/Kg dry	0.0220	ND	**67.8**	*	70-130			MS-07
1,2-Dibromo-3-chloropropane (DBCP)	0.0174	0.0044	mg/Kg dry	0.0220	ND	78.8		70-130			
1,2-Dibromoethane (EDB)	0.0196	0.0011	mg/Kg dry	0.0220	ND	89.1		70-130			
Dibromomethane	0.0206	0.0022	mg/Kg dry	0.0220	ND	93.5		70-130			
1,2-Dichlorobenzene	0.0145	0.0022	mg/Kg dry	0.0220	ND	**66.0**	*	70-130			MS-07
1,3-Dichlorobenzene	0.0143	0.0022	mg/Kg dry	0.0220	ND	**65.1**	*	70-130			MS-07
1,4-Dichlorobenzene	0.0138	0.0022	mg/Kg dry	0.0220	ND	**62.5**	*	70-130			MS-07
trans-1,4-Dichloro-2-butene	0.0179	0.0044	mg/Kg dry	0.0220	ND	81.3		70-130			
Dichlorodifluoromethane (Freon 12)	0.0170	0.022	mg/Kg dry	0.0220	ND	77.3		70-130			J
1,1-Dichloroethane	0.0174	0.0022	mg/Kg dry	0.0220	ND	79.2		70-130			
1,2-Dichloroethane	0.0207	0.0022	mg/Kg dry	0.0220	ND	94.0		70-130			
1,1-Dichloroethylene	0.0205	0.0044	mg/Kg dry	0.0220	ND	92.9		70-130			
cis-1,2-Dichloroethylene	0.0178	0.0022	mg/Kg dry	0.0220	ND	80.8		70-130			
trans-1,2-Dichloroethylene	0.0183	0.0022	mg/Kg dry	0.0220	ND	83.3		70-130			
1,2-Dichloropropane	0.0172	0.0022	mg/Kg dry	0.0220	ND	78.0		70-130			
1,3-Dichloropropane	0.0201	0.0011	mg/Kg dry	0.0220	ND	91.5		70-130			
2,2-Dichloropropane	0.0169	0.0022	mg/Kg dry	0.0220	ND	76.6		70-130			
1,1-Dichloropropene	0.0168	0.0022	mg/Kg dry	0.0220	ND	76.5		70-130			
cis-1,3-Dichloropropene	0.0167	0.0011	mg/Kg dry	0.0220	ND	75.7		70-130			
trans-1,3-Dichloropropene	0.0178	0.0022	mg/Kg dry	0.0220	ND	81.0		70-130			
Diethyl Ether	0.0205	0.022	mg/Kg dry	0.0220	ND	92.9		70-130			J
Diisopropyl Ether (DIPE)	0.0174	0.0011	mg/Kg dry	0.0220	ND	79.2		70-130			
1,4-Dioxane	0.159	0.11	mg/Kg dry	0.220	ND	72.2		70-130			V-05, V-16
Ethylbenzene	0.0158	0.0022	mg/Kg dry	0.0220	ND	71.6		70-130			
Hexachlorobutadiene	0.0124	0.0022	mg/Kg dry	0.0220	ND	**56.4**	*	70-130			MS-07
2-Hexanone (MBK)	0.182	0.022	mg/Kg dry	0.220	ND	82.6		70-130			
Isopropylbenzene (Cumene)	0.0146	0.0022	mg/Kg dry	0.0220	ND	**66.5**	*	70-130			MS-07
p-Isopropyltoluene (p-Cymene)	0.0140	0.0022	mg/Kg dry	0.0220	ND	**63.7**	*	70-130			MS-07
Methyl tert-Butyl Ether (MTBE)	0.0204	0.0044	mg/Kg dry	0.0220	ND	92.7		70-130			
Methylene Chloride	0.0211	0.022	mg/Kg dry	0.0220	ND	95.7		70-130			J
4-Methyl-2-pentanone (MIBK)	0.195	0.022	mg/Kg dry	0.220	ND	88.8		70-130			
Naphthalene	0.0131	0.0044	mg/Kg dry	0.0220	ND	**59.7**	*	70-130			MS-07
n-Propylbenzene	0.0145	0.0022	mg/Kg dry	0.0220	ND	**65.7**	*	70-130			MS-07
Styrene	0.0157	0.0022	mg/Kg dry	0.0220	ND	71.3		70-130			
1,1,1,2-Tetrachloroethane	0.0173	0.0022	mg/Kg dry	0.0220	ND	78.5		70-130			
1,1,2,2-Tetrachloroethane	0.0182	0.0011	mg/Kg dry	0.0220	ND	82.8		70-130			
Tetrachloroethylene	0.0167	0.0022	mg/Kg dry	0.0220	ND	75.9		70-130			
Tetrahydrofuran	0.0177	0.011	mg/Kg dry	0.0220	ND	80.2		70-130			V-16
Toluene	0.0168	0.0022	mg/Kg dry	0.0220	ND	76.3		70-130			
1,2,3-Trichlorobenzene	0.0119	0.0022	mg/Kg dry	0.0220	ND	**54.2**	*	70-130			MS-07
1,2,4-Trichlorobenzene	0.0112	0.0044	mg/Kg dry	0.0220	ND	**50.7**	*	70-130			MS-07
1,3,5-Trichlorobenzene	0.0131	0.0022	mg/Kg dry	0.0220	ND	**59.3**	*	70-130			MS-07
1,1,1-Trichloroethane	0.0179	0.0022	mg/Kg dry	0.0220	ND	81.1		70-130			
1,1,2-Trichloroethane	0.0196	0.0022	mg/Kg dry	0.0220	ND	89.2		70-130			
Trichloroethylene	0.0164	0.0022	mg/Kg dry	0.0220	ND	74.5		70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084721 - SW-846 5035											
Matrix Spike (B084721-MS1)	**Source: 13K0259-01**			Prepared & Analyzed: 11/08/13							
Trichlorofluoromethane (Freon 11)	0.0194	0.011	mg/Kg dry	0.0220	ND	88.0		70-130			
1,2,3-Trichloropropane	0.0191	0.0022	mg/Kg dry	0.0220	ND	86.7		70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0193	0.011	mg/Kg dry	0.0220	ND	87.6		70-130			
1,2,4-Trimethylbenzene	0.0152	0.0022	mg/Kg dry	0.0220	ND	**69.1**	*	70-130			MS-07
1,3,5-Trimethylbenzene	0.0147	0.0022	mg/Kg dry	0.0220	ND	**66.8**	*	70-130			MS-07
Vinyl Chloride	0.0163	0.011	mg/Kg dry	0.0220	ND	74.2		70-130			
m+p Xylene	0.0314	0.0044	mg/Kg dry	0.0440	ND	71.4		70-130			
o-Xylene	0.0157	0.0022	mg/Kg dry	0.0220	ND	71.3		70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0583*		mg/Kg dry	0.0550		106		70-130			
Surrogate: Toluene-d8	*0.0543*		mg/Kg dry	0.0550		98.6		70-130			
Surrogate: 4-Bromofluorobenzene	*0.0550*		mg/Kg dry	0.0550		99.9		70-130			
Batch B084846 - SW-846 5035											
Blank (B084846-BLK1)				Prepared & Analyzed: 11/11/13							
Acetone	ND	0.10	mg/Kg wet								
Acrylonitrile	ND	0.0060	mg/Kg wet								V-16
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet								
Benzene	ND	0.0020	mg/Kg wet								
Bromobenzene	ND	0.0020	mg/Kg wet								
Bromochloromethane	ND	0.0020	mg/Kg wet								
Bromodichloromethane	ND	0.0020	mg/Kg wet								
Bromoform	ND	0.0020	mg/Kg wet								
Bromomethane	ND	0.010	mg/Kg wet								
2-Butanone (MEK)	ND	0.040	mg/Kg wet								
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet								V-16
n-Butylbenzene	ND	0.0020	mg/Kg wet								
sec-Butylbenzene	ND	0.0020	mg/Kg wet								
tert-Butylbenzene	ND	0.0020	mg/Kg wet								
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet								
Carbon Disulfide	ND	0.0060	mg/Kg wet								
Carbon Tetrachloride	ND	0.0020	mg/Kg wet								
Chlorobenzene	ND	0.0020	mg/Kg wet								
Chlorodibromomethane	ND	0.0010	mg/Kg wet								
Chloroethane	ND	0.020	mg/Kg wet								
Chloroform	ND	0.0040	mg/Kg wet								
Chloromethane	ND	0.010	mg/Kg wet								
2-Chlorotoluene	ND	0.0020	mg/Kg wet								
4-Chlorotoluene	ND	0.0020	mg/Kg wet								
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet								
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet								
Dibromomethane	ND	0.0020	mg/Kg wet								
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet								
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet								
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet								
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet								
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet								
1,1-Dichloroethane	ND	0.0020	mg/Kg wet								
1,2-Dichloroethane	ND	0.0020	mg/Kg wet								
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet								
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet								
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet								

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084846 - SW-846 5035										
Blank (B084846-BLK1)				Prepared & Analyzed: 11/11/13						
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-05, V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methylene Chloride	ND	0.020	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Naphthalene	ND	0.0040	mg/Kg wet							
n-Propylbenzene	ND	0.0020	mg/Kg wet							
Styrene	ND	0.0020	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet							
Tetrachloroethylene	ND	0.0020	mg/Kg wet							
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-05, V-16
Toluene	ND	0.0020	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet							
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet							
Trichloroethylene	ND	0.0020	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet							
Vinyl Chloride	ND	0.010	mg/Kg wet							
m+p Xylene	ND	0.0040	mg/Kg wet							
o-Xylene	ND	0.0020	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0493*		mg/Kg wet	0.0500		98.7	70-130			
Surrogate: Toluene-d8	*0.0491*		mg/Kg wet	0.0500		98.1	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0498*		mg/Kg wet	0.0500		99.6	70-130			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035												
LCS (B084846-BS1)				Prepared & Analyzed: 11/11/13								
Acetone	0.126	0.10	mg/Kg wet	0.200		**63.2**	*	70-160			L-07, V-20	†
Acrylonitrile	0.0172	0.0060	mg/Kg wet	0.0200		85.8		70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0188	0.0010	mg/Kg wet	0.0200		93.8		70-130				
Benzene	0.0181	0.0020	mg/Kg wet	0.0200		90.7		70-130				
Bromobenzene	0.0169	0.0020	mg/Kg wet	0.0200		84.7		70-130				
Bromochloromethane	0.0199	0.0020	mg/Kg wet	0.0200		99.4		70-130				
Bromodichloromethane	0.0197	0.0020	mg/Kg wet	0.0200		98.7		70-130				
Bromoform	0.0178	0.0020	mg/Kg wet	0.0200		89.2		70-130				
Bromomethane	0.0184	0.010	mg/Kg wet	0.0200		91.8		40-130			V-20	†
2-Butanone (MEK)	0.140	0.040	mg/Kg wet	0.200		70.2		70-160				†
tert-Butyl Alcohol (TBA)	0.146	0.040	mg/Kg wet	0.200		73.2		40-130			V-16	†
n-Butylbenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.0		70-130				
sec-Butylbenzene	0.0181	0.0020	mg/Kg wet	0.0200		90.4		70-130				
tert-Butylbenzene	0.0176	0.0020	mg/Kg wet	0.0200		87.9		70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0191	0.0010	mg/Kg wet	0.0200		95.5		70-130				
Carbon Disulfide	0.0208	0.0060	mg/Kg wet	0.0200		104		70-130				
Carbon Tetrachloride	0.0199	0.0020	mg/Kg wet	0.0200		99.7		70-130				
Chlorobenzene	0.0179	0.0020	mg/Kg wet	0.0200		89.5		70-130				
Chlorodibromomethane	0.0188	0.0010	mg/Kg wet	0.0200		94.0		70-130				
Chloroethane	0.0215	0.020	mg/Kg wet	0.0200		108		70-130				
Chloroform	0.0202	0.0040	mg/Kg wet	0.0200		101		70-130				
Chloromethane	0.0153	0.010	mg/Kg wet	0.0200		76.7		70-130				
2-Chlorotoluene	0.0180	0.0020	mg/Kg wet	0.0200		89.9		70-130				
4-Chlorotoluene	0.0189	0.0020	mg/Kg wet	0.0200		94.5		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0164	0.0040	mg/Kg wet	0.0200		81.8		70-130				
1,2-Dibromoethane (EDB)	0.0193	0.0010	mg/Kg wet	0.0200		96.7		70-130				
Dibromomethane	0.0195	0.0020	mg/Kg wet	0.0200		97.5		70-130				
1,2-Dichlorobenzene	0.0181	0.0020	mg/Kg wet	0.0200		90.6		70-130				
1,3-Dichlorobenzene	0.0175	0.0020	mg/Kg wet	0.0200		87.7		70-130				
1,4-Dichlorobenzene	0.0177	0.0020	mg/Kg wet	0.0200		88.5		70-130				
trans-1,4-Dichloro-2-butene	0.0174	0.0040	mg/Kg wet	0.0200		86.9		70-130				
Dichlorodifluoromethane (Freon 12)	0.0166	0.020	mg/Kg wet	0.0200		83.1		40-160			J	†
1,1-Dichloroethane	0.0195	0.0020	mg/Kg wet	0.0200		97.4		70-130				
1,2-Dichloroethane	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130				
1,1-Dichloroethylene	0.0229	0.0040	mg/Kg wet	0.0200		114		70-130				
cis-1,2-Dichloroethylene	0.0191	0.0020	mg/Kg wet	0.0200		95.6		70-130				
trans-1,2-Dichloroethylene	0.0199	0.0020	mg/Kg wet	0.0200		99.4		70-130				
1,2-Dichloropropane	0.0182	0.0020	mg/Kg wet	0.0200		90.8		70-130				
1,3-Dichloropropane	0.0199	0.0010	mg/Kg wet	0.0200		99.5		70-130				
2,2-Dichloropropane	0.0199	0.0020	mg/Kg wet	0.0200		99.6		70-130				
1,1-Dichloropropene	0.0196	0.0020	mg/Kg wet	0.0200		97.8		70-130				
cis-1,3-Dichloropropene	0.0180	0.0010	mg/Kg wet	0.0200		89.8		70-130				
trans-1,3-Dichloropropene	0.0193	0.0020	mg/Kg wet	0.0200		96.3		70-130				
Diethyl Ether	0.0198	0.020	mg/Kg wet	0.0200		99.2		70-130			J	
Diisopropyl Ether (DIPE)	0.0193	0.0010	mg/Kg wet	0.0200		96.7		70-130				
1,4-Dioxane	0.118	0.10	mg/Kg wet	0.200		58.8		40-160			V-05, V-16	†
Ethylbenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.1		70-130				
Hexachlorobutadiene	0.0210	0.0020	mg/Kg wet	0.0200		105		70-160				
2-Hexanone (MBK)	0.163	0.020	mg/Kg wet	0.200		81.7		70-160				†
Isopropylbenzene (Cumene)	0.0186	0.0020	mg/Kg wet	0.0200		93.0		70-130				
p-Isopropyltoluene (p-Cymene)	0.0181	0.0020	mg/Kg wet	0.0200		90.3		70-130				
Methyl tert-Butyl Ether (MTBE)	0.0199	0.0040	mg/Kg wet	0.0200		99.4		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035											
LCS (B084846-BS1)				Prepared & Analyzed: 11/11/13							
Methylene Chloride	0.0200	0.020	mg/Kg wet	0.0200		99.8	40-160			J	†
4-Methyl-2-pentanone (MIBK)	0.170	0.020	mg/Kg wet	0.200		85.0	70-160				†
Naphthalene	0.0158	0.0040	mg/Kg wet	0.0200		78.8	40-130				†
n-Propylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		96.2	70-130				
Styrene	0.0187	0.0020	mg/Kg wet	0.0200		93.4	70-130				
1,1,1,2-Tetrachloroethane	0.0189	0.0020	mg/Kg wet	0.0200		94.6	70-130				
1,1,2,2-Tetrachloroethane	0.0187	0.0010	mg/Kg wet	0.0200		93.7	70-130				
Tetrachloroethylene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
Tetrahydrofuran	0.0159	0.010	mg/Kg wet	0.0200		79.7	70-130			V-05, V-16	
Toluene	0.0188	0.0020	mg/Kg wet	0.0200		93.8	70-130				
1,2,3-Trichlorobenzene	0.0178	0.0020	mg/Kg wet	0.0200		88.9	70-130				
1,2,4-Trichlorobenzene	0.0183	0.0040	mg/Kg wet	0.0200		91.4	70-130				
1,3,5-Trichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130				
1,1,1-Trichloroethane	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130				
1,1,2-Trichloroethane	0.0190	0.0020	mg/Kg wet	0.0200		94.9	70-130				
Trichloroethylene	0.0184	0.0020	mg/Kg wet	0.0200		91.9	70-130				
Trichlorofluoromethane (Freon 11)	0.0233	0.010	mg/Kg wet	0.0200		116	70-130				
1,2,3-Trichloropropane	0.0183	0.0020	mg/Kg wet	0.0200		91.3	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0221	0.010	mg/Kg wet	0.0200		111	70-130				
1,2,4-Trimethylbenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.1	70-130				
1,3,5-Trimethylbenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.7	70-130				
Vinyl Chloride	0.0163	0.010	mg/Kg wet	0.0200		81.3	40-130				†
m+p Xylene	0.0370	0.0040	mg/Kg wet	0.0400		92.5	70-130				
o-Xylene	0.0187	0.0020	mg/Kg wet	0.0200		93.5	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0515*		mg/Kg wet	0.0500		103	70-130				
Surrogate: Toluene-d8	*0.0495*		mg/Kg wet	0.0500		99.0	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0509*		mg/Kg wet	0.0500		102	70-130				
LCS Dup (B084846-BSD1)				Prepared & Analyzed: 11/11/13							
Acetone	0.147	0.10	mg/Kg wet	0.200		73.6	70-160	15.3	25	V-20	†
Acrylonitrile	0.0167	0.0060	mg/Kg wet	0.0200		83.3	70-130	2.96	25	V-16	
tert-Amyl Methyl Ether (TAME)	0.0211	0.0010	mg/Kg wet	0.0200		105	70-130	11.6	25		
Benzene	0.0194	0.0020	mg/Kg wet	0.0200		97.0	70-130	6.71	25		
Bromobenzene	0.0196	0.0020	mg/Kg wet	0.0200		98.1	70-130	14.7	25		
Bromochloromethane	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130	11.2	25		
Bromodichloromethane	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130	10.3	25		
Bromoform	0.0193	0.0020	mg/Kg wet	0.0200		96.5	70-130	7.86	25		
Bromomethane	0.0226	0.010	mg/Kg wet	0.0200		113	40-130	20.9	25	V-20	†
2-Butanone (MEK)	0.166	0.040	mg/Kg wet	0.200		83.2	70-160	16.9	25		†
tert-Butyl Alcohol (TBA)	0.177	0.040	mg/Kg wet	0.200		88.4	40-130	18.9	25	V-16	†
n-Butylbenzene	0.0211	0.0020	mg/Kg wet	0.0200		106	70-130	10.6	25		
sec-Butylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		101	70-130	10.7	25		
tert-Butylbenzene	0.0194	0.0020	mg/Kg wet	0.0200		96.9	70-160	9.74	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0209	0.0010	mg/Kg wet	0.0200		104	70-130	9.00	25		
Carbon Disulfide	0.0223	0.0060	mg/Kg wet	0.0200		112	70-130	7.05	25		
Carbon Tetrachloride	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130	9.19	25		
Chlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	10.4	25		
Chlorodibromomethane	0.0213	0.0010	mg/Kg wet	0.0200		107	70-130	12.6	25		
Chloroethane	0.0224	0.020	mg/Kg wet	0.0200		112	70-130	4.01	25		
Chloroform	0.0217	0.0040	mg/Kg wet	0.0200		109	70-130	7.45	25		
Chloromethane	0.0159	0.010	mg/Kg wet	0.0200		79.4	70-130	3.46	25		
2-Chlorotoluene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	12.9	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035											
LCS Dup (B084846-BSD1)				Prepared & Analyzed: 11/11/13							
4-Chlorotoluene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	11.3	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0196	0.0040	mg/Kg wet	0.0200		98.2	70-130	18.2	25		
1,2-Dibromoethane (EDB)	0.0217	0.0010	mg/Kg wet	0.0200		108	70-130	11.5	25		
Dibromomethane	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130	12.0	25		
1,2-Dichlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	9.16	25		
1,3-Dichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.3	70-130	11.4	25		
1,4-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.7	70-130	9.88	25		
trans-1,4-Dichloro-2-butene	0.0200	0.0040	mg/Kg wet	0.0200		100	70-130	14.1	25		
Dichlorodifluoromethane (Freon 12)	0.0179	0.020	mg/Kg wet	0.0200		89.3	40-160	7.19	25	J	†
1,1-Dichloroethane	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	8.93	25		
1,2-Dichloroethane	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	6.87	25		
1,1-Dichloroethylene	0.0249	0.0040	mg/Kg wet	0.0200		125	70-130	8.53	25		
cis-1,2-Dichloroethylene	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130	8.99	25		
trans-1,2-Dichloroethylene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	4.52	25		
1,2-Dichloropropane	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130	8.84	25		
1,3-Dichloropropane	0.0221	0.0010	mg/Kg wet	0.0200		110	70-130	10.3	25		
2,2-Dichloropropane	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	6.51	25		
1,1-Dichloropropene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	10.3	25		
cis-1,3-Dichloropropene	0.0196	0.0010	mg/Kg wet	0.0200		98.0	70-130	8.73	25		
trans-1,3-Dichloropropene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	9.68	25		
Diethyl Ether	0.0224	0.020	mg/Kg wet	0.0200		112	70-130	12.3	25		
Diisopropyl Ether (DIPE)	0.0212	0.0010	mg/Kg wet	0.0200		106	70-130	9.08	25		
1,4-Dioxane	0.156	0.10	mg/Kg wet	0.200		77.8	40-160	27.9	50	V-05, V-16	† ‡
Ethylbenzene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130	9.12	25		
Hexachlorobutadiene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-160	6.35	25		
2-Hexanone (MBK)	0.184	0.020	mg/Kg wet	0.200		91.8	70-160	11.6	25		†
Isopropylbenzene (Cumene)	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	11.2	25		
p-Isopropyltoluene (p-Cymene)	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130	9.39	25		
Methyl tert-Butyl Ether (MTBE)	0.0223	0.0040	mg/Kg wet	0.0200		111	70-130	11.4	25		
Methylene Chloride	0.0219	0.020	mg/Kg wet	0.0200		110	40-160	9.27	25		†
4-Methyl-2-pentanone (MIBK)	0.197	0.020	mg/Kg wet	0.200		98.6	70-160	14.8	25		†
Naphthalene	0.0174	0.0040	mg/Kg wet	0.0200		86.9	40-130	9.78	25		†
n-Propylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	8.75	25		
Styrene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.70	25		
1,1,1,2-Tetrachloroethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	9.56	25		
1,1,2,2-Tetrachloroethane	0.0214	0.0010	mg/Kg wet	0.0200		107	70-130	13.1	25		
Tetrachloroethylene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	6.06	25		
Tetrahydrofuran	0.0155	0.010	mg/Kg wet	0.0200		77.5	70-130	2.80	25	V-05, V-16	
Toluene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.18	25		
1,2,3-Trichlorobenzene	0.0187	0.0020	mg/Kg wet	0.0200		93.6	70-130	5.15	25		
1,2,4-Trichlorobenzene	0.0202	0.0040	mg/Kg wet	0.0200		101	70-130	9.88	25		
1,3,5-Trichlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	4.66	25		
1,1,1-Trichloroethane	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	6.38	25		
1,1,2-Trichloroethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	9.53	25		
Trichloroethylene	0.0193	0.0020	mg/Kg wet	0.0200		96.4	70-130	4.78	25		
Trichlorofluoromethane (Freon 11)	0.0257	0.010	mg/Kg wet	0.0200		129	70-130	9.96	25		
1,2,3-Trichloropropane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	13.0	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0251	0.010	mg/Kg wet	0.0200		125	70-130	12.5	25		
1,2,4-Trimethylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	7.52	25		
1,3,5-Trimethylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	12.4	25		
Vinyl Chloride	0.0175	0.010	mg/Kg wet	0.0200		87.5	40-130	7.35	25		†

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Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084846 - SW-846 5035										
LCS Dup (B084846-BSD1)				Prepared & Analyzed: 11/11/13						
m+p Xylene	0.0411	0.0040	mg/Kg wet	0.0400		103	70-130	10.5	25	
o-Xylene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	8.99	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0519*		mg/Kg wet	0.0500		104	70-130			
Surrogate: Toluene-d8	*0.0498*		mg/Kg wet	0.0500		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0518*		mg/Kg wet	0.0500		104	70-130			
Batch B084861 - SW-846 5030B										
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13						
Acetone	ND	50	µg/L							
Acrylonitrile	ND	5.0	µg/L							
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L							
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	µg/L							
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	0.50	µg/L							
Bromoform	ND	1.0	µg/L							R-05
Bromomethane	ND	2.0	µg/L							R-05
2-Butanone (MEK)	ND	20	µg/L							
tert-Butyl Alcohol (TBA)	ND	20	µg/L							R-05, V-16
n-Butylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	1.0	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	4.0	µg/L							
Carbon Tetrachloride	ND	5.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							R-05
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L							R-05
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Diethyl Ether	ND	2.0	µg/L							

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L								
1,4-Dioxane	ND	50	µg/L							V-16	
Ethylbenzene	ND	1.0	µg/L								
Hexachlorobutadiene	ND	0.50	µg/L								
2-Hexanone (MBK)	ND	10	µg/L								
Isopropylbenzene (Cumene)	ND	1.0	µg/L								
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L								
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L								
Methylene Chloride	ND	5.0	µg/L								
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L								
Naphthalene	ND	2.0	µg/L								
n-Propylbenzene	ND	1.0	µg/L								
Styrene	ND	1.0	µg/L								
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L								
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L								
Tetrachloroethylene	ND	1.0	µg/L								
Tetrahydrofuran	ND	10	µg/L								
Toluene	ND	1.0	µg/L								
1,2,3-Trichlorobenzene	ND	5.0	µg/L								
1,2,4-Trichlorobenzene	ND	1.0	µg/L								
1,3,5-Trichlorobenzene	ND	1.0	µg/L								
1,1,1-Trichloroethane	ND	1.0	µg/L								
1,1,2-Trichloroethane	ND	1.0	µg/L								
Trichloroethylene	ND	1.0	µg/L								
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L								
1,2,3-Trichloropropane	ND	2.0	µg/L								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L								
1,2,4-Trimethylbenzene	ND	1.0	µg/L								
1,3,5-Trimethylbenzene	ND	1.0	µg/L								
Vinyl Chloride	ND	2.0	µg/L							R-05	
m+p Xylene	ND	2.0	µg/L								
o-Xylene	ND	1.0	µg/L								
Surrogate: 1,2-Dichloroethane-d4	*25.3*		µg/L	25.0		101	70-130				
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130				
Surrogate: 4-Bromofluorobenzene	*25.4*		µg/L	25.0		102	70-130				
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	90.7	50	µg/L	100		90.7	70-160				†
Acrylonitrile	10.9	5.0	µg/L	10.0		109	70-130				
tert-Amyl Methyl Ether (TAME)	11.1	0.50	µg/L	10.0		111	70-130				
Benzene	11.4	1.0	µg/L	10.0		114	70-130				
Bromobenzene	10.8	1.0	µg/L	10.0		108	70-130				
Bromochloromethane	11.8	1.0	µg/L	10.0		118	70-130				
Bromodichloromethane	10.4	0.50	µg/L	10.0		104	70-130				
Bromoform	9.61	1.0	µg/L	10.0		96.1	70-130			R-05	
Bromomethane	5.70	2.0	µg/L	10.0		57.0	40-160			R-05, V-20	†
2-Butanone (MEK)	101	20	µg/L	100		101	40-160				†
tert-Butyl Alcohol (TBA)	80.0	20	µg/L	100		80.0	40-160			R-05, V-16	†
n-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
sec-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
tert-Butylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
tert-Butyl Ethyl Ether (TBEE)	11.7	0.50	µg/L	10.0		117	70-130				

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Carbon Disulfide	12.9	4.0	µg/L	10.0		129	70-130				
Carbon Tetrachloride	9.26	5.0	µg/L	10.0		92.6	70-130				
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130				
Chlorodibromomethane	9.84	0.50	µg/L	10.0		98.4	70-130				
Chloroethane	12.8	2.0	µg/L	10.0		128	70-130				
Chloroform	10.8	2.0	µg/L	10.0		108	70-130				
Chloromethane	11.6	2.0	µg/L	10.0		116	40-160			V-20	†
2-Chlorotoluene	11.2	1.0	µg/L	10.0		112	70-130				
4-Chlorotoluene	11.0	1.0	µg/L	10.0		110	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	9.41	5.0	µg/L	10.0		94.1	70-130			R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130				
Dibromomethane	10.2	1.0	µg/L	10.0		102	70-130				
1,2-Dichlorobenzene	11.6	1.0	µg/L	10.0		116	70-130				
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117	70-130				
1,4-Dichlorobenzene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,4-Dichloro-2-butene	7.28	2.0	µg/L	10.0		72.8	70-130			R-05	
Dichlorodifluoromethane (Freon 12)	6.29	2.0	µg/L	10.0		62.9	40-160				†
1,1-Dichloroethane	11.6	1.0	µg/L	10.0		116	70-130				
1,2-Dichloroethane	9.31	1.0	µg/L	10.0		93.1	70-130				
1,1-Dichloroethylene	11.1	1.0	µg/L	10.0		111	70-130				
cis-1,2-Dichloroethylene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,2-Dichloroethylene	11.3	1.0	µg/L	10.0		113	70-130				
1,2-Dichloropropane	10.7	1.0	µg/L	10.0		107	70-130				
1,3-Dichloropropane	11.7	0.50	µg/L	10.0		117	70-130				
2,2-Dichloropropane	9.92	1.0	µg/L	10.0		99.2	40-130				†
1,1-Dichloropropene	11.4	2.0	µg/L	10.0		114	70-130				
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130				
trans-1,3-Dichloropropene	10.8	0.50	µg/L	10.0		108	70-130				
Diethyl Ether	10.3	2.0	µg/L	10.0		103	70-130				
Diisopropyl Ether (DIPE)	13.0	0.50	µg/L	10.0		130	70-130				
1,4-Dioxane	65.1	50	µg/L	100		65.1	40-130			V-16	†
Ethylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
Hexachlorobutadiene	13.7	0.50	µg/L	10.0		**137**	70-130	*		L-07	
2-Hexanone (MBK)	95.4	10	µg/L	100		95.4	70-160				†
Isopropylbenzene (Cumene)	10.7	1.0	µg/L	10.0		107	70-130				
p-Isopropyltoluene (p-Cymene)	11.3	1.0	µg/L	10.0		113	70-130				
Methyl tert-Butyl Ether (MTBE)	11.5	1.0	µg/L	10.0		115	70-130				
Methylene Chloride	11.3	5.0	µg/L	10.0		113	70-130				
4-Methyl-2-pentanone (MIBK)	102	10	µg/L	100		102	70-160				†
Naphthalene	11.6	2.0	µg/L	10.0		116	40-130				†
n-Propylbenzene	11.0	1.0	µg/L	10.0		110	70-130				
Styrene	10.9	1.0	µg/L	10.0		109	70-130				
1,1,1,2-Tetrachloroethane	9.98	1.0	µg/L	10.0		99.8	70-130				
1,1,2,2-Tetrachloroethane	11.4	0.50	µg/L	10.0		114	70-130				
Tetrachloroethylene	11.2	1.0	µg/L	10.0		112	70-130				
Tetrahydrofuran	9.37	10	µg/L	10.0		93.7	70-130			J	
Toluene	10.8	1.0	µg/L	10.0		108	70-130				
1,2,3-Trichlorobenzene	12.2	5.0	µg/L	10.0		122	70-130				
1,2,4-Trichlorobenzene	12.4	1.0	µg/L	10.0		124	70-130				
1,3,5-Trichlorobenzene	12.7	1.0	µg/L	10.0		127	70-130				
1,1,1-Trichloroethane	9.17	1.0	µg/L	10.0		91.7	70-130				
1,1,2-Trichloroethane	10.3	1.0	µg/L	10.0		103	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13								
Trichloroethylene	9.51	1.0	µg/L	10.0		95.1	70-130					
Trichlorofluoromethane (Freon 11)	9.36	2.0	µg/L	10.0		93.6	70-130					
1,2,3-Trichloropropane	11.1	2.0	µg/L	10.0		111	70-130					
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	11.3	1.0	µg/L	10.0		113	70-130					
1,2,4-Trimethylbenzene	10.9	1.0	µg/L	10.0		109	70-130					
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130					
Vinyl Chloride	9.74	2.0	µg/L	10.0		97.4	40-160				R-05	†
m+p Xylene	21.8	2.0	µg/L	20.0		109	70-130					
o-Xylene	10.9	1.0	µg/L	10.0		109	70-130					
Surrogate: 1,2-Dichloroethane-d4	*24.0*		µg/L	25.0		95.9	70-130					
Surrogate: Toluene-d8	*24.7*		µg/L	25.0		98.8	70-130					
Surrogate: 4-Bromofluorobenzene	*24.2*		µg/L	25.0		96.9	70-130					
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13								
Acetone	107	50	µg/L	100		107	70-160	16.7		25		†
Acrylonitrile	10.5	5.0	µg/L	10.0		105	70-130	3.36		25		
tert-Amyl Methyl Ether (TAME)	10.0	0.50	µg/L	10.0		100	70-130	9.67		25		
Benzene	9.82	1.0	µg/L	10.0		98.2	70-130	14.7		25		
Bromobenzene	10.3	1.0	µg/L	10.0		103	70-130	4.94		25		
Bromochloromethane	10.1	1.0	µg/L	10.0		101	70-130	15.4		25		
Bromodichloromethane	11.2	0.50	µg/L	10.0		112	70-130	7.97		25		
Bromoform	12.4	1.0	µg/L	10.0		124	70-130	**25.2**	*	25	R-05	
Bromomethane	9.01	2.0	µg/L	10.0		90.1	40-160	**45.0**	*	25	R-05, V-20	†
2-Butanone (MEK)	115	20	µg/L	100		115	40-160	13.2		25		†
tert-Butyl Alcohol (TBA)	111	20	µg/L	100		111	40-160	**32.3**	*	25	R-05, V-16	†
n-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	9.68		25		
sec-Butylbenzene	10.4	1.0	µg/L	10.0		104	70-130	9.82		25		
tert-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	8.47		25		
tert-Butyl Ethyl Ether (TBEE)	10.5	0.50	µg/L	10.0		105	70-130	10.9		25		
Carbon Disulfide	10.9	4.0	µg/L	10.0		109	70-130	16.2		25		
Carbon Tetrachloride	11.0	5.0	µg/L	10.0		110	70-130	16.9		25		
Chlorobenzene	10.3	1.0	µg/L	10.0		103	70-130	7.32		25		
Chlorodibromomethane	11.6	0.50	µg/L	10.0		116	70-130	16.5		25		
Chloroethane	11.4	2.0	µg/L	10.0		114	70-130	12.2		25		
Chloroform	10.5	2.0	µg/L	10.0		105	70-130	3.28		25		
Chloromethane	9.82	2.0	µg/L	10.0		98.2	40-160	17.0		25	V-20	†
2-Chlorotoluene	10.1	1.0	µg/L	10.0		101	70-130	10.3		25		
4-Chlorotoluene	10.2	1.0	µg/L	10.0		102	70-130	7.43		25		
1,2-Dibromo-3-chloropropane (DBCP)	12.4	5.0	µg/L	10.0		124	70-130	**27.7**	*	25	R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130	0.274		25		
Dibromomethane	10.8	1.0	µg/L	10.0		108	70-130	5.05		25		
1,2-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	12.3		25		
1,3-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	14.0		25		
1,4-Dichlorobenzene	10.7	1.0	µg/L	10.0		107	70-130	7.19		25		
trans-1,4-Dichloro-2-butene	9.44	2.0	µg/L	10.0		94.4	70-130	**25.8**	*	25	R-05	
Dichlorodifluoromethane (Freon 12)	6.69	2.0	µg/L	10.0		66.9	40-160	6.16		25		†
1,1-Dichloroethane	10.5	1.0	µg/L	10.0		105	70-130	10.3		25		
1,2-Dichloroethane	11.2	1.0	µg/L	10.0		112	70-130	18.7		25		
1,1-Dichloroethylene	10.1	1.0	µg/L	10.0		101	70-130	9.14		25		
cis-1,2-Dichloroethylene	10.6	1.0	µg/L	10.0		106	70-130	7.88		25		
trans-1,2-Dichloroethylene	10.5	1.0	µg/L	10.0		105	70-130	7.31		25		
1,2-Dichloropropane	10.4	1.0	µg/L	10.0		104	70-130	3.41		25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13							
1,3-Dichloropropane	11.0	0.50	µg/L	10.0		110	70-130	6.00	25		
2,2-Dichloropropane	11.1	1.0	µg/L	10.0		111	40-130	11.6	25		†
1,1-Dichloropropene	10.8	2.0	µg/L	10.0		108	70-130	5.67	25		
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130	0.476	25		
trans-1,3-Dichloropropene	11.6	0.50	µg/L	10.0		116	70-130	7.67	25		
Diethyl Ether	8.79	2.0	µg/L	10.0		87.9	70-130	15.4	25		
Diisopropyl Ether (DIPE)	10.4	0.50	µg/L	10.0		104	70-130	21.5	25		
1,4-Dioxane	88.1	50	µg/L	100		88.1	40-130	30.0	50	V-16	† ‡
Ethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	10.1	25		
Hexachlorobutadiene	11.2	0.50	µg/L	10.0		112	70-130	19.9	25		
2-Hexanone (MBK)	108	10	µg/L	100		108	70-160	12.7	25		†
Isopropylbenzene (Cumene)	10.2	1.0	µg/L	10.0		102	70-130	5.08	25		
p-Isopropyltoluene (p-Cymene)	10.4	1.0	µg/L	10.0		104	70-130	7.65	25		
Methyl tert-Butyl Ether (MTBE)	11.0	1.0	µg/L	10.0		110	70-130	4.36	25		
Methylene Chloride	12.9	5.0	µg/L	10.0		129	70-130	13.3	25		
4-Methyl-2-pentanone (MIBK)	108	10	µg/L	100		108	70-160	6.11	25		†
Naphthalene	11.3	2.0	µg/L	10.0		113	40-130	2.62	25		†
n-Propylbenzene	10.7	1.0	µg/L	10.0		107	70-130	2.31	25		
Styrene	10.6	1.0	µg/L	10.0		106	70-130	2.51	25		
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116	70-130	15.3	25		
1,1,2,2-Tetrachloroethane	11.1	0.50	µg/L	10.0		111	70-130	2.59	25		
Tetrachloroethylene	10.8	1.0	µg/L	10.0		108	70-130	3.99	25		
Tetrahydrofuran	9.87	10	µg/L	10.0		98.7	70-130	5.20	25	J	
Toluene	10.1	1.0	µg/L	10.0		101	70-130	6.80	25		
1,2,3-Trichlorobenzene	11.0	5.0	µg/L	10.0		110	70-130	10.4	25		
1,2,4-Trichlorobenzene	10.8	1.0	µg/L	10.0		108	70-130	13.4	25		
1,3,5-Trichlorobenzene	9.89	1.0	µg/L	10.0		98.9	70-130	25.0	25		
1,1,1-Trichloroethane	10.5	1.0	µg/L	10.0		105	70-130	13.5	25		
1,1,2-Trichloroethane	10.7	1.0	µg/L	10.0		107	70-130	3.61	25		
Trichloroethylene	10.2	1.0	µg/L	10.0		102	70-130	6.61	25		
Trichlorofluoromethane (Freon 11)	10.0	2.0	µg/L	10.0		100	70-130	6.71	25		
1,2,3-Trichloropropane	10.9	2.0	µg/L	10.0		109	70-130	1.81	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	10.4	1.0	µg/L	10.0		104	70-130	8.50	25		
1,2,4-Trimethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	5.96	25		
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130	0.495	25		
Vinyl Chloride	7.50	2.0	µg/L	10.0		75.0	40-160	**26.0** *	25	R-05	†
m+p Xylene	20.8	2.0	µg/L	20.0		104	70-130	4.50	25		
o-Xylene	10.4	1.0	µg/L	10.0		104	70-130	4.71	25		
Surrogate: 1,2-Dichloroethane-d4	*25.1*		µg/L	25.0		100	70-130				
Surrogate: Toluene-d8	*24.8*		µg/L	25.0		99.1	70-130				
Surrogate: 4-Bromofluorobenzene	*24.6*		µg/L	25.0		98.5	70-130				

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084653 - SW-846 3050B										
Blank (B084653-BLK1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	1.5	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.82	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.50	1.0	mg/Kg wet							J
LCS (B084653-BS1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	8400	5.0	mg/Kg wet	8840		95.0	46.1-153.4			
Antimony	96.8	5.0	mg/Kg wet	88.2		110	8.2-218.9			
Arsenic	110	5.0	mg/Kg wet	99.6		110	83-117.6			
Barium	307	5.0	mg/Kg wet	310		99.1	83.2-117.5			
Beryllium	75.5	0.50	mg/Kg wet	72.3		104	83.9-116			
Cadmium	173	0.50	mg/Kg wet	182		94.9	83.1-116.9			
Calcium	6840	15	mg/Kg wet	6790		101	83.1-116.7			
Chromium	134	1.0	mg/Kg wet	136		98.9	81.6-117.6			
Cobalt	124	5.0	mg/Kg wet	128		97.2	84.7-115.3			
Copper	110	1.0	mg/Kg wet	102		107	83.8-116.1			
Iron	11600	5.0	mg/Kg wet	12600		91.8	50.8-149.6			
Lead	116	1.5	mg/Kg wet	115		101	82.4-117.8			
Magnesium	3070	15	mg/Kg wet	3010		102	75.4-124.2			
Manganese	326	1.0	mg/Kg wet	323		101	82.8-117.5			
Nickel	144	1.0	mg/Kg wet	153		94.2	84.4-115.6			
Potassium	2850	200	mg/Kg wet	2840		100	72.7-127.3			
Selenium	147	5.0	mg/Kg wet	150		97.8	80-120			
Silver	37.7	1.0	mg/Kg wet	40.4		93.3	66.2-133.8			
Sodium	2920	200	mg/Kg wet	2760		106	73.8-126.2			
Thallium	170	5.0	mg/Kg wet	174		97.6	81.2-118.8			
Vanadium	100	2.0	mg/Kg wet	97.6		102	75.5-124			
Zinc	163	2.0	mg/Kg wet	161		102	81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084653 - SW-846 3050B										
LCS Dup (B084653-BSD1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	8860	5.0	mg/Kg wet	8840		100	46.1-153.4	5.38	30	
Antimony	94.4	5.0	mg/Kg wet	88.2		107	8.2-218.9	2.43	30	
Arsenic	109	5.0	mg/Kg wet	99.6		109	83-117.6	0.833	30	
Barium	300	5.0	mg/Kg wet	310		96.9	83.2-117.5	2.25	30	
Beryllium	74.9	0.50	mg/Kg wet	72.3		104	83.9-116	0.781	30	
Cadmium	172	0.50	mg/Kg wet	182		94.4	83.1-116.9	0.586	30	
Calcium	6760	15	mg/Kg wet	6790		99.6	83.1-116.7	1.08	30	
Chromium	134	1.0	mg/Kg wet	136		98.7	81.6-117.6	0.144	30	
Cobalt	125	5.0	mg/Kg wet	128		97.4	84.7-115.3	0.201	30	
Copper	109	1.0	mg/Kg wet	102		107	83.8-116.1	0.483	30	
Iron	12000	5.0	mg/Kg wet	12600		95.2	50.8-149.6	3.66	30	
Lead	115	1.5	mg/Kg wet	115		100	82.4-117.8	0.508	30	
Magnesium	3110	15	mg/Kg wet	3010		103	75.4-124.2	1.27	30	
Manganese	326	1.0	mg/Kg wet	323		101	82.8-117.5	0.0246	30	
Nickel	143	1.0	mg/Kg wet	153		93.7	84.4-115.6	0.537	30	
Potassium	2900	200	mg/Kg wet	2840		102	72.7-127.3	1.83	30	
Selenium	145	5.0	mg/Kg wet	150		96.3	80-120	1.53	30	
Silver	38.4	1.0	mg/Kg wet	40.4		95.1	66.2-133.8	1.88	30	
Sodium	2910	200	mg/Kg wet	2760		105	73.8-126.2	0.408	30	
Thallium	171	5.0	mg/Kg wet	174		98.4	81.2-118.8	0.879	30	
Vanadium	102	2.0	mg/Kg wet	97.6		104	75.5-124	1.55	30	
Zinc	166	2.0	mg/Kg wet	161		103	81.9-117.6	1.39	30	
MRL Check (B084653-MRL1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Lead	0.795	0.74	mg/Kg wet	0.742		107	80-120			
Batch B084670 - SW-846 3050B										
Blank (B084670-BLK1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	1.5	2.5	mg/Kg wet							J
Antimony	2.4	2.5	mg/Kg wet							J
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084670 - SW-846 3050B										
LCS (B084670-BS1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	7990	5.0	mg/Kg wet	8840		90.4	46.1-153.4			
Antimony	119	5.0	mg/Kg wet	88.2		134	8.2-218.9			
Arsenic	110	5.0	mg/Kg wet	99.6		110	83-117.6			
Barium	298	5.0	mg/Kg wet	310		96.3	83.2-117.5			
Beryllium	77.8	0.50	mg/Kg wet	72.3		108	83.9-116			
Cadmium	172	0.50	mg/Kg wet	182		94.7	83.1-116.9			
Calcium	7100	15	mg/Kg wet	6790		104	83.1-116.7			
Chromium	135	1.0	mg/Kg wet	136		99.6	81.6-117.6			
Cobalt	125	5.0	mg/Kg wet	128		97.9	84.7-115.3			
Copper	108	1.0	mg/Kg wet	102		106	83.8-116.1			
Iron	12300	5.0	mg/Kg wet	12600		97.8	50.8-149.6			
Lead	108	1.5	mg/Kg wet	115		93.8	82.4-117.8			
Magnesium	2800	15	mg/Kg wet	3010		93.0	75.4-124.2			
Manganese	332	1.0	mg/Kg wet	323		103	82.8-117.5			
Nickel	149	1.0	mg/Kg wet	153		97.5	84.4-115.6			
Potassium	2770	200	mg/Kg wet	2840		97.6	72.7-127.3			
Selenium	128	5.0	mg/Kg wet	150		85.4	80-120			
Silver	38.7	1.0	mg/Kg wet	40.4		95.7	66.2-133.8			
Sodium	2890	200	mg/Kg wet	2760		105	73.8-126.2			
Thallium	175	5.0	mg/Kg wet	174		101	81.2-118.8			
Vanadium	102	2.0	mg/Kg wet	97.6		105	75.5-124			
Zinc	154	2.0	mg/Kg wet	161		95.7	81.9-117.6			
LCS Dup (B084670-BSD1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Aluminum	7720	5.0	mg/Kg wet	8840		87.3	46.1-153.4	3.45	30	
Antimony	119	5.0	mg/Kg wet	88.2		135	8.2-218.9	0.515	30	
Arsenic	108	5.0	mg/Kg wet	99.6		109	83-117.6	1.00	30	
Barium	293	5.0	mg/Kg wet	310		94.4	83.2-117.5	1.94	30	
Beryllium	77.6	0.50	mg/Kg wet	72.3		107	83.9-116	0.293	30	
Cadmium	173	0.50	mg/Kg wet	182		95.3	83.1-116.9	0.653	30	
Calcium	7090	15	mg/Kg wet	6790		104	83.1-116.7	0.130	30	
Chromium	134	1.0	mg/Kg wet	136		98.4	81.6-117.6	1.18	30	
Cobalt	125	5.0	mg/Kg wet	128		97.6	84.7-115.3	0.282	30	
Copper	110	1.0	mg/Kg wet	102		108	83.8-116.1	1.76	30	
Iron	12000	5.0	mg/Kg wet	12600		95.4	50.8-149.6	2.52	30	
Lead	110	1.5	mg/Kg wet	115		95.5	82.4-117.8	1.80	30	
Magnesium	2670	15	mg/Kg wet	3010		88.7	75.4-124.2	4.75	30	
Manganese	332	1.0	mg/Kg wet	323		103	82.8-117.5	0.0463	30	
Nickel	151	1.0	mg/Kg wet	153		98.4	84.4-115.6	0.941	30	
Potassium	2680	200	mg/Kg wet	2840		94.2	72.7-127.3	3.49	30	
Selenium	133	5.0	mg/Kg wet	150		88.3	80-120	3.37	30	
Silver	38.1	1.0	mg/Kg wet	40.4		94.3	66.2-133.8	1.46	30	
Sodium	2890	200	mg/Kg wet	2760		105	73.8-126.2	0.179	30	
Thallium	167	5.0	mg/Kg wet	174		96.0	81.2-118.8	4.89	30	
Vanadium	101	2.0	mg/Kg wet	97.6		103	75.5-124	1.67	30	
Zinc	155	2.0	mg/Kg wet	161		96.1	81.9-117.6	0.372	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084670 - SW-846 3050B										
MRL Check (B084670-MRL1)				Prepared: 11/07/13 Analyzed: 11/08/13						
Lead	0.785	0.72	mg/Kg wet	0.724		108	80-120			
Batch B084685 - SW-846 7470A Prep										
Blank (B084685-BLK1)				Prepared & Analyzed: 11/08/13						
Mercury	ND	0.00010	mg/L							
LCS (B084685-BS1)				Prepared & Analyzed: 11/08/13						
Mercury	0.00209	0.00010	mg/L	0.00200		105	80-120			
LCS Dup (B084685-BSD1)				Prepared & Analyzed: 11/08/13						
Mercury	0.00196	0.00010	mg/L	0.00200		97.9	80-120	6.60	20	
Duplicate (B084685-DUP1)		**Source: 13K0259-03**		Prepared & Analyzed: 11/08/13						
Mercury	ND	0.00010	mg/L		ND			NC	20	
Matrix Spike (B084685-MS1)		**Source: 13K0259-03**		Prepared & Analyzed: 11/08/13						
Mercury	0.00196	0.00010	mg/L	0.00200	ND	98.1	75-125			
Batch B084766 - SW-846 7471										
Blank (B084766-BLK1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B084766-BS1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	4.26	0.33	mg/Kg wet	4.05		105	71.6-128.1			
LCS Dup (B084766-BSD1)				Prepared: 11/08/13 Analyzed: 11/11/13						
Mercury	3.72	0.33	mg/Kg wet	4.05		91.8	71.6-128.1	13.5	30	
Batch B084779 - SW-846 7471										
Blank (B084779-BLK1)				Prepared: 11/09/13 Analyzed: 11/11/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B084779-BS1)				Prepared: 11/09/13 Analyzed: 11/11/13						
Mercury	3.66	0.33	mg/Kg wet	4.05		90.5	71.6-128.1			
LCS Dup (B084779-BSD1)				Prepared: 11/09/13 Analyzed: 11/11/13						
Mercury	3.04	0.33	mg/Kg wet	4.05		75.0	71.6-128.1	18.7	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084779 - SW-846 7471										
Duplicate (B084779-DUP1)	**Source: 13K0259-05**			Prepared: 11/09/13 Analyzed: 11/11/13						
Mercury	ND	0.026	mg/Kg dry		ND			NC	35	
Matrix Spike (B084779-MS1)	**Source: 13K0259-05**			Prepared: 11/09/13 Analyzed: 11/11/13						
Mercury	0.159	0.026	mg/Kg dry	0.172	ND	92.4	75-125			
Batch B084805 - SW-846 3005A										
Blank (B084805-BLK1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	ND	0.050	mg/L							
Antimony	ND	0.050	mg/L							
Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0040	mg/L							
Cadmium	ND	0.0040	mg/L							
Calcium	ND	0.15	mg/L							
Chromium	ND	0.010	mg/L							
Cobalt	ND	0.050	mg/L							
Copper	ND	0.010	mg/L							
Iron	ND	0.050	mg/L							
Lead	ND	0.010	mg/L							
Magnesium	ND	0.15	mg/L							
Manganese	ND	0.010	mg/L							
Nickel	ND	0.010	mg/L							
Potassium	ND	2.0	mg/L							
Selenium	ND	0.050	mg/L							
Silver	ND	0.0050	mg/L							
Sodium	ND	2.0	mg/L							
Thallium	ND	0.050	mg/L							
Vanadium	ND	0.010	mg/L							
Zinc	ND	0.020	mg/L							
LCS (B084805-BS1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Silver	0.482	0.0050	mg/L	0.500		96.5	80-120			
LCS (B084805-BS2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	2.02	0.050	mg/L	2.00		101	80-120			
Antimony	2.06	0.050	mg/L	2.00		103	80-120			
Arsenic	1.98	0.010	mg/L	2.00		98.8	80-120			
Barium	1.99	0.050	mg/L	2.00		99.4	80-120			
Beryllium	2.01	0.0040	mg/L	2.00		100	80-120			
Cadmium	2.03	0.0040	mg/L	2.00		102	80-120			
Calcium	2.01	0.15	mg/L	2.00		100	80-120			
Chromium	2.02	0.010	mg/L	2.00		101	80-120			
Cobalt	2.01	0.050	mg/L	2.00		100	80-120			
Copper	2.02	0.010	mg/L	2.00		101	80-120			
Iron	2.02	0.050	mg/L	2.00		101	80-120			
Lead	1.84	0.010	mg/L	2.00		92.1	80-120			
Magnesium	2.08	0.15	mg/L	2.00		104	80-120			
Manganese	2.01	0.010	mg/L	2.00		101	80-120			
Nickel	1.97	0.010	mg/L	2.00		98.5	80-120			
Potassium	19.7	2.0	mg/L	20.0		98.7	80-120			
Selenium	2.08	0.050	mg/L	2.00		104	80-120			
Sodium	1.65	2.0	mg/L	2.00		82.7	80-120			J
Thallium	1.96	0.050	mg/L	2.00		98.2	80-120			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084805 - SW-846 3005A										
LCS (B084805-BS2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Vanadium	1.96	0.010	mg/L	2.00		98.1	80-120			
Zinc	1.98	0.020	mg/L	2.00		98.8	80-120			
LCS Dup (B084805-BSD1)				Prepared: 11/09/13 Analyzed: 11/12/13						
Silver	0.482	0.0050	mg/L	0.500		96.3	80-120	0.109	20	
LCS Dup (B084805-BSD2)				Prepared: 11/09/13 Analyzed: 11/12/13						
Aluminum	2.00	0.050	mg/L	2.00		99.9	80-120	1.35	20	
Antimony	2.17	0.050	mg/L	2.00		108	80-120	5.13	20	
Arsenic	1.95	0.010	mg/L	2.00		97.6	80-120	1.18	20	
Barium	1.97	0.050	mg/L	2.00		98.5	80-120	0.892	20	
Beryllium	1.99	0.0040	mg/L	2.00		99.6	80-120	0.657	20	
Cadmium	2.00	0.0040	mg/L	2.00		99.9	80-120	1.62	20	
Calcium	2.00	0.15	mg/L	2.00		100	80-120	0.134	20	
Chromium	1.98	0.010	mg/L	2.00		99.2	80-120	1.79	20	
Cobalt	1.97	0.050	mg/L	2.00		98.6	80-120	1.71	20	
Copper	1.98	0.010	mg/L	2.00		99.2	80-120	1.97	20	
Iron	2.00	0.050	mg/L	2.00		100	80-120	0.770	20	
Lead	1.95	0.010	mg/L	2.00		97.4	80-120	5.54	20	
Magnesium	2.06	0.15	mg/L	2.00		103	80-120	0.862	20	
Manganese	1.99	0.010	mg/L	2.00		99.6	80-120	1.02	20	
Nickel	1.94	0.010	mg/L	2.00		96.9	80-120	1.57	20	
Potassium	19.6	2.0	mg/L	20.0		97.8	80-120	0.943	20	
Selenium	2.07	0.050	mg/L	2.00		103	80-120	0.697	20	
Sodium	1.73	2.0	mg/L	2.00		86.5	80-120	4.41	20	J
Thallium	1.93	0.050	mg/L	2.00		96.3	80-120	2.00	20	
Vanadium	1.94	0.010	mg/L	2.00		97.2	80-120	0.844	20	
Zinc	1.94	0.020	mg/L	2.00		97.1	80-120	1.74	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085036 - % Solids										
Duplicate (B085036-DUP1)	**Source: 13K0259-14**			Prepared & Analyzed: 11/13/13						
% Solids	94.5		% Wt		95.1			0.633	20	
Duplicate (B085036-DUP2)	**Source: 13K0259-15**			Prepared & Analyzed: 11/13/13						
% Solids	92.4		% Wt		91.7			0.760	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-07A	Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.
MS-08	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-11	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
R-04	Duplicate relative percent difference (RPD) is a less useful indicator of sample precision for sample results that are <5 times the reporting limit (RL).
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-16	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 6010C in Water	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,ME,NC,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,RI
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,NC,ME,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7470A in Water	

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 8260C in Product/Solid	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Product/Solid	
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
1,2-Dichloroethane-d4	VA
Toluene-d8	VA
4-Bromofluorobenzene	VA
Pentafluorobenzene	VA
1,4-Difluorobenzene	VA
Chlorobenzene-d5	VA
1,4-Dichlorobenzene-d4	VA
SW-846 8260C in Soil	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
1,4-Dioxane	NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8260C in Water	
Acetone	CT,NY,ME,NH,VA,NJ
Acrylonitrile	CT,NY,ME,NH,VA,NJ
tert-Amyl Methyl Ether (TAME)	NY,ME,NH,VA,NJ
Benzene	CT,NY,ME,NH,VA,NJ
Bromochloromethane	NY,ME,NH,VA,NJ
Bromodichloromethane	CT,NY,ME,NH,VA,NJ
Bromoform	CT,NY,ME,NH,VA,NJ
Bromomethane	CT,NY,ME,NH,VA,NJ
2-Butanone (MEK)	CT,NY,ME,NH,VA,NJ
tert-Butyl Alcohol (TBA)	NY,ME,NH,VA,NJ
n-Butylbenzene	NY,ME,VA,NJ
sec-Butylbenzene	NY,ME,VA,NJ
tert-Butylbenzene	NY,ME,VA,NJ
tert-Butyl Ethyl Ether (TBEE)	NY,ME,NH,VA,NJ
Carbon Disulfide	CT,NY,ME,NH,VA,NJ
Carbon Tetrachloride	CT,NY,ME,NH,VA,NJ
Chlorobenzene	CT,NY,ME,NH,VA,NJ
Chlorodibromomethane	CT,NY,ME,NH,VA,NJ
Chloroethane	CT,NY,ME,NH,VA,NJ
Chloroform	CT,NY,ME,NH,VA,NJ
Chloromethane	CT,NY,ME,NH,VA,NJ
2-Chlorotoluene	NY,ME,NH,VA,NJ
4-Chlorotoluene	NY,ME,NH,VA,NJ
Dibromomethane	NY,ME,NH,VA,NJ
1,2-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,4-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
trans-1,4-Dichloro-2-butene	NY,ME,NH,VA,NJ
Dichlorodifluoromethane (Freon 12)	NY,ME,NH,VA,NJ
1,1-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,2-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,1-Dichloroethylene	CT,NY,ME,NH,VA,NJ
cis-1,2-Dichloroethylene	NY,ME,NJ
trans-1,2-Dichloroethylene	CT,NY,ME,NH,VA,NJ
1,2-Dichloropropane	CT,NY,ME,NH,VA,NJ
1,3-Dichloropropane	NY,ME,VA,NJ
2,2-Dichloropropane	NY,ME,NH,VA,NJ
1,1-Dichloropropene	NY,ME,NH,VA,NJ
cis-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
trans-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
Diisopropyl Ether (DIPE)	NY,ME,NH,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Water	
Ethylbenzene	CT,NY,ME,NH,VA,NJ
Hexachlorobutadiene	CT,NY,ME,NH,VA,NJ
2-Hexanone (MBK)	CT,NY,ME,NH,VA,NJ
Isopropylbenzene (Cumene)	NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	CT,NY,ME,NH,VA,NJ
Methyl tert-Butyl Ether (MTBE)	CT,NY,ME,NH,VA,NJ
Methylene Chloride	CT,NY,ME,NH,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NY,ME,NH,VA,NJ
Naphthalene	NY,ME,NH,VA,NJ
n-Propylbenzene	CT,NY,ME,NH,VA,NJ
Styrene	CT,NY,ME,NH,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
Tetrachloroethylene	CT,NY,ME,NH,VA,NJ
Toluene	CT,NY,ME,NH,VA,NJ
1,2,3-Trichlorobenzene	NY,ME,NH,VA,NJ
1,2,4-Trichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NY,ME,NH,VA,NJ
1,1,2-Trichloroethane	CT,NY,ME,NH,VA,NJ
Trichloroethylene	CT,NY,ME,NH,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NY,ME,NH,VA,NJ
1,2,3-Trichloropropane	NY,ME,NH,VA,NJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	NY,VA,NJ
1,2,4-Trimethylbenzene	NY,ME,VA,NJ
1,3,5-Trimethylbenzene	NY,ME,VA,NJ
Vinyl Chloride	CT,NY,ME,NH,VA,NJ
m+p Xylene	CT,NY,ME,NH,VA
o-Xylene	CT,NY,ME,NH,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

13K0259

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: Cortlandt-Magna
Sampled By: MVP

Telephone: 845 735 8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ☑ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
☑ OTHER NYSEDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	I/H VOCs	N/I TAL Metals	% Solids
01	LPSB113-0-0.5	11.6.13	0715		X	S		2	1	
02	LPSB113-9-9.5	11.6.13	0815		X	S		2	1	
03	FB-2	11.6.13	0850		X	W		3	1	
04	LPSB111-0-0.5	11.6.13	0900		X	S		2	1	
05	LPSB111-6.5-7	11.6.13	0940		X	S		2	1	
06	LPSB110-0-0.5	11.6.13	1010		X	S		2	1	
07	LPSB110-5.5-6	11.6.13	1040		X	S		2	1	
08	LPSB108-0-0.5	11.6.13	1115		X	S		2	1	
09	LPSB108-4.5-5	11.6.13	1130		X	S		2	1	
10	LPSB109-0-0.5	11.6.13	1200		X	S		2	1	

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: Please Contact Amita Patel Re: NYSEDD Deliverable 845-735-8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	11/6/13 1630
Received by: (signature) Kenneth B.A. 5.2c	Date/Time: 11/7/15 1006
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other STD

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
nelac

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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Email: info@contestlabs.com
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CHAIN OF CUSTODY RECORD

13K0259
Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: MAGNA METALS
Sampled By: MVP

Telephone: 845 735 8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
☑ OTHER NYSEDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

ANALYSIS REQUESTED

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	VOCs 8260	TAL Metals
11	LPSB109-9-9.5	11.6.13	1330		X	S		2	1
12	LPSB109-14-14.5	11.6.13	1355		X	S		2	1
13	LPSB107-0-0.5	11.6.13	1430		X	S		2	1
14	LPSB107-10-10.5	11.6.13	1500		X	S		2	1
15	LPSB107-13.5-14.	11.6.13	1520		X	S		2	1

# of Containers
** Preservation
***Container Cod

Dissolved Meta
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: Please contact Amita Patel REi
NYSDEC EDD Deliverable 845 735 8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature]	11/6/13 1630
Received by: (signature)	Date/Time:
Kenneth [signature] 5.2c 11/7/13	1006
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other STD

RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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United States

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Thursday, 11/07/2013 at 10:06 A.M.

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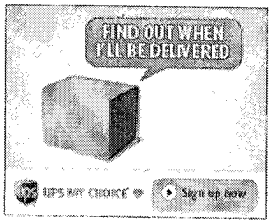

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Type: Package

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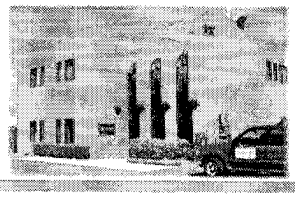

Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: KOB DATE: 11-7-13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 5.2°

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** (Yes) No ~~N/A~~ _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	14
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic	1	Non-ConTest Container	
40 mL Vial - type listed below	3	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore	28	Other	

Laboratory Comments:

40 mL vials: # HCl 3 # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: KOB **Date/Time:** 11-7-13 1006

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

November 19, 2013

Jiss Philip
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13K0326

Enclosed are results of analyses for samples received by the laboratory on November 8, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/19/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0326

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
FB-3	13K0326-01	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
LPSB112 0-0.5	13K0326-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112D 0-0.5	13K0326-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112 9-9.5	13K0326-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112 12.5-13	13K0326-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB106 0-0.5	13K0326-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB106 9-9.5	13K0326-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB105 0-0.5	13K0326-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB105 7.5-8	13K0326-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB104 0-0.5	13K0326-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/19/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0326

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB104 9-9.5	13K0326-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 0-0.5	13K0326-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 9-9.5	13K0326-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 12.5-13	13K0326-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 0-0.5	13K0326-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 9-9.5	13K0326-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 12-13.5	13K0326-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Iron

13K0326-05[LPSB112 12.5-13], 13K0326-06[LPSB106 0-0.5], 13K0326-07[LPSB106 9-9.5], 13K0326-08[LPSB105 0-0.5], 13K0326-09[LPSB105 7.5-8], 13K0326-10[LPSB104 0-0.5], 13K0326-11[LPSB104 9-9.5], 13K0326-12[LPSB102 0-0.5], 13K0326-13[LPSB102 9-9.5], 13K0326-14[LPSB102 12.5-13], B084776-BLK1, B084776-DUP1

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Antimony, Beryllium, Silver, Thallium

13K0326-09[LPSB105 7.5-8], 13K0326-02[LPSB112 0-0.5], 13K0326-03[LPSB112D 0-0.5], 13K0326-04[LPSB112 9-9.5], 13K0326-14[LPSB102 12.5-13]

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be biased on the high side.

Analyte & Samples(s) Qualified:

Lead

13K0326-15[LPSB103 0-0.5], 13K0326-16[LPSB103 9-9.5], 13K0326-17[LPSB103 12-13.5], B084767-MRL1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13K0326-05[LPSB112 12.5-13], B084776-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13K0326-05[LPSB112 12.5-13], B084776-MS1

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Barium, Potassium

13K0326-05[LPSB112 12.5-13], B084776-DUP1

SW-846 8260C

Qualifications:

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Acetone, Hexachlorobutadiene

B084846-BS1, B084861-BS1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Chloromethane

13K0326-02[LPSB112 0-0.5], B084846-MS1

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:

1,2-Dibromo-3-chloropropane (DBCP), Bromoform, Bromomethane, tert-Butyl Alcohol (TBA), trans-1,4-Dichloro-2-butene, Vinyl Chloride

13K0326-01[FB-3], B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Tetrahydrofuran

13K0326-02[LPSB112 0-0.5], 13K0326-03[LPSB112D 0-0.5], 13K0326-04[LPSB112 9-9.5], 13K0326-05[LPSB112 12.5-13], 13K0326-06[LPSB106 0-0.5], 13K0326-07[LPSB106 9-9.5], 13K0326-08[LPSB105 0-0.5], 13K0326-09[LPSB105 7.5-8], 13K0326-10[LPSB104 0-0.5], 13K0326-11[LPSB104 9-9.5], 13K0326-12[LPSB102 0-0.5], 13K0326-13[LPSB102 9-9.5], 13K0326-14[LPSB102 12.5-13], 13K0326-15[LPSB103 0-0.5], 13K0326-16[LPSB103 9-9.5], 13K0326-17[LPSB103 12-13.5], B084846-BLK1, B084846-BS1, B084846-BSD1, B084846-MS1

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Acrylonitrile, tert-Butyl Alcohol (TBA), Tetrahydrofuran

13K0326-01[FB-3], 13K0326-02[LPSB112 0-0.5], 13K0326-03[LPSB112D 0-0.5], 13K0326-04[LPSB112 9-9.5], 13K0326-05[LPSB112 12.5-13], 13K0326-06[LPSB106 0-0.5], 13K0326-07[LPSB106 9-9.5], 13K0326-08[LPSB105 0-0.5], 13K0326-09[LPSB105 7.5-8], 13K0326-10[LPSB104 0-0.5], 13K0326-11[LPSB104 9-9.5], 13K0326-12[LPSB102 0-0.5], 13K0326-13[LPSB102 9-9.5], 13K0326-14[LPSB102 12.5-13], 13K0326-15[LPSB103 0-0.5], 13K0326-16[LPSB103 9-9.5], 13K0326-17[LPSB103 12-13.5], B084846-BLK1, B084846-BS1, B084846-BSD1, B084846-MS1, B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Acetone, Bromomethane, Chloromethane

B084846-BS1, B084846-BSD1, B084861-BS1, B084861-BSD1, S004934-CCV1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: FB-3 | Sampled: 11/8/2013 08:00

Sample ID: 13K0326-01

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	7.1	50	4.7	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Acrylonitrile	ND	5.0	0.58	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Bromobenzene	ND	1.0	0.044	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Bromodichloromethane	ND	0.50	0.088	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Bromoform	ND	1.0	0.21	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Bromomethane	ND	2.0	0.94	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
2-Butanone (MEK)	ND	20	2.4	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
tert-Butyl Alcohol (TBA)	ND	20	2.2	µg/L	1	R-05, V-16	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
n-Butylbenzene	ND	1.0	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
sec-Butylbenzene	ND	1.0	0.084	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
tert-Butylbenzene	ND	1.0	0.096	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Carbon Disulfide	ND	4.0	1.0	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Carbon Tetrachloride	ND	5.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Chlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Chlorodibromomethane	ND	0.50	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Chloroethane	ND	2.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Chloroform	ND	2.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
2-Chlorotoluene	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
4-Chlorotoluene	ND	1.0	0.074	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	0.34	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Dibromomethane	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2-Dichlorobenzene	ND	1.0	0.076	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,3-Dichlorobenzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,4-Dichlorobenzene	ND	1.0	0.046	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
trans-1,4-Dichloro-2-butene	ND	2.0	0.12	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2-Dichloropropane	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,3-Dichloropropane	ND	0.50	0.099	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
2,2-Dichloropropane	ND	1.0	0.072	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1-Dichloropropene	ND	2.0	0.13	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
cis-1,3-Dichloropropene	ND	0.50	0.062	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
trans-1,3-Dichloropropene	ND	0.50	0.056	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Diethyl Ether	0.26	2.0	0.22	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 17:20	EEH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: FB-3 | Sampled: 11/8/2013 08:00

Sample ID: 13K0326-01

Sample Matrix: Field Blank

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Ethylbenzene	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
2-Hexanone (MBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Isopropylbenzene (Cumene)	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Methylene Chloride	ND	5.0	3.2	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
n-Propylbenzene	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Styrene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1,2,2-Tetrachloroethane	ND	0.50	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Tetrachloroethylene	ND	1.0	0.080	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Tetrahydrofuran	ND	10	1.1	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Toluene	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2,3-Trichlorobenzene	ND	5.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2,4-Trichlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,3,5-Trichlorobenzene	ND	1.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Trichloroethylene	ND	1.0	0.077	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2,3-Trichloropropane	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
Vinyl Chloride	ND	2.0	0.13	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:20	EEH
m+p Xylene	ND	2.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH
o-Xylene	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:20	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		11/13/13 17:20
Toluene-d8	98.4	70-130		11/13/13 17:20
4-Bromofluorobenzene	101	70-130		11/13/13 17:20

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: FB-3 | Sampled: 11/8/2013 08:00

Sample ID: 13K0326-01

Sample Matrix: Field Blank

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/12/13	11/18/13 14:04	OP
Antimony	ND	0.050	0.030	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:37	OP
Arsenic	ND	0.010	0.0086	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Barium	ND	0.050	0.015	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Beryllium	ND	0.0040	0.0010	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Cadmium	ND	0.0040	0.0018	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:37	OP
Calcium	ND	0.15	0.088	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Chromium	ND	0.010	0.0034	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Cobalt	ND	0.050	0.0075	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:37	OP
Copper	ND	0.010	0.0050	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Iron	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Lead	ND	0.010	0.0027	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:37	OP
Magnesium	ND	0.15	0.037	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Manganese	ND	0.010	0.0020	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Mercury	ND	0.00010	0.000048	mg/L	1		SW-846 7470A	11/11/13	11/11/13 14:38	SAJ
Nickel	ND	0.010	0.0017	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Potassium	ND	2.0	0.46	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Selenium	ND	0.050	0.016	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Silver	ND	0.0050	0.0040	mg/L	1		SW-846 6010C	11/15/13	11/18/13 12:38	OP
Sodium	ND	2.0	1.9	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Thallium	ND	0.050	0.020	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Vanadium	ND	0.010	0.0040	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP
Zinc	ND	0.020	0.0071	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:20	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 0-0.5 | Sampled: 11/7/2013 08:00

Sample ID: 13K0326-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Acrylonitrile	ND	0.0067	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Benzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Bromobenzene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Bromochloromethane	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Bromodichloromethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Bromoform	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
n-Butylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
tert-Butylbenzene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Carbon Disulfide	ND	0.0067	0.0037	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Carbon Tetrachloride	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Chlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Chlorodibromomethane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Chloroethane	ND	0.022	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Chloroform	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1	MS-07	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
2-Chlorotoluene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
4-Chlorotoluene	0.0033	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Dibromomethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1-Dichloroethane	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2-Dichloroethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2-Dichloropropane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,3-Dichloropropane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
2,2-Dichloropropane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1-Dichloropropene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 0-0.5 | Sampled: 11/7/2013 08:00

Sample ID: 13K0326-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,4-Dioxane	ND	0.11	0.064	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Ethylbenzene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
p-Isopropyltoluene (p-Cymene)	0.0013	0.0022	0.00089	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Methylene Chloride	ND	0.022	0.0079	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Naphthalene	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
n-Propylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Styrene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Tetrachloroethylene	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Toluene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Trichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF
o-Xylene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 7:56	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	105	70-130		11/11/13 7:56
Toluene-d8	98.0	70-130		11/11/13 7:56
4-Bromofluorobenzene	102	70-130		11/11/13 7:56

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 0-0.5 | Sampled: 11/7/2013 08:00

Sample ID: 13K0326-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Arsenic	1.1	2.9	1.1	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/15/13 12:11	OP
Barium	71	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Beryllium	ND	1.5	0.23	mg/Kg dry	5	DL-04	SW-846 6010C	11/11/13	11/15/13 15:03	OP
Cadmium	0.39	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Calcium	2100	8.8	1.6	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Chromium	30	0.58	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Cobalt	12	2.9	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Copper	99	0.58	0.45	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Iron	15000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Lead	41	0.88	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Magnesium	4300	8.8	0.91	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Manganese	290	0.58	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Mercury	0.026	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:17	SAJ
Nickel	32	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Potassium	920	120	20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Sodium	82	120	57	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/15/13 12:11	OP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Vanadium	28	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP
Zinc	99	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:11	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 0-0.5 | Sampled: 11/7/2013 08:00

Sample ID: 13K0326-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.0		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112D 0-0.5 | Sampled: 11/7/2013 08:05

Sample ID: 13K0326-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Acrylonitrile	ND	0.0066	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 8:23	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Benzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Bromobenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Bromodichloromethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
2-Butanone (MEK)	ND	0.044	0.019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
tert-Butyl Alcohol (TBA)	ND	0.044	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 8:23	MFF
n-Butylbenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
tert-Butylbenzene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Carbon Disulfide	ND	0.0066	0.0036	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Carbon Tetrachloride	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Chlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Chlorodibromomethane	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Chloroform	ND	0.0044	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Chloromethane	ND	0.011	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
2-Chlorotoluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
4-Chlorotoluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Dibromomethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
trans-1,4-Dichloro-2-butene	ND	0.0044	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1-Dichloroethane	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1-Dichloroethylene	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,3-Dichloropropane	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
2,2-Dichloropropane	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1-Dichloropropene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112D 0-0.5 | Sampled: 11/7/2013 08:05

Sample ID: 13K0326-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,4-Dioxane	ND	0.11	0.063	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Ethylbenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0044	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Methylene Chloride	ND	0.022	0.0078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Naphthalene	ND	0.0044	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
n-Propylbenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Styrene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Toluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2,4-Trichlorobenzene	ND	0.0044	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Trichloroethylene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00099	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
m+p Xylene	ND	0.0044	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF
o-Xylene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 8:23	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		11/11/13 8:23
Toluene-d8	98.5	70-130		11/11/13 8:23
4-Bromofluorobenzene	98.8	70-130		11/11/13 8:23

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112D 0-0.5 | Sampled: 11/7/2013 08:05

Sample ID: 13K0326-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Barium	68	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Beryllium	ND	1.4	0.22	mg/Kg dry	5	DL-04	SW-846 6010C	11/11/13	11/15/13 15:09	OP
Cadmium	0.35	0.28	0.16	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Calcium	2100	8.3	1.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Chromium	29	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Cobalt	11	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Copper	72	0.56	0.42	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Iron	15000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Lead	20	0.83	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Magnesium	4500	8.3	0.87	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Manganese	280	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Mercury	0.023	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:23	SAJ
Nickel	33	0.56	0.13	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Potassium	1000	110	19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Sodium	80	110	54	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/15/13 12:36	OP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Vanadium	26	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP
Zinc	84	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:36	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112D 0-0.5 | Sampled: 11/7/2013 08:05

Sample ID: 13K0326-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.9		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 9-9.5 | Sampled: 11/7/2013 08:30

Sample ID: 13K0326-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.097	0.023	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Acrylonitrile	ND	0.0058	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 9:44	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Benzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Bromobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Bromochloromethane	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Bromodichloromethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Bromoform	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Bromomethane	ND	0.0097	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
2-Butanone (MEK)	ND	0.039	0.017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
tert-Butyl Alcohol (TBA)	ND	0.039	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 9:44	MFF
n-Butylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
sec-Butylbenzene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
tert-Butylbenzene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Carbon Disulfide	ND	0.0058	0.0032	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Carbon Tetrachloride	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Chlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Chlorodibromomethane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Chloroethane	ND	0.019	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Chloroform	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Chloromethane	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
2-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
4-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2-Dibromoethane (EDB)	ND	0.00097	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Dibromomethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
trans-1,4-Dichloro-2-butene	ND	0.0039	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1-Dichloroethane	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2-Dichloroethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1-Dichloroethylene	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2-Dichloropropane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,3-Dichloropropane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
2,2-Dichloropropane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1-Dichloropropene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
cis-1,3-Dichloropropene	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 9-9.5 | Sampled: 11/7/2013 08:30

Sample ID: 13K0326-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,4-Dioxane	ND	0.097	0.056	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Ethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Hexachlorobutadiene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
2-Hexanone (MBK)	ND	0.019	0.011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0039	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Methylene Chloride	ND	0.019	0.0069	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Naphthalene	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
n-Propylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Styrene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1,2,2-Tetrachloroethane	ND	0.00097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Tetrachloroethylene	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Tetrahydrofuran	ND	0.0097	0.0021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Toluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2,4-Trichlorobenzene	ND	0.0039	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Trichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
Vinyl Chloride	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
m+p Xylene	ND	0.0039	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF
o-Xylene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 9:44	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
1,2-Dichloroethane-d4	107	70-130		11/11/13	9:44
Toluene-d8	98.7	70-130		11/11/13	9:44
4-Bromofluorobenzene	101	70-130		11/11/13	9:44

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 9-9.5 | Sampled: 11/7/2013 08:30

Sample ID: 13K0326-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Arsenic	ND	2.6	0.94	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Barium	69	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Beryllium	ND	1.3	0.21	mg/Kg dry	5	DL-04	SW-846 6010C	11/11/13	11/15/13 15:14	OP
Cadmium	0.17	0.26	0.15	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/15/13 12:42	OP
Calcium	1500	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Chromium	23	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Cobalt	6.4	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Copper	27	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Iron	13000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Lead	2.9	0.78	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Magnesium	2900	7.8	0.81	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Manganese	220	0.52	0.16	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Mercury	0.0027	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:25	SAJ
Nickel	28	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Potassium	890	100	18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Sodium	100	100	51	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/15/13 12:42	OP
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Vanadium	21	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP
Zinc	17	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/11/13	11/15/13 12:42	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 9-9.5 | Sampled: 11/7/2013 08:30

Sample ID: 13K0326-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.7		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 12.5-13 | Sampled: 11/7/2013 09:05

Sample ID: 13K0326-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.095	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Acrylonitrile	ND	0.0057	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:05	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00095	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Benzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Bromobenzene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Bromochloromethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Bromodichloromethane	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Bromoform	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Bromomethane	ND	0.0095	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
2-Butanone (MEK)	ND	0.038	0.017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
tert-Butyl Alcohol (TBA)	ND	0.038	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:05	MFF
n-Butylbenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
sec-Butylbenzene	ND	0.0019	0.00095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
tert-Butylbenzene	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00095	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Carbon Disulfide	ND	0.0057	0.0031	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Carbon Tetrachloride	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Chlorobenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Chlorodibromomethane	ND	0.00095	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Chloroethane	ND	0.019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Chloroform	ND	0.0038	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Chloromethane	ND	0.0095	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
2-Chlorotoluene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
4-Chlorotoluene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0038	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2-Dibromoethane (EDB)	ND	0.00095	0.00095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Dibromomethane	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
trans-1,4-Dichloro-2-butene	ND	0.0038	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1-Dichloroethane	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2-Dichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1-Dichloroethylene	ND	0.0038	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2-Dichloropropane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,3-Dichloropropane	ND	0.00095	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
2,2-Dichloropropane	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1-Dichloropropene	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
cis-1,3-Dichloropropene	ND	0.00095	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 12.5-13 | Sampled: 11/7/2013 09:05

Sample ID: 13K0326-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00095	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,4-Dioxane	ND	0.095	0.055	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Ethylbenzene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Hexachlorobutadiene	ND	0.0019	0.00095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
2-Hexanone (MBK)	ND	0.019	0.010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0038	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Methylene Chloride	ND	0.019	0.0067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0072	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Naphthalene	ND	0.0038	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
n-Propylbenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Styrene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1,2,2-Tetrachloroethane	ND	0.00095	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Tetrachloroethylene	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Tetrahydrofuran	ND	0.0095	0.0021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Toluene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2,4-Trichlorobenzene	ND	0.0038	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Trichloroethylene	ND	0.0019	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0095	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0095	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
Vinyl Chloride	ND	0.0095	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
m+p Xylene	ND	0.0038	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF
o-Xylene	ND	0.0019	0.00066	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:05	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	109	70-130		11/11/13 11:05
Toluene-d8	99.9	70-130		11/11/13 11:05
4-Bromofluorobenzene	99.3	70-130		11/11/13 11:05

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 12.5-13 | Sampled: 11/7/2013 09:05

Sample ID: 13K0326-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	2.4	1.0	mg/Kg dry	1	MS-19	SW-846 6010C	11/9/13	11/17/13 16:18	OP
Antimony	ND	2.4	2.0	mg/Kg dry	1	MS-07	SW-846 6010C	11/9/13	11/17/13 16:18	OP
Arsenic	19	2.4	0.87	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:18	OP
Barium	130	2.4	0.30	mg/Kg dry	1	R-02	SW-846 6010C	11/9/13	11/12/13 22:34	OP
Beryllium	0.098	0.24	0.039	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/12/13 22:34	OP
Cadmium	ND	0.24	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Calcium	2600	7.3	1.3	mg/Kg dry	1	MS-19	SW-846 6010C	11/9/13	11/12/13 22:34	OP
Chromium	130	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Cobalt	21	2.4	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Copper	110	0.48	0.37	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Iron	12000	2.4	2.1	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	11/9/13	11/17/13 16:18	OP
Lead	2.4	0.73	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Magnesium	7200	7.3	0.76	mg/Kg dry	1	MS-19	SW-846 6010C	11/9/13	11/12/13 22:34	OP
Manganese	190	0.48	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Mercury	ND	0.026	0.0016	mg/Kg dry	1		SW-846 7471B	11/12/13	11/13/13 13:26	SAJ
Nickel	38	0.48	0.12	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Potassium	1300	97	17	mg/Kg dry	1	R-02	SW-846 6010C	11/9/13	11/17/13 16:18	OP
Selenium	0.91	2.4	0.75	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/18/13 17:13	OP
Silver	ND	0.48	0.43	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:18	OP
Sodium	340	97	47	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Thallium	1.9	2.4	0.80	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 16:18	OP
Vanadium	31	0.97	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 22:34	OP
Zinc	25	0.97	0.25	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:18	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB112 12.5-13 | Sampled: 11/7/2013 09:05

Sample ID: 13K0326-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	96.0		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 0-0.5 | Sampled: 11/7/2013 09:40

Sample ID: 13K0326-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.13	0.029	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Acrylonitrile	ND	0.0075	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:32	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Benzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Bromobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Bromochloromethane	ND	0.0025	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Bromodichloromethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Bromoform	ND	0.0025	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Bromomethane	ND	0.013	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
2-Butanone (MEK)	ND	0.050	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
tert-Butyl Alcohol (TBA)	ND	0.050	0.026	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:32	MFF
n-Butylbenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
sec-Butylbenzene	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0013	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Carbon Disulfide	ND	0.0075	0.0041	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Carbon Tetrachloride	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Chlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Chlorodibromomethane	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Chloroform	ND	0.0050	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Chloromethane	ND	0.013	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
2-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
4-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2-Dibromoethane (EDB)	ND	0.0013	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Dibromomethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,4-Dichlorobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
trans-1,4-Dichloro-2-butene	ND	0.0050	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1-Dichloroethane	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1-Dichloroethylene	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,3-Dichloropropane	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
cis-1,3-Dichloropropene	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Diethyl Ether	ND	0.025	0.0023	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 0-0.5 | Sampled: 11/7/2013 09:40

Sample ID: 13K0326-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0013	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,4-Dioxane	ND	0.13	0.072	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Ethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Hexachlorobutadiene	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0050	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Methylene Chloride	ND	0.025	0.0089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Naphthalene	ND	0.0050	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
n-Propylbenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Styrene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1,2,2-Tetrachloroethane	ND	0.0013	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Tetrahydrofuran	ND	0.013	0.0028	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Toluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2,4-Trichlorobenzene	ND	0.0050	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Trichlorofluoromethane (Freon 11)	ND	0.013	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.013	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
Vinyl Chloride	ND	0.013	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
m+p Xylene	ND	0.0050	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF
o-Xylene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:32	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	114	70-130		11/11/13 11:32
Toluene-d8	98.2	70-130		11/11/13 11:32
4-Bromofluorobenzene	97.3	70-130		11/11/13 11:32

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 0-0.5 | Sampled: 11/7/2013 09:40

Sample ID: 13K0326-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Barium	130	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Beryllium	ND	0.26	0.043	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Cadmium	ND	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Calcium	2800	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Chromium	26	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Cobalt	14	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Copper	130	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Iron	18000	2.6	2.3	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 16:41	OP
Lead	36	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Magnesium	5700	7.9	0.83	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Manganese	300	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Mercury	0.026	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:28	SAJ
Nickel	31	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Potassium	1600	110	18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Selenium	ND	2.6	0.82	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 17:36	OP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Sodium	190	110	52	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Thallium	ND	2.6	0.88	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP
Vanadium	39	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:27	OP
Zinc	89	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:41	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 0-0.5 | Sampled: 11/7/2013 09:40

Sample ID: 13K0326-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.8		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 9-9.5 | Sampled: 11/7/2013 10:25

Sample ID: 13K0326-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.097	0.023	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Acrylonitrile	ND	0.0058	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:59	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Benzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Bromobenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Bromochloromethane	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Bromodichloromethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Bromoform	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Bromomethane	ND	0.0097	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
2-Butanone (MEK)	ND	0.039	0.017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
tert-Butyl Alcohol (TBA)	ND	0.039	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 11:59	MFF
n-Butylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
sec-Butylbenzene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
tert-Butylbenzene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Carbon Disulfide	ND	0.0058	0.0032	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Carbon Tetrachloride	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Chlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Chlorodibromomethane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Chloroethane	ND	0.019	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Chloroform	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Chloromethane	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
2-Chlorotoluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
4-Chlorotoluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2-Dibromoethane (EDB)	ND	0.00097	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Dibromomethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
trans-1,4-Dichloro-2-butene	ND	0.0039	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1-Dichloroethane	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2-Dichloroethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1-Dichloroethylene	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2-Dichloropropane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,3-Dichloropropane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
2,2-Dichloropropane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1-Dichloropropene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
cis-1,3-Dichloropropene	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 9-9.5 | Sampled: 11/7/2013 10:25

Sample ID: 13K0326-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,4-Dioxane	ND	0.097	0.056	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Ethylbenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Hexachlorobutadiene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
2-Hexanone (MBK)	ND	0.019	0.011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0039	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Methylene Chloride	ND	0.019	0.0069	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Naphthalene	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
n-Propylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Styrene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1,2,2-Tetrachloroethane	ND	0.00097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Tetrachloroethylene	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Tetrahydrofuran	ND	0.0097	0.0021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Toluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2,4-Trichlorobenzene	ND	0.0039	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Trichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
Vinyl Chloride	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
m+p Xylene	ND	0.0039	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF
o-Xylene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 11:59	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	109	70-130		11/11/13 11:59
Toluene-d8	97.0	70-130		11/11/13 11:59
4-Bromofluorobenzene	99.7	70-130		11/11/13 11:59

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 9-9.5 | Sampled: 11/7/2013 10:25

Sample ID: 13K0326-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	2.5	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Arsenic	ND	2.5	0.92	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Barium	170	2.5	0.32	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Beryllium	ND	0.25	0.041	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Cadmium	ND	0.25	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Calcium	2700	7.6	1.4	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Chromium	45	0.51	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Cobalt	16	2.5	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Copper	280	0.51	0.39	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Iron	16000	2.5	2.2	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 16:46	OP
Lead	7.2	0.76	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Magnesium	7500	7.6	0.80	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Manganese	210	0.51	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Mercury	ND	0.025	0.0016	mg/Kg dry	1		SW-846 7471B	11/12/13	11/13/13 13:30	SAJ
Nickel	130	0.51	0.12	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Potassium	2100	100	17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Selenium	ND	2.5	0.78	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 17:40	OP
Silver	ND	0.51	0.45	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Sodium	420	100	50	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Thallium	ND	2.5	0.84	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP
Vanadium	56	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:32	OP
Zinc	35	1.0	0.26	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:46	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB106 9-9.5 | Sampled: 11/7/2013 10:25

Sample ID: 13K0326-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	97.2		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 0-0.5 | Sampled: 11/7/2013 10:45

Sample ID: 13K0326-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.029	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Acrylonitrile	ND	0.0075	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 12:26	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Benzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Bromobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Bromochloromethane	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Bromodichloromethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Bromoform	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Bromomethane	ND	0.012	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
2-Butanone (MEK)	ND	0.050	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
tert-Butyl Alcohol (TBA)	ND	0.050	0.026	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 12:26	MFF
n-Butylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
sec-Butylbenzene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Carbon Disulfide	ND	0.0075	0.0041	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Carbon Tetrachloride	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Chlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Chlorodibromomethane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Chloroform	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
2-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
4-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Dibromomethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,4-Dichlorobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
trans-1,4-Dichloro-2-butene	ND	0.0050	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1-Dichloroethane	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1-Dichloroethylene	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,3-Dichloropropane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Diethyl Ether	ND	0.025	0.0022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 0-0.5 | Sampled: 11/7/2013 10:45

Sample ID: 13K0326-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,4-Dioxane	ND	0.12	0.072	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Ethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Hexachlorobutadiene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
p-Isopropyltoluene (p-Cymene)	0.0017	0.0025	0.0010	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0050	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Methylene Chloride	ND	0.025	0.0089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0095	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Naphthalene	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
n-Propylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Styrene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Tetrahydrofuran	ND	0.012	0.0027	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Toluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2,4-Trichlorobenzene	ND	0.0050	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
Vinyl Chloride	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
m+p Xylene	ND	0.0050	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF
o-Xylene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	112	70-130		11/11/13 12:26
Toluene-d8	97.6	70-130		11/11/13 12:26
4-Bromofluorobenzene	98.9	70-130		11/11/13 12:26

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 0-0.5 | Sampled: 11/7/2013 10:45

Sample ID: 13K0326-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP
Arsenic	ND	2.6	0.94	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP
Barium	70	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Calcium	1800	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Chromium	15	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Cobalt	8.0	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Copper	39	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Iron	15000	2.6	2.2	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 16:51	OP
Lead	17	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Magnesium	3200	7.9	0.82	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Manganese	320	0.52	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Mercury	0.026	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:31	SAJ
Nickel	14	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Potassium	910	100	18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 17:45	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP
Sodium	96	100	51	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/12/13 23:36	OP
Thallium	1.8	2.6	0.87	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 16:51	OP
Vanadium	27	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:36	OP
Zinc	50	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:51	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 0-0.5 | Sampled: 11/7/2013 10:45

Sample ID: 13K0326-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.1		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 7.5-8 | Sampled: 11/7/2013 11:30

Sample ID: 13K0326-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Acrylonitrile	ND	0.0064	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Benzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Bromobenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Bromodichloromethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.022	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
n-Butylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
tert-Butylbenzene	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Carbon Disulfide	ND	0.0064	0.0035	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Carbon Tetrachloride	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Chlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Chlorodibromomethane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Chloroform	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Chloromethane	ND	0.011	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
2-Chlorotoluene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
4-Chlorotoluene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Dibromomethane	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1-Dichloroethane	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,3-Dichloropropane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
2,2-Dichloropropane	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1-Dichloropropene	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 7.5-8 | Sampled: 11/7/2013 11:30

Sample ID: 13K0326-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,4-Dioxane	ND	0.11	0.061	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Ethylbenzene	0.0027	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
2-Hexanone (MBK)	ND	0.021	0.012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
p-Isopropyltoluene (p-Cymene)	0.0017	0.0021	0.00085	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Methylene Chloride	ND	0.021	0.0076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Naphthalene	0.0044	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
n-Propylbenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Styrene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Tetrahydrofuran	ND	0.011	0.0023	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Toluene	0.0012	0.0021	0.00085	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00064	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Trichloroethylene	ND	0.0021	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,2,4-Trimethylbenzene	0.0024	0.0021	0.00085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
1,3,5-Trimethylbenzene	0.0013	0.0021	0.00064	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 12:53	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
m+p Xylene	0.017	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF
o-Xylene	0.0097	0.0021	0.00075	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 12:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/11/13 12:53
Toluene-d8	99.1	70-130		11/11/13 12:53
4-Bromofluorobenzene	101	70-130		11/11/13 12:53

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 7.5-8 | Sampled: 11/7/2013 11:30

Sample ID: 13K0326-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:56	OP
Antimony	ND	5.6	4.5	mg/Kg dry	2	DL-04	SW-846 6010C	11/9/13	11/19/13 12:02	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:56	OP
Barium	110	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Beryllium	0.19	0.28	0.045	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/12/13 23:41	OP
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:56	OP
Calcium	2100	8.3	1.5	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Chromium	300	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Cobalt	82	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Copper	71	0.56	0.42	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Iron	74000	28	24	mg/Kg dry	10	B-07	SW-846 6010C	11/9/13	11/17/13 18:46	OP
Lead	21	0.83	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Magnesium	82000	83	8.7	mg/Kg dry	10		SW-846 6010C	11/9/13	11/17/13 18:46	OP
Manganese	660	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Mercury	0.0043	0.029	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:33	SAJ
Nickel	400	0.56	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Potassium	1800	110	19	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:56	OP
Selenium	1.1	2.8	0.86	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/18/13 17:51	OP
Silver	ND	1.1	0.98	mg/Kg dry	2	DL-04	SW-846 6010C	11/9/13	11/19/13 12:02	OP
Sodium	270	110	54	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Thallium	ND	5.6	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	11/9/13	11/19/13 12:02	OP
Vanadium	27	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:41	OP
Zinc	82	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 16:56	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB105 7.5-8 | Sampled: 11/7/2013 11:30

Sample ID: 13K0326-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.8		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 0-0.5 | Sampled: 11/7/2013 12:00

Sample ID: 13K0326-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.027	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Acrylonitrile	ND	0.0070	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 13:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Benzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Bromobenzene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Bromodichloromethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
2-Butanone (MEK)	ND	0.046	0.020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
tert-Butyl Alcohol (TBA)	ND	0.046	0.024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 13:20	MFF
n-Butylbenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
sec-Butylbenzene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Carbon Disulfide	ND	0.0070	0.0038	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Carbon Tetrachloride	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Chlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Chlorodibromomethane	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Chloroform	ND	0.0046	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Chloromethane	ND	0.012	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
2-Chlorotoluene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
4-Chlorotoluene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Dibromomethane	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.0046	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1-Dichloroethane	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1-Dichloroethylene	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,3-Dichloropropane	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 0-0.5 | Sampled: 11/7/2013 12:00

Sample ID: 13K0326-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,4-Dioxane	ND	0.12	0.067	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Ethylbenzene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Hexachlorobutadiene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
2-Hexanone (MBK)	ND	0.023	0.013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0046	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Methylene Chloride	0.0083	0.023	0.0082	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 13:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0088	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Naphthalene	ND	0.0046	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
n-Propylbenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Styrene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Toluene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2,4-Trichlorobenzene	ND	0.0046	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00093	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
m+p Xylene	ND	0.0046	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF
o-Xylene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:20	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	114	70-130		11/11/13 13:20
Toluene-d8	98.8	70-130		11/11/13 13:20
4-Bromofluorobenzene	99.8	70-130		11/11/13 13:20

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 0-0.5 | Sampled: 11/7/2013 12:00

Sample ID: 13K0326-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.9	1.2	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP
Barium	60	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Beryllium	ND	0.29	0.046	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Calcium	2800	8.6	1.6	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Chromium	16	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Cobalt	6.8	2.9	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Copper	25	0.57	0.44	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Iron	12000	2.9	2.5	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 17:21	OP
Lead	14	0.86	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Magnesium	2900	8.6	0.90	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Manganese	250	0.57	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Mercury	0.031	0.029	0.0019	mg/Kg dry	1		SW-846 7471B	11/12/13	11/13/13 13:35	SAJ
Nickel	12	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Potassium	1000	110	20	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 17:55	OP
Silver	ND	0.57	0.51	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP
Sodium	87	110	56	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/12/13 23:45	OP
Thallium	1.5	2.9	0.95	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 17:21	OP
Vanadium	23	1.1	0.19	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:45	OP
Zinc	40	1.1	0.30	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:21	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 0-0.5 | Sampled: 11/7/2013 12:00

Sample ID: 13K0326-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.4		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 9-9.5 | Sampled: 11/7/2013 12:30

Sample ID: 13K0326-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.097	0.023	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Acrylonitrile	ND	0.0058	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 13:47	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Benzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Bromobenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Bromochloromethane	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Bromodichloromethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Bromoform	ND	0.0019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Bromomethane	ND	0.0097	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
2-Butanone (MEK)	ND	0.039	0.017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
tert-Butyl Alcohol (TBA)	ND	0.039	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 13:47	MFF
n-Butylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
sec-Butylbenzene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
tert-Butylbenzene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Carbon Disulfide	ND	0.0058	0.0032	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Carbon Tetrachloride	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Chlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Chlorodibromomethane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Chloroethane	ND	0.019	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Chloroform	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Chloromethane	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
2-Chlorotoluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
4-Chlorotoluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2-Dibromoethane (EDB)	ND	0.00097	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Dibromomethane	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
trans-1,4-Dichloro-2-butene	ND	0.0039	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1-Dichloroethane	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2-Dichloroethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1-Dichloroethylene	ND	0.0039	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2-Dichloropropane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,3-Dichloropropane	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
2,2-Dichloropropane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1-Dichloropropene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
cis-1,3-Dichloropropene	ND	0.00097	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 9-9.5 | Sampled: 11/7/2013 12:30

Sample ID: 13K0326-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00097	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,4-Dioxane	ND	0.097	0.056	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Ethylbenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Hexachlorobutadiene	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
2-Hexanone (MBK)	ND	0.019	0.011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0039	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Methylene Chloride	0.0073	0.019	0.0069	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 13:47	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Naphthalene	ND	0.0039	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
n-Propylbenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Styrene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1,2,2-Tetrachloroethane	ND	0.00097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Tetrachloroethylene	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Tetrahydrofuran	ND	0.0097	0.0021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Toluene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2,4-Trichlorobenzene	ND	0.0039	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00097	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Trichloroethylene	ND	0.0019	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0097	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00058	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
Vinyl Chloride	ND	0.0097	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
m+p Xylene	ND	0.0039	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF
o-Xylene	ND	0.0019	0.00068	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 13:47	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	108	70-130		11/11/13 13:47
Toluene-d8	100	70-130		11/11/13 13:47
4-Bromofluorobenzene	102	70-130		11/11/13 13:47

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 9-9.5 | Sampled: 11/7/2013 12:30

Sample ID: 13K0326-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Arsenic	ND	2.6	0.94	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Barium	47	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Calcium	980	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Chromium	17	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Cobalt	9.6	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Copper	23	0.52	0.40	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Iron	15000	2.6	2.2	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 17:26	OP
Lead	6.8	0.78	0.16	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Magnesium	2700	7.8	0.82	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Manganese	190	0.52	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Mercury	0.017	0.027	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:36	SAJ
Nickel	15	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Potassium	740	100	18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 18:20	OP
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Sodium	220	100	51	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP
Vanadium	29	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:50	OP
Zinc	24	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:26	OP

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB104 9-9.5 | Sampled: 11/7/2013 12:30

Sample ID: 13K0326-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 0-0.5 | Sampled: 11/7/2013 13:15

Sample ID: 13K0326-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.028	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Acrylonitrile	ND	0.0071	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 14:14	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Benzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Bromobenzene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Bromochloromethane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Bromodichloromethane	ND	0.0024	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Bromoform	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
2-Butanone (MEK)	ND	0.047	0.021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
tert-Butyl Alcohol (TBA)	ND	0.047	0.025	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 14:14	MFF
n-Butylbenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
sec-Butylbenzene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
tert-Butylbenzene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Carbon Disulfide	ND	0.0071	0.0039	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Carbon Tetrachloride	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Chlorobenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Chlorodibromomethane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Chloroethane	ND	0.024	0.0018	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Chloroform	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
2-Chlorotoluene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
4-Chlorotoluene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Dibromomethane	ND	0.0024	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2-Dichlorobenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,3-Dichlorobenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,4-Dichlorobenzene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
trans-1,4-Dichloro-2-butene	ND	0.0047	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.024	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1-Dichloroethane	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2-Dichloroethane	ND	0.0024	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1-Dichloroethylene	ND	0.0047	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
cis-1,2-Dichloroethylene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
trans-1,2-Dichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2-Dichloropropane	ND	0.0024	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,3-Dichloropropane	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
2,2-Dichloropropane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1-Dichloropropene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
trans-1,3-Dichloropropene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Diethyl Ether	ND	0.024	0.0021	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 0-0.5 | Sampled: 11/7/2013 13:15

Sample ID: 13K0326-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,4-Dioxane	ND	0.12	0.068	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Ethylbenzene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Hexachlorobutadiene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
2-Hexanone (MBK)	ND	0.024	0.013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Isopropylbenzene (Cumene)	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0047	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Methylene Chloride	0.010	0.024	0.0084	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 14:14	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.024	0.0089	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Naphthalene	ND	0.0047	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
n-Propylbenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Styrene	ND	0.0024	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1,1,2-Tetrachloroethane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Tetrachloroethylene	ND	0.0024	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Toluene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2,3-Trichlorobenzene	ND	0.0024	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2,4-Trichlorobenzene	ND	0.0047	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,3,5-Trichlorobenzene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1,1-Trichloroethane	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1,2-Trichloroethane	ND	0.0024	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Trichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2,3-Trichloropropane	ND	0.0024	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,2,4-Trimethylbenzene	ND	0.0024	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
1,3,5-Trimethylbenzene	ND	0.0024	0.00071	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
m+p Xylene	ND	0.0047	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF
o-Xylene	ND	0.0024	0.00082	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:14	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/11/13 14:14
Toluene-d8	98.8	70-130		11/11/13 14:14
4-Bromofluorobenzene	100	70-130		11/11/13 14:14

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 0-0.5 | Sampled: 11/7/2013 13:15

Sample ID: 13K0326-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP
Barium	57	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Beryllium	ND	0.28	0.046	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Calcium	1900	8.5	1.5	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Chromium	17	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Cobalt	7.7	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Copper	82	0.57	0.43	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Iron	14000	2.8	2.4	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 17:31	OP
Lead	29	0.85	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Magnesium	3300	8.5	0.89	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Manganese	250	0.57	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Mercury	0.020	0.029	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:38	SAJ
Nickel	16	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Potassium	880	110	19	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP
Selenium	ND	2.8	0.88	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 18:25	OP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP
Sodium	88	110	55	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/12/13 23:55	OP
Thallium	1.0	2.8	0.94	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 17:31	OP
Vanadium	24	1.1	0.19	mg/Kg dry	1		SW-846 6010C	11/9/13	11/12/13 23:55	OP
Zinc	77	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:31	OP

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 0-0.5 | Sampled: 11/7/2013 13:15

Sample ID: 13K0326-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.7		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 9-9.5 | Sampled: 11/7/2013 13:45

Sample ID: 13K0326-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.13	0.031	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Acrylonitrile	ND	0.0081	0.0034	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0013	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Benzene	0.0023	0.0027	0.00094	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Bromobenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Bromochloromethane	ND	0.0027	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Bromodichloromethane	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Bromoform	ND	0.0027	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Bromomethane	ND	0.013	0.0023	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
2-Butanone (MEK)	ND	0.054	0.024	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
tert-Butyl Alcohol (TBA)	ND	0.054	0.028	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
n-Butylbenzene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
sec-Butylbenzene	ND	0.0027	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
tert-Butylbenzene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0013	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Carbon Disulfide	ND	0.0081	0.0044	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Carbon Tetrachloride	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Chlorobenzene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Chlorodibromomethane	ND	0.0013	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Chloroethane	ND	0.027	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Chloroform	ND	0.0054	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Chloromethane	ND	0.013	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
2-Chlorotoluene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
4-Chlorotoluene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0054	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2-Dibromoethane (EDB)	ND	0.0013	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Dibromomethane	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2-Dichlorobenzene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,3-Dichlorobenzene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,4-Dichlorobenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
trans-1,4-Dichloro-2-butene	ND	0.0054	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.027	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1-Dichloroethane	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2-Dichloroethane	ND	0.0027	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1-Dichloroethylene	ND	0.0054	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
cis-1,2-Dichloroethylene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
trans-1,2-Dichloroethylene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2-Dichloropropane	ND	0.0027	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,3-Dichloropropane	ND	0.0013	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
2,2-Dichloropropane	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1-Dichloropropene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
cis-1,3-Dichloropropene	ND	0.0013	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
trans-1,3-Dichloropropene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Diethyl Ether	ND	0.027	0.0024	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 9-9.5 | Sampled: 11/7/2013 13:45

Sample ID: 13K0326-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0013	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,4-Dioxane	ND	0.13	0.077	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Ethylbenzene	0.96	0.22		mg/Kg dry	1		SW-846 8260C	11/12/13	11/13/13 11:28	LBD
Hexachlorobutadiene	ND	0.0027	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
2-Hexanone (MBK)	ND	0.027	0.015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Isopropylbenzene (Cumene)	0.0070	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0054	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Methylene Chloride	0.012	0.027	0.0095	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.027	0.010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Naphthalene	0.0061	0.0054	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
n-Propylbenzene	0.0046	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Styrene	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1,1,2-Tetrachloroethane	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1,2,2-Tetrachloroethane	ND	0.0013	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Tetrachloroethylene	ND	0.0027	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Tetrahydrofuran	ND	0.013	0.0030	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Toluene	0.021	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2,3-Trichlorobenzene	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2,4-Trichlorobenzene	ND	0.0054	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,3,5-Trichlorobenzene	ND	0.0027	0.00094	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1,1-Trichloroethane	ND	0.0027	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1,2-Trichloroethane	ND	0.0027	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Trichloroethylene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Trichlorofluoromethane (Freon 11)	ND	0.013	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2,3-Trichloropropane	ND	0.0027	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.013	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,2,4-Trimethylbenzene	0.026	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
1,3,5-Trimethylbenzene	0.0066	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
Vinyl Chloride	ND	0.013	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 14:41	MFF
m+p Xylene	3.6	0.44		mg/Kg dry	1		SW-846 8260C	11/12/13	11/13/13 11:28	LBD
o-Xylene	1.5	0.22		mg/Kg dry	1		SW-846 8260C	11/12/13	11/13/13 11:28	LBD

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	102	70-130		11/13/13 11:28
1,2-Dichloroethane-d4	109	70-130		11/11/13 14:41
Toluene-d8	98.5	70-130		11/13/13 11:28
Toluene-d8	100	70-130		11/11/13 14:41
4-Bromofluorobenzene	103	70-130		11/13/13 11:28
4-Bromofluorobenzene	101	70-130		11/11/13 14:41

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 9-9.5 | Sampled: 11/7/2013 13:45

Sample ID: 13K0326-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	3.5	1.5	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:37	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:37	OP
Arsenic	1.9	3.5	1.3	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 17:37	OP
Barium	230	3.5	0.43	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Beryllium	ND	0.35	0.056	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Cadmium	1.6	0.35	0.21	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Calcium	10000	10	1.9	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Chromium	62	0.70	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Cobalt	18	3.5	0.22	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Copper	5300	0.70	0.53	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Iron	46000	35	30	mg/Kg dry	10	B-07	SW-846 6010C	11/9/13	11/17/13 18:52	OP
Lead	430	1.0	0.21	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Magnesium	8600	10	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Manganese	430	0.70	0.22	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Mercury	0.081	0.035	0.0022	mg/Kg dry	1		SW-846 7471B	11/12/13	11/13/13 13:44	SAJ
Nickel	250	0.70	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Potassium	1600	140	24	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:37	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 18:30	OP
Silver	ND	0.70	0.61	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:37	OP
Sodium	1200	140	68	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:37	OP
Vanadium	38	1.4	0.23	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:00	OP
Zinc	8700	14	3.6	mg/Kg dry	10		SW-846 6010C	11/9/13	11/17/13 18:52	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 9-9.5 | Sampled: 11/7/2013 13:45

Sample ID: 13K0326-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.6		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 12.5-13 | Sampled: 11/7/2013 14:00

Sample ID: 13K0326-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Acrylonitrile	ND	0.0067	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 15:08	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Benzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Bromobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Bromochloromethane	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Bromodichloromethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Bromoform	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 15:08	MFF
n-Butylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
tert-Butylbenzene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Carbon Disulfide	ND	0.0067	0.0037	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Carbon Tetrachloride	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Chlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Chlorodibromomethane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Chloroethane	ND	0.022	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Chloroform	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
2-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
4-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Dibromomethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1-Dichloroethane	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2-Dichloroethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2-Dichloropropane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,3-Dichloropropane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
2,2-Dichloropropane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1-Dichloropropene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 12.5-13 | Sampled: 11/7/2013 14:00

Sample ID: 13K0326-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Ethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Methylene Chloride	0.011	0.022	0.0080	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 15:08	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0085	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Naphthalene	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
n-Propylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Styrene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Tetrachloroethylene	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Toluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Trichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF
o-Xylene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:08	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/11/13 15:08
Toluene-d8	100	70-130		11/11/13 15:08
4-Bromofluorobenzene	99.3	70-130		11/11/13 15:08

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 12.5-13 | Sampled: 11/7/2013 14:00

Sample ID: 13K0326-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6700	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Barium	50	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Beryllium	ND	0.56	0.090	mg/Kg dry	2	DL-04	SW-846 6010C	11/9/13	11/19/13 12:13	OP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Calcium	2300	8.4	1.5	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Chromium	8.4	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Cobalt	4.2	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Copper	36	0.56	0.43	mg/Kg dry	1		SW-846 6010C	11/9/13	11/13/13 0:25	OP
Iron	10000	2.8	2.4	mg/Kg dry	1	B-07	SW-846 6010C	11/9/13	11/17/13 17:43	OP
Lead	3.1	0.84	0.17	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Magnesium	1900	8.4	0.88	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Manganese	110	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Mercury	ND	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/12/13	11/13/13 13:45	SAJ
Nickel	76	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Potassium	870	110	19	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	11/9/13	11/18/13 18:36	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Sodium	170	110	55	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Thallium	1.9	2.8	0.93	mg/Kg dry	1	J	SW-846 6010C	11/9/13	11/17/13 17:43	OP
Vanadium	15	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP
Zinc	26	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/9/13	11/17/13 17:43	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB102 12.5-13 | Sampled: 11/7/2013 14:00

Sample ID: 13K0326-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.5		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 0-0.5 | Sampled: 11/7/2013 14:30

Sample ID: 13K0326-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Acrylonitrile	ND	0.0065	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 15:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Benzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Bromobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Bromodichloromethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
2-Butanone (MEK)	ND	0.044	0.019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
tert-Butyl Alcohol (TBA)	ND	0.044	0.023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 15:35	MFF
n-Butylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
tert-Butylbenzene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Carbon Disulfide	ND	0.0065	0.0036	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Carbon Tetrachloride	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Chlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Chlorodibromomethane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Chloroform	ND	0.0044	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Chloromethane	ND	0.011	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
2-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
4-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Dibromomethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
trans-1,4-Dichloro-2-butene	ND	0.0044	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1-Dichloroethane	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1-Dichloroethylene	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,3-Dichloropropane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
2,2-Dichloropropane	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1-Dichloropropene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 0-0.5 | Sampled: 11/7/2013 14:30

Sample ID: 13K0326-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,4-Dioxane	ND	0.11	0.063	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Ethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0044	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Methylene Chloride	0.0084	0.022	0.0077	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 15:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Naphthalene	ND	0.0044	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
n-Propylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Styrene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Toluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2,4-Trichlorobenzene	ND	0.0044	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Trichloroethylene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00098	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
m+p Xylene	ND	0.0044	0.0019	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF
o-Xylene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 15:35	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	112	70-130		11/11/13 15:35
Toluene-d8	98.0	70-130		11/11/13 15:35
4-Bromofluorobenzene	98.4	70-130		11/11/13 15:35

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 0-0.5 | Sampled: 11/7/2013 14:30

Sample ID: 13K0326-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:35	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Barium	62	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Calcium	2300	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Chromium	18	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Cobalt	9.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Copper	45	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Iron	15000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Lead	18	0.81	0.16	mg/Kg dry	1	M-10	SW-846 6010C	11/8/13	11/14/13 0:41	OP
Magnesium	4400	8.1	0.85	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Manganese	280	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Mercury	0.018	0.027	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:47	SAJ
Nickel	24	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Potassium	1200	110	19	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:35	OP
Sodium	110	110	53	mg/Kg dry	1	J	SW-846 6010C	11/8/13	11/14/13 0:41	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Vanadium	23	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP
Zinc	99	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:41	OP

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 0-0.5 | Sampled: 11/7/2013 14:30

Sample ID: 13K0326-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.9		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 9-9.5 | Sampled: 11/7/2013 14:50

Sample ID: 13K0326-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.096	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Acrylonitrile	ND	0.0057	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 16:03	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Benzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Bromobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Bromochloromethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Bromodichloromethane	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Bromoform	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Bromomethane	ND	0.0096	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
2-Butanone (MEK)	ND	0.038	0.017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
tert-Butyl Alcohol (TBA)	ND	0.038	0.020	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 16:03	MFF
n-Butylbenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
sec-Butylbenzene	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
tert-Butylbenzene	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00096	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Carbon Disulfide	ND	0.0057	0.0032	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Carbon Tetrachloride	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Chlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Chlorodibromomethane	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Chloroethane	ND	0.019	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Chloroform	ND	0.0038	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Chloromethane	ND	0.0096	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
2-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
4-Chlorotoluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0038	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2-Dibromoethane (EDB)	ND	0.00096	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Dibromomethane	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
trans-1,4-Dichloro-2-butene	ND	0.0038	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1-Dichloroethane	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2-Dichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1-Dichloroethylene	ND	0.0038	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2-Dichloropropane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,3-Dichloropropane	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
2,2-Dichloropropane	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1-Dichloropropene	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
cis-1,3-Dichloropropene	ND	0.00096	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 9-9.5 | Sampled: 11/7/2013 14:50

Sample ID: 13K0326-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00096	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,4-Dioxane	ND	0.096	0.055	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Ethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Hexachlorobutadiene	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
2-Hexanone (MBK)	ND	0.019	0.010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0038	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Methylene Chloride	0.0086	0.019	0.0068	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 16:03	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0073	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Naphthalene	ND	0.0038	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
n-Propylbenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Styrene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1,2,2-Tetrachloroethane	ND	0.00096	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Tetrachloroethylene	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Tetrahydrofuran	ND	0.0096	0.0021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Toluene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2,4-Trichlorobenzene	ND	0.0038	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00096	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Trichloroethylene	ND	0.0019	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0096	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0096	0.00086	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00077	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00057	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
Vinyl Chloride	ND	0.0096	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
m+p Xylene	ND	0.0038	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF
o-Xylene	ND	0.0019	0.00067	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:03	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/11/13 16:03
Toluene-d8	99.4	70-130		11/11/13 16:03
4-Bromofluorobenzene	101	70-130		11/11/13 16:03

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 9-9.5 | Sampled: 11/7/2013 14:50

Sample ID: 13K0326-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:40	OP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Barium	72	2.8	0.35	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Beryllium	ND	0.28	0.045	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Calcium	2600	8.4	1.5	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Chromium	20	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Cobalt	10	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Copper	59	0.56	0.43	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Iron	16000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Lead	19	0.84	0.17	mg/Kg dry	1	M-10	SW-846 6010C	11/8/13	11/14/13 0:46	OP
Magnesium	4600	8.4	0.88	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Manganese	340	0.56	0.18	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Mercury	0.012	0.029	0.0019	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:48	SAJ
Nickel	24	0.56	0.14	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Potassium	1400	110	19	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:40	OP
Sodium	120	110	54	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Vanadium	24	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP
Zinc	120	1.1	0.29	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:46	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 9-9.5 | Sampled: 11/7/2013 14:50

Sample ID: 13K0326-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.6		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 12-13.5 | Sampled: 11/7/2013 15:00

Sample ID: 13K0326-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.092	0.022	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Acrylonitrile	ND	0.0055	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 16:30	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Benzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Bromobenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Bromochloromethane	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Bromodichloromethane	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Bromoform	ND	0.0018	0.0013	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Bromomethane	ND	0.0092	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
2-Butanone (MEK)	ND	0.037	0.016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
tert-Butyl Alcohol (TBA)	ND	0.037	0.019	mg/Kg dry	1	V-16	SW-846 8260C	11/11/13	11/11/13 16:30	MFF
n-Butylbenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
sec-Butylbenzene	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
tert-Butylbenzene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00092	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Carbon Disulfide	ND	0.0055	0.0030	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Carbon Tetrachloride	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Chlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Chlorodibromomethane	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Chloroethane	ND	0.018	0.0014	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Chloroform	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Chloromethane	ND	0.0092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
2-Chlorotoluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
4-Chlorotoluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2-Dibromoethane (EDB)	ND	0.00092	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Dibromomethane	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2-Dichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,3-Dichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,4-Dichlorobenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
trans-1,4-Dichloro-2-butene	ND	0.0037	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1-Dichloroethane	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2-Dichloroethane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1-Dichloroethylene	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
cis-1,2-Dichloroethylene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
trans-1,2-Dichloroethylene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2-Dichloropropane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,3-Dichloropropane	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
2,2-Dichloropropane	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1-Dichloropropene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
cis-1,3-Dichloropropene	ND	0.00092	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
trans-1,3-Dichloropropene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Diethyl Ether	ND	0.018	0.0017	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 12-13.5 | Sampled: 11/7/2013 15:00

Sample ID: 13K0326-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00092	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,4-Dioxane	ND	0.092	0.053	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Ethylbenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Hexachlorobutadiene	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
2-Hexanone (MBK)	ND	0.018	0.010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Isopropylbenzene (Cumene)	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0037	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Methylene Chloride	0.0066	0.018	0.0065	mg/Kg dry	1	J	SW-846 8260C	11/11/13	11/11/13 16:30	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.018	0.0070	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Naphthalene	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
n-Propylbenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Styrene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1,1,2-Tetrachloroethane	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1,2,2-Tetrachloroethane	ND	0.00092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Tetrachloroethylene	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Tetrahydrofuran	ND	0.0092	0.0020	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Toluene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2,3-Trichlorobenzene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2,4-Trichlorobenzene	ND	0.0037	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,3,5-Trichlorobenzene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1,1-Trichloroethane	ND	0.0018	0.00092	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1,2-Trichloroethane	ND	0.0018	0.0011	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Trichloroethylene	ND	0.0018	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0092	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2,3-Trichloropropane	ND	0.0018	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0092	0.00083	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,2,4-Trimethylbenzene	ND	0.0018	0.00074	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
1,3,5-Trimethylbenzene	ND	0.0018	0.00055	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
Vinyl Chloride	ND	0.0092	0.0010	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
m+p Xylene	ND	0.0037	0.0016	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF
o-Xylene	ND	0.0018	0.00065	mg/Kg dry	1		SW-846 8260C	11/11/13	11/11/13 16:30	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	111	70-130		11/11/13 16:30
Toluene-d8	99.8	70-130		11/11/13 16:30
4-Bromofluorobenzene	98.4	70-130		11/11/13 16:30

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 12-13.5 | Sampled: 11/7/2013 15:00

Sample ID: 13K0326-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	2.7	1.1	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Antimony	ND	2.7	2.1	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:46	OP
Arsenic	ND	2.7	0.96	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Barium	45	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Calcium	2500	8.0	1.4	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Chromium	9.3	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Cobalt	5.2	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Copper	31	0.53	0.41	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Iron	10000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Lead	4.8	0.80	0.16	mg/Kg dry	1	M-10	SW-846 6010C	11/8/13	11/14/13 0:50	OP
Magnesium	2100	8.0	0.83	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Manganese	270	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Mercury	0.0020	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/12/13	11/13/13 13:50	SAJ
Nickel	10	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Potassium	890	110	18	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 17:46	OP
Sodium	140	110	52	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Thallium	ND	2.7	0.88	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Vanadium	17	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP
Zinc	25	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/8/13	11/14/13 0:50	OP

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Project Location: Magna | Sample Description: | Work Order: 13K0326

Date Received: 11/8/2013

Field Sample #: LPSB103 12-13.5 | Sampled: 11/7/2013 15:00

Sample ID: 13K0326-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	11/14/13	11/15/13 9:52	MXG

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13K0326-02 [LPSB112 0-0.5]	B085212	11/14/13
13K0326-03 [LPSB112D 0-0.5]	B085212	11/14/13
13K0326-04 [LPSB112 9-9.5]	B085212	11/14/13
13K0326-05 [LPSB112 12.5-13]	B085212	11/14/13
13K0326-06 [LPSB106 0-0.5]	B085212	11/14/13
13K0326-07 [LPSB106 9-9.5]	B085212	11/14/13
13K0326-08 [LPSB105 0-0.5]	B085212	11/14/13
13K0326-09 [LPSB105 7.5-8]	B085212	11/14/13
13K0326-10 [LPSB104 0-0.5]	B085212	11/14/13
13K0326-11 [LPSB104 9-9.5]	B085212	11/14/13
13K0326-12 [LPSB102 0-0.5]	B085212	11/14/13
13K0326-13 [LPSB102 9-9.5]	B085212	11/14/13
13K0326-14 [LPSB102 12.5-13]	B085212	11/14/13
13K0326-15 [LPSB103 0-0.5]	B085212	11/14/13
13K0326-16 [LPSB103 9-9.5]	B085212	11/14/13
13K0326-17 [LPSB103 12-13.5]	B085212	11/14/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0326-15 [LPSB103 0-0.5]	B084767	1.03	50.0	11/08/13
13K0326-16 [LPSB103 9-9.5]	B084767	1.04	50.0	11/08/13
13K0326-17 [LPSB103 12-13.5]	B084767	1.06	50.0	11/08/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0326-05 [LPSB112 12.5-13]	B084776	1.08	50.0	11/09/13
13K0326-06 [LPSB106 0-0.5]	B084776	1.04	50.0	11/09/13
13K0326-07 [LPSB106 9-9.5]	B084776	1.01	50.0	11/09/13
13K0326-08 [LPSB105 0-0.5]	B084776	1.05	50.0	11/09/13
13K0326-09 [LPSB105 7.5-8]	B084776	1.07	50.0	11/09/13
13K0326-10 [LPSB104 0-0.5]	B084776	1.03	50.0	11/09/13
13K0326-11 [LPSB104 9-9.5]	B084776	1.08	50.0	11/09/13
13K0326-12 [LPSB102 0-0.5]	B084776	1.02	50.0	11/09/13
13K0326-13 [LPSB102 9-9.5]	B084776	1.00	50.0	11/09/13
13K0326-14 [LPSB102 12.5-13]	B084776	1.02	50.0	11/09/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0326-02 [LPSB112 0-0.5]	B084868	0.995	50.0	11/11/13
13K0326-03 [LPSB112D 0-0.5]	B084868	1.05	50.0	11/11/13
13K0326-04 [LPSB112 9-9.5]	B084868	1.06	50.0	11/11/13

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0326-01 [FB-3]	B084935	50.0	50.0	11/12/13

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Sample Extraction Data

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0326-01RE1 [FB-3]	B085233	50.0	50.0	11/15/13

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0326-01 [FB-3]	B084832	6.00	6.00	11/11/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0326-02 [LPSB112 0-0.5]	B085003	0.615	50.0	11/12/13
13K0326-03 [LPSB112D 0-0.5]	B085003	0.614	50.0	11/12/13
13K0326-04 [LPSB112 9-9.5]	B085003	0.610	50.0	11/12/13
13K0326-05 [LPSB112 12.5-13]	B085003	0.606	50.0	11/12/13
13K0326-06 [LPSB106 0-0.5]	B085003	0.614	50.0	11/12/13
13K0326-07 [LPSB106 9-9.5]	B085003	0.606	50.0	11/12/13
13K0326-08 [LPSB105 0-0.5]	B085003	0.604	50.0	11/12/13
13K0326-09 [LPSB105 7.5-8]	B085003	0.619	50.0	11/12/13
13K0326-10 [LPSB104 0-0.5]	B085003	0.609	50.0	11/12/13
13K0326-11 [LPSB104 9-9.5]	B085003	0.615	50.0	11/12/13
13K0326-12 [LPSB102 0-0.5]	B085003	0.602	50.0	11/12/13
13K0326-13 [LPSB102 9-9.5]	B085003	0.604	50.0	11/12/13
13K0326-14 [LPSB102 12.5-13]	B085003	0.617	50.0	11/12/13
13K0326-15 [LPSB103 0-0.5]	B085003	0.610	50.0	11/12/13
13K0326-16 [LPSB103 9-9.5]	B085003	0.603	50.0	11/12/13
13K0326-17 [LPSB103 12-13.5]	B085003	0.600	50.0	11/12/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0326-02 [LPSB112 0-0.5]	B084846	5.20	10.0	11/11/13
13K0326-03 [LPSB112D 0-0.5]	B084846	5.30	10.0	11/11/13
13K0326-04 [LPSB112 9-9.5]	B084846	5.70	10.0	11/11/13
13K0326-05 [LPSB112 12.5-13]	B084846	5.50	10.0	11/11/13
13K0326-06 [LPSB106 0-0.5]	B084846	4.40	10.0	11/11/13
13K0326-07 [LPSB106 9-9.5]	B084846	5.30	10.0	11/11/13
13K0326-08 [LPSB105 0-0.5]	B084846	4.40	10.0	11/11/13
13K0326-09 [LPSB105 7.5-8]	B084846	5.60	10.0	11/11/13
13K0326-10 [LPSB104 0-0.5]	B084846	5.10	10.0	11/11/13
13K0326-11 [LPSB104 9-9.5]	B084846	5.80	10.0	11/11/13
13K0326-12 [LPSB102 0-0.5]	B084846	4.90	10.0	11/11/13
13K0326-13 [LPSB102 9-9.5]	B084846	5.20	10.0	11/11/13
13K0326-14 [LPSB102 12.5-13]	B084846	5.10	10.0	11/11/13
13K0326-15 [LPSB103 0-0.5]	B084846	5.10	10.0	11/11/13
13K0326-16 [LPSB103 9-9.5]	B084846	6.10	10.0	11/11/13
13K0326-17 [LPSB103 12-13.5]	B084846	6.10	10.0	11/11/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date

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Sample Extraction Data

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
13K0326-13 [LPSB102 9-9.5]	B084928	5.20	16.5	1	50	11/12/13

Prep Method: SW-846 5030B-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0326-01 [FB-3]	B084861	5	5.00	11/11/13

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084846 - SW-846 5035										
Blank (B084846-BLK1)				Prepared & Analyzed: 11/11/13						
Acetone	ND	0.10	mg/Kg wet							
Acrylonitrile	ND	0.0060	mg/Kg wet							V-16
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							V-16
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.020	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-05, V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035												
Blank (B084846-BLK1)				Prepared & Analyzed: 11/11/13								
Methylene Chloride	ND	0.020	mg/Kg wet									
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet									
Naphthalene	ND	0.0040	mg/Kg wet									
n-Propylbenzene	ND	0.0020	mg/Kg wet									
Styrene	ND	0.0020	mg/Kg wet									
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet									
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet									
Tetrachloroethylene	ND	0.0020	mg/Kg wet									
Tetrahydrofuran	ND	0.010	mg/Kg wet								V-05, V-16	
Toluene	ND	0.0020	mg/Kg wet									
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet									
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet									
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet									
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet									
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet									
Trichloroethylene	ND	0.0020	mg/Kg wet									
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet									
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet									
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet									
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet									
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet									
Vinyl Chloride	ND	0.010	mg/Kg wet									
m+p Xylene	ND	0.0040	mg/Kg wet									
o-Xylene	ND	0.0020	mg/Kg wet									
Surrogate: 1,2-Dichloroethane-d4	*0.0493*		mg/Kg wet	0.0500		98.7		70-130				
Surrogate: Toluene-d8	*0.0491*		mg/Kg wet	0.0500		98.1		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0498*		mg/Kg wet	0.0500		99.6		70-130				
LCS (B084846-BS1)				Prepared & Analyzed: 11/11/13								
Acetone	0.126	0.10	mg/Kg wet	0.200		**63.2**	*	70-160			L-07, V-20	†
Acrylonitrile	0.0172	0.0060	mg/Kg wet	0.0200		85.8		70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0188	0.0010	mg/Kg wet	0.0200		93.8		70-130				
Benzene	0.0181	0.0020	mg/Kg wet	0.0200		90.7		70-130				
Bromobenzene	0.0169	0.0020	mg/Kg wet	0.0200		84.7		70-130				
Bromochloromethane	0.0199	0.0020	mg/Kg wet	0.0200		99.4		70-130				
Bromodichloromethane	0.0197	0.0020	mg/Kg wet	0.0200		98.7		70-130				
Bromoform	0.0178	0.0020	mg/Kg wet	0.0200		89.2		70-130				
Bromomethane	0.0184	0.010	mg/Kg wet	0.0200		91.8		40-130			V-20	†
2-Butanone (MEK)	0.140	0.040	mg/Kg wet	0.200		70.2		70-160				†
tert-Butyl Alcohol (TBA)	0.146	0.040	mg/Kg wet	0.200		73.2		40-130			V-16	†
n-Butylbenzene	0.0190	0.0020	mg/Kg wet	0.0200		95.0		70-130				
sec-Butylbenzene	0.0181	0.0020	mg/Kg wet	0.0200		90.4		70-130				
tert-Butylbenzene	0.0176	0.0020	mg/Kg wet	0.0200		87.9		70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0191	0.0010	mg/Kg wet	0.0200		95.5		70-130				
Carbon Disulfide	0.0208	0.0060	mg/Kg wet	0.0200		104		70-130				
Carbon Tetrachloride	0.0199	0.0020	mg/Kg wet	0.0200		99.7		70-130				
Chlorobenzene	0.0179	0.0020	mg/Kg wet	0.0200		89.5		70-130				
Chlorodibromomethane	0.0188	0.0010	mg/Kg wet	0.0200		94.0		70-130				
Chloroethane	0.0215	0.020	mg/Kg wet	0.0200		108		70-130				
Chloroform	0.0202	0.0040	mg/Kg wet	0.0200		101		70-130				
Chloromethane	0.0153	0.010	mg/Kg wet	0.0200		76.7		70-130				
2-Chlorotoluene	0.0180	0.0020	mg/Kg wet	0.0200		89.9		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035											
LCS (B084846-BS1)				Prepared & Analyzed: 11/11/13							
4-Chlorotoluene	0.0189	0.0020	mg/Kg wet	0.0200		94.5	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0164	0.0040	mg/Kg wet	0.0200		81.8	70-130				
1,2-Dibromoethane (EDB)	0.0193	0.0010	mg/Kg wet	0.0200		96.7	70-130				
Dibromomethane	0.0195	0.0020	mg/Kg wet	0.0200		97.5	70-130				
1,2-Dichlorobenzene	0.0181	0.0020	mg/Kg wet	0.0200		90.6	70-130				
1,3-Dichlorobenzene	0.0175	0.0020	mg/Kg wet	0.0200		87.7	70-130				
1,4-Dichlorobenzene	0.0177	0.0020	mg/Kg wet	0.0200		88.5	70-130				
trans-1,4-Dichloro-2-butene	0.0174	0.0040	mg/Kg wet	0.0200		86.9	70-130				
Dichlorodifluoromethane (Freon 12)	0.0166	0.020	mg/Kg wet	0.0200		83.1	40-160			J	†
1,1-Dichloroethane	0.0195	0.0020	mg/Kg wet	0.0200		97.4	70-130				
1,2-Dichloroethane	0.0200	0.0020	mg/Kg wet	0.0200		99.8	70-130				
1,1-Dichloroethylene	0.0229	0.0040	mg/Kg wet	0.0200		114	70-130				
cis-1,2-Dichloroethylene	0.0191	0.0020	mg/Kg wet	0.0200		95.6	70-130				
trans-1,2-Dichloroethylene	0.0199	0.0020	mg/Kg wet	0.0200		99.4	70-130				
1,2-Dichloropropane	0.0182	0.0020	mg/Kg wet	0.0200		90.8	70-130				
1,3-Dichloropropane	0.0199	0.0010	mg/Kg wet	0.0200		99.5	70-130				
2,2-Dichloropropane	0.0199	0.0020	mg/Kg wet	0.0200		99.6	70-130				
1,1-Dichloropropene	0.0196	0.0020	mg/Kg wet	0.0200		97.8	70-130				
cis-1,3-Dichloropropene	0.0180	0.0010	mg/Kg wet	0.0200		89.8	70-130				
trans-1,3-Dichloropropene	0.0193	0.0020	mg/Kg wet	0.0200		96.3	70-130				
Diethyl Ether	0.0198	0.020	mg/Kg wet	0.0200		99.2	70-130			J	
Diisopropyl Ether (DIPE)	0.0193	0.0010	mg/Kg wet	0.0200		96.7	70-130				
1,4-Dioxane	0.118	0.10	mg/Kg wet	0.200		58.8	40-160			V-05, V-16	†
Ethylbenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.1	70-130				
Hexachlorobutadiene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-160				
2-Hexanone (MBK)	0.163	0.020	mg/Kg wet	0.200		81.7	70-160				†
Isopropylbenzene (Cumene)	0.0186	0.0020	mg/Kg wet	0.0200		93.0	70-130				
p-Isopropyltoluene (p-Cymene)	0.0181	0.0020	mg/Kg wet	0.0200		90.3	70-130				
Methyl tert-Butyl Ether (MTBE)	0.0199	0.0040	mg/Kg wet	0.0200		99.4	70-130				
Methylene Chloride	0.0200	0.020	mg/Kg wet	0.0200		99.8	40-160			J	†
4-Methyl-2-pentanone (MIBK)	0.170	0.020	mg/Kg wet	0.200		85.0	70-160				†
Naphthalene	0.0158	0.0040	mg/Kg wet	0.0200		78.8	40-130				†
n-Propylbenzene	0.0192	0.0020	mg/Kg wet	0.0200		96.2	70-130				
Styrene	0.0187	0.0020	mg/Kg wet	0.0200		93.4	70-130				
1,1,1,2-Tetrachloroethane	0.0189	0.0020	mg/Kg wet	0.0200		94.6	70-130				
1,1,2,2-Tetrachloroethane	0.0187	0.0010	mg/Kg wet	0.0200		93.7	70-130				
Tetrachloroethylene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130				
Tetrahydrofuran	0.0159	0.010	mg/Kg wet	0.0200		79.7	70-130			V-05, V-16	
Toluene	0.0188	0.0020	mg/Kg wet	0.0200		93.8	70-130				
1,2,3-Trichlorobenzene	0.0178	0.0020	mg/Kg wet	0.0200		88.9	70-130				
1,2,4-Trichlorobenzene	0.0183	0.0040	mg/Kg wet	0.0200		91.4	70-130				
1,3,5-Trichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.5	70-130				
1,1,1-Trichloroethane	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130				
1,1,2-Trichloroethane	0.0190	0.0020	mg/Kg wet	0.0200		94.9	70-130				
Trichloroethylene	0.0184	0.0020	mg/Kg wet	0.0200		91.9	70-130				
Trichlorofluoromethane (Freon 11)	0.0233	0.010	mg/Kg wet	0.0200		116	70-130				
1,2,3-Trichloropropane	0.0183	0.0020	mg/Kg wet	0.0200		91.3	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0221	0.010	mg/Kg wet	0.0200		111	70-130				
1,2,4-Trimethylbenzene	0.0184	0.0020	mg/Kg wet	0.0200		92.1	70-130				
1,3,5-Trimethylbenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.7	70-130				
Vinyl Chloride	0.0163	0.010	mg/Kg wet	0.0200		81.3	40-130				†

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035											
LCS (B084846-BS1)				Prepared & Analyzed: 11/11/13							
m+p Xylene	0.0370	0.0040	mg/Kg wet	0.0400		92.5	70-130				
o-Xylene	0.0187	0.0020	mg/Kg wet	0.0200		93.5	70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0515*		mg/Kg wet	0.0500		103	70-130				
Surrogate: Toluene-d8	*0.0495*		mg/Kg wet	0.0500		99.0	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0509*		mg/Kg wet	0.0500		102	70-130				
LCS Dup (B084846-BSD1)				Prepared & Analyzed: 11/11/13							
Acetone	0.147	0.10	mg/Kg wet	0.200		73.6	70-160	15.3	25	V-20	†
Acrylonitrile	0.0167	0.0060	mg/Kg wet	0.0200		83.3	70-130	2.96	25	V-16	
tert-Amyl Methyl Ether (TAME)	0.0211	0.0010	mg/Kg wet	0.0200		105	70-130	11.6	25		
Benzene	0.0194	0.0020	mg/Kg wet	0.0200		97.0	70-130	6.71	25		
Bromobenzene	0.0196	0.0020	mg/Kg wet	0.0200		98.1	70-130	14.7	25		
Bromochloromethane	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130	11.2	25		
Bromodichloromethane	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130	10.3	25		
Bromoform	0.0193	0.0020	mg/Kg wet	0.0200		96.5	70-130	7.86	25		
Bromomethane	0.0226	0.010	mg/Kg wet	0.0200		113	40-130	20.9	25	V-20	†
2-Butanone (MEK)	0.166	0.040	mg/Kg wet	0.200		83.2	70-160	16.9	25		†
tert-Butyl Alcohol (TBA)	0.177	0.040	mg/Kg wet	0.200		88.4	40-130	18.9	25	V-16	†
n-Butylbenzene	0.0211	0.0020	mg/Kg wet	0.0200		106	70-130	10.6	25		
sec-Butylbenzene	0.0201	0.0020	mg/Kg wet	0.0200		101	70-130	10.7	25		
tert-Butylbenzene	0.0194	0.0020	mg/Kg wet	0.0200		96.9	70-160	9.74	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0209	0.0010	mg/Kg wet	0.0200		104	70-130	9.00	25		
Carbon Disulfide	0.0223	0.0060	mg/Kg wet	0.0200		112	70-130	7.05	25		
Carbon Tetrachloride	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130	9.19	25		
Chlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	10.4	25		
Chlorodibromomethane	0.0213	0.0010	mg/Kg wet	0.0200		107	70-130	12.6	25		
Chloroethane	0.0224	0.020	mg/Kg wet	0.0200		112	70-130	4.01	25		
Chloroform	0.0217	0.0040	mg/Kg wet	0.0200		109	70-130	7.45	25		
Chloromethane	0.0159	0.010	mg/Kg wet	0.0200		79.4	70-130	3.46	25		
2-Chlorotoluene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	12.9	25		
4-Chlorotoluene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	11.3	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0196	0.0040	mg/Kg wet	0.0200		98.2	70-130	18.2	25		
1,2-Dibromoethane (EDB)	0.0217	0.0010	mg/Kg wet	0.0200		108	70-130	11.5	25		
Dibromomethane	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130	12.0	25		
1,2-Dichlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	9.16	25		
1,3-Dichlorobenzene	0.0197	0.0020	mg/Kg wet	0.0200		98.3	70-130	11.4	25		
1,4-Dichlorobenzene	0.0195	0.0020	mg/Kg wet	0.0200		97.7	70-130	9.88	25		
trans-1,4-Dichloro-2-butene	0.0200	0.0040	mg/Kg wet	0.0200		100	70-130	14.1	25		
Dichlorodifluoromethane (Freon 12)	0.0179	0.020	mg/Kg wet	0.0200		89.3	40-160	7.19	25	J	†
1,1-Dichloroethane	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	8.93	25		
1,2-Dichloroethane	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	6.87	25		
1,1-Dichloroethylene	0.0249	0.0040	mg/Kg wet	0.0200		125	70-130	8.53	25		
cis-1,2-Dichloroethylene	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130	8.99	25		
trans-1,2-Dichloroethylene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	4.52	25		
1,2-Dichloropropane	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130	8.84	25		
1,3-Dichloropropane	0.0221	0.0010	mg/Kg wet	0.0200		110	70-130	10.3	25		
2,2-Dichloropropane	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	6.51	25		
1,1-Dichloropropene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	10.3	25		
cis-1,3-Dichloropropene	0.0196	0.0010	mg/Kg wet	0.0200		98.0	70-130	8.73	25		
trans-1,3-Dichloropropene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	9.68	25		
Diethyl Ether	0.0224	0.020	mg/Kg wet	0.0200		112	70-130	12.3	25		
Diisopropyl Ether (DIPE)	0.0212	0.0010	mg/Kg wet	0.0200		106	70-130	9.08	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084846 - SW-846 5035											
LCS Dup (B084846-BSD1)			Prepared & Analyzed: 11/11/13								
1,4-Dioxane	0.156	0.10	mg/Kg wet	0.200		77.8	40-160	27.9	50	V-05, V-16	† ‡
Ethylbenzene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130	9.12	25		
Hexachlorobutadiene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-160	6.35	25		
2-Hexanone (MBK)	0.184	0.020	mg/Kg wet	0.200		91.8	70-160	11.6	25		†
Isopropylbenzene (Cumene)	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	11.2	25		
p-Isopropyltoluene (p-Cymene)	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130	9.39	25		
Methyl tert-Butyl Ether (MTBE)	0.0223	0.0040	mg/Kg wet	0.0200		111	70-130	11.4	25		
Methylene Chloride	0.0219	0.020	mg/Kg wet	0.0200		110	40-160	9.27	25		†
4-Methyl-2-pentanone (MIBK)	0.197	0.020	mg/Kg wet	0.200		98.6	70-160	14.8	25		†
Naphthalene	0.0174	0.0040	mg/Kg wet	0.0200		86.9	40-130	9.78	25		†
n-Propylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	8.75	25		
Styrene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.70	25		
1,1,1,2-Tetrachloroethane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	9.56	25		
1,1,2,2-Tetrachloroethane	0.0214	0.0010	mg/Kg wet	0.0200		107	70-130	13.1	25		
Tetrachloroethylene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	6.06	25		
Tetrahydrofuran	0.0155	0.010	mg/Kg wet	0.0200		77.5	70-130	2.80	25	V-05, V-16	
Toluene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130	8.18	25		
1,2,3-Trichlorobenzene	0.0187	0.0020	mg/Kg wet	0.0200		93.6	70-130	5.15	25		
1,2,4-Trichlorobenzene	0.0202	0.0040	mg/Kg wet	0.0200		101	70-130	9.88	25		
1,3,5-Trichlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	4.66	25		
1,1,1-Trichloroethane	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	6.38	25		
1,1,2-Trichloroethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	9.53	25		
Trichloroethylene	0.0193	0.0020	mg/Kg wet	0.0200		96.4	70-130	4.78	25		
Trichlorofluoromethane (Freon 11)	0.0257	0.010	mg/Kg wet	0.0200		129	70-130	9.96	25		
1,2,3-Trichloropropane	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130	13.0	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0251	0.010	mg/Kg wet	0.0200		125	70-130	12.5	25		
1,2,4-Trimethylbenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.3	70-130	7.52	25		
1,3,5-Trimethylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	12.4	25		
Vinyl Chloride	0.0175	0.010	mg/Kg wet	0.0200		87.5	40-130	7.35	25		†
m+p Xylene	0.0411	0.0040	mg/Kg wet	0.0400		103	70-130	10.5	25		
o-Xylene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	8.99	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0519*		mg/Kg wet	0.0500		104	70-130				
Surrogate: Toluene-d8	*0.0498*		mg/Kg wet	0.0500		99.7	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0518*		mg/Kg wet	0.0500		104	70-130				
Matrix Spike (B084846-MS1)		**Source: 13K0326-02**	Prepared & Analyzed: 11/11/13								
Acetone	0.166	0.11	mg/Kg dry	0.219	ND	75.4	70-130				
Acrylonitrile	0.0187	0.0066	mg/Kg dry	0.0219	ND	85.1	70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0198	0.0011	mg/Kg dry	0.0219	ND	90.2	70-130				
Benzene	0.0185	0.0022	mg/Kg dry	0.0219	ND	84.1	70-130				
Bromobenzene	0.0183	0.0022	mg/Kg dry	0.0219	ND	83.4	70-130				
Bromochloromethane	0.0211	0.0022	mg/Kg dry	0.0219	ND	96.1	70-130				
Bromodichloromethane	0.0210	0.0022	mg/Kg dry	0.0219	ND	95.8	70-130				
Bromoform	0.0192	0.0022	mg/Kg dry	0.0219	ND	87.7	70-130				
Bromomethane	0.0198	0.011	mg/Kg dry	0.0219	ND	90.4	70-130				
2-Butanone (MEK)	0.163	0.044	mg/Kg dry	0.219	ND	74.5	70-130				
tert-Butyl Alcohol (TBA)	0.172	0.044	mg/Kg dry	0.219	ND	78.2	70-130			V-16	
n-Butylbenzene	0.0192	0.0022	mg/Kg dry	0.0219	ND	87.7	70-130				
sec-Butylbenzene	0.0180	0.0022	mg/Kg dry	0.0219	ND	81.9	70-130				
tert-Butylbenzene	0.0181	0.0022	mg/Kg dry	0.0219	ND	82.4	70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0199	0.0011	mg/Kg dry	0.0219	ND	90.6	70-130				
Carbon Disulfide	0.0212	0.0066	mg/Kg dry	0.0219	ND	96.6	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084846 - SW-846 5035											
Matrix Spike (B084846-MS1)		**Source: 13K0326-02**		Prepared & Analyzed: 11/11/13							
Carbon Tetrachloride	0.0206	0.0022	mg/Kg dry	0.0219	ND	94.1		70-130			
Chlorobenzene	0.0187	0.0022	mg/Kg dry	0.0219	ND	85.4		70-130			
Chlorodibromomethane	0.0201	0.0011	mg/Kg dry	0.0219	ND	91.8		70-130			
Chloroethane	0.0231	0.022	mg/Kg dry	0.0219	ND	105		70-130			
Chloroform	0.0212	0.0044	mg/Kg dry	0.0219	ND	96.7		70-130			
Chloromethane	0.0151	0.011	mg/Kg dry	0.0219	ND	**68.8**	*	70-130			MS-07
2-Chlorotoluene	0.0181	0.0022	mg/Kg dry	0.0219	ND	82.5		70-130			
4-Chlorotoluene	0.0195	0.0022	mg/Kg dry	0.0219	0.00331	73.6		70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.0184	0.0022	mg/Kg dry	0.0219	ND	83.9		70-130			
1,2-Dibromoethane (EDB)	0.0218	0.0011	mg/Kg dry	0.0219	ND	99.5		70-130			
Dibromomethane	0.0223	0.0022	mg/Kg dry	0.0219	ND	102		70-130			
1,2-Dichlorobenzene	0.0189	0.0022	mg/Kg dry	0.0219	ND	86.3		70-130			
1,3-Dichlorobenzene	0.0186	0.0022	mg/Kg dry	0.0219	ND	84.8		70-130			
1,4-Dichlorobenzene	0.0184	0.0022	mg/Kg dry	0.0219	ND	83.8		70-130			
trans-1,4-Dichloro-2-butene	0.0195	0.0044	mg/Kg dry	0.0219	ND	89.0		70-130			
Dichlorodifluoromethane (Freon 12)	0.0172	0.022	mg/Kg dry	0.0219	ND	78.2		70-130			J
1,1-Dichloroethane	0.0202	0.0022	mg/Kg dry	0.0219	ND	92.0		70-130			
1,2-Dichloroethane	0.0220	0.0022	mg/Kg dry	0.0219	ND	100		70-130			
1,1-Dichloroethylene	0.0242	0.0044	mg/Kg dry	0.0219	ND	110		70-130			
cis-1,2-Dichloroethylene	0.0199	0.0022	mg/Kg dry	0.0219	ND	90.9		70-130			
trans-1,2-Dichloroethylene	0.0201	0.0022	mg/Kg dry	0.0219	ND	91.5		70-130			
1,2-Dichloropropane	0.0186	0.0022	mg/Kg dry	0.0219	ND	84.7		70-130			
1,3-Dichloropropane	0.0216	0.0011	mg/Kg dry	0.0219	ND	98.4		70-130			
2,2-Dichloropropane	0.0202	0.0022	mg/Kg dry	0.0219	ND	92.2		70-130			
1,1-Dichloropropene	0.0201	0.0022	mg/Kg dry	0.0219	ND	91.6		70-130			
cis-1,3-Dichloropropene	0.0189	0.0011	mg/Kg dry	0.0219	ND	86.0		70-130			
trans-1,3-Dichloropropene	0.0197	0.0022	mg/Kg dry	0.0219	ND	89.6		70-130			
Diethyl Ether	0.0217	0.022	mg/Kg dry	0.0219	ND	98.8		70-130			J
Diisopropyl Ether (DIPE)	0.0194	0.0011	mg/Kg dry	0.0219	ND	88.4		70-130			
1,4-Dioxane	0.173	0.11	mg/Kg dry	0.219	ND	78.7		70-130			V-16, V-05
Ethylbenzene	0.0190	0.0022	mg/Kg dry	0.0219	ND	86.8		70-130			
Hexachlorobutadiene	0.0181	0.0022	mg/Kg dry	0.0219	ND	82.5		70-130			
2-Hexanone (MBK)	0.184	0.022	mg/Kg dry	0.219	ND	84.1		70-130			
Isopropylbenzene (Cumene)	0.0189	0.0022	mg/Kg dry	0.0219	ND	86.0		70-130			
p-Isopropyltoluene (p-Cymene)	0.0181	0.0022	mg/Kg dry	0.0219	0.00127	76.7		70-130			
Methyl tert-Butyl Ether (MTBE)	0.0217	0.0044	mg/Kg dry	0.0219	ND	98.9		70-130			
Methylene Chloride	0.0230	0.022	mg/Kg dry	0.0219	ND	105		70-130			
4-Methyl-2-pentanone (MIBK)	0.196	0.022	mg/Kg dry	0.219	ND	89.1		70-130			
Naphthalene	0.0159	0.0044	mg/Kg dry	0.0219	ND	72.6		70-130			
n-Propylbenzene	0.0190	0.0022	mg/Kg dry	0.0219	ND	86.6		70-130			
Styrene	0.0189	0.0022	mg/Kg dry	0.0219	ND	86.2		70-130			
1,1,1,2-Tetrachloroethane	0.0200	0.0022	mg/Kg dry	0.0219	ND	91.0		70-130			
1,1,2,2-Tetrachloroethane	0.0206	0.0011	mg/Kg dry	0.0219	ND	94.1		70-130			
Tetrachloroethylene	0.0201	0.0022	mg/Kg dry	0.0219	ND	91.4		70-130			
Tetrahydrofuran	0.0195	0.011	mg/Kg dry	0.0219	ND	88.7		70-130			V-05, V-16
Toluene	0.0194	0.0022	mg/Kg dry	0.0219	ND	88.2		70-130			
1,2,3-Trichlorobenzene	0.0166	0.0022	mg/Kg dry	0.0219	ND	75.5		70-130			
1,2,4-Trichlorobenzene	0.0173	0.0044	mg/Kg dry	0.0219	ND	78.8		70-130			
1,3,5-Trichlorobenzene	0.0186	0.0022	mg/Kg dry	0.0219	ND	84.7		70-130			
1,1,1-Trichloroethane	0.0210	0.0022	mg/Kg dry	0.0219	ND	95.7		70-130			
1,1,2-Trichloroethane	0.0206	0.0022	mg/Kg dry	0.0219	ND	94.1		70-130			
Trichloroethylene	0.0189	0.0022	mg/Kg dry	0.0219	ND	86.1		70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084846 - SW-846 5035										
Matrix Spike (B084846-MS1)		**Source: 13K0326-02**		Prepared & Analyzed: 11/11/13						
Trichlorofluoromethane (Freon 11)	0.0252	0.011	mg/Kg dry	0.0219	ND	115	70-130			
1,2,3-Trichloropropane	0.0211	0.0022	mg/Kg dry	0.0219	ND	96.1	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0232	0.011	mg/Kg dry	0.0219	ND	106	70-130			
1,2,4-Trimethylbenzene	0.0189	0.0022	mg/Kg dry	0.0219	ND	86.2	70-130			
1,3,5-Trimethylbenzene	0.0188	0.0022	mg/Kg dry	0.0219	ND	85.6	70-130			
Vinyl Chloride	0.0160	0.011	mg/Kg dry	0.0219	ND	73.0	70-130			
m+p Xylene	0.0380	0.0044	mg/Kg dry	0.0439	ND	86.6	70-130			
o-Xylene	0.0193	0.0022	mg/Kg dry	0.0219	ND	88.1	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0588*		mg/Kg dry	0.0548		107	70-130			
Surrogate: Toluene-d8	*0.0543*		mg/Kg dry	0.0548		99.0	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0560*		mg/Kg dry	0.0548		102	70-130			
Batch B084861 - SW-846 5030B										
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13						
Acetone	ND	50	µg/L							
Acrylonitrile	ND	5.0	µg/L							
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L							
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	µg/L							
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	0.50	µg/L							
Bromoform	ND	1.0	µg/L							R-05
Bromomethane	ND	2.0	µg/L							R-05
2-Butanone (MEK)	ND	20	µg/L							
tert-Butyl Alcohol (TBA)	ND	20	µg/L							R-05, V-16
n-Butylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	1.0	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	4.0	µg/L							
Carbon Tetrachloride	ND	5.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							R-05
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L							R-05
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084861 - SW-846 5030B										
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13						
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Diethyl Ether	ND	2.0	µg/L							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L							
1,4-Dioxane	ND	50	µg/L							V-16
Ethylbenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	0.50	µg/L							
2-Hexanone (MBK)	ND	10	µg/L							
Isopropylbenzene (Cumene)	ND	1.0	µg/L							
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
Methylene Chloride	ND	5.0	µg/L							
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L							
Naphthalene	ND	2.0	µg/L							
n-Propylbenzene	ND	1.0	µg/L							
Styrene	ND	1.0	µg/L							
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L							
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L							
Tetrachloroethylene	ND	1.0	µg/L							
Tetrahydrofuran	ND	10	µg/L							
Toluene	ND	1.0	µg/L							
1,2,3-Trichlorobenzene	ND	5.0	µg/L							
1,2,4-Trichlorobenzene	ND	1.0	µg/L							
1,3,5-Trichlorobenzene	ND	1.0	µg/L							
1,1,1-Trichloroethane	ND	1.0	µg/L							
1,1,2-Trichloroethane	ND	1.0	µg/L							
Trichloroethylene	ND	1.0	µg/L							
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L							
1,2,3-Trichloropropane	ND	2.0	µg/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L							
1,2,4-Trimethylbenzene	ND	1.0	µg/L							
1,3,5-Trimethylbenzene	ND	1.0	µg/L							
Vinyl Chloride	ND	2.0	µg/L							R-05
m+p Xylene	ND	2.0	µg/L							
o-Xylene	ND	1.0	µg/L							
Surrogate: 1,2-Dichloroethane-d4	*25.3*		µg/L	25.0		101	70-130			
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130			
Surrogate: 4-Bromofluorobenzene	*25.4*		µg/L	25.0		102	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	90.7	50	µg/L	100		90.7	70-160				†
Acrylonitrile	10.9	5.0	µg/L	10.0		109	70-130				
tert-Amyl Methyl Ether (TAME)	11.1	0.50	µg/L	10.0		111	70-130				
Benzene	11.4	1.0	µg/L	10.0		114	70-130				
Bromobenzene	10.8	1.0	µg/L	10.0		108	70-130				
Bromochloromethane	11.8	1.0	µg/L	10.0		118	70-130				
Bromodichloromethane	10.4	0.50	µg/L	10.0		104	70-130				
Bromoform	9.61	1.0	µg/L	10.0		96.1	70-130			R-05	
Bromomethane	5.70	2.0	µg/L	10.0		57.0	40-160			R-05, V-20	†
2-Butanone (MEK)	101	20	µg/L	100		101	40-160				†
tert-Butyl Alcohol (TBA)	80.0	20	µg/L	100		80.0	40-160			R-05, V-16	†
n-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
sec-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
tert-Butylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
tert-Butyl Ethyl Ether (TBEE)	11.7	0.50	µg/L	10.0		117	70-130				
Carbon Disulfide	12.9	4.0	µg/L	10.0		129	70-130				
Carbon Tetrachloride	9.26	5.0	µg/L	10.0		92.6	70-130				
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130				
Chlorodibromomethane	9.84	0.50	µg/L	10.0		98.4	70-130				
Chloroethane	12.8	2.0	µg/L	10.0		128	70-130				
Chloroform	10.8	2.0	µg/L	10.0		108	70-130				
Chloromethane	11.6	2.0	µg/L	10.0		116	40-160			V-20	†
2-Chlorotoluene	11.2	1.0	µg/L	10.0		112	70-130				
4-Chlorotoluene	11.0	1.0	µg/L	10.0		110	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	9.41	5.0	µg/L	10.0		94.1	70-130			R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130				
Dibromomethane	10.2	1.0	µg/L	10.0		102	70-130				
1,2-Dichlorobenzene	11.6	1.0	µg/L	10.0		116	70-130				
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117	70-130				
1,4-Dichlorobenzene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,4-Dichloro-2-butene	7.28	2.0	µg/L	10.0		72.8	70-130			R-05	
Dichlorodifluoromethane (Freon 12)	6.29	2.0	µg/L	10.0		62.9	40-160				†
1,1-Dichloroethane	11.6	1.0	µg/L	10.0		116	70-130				
1,2-Dichloroethane	9.31	1.0	µg/L	10.0		93.1	70-130				
1,1-Dichloroethylene	11.1	1.0	µg/L	10.0		111	70-130				
cis-1,2-Dichloroethylene	11.5	1.0	µg/L	10.0		115	70-130				
trans-1,2-Dichloroethylene	11.3	1.0	µg/L	10.0		113	70-130				
1,2-Dichloropropane	10.7	1.0	µg/L	10.0		107	70-130				
1,3-Dichloropropane	11.7	0.50	µg/L	10.0		117	70-130				
2,2-Dichloropropane	9.92	1.0	µg/L	10.0		99.2	40-130				†
1,1-Dichloropropene	11.4	2.0	µg/L	10.0		114	70-130				
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130				
trans-1,3-Dichloropropene	10.8	0.50	µg/L	10.0		108	70-130				
Diethyl Ether	10.3	2.0	µg/L	10.0		103	70-130				
Diisopropyl Ether (DIPE)	13.0	0.50	µg/L	10.0		130	70-130				
1,4-Dioxane	65.1	50	µg/L	100		65.1	40-130			V-16	†
Ethylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
Hexachlorobutadiene	13.7	0.50	µg/L	10.0		**137**	* 70-130			L-07	
2-Hexanone (MBK)	95.4	10	µg/L	100		95.4	70-160				†
Isopropylbenzene (Cumene)	10.7	1.0	µg/L	10.0		107	70-130				
p-Isopropyltoluene (p-Cymene)	11.3	1.0	µg/L	10.0		113	70-130				
Methyl tert-Butyl Ether (MTBE)	11.5	1.0	µg/L	10.0		115	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Methylene Chloride	11.3	5.0	µg/L	10.0		113	70-130				
4-Methyl-2-pentanone (MIBK)	102	10	µg/L	100		102	70-160				†
Naphthalene	11.6	2.0	µg/L	10.0		116	40-130				†
n-Propylbenzene	11.0	1.0	µg/L	10.0		110	70-130				
Styrene	10.9	1.0	µg/L	10.0		109	70-130				
1,1,1,2-Tetrachloroethane	9.98	1.0	µg/L	10.0		99.8	70-130				
1,1,2,2-Tetrachloroethane	11.4	0.50	µg/L	10.0		114	70-130				
Tetrachloroethylene	11.2	1.0	µg/L	10.0		112	70-130				
Tetrahydrofuran	9.37	10	µg/L	10.0		93.7	70-130			J	
Toluene	10.8	1.0	µg/L	10.0		108	70-130				
1,2,3-Trichlorobenzene	12.2	5.0	µg/L	10.0		122	70-130				
1,2,4-Trichlorobenzene	12.4	1.0	µg/L	10.0		124	70-130				
1,3,5-Trichlorobenzene	12.7	1.0	µg/L	10.0		127	70-130				
1,1,1-Trichloroethane	9.17	1.0	µg/L	10.0		91.7	70-130				
1,1,2-Trichloroethane	10.3	1.0	µg/L	10.0		103	70-130				
Trichloroethylene	9.51	1.0	µg/L	10.0		95.1	70-130				
Trichlorofluoromethane (Freon 11)	9.36	2.0	µg/L	10.0		93.6	70-130				
1,2,3-Trichloropropane	11.1	2.0	µg/L	10.0		111	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	11.3	1.0	µg/L	10.0		113	70-130				
1,2,4-Trimethylbenzene	10.9	1.0	µg/L	10.0		109	70-130				
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130				
Vinyl Chloride	9.74	2.0	µg/L	10.0		97.4	40-160			R-05	†
m+p Xylene	21.8	2.0	µg/L	20.0		109	70-130				
o-Xylene	10.9	1.0	µg/L	10.0		109	70-130				
Surrogate: 1,2-Dichloroethane-d4	*24.0*		µg/L	25.0		95.9	70-130				
Surrogate: Toluene-d8	*24.7*		µg/L	25.0		98.8	70-130				
Surrogate: 4-Bromofluorobenzene	*24.2*		µg/L	25.0		96.9	70-130				
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	107	50	µg/L	100		107	70-160	16.7	25		†
Acrylonitrile	10.5	5.0	µg/L	10.0		105	70-130	3.36	25		
tert-Amyl Methyl Ether (TAME)	10.0	0.50	µg/L	10.0		100	70-130	9.67	25		
Benzene	9.82	1.0	µg/L	10.0		98.2	70-130	14.7	25		
Bromobenzene	10.3	1.0	µg/L	10.0		103	70-130	4.94	25		
Bromochloromethane	10.1	1.0	µg/L	10.0		101	70-130	15.4	25		
Bromodichloromethane	11.2	0.50	µg/L	10.0		112	70-130	7.97	25		
Bromoform	12.4	1.0	µg/L	10.0		124	70-130	**25.2** *	25	R-05	
Bromomethane	9.01	2.0	µg/L	10.0		90.1	40-160	**45.0** *	25	R-05, V-20	†
2-Butanone (MEK)	115	20	µg/L	100		115	40-160	13.2	25		†
tert-Butyl Alcohol (TBA)	111	20	µg/L	100		111	40-160	**32.3** *	25	R-05, V-16	†
n-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	9.68	25		
sec-Butylbenzene	10.4	1.0	µg/L	10.0		104	70-130	9.82	25		
tert-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	8.47	25		
tert-Butyl Ethyl Ether (TBEE)	10.5	0.50	µg/L	10.0		105	70-130	10.9	25		
Carbon Disulfide	10.9	4.0	µg/L	10.0		109	70-130	16.2	25		
Carbon Tetrachloride	11.0	5.0	µg/L	10.0		110	70-130	16.9	25		
Chlorobenzene	10.3	1.0	µg/L	10.0		103	70-130	7.32	25		
Chlorodibromomethane	11.6	0.50	µg/L	10.0		116	70-130	16.5	25		
Chloroethane	11.4	2.0	µg/L	10.0		114	70-130	12.2	25		
Chloroform	10.5	2.0	µg/L	10.0		105	70-130	3.28	25		
Chloromethane	9.82	2.0	µg/L	10.0		98.2	40-160	17.0	25	V-20	†
2-Chlorotoluene	10.1	1.0	µg/L	10.0		101	70-130	10.3	25		

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13								
4-Chlorotoluene	10.2	1.0	µg/L	10.0		102	70-130	7.43		25		
1,2-Dibromo-3-chloropropane (DBCP)	12.4	5.0	µg/L	10.0		124	70-130	**27.7**	*	25	R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130	0.274		25		
Dibromomethane	10.8	1.0	µg/L	10.0		108	70-130	5.05		25		
1,2-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	12.3		25		
1,3-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	14.0		25		
1,4-Dichlorobenzene	10.7	1.0	µg/L	10.0		107	70-130	7.19		25		
trans-1,4-Dichloro-2-butene	9.44	2.0	µg/L	10.0		94.4	70-130	**25.8**	*	25	R-05	
Dichlorodifluoromethane (Freon 12)	6.69	2.0	µg/L	10.0		66.9	40-160	6.16		25		†
1,1-Dichloroethane	10.5	1.0	µg/L	10.0		105	70-130	10.3		25		
1,2-Dichloroethane	11.2	1.0	µg/L	10.0		112	70-130	18.7		25		
1,1-Dichloroethylene	10.1	1.0	µg/L	10.0		101	70-130	9.14		25		
cis-1,2-Dichloroethylene	10.6	1.0	µg/L	10.0		106	70-130	7.88		25		
trans-1,2-Dichloroethylene	10.5	1.0	µg/L	10.0		105	70-130	7.31		25		
1,2-Dichloropropane	10.4	1.0	µg/L	10.0		104	70-130	3.41		25		
1,3-Dichloropropane	11.0	0.50	µg/L	10.0		110	70-130	6.00		25		
2,2-Dichloropropane	11.1	1.0	µg/L	10.0		111	40-130	11.6		25		†
1,1-Dichloropropene	10.8	2.0	µg/L	10.0		108	70-130	5.67		25		
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130	0.476		25		
trans-1,3-Dichloropropene	11.6	0.50	µg/L	10.0		116	70-130	7.67		25		
Diethyl Ether	8.79	2.0	µg/L	10.0		87.9	70-130	15.4		25		
Diisopropyl Ether (DIPE)	10.4	0.50	µg/L	10.0		104	70-130	21.5		25		
1,4-Dioxane	88.1	50	µg/L	100		88.1	40-130	30.0		50	V-16	† ‡
Ethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	10.1		25		
Hexachlorobutadiene	11.2	0.50	µg/L	10.0		112	70-130	19.9		25		
2-Hexanone (MBK)	108	10	µg/L	100		108	70-160	12.7		25		†
Isopropylbenzene (Cumene)	10.2	1.0	µg/L	10.0		102	70-130	5.08		25		
p-Isopropyltoluene (p-Cymene)	10.4	1.0	µg/L	10.0		104	70-130	7.65		25		
Methyl tert-Butyl Ether (MTBE)	11.0	1.0	µg/L	10.0		110	70-130	4.36		25		
Methylene Chloride	12.9	5.0	µg/L	10.0		129	70-130	13.3		25		
4-Methyl-2-pentanone (MIBK)	108	10	µg/L	100		108	70-160	6.11		25		†
Naphthalene	11.3	2.0	µg/L	10.0		113	40-130	2.62		25		†
n-Propylbenzene	10.7	1.0	µg/L	10.0		107	70-130	2.31		25		
Styrene	10.6	1.0	µg/L	10.0		106	70-130	2.51		25		
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116	70-130	15.3		25		
1,1,2,2-Tetrachloroethane	11.1	0.50	µg/L	10.0		111	70-130	2.59		25		
Tetrachloroethylene	10.8	1.0	µg/L	10.0		108	70-130	3.99		25		
Tetrahydrofuran	9.87	10	µg/L	10.0		98.7	70-130	5.20		25	J	
Toluene	10.1	1.0	µg/L	10.0		101	70-130	6.80		25		
1,2,3-Trichlorobenzene	11.0	5.0	µg/L	10.0		110	70-130	10.4		25		
1,2,4-Trichlorobenzene	10.8	1.0	µg/L	10.0		108	70-130	13.4		25		
1,3,5-Trichlorobenzene	9.89	1.0	µg/L	10.0		98.9	70-130	25.0		25		
1,1,1-Trichloroethane	10.5	1.0	µg/L	10.0		105	70-130	13.5		25		
1,1,2-Trichloroethane	10.7	1.0	µg/L	10.0		107	70-130	3.61		25		
Trichloroethylene	10.2	1.0	µg/L	10.0		102	70-130	6.61		25		
Trichlorofluoromethane (Freon 11)	10.0	2.0	µg/L	10.0		100	70-130	6.71		25		
1,2,3-Trichloropropane	10.9	2.0	µg/L	10.0		109	70-130	1.81		25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	10.4	1.0	µg/L	10.0		104	70-130	8.50		25		
1,2,4-Trimethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	5.96		25		
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130	0.495		25		
Vinyl Chloride	7.50	2.0	µg/L	10.0		75.0	40-160	**26.0**	*	25	R-05	†

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084861 - SW-846 5030B										
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13						
m+p Xylene	20.8	2.0	µg/L	20.0		104	70-130	4.50	25	
o-Xylene	10.4	1.0	µg/L	10.0		104	70-130	4.71	25	
Surrogate: 1,2-Dichloroethane-d4	*25.1*		µg/L	25.0		100	70-130			
Surrogate: Toluene-d8	*24.8*		µg/L	25.0		99.1	70-130			
Surrogate: 4-Bromofluorobenzene	*24.6*		µg/L	25.0		98.5	70-130			
Batch B084928 - SW-846 5035										
Blank (B084928-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Ethylbenzene	ND	0.050	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0252*		mg/Kg wet	0.0250		101	70-130			
Surrogate: Toluene-d8	*0.0246*		mg/Kg wet	0.0250		98.5	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0247*		mg/Kg wet	0.0250		98.8	70-130			
LCS (B084928-BS1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Ethylbenzene	0.0137	0.0011	mg/Kg wet	0.0113		121	70-130			
m+p Xylene	0.0267	0.0023	mg/Kg wet	0.0227		118	70-130			
o-Xylene	0.0136	0.0011	mg/Kg wet	0.0113		120	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0285*		mg/Kg wet	0.0283		101	70-130			
Surrogate: Toluene-d8	*0.0279*		mg/Kg wet	0.0283		98.6	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0285*		mg/Kg wet	0.0283		101	70-130			
LCS Dup (B084928-BSD1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Ethylbenzene	0.0136	0.0011	mg/Kg wet	0.0113		120	70-130	0.665	25	
m+p Xylene	0.0264	0.0023	mg/Kg wet	0.0227		116	70-130	1.20	25	
o-Xylene	0.0135	0.0011	mg/Kg wet	0.0113		119	70-130	0.668	25	
Surrogate: 1,2-Dichloroethane-d4	*0.0287*		mg/Kg wet	0.0283		101	70-130			
Surrogate: Toluene-d8	*0.0279*		mg/Kg wet	0.0283		98.4	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0283*		mg/Kg wet	0.0283		99.8	70-130			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084767 - SW-846 3050B										
Blank (B084767-BLK1)				Prepared: 11/08/13 Analyzed: 11/13/13						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.6	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.94	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.44	1.0	mg/Kg wet							J
LCS (B084767-BS1)				Prepared: 11/08/13 Analyzed: 11/13/13						
Aluminum	9920	5.0	mg/Kg wet	8840		112	46.1-153.4			
Antimony	100	5.0	mg/Kg wet	88.2		114	8.2-218.9			
Arsenic	107	5.0	mg/Kg wet	99.6		107	83-117.6			
Barium	339	5.0	mg/Kg wet	310		109	83.2-117.5			
Beryllium	81.1	0.50	mg/Kg wet	72.3		112	83.9-116			
Cadmium	189	0.50	mg/Kg wet	182		104	83.1-116.9			
Calcium	7720	15	mg/Kg wet	6790		114	83.1-116.7			
Chromium	149	1.0	mg/Kg wet	136		110	81.6-117.6			
Cobalt	139	5.0	mg/Kg wet	128		108	84.7-115.3			
Copper	115	1.0	mg/Kg wet	102		112	83.8-116.1			
Iron	13600	5.0	mg/Kg wet	12600		108	50.8-149.6			
Lead	122	1.5	mg/Kg wet	115		106	82.4-117.8			
Magnesium	3330	15	mg/Kg wet	3010		111	75.4-124.2			
Manganese	354	1.0	mg/Kg wet	323		110	82.8-117.5			
Nickel	163	1.0	mg/Kg wet	153		107	84.4-115.6			
Potassium	3410	200	mg/Kg wet	2840		120	72.7-127.3			
Selenium	158	5.0	mg/Kg wet	150		105	80-120			
Silver	40.2	1.0	mg/Kg wet	40.4		99.5	66.2-133.8			
Sodium	3020	200	mg/Kg wet	2760		110	73.8-126.2			
Thallium	191	5.0	mg/Kg wet	174		110	81.2-118.8			
Vanadium	112	2.0	mg/Kg wet	97.6		115	75.5-124			
Zinc	171	2.0	mg/Kg wet	161		106	81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084767 - SW-846 3050B										
LCS Dup (B084767-BSD1)				Prepared: 11/08/13 Analyzed: 11/13/13						
Aluminum	9140	5.0	mg/Kg wet	8840		103	46.1-153.4	8.25	30	
Antimony	105	5.0	mg/Kg wet	88.2		119	8.2-218.9	4.93	30	
Arsenic	103	5.0	mg/Kg wet	99.6		103	83-117.6	3.97	30	
Barium	320	5.0	mg/Kg wet	310		103	83.2-117.5	5.98	30	
Beryllium	76.4	0.50	mg/Kg wet	72.3		106	83.9-116	5.87	30	
Cadmium	176	0.50	mg/Kg wet	182		96.5	83.1-116.9	7.15	30	
Calcium	7680	15	mg/Kg wet	6790		113	83.1-116.7	0.474	30	
Chromium	141	0.99	mg/Kg wet	136		104	81.6-117.6	5.40	30	
Cobalt	130	5.0	mg/Kg wet	128		101	84.7-115.3	6.52	30	
Copper	107	0.99	mg/Kg wet	102		105	83.8-116.1	6.99	30	
Iron	13000	5.0	mg/Kg wet	12600		104	50.8-149.6	4.44	30	
Lead	114	1.5	mg/Kg wet	115		99.3	82.4-117.8	6.71	30	
Magnesium	3220	15	mg/Kg wet	3010		107	75.4-124.2	3.36	30	
Manganese	331	0.99	mg/Kg wet	323		103	82.8-117.5	6.69	30	
Nickel	153	0.99	mg/Kg wet	153		99.9	84.4-115.6	6.63	30	
Potassium	3200	200	mg/Kg wet	2840		113	72.7-127.3	6.34	30	
Selenium	151	5.0	mg/Kg wet	150		100	80-120	4.90	30	
Silver	37.8	0.99	mg/Kg wet	40.4		93.5	66.2-133.8	6.28	30	
Sodium	2780	200	mg/Kg wet	2760		101	73.8-126.2	8.37	30	
Thallium	181	5.0	mg/Kg wet	174		104	81.2-118.8	5.34	30	
Vanadium	106	2.0	mg/Kg wet	97.6		109	75.5-124	5.51	30	
Zinc	162	2.0	mg/Kg wet	161		101	81.9-117.6	5.41	30	
MRL Check (B084767-MRL1)				Prepared: 11/08/13 Analyzed: 11/14/13						
Lead	1.06	0.72	mg/Kg wet	0.719		**147**	* 80-120			M-10
Batch B084776 - SW-846 3050B										
Blank (B084776-BLK1)				Prepared: 11/09/13 Analyzed: 11/17/13						
Aluminum	1.6	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.4	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	2.9	2.5	mg/Kg wet							B-07
Lead	0.35	0.75	mg/Kg wet							J
Magnesium	0.82	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	0.13	0.50	mg/Kg wet							J
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.36	1.0	mg/Kg wet							J

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084776 - SW-846 3050B										
LCS (B084776-BS1)				Prepared: 11/09/13 Analyzed: 11/17/13						
Aluminum	10300	5.0	mg/Kg wet	8840		117	46.1-153.4			
Antimony	90.3	5.0	mg/Kg wet	88.2		102	8.2-218.9			
Arsenic	99.2	5.0	mg/Kg wet	99.6		99.6	83-117.6			
Barium	302	5.0	mg/Kg wet	310		97.3	83.2-117.5			
Beryllium	71.2	0.50	mg/Kg wet	72.3		98.5	83.9-116			
Cadmium	171	0.50	mg/Kg wet	182		93.8	83.1-116.9			
Calcium	6590	15	mg/Kg wet	6790		97.0	83.1-116.7			
Chromium	128	1.0	mg/Kg wet	136		94.3	81.6-117.6			
Cobalt	120	5.0	mg/Kg wet	128		93.8	84.7-115.3			
Copper	102	1.0	mg/Kg wet	102		100	83.8-116.1			
Iron	13100	5.0	mg/Kg wet	12600		104	50.8-149.6			
Lead	112	1.5	mg/Kg wet	115		97.3	82.4-117.8			
Magnesium	2910	15	mg/Kg wet	3010		96.5	75.4-124.2			
Manganese	320	1.0	mg/Kg wet	323		99.0	82.8-117.5			
Nickel	137	1.0	mg/Kg wet	153		89.7	84.4-115.6			
Potassium	3220	200	mg/Kg wet	2840		113	72.7-127.3			
Selenium	143	5.0	mg/Kg wet	150		95.3	80-120			
Silver	37.3	1.0	mg/Kg wet	40.4		92.3	66.2-133.8			
Sodium	2880	200	mg/Kg wet	2760		105	73.8-126.2			
Thallium	182	5.0	mg/Kg wet	174		105	81.2-118.8			
Vanadium	98.3	2.0	mg/Kg wet	97.6		101	75.5-124			
Zinc	159	2.0	mg/Kg wet	161		98.6	81.9-117.6			
LCS Dup (B084776-BSD1)				Prepared: 11/09/13 Analyzed: 11/17/13						
Aluminum	9270	5.0	mg/Kg wet	8840		105	46.1-153.4	10.9	30	
Antimony	89.1	5.0	mg/Kg wet	88.2		101	8.2-218.9	1.32	30	
Arsenic	104	5.0	mg/Kg wet	99.6		105	83-117.6	4.81	30	
Barium	329	5.0	mg/Kg wet	310		106	83.2-117.5	8.57	30	
Beryllium	77.6	0.50	mg/Kg wet	72.3		107	83.9-116	8.56	30	
Cadmium	182	0.50	mg/Kg wet	182		100	83.1-116.9	6.57	30	
Calcium	7250	15	mg/Kg wet	6790		107	83.1-116.7	9.64	30	
Chromium	140	1.0	mg/Kg wet	136		103	81.6-117.6	8.53	30	
Cobalt	131	5.0	mg/Kg wet	128		102	84.7-115.3	8.38	30	
Copper	110	1.0	mg/Kg wet	102		108	83.8-116.1	7.67	30	
Iron	12400	5.0	mg/Kg wet	12600		98.2	50.8-149.6	5.52	30	
Lead	121	1.5	mg/Kg wet	115		105	82.4-117.8	7.38	30	
Magnesium	3100	15	mg/Kg wet	3010		103	75.4-124.2	6.60	30	
Manganese	349	1.0	mg/Kg wet	323		108	82.8-117.5	8.81	30	
Nickel	151	1.0	mg/Kg wet	153		98.5	84.4-115.6	9.39	30	
Potassium	2910	200	mg/Kg wet	2840		102	72.7-127.3	10.2	30	
Selenium	154	5.0	mg/Kg wet	150		103	80-120	7.26	30	
Silver	36.6	1.0	mg/Kg wet	40.4		90.7	66.2-133.8	1.71	30	
Sodium	3020	200	mg/Kg wet	2760		109	73.8-126.2	4.47	30	
Thallium	168	5.0	mg/Kg wet	174		96.3	81.2-118.8	8.29	30	
Vanadium	107	2.0	mg/Kg wet	97.6		109	75.5-124	8.28	30	
Zinc	150	2.0	mg/Kg wet	161		93.2	81.9-117.6	5.62	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B084776 - SW-846 3050B												
Duplicate (B084776-DUP1)		**Source: 13K0326-05**		Prepared: 11/09/13 Analyzed: 11/17/13								
Aluminum	6390	2.5	mg/Kg dry		5240				19.9		35	
Antimony	2.19	2.5	mg/Kg dry		ND				NC		35	J
Arsenic	14.7	2.5	mg/Kg dry		19.0				25.6		35	
Barium	236	2.5	mg/Kg dry		131				**57.2**	*	35	R-02
Beryllium	0.111	0.25	mg/Kg dry		0.0982				12.5		35	J
Cadmium	ND	0.25	mg/Kg dry		ND				NC		35	
Calcium	3490	7.5	mg/Kg dry		2600				29.2		35	
Chromium	143	0.50	mg/Kg dry		133				7.55		35	
Cobalt	21.0	2.5	mg/Kg dry		20.9				0.577		35	
Copper	102	0.50	mg/Kg dry		110				7.14		35	
Iron	11900	2.5	mg/Kg dry		11700				1.57		35	B-07
Lead	2.28	0.75	mg/Kg dry		2.39				4.67		35	
Magnesium	8470	7.5	mg/Kg dry		7160				16.7		35	
Manganese	175	0.50	mg/Kg dry		187				6.44		35	
Nickel	37.7	0.50	mg/Kg dry		37.6				0.0294		35	
Potassium	2300	100	mg/Kg dry		1260				**58.2**	*	35	R-02
Selenium	1.28	2.5	mg/Kg dry		0.906				34.3		35	J
Silver	ND	0.50	mg/Kg dry		ND				NC		35	
Sodium	390	100	mg/Kg dry		336				14.9		35	
Thallium	1.59	2.5	mg/Kg dry		1.91				18.4		35	J
Vanadium	36.8	1.0	mg/Kg dry		31.3				16.2		35	
Zinc	24.0	1.0	mg/Kg dry		24.9				3.71		35	
MRL Check (B084776-MRL1)				Prepared: 11/09/13 Analyzed: 11/12/13								
Lead	0.808	0.75	mg/Kg wet	0.749		108		80-120				
Matrix Spike (B084776-MS1)		**Source: 13K0326-05**		Prepared: 11/09/13 Analyzed: 11/17/13								
Aluminum	5010	2.4	mg/Kg dry	96.3	5240	**-236**	*	75-125				MS-19
Antimony	44.8	2.4	mg/Kg dry	96.3	ND	**46.6**	*	75-125				MS-07
Arsenic	110	2.4	mg/Kg dry	96.3	19.0	95.0		75-125				
Barium	205	2.4	mg/Kg dry	96.3	131	76.9		75-125				
Beryllium	98.0	0.24	mg/Kg dry	96.3	0.0982	102		75-125				
Cadmium	96.5	0.24	mg/Kg dry	96.3	ND	100		75-125				
Calcium	3260	7.2	mg/Kg dry	96.3	2600	**684**	*	75-125				MS-19
Chromium	233	0.48	mg/Kg dry	96.3	133	104		75-125				
Cobalt	112	2.4	mg/Kg dry	96.3	20.9	94.8		75-125				
Copper	201	0.48	mg/Kg dry	96.3	110	94.3		75-125				
Iron	11400	2.4	mg/Kg dry	96.3	11700	**-387**	*	75-125				MS-19
Lead	94.5	0.72	mg/Kg dry	96.3	2.39	95.7		75-125				
Magnesium	7000	7.2	mg/Kg dry	96.3	7160	**-166**	*	75-125				MS-19
Manganese	281	0.48	mg/Kg dry	96.3	187	97.1		75-125				
Nickel	123	0.48	mg/Kg dry	96.3	37.6	89.1		75-125				
Potassium	2210	96	mg/Kg dry	963	1260	98.6		75-125				
Selenium	90.6	2.4	mg/Kg dry	96.3	0.906	93.2		75-125				
Silver	90.6	0.48	mg/Kg dry	96.3	ND	94.1		75-125				
Sodium	449	96	mg/Kg dry	96.3	336	117		75-125				
Thallium	94.2	2.4	mg/Kg dry	96.3	1.91	95.9		75-125				
Vanadium	129	0.96	mg/Kg dry	96.3	31.3	101		75-125				
Zinc	109	0.96	mg/Kg dry	96.3	24.9	87.8		75-125				

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084832 - SW-846 7470A Prep										
Blank (B084832-BLK1)				Prepared & Analyzed: 11/11/13						
Mercury	ND	0.00010	mg/L							
LCS (B084832-BS1)				Prepared & Analyzed: 11/11/13						
Mercury	0.00197	0.00010	mg/L	0.00200		98.4	80-120			
LCS Dup (B084832-BSD1)				Prepared & Analyzed: 11/11/13						
Mercury	0.00198	0.00010	mg/L	0.00200		99.2	80-120	0.876	20	
Duplicate (B084832-DUP1)		**Source: 13K0326-01**		Prepared & Analyzed: 11/11/13						
Mercury	ND	0.00010	mg/L		ND			NC	20	
Matrix Spike (B084832-MS1)		**Source: 13K0326-01**		Prepared & Analyzed: 11/11/13						
Mercury	0.00194	0.00010	mg/L	0.00200	ND	96.9	75-125			
Batch B084868 - SW-846 3050B										
Blank (B084868-BLK1)				Prepared: 11/11/13 Analyzed: 11/15/13						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.6	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	0.45	0.50	mg/Kg wet							J
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.42	1.0	mg/Kg wet							J
LCS (B084868-BS1)				Prepared: 11/11/13 Analyzed: 11/15/13						
Aluminum	7430	4.7	mg/Kg wet	8840		84.0	46.1-153.4			
Antimony	72.0	4.7	mg/Kg wet	88.2		81.6	8.2-218.9			
Arsenic	99.4	4.7	mg/Kg wet	99.6		99.8	83-117.6			
Barium	306	4.7	mg/Kg wet	310		98.6	83.2-117.5			
Beryllium	73.0	0.47	mg/Kg wet	72.3		101	83.9-116			
Cadmium	168	0.47	mg/Kg wet	182		92.6	83.1-116.9			
Calcium	6740	14	mg/Kg wet	6790		99.3	83.1-116.7			
Chromium	135	0.95	mg/Kg wet	136		98.9	81.6-117.6			
Cobalt	123	4.7	mg/Kg wet	128		96.0	84.7-115.3			
Copper	105	0.95	mg/Kg wet	102		103	83.8-116.1			
Iron	10800	4.7	mg/Kg wet	12600		85.6	50.8-149.6			
Lead	102	1.4	mg/Kg wet	115		88.6	82.4-117.8			
Magnesium	2890	14	mg/Kg wet	3010		96.1	75.4-124.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084868 - SW-846 3050B										
LCS (B084868-BS1)				Prepared: 11/11/13 Analyzed: 11/15/13						
Manganese	310	0.95	mg/Kg wet	323		96.1	82.8-117.5			
Nickel	142	0.95	mg/Kg wet	153		93.0	84.4-115.6			
Potassium	2680	190	mg/Kg wet	2840		94.3	72.7-127.3			
Selenium	145	4.7	mg/Kg wet	150		96.7	80-120			
Silver	37.0	0.95	mg/Kg wet	40.4		91.6	66.2-133.8			
Sodium	2730	190	mg/Kg wet	2760		98.8	73.8-126.2			
Thallium	172	4.7	mg/Kg wet	174		98.9	81.2-118.8			
Vanadium	98.3	1.9	mg/Kg wet	97.6		101	75.5-124			
Zinc	146	1.9	mg/Kg wet	161		91.0	81.9-117.6			
LCS Dup (B084868-BSD1)				Prepared: 11/11/13 Analyzed: 11/15/13						
Aluminum	7620	5.3	mg/Kg wet	8840		86.2	46.1-153.4	2.55	30	
Antimony	76.6	5.3	mg/Kg wet	88.2		86.8	8.2-218.9	6.19	30	
Arsenic	104	5.3	mg/Kg wet	99.6		104	83-117.6	4.58	30	
Barium	316	5.3	mg/Kg wet	310		102	83.2-117.5	3.35	30	
Beryllium	75.6	0.53	mg/Kg wet	72.3		105	83.9-116	3.54	30	
Cadmium	175	0.53	mg/Kg wet	182		96.3	83.1-116.9	3.97	30	
Calcium	7000	16	mg/Kg wet	6790		103	83.1-116.7	3.75	30	
Chromium	140	1.1	mg/Kg wet	136		103	81.6-117.6	3.74	30	
Cobalt	128	5.3	mg/Kg wet	128		99.8	84.7-115.3	3.91	30	
Copper	108	1.1	mg/Kg wet	102		106	83.8-116.1	3.43	30	
Iron	11300	5.3	mg/Kg wet	12600		90.0	50.8-149.6	5.02	30	
Lead	106	1.6	mg/Kg wet	115		92.4	82.4-117.8	4.14	30	
Magnesium	2990	16	mg/Kg wet	3010		99.5	75.4-124.2	3.48	30	
Manganese	321	1.1	mg/Kg wet	323		99.2	82.8-117.5	3.18	30	
Nickel	148	1.1	mg/Kg wet	153		97.0	84.4-115.6	4.18	30	
Potassium	2780	210	mg/Kg wet	2840		97.8	72.7-127.3	3.67	30	
Selenium	153	5.3	mg/Kg wet	150		102	80-120	5.07	30	
Silver	38.4	1.1	mg/Kg wet	40.4		95.2	66.2-133.8	3.84	30	
Sodium	2830	210	mg/Kg wet	2760		103	73.8-126.2	3.70	30	
Thallium	180	5.3	mg/Kg wet	174		103	81.2-118.8	4.38	30	
Vanadium	103	2.1	mg/Kg wet	97.6		105	75.5-124	4.57	30	
Zinc	153	2.1	mg/Kg wet	161		95.1	81.9-117.6	4.39	30	
MRL Check (B084868-MRL1)				Prepared: 11/11/13 Analyzed: 11/15/13						
Lead	0.766	0.79	mg/Kg wet	0.794		96.4	80-120			J
Batch B084935 - SW-846 3005A										
Blank (B084935-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	ND	0.050	mg/L							
Antimony	ND	0.050	mg/L							
Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0040	mg/L							
Cadmium	ND	0.0040	mg/L							
Calcium	ND	0.15	mg/L							
Chromium	ND	0.010	mg/L							
Cobalt	ND	0.050	mg/L							
Copper	ND	0.010	mg/L							
Iron	ND	0.050	mg/L							
Lead	0.0080	0.010	mg/L							J
Magnesium	ND	0.15	mg/L							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084935 - SW-846 3005A										
Blank (B084935-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Manganese	ND	0.010	mg/L							
Nickel	ND	0.010	mg/L							
Potassium	ND	2.0	mg/L							
Selenium	ND	0.050	mg/L							
Sodium	ND	2.0	mg/L							
Thallium	ND	0.050	mg/L							
Vanadium	ND	0.010	mg/L							
Zinc	ND	0.020	mg/L							
LCS (B084935-BS2)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	2.20	0.050	mg/L	2.00		110	80-120			
Antimony	2.20	0.050	mg/L	2.00		110	80-120			
Arsenic	2.08	0.010	mg/L	2.00		104	80-120			
Barium	2.12	0.050	mg/L	2.00		106	80-120			
Beryllium	2.12	0.0040	mg/L	2.00		106	80-120			
Cadmium	1.96	0.0040	mg/L	2.00		98.2	80-120			
Calcium	2.11	0.15	mg/L	2.00		106	80-120			
Chromium	2.14	0.010	mg/L	2.00		107	80-120			
Cobalt	1.94	0.050	mg/L	2.00		97.1	80-120			
Copper	2.08	0.010	mg/L	2.00		104	80-120			
Iron	2.09	0.050	mg/L	2.00		104	80-120			
Lead	1.95	0.010	mg/L	2.00		97.3	80-120			
Magnesium	2.11	0.15	mg/L	2.00		106	80-120			
Manganese	2.09	0.010	mg/L	2.00		105	80-120			
Nickel	2.12	0.010	mg/L	2.00		106	80-120			
Potassium	19.5	2.0	mg/L	20.0		97.3	80-120			
Selenium	2.06	0.050	mg/L	2.00		103	80-120			
Sodium	1.99	2.0	mg/L	2.00		99.7	80-120			J
Thallium	2.09	0.050	mg/L	2.00		105	80-120			
Vanadium	2.08	0.010	mg/L	2.00		104	80-120			
Zinc	2.13	0.020	mg/L	2.00		106	80-120			
LCS Dup (B084935-BSD2)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	2.23	0.050	mg/L	2.00		111	80-120	1.14	20	
Antimony	2.16	0.050	mg/L	2.00		108	80-120	2.11	20	
Arsenic	2.14	0.010	mg/L	2.00		107	80-120	2.61	20	
Barium	2.15	0.050	mg/L	2.00		107	80-120	1.61	20	
Beryllium	2.14	0.0040	mg/L	2.00		107	80-120	0.681	20	
Cadmium	2.00	0.0040	mg/L	2.00		100	80-120	1.73	20	
Calcium	2.11	0.15	mg/L	2.00		106	80-120	0.0594	20	
Chromium	2.19	0.010	mg/L	2.00		109	80-120	2.27	20	
Cobalt	1.98	0.050	mg/L	2.00		98.8	80-120	1.69	20	
Copper	2.12	0.010	mg/L	2.00		106	80-120	1.91	20	
Iron	2.10	0.050	mg/L	2.00		105	80-120	0.627	20	
Lead	1.98	0.010	mg/L	2.00		98.8	80-120	1.57	20	
Magnesium	2.13	0.15	mg/L	2.00		107	80-120	0.857	20	
Manganese	2.11	0.010	mg/L	2.00		105	80-120	0.800	20	
Nickel	2.17	0.010	mg/L	2.00		108	80-120	2.21	20	
Potassium	19.6	2.0	mg/L	20.0		98.1	80-120	0.855	20	
Selenium	2.10	0.050	mg/L	2.00		105	80-120	2.22	20	
Sodium	1.92	2.0	mg/L	2.00		95.8	80-120	3.99	20	J
Thallium	2.14	0.050	mg/L	2.00		107	80-120	2.27	20	
Vanadium	2.12	0.010	mg/L	2.00		106	80-120	1.75	20	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084935 - SW-846 3005A										
LCS Dup (B084935-BSD2)				Prepared: 11/12/13 Analyzed: 11/13/13						
Zinc	2.17	0.020	mg/L	2.00		109	80-120	2.07	20	
Batch B085003 - SW-846 7471										
Blank (B085003-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B085003-BS1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Mercury	4.51	0.33	mg/Kg wet	4.05		111	71.6-128.1			
LCS Dup (B085003-BSD1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Mercury	3.84	0.33	mg/Kg wet	4.05		94.9	71.6-128.1	16.1	30	
Batch B085233 - SW-846 3005A										
Blank (B085233-BLK1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	ND	0.0050	mg/L							
LCS (B085233-BS1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	0.446	0.0050	mg/L	0.500		89.1	80-120			
LCS Dup (B085233-BSD1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	0.482	0.0050	mg/L	0.500		96.5	80-120	7.92	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085212 - % Solids										
Duplicate (B085212-DUP2)	**Source: 13K0326-02**		Prepared: 11/14/13 Analyzed: 11/15/13							
% Solids	86.4		% Wt		86.0			0.464	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
M-10	The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be biased on the high side.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-16	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 6010C in Water	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,ME,NC,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,RI
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,NC,ME,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7470A in Water	

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 8260C in Product/Solid	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Product/Solid	
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
1,2-Dichloroethane-d4	VA
Toluene-d8	VA
4-Bromofluorobenzene	VA
Pentafluorobenzene	VA
1,4-Difluorobenzene	VA
Chlorobenzene-d5	VA
1,4-Dichlorobenzene-d4	VA
SW-846 8260C in Soil	
Acetone	CT,NH,NY,ME,VA,NJ
Acetone	CT,NH,NY,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,VA,NJ
Benzene	CT,NH,NY,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,VA,NJ
Bromochloromethane	NH,NY,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,VA,NJ
Bromomethane	CT,NH,NY,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,VA,NJ
sec-Butylbenzene	CT,NH,NY,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,VA,NJ
Carbon Disulfide	CT,NH,NY,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,VA,NJ
Chlorodibromomethane	CT,NH,NY,VA,NJ
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,VA,NJ
Chloroform	CT,NH,NY,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NY,VA,NJ
1,1-Dichloroethane	CT,NH,NY,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,VA,NJ

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,VA,NJ
1,3-Dichloropropane	NH,NY,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,VA,NJ
1,4-Dioxane	NJ
Ethylbenzene	CT,NH,NY,VA,NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
Naphthalene	NH,NY,VA,NJ
n-Propylbenzene	NH,NY,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,VA,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Tetrahydrofuran	NJ
Toluene	CT,NH,NY,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,2,4-Trichlorobenzene	NH,NY,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,1-Trichloroethane	CT,NH,NY,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,VA,NJ
Vinyl Chloride	CT,NH,NY,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8260C in Water	
Acetone	CT,NY,ME,NH,VA,NJ
Acrylonitrile	CT,NY,ME,NH,VA,NJ
tert-Amyl Methyl Ether (TAME)	NY,ME,NH,VA,NJ
Benzene	CT,NY,ME,NH,VA,NJ
Bromochloromethane	NY,ME,NH,VA,NJ
Bromodichloromethane	CT,NY,ME,NH,VA,NJ
Bromoform	CT,NY,ME,NH,VA,NJ
Bromomethane	CT,NY,ME,NH,VA,NJ
2-Butanone (MEK)	CT,NY,ME,NH,VA,NJ
tert-Butyl Alcohol (TBA)	NY,ME,NH,VA,NJ
n-Butylbenzene	NY,ME,VA,NJ
sec-Butylbenzene	NY,ME,VA,NJ
tert-Butylbenzene	NY,ME,VA,NJ
tert-Butyl Ethyl Ether (TBEE)	NY,ME,NH,VA,NJ
Carbon Disulfide	CT,NY,ME,NH,VA,NJ
Carbon Tetrachloride	CT,NY,ME,NH,VA,NJ
Chlorobenzene	CT,NY,ME,NH,VA,NJ
Chlorodibromomethane	CT,NY,ME,NH,VA,NJ
Chloroethane	CT,NY,ME,NH,VA,NJ
Chloroform	CT,NY,ME,NH,VA,NJ
Chloromethane	CT,NY,ME,NH,VA,NJ
2-Chlorotoluene	NY,ME,NH,VA,NJ
4-Chlorotoluene	NY,ME,NH,VA,NJ
Dibromomethane	NY,ME,NH,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Water	
1,2-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,4-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
trans-1,4-Dichloro-2-butene	NY,ME,NH,VA,NJ
Dichlorodifluoromethane (Freon 12)	NY,ME,NH,VA,NJ
1,1-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,2-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,1-Dichloroethylene	CT,NY,ME,NH,VA,NJ
cis-1,2-Dichloroethylene	NY,ME,NJ
trans-1,2-Dichloroethylene	CT,NY,ME,NH,VA,NJ
1,2-Dichloropropane	CT,NY,ME,NH,VA,NJ
1,3-Dichloropropane	NY,ME,VA,NJ
2,2-Dichloropropane	NY,ME,NH,VA,NJ
1,1-Dichloropropene	NY,ME,NH,VA,NJ
cis-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
trans-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
Diisopropyl Ether (DIPE)	NY,ME,NH,VA,NJ
Ethylbenzene	CT,NY,ME,NH,VA,NJ
Hexachlorobutadiene	CT,NY,ME,NH,VA,NJ
2-Hexanone (MBK)	CT,NY,ME,NH,VA,NJ
Isopropylbenzene (Cumene)	NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	CT,NY,ME,NH,VA,NJ
Methyl tert-Butyl Ether (MTBE)	CT,NY,ME,NH,VA,NJ
Methylene Chloride	CT,NY,ME,NH,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NY,ME,NH,VA,NJ
Naphthalene	NY,ME,NH,VA,NJ
n-Propylbenzene	CT,NY,ME,NH,VA,NJ
Styrene	CT,NY,ME,NH,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
Tetrachloroethylene	CT,NY,ME,NH,VA,NJ
Toluene	CT,NY,ME,NH,VA,NJ
1,2,3-Trichlorobenzene	NY,ME,NH,VA,NJ
1,2,4-Trichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NY,ME,NH,VA,NJ
1,1,2-Trichloroethane	CT,NY,ME,NH,VA,NJ
Trichloroethylene	CT,NY,ME,NH,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NY,ME,NH,VA,NJ
1,2,3-Trichloropropane	NY,ME,NH,VA,NJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	NY,VA,NJ
1,2,4-Trimethylbenzene	NY,ME,VA,NJ
1,3,5-Trimethylbenzene	NY,ME,VA,NJ
Vinyl Chloride	CT,NY,ME,NH,VA,NJ
m+p Xylene	CT,NY,ME,NH,VA
o-Xylene	CT,NY,ME,NH,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
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13K0326
Rev 04.05.12

Page 1 of

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: MAGNA
Sampled By: M. V. Pantelion

Telephone: 845 735 8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ⊘ EMAIL ○ WEBSITE
Fax #
Email: Jiss.Philip@HDRINC.com
Format: ○ PDF ○ EXCEL ○ GIS ⊘ OTHER NYSDEC EDP
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	*** Container Code	VOCs	TAL Metals	% Solids
01	FB-3		0800			W		3	I				
02	LPSB112-0-0.5		0909			S		2	I				
03	LPSB112D-0-0.5		0805			S		2	I				
04	LPSB112-9-9.5		0830			S		2	I				
05	LPSB112-12.5-13		0905			S		2	I				
06	LPSB106-0-0.5		0940			S		2	I				
07	LPSB106-9-9.5		1025			S		2	I				
08	LPSB105-0-0.5		1045			S		2	I				
09	LPSB105-7.5-8		1130			S		2	I				
10	LPSB104-0-0.5		1200			S		2	I				

ANALYSIS REQUESTED

Dissolved Meta
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments: Please Contact Amita Patel RE: NYSDEC EDP Deliverable 845 735 8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	11.7.13	Date/Time: 1640
Received by: (signature)	11/8/13 3.0	Date/Time: 10:04
Relinquished by: (signature)		Date/Time:
Received by: (signature)		Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other STD
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____
Frozen 11/8/13 10:04

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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13K0326

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Page 2 of ___

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: MAGNA Metals
Sampled By: M.V. Pantlians

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ● OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code
11	LPSB104-9-9.5	11.7.13	1230		X	S		2	I	A
12	LPSB102-0-0.5	11.7.13	1315		X	S		2	I	A
13	LPSB102-9-9.5	11.7.13	1345		X	S		2	I	A
14	LPSB102-12.5-13	11.7.13	1400		X	S		2	I	A
15	LPSB103-0-0.5	11.7.13	1430		X	S		2	I	A
16	LPSB103-9-9.5	11.7.13	1450		X	S		2	I	A
17	LPSB103 12-13.5	11.7.13	1500		X	S		2	I	A
$										

ANALYSIS REQUESTED

Dissolved Meta
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other ____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other ____

Comments: Please Contact Amita Patel re NYSDEC EDD deliverable 845 735 8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	11.7.13 1630
Received by: (signature)	Date/Time:
Paula	11/7/13
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other STP
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** PB **Date/Time:** 11/8/13 10:04

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
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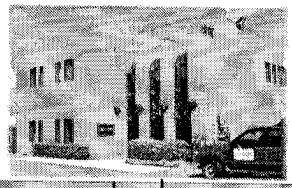

Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: PB DATE: 11/8/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No

If not, explain:

3) **Are all the samples in good condition?** (Yes) No

If not, explain:

4) **How were the samples received:**

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank 3.0 Temperature °C by Temp gun _____

5) **Are there Dissolved samples for the lab to filter?** Yes (No)

Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)

Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** Log in

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** (Yes) No N/A _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		~~8 oz amber/clear jar~~ 3	~~16~~
500 mL Amber		4 oz amber/clear jar	16
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic	1	Non-ConTest Container	
40 mL Vial - type listed below	3	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore	16	Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____

Bisulfate _____ # DI Water _____

Thiosulfate _____ Unpreserved

Time and Date Frozen: 11/8/13 10:00

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November 21, 2013

Jiss Philip
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Magna Metals
Client Job Number:
Project Number: [none]
Laboratory Work Order Number: 13K0384

Enclosed are results of analyses for samples received by the laboratory on November 9, 2013. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB101-0-0.5	13K0384-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB101D-0-0.5	13K0384-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB101-6.5-7	13K0384-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB210-0-0.5	13K0384-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB210-1-1.5	13K0384-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-4	13K0384-06	Water		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
UASB209-0-0.5	13K0384-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB209-1-1.5	13K0384-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB208-0-0.5	13K0384-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB208-1-1.5	13K0384-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB208-2-2.5	13K0384-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-2-2.5	13K0384-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-3-3.5	13K0384-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-4-4.5	13K0384-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB206-0-0.5	13K0384-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB206-1-1.5	13K0384-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-2-2.5	13K0384-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-3-3.5	13K0384-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-4-4.5	13K0384-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB204-0-0.5	13K0384-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB204-1-1.5	13K0384-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB204-2-2.5	13K0384-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-0-0.5	13K0384-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-1-1.5	13K0384-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-2-2.5	13K0384-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB202-0-0.5	13K0384-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB201-0-0.5	13K0384-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB202D-0-0.5	13K0384-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Manganese

B084965-BS1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

13K0384-04[UASB210-0-0.5], B084994-MS1

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Manganese

13K0384-04[UASB210-0-0.5], B084994-MS1

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum, Calcium, Iron, Magnesium

13K0384-04[UASB210-0-0.5], B084994-MS1

SW-846 8260C

Qualifications:

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

Chloromethane

13K0384-13[UASB207-3-3.5], 13K0384-14[UASB207-4-4.5], 13K0384-15[UASB206-0-0.5], 13K0384-16[UASB206-1-1.5], 13K0384-17[UASB205-2-2.5], 13K0384-18[UASB205-3-3.5], 13K0384-19[UASB205-4-4.5], 13K0384-20[UASB204-0-0.5], 13K0384-21[UASB204-1-1.5], 13K0384-22[UASB204-2-2.5], 13K0384-23[UASB203-0-0.5], 13K0384-24[UASB203-1-1.5], 13K0384-25[UASB203-2-2.5], 13K0384-26[UASB202-0-0.5], 13K0384-27[UASB201-0-0.5], 13K0384-28[UASB202D-0-0.5], B085078-BLK1, B085078-BS1, B085078-BSD1

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Acetone, Hexachlorobutadiene, Trichlorofluoromethane (Freon 11)

B085075-BSD1, B084861-BS1, B085075-BS1

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

1,2,3-Trichlorobenzene, 1,4-Dioxane, Chloromethane, Dichlorodifluoromethane (Freon 12), Naphthalene, Tetrahydrofuran

13K0384-01[LPSB101-0-0.5], B085075-MS1

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:

Acetone

13K0384-01[LPSB101-0-0.5], B085075-MS1

Matrix spike recovery is outside of control limits. Data validation is not affected since sample result is "not detected" and recovery bias is on the high side for this compound.

Analyte & Samples(s) Qualified:

Methylene Chloride

B085075-MS1

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:

1,2-Dibromo-3-chloropropane (DBCP), Bromoform, Bromomethane, tert-Butyl Alcohol (TBA), trans-1,4-Dichloro-2-butene, Vinyl Chloride

13K0384-06[FB-4], B084861-BLK1, B084861-BS1, B084861-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

1,4-Dioxane, 2-Butanone (MEK), Acetone, Chloromethane, Dichlorodifluoromethane (Freon 12), tert-Butyl Alcohol (TBA)

13K0384-01[LPSB101-0-0.5], 13K0384-02[LPSB101D-0-0.5], 13K0384-03[LPSB101-6.5-7], 13K0384-04[UASB210-0-0.5], 13K0384-05[UASB210-1-1.5], 13K0384-07[UASB209-0-0.5], 13K0384-08[UASB209-1-1.5], 13K0384-09[UASB208-0-0.5], 13K0384-10[UASB208-1-1.5], 13K0384-11[UASB208-2-2.5], 13K0384-12[UASB207-2-2.5], 13K0384-13[UASB207-3-3.5], 13K0384-14[UASB207-4-4.5], 13K0384-15[UASB206-0-0.5], 13K0384-16[UASB206-1-1.5], 13K0384-17[UASB205-2-2.5], 13K0384-18[UASB205-3-3.5], 13K0384-19[UASB205-4-4.5], 13K0384-20[UASB204-0-0.5], 13K0384-21[UASB204-1-1.5], 13K0384-22[UASB204-2-2.5], 13K0384-23[UASB203-0-0.5], 13K0384-24[UASB203-1-1.5], 13K0384-25[UASB203-2-2.5], 13K0384-26[UASB202-0-0.5], 13K0384-27[UASB201-0-0.5], 13K0384-28[UASB202D-0-0.5], B085075-BLK1, B085075-BS1, B085075-BSD1, B085075-MS1, B085078-BLK1, B085078-BS1, B085078-BSD1

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

Analyte & Samples(s) Qualified:

1,4-Dioxane, Acrylonitrile, tert-Butyl Alcohol (TBA), Tetrahydrofuran

13K0384-01[LPSB101-0-0.5], 13K0384-02[LPSB101D-0-0.5], 13K0384-03[LPSB101-6.5-7], 13K0384-04[UASB210-0-0.5], 13K0384-05[UASB210-1-1.5], 13K0384-06[FB-4], 13K0384-07[UASB209-0-0.5], 13K0384-08[UASB209-1-1.5], 13K0384-09[UASB208-0-0.5], 13K0384-10[UASB208-1-1.5], 13K0384-11[UASB208-2-2.5], 13K0384-12[UASB207-2-2.5], 13K0384-13[UASB207-3-3.5], 13K0384-14[UASB207-4-4.5], 13K0384-15[UASB206-0-0.5], 13K0384-16[UASB206-1-1.5], 13K0384-17[UASB205-2-2.5], 13K0384-18[UASB205-3-3.5], 13K0384-19[UASB205-4-4.5], 13K0384-20[UASB204-0-0.5], 13K0384-21[UASB204-1-1.5], 13K0384-22[UASB204-2-2.5], 13K0384-23[UASB203-0-0.5], 13K0384-24[UASB203-1-1.5], 13K0384-25[UASB203-2-2.5], 13K0384-26[UASB202-0-0.5], 13K0384-27[UASB201-0-0.5], 13K0384-28[UASB202D-0-0.5], B084861-BLK1, B084861-BS1, B084861-BSD1, B085075-BLK1, B085075-BS1, B085075-BSD1, B085075-MS1, B085078-BLK1, B085078-BS1, B085078-BSD1, S004934-CCV1

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Acetone, Bromomethane, Chloromethane

B085078-BS1, B085078-BSD1, B084861-BS1, B084861-BSD1, B085075-BS1, B085075-BSD1, S004934-CCV1

---

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Michael A. Erickson
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-0-0.5 | Sampled: 11/8/2013 07:05

Sample ID: 13K0384-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1	MS-08, V-05	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Acrylonitrile	ND	0.0068	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Benzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Bromobenzene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Bromodichloromethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
n-Butylbenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
sec-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Carbon Disulfide	ND	0.0068	0.0037	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Carbon Tetrachloride	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Chlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Chlorodibromomethane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Chloroform	ND	0.0045	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1	MS-07	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
2-Chlorotoluene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
4-Chlorotoluene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Dibromomethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1	MS-07	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1-Dichloroethane	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,3-Dichloropropane	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Diethyl Ether	ND	0.023	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-0-0.5 | Sampled: 11/8/2013 07:05

Sample ID: 13K0384-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	MS-07, V-05, V-16	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Ethylbenzene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Hexachlorobutadiene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
2-Hexanone (MBK)	ND	0.023	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Methylene Chloride	ND	0.023	0.0080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Naphthalene	ND	0.0045	0.00079	mg/Kg dry	1	MS-07	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
n-Propylbenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Styrene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	MS-07, V-16	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Toluene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00068	mg/Kg dry	1	MS-07	SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF
o-Xylene	ND	0.0023	0.00079	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 6:57	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/13/13 6:57
Toluene-d8	99.8	70-130		11/13/13 6:57
4-Bromofluorobenzene	97.8	70-130		11/13/13 6:57

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-0-0.5 | Sampled: 11/8/2013 07:05

Sample ID: 13K0384-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9600	2.9	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Barium	53	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Beryllium	0.36	0.29	0.046	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 10:47	OP
Cadmium	0.34	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Calcium	2200	8.6	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Chromium	14	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Cobalt	6.0	2.9	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Copper	52	0.57	0.44	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Iron	12000	2.9	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Lead	15	0.86	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Magnesium	2900	8.6	0.90	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Manganese	210	0.57	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Mercury	0.046	0.030	0.0019	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:27	SAJ
Nickel	15	0.57	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Potassium	720	110	20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Selenium	1.3	2.9	0.88	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:20	OP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Sodium	79	110	56	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:20	OP
Thallium	ND	2.9	0.95	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Vanadium	20	1.1	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP
Zinc	82	1.1	0.30	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:20	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-0-0.5 | Sampled: 11/8/2013 07:05

Sample ID: 13K0384-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.5		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101D-0-0.5 | Sampled: 11/8/2013 07:10

Sample ID: 13K0384-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.027	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Acrylonitrile	ND	0.0069	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Benzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Bromobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Bromodichloromethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
2-Butanone (MEK)	ND	0.046	0.020	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
tert-Butyl Alcohol (TBA)	ND	0.046	0.024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
n-Butylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
sec-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Carbon Disulfide	ND	0.0069	0.0038	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Carbon Tetrachloride	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Chlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Chlorodibromomethane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Chloroform	ND	0.0046	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
2-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
4-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Dibromomethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
trans-1,4-Dichloro-2-butene	ND	0.0046	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1-Dichloroethane	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1-Dichloroethylene	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,3-Dichloropropane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101D-0-0.5 | Sampled: 11/8/2013 07:10

Sample ID: 13K0384-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,4-Dioxane	ND	0.11	0.066	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Ethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Hexachlorobutadiene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
2-Hexanone (MBK)	ND	0.023	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0046	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Methylene Chloride	0.0086	0.023	0.0081	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Naphthalene	ND	0.0046	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
n-Propylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Styrene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Toluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2,4-Trichlorobenzene	ND	0.0046	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
Vinyl Chloride	ND	0.011	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
m+p Xylene	ND	0.0046	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF
o-Xylene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 7:24	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/13/13 7:24
Toluene-d8	91.0	70-130		11/13/13 7:24
4-Bromofluorobenzene	97.4	70-130		11/13/13 7:24

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101D-0-0.5 | Sampled: 11/8/2013 07:10

Sample ID: 13K0384-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.9	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Barium	57	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Beryllium	0.38	0.29	0.046	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 10:52	OP
Cadmium	0.37	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Calcium	2400	8.6	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Chromium	15	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Cobalt	6.5	2.9	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Copper	56	0.58	0.44	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Iron	13000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Lead	16	0.86	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Magnesium	3100	8.6	0.90	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Manganese	220	0.58	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Mercury	0.046	0.029	0.0018	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:29	SAJ
Nickel	16	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Potassium	770	120	20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Selenium	1.1	2.9	0.89	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:26	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Sodium	85	120	56	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:26	OP
Thallium	ND	2.9	0.95	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Vanadium	22	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP
Zinc	80	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:26	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101D-0-0.5 | Sampled: 11/8/2013 07:10

Sample ID: 13K0384-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.1		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-6.5-7 | Sampled: 11/8/2013 07:40

Sample ID: 13K0384-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.056	0.11	0.027	mg/Kg dry	1	V-05, J	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Acrylonitrile	ND	0.0069	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Benzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Bromobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Bromodichloromethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
2-Butanone (MEK)	ND	0.046	0.020	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
tert-Butyl Alcohol (TBA)	ND	0.046	0.024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
n-Butylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
sec-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Carbon Disulfide	ND	0.0069	0.0038	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Carbon Tetrachloride	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Chlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Chlorodibromomethane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Chloroform	ND	0.0046	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
2-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
4-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Dibromomethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
trans-1,4-Dichloro-2-butene	ND	0.0046	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1-Dichloroethane	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1-Dichloroethylene	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,3-Dichloropropane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-6.5-7 | Sampled: 11/8/2013 07:40

Sample ID: 13K0384-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,4-Dioxane	ND	0.11	0.066	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Ethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Hexachlorobutadiene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
2-Hexanone (MBK)	ND	0.023	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0046	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Methylene Chloride	0.0083	0.023	0.0081	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Naphthalene	ND	0.0046	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
n-Propylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Styrene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Toluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2,4-Trichlorobenzene	ND	0.0046	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
Vinyl Chloride	ND	0.011	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
m+p Xylene	ND	0.0046	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF
o-Xylene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 8:44	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	106	70-130		11/13/13 8:44
Toluene-d8	100	70-130		11/13/13 8:44
4-Bromofluorobenzene	98.8	70-130		11/13/13 8:44

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-6.5-7 | Sampled: 11/8/2013 07:40

Sample ID: 13K0384-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Barium	170	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Beryllium	0.47	0.29	0.047	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 10:57	OP
Cadmium	2.6	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Calcium	5300	8.7	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Chromium	85	0.58	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Cobalt	20	2.9	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Copper	850	0.58	0.44	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Iron	31000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 10:57	OP
Lead	640	0.87	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Magnesium	7700	8.7	0.91	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Manganese	370	0.58	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Mercury	0.087	0.031	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:30	SAJ
Nickel	120	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Potassium	1600	120	20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Selenium	2.6	2.9	0.90	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:31	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Sodium	690	120	57	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Vanadium	35	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP
Zinc	920	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:31	OP

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: LPSB101-6.5-7 | Sampled: 11/8/2013 07:40

Sample ID: 13K0384-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.5		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-0-0.5 | Sampled: 11/8/2013 08:35

Sample ID: 13K0384-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.16	0.037	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Acrylonitrile	ND	0.0095	0.0039	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0016	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Benzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Bromobenzene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Bromochloromethane	ND	0.0032	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Bromodichloromethane	ND	0.0032	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Bromoform	ND	0.0032	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Bromomethane	ND	0.016	0.0027	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
2-Butanone (MEK)	ND	0.063	0.028	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
tert-Butyl Alcohol (TBA)	ND	0.063	0.033	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
n-Butylbenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
sec-Butylbenzene	ND	0.0032	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
tert-Butylbenzene	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0016	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Carbon Disulfide	ND	0.0095	0.0052	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Carbon Tetrachloride	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Chlorobenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Chlorodibromomethane	ND	0.0016	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Chloroethane	ND	0.032	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Chloroform	ND	0.0063	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Chloromethane	ND	0.016	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
2-Chlorotoluene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
4-Chlorotoluene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0063	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2-Dibromoethane (EDB)	ND	0.0016	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Dibromomethane	ND	0.0032	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2-Dichlorobenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,3-Dichlorobenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,4-Dichlorobenzene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
trans-1,4-Dichloro-2-butene	ND	0.0063	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.032	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1-Dichloroethane	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2-Dichloroethane	ND	0.0032	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1-Dichloroethylene	ND	0.0063	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
cis-1,2-Dichloroethylene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
trans-1,2-Dichloroethylene	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2-Dichloropropane	ND	0.0032	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,3-Dichloropropane	ND	0.0016	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
2,2-Dichloropropane	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1-Dichloropropene	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
cis-1,3-Dichloropropene	ND	0.0016	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
trans-1,3-Dichloropropene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Diethyl Ether	ND	0.032	0.0028	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-0-0.5 | Sampled: 11/8/2013 08:35

Sample ID: 13K0384-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0016	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,4-Dioxane	ND	0.16	0.091	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Ethylbenzene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Hexachlorobutadiene	ND	0.0032	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
2-Hexanone (MBK)	ND	0.032	0.017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Isopropylbenzene (Cumene)	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0063	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Methylene Chloride	ND	0.032	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.032	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Naphthalene	ND	0.0063	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
n-Propylbenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Styrene	ND	0.0032	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1,1,2-Tetrachloroethane	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1,2,2-Tetrachloroethane	ND	0.0016	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Tetrachloroethylene	ND	0.0032	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Tetrahydrofuran	ND	0.016	0.0035	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Toluene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2,3-Trichlorobenzene	ND	0.0032	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2,4-Trichlorobenzene	ND	0.0063	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,3,5-Trichlorobenzene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1,1-Trichloroethane	ND	0.0032	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1,2-Trichloroethane	ND	0.0032	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Trichloroethylene	ND	0.0032	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Trichlorofluoromethane (Freon 11)	ND	0.016	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2,3-Trichloropropane	ND	0.0032	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.016	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,2,4-Trimethylbenzene	ND	0.0032	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
1,3,5-Trimethylbenzene	ND	0.0032	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
Vinyl Chloride	ND	0.016	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
m+p Xylene	ND	0.0063	0.0027	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF
o-Xylene	ND	0.0032	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:12	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	116	70-130		11/13/13 9:12
Toluene-d8	97.3	70-130		11/13/13 9:12
4-Bromofluorobenzene	93.9	70-130		11/13/13 9:12

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-0-0.5 | Sampled: 11/8/2013 08:35

Sample ID: 13K0384-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9400	3.5	1.5	mg/Kg dry	1	MS-19	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1	MS-07	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Arsenic	2.7	3.5	1.3	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Barium	85	3.5	0.44	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Beryllium	ND	0.35	0.057	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 10:37	OP
Cadmium	0.67	0.35	0.21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Calcium	5200	11	1.9	mg/Kg dry	1	MS-19	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Chromium	20	0.71	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Cobalt	6.2	3.5	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Copper	510	0.71	0.54	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Iron	12000	3.5	3.0	mg/Kg dry	1	MS-19	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Lead	63	1.1	0.21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Magnesium	2400	11	1.1	mg/Kg dry	1	MS-19	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Manganese	220	0.71	0.22	mg/Kg dry	1	MS-08	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Mercury	0.19	0.036	0.0023	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:32	SAJ
Nickel	62	0.71	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Potassium	740	140	24	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Silver	ND	0.71	0.62	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Sodium	97	140	69	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 12:52	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Vanadium	22	1.4	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP
Zinc	180	1.4	0.36	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 12:52	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-0-0.5 | Sampled: 11/8/2013 08:35

Sample ID: 13K0384-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.8		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-1-1.5 | Sampled: 11/8/2013 08:40

Sample ID: 13K0384-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Acrylonitrile	ND	0.0066	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Benzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Bromobenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Bromodichloromethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
2-Butanone (MEK)	ND	0.044	0.019	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
tert-Butyl Alcohol (TBA)	ND	0.044	0.023	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
n-Butylbenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
tert-Butylbenzene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Carbon Disulfide	ND	0.0066	0.0036	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Carbon Tetrachloride	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Chlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Chlorodibromomethane	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Chloroform	ND	0.0044	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Chloromethane	ND	0.011	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
2-Chlorotoluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
4-Chlorotoluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Dibromomethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
trans-1,4-Dichloro-2-butene	ND	0.0044	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1-Dichloroethane	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1-Dichloroethylene	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,3-Dichloropropane	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
2,2-Dichloropropane	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1-Dichloropropene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-1-1.5 | Sampled: 11/8/2013 08:40

Sample ID: 13K0384-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,4-Dioxane	ND	0.11	0.063	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Ethylbenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0044	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Methylene Chloride	ND	0.022	0.0078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Naphthalene	ND	0.0044	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
n-Propylbenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Styrene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Toluene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2,4-Trichlorobenzene	ND	0.0044	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Trichloroethylene	ND	0.0022	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
m+p Xylene	ND	0.0044	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF
o-Xylene	ND	0.0022	0.00077	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 9:38	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	113	70-130		11/13/13 9:38
Toluene-d8	98.7	70-130		11/13/13 9:38
4-Bromofluorobenzene	94.8	70-130		11/13/13 9:38

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-1-1.5 | Sampled: 11/8/2013 08:40

Sample ID: 13K0384-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Arsenic	8.0	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Barium	62	3.0	0.37	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Beryllium	0.29	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/18/13 11:10	OP
Cadmium	0.26	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:56	OP
Calcium	1400	8.9	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Chromium	52	0.59	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Cobalt	5.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Copper	690	0.59	0.45	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Iron	14000	3.0	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Lead	29	0.89	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Magnesium	2000	8.9	0.93	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Manganese	93	0.59	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Mercury	0.066	0.032	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:34	SAJ
Nickel	280	0.59	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Potassium	400	120	20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Selenium	8.4	3.0	0.91	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Sodium	66	120	58	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 14:56	OP
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Vanadium	26	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP
Zinc	220	1.2	0.31	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 14:56	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB210-1-1.5 | Sampled: 11/8/2013 08:40

Sample ID: 13K0384-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: FB-4 | Sampled: 11/8/2013 08:00

Sample ID: 13K0384-06

Sample Matrix: Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	4.7	50	4.7	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Acrylonitrile	ND	5.0	0.58	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.091	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Benzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Bromobenzene	ND	1.0	0.044	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Bromodichloromethane	ND	0.50	0.088	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Bromoform	ND	1.0	0.21	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Bromomethane	ND	2.0	0.94	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
2-Butanone (MEK)	ND	20	2.4	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
tert-Butyl Alcohol (TBA)	ND	20	2.2	µg/L	1	R-05, V-16	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
n-Butylbenzene	ND	1.0	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
sec-Butylbenzene	ND	1.0	0.084	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
tert-Butylbenzene	ND	1.0	0.096	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.075	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Carbon Disulfide	ND	4.0	1.0	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Carbon Tetrachloride	ND	5.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Chlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Chlorodibromomethane	ND	0.50	0.054	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Chloroethane	ND	2.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Chloroform	ND	2.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Chloromethane	ND	2.0	0.32	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
2-Chlorotoluene	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
4-Chlorotoluene	ND	1.0	0.074	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	0.34	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2-Dibromoethane (EDB)	ND	0.50	0.089	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Dibromomethane	ND	1.0	0.070	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2-Dichlorobenzene	ND	1.0	0.076	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,3-Dichlorobenzene	ND	1.0	0.079	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,4-Dichlorobenzene	ND	1.0	0.046	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
trans-1,4-Dichloro-2-butene	ND	2.0	0.12	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2-Dichloropropane	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,3-Dichloropropane	ND	0.50	0.099	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
2,2-Dichloropropane	ND	1.0	0.072	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1-Dichloropropene	ND	2.0	0.13	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
cis-1,3-Dichloropropene	ND	0.50	0.062	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
trans-1,3-Dichloropropene	ND	0.50	0.056	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Diethyl Ether	0.32	2.0	0.22	µg/L	1	J	SW-846 8260C	11/11/13	11/13/13 17:46	EEH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: FB-4 | Sampled: 11/8/2013 08:00

Sample ID: 13K0384-06

Sample Matrix: Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.50	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,4-Dioxane	ND	50	26	µg/L	1	V-16	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Ethylbenzene	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Hexachlorobutadiene	ND	0.50	0.17	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
2-Hexanone (MBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Isopropylbenzene (Cumene)	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Methylene Chloride	ND	5.0	3.2	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
n-Propylbenzene	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Styrene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1,2,2-Tetrachloroethane	ND	0.50	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Tetrachloroethylene	ND	1.0	0.080	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Tetrahydrofuran	ND	10	1.1	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Toluene	ND	1.0	0.090	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2,3-Trichlorobenzene	ND	5.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2,4-Trichlorobenzene	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,3,5-Trichlorobenzene	ND	1.0	0.14	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1,1-Trichloroethane	ND	1.0	0.094	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1,2-Trichloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Trichloroethylene	ND	1.0	0.077	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2,3-Trichloropropane	ND	2.0	0.12	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	0.092	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
1,3,5-Trimethylbenzene	ND	1.0	0.10	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
Vinyl Chloride	ND	2.0	0.13	µg/L	1	R-05	SW-846 8260C	11/11/13	11/13/13 17:46	EEH
m+p Xylene	ND	2.0	0.18	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH
o-Xylene	ND	1.0	0.11	µg/L	1		SW-846 8260C	11/11/13	11/13/13 17:46	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	104	70-130		11/13/13 17:46
Toluene-d8	103	70-130		11/13/13 17:46
4-Bromofluorobenzene	102	70-130		11/13/13 17:46

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: FB-4 | Sampled: 11/8/2013 08:00

Sample ID: 13K0384-06

Sample Matrix: Water

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/12/13	11/18/13 14:09	OP
Antimony	ND	0.050	0.030	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:41	OP
Arsenic	ND	0.010	0.0086	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Barium	ND	0.050	0.015	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Beryllium	ND	0.0040	0.0010	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Cadmium	ND	0.0040	0.0018	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:41	OP
Calcium	ND	0.15	0.088	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Chromium	ND	0.010	0.0034	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Cobalt	ND	0.050	0.0075	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:41	OP
Copper	ND	0.010	0.0050	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Iron	ND	0.050	0.026	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Lead	ND	0.010	0.0027	mg/L	1		SW-846 6010C	11/12/13	11/18/13 9:41	OP
Magnesium	ND	0.15	0.037	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Manganese	ND	0.010	0.0020	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Mercury	ND	0.00010	0.000048	mg/L	1		SW-846 7470A	11/11/13	11/11/13 15:04	SAJ
Nickel	ND	0.010	0.0017	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Potassium	ND	2.0	0.46	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Selenium	ND	0.050	0.016	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Silver	ND	0.0050	0.0040	mg/L	1		SW-846 6010C	11/15/13	11/18/13 15:11	OP
Sodium	ND	2.0	1.9	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Thallium	ND	0.050	0.020	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Vanadium	ND	0.010	0.0040	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP
Zinc	ND	0.020	0.0071	mg/L	1		SW-846 6010C	11/12/13	11/14/13 0:25	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-0-0.5 | Sampled: 11/8/2013 08:15

Sample ID: 13K0384-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.18	0.041	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Acrylonitrile	ND	0.011	0.0044	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Benzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Bromobenzene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Bromochloromethane	ND	0.0035	0.0025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Bromodichloromethane	ND	0.0035	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Bromoform	ND	0.0035	0.0025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Bromomethane	ND	0.018	0.0030	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
2-Butanone (MEK)	ND	0.071	0.031	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
tert-Butyl Alcohol (TBA)	ND	0.071	0.037	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
n-Butylbenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
sec-Butylbenzene	ND	0.0035	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
tert-Butylbenzene	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0018	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Carbon Disulfide	ND	0.011	0.0058	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Carbon Tetrachloride	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Chlorobenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Chlorodibromomethane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Chloroethane	ND	0.035	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Chloroform	ND	0.0071	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Chloromethane	ND	0.018	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
2-Chlorotoluene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
4-Chlorotoluene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0071	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2-Dibromoethane (EDB)	ND	0.0018	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Dibromomethane	ND	0.0035	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2-Dichlorobenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,3-Dichlorobenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,4-Dichlorobenzene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
trans-1,4-Dichloro-2-butene	ND	0.0071	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.035	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1-Dichloroethane	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2-Dichloroethane	ND	0.0035	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1-Dichloroethylene	ND	0.0071	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
cis-1,2-Dichloroethylene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
trans-1,2-Dichloroethylene	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2-Dichloropropane	ND	0.0035	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,3-Dichloropropane	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
2,2-Dichloropropane	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1-Dichloropropene	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
cis-1,3-Dichloropropene	ND	0.0018	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
trans-1,3-Dichloropropene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Diethyl Ether	ND	0.035	0.0032	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-0-0.5 | Sampled: 11/8/2013 08:15

Sample ID: 13K0384-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0018	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,4-Dioxane	ND	0.18	0.10	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Ethylbenzene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Hexachlorobutadiene	ND	0.0035	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
2-Hexanone (MBK)	ND	0.035	0.019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Isopropylbenzene (Cumene)	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0071	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Methylene Chloride	ND	0.035	0.013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.035	0.013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Naphthalene	ND	0.0071	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
n-Propylbenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Styrene	ND	0.0035	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1,1,2-Tetrachloroethane	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1,2,2-Tetrachloroethane	ND	0.0018	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Tetrachloroethylene	ND	0.0035	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Tetrahydrofuran	ND	0.018	0.0039	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Toluene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2,3-Trichlorobenzene	ND	0.0035	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2,4-Trichlorobenzene	ND	0.0071	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,3,5-Trichlorobenzene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1,1-Trichloroethane	ND	0.0035	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1,2-Trichloroethane	ND	0.0035	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Trichloroethylene	ND	0.0035	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Trichlorofluoromethane (Freon 11)	ND	0.018	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2,3-Trichloropropane	ND	0.0035	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.018	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,2,4-Trimethylbenzene	ND	0.0035	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
1,3,5-Trimethylbenzene	ND	0.0035	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
Vinyl Chloride	ND	0.018	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
m+p Xylene	ND	0.0071	0.0030	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF
o-Xylene	ND	0.0035	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 10:33	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	119	70-130		11/13/13 10:33
Toluene-d8	97.1	70-130		11/13/13 10:33
4-Bromofluorobenzene	92.3	70-130		11/13/13 10:33

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-0-0.5 | Sampled: 11/8/2013 08:15

Sample ID: 13K0384-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	3.8	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Antimony	ND	3.8	3.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Arsenic	6.8	3.8	1.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Barium	340	3.8	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Beryllium	ND	0.38	0.061	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Cadmium	0.27	0.38	0.22	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:02	OP
Calcium	6800	11	2.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Chromium	52	0.76	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Cobalt	14	3.8	0.24	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Copper	680	0.76	0.58	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Iron	8800	3.8	3.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Lead	26	1.1	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Magnesium	2500	11	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Manganese	270	0.76	0.24	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Mercury	0.11	0.039	0.0025	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:35	SAJ
Nickel	220	0.76	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Potassium	890	150	26	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Selenium	9.0	3.8	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Silver	ND	0.76	0.67	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Sodium	86	150	74	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:02	OP
Thallium	3.2	3.8	1.3	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:02	OP
Vanadium	21	1.5	0.25	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP
Zinc	170	1.5	0.39	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:02	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-0-0.5 | Sampled: 11/8/2013 08:15

Sample ID: 13K0384-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	63.0		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-1-1.5 | Sampled: 11/8/2013 08:25

Sample ID: 13K0384-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.20	0.048	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Acrylonitrile	ND	0.012	0.0051	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Benzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Bromobenzene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Bromochloromethane	ND	0.0041	0.0029	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Bromodichloromethane	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Bromoform	ND	0.0041	0.0029	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Bromomethane	ND	0.020	0.0035	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
2-Butanone (MEK)	ND	0.081	0.036	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
tert-Butyl Alcohol (TBA)	ND	0.081	0.043	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
n-Butylbenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
sec-Butylbenzene	ND	0.0041	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
tert-Butylbenzene	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0020	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Carbon Disulfide	ND	0.012	0.0067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Carbon Tetrachloride	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Chlorobenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Chlorodibromomethane	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Chloroethane	ND	0.041	0.0031	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Chloroform	ND	0.0081	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Chloromethane	ND	0.020	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
2-Chlorotoluene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
4-Chlorotoluene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0081	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2-Dibromoethane (EDB)	ND	0.0020	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Dibromomethane	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2-Dichlorobenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,3-Dichlorobenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,4-Dichlorobenzene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
trans-1,4-Dichloro-2-butene	ND	0.0081	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.041	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1-Dichloroethane	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2-Dichloroethane	ND	0.0041	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1-Dichloroethylene	ND	0.0081	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
cis-1,2-Dichloroethylene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
trans-1,2-Dichloroethylene	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2-Dichloropropane	ND	0.0041	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,3-Dichloropropane	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
2,2-Dichloropropane	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1-Dichloropropene	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
cis-1,3-Dichloropropene	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
trans-1,3-Dichloropropene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Diethyl Ether	ND	0.041	0.0037	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-1-1.5 | Sampled: 11/8/2013 08:25

Sample ID: 13K0384-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0020	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,4-Dioxane	ND	0.20	0.12	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Ethylbenzene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Hexachlorobutadiene	ND	0.0041	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
2-Hexanone (MBK)	ND	0.041	0.022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Isopropylbenzene (Cumene)	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0081	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Methylene Chloride	ND	0.041	0.014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.041	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Naphthalene	ND	0.0081	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
n-Propylbenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Styrene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1,1,2-Tetrachloroethane	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1,2,2-Tetrachloroethane	ND	0.0020	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Tetrachloroethylene	ND	0.0041	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Tetrahydrofuran	ND	0.020	0.0045	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Toluene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2,3-Trichlorobenzene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2,4-Trichlorobenzene	ND	0.0081	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,3,5-Trichlorobenzene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1,1-Trichloroethane	ND	0.0041	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1,2-Trichloroethane	ND	0.0041	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Trichloroethylene	ND	0.0041	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Trichlorofluoromethane (Freon 11)	ND	0.020	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2,3-Trichloropropane	ND	0.0041	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.020	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,2,4-Trimethylbenzene	ND	0.0041	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
1,3,5-Trimethylbenzene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
Vinyl Chloride	ND	0.020	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
m+p Xylene	ND	0.0081	0.0035	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF
o-Xylene	ND	0.0041	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:00	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	114	70-130		11/13/13 11:00
Toluene-d8	97.6	70-130		11/13/13 11:00
4-Bromofluorobenzene	93.2	70-130		11/13/13 11:00

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-1-1.5 | Sampled: 11/8/2013 08:25

Sample ID: 13K0384-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	3.9	1.7	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Antimony	ND	3.9	3.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Arsenic	21	3.9	1.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Barium	330	3.9	0.48	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Beryllium	ND	0.39	0.062	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Cadmium	0.59	0.39	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Calcium	4800	12	2.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Chromium	110	0.77	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Cobalt	15	3.9	0.25	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Copper	1400	0.77	0.59	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Iron	15000	3.9	3.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Lead	39	1.2	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Magnesium	3000	12	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Manganese	140	0.77	0.25	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Mercury	0.13	0.041	0.0026	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:37	SAJ
Nickel	450	0.77	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Potassium	780	150	27	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Selenium	19	3.9	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Silver	ND	0.77	0.68	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Sodium	91	150	75	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:07	OP
Thallium	1.4	3.9	1.3	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:07	OP
Vanadium	36	1.5	0.25	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP
Zinc	370	1.5	0.40	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:07	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB209-1-1.5 | Sampled: 11/8/2013 08:25

Sample ID: 13K0384-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	59.9		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-0-0.5 | Sampled: 11/8/2013 09:10

Sample ID: 13K0384-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.14	0.032	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Acrylonitrile	ND	0.0083	0.0034	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0014	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Benzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Bromobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Bromochloromethane	ND	0.0028	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Bromodichloromethane	ND	0.0028	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Bromoform	ND	0.0028	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Bromomethane	ND	0.014	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
2-Butanone (MEK)	ND	0.055	0.024	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
tert-Butyl Alcohol (TBA)	ND	0.055	0.029	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
n-Butylbenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
sec-Butylbenzene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
tert-Butylbenzene	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0014	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Carbon Disulfide	ND	0.0083	0.0045	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Carbon Tetrachloride	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Chlorobenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Chlorodibromomethane	ND	0.0014	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Chloroethane	ND	0.028	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Chloroform	ND	0.0055	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Chloromethane	ND	0.014	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
2-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
4-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0055	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Dibromomethane	ND	0.0028	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2-Dichlorobenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,3-Dichlorobenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,4-Dichlorobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
trans-1,4-Dichloro-2-butene	ND	0.0055	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1-Dichloroethane	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2-Dichloroethane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1-Dichloroethylene	ND	0.0055	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
cis-1,2-Dichloroethylene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
trans-1,2-Dichloroethylene	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2-Dichloropropane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,3-Dichloropropane	ND	0.0014	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
2,2-Dichloropropane	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1-Dichloropropene	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
cis-1,3-Dichloropropene	ND	0.0014	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
trans-1,3-Dichloropropene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Diethyl Ether	ND	0.028	0.0025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-0-0.5 | Sampled: 11/8/2013 09:10

Sample ID: 13K0384-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0014	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,4-Dioxane	ND	0.14	0.079	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Ethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Hexachlorobutadiene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
2-Hexanone (MBK)	ND	0.028	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Isopropylbenzene (Cumene)	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0055	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Methylene Chloride	ND	0.028	0.0098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.028	0.010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Naphthalene	ND	0.0055	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
n-Propylbenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Styrene	ND	0.0028	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1,1,2-Tetrachloroethane	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1,2,2-Tetrachloroethane	ND	0.0014	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Tetrachloroethylene	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Tetrahydrofuran	ND	0.014	0.0030	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Toluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2,3-Trichlorobenzene	ND	0.0028	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2,4-Trichlorobenzene	ND	0.0055	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,3,5-Trichlorobenzene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1,1-Trichloroethane	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1,2-Trichloroethane	ND	0.0028	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Trichloroethylene	ND	0.0028	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Trichlorofluoromethane (Freon 11)	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2,3-Trichloropropane	ND	0.0028	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.014	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,2,4-Trimethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
1,3,5-Trimethylbenzene	ND	0.0028	0.00083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
Vinyl Chloride	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
m+p Xylene	ND	0.0055	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF
o-Xylene	ND	0.0028	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	116	70-130		11/13/13 11:26
Toluene-d8	97.2	70-130		11/13/13 11:26
4-Bromofluorobenzene	92.6	70-130		11/13/13 11:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-0-0.5 | Sampled: 11/8/2013 09:10

Sample ID: 13K0384-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Barium	42	3.0	0.37	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Beryllium	0.49	0.30	0.048	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 11:15	OP
Cadmium	0.26	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:13	OP
Calcium	2400	9.0	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Chromium	11	0.60	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Cobalt	5.8	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Copper	30	0.60	0.46	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Iron	11000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Lead	11	0.90	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Magnesium	2400	9.0	0.94	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Manganese	190	0.60	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Mercury	0.064	0.031	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:39	SAJ
Nickel	13	0.60	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Potassium	630	120	21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Sodium	72	120	58	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:13	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Vanadium	19	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP
Zinc	56	1.2	0.31	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:13	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-0-0.5 | Sampled: 11/8/2013 09:10

Sample ID: 13K0384-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.7		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-1-1.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.029	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Acrylonitrile	ND	0.0074	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Benzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Bromobenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Bromochloromethane	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Bromodichloromethane	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Bromoform	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Bromomethane	ND	0.012	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
2-Butanone (MEK)	ND	0.050	0.022	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
tert-Butyl Alcohol (TBA)	ND	0.050	0.026	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
n-Butylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
sec-Butylbenzene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Carbon Disulfide	ND	0.0074	0.0041	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Carbon Tetrachloride	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Chlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Chlorodibromomethane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Chloroform	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
2-Chlorotoluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
4-Chlorotoluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Dibromomethane	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,4-Dichlorobenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
trans-1,4-Dichloro-2-butene	ND	0.0050	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1-Dichloroethane	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1-Dichloroethylene	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,3-Dichloropropane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Diethyl Ether	ND	0.025	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-1-1.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,4-Dioxane	ND	0.12	0.072	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Ethylbenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Hexachlorobutadiene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0050	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Methylene Chloride	0.014	0.025	0.0088	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0094	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Naphthalene	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
n-Propylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Styrene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Tetrahydrofuran	ND	0.012	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Toluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2,4-Trichlorobenzene	ND	0.0050	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
Vinyl Chloride	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
m+p Xylene	ND	0.0050	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF
o-Xylene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 11:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/13/13 11:53
Toluene-d8	98.2	70-130		11/13/13 11:53
4-Bromofluorobenzene	88.9	70-130		11/13/13 11:53

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-1-1.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Barium	51	2.6	0.33	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Beryllium	0.48	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 11:19	OP
Cadmium	0.37	0.26	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Calcium	930	7.9	1.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Chromium	16	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Cobalt	5.6	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Copper	29	0.53	0.40	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Iron	14000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Lead	15	0.79	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Magnesium	2700	7.9	0.82	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Manganese	160	0.53	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Mercury	0.054	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:44	SAJ
Nickel	15	0.53	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Potassium	450	110	18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Sodium	59	110	51	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:18	OP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Vanadium	26	1.1	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP
Zinc	100	1.1	0.27	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:18	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-1-1.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.5		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-2-2.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.079	0.12	0.028	mg/Kg dry	1	V-05, J	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Acrylonitrile	ND	0.0072	0.0030	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Benzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Bromobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Bromochloromethane	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Bromodichloromethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Bromoform	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
2-Butanone (MEK)	ND	0.048	0.021	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
tert-Butyl Alcohol (TBA)	ND	0.048	0.025	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
n-Butylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
sec-Butylbenzene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
tert-Butylbenzene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Carbon Disulfide	ND	0.0072	0.0040	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Carbon Tetrachloride	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Chlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Chlorodibromomethane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Chloroethane	ND	0.024	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Chloroform	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
2-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
4-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Dibromomethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,3-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,4-Dichlorobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.0048	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1-Dichloroethane	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2-Dichloroethane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1-Dichloroethylene	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
cis-1,2-Dichloroethylene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
trans-1,2-Dichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2-Dichloropropane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,3-Dichloropropane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
2,2-Dichloropropane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1-Dichloropropene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
trans-1,3-Dichloropropene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Diethyl Ether	ND	0.024	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-2-2.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,4-Dioxane	ND	0.12	0.069	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Ethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Hexachlorobutadiene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
2-Hexanone (MBK)	ND	0.024	0.013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Isopropylbenzene (Cumene)	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0048	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Methylene Chloride	0.016	0.024	0.0085	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.024	0.0091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Naphthalene	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
n-Propylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Styrene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Tetrachloroethylene	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Tetrahydrofuran	ND	0.012	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Toluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2,3-Trichlorobenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2,4-Trichlorobenzene	ND	0.0048	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,3,5-Trichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1,1-Trichloroethane	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1,2-Trichloroethane	ND	0.0024	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Trichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2,3-Trichloropropane	ND	0.0024	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,2,4-Trimethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
1,3,5-Trimethylbenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
m+p Xylene	ND	0.0048	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF
o-Xylene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:20	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	112	70-130		11/13/13 12:20
Toluene-d8	98.5	70-130		11/13/13 12:20
4-Bromofluorobenzene	98.2	70-130		11/13/13 12:20

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-2-2.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Arsenic	ND	2.8	0.99	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Barium	50	2.8	0.34	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Beryllium	0.50	0.28	0.044	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 11:47	OP
Cadmium	0.28	0.28	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Calcium	690	8.3	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Chromium	15	0.55	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Cobalt	4.9	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Copper	21	0.55	0.42	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Iron	13000	2.8	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Lead	8.7	0.83	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Magnesium	2100	8.3	0.86	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Manganese	110	0.55	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Mercury	0.032	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 16:46	SAJ
Nickel	13	0.55	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Potassium	410	110	19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Sodium	ND	110	54	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Thallium	ND	2.8	0.91	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Vanadium	26	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP
Zinc	59	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:24	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB208-2-2.5 | Sampled: 11/8/2013 09:20

Sample ID: 13K0384-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.5		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-2-2.5 | Sampled: 11/8/2013 08:50

Sample ID: 13K0384-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.028	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Acrylonitrile	ND	0.0072	0.0030	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Benzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Bromobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Bromochloromethane	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Bromodichloromethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Bromoform	ND	0.0024	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
2-Butanone (MEK)	ND	0.048	0.021	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
tert-Butyl Alcohol (TBA)	ND	0.048	0.025	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
n-Butylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
sec-Butylbenzene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
tert-Butylbenzene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Carbon Disulfide	ND	0.0072	0.0040	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Carbon Tetrachloride	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Chlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Chlorodibromomethane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Chloroethane	ND	0.024	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Chloroform	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
2-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
4-Chlorotoluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Dibromomethane	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,3-Dichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,4-Dichlorobenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
trans-1,4-Dichloro-2-butene	ND	0.0048	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1-Dichloroethane	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2-Dichloroethane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1-Dichloroethylene	ND	0.0048	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
cis-1,2-Dichloroethylene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
trans-1,2-Dichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2-Dichloropropane	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,3-Dichloropropane	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
2,2-Dichloropropane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1-Dichloropropene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
trans-1,3-Dichloropropene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Diethyl Ether	ND	0.024	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-2-2.5 | Sampled: 11/8/2013 08:50

Sample ID: 13K0384-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,4-Dioxane	ND	0.12	0.069	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Ethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Hexachlorobutadiene	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
2-Hexanone (MBK)	ND	0.024	0.013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Isopropylbenzene (Cumene)	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0048	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Methylene Chloride	0.012	0.024	0.0086	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.024	0.0092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Naphthalene	ND	0.0048	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
n-Propylbenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Styrene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1,1,2-Tetrachloroethane	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Tetrachloroethylene	ND	0.0024	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Tetrahydrofuran	ND	0.012	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Toluene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2,3-Trichlorobenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2,4-Trichlorobenzene	ND	0.0048	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,3,5-Trichlorobenzene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1,1-Trichloroethane	ND	0.0024	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1,2-Trichloroethane	ND	0.0024	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Trichloroethylene	ND	0.0024	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2,3-Trichloropropane	ND	0.0024	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,2,4-Trimethylbenzene	ND	0.0024	0.00096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
1,3,5-Trimethylbenzene	ND	0.0024	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
m+p Xylene	ND	0.0048	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF
o-Xylene	ND	0.0024	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 12:48	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	111	70-130		11/13/13 12:48
Toluene-d8	98.5	70-130		11/13/13 12:48
4-Bromofluorobenzene	99.3	70-130		11/13/13 12:48

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-2-2.5 | Sampled: 11/8/2013 08:50

Sample ID: 13K0384-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	3.1	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Barium	67	3.1	0.39	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Beryllium	ND	0.31	0.050	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 11:53	OP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Calcium	1500	9.3	1.7	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Chromium	16	0.62	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Cobalt	5.7	3.1	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Copper	200	0.62	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Iron	12000	3.1	2.7	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Lead	14	0.93	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Magnesium	2600	9.3	0.97	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Manganese	140	0.62	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Mercury	0.033	0.032	0.0020	mg/Kg dry	1		SW-846 7471B	11/14/13	11/15/13 14:08	AMP
Nickel	81	0.62	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Potassium	640	120	21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Selenium	2.7	3.1	0.96	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:29	OP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Sodium	100	120	61	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:29	OP
Thallium	1.3	3.1	1.0	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:29	OP
Vanadium	25	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP
Zinc	100	1.2	0.32	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:29	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-2-2.5 | Sampled: 11/8/2013 08:50

Sample ID: 13K0384-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.3		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-3-3.5 | Sampled: 11/8/2013 08:55

Sample ID: 13K0384-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.027	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Acrylonitrile	ND	0.0069	0.0029	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Benzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Bromobenzene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Bromodichloromethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Bromomethane	ND	0.012	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
2-Butanone (MEK)	ND	0.046	0.020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
tert-Butyl Alcohol (TBA)	ND	0.046	0.024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
n-Butylbenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
sec-Butylbenzene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Carbon Disulfide	ND	0.0069	0.0038	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Carbon Tetrachloride	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Chlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Chlorodibromomethane	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Chloroform	ND	0.0046	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Chloromethane	ND	0.012	0.0010	mg/Kg dry	1	V-05, L-04	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
2-Chlorotoluene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
4-Chlorotoluene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Dibromomethane	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
trans-1,4-Dichloro-2-butene	ND	0.0046	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1-Dichloroethane	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1-Dichloroethylene	ND	0.0046	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,3-Dichloropropane	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Diethyl Ether	ND	0.023	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-3-3.5 | Sampled: 11/8/2013 08:55

Sample ID: 13K0384-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,4-Dioxane	ND	0.12	0.067	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Ethylbenzene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Hexachlorobutadiene	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
2-Hexanone (MBK)	ND	0.023	0.013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0046	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Methylene Chloride	0.0090	0.023	0.0082	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Naphthalene	ND	0.0046	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
n-Propylbenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Styrene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Tetrahydrofuran	ND	0.012	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Toluene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2,4-Trichlorobenzene	ND	0.0046	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00069	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
Vinyl Chloride	ND	0.012	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
m+p Xylene	ND	0.0046	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF
o-Xylene	ND	0.0023	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:27	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	115	70-130		11/13/13 16:27
Toluene-d8	99.0	70-130		11/13/13 16:27
4-Bromofluorobenzene	98.6	70-130		11/13/13 16:27

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-3-3.5 | Sampled: 11/8/2013 08:55

Sample ID: 13K0384-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Barium	49	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Beryllium	0.48	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/12/13	11/18/13 11:58	OP
Cadmium	0.25	0.27	0.16	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/17/13 15:35	OP
Calcium	920	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Chromium	18	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Cobalt	6.4	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Copper	28	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Iron	18000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Lead	6.5	0.81	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Magnesium	2800	8.1	0.84	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Manganese	89	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Mercury	ND	0.029	0.0018	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 14:55	SAJ
Nickel	16	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Potassium	600	110	18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Sodium	320	110	52	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Vanadium	32	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP
Zinc	32	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/17/13 15:35	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-3-3.5 | Sampled: 11/8/2013 08:55

Sample ID: 13K0384-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.5		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-4-4.5 | Sampled: 11/8/2013 00:00

Sample ID: 13K0384-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Acrylonitrile	ND	0.0063	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Benzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Bromobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Bromochloromethane	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Bromodichloromethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Bromoform	ND	0.0021	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
2-Butanone (MEK)	ND	0.042	0.018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
tert-Butyl Alcohol (TBA)	ND	0.042	0.022	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
n-Butylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
sec-Butylbenzene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
tert-Butylbenzene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Carbon Disulfide	ND	0.0063	0.0035	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Carbon Tetrachloride	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Chlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Chlorodibromomethane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Chloroethane	ND	0.021	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Chloroform	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Chloromethane	ND	0.011	0.00095	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
2-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
4-Chlorotoluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Dibromomethane	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
trans-1,4-Dichloro-2-butene	ND	0.0042	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1-Dichloroethane	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2-Dichloroethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1-Dichloroethylene	ND	0.0042	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2-Dichloropropane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,3-Dichloropropane	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
2,2-Dichloropropane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1-Dichloropropene	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Diethyl Ether	ND	0.021	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-4-4.5 | Sampled: 11/8/2013 00:00

Sample ID: 13K0384-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,4-Dioxane	ND	0.11	0.061	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Ethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Hexachlorobutadiene	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0042	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Methylene Chloride	0.011	0.021	0.0075	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Naphthalene	ND	0.0042	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
n-Propylbenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Styrene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Tetrachloroethylene	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Tetrahydrofuran	ND	0.011	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Toluene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2,4-Trichlorobenzene	ND	0.0042	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Trichloroethylene	0.0010	0.0021	0.00095	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00063	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
m+p Xylene	ND	0.0042	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF
o-Xylene	ND	0.0021	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 16:54	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	112	70-130		11/13/13 16:54
Toluene-d8	97.7	70-130		11/13/13 16:54
4-Bromofluorobenzene	99.7	70-130		11/13/13 16:54

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-4-4.5 | Sampled: 11/8/2013 00:00

Sample ID: 13K0384-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Barium	55	3.0	0.38	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Beryllium	0.40	0.30	0.049	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Calcium	980	9.1	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Chromium	17	0.61	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Cobalt	5.5	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Copper	31	0.61	0.46	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Iron	11000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Lead	9.7	0.91	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Magnesium	3100	9.1	0.95	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Manganese	70	0.61	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Mercury	0.0074	0.031	0.0020	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 14:57	SAJ
Nickel	19	0.61	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Potassium	880	120	21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 12:51	OP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 12:51	OP
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Sodium	200	120	59	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Vanadium	31	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP
Zinc	41	1.2	0.31	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 21:56	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB207-4-4.5 | Sampled: 11/8/2013 00:00

Sample ID: 13K0384-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-0-0.5 | Sampled: 11/8/2013 09:25

Sample ID: 13K0384-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.14	0.033	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Acrylonitrile	ND	0.0084	0.0035	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Benzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Bromobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Bromochloromethane	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Bromodichloromethane	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Bromoform	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Bromomethane	ND	0.014	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
2-Butanone (MEK)	ND	0.056	0.024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
tert-Butyl Alcohol (TBA)	ND	0.056	0.029	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
n-Butylbenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
sec-Butylbenzene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
tert-Butylbenzene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0014	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Carbon Disulfide	ND	0.0084	0.0046	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Carbon Tetrachloride	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Chlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Chlorodibromomethane	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Chloroethane	ND	0.028	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Chloroform	ND	0.0056	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Chloromethane	ND	0.014	0.0013	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
2-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
4-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0056	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Dibromomethane	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2-Dichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,3-Dichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,4-Dichlorobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
trans-1,4-Dichloro-2-butene	ND	0.0056	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.028	0.0018	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1-Dichloroethane	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2-Dichloroethane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1-Dichloroethylene	ND	0.0056	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
cis-1,2-Dichloroethylene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
trans-1,2-Dichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2-Dichloropropane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,3-Dichloropropane	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
2,2-Dichloropropane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1-Dichloropropene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
cis-1,3-Dichloropropene	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
trans-1,3-Dichloropropene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Diethyl Ether	ND	0.028	0.0025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-0-0.5 | Sampled: 11/8/2013 09:25

Sample ID: 13K0384-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0014	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,4-Dioxane	ND	0.14	0.080	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Ethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Hexachlorobutadiene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
2-Hexanone (MBK)	ND	0.028	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Isopropylbenzene (Cumene)	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0056	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Methylene Chloride	ND	0.028	0.0099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.028	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Naphthalene	ND	0.0056	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
n-Propylbenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Styrene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1,1,2-Tetrachloroethane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1,2,2-Tetrachloroethane	ND	0.0014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Tetrachloroethylene	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Tetrahydrofuran	ND	0.014	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Toluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2,3-Trichlorobenzene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2,4-Trichlorobenzene	ND	0.0056	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,3,5-Trichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1,1-Trichloroethane	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1,2-Trichloroethane	ND	0.0028	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Trichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Trichlorofluoromethane (Freon 11)	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2,3-Trichloropropane	ND	0.0028	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,2,4-Trimethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
1,3,5-Trimethylbenzene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
Vinyl Chloride	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
m+p Xylene	ND	0.0056	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF
o-Xylene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:21	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	121	70-130		11/13/13 17:21
Toluene-d8	97.7	70-130		11/13/13 17:21
4-Bromofluorobenzene	95.8	70-130		11/13/13 17:21

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-0-0.5 | Sampled: 11/8/2013 09:25

Sample ID: 13K0384-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Barium	68	2.9	0.37	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Beryllium	0.50	0.29	0.047	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Calcium	1900	8.8	1.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Chromium	22	0.59	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Cobalt	7.7	2.9	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Copper	80	0.59	0.45	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Iron	16000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Lead	29	0.88	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Magnesium	3500	8.8	0.92	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Manganese	190	0.59	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Mercury	0.11	0.030	0.0019	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:12	SAJ
Nickel	21	0.59	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Potassium	780	120	20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 12:57	OP
Selenium	ND	2.9	0.91	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 12:57	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Sodium	99	120	57	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:21	OP
Thallium	ND	2.9	0.98	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Vanadium	32	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP
Zinc	130	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:21	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-0-0.5 | Sampled: 11/8/2013 09:25

Sample ID: 13K0384-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.3		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-1-1.5 | Sampled: 11/8/2013 09:30

Sample ID: 13K0384-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Acrylonitrile	ND	0.0066	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Benzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Bromobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Bromodichloromethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
2-Butanone (MEK)	ND	0.044	0.019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
tert-Butyl Alcohol (TBA)	ND	0.044	0.023	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
n-Butylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
tert-Butylbenzene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Carbon Disulfide	ND	0.0066	0.0036	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Carbon Tetrachloride	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Chlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Chlorodibromomethane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Chloroform	ND	0.0044	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Chloromethane	ND	0.011	0.00098	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
2-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
4-Chlorotoluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Dibromomethane	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
trans-1,4-Dichloro-2-butene	ND	0.0044	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1-Dichloroethane	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1-Dichloroethylene	ND	0.0044	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,3-Dichloropropane	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
2,2-Dichloropropane	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1-Dichloropropene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-1-1.5 | Sampled: 11/8/2013 09:30

Sample ID: 13K0384-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,4-Dioxane	ND	0.11	0.063	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Ethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0044	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Methylene Chloride	0.012	0.022	0.0078	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0083	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Naphthalene	ND	0.0044	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
n-Propylbenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Styrene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Toluene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2,4-Trichlorobenzene	ND	0.0044	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Trichloroethylene	ND	0.0022	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00066	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
m+p Xylene	ND	0.0044	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF
o-Xylene	ND	0.0022	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 17:48	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	111	70-130		11/13/13 17:48
Toluene-d8	100	70-130		11/13/13 17:48
4-Bromofluorobenzene	98.2	70-130		11/13/13 17:48

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-1-1.5 | Sampled: 11/8/2013 09:30

Sample ID: 13K0384-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Arsenic	ND	2.6	0.93	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Barium	63	2.6	0.32	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Beryllium	0.48	0.26	0.042	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Calcium	620	7.8	1.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Chromium	18	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Cobalt	8.7	2.6	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Copper	26	0.52	0.39	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Iron	16000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Lead	9.4	0.78	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Magnesium	3800	7.8	0.81	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Manganese	170	0.52	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Mercury	0.016	0.027	0.0017	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 15:14	SAJ
Nickel	15	0.52	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Potassium	660	100	18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:02	OP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:02	OP
Silver	ND	0.52	0.45	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Sodium	87	100	50	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:26	OP
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Vanadium	29	1.0	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP
Zinc	35	1.0	0.27	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:26	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB206-1-1.5 | Sampled: 11/8/2013 09:30

Sample ID: 13K0384-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-2-2.5 | Sampled: 11/8/2013 10:00

Sample ID: 13K0384-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.029	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Acrylonitrile	ND	0.0074	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Benzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Bromobenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Bromochloromethane	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Bromodichloromethane	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Bromoform	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Bromomethane	ND	0.012	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
2-Butanone (MEK)	ND	0.050	0.022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
tert-Butyl Alcohol (TBA)	ND	0.050	0.026	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
n-Butylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
sec-Butylbenzene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Carbon Disulfide	ND	0.0074	0.0041	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Carbon Tetrachloride	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Chlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Chlorodibromomethane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Chloroform	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
2-Chlorotoluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
4-Chlorotoluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Dibromomethane	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,4-Dichlorobenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
trans-1,4-Dichloro-2-butene	ND	0.0050	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1-Dichloroethane	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1-Dichloroethylene	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,3-Dichloropropane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Diethyl Ether	ND	0.025	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-2-2.5 | Sampled: 11/8/2013 10:00

Sample ID: 13K0384-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,4-Dioxane	ND	0.12	0.071	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Ethylbenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Hexachlorobutadiene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0050	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Methylene Chloride	ND	0.025	0.0088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0094	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Naphthalene	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
n-Propylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Styrene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Tetrahydrofuran	ND	0.012	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Toluene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2,4-Trichlorobenzene	ND	0.0050	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00074	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
Vinyl Chloride	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
m+p Xylene	ND	0.0050	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF
o-Xylene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:16	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	114	70-130		11/13/13 18:16
Toluene-d8	98.2	70-130		11/13/13 18:16
4-Bromofluorobenzene	99.5	70-130		11/13/13 18:16

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-2-2.5 | Sampled: 11/8/2013 10:00

Sample ID: 13K0384-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.5	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Arsenic	ND	3.5	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Barium	82	3.5	0.44	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Beryllium	0.40	0.35	0.056	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Cadmium	ND	0.35	0.21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Calcium	3300	11	1.9	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Chromium	21	0.70	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Cobalt	5.6	3.5	0.22	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Copper	2800	0.70	0.54	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Iron	12000	3.5	3.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Lead	25	1.1	0.21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Magnesium	2200	11	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Manganese	340	0.70	0.22	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Mercury	0.11	0.035	0.0022	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:21	SAJ
Nickel	300	0.70	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Potassium	350	140	24	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:08	OP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:08	OP
Silver	ND	0.70	0.62	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Sodium	150	140	68	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Vanadium	25	1.4	0.23	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP
Zinc	52	1.4	0.36	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:31	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-2-2.5 | Sampled: 11/8/2013 10:00

Sample ID: 13K0384-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	70.7		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-3-3.5 | Sampled: 11/8/2013 10:05

Sample ID: 13K0384-18

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Acrylonitrile	ND	0.0060	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Benzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Bromobenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Bromochloromethane	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Bromodichloromethane	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Bromoform	ND	0.0020	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Bromomethane	ND	0.010	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
2-Butanone (MEK)	ND	0.040	0.017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
tert-Butyl Alcohol (TBA)	ND	0.040	0.021	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
n-Butylbenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
sec-Butylbenzene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
tert-Butylbenzene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Carbon Disulfide	ND	0.0060	0.0033	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Carbon Tetrachloride	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Chlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Chlorodibromomethane	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Chloroethane	ND	0.020	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Chloroform	ND	0.0040	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Chloromethane	ND	0.010	0.00090	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
2-Chlorotoluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
4-Chlorotoluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Dibromomethane	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2-Dichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,3-Dichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,4-Dichlorobenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
trans-1,4-Dichloro-2-butene	ND	0.0040	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.020	0.0013	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1-Dichloroethane	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2-Dichloroethane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1-Dichloroethylene	ND	0.0040	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
cis-1,2-Dichloroethylene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
trans-1,2-Dichloroethylene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2-Dichloropropane	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,3-Dichloropropane	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
2,2-Dichloropropane	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1-Dichloropropene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
trans-1,3-Dichloropropene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Diethyl Ether	ND	0.020	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-3-3.5 | Sampled: 11/8/2013 10:05

Sample ID: 13K0384-18

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,4-Dioxane	ND	0.10	0.058	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Ethylbenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Hexachlorobutadiene	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
2-Hexanone (MBK)	ND	0.020	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Isopropylbenzene (Cumene)	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Methylene Chloride	ND	0.020	0.0071	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.020	0.0076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Naphthalene	ND	0.0040	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
n-Propylbenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Styrene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1,1,2-Tetrachloroethane	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Tetrachloroethylene	ND	0.0020	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Tetrahydrofuran	ND	0.010	0.0022	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Toluene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2,3-Trichlorobenzene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2,4-Trichlorobenzene	ND	0.0040	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,3,5-Trichlorobenzene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1,1-Trichloroethane	ND	0.0020	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1,2-Trichloroethane	ND	0.0020	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Trichloroethylene	ND	0.0020	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2,3-Trichloropropane	ND	0.0020	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,2,4-Trimethylbenzene	ND	0.0020	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
1,3,5-Trimethylbenzene	ND	0.0020	0.00060	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
m+p Xylene	ND	0.0040	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF
o-Xylene	ND	0.0020	0.00070	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 18:43	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	112	70-130		11/13/13 18:43
Toluene-d8	98.6	70-130		11/13/13 18:43
4-Bromofluorobenzene	98.4	70-130		11/13/13 18:43

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-3-3.5 | Sampled: 11/8/2013 10:05

Sample ID: 13K0384-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Barium	50	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Beryllium	0.21	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:36	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Calcium	1200	8.2	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Chromium	13	0.54	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Cobalt	4.7	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Copper	140	0.54	0.42	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Iron	9000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Lead	4.6	0.82	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Magnesium	2900	8.2	0.85	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Manganese	93	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Mercury	ND	0.028	0.0018	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:23	SAJ
Nickel	38	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Potassium	940	110	19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:13	OP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:13	OP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Sodium	96	110	53	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:36	OP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP
Zinc	22	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:36	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-3-3.5 | Sampled: 11/8/2013 10:05

Sample ID: 13K0384-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-4-4.5 | Sampled: 11/8/2013 10:10

Sample ID: 13K0384-19

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.093	0.022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Acrylonitrile	ND	0.0056	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.00093	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Benzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Bromobenzene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Bromochloromethane	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Bromodichloromethane	ND	0.0019	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Bromoform	ND	0.0019	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Bromomethane	ND	0.0093	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
2-Butanone (MEK)	ND	0.037	0.016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
tert-Butyl Alcohol (TBA)	ND	0.037	0.019	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
n-Butylbenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
sec-Butylbenzene	ND	0.0019	0.00093	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
tert-Butylbenzene	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.00093	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Carbon Disulfide	ND	0.0056	0.0031	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Carbon Tetrachloride	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Chlorobenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Chlorodibromomethane	ND	0.00093	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Chloroethane	ND	0.019	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Chloroform	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Chloromethane	ND	0.0093	0.00084	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
2-Chlorotoluene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
4-Chlorotoluene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2-Dibromoethane (EDB)	ND	0.00093	0.00093	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Dibromomethane	ND	0.0019	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2-Dichlorobenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,3-Dichlorobenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,4-Dichlorobenzene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
trans-1,4-Dichloro-2-butene	ND	0.0037	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.019	0.0012	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1-Dichloroethane	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2-Dichloroethane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1-Dichloroethylene	ND	0.0037	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
cis-1,2-Dichloroethylene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
trans-1,2-Dichloroethylene	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2-Dichloropropane	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,3-Dichloropropane	ND	0.00093	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
2,2-Dichloropropane	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1-Dichloropropene	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
cis-1,3-Dichloropropene	ND	0.00093	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
trans-1,3-Dichloropropene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Diethyl Ether	ND	0.019	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-4-4.5 | Sampled: 11/8/2013 10:10

Sample ID: 13K0384-19

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.00093	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,4-Dioxane	ND	0.093	0.054	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Ethylbenzene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Hexachlorobutadiene	ND	0.0019	0.00093	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
2-Hexanone (MBK)	ND	0.019	0.010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Isopropylbenzene (Cumene)	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0037	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Methylene Chloride	0.0089	0.019	0.0066	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.019	0.0071	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Naphthalene	ND	0.0037	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
n-Propylbenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Styrene	ND	0.0019	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1,1,2-Tetrachloroethane	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1,2,2-Tetrachloroethane	ND	0.00093	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Tetrachloroethylene	ND	0.0019	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Tetrahydrofuran	ND	0.0093	0.0021	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Toluene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2,3-Trichlorobenzene	ND	0.0019	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2,4-Trichlorobenzene	ND	0.0037	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,3,5-Trichlorobenzene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1,1-Trichloroethane	ND	0.0019	0.00093	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1,2-Trichloroethane	ND	0.0019	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Trichloroethylene	ND	0.0019	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Trichlorofluoromethane (Freon 11)	ND	0.0093	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2,3-Trichloropropane	ND	0.0019	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.0093	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,2,4-Trimethylbenzene	ND	0.0019	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
1,3,5-Trimethylbenzene	ND	0.0019	0.00056	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
Vinyl Chloride	ND	0.0093	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
m+p Xylene	ND	0.0037	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF
o-Xylene	ND	0.0019	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:10	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	121	70-130		11/13/13 19:10
Toluene-d8	101	70-130		11/13/13 19:10
4-Bromofluorobenzene	113	70-130		11/13/13 19:10

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-4-4.5 | Sampled: 11/8/2013 10:10

Sample ID: 13K0384-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8900	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Barium	51	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Beryllium	0.39	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Calcium	2000	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Chromium	17	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Cobalt	7.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Copper	170	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Iron	16000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Lead	6.0	0.81	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Magnesium	3800	8.1	0.84	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Manganese	180	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Mercury	0.0083	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 15:25	SAJ
Nickel	44	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Potassium	1500	110	18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:19	OP
Selenium	1.2	2.7	0.83	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/19/13 13:19	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Sodium	150	110	52	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Vanadium	25	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP
Zinc	27	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:41	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB205-4-4.5 | Sampled: 11/8/2013 10:10

Sample ID: 13K0384-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.9		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-20

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Acrylonitrile	ND	0.0067	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Benzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Bromobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Bromochloromethane	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Bromodichloromethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Bromoform	ND	0.0022	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.023	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
n-Butylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
tert-Butylbenzene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Carbon Disulfide	ND	0.0067	0.0037	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Carbon Tetrachloride	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Chlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Chlorodibromomethane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Chloroethane	ND	0.022	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Chloroform	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
2-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
4-Chlorotoluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Dibromomethane	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1-Dichloroethane	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2-Dichloroethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2-Dichloropropane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,3-Dichloropropane	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
2,2-Dichloropropane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1-Dichloropropene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Diethyl Ether	ND	0.022	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-20

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Ethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Methylene Chloride	0.0085	0.022	0.0080	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Naphthalene	ND	0.0045	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
n-Propylbenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Styrene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Tetrachloroethylene	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Toluene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Trichloroethylene	ND	0.0022	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00090	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00067	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF
o-Xylene	ND	0.0022	0.00078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 19:37	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	107	70-130		11/13/13 19:37
Toluene-d8	99.2	70-130		11/13/13 19:37
4-Bromofluorobenzene	97.7	70-130		11/13/13 19:37

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6900	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Barium	43	2.7	0.34	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Beryllium	0.20	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:46	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Calcium	2100	8.2	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Chromium	18	0.54	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Cobalt	6.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Copper	74	0.54	0.42	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Iron	9900	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Lead	13	0.82	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Magnesium	3200	8.2	0.85	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Manganese	200	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Mercury	0.034	0.027	0.0017	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:26	SAJ
Nickel	21	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Potassium	720	110	19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:23	OP
Selenium	1.7	2.7	0.84	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/19/13 13:23	OP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Sodium	82	110	53	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:46	OP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Vanadium	17	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP
Zinc	73	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:46	OP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.0		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-1-1.5 | Sampled: 11/8/2013 10:25

Sample ID: 13K0384-21

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.039	0.11	0.027	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Acrylonitrile	ND	0.0068	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Benzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Bromobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Bromochloromethane	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Bromodichloromethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Bromoform	ND	0.0023	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Bromomethane	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
2-Butanone (MEK)	ND	0.045	0.020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
tert-Butyl Alcohol (TBA)	ND	0.045	0.024	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
n-Butylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
sec-Butylbenzene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
tert-Butylbenzene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Carbon Disulfide	ND	0.0068	0.0038	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Carbon Tetrachloride	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Chlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Chlorodibromomethane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Chloroethane	ND	0.023	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Chloroform	ND	0.0045	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Chloromethane	ND	0.011	0.0010	mg/Kg dry	1	V-05, L-04	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
2-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
4-Chlorotoluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Dibromomethane	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,3-Dichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,4-Dichlorobenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
trans-1,4-Dichloro-2-butene	ND	0.0045	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.023	0.0015	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1-Dichloroethane	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2-Dichloroethane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1-Dichloroethylene	ND	0.0045	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
cis-1,2-Dichloroethylene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
trans-1,2-Dichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2-Dichloropropane	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,3-Dichloropropane	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
2,2-Dichloropropane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1-Dichloropropene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
trans-1,3-Dichloropropene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Diethyl Ether	ND	0.023	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-1-1.5 | Sampled: 11/8/2013 10:25

Sample ID: 13K0384-21

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,4-Dioxane	ND	0.11	0.065	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Ethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Hexachlorobutadiene	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
2-Hexanone (MBK)	ND	0.023	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Isopropylbenzene (Cumene)	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
p-Isopropyltoluene (p-Cymene)	0.0051	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0045	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Methylene Chloride	0.0088	0.023	0.0081	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.023	0.0086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Naphthalene	ND	0.0045	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
n-Propylbenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Styrene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1,1,2-Tetrachloroethane	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Tetrachloroethylene	ND	0.0023	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Tetrahydrofuran	ND	0.011	0.0025	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Toluene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2,3-Trichlorobenzene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2,4-Trichlorobenzene	ND	0.0045	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,3,5-Trichlorobenzene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1,1-Trichloroethane	ND	0.0023	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1,2-Trichloroethane	ND	0.0023	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Trichloroethylene	ND	0.0023	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2,3-Trichloropropane	ND	0.0023	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,2,4-Trimethylbenzene	ND	0.0023	0.00091	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
1,3,5-Trimethylbenzene	ND	0.0023	0.00068	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
m+p Xylene	ND	0.0045	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF
o-Xylene	ND	0.0023	0.00080	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:04	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	117	70-130		11/13/13 20:04
Toluene-d8	97.6	70-130		11/13/13 20:04
4-Bromofluorobenzene	102	70-130		11/13/13 20:04

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-1-1.5 | Sampled: 11/8/2013 10:25

Sample ID: 13K0384-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Barium	79	2.7	0.33	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Beryllium	0.40	0.27	0.043	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Calcium	930	8.1	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Chromium	24	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Cobalt	9.0	2.7	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Copper	120	0.54	0.41	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Iron	16000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Lead	8.0	0.81	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Magnesium	3600	8.1	0.84	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Manganese	140	0.54	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Mercury	0.013	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 15:28	SAJ
Nickel	31	0.54	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Potassium	830	110	18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:48	OP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:48	OP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Sodium	100	110	52	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 22:50	OP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Vanadium	32	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP
Zinc	60	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:50	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-1-1.5 | Sampled: 11/8/2013 10:25

Sample ID: 13K0384-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.0		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-2-2.5 | Sampled: 11/8/2013 10:30

Sample ID: 13K0384-22

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.10	0.024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Acrylonitrile	ND	0.0062	0.0026	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Benzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Bromobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Bromochloromethane	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Bromodichloromethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Bromoform	ND	0.0021	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Bromomethane	ND	0.010	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
2-Butanone (MEK)	ND	0.041	0.018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
tert-Butyl Alcohol (TBA)	ND	0.041	0.021	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
n-Butylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
sec-Butylbenzene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
tert-Butylbenzene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Carbon Disulfide	ND	0.0062	0.0034	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Carbon Tetrachloride	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Chlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Chlorodibromomethane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Chloroethane	ND	0.021	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Chloroform	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Chloromethane	ND	0.010	0.00092	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
2-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
4-Chlorotoluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2-Dibromoethane (EDB)	ND	0.0010	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Dibromomethane	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,3-Dichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,4-Dichlorobenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
trans-1,4-Dichloro-2-butene	ND	0.0041	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.021	0.0013	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1-Dichloroethane	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2-Dichloroethane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1-Dichloroethylene	ND	0.0041	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
cis-1,2-Dichloroethylene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
trans-1,2-Dichloroethylene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2-Dichloropropane	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,3-Dichloropropane	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
2,2-Dichloropropane	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1-Dichloropropene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
cis-1,3-Dichloropropene	ND	0.0010	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
trans-1,3-Dichloropropene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Diethyl Ether	ND	0.021	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-2-2.5 | Sampled: 11/8/2013 10:30

Sample ID: 13K0384-22

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0010	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,4-Dioxane	ND	0.10	0.059	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Ethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Hexachlorobutadiene	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
2-Hexanone (MBK)	ND	0.021	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Isopropylbenzene (Cumene)	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0041	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Methylene Chloride	0.011	0.021	0.0073	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.021	0.0078	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Naphthalene	ND	0.0041	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
n-Propylbenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Styrene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1,1,2-Tetrachloroethane	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1,2,2-Tetrachloroethane	ND	0.0010	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Tetrachloroethylene	ND	0.0021	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Tetrahydrofuran	ND	0.010	0.0023	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Toluene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2,3-Trichlorobenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2,4-Trichlorobenzene	ND	0.0041	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,3,5-Trichlorobenzene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1,1-Trichloroethane	ND	0.0021	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1,2-Trichloroethane	ND	0.0021	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Trichloroethylene	ND	0.0021	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Trichlorofluoromethane (Freon 11)	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2,3-Trichloropropane	ND	0.0021	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	0.00092	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,2,4-Trimethylbenzene	ND	0.0021	0.00082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
1,3,5-Trimethylbenzene	ND	0.0021	0.00062	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
Vinyl Chloride	ND	0.010	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
m+p Xylene	ND	0.0041	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF
o-Xylene	ND	0.0021	0.00072	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:31	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	109	70-130		11/13/13 20:31
Toluene-d8	97.6	70-130		11/13/13 20:31
4-Bromofluorobenzene	99.4	70-130		11/13/13 20:31

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-2-2.5 | Sampled: 11/8/2013 10:30

Sample ID: 13K0384-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Arsenic	ND	2.8	0.99	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Barium	63	2.8	0.34	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Beryllium	0.48	0.28	0.044	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Calcium	780	8.3	1.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Chromium	26	0.55	0.14	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Cobalt	10	2.8	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Copper	120	0.55	0.42	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Iron	19000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Lead	9.8	0.83	0.16	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Magnesium	3700	8.3	0.86	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Manganese	200	0.55	0.17	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Mercury	0.010	0.028	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 15:30	SAJ
Nickel	35	0.55	0.13	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Potassium	880	110	19	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:53	OP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:53	OP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Sodium	110	110	54	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Thallium	ND	2.8	0.91	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Vanadium	38	1.1	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP
Zinc	40	1.1	0.28	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 22:55	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB204-2-2.5 | Sampled: 11/8/2013 10:30

Sample ID: 13K0384-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.6		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-23

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.14	0.033	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Acrylonitrile	ND	0.0085	0.0035	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0014	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Benzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Bromobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Bromochloromethane	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Bromodichloromethane	ND	0.0028	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Bromoform	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Bromomethane	ND	0.014	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
2-Butanone (MEK)	ND	0.057	0.025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
tert-Butyl Alcohol (TBA)	ND	0.057	0.030	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
n-Butylbenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
sec-Butylbenzene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
tert-Butylbenzene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0014	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Carbon Disulfide	ND	0.0085	0.0047	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Carbon Tetrachloride	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Chlorobenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Chlorodibromomethane	ND	0.0014	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Chloroethane	ND	0.028	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Chloroform	ND	0.0057	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Chloromethane	ND	0.014	0.0013	mg/Kg dry	1	V-05, L-04	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
2-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
4-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0057	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Dibromomethane	ND	0.0028	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2-Dichlorobenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,3-Dichlorobenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,4-Dichlorobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
trans-1,4-Dichloro-2-butene	ND	0.0057	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.028	0.0018	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1-Dichloroethane	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2-Dichloroethane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1-Dichloroethylene	ND	0.0057	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
cis-1,2-Dichloroethylene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
trans-1,2-Dichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2-Dichloropropane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,3-Dichloropropane	ND	0.0014	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
2,2-Dichloropropane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1-Dichloropropene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
cis-1,3-Dichloropropene	ND	0.0014	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
trans-1,3-Dichloropropene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Diethyl Ether	ND	0.028	0.0026	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-23

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0014	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,4-Dioxane	ND	0.14	0.082	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Ethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Hexachlorobutadiene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
2-Hexanone (MBK)	ND	0.028	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Isopropylbenzene (Cumene)	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0057	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Methylene Chloride	ND	0.028	0.010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.028	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Naphthalene	ND	0.0057	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
n-Propylbenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Styrene	ND	0.0028	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1,1,2-Tetrachloroethane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1,2,2-Tetrachloroethane	ND	0.0014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Tetrachloroethylene	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Tetrahydrofuran	ND	0.014	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Toluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2,3-Trichlorobenzene	ND	0.0028	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2,4-Trichlorobenzene	ND	0.0057	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,3,5-Trichlorobenzene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1,1-Trichloroethane	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1,2-Trichloroethane	ND	0.0028	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Trichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Trichlorofluoromethane (Freon 11)	ND	0.014	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2,3-Trichloropropane	ND	0.0028	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,2,4-Trimethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
1,3,5-Trimethylbenzene	ND	0.0028	0.00085	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
Vinyl Chloride	ND	0.014	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
m+p Xylene	ND	0.0057	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF
o-Xylene	ND	0.0028	0.00099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 20:58	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	114	70-130		11/13/13 20:58
Toluene-d8	97.1	70-130		11/13/13 20:58
4-Bromofluorobenzene	96.9	70-130		11/13/13 20:58

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.1	1.3	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Barium	73	3.1	0.38	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Beryllium	0.37	0.31	0.049	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Calcium	1500	9.2	1.7	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Chromium	32	0.62	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Cobalt	9.3	3.1	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Copper	570	0.62	0.47	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Iron	15000	3.1	2.6	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Lead	27	0.92	0.18	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Magnesium	3400	9.2	0.96	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Manganese	190	0.62	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Mercury	0.11	0.032	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:31	SAJ
Nickel	41	0.62	0.15	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Potassium	550	120	21	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:58	OP
Selenium	ND	3.1	0.95	mg/Kg dry	1		SW-846 6010C	11/12/13	11/19/13 13:58	OP
Silver	ND	0.62	0.54	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Sodium	96	120	60	mg/Kg dry	1	J	SW-846 6010C	11/12/13	11/15/13 23:00	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Vanadium	29	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP
Zinc	76	1.2	0.32	mg/Kg dry	1		SW-846 6010C	11/12/13	11/15/13 23:00	OP

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-0-0.5 | Sampled: 11/8/2013 10:40

Sample ID: 13K0384-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	78.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-1-1.5 | Sampled: 11/8/2013 13:00

Sample ID: 13K0384-24

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.12	0.029	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Acrylonitrile	ND	0.0075	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Benzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Bromobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Bromochloromethane	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Bromodichloromethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Bromoform	ND	0.0025	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Bromomethane	ND	0.012	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
2-Butanone (MEK)	ND	0.050	0.022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
tert-Butyl Alcohol (TBA)	ND	0.050	0.026	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
n-Butylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
sec-Butylbenzene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0012	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Carbon Disulfide	ND	0.0075	0.0041	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Carbon Tetrachloride	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Chlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Chlorodibromomethane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Chloroform	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Chloromethane	ND	0.012	0.0011	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
2-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
4-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2-Dibromoethane (EDB)	ND	0.0012	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Dibromomethane	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,4-Dichlorobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
trans-1,4-Dichloro-2-butene	ND	0.0050	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1-Dichloroethane	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1-Dichloroethylene	ND	0.0050	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,3-Dichloropropane	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
cis-1,3-Dichloropropene	ND	0.0012	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Diethyl Ether	ND	0.025	0.0022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-1-1.5 | Sampled: 11/8/2013 13:00

Sample ID: 13K0384-24

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0012	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,4-Dioxane	ND	0.12	0.072	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Ethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Hexachlorobutadiene	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0050	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Methylene Chloride	0.010	0.025	0.0088	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Naphthalene	ND	0.0050	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
n-Propylbenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Styrene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1,2,2-Tetrachloroethane	ND	0.0012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Tetrahydrofuran	ND	0.012	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Toluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2,4-Trichlorobenzene	ND	0.0050	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Trichlorofluoromethane (Freon 11)	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.012	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
Vinyl Chloride	ND	0.012	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
m+p Xylene	ND	0.0050	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF
o-Xylene	ND	0.0025	0.00087	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:26	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/13/13 21:26
Toluene-d8	99.0	70-130		11/13/13 21:26
4-Bromofluorobenzene	96.7	70-130		11/13/13 21:26

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-1-1.5 | Sampled: 11/8/2013 13:00

Sample ID: 13K0384-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	3.1	1.3	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Barium	70	3.1	0.38	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Beryllium	0.63	0.31	0.050	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:37	OP
Cadmium	0.34	0.31	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Calcium	1300	9.3	1.7	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Chromium	33	0.62	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Cobalt	9.5	3.1	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Copper	480	0.62	0.47	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Iron	18000	3.1	2.6	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Lead	14	0.93	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Magnesium	3800	9.3	0.97	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:37	OP
Manganese	160	0.62	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Mercury	0.047	0.031	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:33	SAJ
Nickel	54	0.62	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Potassium	410	120	21	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Selenium	2.0	3.1	0.95	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/14/13 23:12	OP
Silver	ND	0.62	0.54	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Sodium	120	120	60	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/14/13 23:12	OP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Vanadium	35	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP
Zinc	66	1.2	0.32	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:12	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-1-1.5 | Sampled: 11/8/2013 13:00

Sample ID: 13K0384-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-2-2.5 | Sampled: 11/8/2013 10:45

Sample ID: 13K0384-25

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.11	0.025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Acrylonitrile	ND	0.0065	0.0027	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Benzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Bromobenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Bromochloromethane	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Bromodichloromethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Bromoform	ND	0.0022	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Bromomethane	ND	0.011	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
2-Butanone (MEK)	ND	0.043	0.019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
tert-Butyl Alcohol (TBA)	ND	0.043	0.022	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
n-Butylbenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
sec-Butylbenzene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
tert-Butylbenzene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Carbon Disulfide	ND	0.0065	0.0036	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Carbon Tetrachloride	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Chlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Chlorodibromomethane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Chloroethane	ND	0.022	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Chloroform	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Chloromethane	ND	0.011	0.00097	mg/Kg dry	1	V-05, L-04	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
2-Chlorotoluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
4-Chlorotoluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2-Dibromoethane (EDB)	ND	0.0011	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Dibromomethane	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2-Dichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,3-Dichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,4-Dichlorobenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
trans-1,4-Dichloro-2-butene	ND	0.0043	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.022	0.0014	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1-Dichloroethane	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2-Dichloroethane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1-Dichloroethylene	ND	0.0043	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
cis-1,2-Dichloroethylene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
trans-1,2-Dichloroethylene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2-Dichloropropane	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,3-Dichloropropane	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
2,2-Dichloropropane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1-Dichloropropene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
cis-1,3-Dichloropropene	ND	0.0011	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
trans-1,3-Dichloropropene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Diethyl Ether	ND	0.022	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-2-2.5 | Sampled: 11/8/2013 10:45

Sample ID: 13K0384-25

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0011	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,4-Dioxane	ND	0.11	0.062	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Ethylbenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Hexachlorobutadiene	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
2-Hexanone (MBK)	ND	0.022	0.012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Isopropylbenzene (Cumene)	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0043	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Methylene Chloride	0.010	0.022	0.0076	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.022	0.0082	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Naphthalene	ND	0.0043	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
n-Propylbenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Styrene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1,1,2-Tetrachloroethane	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1,2,2-Tetrachloroethane	ND	0.0011	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Tetrachloroethylene	ND	0.0022	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Tetrahydrofuran	ND	0.011	0.0024	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Toluene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2,3-Trichlorobenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2,4-Trichlorobenzene	ND	0.0043	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,3,5-Trichlorobenzene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1,1-Trichloroethane	ND	0.0022	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1,2-Trichloroethane	ND	0.0022	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Trichloroethylene	ND	0.0022	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Trichlorofluoromethane (Freon 11)	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2,3-Trichloropropane	ND	0.0022	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.011	0.00097	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,2,4-Trimethylbenzene	ND	0.0022	0.00086	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
1,3,5-Trimethylbenzene	ND	0.0022	0.00065	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
Vinyl Chloride	ND	0.011	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
m+p Xylene	ND	0.0043	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF
o-Xylene	ND	0.0022	0.00075	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 21:53	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	110	70-130		11/13/13 21:53
Toluene-d8	91.3	70-130		11/13/13 21:53
4-Bromofluorobenzene	99.4	70-130		11/13/13 21:53

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-2-2.5 | Sampled: 11/8/2013 10:45

Sample ID: 13K0384-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Barium	44	2.9	0.36	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Beryllium	0.44	0.29	0.047	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:40	OP
Cadmium	0.22	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/14/13 23:17	OP
Calcium	610	8.8	1.6	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Chromium	29	0.58	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Cobalt	16	2.9	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Copper	130	0.58	0.45	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Iron	19000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Lead	4.5	0.88	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Magnesium	4000	8.8	0.91	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:40	OP
Manganese	240	0.58	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Mercury	0.0051	0.027	0.0018	mg/Kg dry	1	J	SW-846 7471B	11/13/13	11/13/13 15:35	SAJ
Nickel	45	0.58	0.14	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Potassium	700	120	20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Sodium	91	120	57	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/14/13 23:17	OP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Vanadium	25	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP
Zinc	31	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:17	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB203-2-2.5 | Sampled: 11/8/2013 10:45

Sample ID: 13K0384-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.1		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202-0-0.5 | Sampled: 11/8/2013 13:10

Sample ID: 13K0384-26

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.14	0.032	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Acrylonitrile	ND	0.0081	0.0034	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0014	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Benzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Bromobenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Bromochloromethane	ND	0.0027	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Bromodichloromethane	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Bromoform	ND	0.0027	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Bromomethane	ND	0.014	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
2-Butanone (MEK)	ND	0.054	0.024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
tert-Butyl Alcohol (TBA)	ND	0.054	0.028	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
n-Butylbenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
sec-Butylbenzene	ND	0.0027	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
tert-Butylbenzene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0014	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Carbon Disulfide	ND	0.0081	0.0045	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Carbon Tetrachloride	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Chlorobenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Chlorodibromomethane	ND	0.0014	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Chloroethane	ND	0.027	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Chloroform	ND	0.0054	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Chloromethane	ND	0.014	0.0012	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
2-Chlorotoluene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
4-Chlorotoluene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0054	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Dibromomethane	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2-Dichlorobenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,3-Dichlorobenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,4-Dichlorobenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.0054	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.027	0.0018	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1-Dichloroethane	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2-Dichloroethane	ND	0.0027	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1-Dichloroethylene	ND	0.0054	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
cis-1,2-Dichloroethylene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
trans-1,2-Dichloroethylene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2-Dichloropropane	ND	0.0027	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,3-Dichloropropane	ND	0.0014	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
2,2-Dichloropropane	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1-Dichloropropene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
cis-1,3-Dichloropropene	ND	0.0014	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
trans-1,3-Dichloropropene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Diethyl Ether	ND	0.027	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202-0-0.5 | Sampled: 11/8/2013 13:10

Sample ID: 13K0384-26

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0014	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,4-Dioxane	ND	0.14	0.078	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Ethylbenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Hexachlorobutadiene	ND	0.0027	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
2-Hexanone (MBK)	ND	0.027	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Isopropylbenzene (Cumene)	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0054	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Methylene Chloride	ND	0.027	0.0096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.027	0.010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Naphthalene	ND	0.0054	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
n-Propylbenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Styrene	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.0014	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Tetrachloroethylene	ND	0.0027	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Tetrahydrofuran	ND	0.014	0.0030	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Toluene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2,3-Trichlorobenzene	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2,4-Trichlorobenzene	ND	0.0054	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,3,5-Trichlorobenzene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1,1-Trichloroethane	ND	0.0027	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1,2-Trichloroethane	ND	0.0027	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Trichloroethylene	ND	0.0027	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2,3-Trichloropropane	ND	0.0027	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.014	0.0012	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,2,4-Trimethylbenzene	ND	0.0027	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
1,3,5-Trimethylbenzene	ND	0.0027	0.00081	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
Vinyl Chloride	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
m+p Xylene	ND	0.0054	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF
o-Xylene	ND	0.0027	0.00095	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:20	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	116	70-130		11/13/13 22:20
Toluene-d8	95.8	70-130		11/13/13 22:20
4-Bromofluorobenzene	96.6	70-130		11/13/13 22:20

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202-0-0.5 | Sampled: 11/8/2013 13:10

Sample ID: 13K0384-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Barium	71	3.0	0.37	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Beryllium	0.48	0.30	0.048	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:44	OP
Cadmium	0.45	0.30	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Calcium	1400	8.9	1.6	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Chromium	51	0.59	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Cobalt	15	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Copper	32	0.59	0.45	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Iron	19000	3.0	2.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Lead	26	0.89	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Magnesium	4700	8.9	0.93	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:44	OP
Manganese	230	0.59	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Mercury	0.081	0.031	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:36	SAJ
Nickel	59	0.59	0.14	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Potassium	340	120	20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Selenium	ND	3.0	0.91	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Sodium	67	120	58	mg/Kg dry	1	J	SW-846 6010C	11/11/13	11/14/13 23:23	OP
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Vanadium	28	1.2	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP
Zinc	65	1.2	0.30	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:23	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202-0-0.5 | Sampled: 11/8/2013 13:10

Sample ID: 13K0384-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	80.3		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB201-0-0.5 | Sampled: 11/8/2013 13:30

Sample ID: 13K0384-27

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.14	0.033	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Acrylonitrile	ND	0.0084	0.0035	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Benzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Bromobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Bromochloromethane	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Bromodichloromethane	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Bromoform	ND	0.0028	0.0020	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Bromomethane	ND	0.014	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
2-Butanone (MEK)	ND	0.056	0.024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
tert-Butyl Alcohol (TBA)	ND	0.056	0.029	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
n-Butylbenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
sec-Butylbenzene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
tert-Butylbenzene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0014	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Carbon Disulfide	ND	0.0084	0.0046	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Carbon Tetrachloride	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Chlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Chlorodibromomethane	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Chloroethane	ND	0.028	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Chloroform	ND	0.0056	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Chloromethane	ND	0.014	0.0013	mg/Kg dry	1	V-05, L-04	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
2-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
4-Chlorotoluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0056	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2-Dibromoethane (EDB)	ND	0.0014	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Dibromomethane	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2-Dichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,3-Dichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,4-Dichlorobenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
trans-1,4-Dichloro-2-butene	ND	0.0056	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.028	0.0018	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1-Dichloroethane	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2-Dichloroethane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1-Dichloroethylene	ND	0.0056	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
cis-1,2-Dichloroethylene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
trans-1,2-Dichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2-Dichloropropane	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,3-Dichloropropane	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
2,2-Dichloropropane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1-Dichloropropene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
cis-1,3-Dichloropropene	ND	0.0014	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
trans-1,3-Dichloropropene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Diethyl Ether	ND	0.028	0.0025	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB201-0-0.5 | Sampled: 11/8/2013 13:30

Sample ID: 13K0384-27

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0014	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,4-Dioxane	ND	0.14	0.080	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Ethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Hexachlorobutadiene	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
2-Hexanone (MBK)	ND	0.028	0.015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Isopropylbenzene (Cumene)	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0056	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Methylene Chloride	ND	0.028	0.0099	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.028	0.011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Naphthalene	ND	0.0056	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
n-Propylbenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Styrene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1,1,2-Tetrachloroethane	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1,2,2-Tetrachloroethane	ND	0.0014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Tetrachloroethylene	ND	0.0028	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Tetrahydrofuran	ND	0.014	0.0031	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Toluene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2,3-Trichlorobenzene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2,4-Trichlorobenzene	ND	0.0056	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,3,5-Trichlorobenzene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1,1-Trichloroethane	ND	0.0028	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1,2-Trichloroethane	ND	0.0028	0.0017	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Trichloroethylene	ND	0.0028	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Trichlorofluoromethane (Freon 11)	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2,3-Trichloropropane	ND	0.0028	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.014	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,2,4-Trimethylbenzene	ND	0.0028	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
1,3,5-Trimethylbenzene	ND	0.0028	0.00084	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
Vinyl Chloride	ND	0.014	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
m+p Xylene	ND	0.0056	0.0024	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF
o-Xylene	ND	0.0028	0.00098	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 22:48	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	119	70-130		11/13/13 22:48
Toluene-d8	97.4	70-130		11/13/13 22:48
4-Bromofluorobenzene	98.0	70-130		11/13/13 22:48

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB201-0-0.5 | Sampled: 11/8/2013 13:30

Sample ID: 13K0384-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.4	1.5	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Antimony	ND	3.4	2.7	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Arsenic	ND	3.4	1.2	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Barium	75	3.4	0.42	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Beryllium	0.52	0.34	0.054	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:48	OP
Cadmium	0.46	0.34	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Calcium	1500	10	1.8	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Chromium	53	0.67	0.17	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Cobalt	17	3.4	0.22	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Copper	39	0.67	0.51	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Iron	19000	3.4	2.9	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Lead	35	1.0	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Magnesium	6000	10	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:48	OP
Manganese	300	0.67	0.21	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Mercury	0.087	0.031	0.0020	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:42	SAJ
Nickel	65	0.67	0.16	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Potassium	360	130	23	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Selenium	ND	3.4	1.0	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Silver	ND	0.67	0.59	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Sodium	ND	130	66	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Thallium	ND	3.4	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Vanadium	30	1.3	0.22	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP
Zinc	75	1.3	0.35	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:28	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB201-0-0.5 | Sampled: 11/8/2013 13:30

Sample ID: 13K0384-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.7		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202D-0-0.5 | Sampled: 11/8/2013 13:15

Sample ID: 13K0384-28

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	0.13	0.030	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Acrylonitrile	ND	0.0076	0.0032	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Benzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Bromobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Bromochloromethane	ND	0.0025	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Bromodichloromethane	ND	0.0025	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Bromoform	ND	0.0025	0.0018	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Bromomethane	ND	0.013	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
2-Butanone (MEK)	ND	0.051	0.022	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
tert-Butyl Alcohol (TBA)	ND	0.051	0.026	mg/Kg dry	1	V-16, V-05	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
n-Butylbenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
sec-Butylbenzene	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
tert-Butylbenzene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.0013	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Carbon Disulfide	ND	0.0076	0.0042	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Carbon Tetrachloride	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Chlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Chlorodibromomethane	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Chloroethane	ND	0.025	0.0019	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Chloroform	ND	0.0051	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Chloromethane	ND	0.013	0.0011	mg/Kg dry	1	L-04, V-05	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
2-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
4-Chlorotoluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0051	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2-Dibromoethane (EDB)	ND	0.0013	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Dibromomethane	ND	0.0025	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2-Dichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,3-Dichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,4-Dichlorobenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
trans-1,4-Dichloro-2-butene	ND	0.0051	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.025	0.0016	mg/Kg dry	1	V-05	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1-Dichloroethane	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2-Dichloroethane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1-Dichloroethylene	ND	0.0051	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
cis-1,2-Dichloroethylene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
trans-1,2-Dichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2-Dichloropropane	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,3-Dichloropropane	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
2,2-Dichloropropane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1-Dichloropropene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
cis-1,3-Dichloropropene	ND	0.0013	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
trans-1,3-Dichloropropene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Diethyl Ether	ND	0.025	0.0023	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202D-0-0.5 | Sampled: 11/8/2013 13:15

Sample ID: 13K0384-28

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.0013	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,4-Dioxane	ND	0.13	0.073	mg/Kg dry	1	V-05, V-16	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Ethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Hexachlorobutadiene	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
2-Hexanone (MBK)	ND	0.025	0.014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Isopropylbenzene (Cumene)	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.0051	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Methylene Chloride	0.011	0.025	0.0090	mg/Kg dry	1	J	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.025	0.0096	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Naphthalene	ND	0.0051	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
n-Propylbenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Styrene	ND	0.0025	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1,1,2-Tetrachloroethane	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1,2,2-Tetrachloroethane	ND	0.0013	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Tetrachloroethylene	ND	0.0025	0.0016	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Tetrahydrofuran	ND	0.013	0.0028	mg/Kg dry	1	V-16	SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Toluene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2,3-Trichlorobenzene	ND	0.0025	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2,4-Trichlorobenzene	ND	0.0051	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,3,5-Trichlorobenzene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1,1-Trichloroethane	ND	0.0025	0.0013	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1,2-Trichloroethane	ND	0.0025	0.0015	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Trichloroethylene	ND	0.0025	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Trichlorofluoromethane (Freon 11)	ND	0.013	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2,3-Trichloropropane	ND	0.0025	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.013	0.0011	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,2,4-Trimethylbenzene	ND	0.0025	0.0010	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
1,3,5-Trimethylbenzene	ND	0.0025	0.00076	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
Vinyl Chloride	ND	0.013	0.0014	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
m+p Xylene	ND	0.0051	0.0021	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF
o-Xylene	ND	0.0025	0.00088	mg/Kg dry	1		SW-846 8260C	11/13/13	11/13/13 23:15	MFF

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	119	70-130		11/13/13 23:15
Toluene-d8	99.4	70-130		11/13/13 23:15
4-Bromofluorobenzene	99.5	70-130		11/13/13 23:15

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202D-0-0.5 | Sampled: 11/8/2013 13:15

Sample ID: 13K0384-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.0	1.3	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Barium	94	3.0	0.38	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Beryllium	0.49	0.30	0.049	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:53	OP
Cadmium	0.39	0.30	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Calcium	5600	9.1	1.6	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Chromium	59	0.61	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Cobalt	28	3.0	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Copper	95	0.61	0.46	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Iron	27000	30	26	mg/Kg dry	10		SW-846 6010C	11/11/13	11/18/13 10:00	OP
Lead	55	0.91	0.18	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Magnesium	20000	9.1	0.95	mg/Kg dry	1		SW-846 6010C	11/11/13	11/21/13 8:53	OP
Manganese	460	0.61	0.19	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Mercury	0.065	0.030	0.0019	mg/Kg dry	1		SW-846 7471B	11/13/13	11/13/13 15:44	SAJ
Nickel	130	0.61	0.15	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Potassium	870	120	21	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Sodium	130	120	59	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Vanadium	29	1.2	0.20	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP
Zinc	240	1.2	0.31	mg/Kg dry	1		SW-846 6010C	11/11/13	11/14/13 23:34	OP

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Magna Metals | Sample Description: | Work Order: 13K0384

Date Received: 11/9/2013

Field Sample #: UASB202D-0-0.5 | Sampled: 11/8/2013 13:15

Sample ID: 13K0384-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.4		% Wt	1		SM 2540G	11/18/13	11/19/13 7:36	MXG

con-test® ANALYTICAL LABORATORY
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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
13K0384-01 [LPSB101-0-0.5]	B085386	11/18/13
13K0384-02 [LPSB101D-0-0.5]	B085386	11/18/13
13K0384-03 [LPSB101-6.5-7]	B085386	11/18/13
13K0384-04 [UASB210-0-0.5]	B085386	11/18/13
13K0384-05 [UASB210-1-1.5]	B085386	11/18/13
13K0384-07 [UASB209-0-0.5]	B085386	11/18/13
13K0384-08 [UASB209-1-1.5]	B085386	11/18/13
13K0384-09 [UASB208-0-0.5]	B085386	11/18/13
13K0384-10 [UASB208-1-1.5]	B085386	11/18/13
13K0384-11 [UASB208-2-2.5]	B085386	11/18/13
13K0384-12 [UASB207-2-2.5]	B085386	11/18/13
13K0384-13 [UASB207-3-3.5]	B085386	11/18/13
13K0384-14 [UASB207-4-4.5]	B085386	11/18/13
13K0384-15 [UASB206-0-0.5]	B085386	11/18/13
13K0384-16 [UASB206-1-1.5]	B085386	11/18/13
13K0384-17 [UASB205-2-2.5]	B085386	11/18/13
13K0384-18 [UASB205-3-3.5]	B085386	11/18/13
13K0384-19 [UASB205-4-4.5]	B085386	11/18/13
13K0384-20 [UASB204-0-0.5]	B085386	11/18/13
13K0384-21 [UASB204-1-1.5]	B085386	11/18/13
13K0384-22 [UASB204-2-2.5]	B085386	11/18/13
13K0384-23 [UASB203-0-0.5]	B085386	11/18/13
13K0384-24 [UASB203-1-1.5]	B085386	11/18/13
13K0384-25 [UASB203-2-2.5]	B085386	11/18/13
13K0384-26 [UASB202-0-0.5]	B085386	11/18/13
13K0384-27 [UASB201-0-0.5]	B085386	11/18/13
13K0384-28 [UASB202D-0-0.5]	B085386	11/18/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-24 [UASB203-1-1.5]	B084892	1.01	50.0	11/11/13
13K0384-25 [UASB203-2-2.5]	B084892	0.940	50.0	11/11/13
13K0384-26 [UASB202-0-0.5]	B084892	1.05	50.0	11/11/13
13K0384-27 [UASB201-0-0.5]	B084892	0.930	50.0	11/11/13
13K0384-28 [UASB202D-0-0.5]	B084892	1.00	50.0	11/11/13

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-14 [UASB207-4-4.5]	B084965	1.03	50.0	11/12/13
13K0384-15 [UASB206-0-0.5]	B084965	1.02	50.0	11/12/13
13K0384-16 [UASB206-1-1.5]	B084965	1.04	50.0	11/12/13
13K0384-17 [UASB205-2-2.5]	B084965	1.01	50.0	11/12/13
13K0384-18 [UASB205-3-3.5]	B084965	1.03	50.0	11/12/13
13K0384-19 [UASB205-4-4.5]	B084965	1.06	50.0	11/12/13
13K0384-20 [UASB204-0-0.5]	B084965	1.01	50.0	11/12/13
13K0384-21 [UASB204-1-1.5]	B084965	1.06	50.0	11/12/13
13K0384-22 [UASB204-2-2.5]	B084965	1.02	50.0	11/12/13
13K0384-23 [UASB203-0-0.5]	B084965	1.04	50.0	11/12/13

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-01 [LPSB101-0-0.5]	B084994	1.05	50.0	11/12/13
13K0384-02 [LPSB101D-0-0.5]	B084994	1.03	50.0	11/12/13
13K0384-03 [LPSB101-6.5-7]	B084994	1.08	50.0	11/12/13
13K0384-04 [UASB210-0-0.5]	B084994	1.03	50.0	11/12/13
13K0384-05 [UASB210-1-1.5]	B084994	1.07	50.0	11/12/13
13K0384-07 [UASB209-0-0.5]	B084994	1.04	50.0	11/12/13
13K0384-08 [UASB209-1-1.5]	B084994	1.08	50.0	11/12/13
13K0384-09 [UASB208-0-0.5]	B084994	1.03	50.0	11/12/13
13K0384-10 [UASB208-1-1.5]	B084994	1.06	50.0	11/12/13
13K0384-11 [UASB208-2-2.5]	B084994	1.00	50.0	11/12/13
13K0384-12 [UASB207-2-2.5]	B084994	1.03	50.0	11/12/13
13K0384-13 [UASB207-3-3.5]	B084994	1.08	50.0	11/12/13

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0384-06 [FB-4]	B084935	50.0	50.0	11/12/13

Prep Method: SW-846 3005A-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0384-06RE1 [FB-4]	B085233	50.0	50.0	11/15/13

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0384-06 [FB-4]	B084832	6.00	6.00	11/11/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-13 [UASB207-3-3.5]	B085029	0.602	50.0	11/13/13
13K0384-14 [UASB207-4-4.5]	B085029	0.601	50.0	11/13/13
13K0384-15 [UASB206-0-0.5]	B085029	0.602	50.0	11/13/13
13K0384-16 [UASB206-1-1.5]	B085029	0.605	50.0	11/13/13
13K0384-17 [UASB205-2-2.5]	B085029	0.604	50.0	11/13/13
13K0384-18 [UASB205-3-3.5]	B085029	0.607	50.0	11/13/13
13K0384-19 [UASB205-4-4.5]	B085029	0.601	50.0	11/13/13
13K0384-20 [UASB204-0-0.5]	B085029	0.604	50.0	11/13/13
13K0384-21 [UASB204-1-1.5]	B085029	0.609	50.0	11/13/13
13K0384-22 [UASB204-2-2.5]	B085029	0.604	50.0	11/13/13
13K0384-23 [UASB203-0-0.5]	B085029	0.602	50.0	11/13/13
13K0384-24 [UASB203-1-1.5]	B085029	0.600	50.0	11/13/13
13K0384-25 [UASB203-2-2.5]	B085029	0.601	50.0	11/13/13
13K0384-26 [UASB202-0-0.5]	B085029	0.600	50.0	11/13/13
13K0384-27 [UASB201-0-0.5]	B085029	0.605	50.0	11/13/13
13K0384-28 [UASB202D-0-0.5]	B085029	0.605	50.0	11/13/13

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-01 [LPSB101-0-0.5]	B085052	0.606	50.0	11/13/13
13K0384-02 [LPSB101D-0-0.5]	B085052	0.618	50.0	11/13/13
13K0384-03 [LPSB101-6.5-7]	B085052	0.608	50.0	11/13/13
13K0384-04 [UASB210-0-0.5]	B085052	0.609	50.0	11/13/13
13K0384-05 [UASB210-1-1.5]	B085052	0.605	50.0	11/13/13
13K0384-07 [UASB209-0-0.5]	B085052	0.611	50.0	11/13/13
13K0384-08 [UASB209-1-1.5]	B085052	0.608	50.0	11/13/13
13K0384-09 [UASB208-0-0.5]	B085052	0.604	50.0	11/13/13
13K0384-10 [UASB208-1-1.5]	B085052	0.603	50.0	11/13/13
13K0384-11 [UASB208-2-2.5]	B085052	0.602	50.0	11/13/13

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-12 [UASB207-2-2.5]	B085199	0.604	50.0	11/14/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-01 [LPSB101-0-0.5]	B085075	5.30	10.0	11/13/13
13K0384-02 [LPSB101D-0-0.5]	B085075	5.20	10.0	11/13/13
13K0384-03 [LPSB101-6.5-7]	B085075	5.50	10.0	11/13/13
13K0384-04 [UASB210-0-0.5]	B085075	4.60	10.0	11/13/13
13K0384-05 [UASB210-1-1.5]	B085075	5.80	10.0	11/13/13
13K0384-07 [UASB209-0-0.5]	B085075	4.50	10.0	11/13/13
13K0384-08 [UASB209-1-1.5]	B085075	4.10	10.0	11/13/13
13K0384-09 [UASB208-0-0.5]	B085075	4.50	10.0	11/13/13
13K0384-10 [UASB208-1-1.5]	B085075	4.50	10.0	11/13/13
13K0384-11 [UASB208-2-2.5]	B085075	4.60	10.0	11/13/13
13K0384-12 [UASB207-2-2.5]	B085075	5.30	10.0	11/13/13

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
13K0384-13 [UASB207-3-3.5]	B085078	5.00	10.0	11/13/13
13K0384-14 [UASB207-4-4.5]	B085078	5.90	10.0	11/13/13
13K0384-15 [UASB206-0-0.5]	B085078	4.30	10.0	11/13/13
13K0384-16 [UASB206-1-1.5]	B085078	4.90	10.0	11/13/13
13K0384-17 [UASB205-2-2.5]	B085078	5.70	10.0	11/13/13
13K0384-18 [UASB205-3-3.5]	B085078	5.60	10.0	11/13/13
13K0384-19 [UASB205-4-4.5]	B085078	6.10	10.0	11/13/13
13K0384-20 [UASB204-0-0.5]	B085078	4.90	10.0	11/13/13
13K0384-21 [UASB204-1-1.5]	B085078	5.00	10.0	11/13/13
13K0384-22 [UASB204-2-2.5]	B085078	5.50	10.0	11/13/13
13K0384-23 [UASB203-0-0.5]	B085078	4.50	10.0	11/13/13
13K0384-24 [UASB203-1-1.5]	B085078	5.00	10.0	11/13/13
13K0384-25 [UASB203-2-2.5]	B085078	5.10	10.0	11/13/13
13K0384-26 [UASB202-0-0.5]	B085078	4.60	10.0	11/13/13
13K0384-27 [UASB201-0-0.5]	B085078	4.50	10.0	11/13/13
13K0384-28 [UASB202D-0-0.5]	B085078	4.80	10.0	11/13/13

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Sample Extraction Data

Prep Method: SW-846 5030B-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
13K0384-06 [FB-4]	B084861	5	5.00	11/11/13

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084861 - SW-846 5030B										
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13						
Acetone	ND	50	µg/L							
Acrylonitrile	ND	5.0	µg/L							
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L							
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	µg/L							
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	0.50	µg/L							
Bromoform	ND	1.0	µg/L							R-05
Bromomethane	ND	2.0	µg/L							R-05
2-Butanone (MEK)	ND	20	µg/L							
tert-Butyl Alcohol (TBA)	ND	20	µg/L							V-16, R-05
n-Butylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	1.0	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	4.0	µg/L							
Carbon Tetrachloride	ND	5.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							R-05
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L							R-05
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Diethyl Ether	ND	2.0	µg/L							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L							
1,4-Dioxane	ND	50	µg/L							V-16
Ethylbenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	0.50	µg/L							
2-Hexanone (MBK)	ND	10	µg/L							
Isopropylbenzene (Cumene)	ND	1.0	µg/L							
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
Blank (B084861-BLK1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Methylene Chloride	ND	5.0	µg/L								
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L								
Naphthalene	ND	2.0	µg/L								
n-Propylbenzene	ND	1.0	µg/L								
Styrene	ND	1.0	µg/L								
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L								
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L								
Tetrachloroethylene	ND	1.0	µg/L								
Tetrahydrofuran	ND	10	µg/L								
Toluene	ND	1.0	µg/L								
1,2,3-Trichlorobenzene	ND	5.0	µg/L								
1,2,4-Trichlorobenzene	ND	1.0	µg/L								
1,3,5-Trichlorobenzene	ND	1.0	µg/L								
1,1,1-Trichloroethane	ND	1.0	µg/L								
1,1,2-Trichloroethane	ND	1.0	µg/L								
Trichloroethylene	ND	1.0	µg/L								
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L								
1,2,3-Trichloropropane	ND	2.0	µg/L								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L								
1,2,4-Trimethylbenzene	ND	1.0	µg/L								
1,3,5-Trimethylbenzene	ND	1.0	µg/L								
Vinyl Chloride	ND	2.0	µg/L							R-05	
m+p Xylene	ND	2.0	µg/L								
o-Xylene	ND	1.0	µg/L								
Surrogate: 1,2-Dichloroethane-d4	*25.3*		µg/L	25.0		101	70-130				
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130				
Surrogate: 4-Bromofluorobenzene	*25.4*		µg/L	25.0		102	70-130				
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13							
Acetone	90.7	50	µg/L	100		90.7	70-160				†
Acrylonitrile	10.9	5.0	µg/L	10.0		109	70-130				
tert-Amyl Methyl Ether (TAME)	11.1	0.50	µg/L	10.0		111	70-130				
Benzene	11.4	1.0	µg/L	10.0		114	70-130				
Bromobenzene	10.8	1.0	µg/L	10.0		108	70-130				
Bromochloromethane	11.8	1.0	µg/L	10.0		118	70-130				
Bromodichloromethane	10.4	0.50	µg/L	10.0		104	70-130				
Bromoform	9.61	1.0	µg/L	10.0		96.1	70-130			R-05	
Bromomethane	5.70	2.0	µg/L	10.0		57.0	40-160			R-05, V-20	†
2-Butanone (MEK)	101	20	µg/L	100		101	40-160				†
tert-Butyl Alcohol (TBA)	80.0	20	µg/L	100		80.0	40-160			R-05, V-16	†
n-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
sec-Butylbenzene	11.4	1.0	µg/L	10.0		114	70-130				
tert-Butylbenzene	11.2	1.0	µg/L	10.0		112	70-130				
tert-Butyl Ethyl Ether (TBEE)	11.7	0.50	µg/L	10.0		117	70-130				
Carbon Disulfide	12.9	4.0	µg/L	10.0		129	70-130				
Carbon Tetrachloride	9.26	5.0	µg/L	10.0		92.6	70-130				
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130				
Chlorodibromomethane	9.84	0.50	µg/L	10.0		98.4	70-130				
Chloroethane	12.8	2.0	µg/L	10.0		128	70-130				
Chloroform	10.8	2.0	µg/L	10.0		108	70-130				
Chloromethane	11.6	2.0	µg/L	10.0		116	40-160			V-20	†
2-Chlorotoluene	11.2	1.0	µg/L	10.0		112	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13								
4-Chlorotoluene	11.0	1.0	µg/L	10.0		110		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	9.41	5.0	µg/L	10.0		94.1		70-130			R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110		70-130				
Dibromomethane	10.2	1.0	µg/L	10.0		102		70-130				
1,2-Dichlorobenzene	11.6	1.0	µg/L	10.0		116		70-130				
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117		70-130				
1,4-Dichlorobenzene	11.5	1.0	µg/L	10.0		115		70-130				
trans-1,4-Dichloro-2-butene	7.28	2.0	µg/L	10.0		72.8		70-130			R-05	
Dichlorodifluoromethane (Freon 12)	6.29	2.0	µg/L	10.0		62.9		40-160				†
1,1-Dichloroethane	11.6	1.0	µg/L	10.0		116		70-130				
1,2-Dichloroethane	9.31	1.0	µg/L	10.0		93.1		70-130				
1,1-Dichloroethylene	11.1	1.0	µg/L	10.0		111		70-130				
cis-1,2-Dichloroethylene	11.5	1.0	µg/L	10.0		115		70-130				
trans-1,2-Dichloroethylene	11.3	1.0	µg/L	10.0		113		70-130				
1,2-Dichloropropane	10.7	1.0	µg/L	10.0		107		70-130				
1,3-Dichloropropane	11.7	0.50	µg/L	10.0		117		70-130				
2,2-Dichloropropane	9.92	1.0	µg/L	10.0		99.2		40-130				†
1,1-Dichloropropene	11.4	2.0	µg/L	10.0		114		70-130				
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105		70-130				
trans-1,3-Dichloropropene	10.8	0.50	µg/L	10.0		108		70-130				
Diethyl Ether	10.3	2.0	µg/L	10.0		103		70-130				
Diisopropyl Ether (DIPE)	13.0	0.50	µg/L	10.0		130		70-130				
1,4-Dioxane	65.1	50	µg/L	100		65.1		40-130			V-16	†
Ethylbenzene	11.2	1.0	µg/L	10.0		112		70-130				
Hexachlorobutadiene	13.7	0.50	µg/L	10.0		**137**	*	70-130			L-07	
2-Hexanone (MBK)	95.4	10	µg/L	100		95.4		70-160				†
Isopropylbenzene (Cumene)	10.7	1.0	µg/L	10.0		107		70-130				
p-Isopropyltoluene (p-Cymene)	11.3	1.0	µg/L	10.0		113		70-130				
Methyl tert-Butyl Ether (MTBE)	11.5	1.0	µg/L	10.0		115		70-130				
Methylene Chloride	11.3	5.0	µg/L	10.0		113		70-130				
4-Methyl-2-pentanone (MIBK)	102	10	µg/L	100		102		70-160				†
Naphthalene	11.6	2.0	µg/L	10.0		116		40-130				†
n-Propylbenzene	11.0	1.0	µg/L	10.0		110		70-130				
Styrene	10.9	1.0	µg/L	10.0		109		70-130				
1,1,1,2-Tetrachloroethane	9.98	1.0	µg/L	10.0		99.8		70-130				
1,1,2,2-Tetrachloroethane	11.4	0.50	µg/L	10.0		114		70-130				
Tetrachloroethylene	11.2	1.0	µg/L	10.0		112		70-130				
Tetrahydrofuran	9.37	10	µg/L	10.0		93.7		70-130			J	
Toluene	10.8	1.0	µg/L	10.0		108		70-130				
1,2,3-Trichlorobenzene	12.2	5.0	µg/L	10.0		122		70-130				
1,2,4-Trichlorobenzene	12.4	1.0	µg/L	10.0		124		70-130				
1,3,5-Trichlorobenzene	12.7	1.0	µg/L	10.0		127		70-130				
1,1,1-Trichloroethane	9.17	1.0	µg/L	10.0		91.7		70-130				
1,1,2-Trichloroethane	10.3	1.0	µg/L	10.0		103		70-130				
Trichloroethylene	9.51	1.0	µg/L	10.0		95.1		70-130				
Trichlorofluoromethane (Freon 11)	9.36	2.0	µg/L	10.0		93.6		70-130				
1,2,3-Trichloropropane	11.1	2.0	µg/L	10.0		111		70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	11.3	1.0	µg/L	10.0		113		70-130				
1,2,4-Trimethylbenzene	10.9	1.0	µg/L	10.0		109		70-130				
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101		70-130				
Vinyl Chloride	9.74	2.0	µg/L	10.0		97.4		40-160			R-05	†

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes	
Batch B084861 - SW-846 5030B												
LCS (B084861-BS1)				Prepared: 11/11/13 Analyzed: 11/13/13								
m+p Xylene	21.8	2.0	µg/L	20.0		109	70-130					
o-Xylene	10.9	1.0	µg/L	10.0		109	70-130					
Surrogate: 1,2-Dichloroethane-d4	*24.0*		µg/L	25.0		95.9	70-130					
Surrogate: Toluene-d8	*24.7*		µg/L	25.0		98.8	70-130					
Surrogate: 4-Bromofluorobenzene	*24.2*		µg/L	25.0		96.9	70-130					
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13								
Acetone	107	50	µg/L	100		107	70-160	16.7		25		†
Acrylonitrile	10.5	5.0	µg/L	10.0		105	70-130	3.36		25		
tert-Amyl Methyl Ether (TAME)	10.0	0.50	µg/L	10.0		100	70-130	9.67		25		
Benzene	9.82	1.0	µg/L	10.0		98.2	70-130	14.7		25		
Bromobenzene	10.3	1.0	µg/L	10.0		103	70-130	4.94		25		
Bromochloromethane	10.1	1.0	µg/L	10.0		101	70-130	15.4		25		
Bromodichloromethane	11.2	0.50	µg/L	10.0		112	70-130	7.97		25		
Bromoform	12.4	1.0	µg/L	10.0		124	70-130	**25.2**	*	25	R-05	
Bromomethane	9.01	2.0	µg/L	10.0		90.1	40-160	**45.0**	*	25	R-05, V-20	†
2-Butanone (MEK)	115	20	µg/L	100		115	40-160	13.2		25		†
tert-Butyl Alcohol (TBA)	111	20	µg/L	100		111	40-160	**32.3**	*	25	R-05, V-16	†
n-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	9.68		25		
sec-Butylbenzene	10.4	1.0	µg/L	10.0		104	70-130	9.82		25		
tert-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130	8.47		25		
tert-Butyl Ethyl Ether (TBEE)	10.5	0.50	µg/L	10.0		105	70-130	10.9		25		
Carbon Disulfide	10.9	4.0	µg/L	10.0		109	70-130	16.2		25		
Carbon Tetrachloride	11.0	5.0	µg/L	10.0		110	70-130	16.9		25		
Chlorobenzene	10.3	1.0	µg/L	10.0		103	70-130	7.32		25		
Chlorodibromomethane	11.6	0.50	µg/L	10.0		116	70-130	16.5		25		
Chloroethane	11.4	2.0	µg/L	10.0		114	70-130	12.2		25		
Chloroform	10.5	2.0	µg/L	10.0		105	70-130	3.28		25		
Chloromethane	9.82	2.0	µg/L	10.0		98.2	40-160	17.0		25	V-20	†
2-Chlorotoluene	10.1	1.0	µg/L	10.0		101	70-130	10.3		25		
4-Chlorotoluene	10.2	1.0	µg/L	10.0		102	70-130	7.43		25		
1,2-Dibromo-3-chloropropane (DBCP)	12.4	5.0	µg/L	10.0		124	70-130	**27.7**	*	25	R-05	
1,2-Dibromoethane (EDB)	11.0	0.50	µg/L	10.0		110	70-130	0.274		25		
Dibromomethane	10.8	1.0	µg/L	10.0		108	70-130	5.05		25		
1,2-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	12.3		25		
1,3-Dichlorobenzene	10.2	1.0	µg/L	10.0		102	70-130	14.0		25		
1,4-Dichlorobenzene	10.7	1.0	µg/L	10.0		107	70-130	7.19		25		
trans-1,4-Dichloro-2-butene	9.44	2.0	µg/L	10.0		94.4	70-130	**25.8**	*	25	R-05	
Dichlorodifluoromethane (Freon 12)	6.69	2.0	µg/L	10.0		66.9	40-160	6.16		25		†
1,1-Dichloroethane	10.5	1.0	µg/L	10.0		105	70-130	10.3		25		
1,2-Dichloroethane	11.2	1.0	µg/L	10.0		112	70-130	18.7		25		
1,1-Dichloroethylene	10.1	1.0	µg/L	10.0		101	70-130	9.14		25		
cis-1,2-Dichloroethylene	10.6	1.0	µg/L	10.0		106	70-130	7.88		25		
trans-1,2-Dichloroethylene	10.5	1.0	µg/L	10.0		105	70-130	7.31		25		
1,2-Dichloropropane	10.4	1.0	µg/L	10.0		104	70-130	3.41		25		
1,3-Dichloropropane	11.0	0.50	µg/L	10.0		110	70-130	6.00		25		
2,2-Dichloropropane	11.1	1.0	µg/L	10.0		111	40-130	11.6		25		†
1,1-Dichloropropene	10.8	2.0	µg/L	10.0		108	70-130	5.67		25		
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130	0.476		25		
trans-1,3-Dichloropropene	11.6	0.50	µg/L	10.0		116	70-130	7.67		25		
Diethyl Ether	8.79	2.0	µg/L	10.0		87.9	70-130	15.4		25		
Diisopropyl Ether (DIPE)	10.4	0.50	µg/L	10.0		104	70-130	21.5		25		

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B084861 - SW-846 5030B											
LCS Dup (B084861-BSD1)				Prepared: 11/11/13 Analyzed: 11/13/13							
1,4-Dioxane	88.1	50	µg/L	100		88.1	40-130	30.0	50	V-16	† ‡
Ethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	10.1	25		
Hexachlorobutadiene	11.2	0.50	µg/L	10.0		112	70-130	19.9	25		
2-Hexanone (MBK)	108	10	µg/L	100		108	70-160	12.7	25		†
Isopropylbenzene (Cumene)	10.2	1.0	µg/L	10.0		102	70-130	5.08	25		
p-Isopropyltoluene (p-Cymene)	10.4	1.0	µg/L	10.0		104	70-130	7.65	25		
Methyl tert-Butyl Ether (MTBE)	11.0	1.0	µg/L	10.0		110	70-130	4.36	25		
Methylene Chloride	12.9	5.0	µg/L	10.0		129	70-130	13.3	25		
4-Methyl-2-pentanone (MIBK)	108	10	µg/L	100		108	70-160	6.11	25		†
Naphthalene	11.3	2.0	µg/L	10.0		113	40-130	2.62	25		†
n-Propylbenzene	10.7	1.0	µg/L	10.0		107	70-130	2.31	25		
Styrene	10.6	1.0	µg/L	10.0		106	70-130	2.51	25		
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116	70-130	15.3	25		
1,1,2,2-Tetrachloroethane	11.1	0.50	µg/L	10.0		111	70-130	2.59	25		
Tetrachloroethylene	10.8	1.0	µg/L	10.0		108	70-130	3.99	25		
Tetrahydrofuran	9.87	10	µg/L	10.0		98.7	70-130	5.20	25	J	
Toluene	10.1	1.0	µg/L	10.0		101	70-130	6.80	25		
1,2,3-Trichlorobenzene	11.0	5.0	µg/L	10.0		110	70-130	10.4	25		
1,2,4-Trichlorobenzene	10.8	1.0	µg/L	10.0		108	70-130	13.4	25		
1,3,5-Trichlorobenzene	9.89	1.0	µg/L	10.0		98.9	70-130	25.0	25		
1,1,1-Trichloroethane	10.5	1.0	µg/L	10.0		105	70-130	13.5	25		
1,1,2-Trichloroethane	10.7	1.0	µg/L	10.0		107	70-130	3.61	25		
Trichloroethylene	10.2	1.0	µg/L	10.0		102	70-130	6.61	25		
Trichlorofluoromethane (Freon 11)	10.0	2.0	µg/L	10.0		100	70-130	6.71	25		
1,2,3-Trichloropropane	10.9	2.0	µg/L	10.0		109	70-130	1.81	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	10.4	1.0	µg/L	10.0		104	70-130	8.50	25		
1,2,4-Trimethylbenzene	10.2	1.0	µg/L	10.0		102	70-130	5.96	25		
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130	0.495	25		
Vinyl Chloride	7.50	2.0	µg/L	10.0		75.0	40-160	**26.0** *	25	R-05	†
m+p Xylene	20.8	2.0	µg/L	20.0		104	70-130	4.50	25		
o-Xylene	10.4	1.0	µg/L	10.0		104	70-130	4.71	25		
Surrogate: 1,2-Dichloroethane-d4	*25.1*		µg/L	25.0		100	70-130				
Surrogate: Toluene-d8	*24.8*		µg/L	25.0		99.1	70-130				
Surrogate: 4-Bromofluorobenzene	*24.6*		µg/L	25.0		98.5	70-130				
Batch B085075 - SW-846 5035											
Blank (B085075-BLK1)				Prepared & Analyzed: 11/13/13							
Acetone	ND	0.10	mg/Kg wet							V-05	
Acrylonitrile	ND	0.0060	mg/Kg wet							V-16	
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet								
Benzene	ND	0.0020	mg/Kg wet								
Bromobenzene	ND	0.0020	mg/Kg wet								
Bromochloromethane	ND	0.0020	mg/Kg wet								
Bromodichloromethane	ND	0.0020	mg/Kg wet								
Bromoform	ND	0.0020	mg/Kg wet								
Bromomethane	ND	0.010	mg/Kg wet								
2-Butanone (MEK)	ND	0.040	mg/Kg wet							V-05	
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							V-05, V-16	
n-Butylbenzene	ND	0.0020	mg/Kg wet								
sec-Butylbenzene	ND	0.0020	mg/Kg wet								
tert-Butylbenzene	ND	0.0020	mg/Kg wet								

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085075 - SW-846 5035										
Blank (B085075-BLK1)				Prepared & Analyzed: 11/13/13						
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.020	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							V-05, V-16
Ethylbenzene	ND	0.0020	mg/Kg wet							
Hexachlorobutadiene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methylene Chloride	ND	0.020	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Naphthalene	ND	0.0040	mg/Kg wet							
n-Propylbenzene	ND	0.0020	mg/Kg wet							
Styrene	ND	0.0020	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet							
Tetrachloroethylene	ND	0.0020	mg/Kg wet							
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-16
Toluene	ND	0.0020	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet							
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B085075 - SW-846 5035											
Blank (B085075-BLK1)				Prepared & Analyzed: 11/13/13							
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								
Trichloroethylene	ND	0.0020	mg/Kg wet								
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet								
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								
Vinyl Chloride	ND	0.010	mg/Kg wet								
m+p Xylene	ND	0.0040	mg/Kg wet								
o-Xylene	ND	0.0020	mg/Kg wet								
Surrogate: 1,2-Dichloroethane-d4	*0.0515*		mg/Kg wet	0.0500		103	70-130				
Surrogate: Toluene-d8	*0.0454*		mg/Kg wet	0.0500		90.9	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0492*		mg/Kg wet	0.0500		98.4	70-130				
LCS (B085075-BS1)				Prepared & Analyzed: 11/13/13							
Acetone	0.153	0.10	mg/Kg wet	0.200		76.7	70-160			V-05	†
Acrylonitrile	0.0181	0.0060	mg/Kg wet	0.0200		90.7	70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0206	0.0010	mg/Kg wet	0.0200		103	70-130				
Benzene	0.0192	0.0020	mg/Kg wet	0.0200		96.2	70-130				
Bromobenzene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
Bromochloromethane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130				
Bromodichloromethane	0.0223	0.0020	mg/Kg wet	0.0200		112	70-130				
Bromoform	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130				
Bromomethane	0.0207	0.010	mg/Kg wet	0.0200		103	40-130			V-20	†
2-Butanone (MEK)	0.157	0.040	mg/Kg wet	0.200		78.6	70-160			V-05	†
tert-Butyl Alcohol (TBA)	0.163	0.040	mg/Kg wet	0.200		81.3	40-130			V-05, V-16	†
n-Butylbenzene	0.0234	0.0020	mg/Kg wet	0.0200		117	70-130				
sec-Butylbenzene	0.0231	0.0020	mg/Kg wet	0.0200		115	70-130				
tert-Butylbenzene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0202	0.0010	mg/Kg wet	0.0200		101	70-130				
Carbon Disulfide	0.0239	0.0060	mg/Kg wet	0.0200		119	70-130				
Carbon Tetrachloride	0.0232	0.0020	mg/Kg wet	0.0200		116	70-130				
Chlorobenzene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
Chlorodibromomethane	0.0220	0.0010	mg/Kg wet	0.0200		110	70-130				
Chloroethane	0.0249	0.020	mg/Kg wet	0.0200		124	70-130				
Chloroform	0.0219	0.0040	mg/Kg wet	0.0200		109	70-130				
Chloromethane	0.0178	0.010	mg/Kg wet	0.0200		89.2	70-130				
2-Chlorotoluene	0.0215	0.0020	mg/Kg wet	0.0200		108	70-130				
4-Chlorotoluene	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0206	0.0040	mg/Kg wet	0.0200		103	70-130				
1,2-Dibromoethane (EDB)	0.0215	0.0010	mg/Kg wet	0.0200		107	70-130				
Dibromomethane	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130				
1,2-Dichlorobenzene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130				
1,3-Dichlorobenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130				
1,4-Dichlorobenzene	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130				
trans-1,4-Dichloro-2-butene	0.0212	0.0040	mg/Kg wet	0.0200		106	70-130				
Dichlorodifluoromethane (Freon 12)	0.0197	0.020	mg/Kg wet	0.0200		98.6	40-160			J	†
1,1-Dichloroethane	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130				
1,2-Dichloroethane	0.0230	0.0020	mg/Kg wet	0.0200		115	70-130				
1,1-Dichloroethylene	0.0258	0.0040	mg/Kg wet	0.0200		129	70-130				
cis-1,2-Dichloroethylene	0.0208	0.0020	mg/Kg wet	0.0200		104	70-130				
trans-1,2-Dichloroethylene	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B085075 - SW-846 5035												
LCS (B085075-BS1)				Prepared & Analyzed: 11/13/13								
1,2-Dichloropropane	0.0200	0.0020	mg/Kg wet	0.0200		100		70-130				
1,3-Dichloropropane	0.0217	0.0010	mg/Kg wet	0.0200		108		70-130				
2,2-Dichloropropane	0.0218	0.0020	mg/Kg wet	0.0200		109		70-130				
1,1-Dichloropropene	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130				
cis-1,3-Dichloropropene	0.0207	0.0010	mg/Kg wet	0.0200		104		70-130				
trans-1,3-Dichloropropene	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130				
Diethyl Ether	0.0225	0.020	mg/Kg wet	0.0200		112		70-130				
Diisopropyl Ether (DIPE)	0.0208	0.0010	mg/Kg wet	0.0200		104		70-130				
1,4-Dioxane	0.150	0.10	mg/Kg wet	0.200		75.2		40-160			V-05, V-16	†
Ethylbenzene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130				
Hexachlorobutadiene	0.0258	0.0020	mg/Kg wet	0.0200		129		70-160				
2-Hexanone (MBK)	0.183	0.020	mg/Kg wet	0.200		91.6		70-160				†
Isopropylbenzene (Cumene)	0.0217	0.0020	mg/Kg wet	0.0200		109		70-130				
p-Isopropyltoluene (p-Cymene)	0.0221	0.0020	mg/Kg wet	0.0200		110		70-130				
Methyl tert-Butyl Ether (MTBE)	0.0206	0.0040	mg/Kg wet	0.0200		103		70-130				
Methylene Chloride	0.0203	0.020	mg/Kg wet	0.0200		102		40-160				†
4-Methyl-2-pentanone (MIBK)	0.196	0.020	mg/Kg wet	0.200		98.1		70-160				†
Naphthalene	0.0181	0.0040	mg/Kg wet	0.0200		90.5		40-130				†
n-Propylbenzene	0.0228	0.0020	mg/Kg wet	0.0200		114		70-130				
Styrene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130				
1,1,1,2-Tetrachloroethane	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130				
1,1,2,2-Tetrachloroethane	0.0209	0.0010	mg/Kg wet	0.0200		105		70-130				
Tetrachloroethylene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130				
Tetrahydrofuran	0.0196	0.010	mg/Kg wet	0.0200		97.8		70-130			V-16	
Toluene	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130				
1,2,3-Trichlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.7		70-130				
1,2,4-Trichlorobenzene	0.0209	0.0040	mg/Kg wet	0.0200		104		70-130				
1,3,5-Trichlorobenzene	0.0236	0.0020	mg/Kg wet	0.0200		118		70-130				
1,1,1-Trichloroethane	0.0234	0.0020	mg/Kg wet	0.0200		117		70-130				
1,1,2-Trichloroethane	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130				
Trichloroethylene	0.0205	0.0020	mg/Kg wet	0.0200		103		70-130				
Trichlorofluoromethane (Freon 11)	0.0263	0.010	mg/Kg wet	0.0200		**132**	*	70-130			L-07	
1,2,3-Trichloropropane	0.0218	0.0020	mg/Kg wet	0.0200		109		70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0259	0.010	mg/Kg wet	0.0200		130		70-130				
1,2,4-Trimethylbenzene	0.0228	0.0020	mg/Kg wet	0.0200		114		70-130				
1,3,5-Trimethylbenzene	0.0226	0.0020	mg/Kg wet	0.0200		113		70-130				
Vinyl Chloride	0.0198	0.010	mg/Kg wet	0.0200		98.8		40-130				†
m+p Xylene	0.0442	0.0040	mg/Kg wet	0.0400		110		70-130				
o-Xylene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0543*		mg/Kg wet	0.0500		109		70-130				
Surrogate: Toluene-d8	*0.0501*		mg/Kg wet	0.0500		100		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0498*		mg/Kg wet	0.0500		99.6		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B085075 - SW-846 5035												
LCS Dup (B085075-BSD1)				Prepared & Analyzed: 11/13/13								
Acetone	0.132	0.10	mg/Kg wet	0.200		**66.2**	*	70-160	14.7	25	L-07, V-05	†
Acrylonitrile	0.0191	0.0060	mg/Kg wet	0.0200		95.4		70-130	5.05	25	V-16	
tert-Amyl Methyl Ether (TAME)	0.0204	0.0010	mg/Kg wet	0.0200		102		70-130	0.877	25		
Benzene	0.0200	0.0020	mg/Kg wet	0.0200		99.9		70-130	3.77	25		
Bromobenzene	0.0196	0.0020	mg/Kg wet	0.0200		98.2		70-130	3.80	25		
Bromochloromethane	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130	5.04	25		
Bromodichloromethane	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130	4.77	25		
Bromoform	0.0195	0.0020	mg/Kg wet	0.0200		97.3		70-130	4.32	25		
Bromomethane	0.0184	0.010	mg/Kg wet	0.0200		92.0		40-130	11.6	25	V-20	†
2-Butanone (MEK)	0.160	0.040	mg/Kg wet	0.200		80.0		70-160	1.74	25	V-05	†
tert-Butyl Alcohol (TBA)	0.165	0.040	mg/Kg wet	0.200		82.7		40-130	1.72	25	V-05, V-16	†
n-Butylbenzene	0.0229	0.0020	mg/Kg wet	0.0200		114		70-130	2.51	25		
sec-Butylbenzene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130	4.70	25		
tert-Butylbenzene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-160	1.11	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0211	0.0010	mg/Kg wet	0.0200		105		70-130	4.16	25		
Carbon Disulfide	0.0213	0.0060	mg/Kg wet	0.0200		106		70-130	11.4	25		
Carbon Tetrachloride	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130	9.95	25		
Chlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	1.35	25		
Chlorodibromomethane	0.0206	0.0010	mg/Kg wet	0.0200		103		70-130	6.77	25		
Chloroethane	0.0222	0.020	mg/Kg wet	0.0200		111		70-130	11.4	25		
Chloroform	0.0216	0.0040	mg/Kg wet	0.0200		108		70-130	1.38	25		
Chloromethane	0.0163	0.010	mg/Kg wet	0.0200		81.3		70-130	9.27	25		
2-Chlorotoluene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130	4.17	25		
4-Chlorotoluene	0.0219	0.0020	mg/Kg wet	0.0200		110		70-130	2.43	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0188	0.0040	mg/Kg wet	0.0200		94.2		70-130	9.02	25		
1,2-Dibromoethane (EDB)	0.0215	0.0010	mg/Kg wet	0.0200		108		70-130	0.279	25		
Dibromomethane	0.0217	0.0020	mg/Kg wet	0.0200		108		70-130	0.735	25		
1,2-Dichlorobenzene	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	2.33	25		
1,3-Dichlorobenzene	0.0211	0.0020	mg/Kg wet	0.0200		105		70-130	0.285	25		
1,4-Dichlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130	3.11	25		
trans-1,4-Dichloro-2-butene	0.0201	0.0040	mg/Kg wet	0.0200		101		70-130	5.03	25		
Dichlorodifluoromethane (Freon 12)	0.0175	0.020	mg/Kg wet	0.0200		87.6		40-160	11.8	25	J	†
1,1-Dichloroethane	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130	4.51	25		
1,2-Dichloroethane	0.0211	0.0020	mg/Kg wet	0.0200		106		70-130	8.25	25		
1,1-Dichloroethylene	0.0228	0.0040	mg/Kg wet	0.0200		114		70-130	12.4	25		
cis-1,2-Dichloroethylene	0.0209	0.0020	mg/Kg wet	0.0200		104		70-130	0.672	25		
trans-1,2-Dichloroethylene	0.0221	0.0020	mg/Kg wet	0.0200		110		70-130	4.06	25		
1,2-Dichloropropane	0.0194	0.0020	mg/Kg wet	0.0200		97.1		70-130	2.94	25		
1,3-Dichloropropane	0.0214	0.0010	mg/Kg wet	0.0200		107		70-130	1.30	25		
2,2-Dichloropropane	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130	3.83	25		
1,1-Dichloropropene	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130	1.54	25		
cis-1,3-Dichloropropene	0.0197	0.0010	mg/Kg wet	0.0200		98.7		70-130	4.94	25		
trans-1,3-Dichloropropene	0.0209	0.0020	mg/Kg wet	0.0200		104		70-130	5.95	25		
Diethyl Ether	0.0208	0.020	mg/Kg wet	0.0200		104		70-130	7.95	25		
Diisopropyl Ether (DIPE)	0.0215	0.0010	mg/Kg wet	0.0200		107		70-130	3.32	25		
1,4-Dioxane	0.143	0.10	mg/Kg wet	0.200		71.4		40-160	5.25	50	V-05, V-16	† ‡
Ethylbenzene	0.0215	0.0020	mg/Kg wet	0.0200		108		70-130	2.21	25		
Hexachlorobutadiene	0.0235	0.0020	mg/Kg wet	0.0200		117		70-160	9.58	25		
2-Hexanone (MBK)	0.179	0.020	mg/Kg wet	0.200		89.3		70-160	2.47	25		†
Isopropylbenzene (Cumene)	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130	1.30	25		
p-Isopropyltoluene (p-Cymene)	0.0213	0.0020	mg/Kg wet	0.0200		107		70-130	3.41	25		
Methyl tert-Butyl Ether (MTBE)	0.0221	0.0040	mg/Kg wet	0.0200		111		70-130	7.40	25		

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B085075 - SW-846 5035												
LCS Dup (B085075-BSD1)				Prepared & Analyzed: 11/13/13								
Methylene Chloride	0.0232	0.020	mg/Kg wet	0.0200		116		40-160	13.5	25		†
4-Methyl-2-pentanone (MIBK)	0.192	0.020	mg/Kg wet	0.200		95.9		70-160	2.25	25		†
Naphthalene	0.0184	0.0040	mg/Kg wet	0.0200		91.9		40-130	1.54	25		†
n-Propylbenzene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130	3.84	25		
Styrene	0.0211	0.0020	mg/Kg wet	0.0200		106		70-130	1.32	25		
1,1,1,2-Tetrachloroethane	0.0213	0.0020	mg/Kg wet	0.0200		106		70-130	5.13	25		
1,1,2,2-Tetrachloroethane	0.0208	0.0010	mg/Kg wet	0.0200		104		70-130	0.479	25		
Tetrachloroethylene	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	1.74	25		
Tetrahydrofuran	0.0164	0.010	mg/Kg wet	0.0200		81.9		70-130	17.7	25	V-16	
Toluene	0.0207	0.0020	mg/Kg wet	0.0200		103		70-130	2.58	25		
1,2,3-Trichlorobenzene	0.0196	0.0020	mg/Kg wet	0.0200		98.2		70-130	1.52	25		
1,2,4-Trichlorobenzene	0.0209	0.0040	mg/Kg wet	0.0200		104		70-130	0.00	25		
1,3,5-Trichlorobenzene	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130	5.04	25		
1,1,1-Trichloroethane	0.0215	0.0020	mg/Kg wet	0.0200		107		70-130	8.48	25		
1,1,2-Trichloroethane	0.0212	0.0020	mg/Kg wet	0.0200		106		70-130	2.78	25		
Trichloroethylene	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130	2.77	25		
Trichlorofluoromethane (Freon 11)	0.0222	0.010	mg/Kg wet	0.0200		111		70-130	17.0	25		
1,2,3-Trichloropropane	0.0211	0.0020	mg/Kg wet	0.0200		105		70-130	3.36	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0234	0.010	mg/Kg wet	0.0200		117		70-130	9.97	25		
1,2,4-Trimethylbenzene	0.0221	0.0020	mg/Kg wet	0.0200		110		70-130	3.47	25		
1,3,5-Trimethylbenzene	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	4.89	25		
Vinyl Chloride	0.0166	0.010	mg/Kg wet	0.0200		83.2		40-130	17.1	25		†
m+p Xylene	0.0426	0.0040	mg/Kg wet	0.0400		107		70-130	3.50	25		
o-Xylene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130	2.86	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0515*		mg/Kg wet	0.0500		103		70-130				
Surrogate: Toluene-d8	*0.0497*		mg/Kg wet	0.0500		99.4		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0495*		mg/Kg wet	0.0500		99.0		70-130				
Matrix Spike (B085075-MS1)		**Source: 13K0384-01**		Prepared & Analyzed: 11/13/13								
Acetone	0.138	0.11	mg/Kg dry	0.218	ND	**63.5**	*	70-130			MS-08, V-05	
Acrylonitrile	0.0163	0.0065	mg/Kg dry	0.0218	ND	74.8		70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0184	0.0011	mg/Kg dry	0.0218	ND	84.4		70-130				
Benzene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.5		70-130				
Bromobenzene	0.0164	0.0022	mg/Kg dry	0.0218	ND	75.3		70-130				
Bromochloromethane	0.0201	0.0022	mg/Kg dry	0.0218	ND	92.4		70-130				
Bromodichloromethane	0.0191	0.0022	mg/Kg dry	0.0218	ND	87.8		70-130				
Bromoform	0.0163	0.0022	mg/Kg dry	0.0218	ND	74.9		70-130				
Bromomethane	0.0189	0.011	mg/Kg dry	0.0218	ND	87.0		70-130				
2-Butanone (MEK)	0.158	0.044	mg/Kg dry	0.218	ND	72.6		70-130			V-05	
tert-Butyl Alcohol (TBA)	0.154	0.044	mg/Kg dry	0.218	ND	70.7		70-130			V-05, V-16	
n-Butylbenzene	0.0177	0.0022	mg/Kg dry	0.0218	ND	81.4		70-130				
sec-Butylbenzene	0.0170	0.0022	mg/Kg dry	0.0218	ND	78.1		70-130				
tert-Butylbenzene	0.0170	0.0022	mg/Kg dry	0.0218	ND	78.0		70-130				
tert-Butyl Ethyl Ether (TBEE)	0.0190	0.0011	mg/Kg dry	0.0218	ND	87.1		70-130				
Carbon Disulfide	0.0179	0.0065	mg/Kg dry	0.0218	ND	82.4		70-130				
Carbon Tetrachloride	0.0184	0.0022	mg/Kg dry	0.0218	ND	84.3		70-130				
Chlorobenzene	0.0171	0.0022	mg/Kg dry	0.0218	ND	78.7		70-130				
Chlorodibromomethane	0.0183	0.0011	mg/Kg dry	0.0218	ND	83.9		70-130				
Chloroethane	0.0197	0.022	mg/Kg dry	0.0218	ND	90.6		70-130			J	
Chloroform	0.0194	0.0044	mg/Kg dry	0.0218	ND	89.0		70-130				
Chloromethane	0.0146	0.011	mg/Kg dry	0.0218	ND	**66.9**	*	70-130			MS-07	
2-Chlorotoluene	0.0166	0.0022	mg/Kg dry	0.0218	ND	76.3		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B085075 - SW-846 5035											
Matrix Spike (B085075-MS1)		**Source: 13K0384-01**		Prepared & Analyzed: 11/13/13							
4-Chlorotoluene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.3		70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.0170	0.0044	mg/Kg dry	0.0218	ND	78.0		70-130			
1,2-Dibromoethane (EDB)	0.0192	0.0011	mg/Kg dry	0.0218	ND	88.3		70-130			
Dibromomethane	0.0197	0.0022	mg/Kg dry	0.0218	ND	90.3		70-130			
1,2-Dichlorobenzene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.2		70-130			
1,3-Dichlorobenzene	0.0174	0.0022	mg/Kg dry	0.0218	ND	80.0		70-130			
1,4-Dichlorobenzene	0.0166	0.0022	mg/Kg dry	0.0218	ND	76.3		70-130			
trans-1,4-Dichloro-2-butene	0.0179	0.0044	mg/Kg dry	0.0218	ND	82.2		70-130			
Dichlorodifluoromethane (Freon 12)	0.0148	0.022	mg/Kg dry	0.0218	ND	**68.0**	*	70-130			MS-07, J
1,1-Dichloroethane	0.0185	0.0022	mg/Kg dry	0.0218	ND	84.8		70-130			
1,2-Dichloroethane	0.0198	0.0022	mg/Kg dry	0.0218	ND	91.1		70-130			
1,1-Dichloroethylene	0.0200	0.0044	mg/Kg dry	0.0218	ND	92.0		70-130			
cis-1,2-Dichloroethylene	0.0187	0.0022	mg/Kg dry	0.0218	ND	85.9		70-130			
trans-1,2-Dichloroethylene	0.0191	0.0022	mg/Kg dry	0.0218	ND	87.9		70-130			
1,2-Dichloropropane	0.0172	0.0022	mg/Kg dry	0.0218	ND	79.2		70-130			
1,3-Dichloropropane	0.0201	0.0011	mg/Kg dry	0.0218	ND	92.3		70-130			
2,2-Dichloropropane	0.0181	0.0022	mg/Kg dry	0.0218	ND	83.0		70-130			
1,1-Dichloropropene	0.0189	0.0022	mg/Kg dry	0.0218	ND	86.7		70-130			
cis-1,3-Dichloropropene	0.0175	0.0011	mg/Kg dry	0.0218	ND	80.3		70-130			
trans-1,3-Dichloropropene	0.0182	0.0022	mg/Kg dry	0.0218	ND	83.6		70-130			
Diethyl Ether	0.0200	0.022	mg/Kg dry	0.0218	ND	91.7		70-130			J
Diisopropyl Ether (DIPE)	0.0191	0.0011	mg/Kg dry	0.0218	ND	87.9		70-130			
1,4-Dioxane	0.117	0.11	mg/Kg dry	0.218	ND	**53.8**	*	70-130			MS-07, V-05, V-16
Ethylbenzene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.5		70-130			
Hexachlorobutadiene	0.0165	0.0022	mg/Kg dry	0.0218	ND	75.8		70-130			
2-Hexanone (MBK)	0.170	0.022	mg/Kg dry	0.218	ND	78.0		70-130			
Isopropylbenzene (Cumene)	0.0168	0.0022	mg/Kg dry	0.0218	ND	77.3		70-130			
p-Isopropyltoluene (p-Cymene)	0.0169	0.0022	mg/Kg dry	0.0218	ND	77.5		70-130			
Methyl tert-Butyl Ether (MTBE)	0.0203	0.0044	mg/Kg dry	0.0218	ND	93.0		70-130			
Methylene Chloride	0.0316	0.022	mg/Kg dry	0.0218	ND	**145**	*	70-130			MS-14
4-Methyl-2-pentanone (MIBK)	0.182	0.022	mg/Kg dry	0.218	ND	83.7		70-130			
Naphthalene	0.0146	0.0044	mg/Kg dry	0.0218	ND	**67.1**	*	70-130			MS-07
n-Propylbenzene	0.0173	0.0022	mg/Kg dry	0.0218	ND	79.4		70-130			
Styrene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.3		70-130			
1,1,1,2-Tetrachloroethane	0.0179	0.0022	mg/Kg dry	0.0218	ND	82.2		70-130			
1,1,2,2-Tetrachloroethane	0.0188	0.0011	mg/Kg dry	0.0218	ND	86.2		70-130			
Tetrachloroethylene	0.0180	0.0022	mg/Kg dry	0.0218	ND	82.8		70-130			
Tetrahydrofuran	0.0148	0.011	mg/Kg dry	0.0218	ND	**67.9**	*	70-130			MS-07, V-16
Toluene	0.0176	0.0022	mg/Kg dry	0.0218	ND	80.9		70-130			
1,2,3-Trichlorobenzene	0.0151	0.0022	mg/Kg dry	0.0218	ND	**69.3**	*	70-130			MS-07
1,2,4-Trichlorobenzene	0.0153	0.0044	mg/Kg dry	0.0218	ND	70.2		70-130			
1,3,5-Trichlorobenzene	0.0173	0.0022	mg/Kg dry	0.0218	ND	79.4		70-130			
1,1,1-Trichloroethane	0.0182	0.0022	mg/Kg dry	0.0218	ND	83.6		70-130			
1,1,2-Trichloroethane	0.0188	0.0022	mg/Kg dry	0.0218	ND	86.3		70-130			
Trichloroethylene	0.0175	0.0022	mg/Kg dry	0.0218	ND	80.5		70-130			
Trichlorofluoromethane (Freon 11)	0.0202	0.011	mg/Kg dry	0.0218	ND	92.9		70-130			
1,2,3-Trichloropropane	0.0193	0.0022	mg/Kg dry	0.0218	ND	88.5		70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0204	0.011	mg/Kg dry	0.0218	ND	93.6		70-130			
1,2,4-Trimethylbenzene	0.0180	0.0022	mg/Kg dry	0.0218	ND	82.8		70-130			
1,3,5-Trimethylbenzene	0.0169	0.0022	mg/Kg dry	0.0218	ND	77.6		70-130			
Vinyl Chloride	0.0155	0.011	mg/Kg dry	0.0218	ND	71.0		70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085075 - SW-846 5035										
Matrix Spike (B085075-MS1)	**Source: 13K0384-01**			Prepared & Analyzed: 11/13/13						
m+p Xylene	0.0348	0.0044	mg/Kg dry	0.0435	ND	80.0	70-130			
o-Xylene	0.0173	0.0022	mg/Kg dry	0.0218	ND	79.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0589*		mg/Kg dry	0.0544		108	70-130			
Surrogate: Toluene-d8	*0.0550*		mg/Kg dry	0.0544		101	70-130			
Surrogate: 4-Bromofluorobenzene	*0.0531*		mg/Kg dry	0.0544		97.6	70-130			
Batch B085078 - SW-846 5035										
Blank (B085078-BLK1)				Prepared & Analyzed: 11/13/13						
Acetone	ND	0.10	mg/Kg wet							
Acrylonitrile	ND	0.0060	mg/Kg wet							V-16
tert-Amyl Methyl Ether (TAME)	ND	0.0010	mg/Kg wet							
Benzene	ND	0.0020	mg/Kg wet							
Bromobenzene	ND	0.0020	mg/Kg wet							
Bromochloromethane	ND	0.0020	mg/Kg wet							
Bromodichloromethane	ND	0.0020	mg/Kg wet							
Bromoform	ND	0.0020	mg/Kg wet							
Bromomethane	ND	0.010	mg/Kg wet							
2-Butanone (MEK)	ND	0.040	mg/Kg wet							
tert-Butyl Alcohol (TBA)	ND	0.040	mg/Kg wet							V-05, V-16
n-Butylbenzene	ND	0.0020	mg/Kg wet							
sec-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butylbenzene	ND	0.0020	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.0010	mg/Kg wet							
Carbon Disulfide	ND	0.0060	mg/Kg wet							
Carbon Tetrachloride	ND	0.0020	mg/Kg wet							
Chlorobenzene	ND	0.0020	mg/Kg wet							
Chlorodibromomethane	ND	0.0010	mg/Kg wet							
Chloroethane	ND	0.020	mg/Kg wet							
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							L-04, V-05
2-Chlorotoluene	ND	0.0020	mg/Kg wet							
4-Chlorotoluene	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0040	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
Dibromomethane	ND	0.0020	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.0040	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							V-05
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,3-Dichloropropane	ND	0.0010	mg/Kg wet							
2,2-Dichloropropane	ND	0.0020	mg/Kg wet							
1,1-Dichloropropene	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0020	mg/Kg wet							
Diethyl Ether	ND	0.020	mg/Kg wet							

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B085078 - SW-846 5035											
Blank (B085078-BLK1)				Prepared & Analyzed: 11/13/13							
Diisopropyl Ether (DIPE)	ND	0.0010	mg/Kg wet								
1,4-Dioxane	ND	0.10	mg/Kg wet							V-05, V-16	
Ethylbenzene	ND	0.0020	mg/Kg wet								
Hexachlorobutadiene	ND	0.0020	mg/Kg wet								
2-Hexanone (MBK)	ND	0.020	mg/Kg wet								
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet								
p-Isopropyltoluene (p-Cymene)	ND	0.0020	mg/Kg wet								
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet								
Methylene Chloride	ND	0.020	mg/Kg wet								
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet								
Naphthalene	ND	0.0040	mg/Kg wet								
n-Propylbenzene	ND	0.0020	mg/Kg wet								
Styrene	ND	0.0020	mg/Kg wet								
1,1,1,2-Tetrachloroethane	ND	0.0020	mg/Kg wet								
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet								
Tetrachloroethylene	ND	0.0020	mg/Kg wet								
Tetrahydrofuran	ND	0.010	mg/Kg wet							V-16	
Toluene	ND	0.0020	mg/Kg wet								
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,2,4-Trichlorobenzene	ND	0.0040	mg/Kg wet								
1,3,5-Trichlorobenzene	ND	0.0020	mg/Kg wet								
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet								
Trichloroethylene	ND	0.0020	mg/Kg wet								
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet								
1,2,3-Trichloropropane	ND	0.0020	mg/Kg wet								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet								
1,2,4-Trimethylbenzene	ND	0.0020	mg/Kg wet								
1,3,5-Trimethylbenzene	ND	0.0020	mg/Kg wet								
Vinyl Chloride	ND	0.010	mg/Kg wet								
m+p Xylene	ND	0.0040	mg/Kg wet								
o-Xylene	ND	0.0020	mg/Kg wet								
Surrogate: 1,2-Dichloroethane-d4	*0.0561*		mg/Kg wet	0.0500		112	70-130				
Surrogate: Toluene-d8	*0.0491*		mg/Kg wet	0.0500		98.3	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0493*		mg/Kg wet	0.0500		98.5	70-130				
LCS (B085078-BS1)				Prepared & Analyzed: 11/13/13							
Acetone	0.146	0.10	mg/Kg wet	0.200		72.8	70-160			V-20	†
Acrylonitrile	0.0171	0.0060	mg/Kg wet	0.0200		85.3	70-130			V-16	
tert-Amyl Methyl Ether (TAME)	0.0196	0.0010	mg/Kg wet	0.0200		97.9	70-130				
Benzene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
Bromobenzene	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130				
Bromochloromethane	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130				
Bromodichloromethane	0.0218	0.0020	mg/Kg wet	0.0200		109	70-130				
Bromoform	0.0196	0.0020	mg/Kg wet	0.0200		97.9	70-130				
Bromomethane	0.0194	0.010	mg/Kg wet	0.0200		97.1	40-130			V-20	†
2-Butanone (MEK)	0.159	0.040	mg/Kg wet	0.200		79.4	70-160				†
tert-Butyl Alcohol (TBA)	0.161	0.040	mg/Kg wet	0.200		80.5	40-130			V-05, V-16	†
n-Butylbenzene	0.0232	0.0020	mg/Kg wet	0.0200		116	70-130				
sec-Butylbenzene	0.0224	0.0020	mg/Kg wet	0.0200		112	70-130				
tert-Butylbenzene	0.0213	0.0020	mg/Kg wet	0.0200		106	70-160				†
tert-Butyl Ethyl Ether (TBEE)	0.0199	0.0010	mg/Kg wet	0.0200		99.5	70-130				

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QUALITY CONTROL

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B085078 - SW-846 5035												
LCS (B085078-BS1)				Prepared & Analyzed: 11/13/13								
Carbon Disulfide	0.0215	0.0060	mg/Kg wet	0.0200		107		70-130				
Carbon Tetrachloride	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130				
Chlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130				
Chlorodibromomethane	0.0210	0.0010	mg/Kg wet	0.0200		105		70-130				
Chloroethane	0.0226	0.020	mg/Kg wet	0.0200		113		70-130				
Chloroform	0.0219	0.0040	mg/Kg wet	0.0200		110		70-130				
Chloromethane	0.0136	0.010	mg/Kg wet	0.0200		**68.0**	*	70-130			L-04, V-05	
2-Chlorotoluene	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130				
4-Chlorotoluene	0.0217	0.0020	mg/Kg wet	0.0200		108		70-130				
1,2-Dibromo-3-chloropropane (DBCP)	0.0194	0.0040	mg/Kg wet	0.0200		96.8		70-130				
1,2-Dibromoethane (EDB)	0.0214	0.0010	mg/Kg wet	0.0200		107		70-130				
Dibromomethane	0.0217	0.0020	mg/Kg wet	0.0200		108		70-130				
1,2-Dichlorobenzene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130				
1,3-Dichlorobenzene	0.0215	0.0020	mg/Kg wet	0.0200		107		70-130				
1,4-Dichlorobenzene	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130				
trans-1,4-Dichloro-2-butene	0.0214	0.0040	mg/Kg wet	0.0200		107		70-130				
Dichlorodifluoromethane (Freon 12)	0.0150	0.020	mg/Kg wet	0.0200		75.1		40-160			V-05, J	†
1,1-Dichloroethane	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130				
1,2-Dichloroethane	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130				
1,1-Dichloroethylene	0.0256	0.0040	mg/Kg wet	0.0200		128		70-130				
cis-1,2-Dichloroethylene	0.0213	0.0020	mg/Kg wet	0.0200		107		70-130				
trans-1,2-Dichloroethylene	0.0220	0.0020	mg/Kg wet	0.0200		110		70-130				
1,2-Dichloropropane	0.0194	0.0020	mg/Kg wet	0.0200		97.2		70-130				
1,3-Dichloropropane	0.0216	0.0010	mg/Kg wet	0.0200		108		70-130				
2,2-Dichloropropane	0.0205	0.0020	mg/Kg wet	0.0200		102		70-130				
1,1-Dichloropropene	0.0219	0.0020	mg/Kg wet	0.0200		110		70-130				
cis-1,3-Dichloropropene	0.0195	0.0010	mg/Kg wet	0.0200		97.6		70-130				
trans-1,3-Dichloropropene	0.0206	0.0020	mg/Kg wet	0.0200		103		70-130				
Diethyl Ether	0.0203	0.020	mg/Kg wet	0.0200		102		70-130				
Diisopropyl Ether (DIPE)	0.0206	0.0010	mg/Kg wet	0.0200		103		70-130				
1,4-Dioxane	0.139	0.10	mg/Kg wet	0.200		69.5		40-160			V-05, V-16	†
Ethylbenzene	0.0215	0.0020	mg/Kg wet	0.0200		107		70-130				
Hexachlorobutadiene	0.0254	0.0020	mg/Kg wet	0.0200		127		70-160				
2-Hexanone (MBK)	0.179	0.020	mg/Kg wet	0.200		89.5		70-160				†
Isopropylbenzene (Cumene)	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130				
p-Isopropyltoluene (p-Cymene)	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130				
Methyl tert-Butyl Ether (MTBE)	0.0211	0.0040	mg/Kg wet	0.0200		106		70-130				
Methylene Chloride	0.0245	0.020	mg/Kg wet	0.0200		122		40-160				†
4-Methyl-2-pentanone (MIBK)	0.188	0.020	mg/Kg wet	0.200		93.9		70-160				†
Naphthalene	0.0185	0.0040	mg/Kg wet	0.0200		92.5		40-130				†
n-Propylbenzene	0.0223	0.0020	mg/Kg wet	0.0200		111		70-130				
Styrene	0.0208	0.0020	mg/Kg wet	0.0200		104		70-130				
1,1,1,2-Tetrachloroethane	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130				
1,1,2,2-Tetrachloroethane	0.0210	0.0010	mg/Kg wet	0.0200		105		70-130				
Tetrachloroethylene	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130				
Tetrahydrofuran	0.0167	0.010	mg/Kg wet	0.0200		83.3		70-130			V-16	
Toluene	0.0205	0.0020	mg/Kg wet	0.0200		103		70-130				
1,2,3-Trichlorobenzene	0.0210	0.0020	mg/Kg wet	0.0200		105		70-130				
1,2,4-Trichlorobenzene	0.0227	0.0040	mg/Kg wet	0.0200		114		70-130				
1,3,5-Trichlorobenzene	0.0236	0.0020	mg/Kg wet	0.0200		118		70-130				
1,1,1-Trichloroethane	0.0219	0.0020	mg/Kg wet	0.0200		109		70-130				
1,1,2-Trichloroethane	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130				

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B085078 - SW-846 5035												
LCS (B085078-BS1)				Prepared & Analyzed: 11/13/13								
Trichloroethylene	0.0209	0.0020	mg/Kg wet	0.0200		104		70-130				
Trichlorofluoromethane (Freon 11)	0.0258	0.010	mg/Kg wet	0.0200		129		70-130				
1,2,3-Trichloropropane	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0254	0.010	mg/Kg wet	0.0200		127		70-130				
1,2,4-Trimethylbenzene	0.0225	0.0020	mg/Kg wet	0.0200		113		70-130				
1,3,5-Trimethylbenzene	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130				
Vinyl Chloride	0.0159	0.010	mg/Kg wet	0.0200		79.5		40-130				†
m+p Xylene	0.0431	0.0040	mg/Kg wet	0.0400		108		70-130				
o-Xylene	0.0211	0.0020	mg/Kg wet	0.0200		105		70-130				
Surrogate: 1,2-Dichloroethane-d4	*0.0529*		mg/Kg wet	0.0500		106		70-130				
Surrogate: Toluene-d8	*0.0490*		mg/Kg wet	0.0500		97.9		70-130				
Surrogate: 4-Bromofluorobenzene	*0.0497*		mg/Kg wet	0.0500		99.5		70-130				
LCS Dup (B085078-BSD1)				Prepared & Analyzed: 11/13/13								
Acetone	0.147	0.10	mg/Kg wet	0.200		73.5		70-160	0.943	25	V-20	†
Acrylonitrile	0.0195	0.0060	mg/Kg wet	0.0200		97.3		70-130	13.1	25	V-16	
tert-Amyl Methyl Ether (TAME)	0.0197	0.0010	mg/Kg wet	0.0200		98.4		70-130	0.509	25		
Benzene	0.0200	0.0020	mg/Kg wet	0.0200		99.8		70-130	0.300	25		
Bromobenzene	0.0196	0.0020	mg/Kg wet	0.0200		97.8		70-130	2.32	25		
Bromochloromethane	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130	0.0901	25		
Bromodichloromethane	0.0219	0.0020	mg/Kg wet	0.0200		110		70-130	0.824	25		
Bromoform	0.0194	0.0020	mg/Kg wet	0.0200		97.2		70-130	0.718	25		
Bromomethane	0.0220	0.010	mg/Kg wet	0.0200		110		40-130	12.4	25	V-20	†
2-Butanone (MEK)	0.164	0.040	mg/Kg wet	0.200		81.8		70-160	3.01	25		†
tert-Butyl Alcohol (TBA)	0.160	0.040	mg/Kg wet	0.200		80.2		40-130	0.423	25	V-05, V-16	†
n-Butylbenzene	0.0233	0.0020	mg/Kg wet	0.0200		116		70-130	0.344	25		
sec-Butylbenzene	0.0222	0.0020	mg/Kg wet	0.0200		111		70-130	1.08	25		
tert-Butylbenzene	0.0207	0.0020	mg/Kg wet	0.0200		104		70-160	2.67	25		†
tert-Butyl Ethyl Ether (TBEE)	0.0203	0.0010	mg/Kg wet	0.0200		101		70-130	1.79	25		
Carbon Disulfide	0.0213	0.0060	mg/Kg wet	0.0200		106		70-130	0.936	25		
Carbon Tetrachloride	0.0221	0.0020	mg/Kg wet	0.0200		111		70-130	1.44	25		
Chlorobenzene	0.0205	0.0020	mg/Kg wet	0.0200		102		70-130	0.682	25		
Chlorodibromomethane	0.0211	0.0010	mg/Kg wet	0.0200		106		70-130	0.855	25		
Chloroethane	0.0221	0.020	mg/Kg wet	0.0200		110		70-130	2.50	25		
Chloroform	0.0223	0.0040	mg/Kg wet	0.0200		112		70-130	1.90	25		
Chloromethane	0.0133	0.010	mg/Kg wet	0.0200		**66.4**	*	70-130	2.38	25	L-04, V-05	
2-Chlorotoluene	0.0203	0.0020	mg/Kg wet	0.0200		101		70-130	0.590	25		
4-Chlorotoluene	0.0215	0.0020	mg/Kg wet	0.0200		108		70-130	0.926	25		
1,2-Dibromo-3-chloropropane (DBCP)	0.0188	0.0040	mg/Kg wet	0.0200		94.2		70-130	2.72	25		
1,2-Dibromoethane (EDB)	0.0216	0.0010	mg/Kg wet	0.0200		108		70-130	0.745	25		
Dibromomethane	0.0233	0.0020	mg/Kg wet	0.0200		116		70-130	7.11	25		
1,2-Dichlorobenzene	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	1.02	25		
1,3-Dichlorobenzene	0.0213	0.0020	mg/Kg wet	0.0200		107		70-130	0.748	25		
1,4-Dichlorobenzene	0.0209	0.0020	mg/Kg wet	0.0200		105		70-130	0.0955	25		
trans-1,4-Dichloro-2-butene	0.0209	0.0040	mg/Kg wet	0.0200		104		70-130	2.55	25		
Dichlorodifluoromethane (Freon 12)	0.0146	0.020	mg/Kg wet	0.0200		73.2		40-160	2.56	25	V-05, J	†
1,1-Dichloroethane	0.0216	0.0020	mg/Kg wet	0.0200		108		70-130	0.930	25		
1,2-Dichloroethane	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130	4.93	25		
1,1-Dichloroethylene	0.0258	0.0040	mg/Kg wet	0.0200		129		70-130	0.701	25		
cis-1,2-Dichloroethylene	0.0214	0.0020	mg/Kg wet	0.0200		107		70-130	0.375	25		
trans-1,2-Dichloroethylene	0.0224	0.0020	mg/Kg wet	0.0200		112		70-130	1.53	25		
1,2-Dichloropropane	0.0204	0.0020	mg/Kg wet	0.0200		102		70-130	4.72	25		

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch B085078 - SW-846 5035											
LCS Dup (B085078-BSD1)				Prepared & Analyzed: 11/13/13							
1,3-Dichloropropane	0.0221	0.0010	mg/Kg wet	0.0200		110	70-130	2.38	25		
2,2-Dichloropropane	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130	1.26	25		
1,1-Dichloropropene	0.0219	0.0020	mg/Kg wet	0.0200		110	70-130	0.182	25		
cis-1,3-Dichloropropene	0.0201	0.0010	mg/Kg wet	0.0200		100	70-130	2.93	25		
trans-1,3-Dichloropropene	0.0205	0.0010	mg/Kg wet	0.0200		102	70-130	0.779	25		
Diethyl Ether	0.0195	0.020	mg/Kg wet	0.0200		97.4	70-130	4.12	25	J	
Diisopropyl Ether (DIPE)	0.0208	0.0010	mg/Kg wet	0.0200		104	70-130	0.870	25		
1,4-Dioxane	0.133	0.10	mg/Kg wet	0.200		66.7	40-160	4.20	50	V-05, V-16	† ‡
Ethylbenzene	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130	1.03	25		
Hexachlorobutadiene	0.0244	0.0020	mg/Kg wet	0.0200		122	70-160	4.09	25		
2-Hexanone (MBK)	0.178	0.020	mg/Kg wet	0.200		89.0	70-160	0.605	25		†
Isopropylbenzene (Cumene)	0.0213	0.0020	mg/Kg wet	0.0200		107	70-130	2.59	25		
p-Isopropyltoluene (p-Cymene)	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130	1.85	25		
Methyl tert-Butyl Ether (MTBE)	0.0216	0.0040	mg/Kg wet	0.0200		108	70-130	2.25	25		
Methylene Chloride	0.0248	0.020	mg/Kg wet	0.0200		124	40-160	1.38	25		†
4-Methyl-2-pentanone (MIBK)	0.190	0.020	mg/Kg wet	0.200		95.0	70-160	1.25	25		†
Naphthalene	0.0181	0.0040	mg/Kg wet	0.0200		90.3	40-130	2.41	25		†
n-Propylbenzene	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130	1.26	25		
Styrene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	0.773	25		
1,1,1,2-Tetrachloroethane	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	0.938	25		
1,1,2,2-Tetrachloroethane	0.0212	0.0010	mg/Kg wet	0.0200		106	70-130	0.758	25		
Tetrachloroethylene	0.0222	0.0020	mg/Kg wet	0.0200		111	70-130	1.27	25		
Tetrahydrofuran	0.0214	0.010	mg/Kg wet	0.0200		107	70-130	24.8	25	V-16	
Toluene	0.0209	0.0020	mg/Kg wet	0.0200		105	70-130	1.93	25		
1,2,3-Trichlorobenzene	0.0203	0.0020	mg/Kg wet	0.0200		102	70-130	3.29	25		
1,2,4-Trichlorobenzene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	6.26	25		
1,3,5-Trichlorobenzene	0.0230	0.0020	mg/Kg wet	0.0200		115	70-130	2.75	25		
1,1,1-Trichloroethane	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130	0.638	25		
1,1,2-Trichloroethane	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130	1.17	25		
Trichloroethylene	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	0.192	25		
Trichlorofluoromethane (Freon 11)	0.0256	0.010	mg/Kg wet	0.0200		128	70-130	0.545	25		
1,2,3-Trichloropropane	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130	3.11	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0252	0.010	mg/Kg wet	0.0200		126	70-130	0.948	25		
1,2,4-Trimethylbenzene	0.0214	0.0020	mg/Kg wet	0.0200		107	70-130	4.91	25		
1,3,5-Trimethylbenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	2.72	25		
Vinyl Chloride	0.0152	0.010	mg/Kg wet	0.0200		76.0	40-130	4.50	25		†
m+p Xylene	0.0422	0.0040	mg/Kg wet	0.0400		106	70-130	2.06	25		
o-Xylene	0.0211	0.0020	mg/Kg wet	0.0200		106	70-130	0.284	25		
Surrogate: 1,2-Dichloroethane-d4	*0.0530*		mg/Kg wet	0.0500		106	70-130				
Surrogate: Toluene-d8	*0.0495*		mg/Kg wet	0.0500		99.0	70-130				
Surrogate: 4-Bromofluorobenzene	*0.0489*		mg/Kg wet	0.0500		97.8	70-130				

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084832 - SW-846 7470A Prep										
Blank (B084832-BLK1)				Prepared & Analyzed: 11/11/13						
Mercury	ND	0.00010	mg/L							
LCS (B084832-BS1)				Prepared & Analyzed: 11/11/13						
Mercury	0.00197	0.00010	mg/L	0.00200		98.4	80-120			
LCS Dup (B084832-BSD1)				Prepared & Analyzed: 11/11/13						
Mercury	0.00198	0.00010	mg/L	0.00200		99.2	80-120	0.876	20	
Batch B084892 - SW-846 3050B										
Blank (B084892-BLK1)				Prepared: 11/11/13 Analyzed: 11/14/13						
Aluminum	1.1	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	0.24	0.75	mg/Kg wet							J
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.42	1.0	mg/Kg wet							J
LCS (B084892-BS1)				Prepared: 11/11/13 Analyzed: 11/14/13						
Aluminum	7780	5.1	mg/Kg wet	8840		88.0	46.1-153.4			
Antimony	64.6	5.1	mg/Kg wet	88.2		73.3	8.2-218.9			
Arsenic	99.7	5.1	mg/Kg wet	99.6		100	83-117.6			
Barium	304	5.1	mg/Kg wet	310		98.0	83.2-117.5			
Beryllium	72.2	0.51	mg/Kg wet	72.3		99.8	83.9-116			
Cadmium	172	0.51	mg/Kg wet	182		94.4	83.1-116.9			
Calcium	6470	15	mg/Kg wet	6790		95.3	83.1-116.7			
Chromium	135	1.0	mg/Kg wet	136		99.4	81.6-117.6			
Cobalt	125	5.1	mg/Kg wet	128		97.9	84.7-115.3			
Copper	106	1.0	mg/Kg wet	102		104	83.8-116.1			
Iron	9870	5.1	mg/Kg wet	12600		78.3	50.8-149.6			
Lead	102	1.5	mg/Kg wet	115		88.5	82.4-117.8			
Magnesium	2740	15	mg/Kg wet	3010		90.9	75.4-124.2			
Manganese	319	1.0	mg/Kg wet	323		98.7	82.8-117.5			
Nickel	146	1.0	mg/Kg wet	153		95.7	84.4-115.6			
Potassium	2560	200	mg/Kg wet	2840		90.2	72.7-127.3			
Selenium	147	5.1	mg/Kg wet	150		98.2	80-120			
Silver	37.3	1.0	mg/Kg wet	40.4		92.3	66.2-133.8			
Sodium	2650	200	mg/Kg wet	2760		96.0	73.8-126.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084892 - SW-846 3050B										
LCS (B084892-BS1)				Prepared: 11/11/13 Analyzed: 11/14/13						
Thallium	170	5.1	mg/Kg wet	174		97.5	81.2-118.8			
Vanadium	98.7	2.0	mg/Kg wet	97.6		101	75.5-124			
Zinc	147	2.0	mg/Kg wet	161		91.1	81.9-117.6			
LCS Dup (B084892-BSD1)				Prepared: 11/11/13 Analyzed: 11/14/13						
Aluminum	7430	5.0	mg/Kg wet	8840		84.1	46.1-153.4	4.49	30	
Antimony	60.7	5.0	mg/Kg wet	88.2		68.8	8.2-218.9	6.34	30	
Arsenic	100	5.0	mg/Kg wet	99.6		101	83-117.6	0.393	30	
Barium	305	5.0	mg/Kg wet	310		98.3	83.2-117.5	0.279	30	
Beryllium	72.9	0.50	mg/Kg wet	72.3		101	83.9-116	1.03	30	
Cadmium	172	0.50	mg/Kg wet	182		94.8	83.1-116.9	0.362	30	
Calcium	6560	15	mg/Kg wet	6790		96.6	83.1-116.7	1.37	30	
Chromium	136	1.0	mg/Kg wet	136		99.8	81.6-117.6	0.491	30	
Cobalt	125	5.0	mg/Kg wet	128		98.0	84.7-115.3	0.148	30	
Copper	106	1.0	mg/Kg wet	102		104	83.8-116.1	0.474	30	
Iron	9810	5.0	mg/Kg wet	12600		77.9	50.8-149.6	0.583	30	
Lead	103	1.5	mg/Kg wet	115		89.2	82.4-117.8	0.738	30	
Magnesium	2690	15	mg/Kg wet	3010		89.4	75.4-124.2	1.70	30	
Manganese	303	1.0	mg/Kg wet	323		93.8	82.8-117.5	5.13	30	
Nickel	147	1.0	mg/Kg wet	153		96.3	84.4-115.6	0.595	30	
Potassium	2500	200	mg/Kg wet	2840		88.1	72.7-127.3	2.36	30	
Selenium	148	5.0	mg/Kg wet	150		98.9	80-120	0.664	30	
Silver	37.5	1.0	mg/Kg wet	40.4		92.8	66.2-133.8	0.543	30	
Sodium	2580	200	mg/Kg wet	2760		93.7	73.8-126.2	2.48	30	
Thallium	169	5.0	mg/Kg wet	174		97.0	81.2-118.8	0.492	30	
Vanadium	99.1	2.0	mg/Kg wet	97.6		102	75.5-124	0.338	30	
Zinc	147	2.0	mg/Kg wet	161		91.5	81.9-117.6	0.490	30	
MRL Check (B084892-MRL1)				Prepared: 11/11/13 Analyzed: 11/14/13						
Lead	0.870	0.74	mg/Kg wet	0.745		117	80-120			
Batch B084935 - SW-846 3005A										
Blank (B084935-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	ND	0.050	mg/L							
Antimony	ND	0.050	mg/L							
Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Beryllium	ND	0.0040	mg/L							
Cadmium	ND	0.0040	mg/L							
Calcium	ND	0.15	mg/L							
Chromium	ND	0.010	mg/L							
Cobalt	ND	0.050	mg/L							
Copper	ND	0.010	mg/L							
Iron	ND	0.050	mg/L							
Lead	0.0080	0.010	mg/L							J
Magnesium	ND	0.15	mg/L							
Manganese	ND	0.010	mg/L							
Nickel	ND	0.010	mg/L							
Potassium	ND	2.0	mg/L							
Selenium	ND	0.050	mg/L							
Sodium	ND	2.0	mg/L							
Thallium	ND	0.050	mg/L							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084935 - SW-846 3005A										
Blank (B084935-BLK1)				Prepared: 11/12/13 Analyzed: 11/13/13						
Vanadium	ND	0.010	mg/L							
Zinc	ND	0.020	mg/L							
LCS (B084935-BS2)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	2.20	0.050	mg/L	2.00		110	80-120			
Antimony	2.20	0.050	mg/L	2.00		110	80-120			
Arsenic	2.08	0.010	mg/L	2.00		104	80-120			
Barium	2.12	0.050	mg/L	2.00		106	80-120			
Beryllium	2.12	0.0040	mg/L	2.00		106	80-120			
Cadmium	1.96	0.0040	mg/L	2.00		98.2	80-120			
Calcium	2.11	0.15	mg/L	2.00		106	80-120			
Chromium	2.14	0.010	mg/L	2.00		107	80-120			
Cobalt	1.94	0.050	mg/L	2.00		97.1	80-120			
Copper	2.08	0.010	mg/L	2.00		104	80-120			
Iron	2.09	0.050	mg/L	2.00		104	80-120			
Lead	1.95	0.010	mg/L	2.00		97.3	80-120			
Magnesium	2.11	0.15	mg/L	2.00		106	80-120			
Manganese	2.09	0.010	mg/L	2.00		105	80-120			
Nickel	2.12	0.010	mg/L	2.00		106	80-120			
Potassium	19.5	2.0	mg/L	20.0		97.3	80-120			
Selenium	2.06	0.050	mg/L	2.00		103	80-120			
Sodium	1.99	2.0	mg/L	2.00		99.7	80-120			J
Thallium	2.09	0.050	mg/L	2.00		105	80-120			
Vanadium	2.08	0.010	mg/L	2.00		104	80-120			
Zinc	2.13	0.020	mg/L	2.00		106	80-120			
LCS Dup (B084935-BSD2)				Prepared: 11/12/13 Analyzed: 11/13/13						
Aluminum	2.23	0.050	mg/L	2.00		111	80-120	1.14	20	
Antimony	2.16	0.050	mg/L	2.00		108	80-120	2.11	20	
Arsenic	2.14	0.010	mg/L	2.00		107	80-120	2.61	20	
Barium	2.15	0.050	mg/L	2.00		107	80-120	1.61	20	
Beryllium	2.14	0.0040	mg/L	2.00		107	80-120	0.681	20	
Cadmium	2.00	0.0040	mg/L	2.00		100	80-120	1.73	20	
Calcium	2.11	0.15	mg/L	2.00		106	80-120	0.0594	20	
Chromium	2.19	0.010	mg/L	2.00		109	80-120	2.27	20	
Cobalt	1.98	0.050	mg/L	2.00		98.8	80-120	1.69	20	
Copper	2.12	0.010	mg/L	2.00		106	80-120	1.91	20	
Iron	2.10	0.050	mg/L	2.00		105	80-120	0.627	20	
Lead	1.98	0.010	mg/L	2.00		98.8	80-120	1.57	20	
Magnesium	2.13	0.15	mg/L	2.00		107	80-120	0.857	20	
Manganese	2.11	0.010	mg/L	2.00		105	80-120	0.800	20	
Nickel	2.17	0.010	mg/L	2.00		108	80-120	2.21	20	
Potassium	19.6	2.0	mg/L	20.0		98.1	80-120	0.855	20	
Selenium	2.10	0.050	mg/L	2.00		105	80-120	2.22	20	
Sodium	1.92	2.0	mg/L	2.00		95.8	80-120	3.99	20	J
Thallium	2.14	0.050	mg/L	2.00		107	80-120	2.27	20	
Vanadium	2.12	0.010	mg/L	2.00		106	80-120	1.75	20	
Zinc	2.17	0.020	mg/L	2.00		109	80-120	2.07	20	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084965 - SW-846 3050B											
Blank (B084965-BLK1)				Prepared: 11/12/13 Analyzed: 11/15/13							
Aluminum	1.5	2.5	mg/Kg wet								J
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	3.6	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	0.32	0.75	mg/Kg wet								J
Magnesium	0.96	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								
LCS (B084965-BS1)				Prepared: 11/12/13 Analyzed: 11/15/13							
Aluminum	8170	5.0	mg/Kg wet	8840		92.4		46.1-153.4			
Antimony	94.6	5.0	mg/Kg wet	88.2		107		8.2-218.9			
Arsenic	93.3	5.0	mg/Kg wet	99.6		93.6		83-117.6			
Barium	319	5.0	mg/Kg wet	310		103		83.2-117.5			
Beryllium	67.7	0.50	mg/Kg wet	72.3		93.7		83.9-116			
Cadmium	160	0.50	mg/Kg wet	182		87.9		83.1-116.9			
Calcium	6440	15	mg/Kg wet	6790		94.8		83.1-116.7			
Chromium	126	1.0	mg/Kg wet	136		92.3		81.6-117.6			
Cobalt	116	5.0	mg/Kg wet	128		90.3		84.7-115.3			
Copper	96.8	1.0	mg/Kg wet	102		94.9		83.8-116.1			
Iron	11200	5.0	mg/Kg wet	12600		89.2		50.8-149.6			
Lead	106	1.5	mg/Kg wet	115		92.3		82.4-117.8			
Magnesium	2890	15	mg/Kg wet	3010		95.9		75.4-124.2			
Manganese	439	1.0	mg/Kg wet	323		**136**	*	82.8-117.5			L-07
Nickel	134	1.0	mg/Kg wet	153		87.4		84.4-115.6			
Potassium	3100	200	mg/Kg wet	2840		109		72.7-127.3			
Selenium	143	5.0	mg/Kg wet	150		95.3		80-120			
Silver	35.2	1.0	mg/Kg wet	40.4		87.0		66.2-133.8			
Sodium	2830	200	mg/Kg wet	2760		102		73.8-126.2			
Thallium	168	5.0	mg/Kg wet	174		96.5		81.2-118.8			
Vanadium	96.2	2.0	mg/Kg wet	97.6		98.5		75.5-124			
Zinc	142	2.0	mg/Kg wet	161		88.4		81.9-117.6			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084965 - SW-846 3050B										
LCS Dup (B084965-BSD1)				Prepared: 11/12/13 Analyzed: 11/15/13						
Aluminum	8450	5.0	mg/Kg wet	8840		95.6	46.1-153.4	3.45	30	
Antimony	95.5	5.0	mg/Kg wet	88.2		108	8.2-218.9	0.981	30	
Arsenic	93.3	5.0	mg/Kg wet	99.6		93.7	83-117.6	0.0890	30	
Barium	291	5.0	mg/Kg wet	310		93.7	83.2-117.5	9.23	30	
Beryllium	66.9	0.50	mg/Kg wet	72.3		92.5	83.9-116	1.22	30	
Cadmium	163	0.50	mg/Kg wet	182		89.8	83.1-116.9	2.05	30	
Calcium	6470	15	mg/Kg wet	6790		95.3	83.1-116.7	0.514	30	
Chromium	127	0.99	mg/Kg wet	136		93.4	81.6-117.6	1.11	30	
Cobalt	117	5.0	mg/Kg wet	128		91.6	84.7-115.3	1.41	30	
Copper	97.7	0.99	mg/Kg wet	102		95.8	83.8-116.1	0.917	30	
Iron	11600	5.0	mg/Kg wet	12600		91.8	50.8-149.6	2.79	30	
Lead	105	1.5	mg/Kg wet	115		91.2	82.4-117.8	1.10	30	
Magnesium	2870	15	mg/Kg wet	3010		95.3	75.4-124.2	0.714	30	
Manganese	337	0.99	mg/Kg wet	323		104	82.8-117.5	26.1	30	
Nickel	136	0.99	mg/Kg wet	153		89.2	84.4-115.6	2.00	30	
Potassium	3010	200	mg/Kg wet	2840		106	72.7-127.3	2.75	30	
Selenium	142	5.0	mg/Kg wet	150		94.5	80-120	0.787	30	
Silver	35.5	0.99	mg/Kg wet	40.4		87.9	66.2-133.8	1.00	30	
Sodium	2840	200	mg/Kg wet	2760		103	73.8-126.2	0.535	30	
Thallium	173	5.0	mg/Kg wet	174		99.3	81.2-118.8	2.84	30	
Vanadium	98.5	2.0	mg/Kg wet	97.6		101	75.5-124	2.35	30	
Zinc	147	2.0	mg/Kg wet	161		91.1	81.9-117.6	3.06	30	
MRL Check (B084965-MRL1)				Prepared: 11/12/13 Analyzed: 11/18/13						
Lead	0.695	0.71	mg/Kg wet	0.706		98.4	80-120			J
Batch B084994 - SW-846 3050B										
Blank (B084994-BLK1)				Prepared: 11/12/13 Analyzed: 11/17/13						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	5.2	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B084994 - SW-846 3050B										
LCS (B084994-BS1)				Prepared: 11/12/13 Analyzed: 11/17/13						
Aluminum	8890	5.0	mg/Kg wet	8840		101	46.1-153.4			
Antimony	107	5.0	mg/Kg wet	88.2		121	8.2-218.9			
Arsenic	101	5.0	mg/Kg wet	99.6		102	83-117.6			
Barium	305	5.0	mg/Kg wet	310		98.3	83.2-117.5			
Beryllium	74.5	0.50	mg/Kg wet	72.3		103	83.9-116			
Cadmium	173	0.50	mg/Kg wet	182		95.3	83.1-116.9			
Calcium	6910	15	mg/Kg wet	6790		102	83.1-116.7			
Chromium	138	0.99	mg/Kg wet	136		101	81.6-117.6			
Cobalt	125	5.0	mg/Kg wet	128		97.4	84.7-115.3			
Copper	108	0.99	mg/Kg wet	102		106	83.8-116.1			
Iron	12400	5.0	mg/Kg wet	12600		98.5	50.8-149.6			
Lead	109	1.5	mg/Kg wet	115		95.1	82.4-117.8			
Magnesium	3040	15	mg/Kg wet	3010		101	75.4-124.2			
Manganese	321	0.99	mg/Kg wet	323		99.3	82.8-117.5			
Nickel	146	0.99	mg/Kg wet	153		95.5	84.4-115.6			
Potassium	2910	200	mg/Kg wet	2840		102	72.7-127.3			
Selenium	145	5.0	mg/Kg wet	150		96.7	80-120			
Silver	38.5	0.99	mg/Kg wet	40.4		95.3	66.2-133.8			
Sodium	2800	200	mg/Kg wet	2760		101	73.8-126.2			
Thallium	172	5.0	mg/Kg wet	174		99.1	81.2-118.8			
Vanadium	103	2.0	mg/Kg wet	97.6		106	75.5-124			
Zinc	151	2.0	mg/Kg wet	161		94.0	81.9-117.6			
LCS Dup (B084994-BSD1)				Prepared: 11/12/13 Analyzed: 11/17/13						
Aluminum	8520	5.0	mg/Kg wet	8840		96.3	46.1-153.4	4.31	30	
Antimony	101	5.0	mg/Kg wet	88.2		115	8.2-218.9	5.46	30	
Arsenic	96.0	5.0	mg/Kg wet	99.6		96.3	83-117.6	5.41	30	
Barium	296	5.0	mg/Kg wet	310		95.6	83.2-117.5	2.75	30	
Beryllium	71.5	0.50	mg/Kg wet	72.3		98.9	83.9-116	4.04	30	
Cadmium	168	0.50	mg/Kg wet	182		92.1	83.1-116.9	3.41	30	
Calcium	6740	15	mg/Kg wet	6790		99.3	83.1-116.7	2.45	30	
Chromium	132	0.99	mg/Kg wet	136		97.1	81.6-117.6	4.38	30	
Cobalt	120	5.0	mg/Kg wet	128		93.8	84.7-115.3	3.84	30	
Copper	103	0.99	mg/Kg wet	102		101	83.8-116.1	4.58	30	
Iron	11900	5.0	mg/Kg wet	12600		94.2	50.8-149.6	4.43	30	
Lead	104	1.5	mg/Kg wet	115		90.7	82.4-117.8	4.75	30	
Magnesium	2940	15	mg/Kg wet	3010		97.5	75.4-124.2	3.63	30	
Manganese	307	0.99	mg/Kg wet	323		95.0	82.8-117.5	4.42	30	
Nickel	140	0.99	mg/Kg wet	153		91.5	84.4-115.6	4.32	30	
Potassium	2800	200	mg/Kg wet	2840		98.7	72.7-127.3	3.68	30	
Selenium	138	5.0	mg/Kg wet	150		91.7	80-120	5.32	30	
Silver	36.9	0.99	mg/Kg wet	40.4		91.4	66.2-133.8	4.17	30	
Sodium	2670	200	mg/Kg wet	2760		96.6	73.8-126.2	4.82	30	
Thallium	168	5.0	mg/Kg wet	174		96.5	81.2-118.8	2.68	30	
Vanadium	99.3	2.0	mg/Kg wet	97.6		102	75.5-124	3.95	30	
Zinc	146	2.0	mg/Kg wet	161		90.8	81.9-117.6	3.48	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B084994 - SW-846 3050B											
Duplicate (B084994-DUP1)		**Source: 13K0384-04**		Prepared: 11/12/13 Analyzed: 11/17/13							
Aluminum	9030	3.4	mg/Kg dry		9370				3.70	35	
Antimony	ND	3.4	mg/Kg dry		ND				NC	35	
Arsenic	2.23	3.4	mg/Kg dry		2.73				20.5	35	J
Barium	81.3	3.4	mg/Kg dry		85.1				4.51	35	
Beryllium	0.327	0.34	mg/Kg dry		ND				NC	35	J
Cadmium	0.586	0.34	mg/Kg dry		0.669				13.2	35	
Calcium	5040	10	mg/Kg dry		5230				3.72	35	
Chromium	19.4	0.67	mg/Kg dry		19.8				2.33	35	
Cobalt	5.67	3.4	mg/Kg dry		6.15				8.15	35	
Copper	485	0.67	mg/Kg dry		512				5.55	35	
Iron	11100	3.4	mg/Kg dry		11900				6.88	35	
Lead	61.0	1.0	mg/Kg dry		63.2				3.61	35	
Magnesium	2370	10	mg/Kg dry		2440				2.92	35	
Manganese	203	0.67	mg/Kg dry		220				7.83	35	
Nickel	58.1	0.67	mg/Kg dry		61.8				6.09	35	
Potassium	713	130	mg/Kg dry		738				3.42	35	
Selenium	ND	3.4	mg/Kg dry		ND				NC	35	
Silver	ND	0.67	mg/Kg dry		ND				NC	35	
Sodium	94.2	130	mg/Kg dry		96.7				2.65	35	J
Thallium	ND	3.4	mg/Kg dry		ND				NC	35	
Vanadium	21.1	1.3	mg/Kg dry		22.4				5.81	35	
Zinc	173	1.3	mg/Kg dry		182				4.77	35	
MRL Check (B084994-MRL1)				Prepared: 11/12/13 Analyzed: 11/17/13							
Lead	0.772	0.71	mg/Kg wet	0.714		108		80-120			
Matrix Spike (B084994-MS1)		**Source: 13K0384-04**		Prepared: 11/12/13 Analyzed: 11/17/13							
Aluminum	9550	3.5	mg/Kg dry	140	9370	**131**	*	75-125			MS-19
Antimony	73.5	3.5	mg/Kg dry	140	ND	**52.4**	*	75-125			MS-07
Arsenic	132	3.5	mg/Kg dry	140	2.73	92.2		75-125			
Barium	210	3.5	mg/Kg dry	140	85.1	89.1		75-125			
Beryllium	133	0.35	mg/Kg dry	140	ND	95.1		75-125			
Cadmium	127	0.35	mg/Kg dry	140	0.669	90.4		75-125			
Calcium	5060	11	mg/Kg dry	140	5230	**-124**	*	75-125			MS-19
Chromium	148	0.70	mg/Kg dry	140	19.8	91.5		75-125			
Cobalt	130	3.5	mg/Kg dry	140	6.15	88.6		75-125			
Copper	620	0.70	mg/Kg dry	140	512	76.7		75-125			
Iron	12600	3.5	mg/Kg dry	140	11900	**465**	*	75-125			MS-19
Lead	178	1.1	mg/Kg dry	140	63.2	82.2		75-125			
Magnesium	2620	11	mg/Kg dry	140	2440	**127**	*	75-125			MS-19
Manganese	321	0.70	mg/Kg dry	140	220	**72.6**	*	75-125			MS-08
Nickel	179	0.70	mg/Kg dry	140	61.8	83.5		75-125			
Potassium	2000	140	mg/Kg dry	1400	738	90.0		75-125			
Selenium	128	3.5	mg/Kg dry	140	ND	91.4		75-125			
Silver	126	0.70	mg/Kg dry	140	ND	90.2		75-125			
Sodium	244	140	mg/Kg dry	140	96.7	105		75-125			
Thallium	129	3.5	mg/Kg dry	140	ND	91.7		75-125			
Vanadium	152	1.4	mg/Kg dry	140	22.4	92.7		75-125			
Zinc	298	1.4	mg/Kg dry	140	182	82.8		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085029 - SW-846 7471										
Blank (B085029-BLK1)				Prepared & Analyzed: 11/13/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B085029-BS1)				Prepared & Analyzed: 11/13/13						
Mercury	4.38	0.33	mg/Kg wet	4.05		108	71.6-128.1			
LCS Dup (B085029-BSD1)				Prepared & Analyzed: 11/13/13						
Mercury	3.71	0.33	mg/Kg wet	4.05		91.7	71.6-128.1	16.4	30	
Duplicate (B085029-DUP1)	**Source: 13K0384-16**			Prepared & Analyzed: 11/13/13						
Mercury	0.0139	0.027	mg/Kg dry		0.0162			15.3	35	J
Matrix Spike (B085029-MS1)	**Source: 13K0384-16**			Prepared & Analyzed: 11/13/13						
Mercury	0.208	0.026	mg/Kg dry	0.176	0.0162	109	75-125			
Batch B085052 - SW-846 7471										
Blank (B085052-BLK1)				Prepared & Analyzed: 11/13/13						
Mercury	0.022	0.025	mg/Kg wet							J
LCS (B085052-BS1)				Prepared & Analyzed: 11/13/13						
Mercury	4.06	0.33	mg/Kg wet	4.05		100	71.6-128.1			
LCS Dup (B085052-BSD1)				Prepared & Analyzed: 11/13/13						
Mercury	4.47	0.32	mg/Kg wet	4.05		110	71.6-128.1	9.65	30	
Batch B085199 - SW-846 7471										
Blank (B085199-BLK1)				Prepared: 11/14/13 Analyzed: 11/15/13						
Mercury	ND	0.025	mg/Kg wet							
LCS (B085199-BS1)				Prepared: 11/14/13 Analyzed: 11/15/13						
Mercury	4.09	0.33	mg/Kg wet	4.05		101	71.6-128.1			
LCS Dup (B085199-BSD1)				Prepared: 11/14/13 Analyzed: 11/15/13						
Mercury	4.11	0.33	mg/Kg wet	4.05		101	71.6-128.1	0.365	30	
Batch B085233 - SW-846 3005A										
Blank (B085233-BLK1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	ND	0.0050	mg/L							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085233 - SW-846 3005A										
LCS (B085233-BS1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	0.446	0.0050	mg/L	0.500		89.1	80-120			
LCS Dup (B085233-BSD1)				Prepared: 11/15/13 Analyzed: 11/18/13						
Silver	0.482	0.0050	mg/L	0.500		96.5	80-120	7.92	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B085386 - % Solids										
Duplicate (B085386-DUP1)	**Source: 13K0384-26**			Prepared: 11/18/13 Analyzed: 11/19/13						
% Solids	80.0		% Wt		80.3			0.374	20	
Duplicate (B085386-DUP2)	**Source: 13K0384-27**			Prepared: 11/18/13 Analyzed: 11/19/13						
% Solids	80.8		% Wt		79.7			1.37	20	
Duplicate (B085386-DUP3)	**Source: 13K0384-28**			Prepared: 11/18/13 Analyzed: 11/19/13						
% Solids	83.0		% Wt		82.4			0.726	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-08	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
MS-14	Matrix spike recovery is outside of control limits. Data validation is not affected since sample result is "not detected" and recovery bias is on the high side for this compound.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
V-05	Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side.
V-16	Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 6010C in Water	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,ME,NC,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,RI
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,NC,ME,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7470A in Water	

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 8260C in Product/Solid	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Product/Solid	
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
1,2-Dichloroethane-d4	VA
Toluene-d8	VA
4-Bromofluorobenzene	VA
Pentafluorobenzene	VA
1,4-Difluorobenzene	VA
Chlorobenzene-d5	VA
1,4-Dichlorobenzene-d4	VA
SW-846 8260C in Soil	
Acetone	CT,NH,NY,ME,VA,NJ
Acrylonitrile	CT,NH,NY,ME,VA,NJ
Benzene	CT,NH,NY,ME,VA,NJ
Bromobenzene	NH,NY,ME,VA,NJ
Bromochloromethane	NH,NY,ME,VA,NJ
Bromodichloromethane	CT,NH,NY,ME,VA,NJ
Bromoform	CT,NH,NY,ME,VA,NJ
Bromomethane	CT,NH,NY,ME,VA,NJ
2-Butanone (MEK)	CT,NH,NY,ME,VA,NJ
n-Butylbenzene	CT,NH,NY,ME,VA,NJ
sec-Butylbenzene	CT,NH,NY,ME,VA,NJ
tert-Butylbenzene	CT,NH,NY,ME,VA,NJ
Carbon Disulfide	CT,NH,NY,ME,VA,NJ
Carbon Tetrachloride	CT,NH,NY,ME,VA,NJ
Chlorobenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
Chlorodibromomethane	CT,NH,NY,ME,VA,NJ
Chloroethane	CT,NH,NY,ME,VA,NJ
Chloroform	CT,NH,NY,ME,VA,NJ
Chloromethane	CT,NH,NY,ME,VA,NJ
2-Chlorotoluene	CT,NH,NY,ME,VA,NJ
4-Chlorotoluene	CT,NH,NY,ME,VA,NJ
Dibromomethane	NH,NY,ME,VA,NJ
1,2-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,3-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
1,4-Dichlorobenzene	CT,NH,NY,ME,VA,NJ
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA,NJ
1,1-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,2-Dichloroethane	CT,NH,NY,ME,VA,NJ
1,1-Dichloroethylene	CT,NH,NY,ME,VA,NJ
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA,NJ
1,2-Dichloropropane	CT,NH,NY,ME,VA,NJ
1,3-Dichloropropane	NH,NY,ME,VA,NJ
2,2-Dichloropropane	NH,NY,ME,VA,NJ
1,1-Dichloropropene	NH,NY,ME,VA,NJ
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA,NJ
1,4-Dioxane	NJ
Ethylbenzene	CT,NH,NY,ME,VA,NJ
Hexachlorobutadiene	NH,NY,ME,VA,NJ
2-Hexanone (MBK)	CT,NH,NY,ME,VA,NJ
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	NH,NY,NJ
Methyl tert-Butyl Ether (MTBE)	NY,VA,NJ
Methylene Chloride	CT,NH,NY,ME,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA,NJ
Naphthalene	NH,NY,ME,VA,NJ
n-Propylbenzene	NH,NY,NJ
Styrene	CT,NH,NY,ME,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA,NJ
Tetrachloroethylene	CT,NH,NY,ME,VA,NJ
Toluene	CT,NH,NY,ME,VA,NJ
1,2,3-Trichlorobenzene	ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA,NJ
1,1,2-Trichloroethane	CT,NH,NY,ME,VA,NJ
Trichloroethylene	CT,NH,NY,ME,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA,NJ
1,2,3-Trichloropropane	NH,NY,ME,VA,NJ
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Soil	
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA,NJ
Vinyl Chloride	CT,NH,NY,ME,VA,NJ
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA
SW-846 8260C in Water	
Acetone	CT,NY,ME,NH,VA,NJ
Acrylonitrile	CT,NY,ME,NH,VA,NJ
tert-Amyl Methyl Ether (TAME)	NY,ME,NH,VA,NJ
Benzene	CT,NY,ME,NH,VA,NJ
Bromochloromethane	NY,ME,NH,VA,NJ
Bromodichloromethane	CT,NY,ME,NH,VA,NJ
Bromoform	CT,NY,ME,NH,VA,NJ
Bromomethane	CT,NY,ME,NH,VA,NJ
2-Butanone (MEK)	CT,NY,ME,NH,VA,NJ
tert-Butyl Alcohol (TBA)	NY,ME,NH,VA,NJ
n-Butylbenzene	NY,ME,VA,NJ
sec-Butylbenzene	NY,ME,VA,NJ
tert-Butylbenzene	NY,ME,VA,NJ
tert-Butyl Ethyl Ether (TBEE)	NY,ME,NH,VA,NJ
Carbon Disulfide	CT,NY,ME,NH,VA,NJ
Carbon Tetrachloride	CT,NY,ME,NH,VA,NJ
Chlorobenzene	CT,NY,ME,NH,VA,NJ
Chlorodibromomethane	CT,NY,ME,NH,VA,NJ
Chloroethane	CT,NY,ME,NH,VA,NJ
Chloroform	CT,NY,ME,NH,VA,NJ
Chloromethane	CT,NY,ME,NH,VA,NJ
2-Chlorotoluene	NY,ME,NH,VA,NJ
4-Chlorotoluene	NY,ME,NH,VA,NJ
Dibromomethane	NY,ME,NH,VA,NJ
1,2-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
1,4-Dichlorobenzene	CT,NY,ME,NH,VA,NJ
trans-1,4-Dichloro-2-butene	NY,ME,NH,VA,NJ
Dichlorodifluoromethane (Freon 12)	NY,ME,NH,VA,NJ
1,1-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,2-Dichloroethane	CT,NY,ME,NH,VA,NJ
1,1-Dichloroethylene	CT,NY,ME,NH,VA,NJ
cis-1,2-Dichloroethylene	NY,ME,NJ
trans-1,2-Dichloroethylene	CT,NY,ME,NH,VA,NJ
1,2-Dichloropropane	CT,NY,ME,NH,VA,NJ
1,3-Dichloropropane	NY,ME,VA,NJ
2,2-Dichloropropane	NY,ME,NH,VA,NJ
1,1-Dichloropropene	NY,ME,NH,VA,NJ
cis-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
trans-1,3-Dichloropropene	CT,NY,ME,NH,VA,NJ
Diisopropyl Ether (DIPE)	NY,ME,NH,VA,NJ

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C in Water	
Ethylbenzene	CT,NY,ME,NH,VA,NJ
Hexachlorobutadiene	CT,NY,ME,NH,VA,NJ
2-Hexanone (MBK)	CT,NY,ME,NH,VA,NJ
Isopropylbenzene (Cumene)	NY,ME,VA,NJ
p-Isopropyltoluene (p-Cymene)	CT,NY,ME,NH,VA,NJ
Methyl tert-Butyl Ether (MTBE)	CT,NY,ME,NH,VA,NJ
Methylene Chloride	CT,NY,ME,NH,VA,NJ
4-Methyl-2-pentanone (MIBK)	CT,NY,ME,NH,VA,NJ
Naphthalene	NY,ME,NH,VA,NJ
n-Propylbenzene	CT,NY,ME,NH,VA,NJ
Styrene	CT,NY,ME,NH,VA,NJ
1,1,1,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
1,1,2,2-Tetrachloroethane	CT,NY,ME,NH,VA,NJ
Tetrachloroethylene	CT,NY,ME,NH,VA,NJ
Toluene	CT,NY,ME,NH,VA,NJ
1,2,3-Trichlorobenzene	NY,ME,NH,VA,NJ
1,2,4-Trichlorobenzene	CT,NY,ME,NH,VA,NJ
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NY,ME,NH,VA,NJ
1,1,2-Trichloroethane	CT,NY,ME,NH,VA,NJ
Trichloroethylene	CT,NY,ME,NH,VA,NJ
Trichlorofluoromethane (Freon 11)	CT,NY,ME,NH,VA,NJ
1,2,3-Trichloropropane	NY,ME,NH,VA,NJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	NY,VA,NJ
1,2,4-Trimethylbenzene	NY,ME,VA,NJ
1,3,5-Trimethylbenzene	NY,ME,VA,NJ
Vinyl Chloride	CT,NY,ME,NH,VA,NJ
m+p Xylene	CT,NY,ME,NH,VA
o-Xylene	CT,NY,ME,NH,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2014
MA	Massachusetts DEP	M-MA100	06/30/2014
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2014
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2014
RI	Rhode Island Department of Health	LAO00112	12/30/2013
NC	North Carolina Div. of Water Quality	652	12/31/2013
NJ	New Jersey DEP	MA007 NELAP	06/30/2014
FL	Florida Department of Health	E871027 NELAP	06/30/2014
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2014
WA	State of Washington Department of Ecology	C2065	02/23/2014
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2013
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2014

CHAIN OF CUSTODY RECORD

13K0384

Rev 04.05.12

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Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 1096
Attention: Jess Philip
Project Location: MAGNA Metals
Sampled By: M.J. Pontecorvo

Telephone: 845 735 8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ● EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ● OTHER NYSDEC EDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code
01	LPSB101-0-0.5	11.8.13	0705		X	S		2	1	
02	LPSB101D-0-0.5	11.8.13	0710		X	S		2	1	
03	LPSB101-6.5-7	11.8.13	0740		X	S		2	1	
04	UASB210-0-0.5	11.8.13	0835		X	S		2	1	
05	UASB210-1-1.5	11.8.13	0840		X	S		2	1	
06	FB-4	11.8.13	0800		X	W		3	1	
07	UASB209-0-0.5	11.8.13	0815		X	S		2	1	
08	UASB209-1-1.5	11.8.13	0825		X	S		2	1	
09	UASB208-0-0.5	11.8.13	0910		X	S		2	1	
10	UASB208-1-1.5	11.8.13	0920		X	S		2	1	

ANALYSIS REQUESTED
VOCs
TAL Metals
%Solids

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW = groundwater
WW = wastewater
DW = drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: Please Contact Amita Patel RE: NYSDEC EDD deliverable - 845-735-8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	11.8.13 1550
Received by: (signature) 4.3°	11/9/13 Date/Time: 9:45
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

13K0384
Rev 04.05.12

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: MAGNA METALS
Sampled By: M.V. Pantliano

Telephone: 8457358300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code
11	~~UA208~~UASB208-2-2.5	11.8	0920		X	S		2	1	
12	UASB207-2-2.5	11.8.13	0850		X	S		2	1	
13	UASB207-3-3.5	11.8.13	0855		X	S		2	1	
14	UASB207-4-4.5	11.8.13			X	S		2	1	
15	UASB206-0-0.5	11.8.13	0925		X	S		2	1	
16	UASB206-1-1.5	11.8.13	0930		X	S		2	1	
17	UASB205-2-2.5	11.8.13	1000		X	S		2	1	
18	UASB205-3-3.5	11.8.13	1005		X	S		2	1	
19	UASB205-4-4.5	11.8.13	1010		X	S		2	1	
20	UASB204-0-0.5	11.8.13	1040		X	S		2	1	

ANALYSIS REQUESTED
VOCs
TAL Metals
% Solid

Dissolved Metal
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other

Comments: Please Contact Amita Patel Re: NYSDE EDD Deliverable 845735-8300

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
[signature] 11.8.13	1530
Received by: (signature) [signature] 4.3C 11/9/13	9:43
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other STD
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other: NYSDEC

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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CHAIN OF CUSTODY RECORD

con-test ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

13K0384
Rev 04.05.12

Company Name: HDR
Address: 1 Blue Hill Plaza
Pearl River NY 10965
Attention: Jiss Philip
Project Location: MAGNA METALS
Sampled By: M.V. Pantlion

Telephone: 845-735-8300
Project #
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ⊘ EMAIL ○ WEBSITE
Fax #
Email:
Format: ○ PDF ○ EXCEL ○ GIS ⊘ OTHER NYSEDD
○ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers: VOCs	# of Containers: TAL METALS	# of Containers: %'s SOILS	ANALYSIS REQUESTED
21	UASB204-1-1.5	11.8.13	1025		X	S		2	1		
22	UASB204-2-2.5	11.8.13	1030		X	S		2	1		
23	UASB203-0-0.5	11.8.13	1040		X	S		2	1		
24	UASB203-1-1.5	11.8.13	1300		X	S		2	1		
25	UASB203-2-2.5	11.8.13	1045		X	S		2	1		
26	UASB202-0-0.5	11.8.13	1310		X	S		2	1		
27	UASB201-0-0.5	11.8.13	1330		X	S		2	1		
28	UASB202D-0-0.5	11.8.13	1315								

# of Containers
** Preservation
***Container Cod

Dissolved Meta
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfa
X = Na hydroxide
T = Na thiosulfate
O = Other

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL= sludge
O = other

Comments: Returning Empty plastic, plastic w/ HNO3 and VOA vial (x3)

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	11.18.13 1500
Received by: (signature) 9.3°	11-9-13 9:43
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
☐ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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United States

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1Z63V9174494677220

Updated: 11/09/2013 10:00 A.M. Eastern Time

Delivered

Delivered On:
Saturday, 11/09/2013 at 9:43 A.M.

Left At:
Receiver

Signed By:
HELIE

Proof of Delivery

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To:
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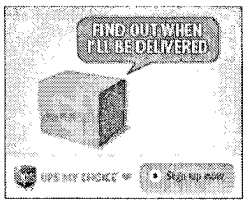

Additional Information

Shipped/Billed On:	11/08/2013
Type:	Package
Weight:	13.00 lbs

Shipment Progress

What's This?

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39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: JMH DATE: 11/9/13

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice (X) Direct from Sampling ☐ Ambient ☐ In Cooler(s) (X)
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank _____ Temperature °C by Temp gun 4.3°
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** (Yes) No N/A _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	27
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic	1	Non-ConTest Container	
40 mL Vial - type listed below	3	Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore	54	Other	

Laboratory Comments:

40 mL vials: # HCl 3 # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	T	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** JMH **Date/Time:** 11/21/13 9:43

Data Validation Services

120 Cobble Creek Road P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
harry@frontiernet.net

May 1, 2014

Amita Patel
HDR Engineering, Inc.
One Blue Hill Plaza
Pearl River, NY 10965

RE: Validation of the Magna Metals Site Analytical Data Packages
Data Usability Summary Report (DUSR)
con-test SDG Nos. 13K0181, 13K0259, 13K0326, and 13K0384

Dear Ms. Patel:

Review has been completed for the data packages noted above, generated by con-test Analytical Laboratory, that pertain to samples collected between 11/05/13 and 11/08/13 at the Magna Metals site. Sixty one soil field samples and four field duplicates were processed for a full list of volatile analytes and Target Analyte List (TAL metals. by USEPA SW846 methods 8260C, 6010C, and 7471. Six additional soil samples were processed for TAL metals. Field blanks were also processed.

The data packages submitted contain full deliverables for validation, but this DUSR is generated from review of the summary form information, with full validation review of sample raw data, and limited review of associated QC raw data. The reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOPs HW-24, HW-2, the USEPA CLP National Functional Guidelines for Organic/Inorganic Data Review, the specific laboratory methodologies, and professional judgment. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Responses
* Matrix Spike (MS) Recoveries/Duplicate (DUP) Correlations
* Field Duplicate Correlations
* Preparation/Calibration/Field Blanks
* Laboratory Control Samples (LCSs)
* Instrument Tunes
* Calibration and Low Level Standards
* Instrument IDLs
* Sample Result Verification

The data review includes evaluation of the specific items noted in The NYS DER-10 Appendix B section 2.0 (c). The items listed above that show deficiencies are discussed within the text of this narrative. The laboratory QC forms illustrating the excursions can be found within the laboratory data packages.

In summary, most of the results are usable either as reported, or with minor qualification. The following items of concern are noted:

- Results for 1,4-dioxane in the samples are not usable due to inherent processing responses.
- Although the analytical protocols require organic surrogate and control recoveries and correlations to fall within analyte-specific laboratory acceptance ranges (generated by historical data), the laboratory utilizes set ranges (ex. 70% to 130% for most volatiles; 25%RPD) Therefore, accuracy and precision have not been properly evaluated.
- The laboratory failed to process the ICP serial dilution evaluations. Therefore, the potential suppression matrix effects on the analyses have not been determined.
- No matrix spike/duplicates were submitted/designated for analysis. The laboratory did perform those evaluations on some of the project samples and batch QC, but the proper frequency of project QC was not available.

Copies of the client sample identifications are attached to this text, and should be reviewed in conjunction with this report. Also included with the submission is client EDD, with validation edits/qualifiers applied in red.

Chain-of-Custody

The following custody variances were noted:

- Write-overs and cross-outs were not initialed/dated
- The custody page 1 for samples collected 11/07/13 does not include the collection date. It is present on the second page
- The custody page 2 for samples collected 11/07/13 has an incorrect laboratory receive date, does not include the time of receipt, and does not include the analytical requirements
- The collection date of UASB207-4-4.5 is not present, and the year of collection is omitted from UASB208-2-2.5.
- The analytical requirements and matrix/grab entries were not completed for UASB202D-0-0.5
- The preservation code/container entries were not completed for custody page 2 of samples collected 11/08/13

The laboratory login forms, rather than noting omissions such as collection dates/times and analytica requirements (noted above), state that all entries are complete.

Blind Duplicate Evaluation

The blind field duplicates were collected at locations BRSB406-1-1.5, LPSB112-0-0.5, LPSB101-0-0.5, and UASB202-0-0.5. Correlations were within validation guidelines of 50%RPD or ±2XCRDL, with the exception of those for the following, for which are qualified as estimated in the parent samples and their duplicates:

- lead in LPSB112-0-0.5
- cobalt, copper, lead, magnesium, manganese, nickel, potassium, sodium, and zinc in UASB202-0-0.5

Volatile Analyses by EPA 8260C

The detected results for acetone in samples reported in SDG 13K0384 are edited to reflect non-detection due to presence in the associated field blank.

The results for i-propyltoluene in LPSB105-0-0.5 and acetone in FB-2 are qualified as tentative in identification and estimated in value due to poor mass spectral quality.

The results for 4-chlorotoluene in LPSB112-0-0.5 and i-propyltoluene in UAB204-1-1.5 are edited to reflect non-detection due to very poor mass spectral quality.

The results for 1,4-dioxane are rejected due to low instrument responses in the associated continuing calibration standards, inherent with the methodology. Other initial and continuing calibration standard (ICV and CCV) responses are within protocol and validation guidelines, with the following exceptions, results for which are qualified as estimated in the samples:

- acrylonitrile and tetrahydrofuran (low RRFs, elevated %Ds) in the soil samples
- t-butyl alcohol (low RRF) in the field blanks
- acetone, acrylonitrile, 2-butanone, and t-butyl alcohol (22%D to 34%D) in eleven soil samples reported in SDG 13K0384
- acetone, t-butyl alcohol, chloromethane, and dichlorodifluoromethane (25%D to 43%D) in sixteen soil samples reported in SDG 13K0384

Due to lack of submitted vials for MS/MSD analyses, a single matrix spike was performed on each of three samples. The recoveries were then compared to the static range of 70% to 130%; 25%RPD. The spike of LPSB112-0-0.5 shows on marginally low recovery (69%); no qualification is made. The matrix spike of LPSB101-0-0.5 shows low recoveries for acetone, chloromethane, dichlorodifluoromethane, naphthalene, tetrahydrofuran, and 1,2,3-trichlorobenzene (64% to 69%). Results for those six elements in the parent sample have been qualified as estimated. The matrix spike of LPSB113-0-0.5 exhibited low recoveries (51% to 69%) for twenty-one analytes. Without an MSD to aid in determining if that MS was an anomaly, and in consideration of the fact that the surrogate recoveries in that spike are close to 100%, no qualification of the parent sample has been performed.

Due to low recoveries (63% to 68%) in associated LCSs, the results for acetone in the soil samples reported in SDGs 13K0259 and 13K0326, and for chloromethane in sixteen soil samples reported in SDG 13K0384, are qualified as estimated in value.

Surrogate standard recoveries are within the ranges utilized by the laboratory. Internal standard recoveries are acceptable.

TAL Metals Analyses by EPA 6010C and 7470/7471

The required ICP serial dilution determinations, which evaluate the effect of sample matrix interferences, were not performed by the laboratory. Therefore, the effect of the matrices on analyte recovery from the samples is not fully known.

The mercury MS/MSDs of RASB305-0-0.5, LPSB11-6.5-7, and UASB206-1-1.5 show acceptable recoveries and correlations.

Some of the instrument calibration blanks report responses above the reporting limits, but associated sample results are more than tenfold higher than the associated samples, and reported results are unaffected.

The MSs and DUPs produced the following outlying recoveries and correlations (%RPD), and results for the listed elements are qualified as estimated in the indicated samples:

Parent Sample	Element	%Recovery	%RPD	Affected Samples
BDSB405-1-1.5	Antimony	59		SDGs 13K0181 and 13K0259
	Arsenic		56	
	Beryllium		54	
	Copper		43	
	Iron		47	
	Sodium	129		
LPSB112-12.5-13	Antimony	47	57	SDGs 13K0326 and 13K0384-1 through -3, -5, and -7
	Barium		57	
	Potassium		58	
UASB210-0-0.5	Antimony	54		SDG 13K0384-4, and -8 through -28
	Manganese	73		

There were not a sufficient number of project MS/MSDs processed. Although batch QC (non-project MS/DUP) was processed by the laboratory, the results of the batch QC were not provided in the data packages. Only project QC results have been utilized for qualification; some of them are associated with more than twenty field samples.

ICP Linear Range and Inter Element Correction Factors summaries were not included in the data packages. These would be required for full validation.

Metals analysis sequence logs do not show the analysis dates or times. Dilution factors are not available on the metals analysis sequence summaries or the raw sequence log.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Att: Validation Qualifier Definitions
Sample Identifications and Laboratory Case Narratives

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

REPORT DATE: 11/14/2013

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Jiss Philip

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0181

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BDSB401- 1-1.5	13K0181-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB402- 1-1.5	13K0181-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-1	13K0181-03	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
BDSB405- 1-1.5	13K0181-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB405- 6-6.5	13K0181-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB403- 1-1.5	13K0181-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB404- 1-1.5	13K0181-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB406- 1-1.5	13K0181-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
BDSB406D- 1.1.5	13K0181-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
RASB305- 0-0.5	13K0181-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB304- 0-0.5	13K0181-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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ATTN: Jiss Philip

REPORT DATE: 11/14/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0181

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
RASB304- 4-4.5	13K0181-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB302- 0-0.5	13K0181-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB303- 1-1.5	13K0181-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
RASB301- 0-0.5	13K0181-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	

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REPORT DATE: 11/15/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0259

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland - Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB113 0-0.5	13K0259-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB113 9-9.5	13K0259-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-2	13K0259-03	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
LPSB111 0-0.5	13K0259-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB111 6.5-7	13K0259-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB110 0-0.5	13K0259-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB110 5.5-6	13K0259-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB108 0-0.5	13K0259-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB108 4.5-5	13K0259-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB109 0-0.5	13K0259-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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ATTN: Jiss Philip

REPORT DATE: 11/15/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0259

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland - Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB109 9-9.5	13K0259-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB109 14-14.5	13K0259-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 0-0.5	13K0259-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 10-10.5	13K0259-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB107 13.5-14	13K0259-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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REPORT DATE: 11/19/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0326

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
FB-3	13K0326-01	Field Blank		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
LPSB112 0-0.5	13K0326-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112D 0-0.5	13K0326-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112 9-9.5	13K0326-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB112 12.5-13	13K0326-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB106 0-0.5	13K0326-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB106 9-9.5	13K0326-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB105 0-0.5	13K0326-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB105 7.5-8	13K0326-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB104 0-0.5	13K0326-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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REPORT DATE: 11/19/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0326

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB104 9-9.5	13K0326-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 0-0.5	13K0326-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 9-9.5	13K0326-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB102 12.5-13	13K0326-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 0-0.5	13K0326-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 9-9.5	13K0326-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB103 12-13.5	13K0326-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LPSB101-0-0.5	13K0384-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB101D-0-0.5	13K0384-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
LPSB101-6.5-7	13K0384-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB210-0-0.5	13K0384-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB210-1-1.5	13K0384-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
FB-4	13K0384-06	Water		SW-846 6010C	
				SW-846 7470A	
				SW-846 8260C	
UASB209-0-0.5	13K0384-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB209-1-1.5	13K0384-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB208-0-0.5	13K0384-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB208-1-1.5	13K0384-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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ATTN: Jiss Philip

REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB208-2-2.5	13K0384-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-2-2.5	13K0384-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-3-3.5	13K0384-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB207-4-4.5	13K0384-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB206-0-0.5	13K0384-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB206-1-1.5	13K0384-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-2-2.5	13K0384-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-3-3.5	13K0384-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB205-4-4.5	13K0384-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB204-0-0.5	13K0384-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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ATTN: Jiss Philip

REPORT DATE: 11/21/2013

PURCHASE ORDER NUMBER:

PROJECT NUMBER: [none]

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 13K0384

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Magna Metals

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB204-1-1.5	13K0384-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB204-2-2.5	13K0384-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-0-0.5	13K0384-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-1-1.5	13K0384-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB203-2-2.5	13K0384-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB202-0-0.5	13K0384-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB201-0-0.5	13K0384-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	
UASB202D-0-0.5	13K0384-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 8260C	

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February 24, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0257

Enclosed are results of analyses for samples received by the laboratory on February 7, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

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ATTN: Amita Patel

REPORT DATE: 2/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB226-2-2.5	15B0257-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB226-4-4.5	15B0257-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB226-6-6.5	15B0257-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB228-2-2.5	15B0257-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB228-7.5-8	15B0257-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-3.5-4	15B0257-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-10-11	15B0257-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-13-14	15B0257-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 2/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB218-0-1	15B0257-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-1-2	15B0257-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-2-3	15B0257-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-3-4	15B0257-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-7-8	15B0257-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-8-9	15B0257-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-1-2	15B0257-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-4-5	15B0257-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB219-4-5-1	15B0257-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-5-6	15B0257-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-6-7	15B0257-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-7-7.5	15B0257-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

DL-04

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Selenium
15B0257-10[UASB218-1-2], 15B0257-11[UASB218-2-3], 15B0257-12[UASB218-3-4], 15B0257-13[UASB218-7-8], 15B0257-14[UASB218-8-9], 15B0257-15[UASB219-1-2], 15B0257-16[UASB219-4-5], 15B0257-17[UASB219-4-5-1], 15B0257-18[UASB219-5-6], 15B0257-19[UASB219-6-7], 15B0257-20[UASB219-7-7.5]

Thallium
15B0257-10[UASB218-1-2], 15B0257-11[UASB218-2-3], 15B0257-12[UASB218-3-4], 15B0257-13[UASB218-7-8], 15B0257-16[UASB219-4-5], 15B0257-17[UASB219-4-5-1], 15B0257-18[UASB219-5-6], 15B0257-19[UASB219-6-7], 15B0257-20[UASB219-7-7.5]

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony
15B0257-06[LPSB116-3.5-4], B114995-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15B0257-06[LPSB116-3.5-4], B114995-MS1

Calcium
15B0257-06[LPSB116-3.5-4], B114995-MS1

Iron
15B0257-06[LPSB116-3.5-4], B114995-MS1

Magnesium
15B0257-06[LPSB116-3.5-4], B114995-MS1

Manganese
15B0257-06[LPSB116-3.5-4], B114995-MS1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-2-2.5 | Sampled: 2/3/2015 16:30

Sample ID: 15B0257-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Barium	110	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Beryllium	0.58	0.28	0.045	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Calcium	1800	8.4	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Chromium	8.6	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Cobalt	11	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Copper	260	0.56	0.43	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Iron	26000	28	24	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:03	AMP
Lead	7.5	0.84	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:31	AMP
Magnesium	7200	84	8.8	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:03	AMP
Manganese	470	0.56	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Mercury	0.0055	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	2/10/15	2/11/15 10:40	SCB
Nickel	48	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Potassium	2400	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:31	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Sodium	140	110	54	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:31	AMP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Vanadium	33	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP
Zinc	42	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:04	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-2-2.5 | Sampled: 2/3/2015 16:30

Sample ID: 15B0257-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.55	0.49	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	86.0			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-4-4.5 | Sampled: 2/3/2015 16:45

Sample ID: 15B0257-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8600	3.0	1.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Barium	55	3.0	0.38	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Beryllium	0.32	0.30	0.049	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Calcium	2000	9.1	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Chromium	15	0.61	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Cobalt	6.4	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Copper	110	0.61	0.46	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Iron	16000	30	26	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:06	AMP
Lead	5.5	0.91	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:35	AMP
Magnesium	3000	9.1	0.95	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Manganese	260	0.61	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Mercury	ND	0.031	0.0044	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:42	SCB
Nickel	39	0.61	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Potassium	930	120	21	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:35	AMP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Sodium	160	120	59	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:35	AMP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Vanadium	26	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP
Zinc	24	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:09	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-4-4.5 | Sampled: 2/3/2015 16:45

Sample ID: 15B0257-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.40	0.36	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	0.16	0.18	0.099	mg/Kg dry	1	J	SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	86.7			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-6-6.5 | Sampled: 2/3/2015 16:50

Sample ID: 15B0257-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4200	3.0	1.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Barium	53	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Beryllium	0.18	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Cadmium	ND	0.30	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Calcium	1300	8.9	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Chromium	6.2	0.59	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Cobalt	4.1	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Copper	26	0.59	0.45	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Iron	12000	30	25	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:10	AMP
Lead	4.0	0.89	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:40	AMP
Magnesium	1800	8.9	0.93	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Manganese	320	0.59	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Mercury	ND	0.026	0.0037	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:43	SCB
Nickel	9.8	0.59	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Potassium	720	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:40	AMP
Selenium	ND	3.0	0.91	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Sodium	77	120	58	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/13/15 19:40	AMP
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Vanadium	12	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP
Zinc	16	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:14	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB226-6-6.5 | Sampled: 2/3/2015 16:50

Sample ID: 15B0257-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.34	0.31	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	0.098	0.17	0.095	mg/Kg dry	1	J	SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	91.5			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB228-2-2.5 | Sampled: 2/4/2015 16:30

Sample ID: 15B0257-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9900	3.3	1.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Antimony	ND	3.3	2.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Arsenic	5.0	3.3	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Barium	89	3.3	0.41	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Beryllium	0.49	0.33	0.053	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Cadmium	ND	0.33	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Calcium	1000	9.8	1.8	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Chromium	23	0.66	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Cobalt	8.1	3.3	0.21	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Copper	770	0.66	0.50	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Iron	24000	33	28	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:14	AMP
Lead	11	0.98	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:45	AMP
Magnesium	2800	9.8	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Manganese	180	0.66	0.21	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Mercury	0.050	0.029	0.0041	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:45	SCB
Nickel	140	0.66	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Potassium	780	130	23	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:45	AMP
Selenium	40	3.3	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Sodium	140	130	64	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:45	AMP
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Vanadium	33	1.3	0.22	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP
Zinc	44	1.3	0.34	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:19	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB228-2-2.5 | Sampled: 2/4/2015 16:30

Sample ID: 15B0257-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.8	0.52	0.47	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	82.0			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB228-7.5-8 | Sampled: 2/4/2015 17:10

Sample ID: 15B0257-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4100	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Barium	50	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Beryllium	0.18	0.28	0.045	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Calcium	1700	8.4	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Chromium	6.3	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Cobalt	5.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Copper	42	0.56	0.42	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Iron	10000	28	24	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:18	AMP
Lead	3.6	0.84	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:50	AMP
Magnesium	2000	8.4	0.87	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Manganese	220	0.56	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Mercury	ND	0.028	0.0040	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:46	SCB
Nickel	16	0.56	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Potassium	870	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:50	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Sodium	130	110	54	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:50	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP
Zinc	19	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:24	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB228-7.5-8 | Sampled: 2/4/2015 17:10

Sample ID: 15B0257-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.4	0.39	0.35	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	90.3			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-3.5-4 | Sampled: 2/6/2015 09:50

Sample ID: 15B0257-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	2.9	1.2	mg/Kg dry	1	MS-19	SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1	MS-07	SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Barium	230	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Beryllium	0.67	0.29	0.046	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Calcium	2500	8.6	1.6	mg/Kg dry	1	MS-19	SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Chromium	85	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Cobalt	36	2.9	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Copper	34	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Iron	37000	29	25	mg/Kg dry	10	MS-19	SW-846 6010C	2/10/15	2/16/15 17:02	AMP
Lead	8.7	0.86	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:26	AMP
Magnesium	7400	86	9.0	mg/Kg dry	10	MS-19	SW-846 6010C	2/10/15	2/16/15 17:02	AMP
Manganese	730	0.58	0.18	mg/Kg dry	1	MS-19	SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Mercury	0.016	0.030	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/10/15	2/11/15 10:47	SCB
Nickel	46	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:26	AMP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Sodium	260	120	56	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 19:26	AMP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Vanadium	66	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP
Zinc	35	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 16:48	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-3.5-4 | Sampled: 2/6/2015 09:50

Sample ID: 15B0257-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.44	0.39	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	86.3			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-10-11 | Sampled: 2/6/2015 10:30

Sample ID: 15B0257-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	2.7	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Barium	250	2.7	0.34	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Beryllium	0.76	0.27	0.043	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Calcium	1200	8.1	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Chromium	40	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Cobalt	25	2.7	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Copper	38	0.54	0.41	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Iron	39000	27	23	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:22	AMP
Lead	4.8	0.81	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Magnesium	17000	81	8.5	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:22	AMP
Manganese	250	0.54	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Mercury	0.0035	0.024	0.0035	mg/Kg dry	1	J	SW-846 7471B	2/10/15	2/11/15 10:49	SCB
Nickel	70	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Potassium	6000	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:25	AMP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Sodium	660	110	53	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:25	AMP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Vanadium	51	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP
Zinc	43	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:29	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-10-11 | Sampled: 2/6/2015 10:30

Sample ID: 15B0257-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.36	0.32	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.16	0.091	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	95.6			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-13-14 | Sampled: 2/6/2015 10:45

Sample ID: 15B0257-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	37000	2.9	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Barium	1100	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Beryllium	0.91	0.29	0.047	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Calcium	15000	8.7	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Chromium	14	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Cobalt	29	2.9	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Copper	43	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Iron	75000	290	250	mg/Kg dry	100		SW-846 6010C	2/10/15	2/18/15 17:56	AMP
Lead	6.7	0.87	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Magnesium	36000	87	9.1	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:27	AMP
Manganese	450	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Mercury	0.0037	0.026	0.0037	mg/Kg dry	1	J	SW-846 7471B	2/10/15	2/11/15 10:50	SCB
Nickel	59	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Potassium	11000	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:29	AMP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Sodium	1900	120	56	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:29	AMP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Vanadium	70	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP
Zinc	57	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:33	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: LPSB116-13-14 | Sampled: 2/6/2015 10:45

Sample ID: 15B0257-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.43	0.39	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	2/10/15	2/10/15 12:30	LL
% Solids	88.9			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-0-1 | Sampled: 2/6/2015 11:00

Sample ID: 15B0257-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.1	1.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Antimony	7.4	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Barium	97	3.1	0.38	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Beryllium	0.34	0.31	0.050	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Cadmium	0.74	0.31	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Calcium	2400	9.2	1.7	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Chromium	120	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Cobalt	55	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Copper	28	0.62	0.47	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Iron	45000	31	26	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:32	AMP
Lead	18	0.92	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Magnesium	52000	92	9.6	mg/Kg dry	10		SW-846 6010C	2/10/15	2/17/15 13:32	AMP
Manganese	520	0.62	0.20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Mercury	0.020	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/10/15	2/11/15 10:56	SCB
Nickel	280	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Potassium	850	120	21	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:34	AMP
Selenium	ND	3.1	0.95	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Silver	ND	0.62	0.54	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Sodium	140	120	60	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:34	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Vanadium	24	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP
Zinc	70	1.2	0.32	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:37	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-0-1 | Sampled: 2/6/2015 11:00

Sample ID: 15B0257-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.36	0.32	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.21	0.12	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	76.1			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-1-2 | Sampled: 2/6/2015 11:05

Sample ID: 15B0257-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9500	2.7	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Antimony	12	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Barium	60	2.7	0.34	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Beryllium	0.19	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Calcium	3200	8.1	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Chromium	270	0.54	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Cobalt	120	2.7	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Copper	12	0.54	0.41	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Iron	140000	270	230	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 13:42	AMP
Lead	15	0.81	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Magnesium	210000	810	85	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 13:42	AMP
Manganese	1100	0.54	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Mercury	ND	0.026	0.0037	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:57	SCB
Nickel	660	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Potassium	280	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:39	AMP
Selenium	ND	5.4	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 13:37	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Sodium	250	110	53	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:39	AMP
Thallium	ND	5.4	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 13:37	AMP
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP
Zinc	77	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 21:42	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-1-2 | Sampled: 2/6/2015 11:05

Sample ID: 15B0257-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.48	0.43	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	88.0			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-2-3 | Sampled: 2/6/2015 11:10

Sample ID: 15B0257-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Antimony	7.4	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/18/15 18:01	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/10/15	2/18/15 18:01	AMP
Barium	68	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Beryllium	0.27	0.28	0.046	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:23	AMP
Calcium	3000	8.5	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Chromium	350	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Cobalt	110	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:23	AMP
Copper	17	0.57	0.43	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Iron	110000	280	240	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:10	AMP
Lead	13	0.85	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:23	AMP
Magnesium	160000	850	89	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:10	AMP
Manganese	920	0.57	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 10:59	SCB
Nickel	670	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:23	AMP
Potassium	360	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:44	AMP
Selenium	ND	5.7	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:05	AMP
Silver	1.0	0.57	0.50	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Sodium	220	110	55	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:44	AMP
Thallium	ND	5.7	1.9	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:05	AMP
Vanadium	15	1.1	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:05	AMP
Zinc	69	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/10/15	2/18/15 18:01	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-2-3 | Sampled: 2/6/2015 11:10

Sample ID: 15B0257-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.53	0.48	mg/Kg dry	1		SW-846 9014	2/12/15	2/13/15 10:30	ABH
Hexavalent Chromium	0.15	0.18	0.099	mg/Kg dry	1	J	SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	86.5			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-3-4 | Sampled: 2/6/2015 11:15

Sample ID: 15B0257-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	2.6	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Antimony	14	2.6	2.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:26	AMP
Arsenic	4.5	2.6	0.94	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:26	AMP
Barium	44	2.6	0.32	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Beryllium	0.16	0.26	0.041	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:28	AMP
Calcium	2800	7.7	1.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Chromium	260	0.51	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Cobalt	110	2.6	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:28	AMP
Copper	32	0.51	0.39	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Iron	130000	260	220	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:19	AMP
Lead	13	0.77	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:28	AMP
Magnesium	180000	770	80	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:19	AMP
Manganese	940	0.51	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Mercury	ND	0.027	0.0038	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:00	SCB
Nickel	580	0.51	0.12	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:28	AMP
Potassium	130	100	18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:49	AMP
Selenium	ND	5.1	1.6	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:14	AMP
Silver	ND	0.51	0.45	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Sodium	260	100	50	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:49	AMP
Thallium	ND	5.1	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:14	AMP
Vanadium	14	1.0	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:09	AMP
Zinc	77	1.0	0.27	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:26	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-3-4 | Sampled: 2/6/2015 11:15

Sample ID: 15B0257-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	91.6			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-7-8 | Sampled: 2/6/2015 11:25

Sample ID: 15B0257-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	2.5	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Antimony	14	2.5	2.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:31	AMP
Arsenic	4.2	2.5	0.92	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:31	AMP
Barium	62	2.5	0.31	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Beryllium	0.13	0.25	0.040	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Cadmium	ND	0.25	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:33	AMP
Calcium	2500	7.5	1.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Chromium	310	0.50	0.12	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Cobalt	120	2.5	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:33	AMP
Copper	5.3	0.50	0.38	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Iron	160000	250	210	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:28	AMP
Lead	15	0.75	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:33	AMP
Magnesium	280000	750	78	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:28	AMP
Manganese	1100	0.50	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Mercury	ND	0.026	0.0037	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:01	SCB
Nickel	710	0.50	0.12	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:33	AMP
Potassium	150	100	17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:54	AMP
Selenium	ND	5.0	1.5	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:23	AMP
Silver	ND	0.50	0.44	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Sodium	160	100	49	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:54	AMP
Thallium	ND	5.0	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:23	AMP
Vanadium	10	1.0	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:13	AMP
Zinc	80	1.0	0.26	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:31	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-7-8 | Sampled: 2/6/2015 11:25

Sample ID: 15B0257-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.46	0.42	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.094	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	92.8			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-8-9 | Sampled: 2/6/2015 14:30

Sample ID: 15B0257-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	18000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Antimony	9.6	2.8	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:36	AMP
Arsenic	3.2	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:36	AMP
Barium	83	2.6	0.33	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Beryllium	0.20	0.26	0.042	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Cadmium	ND	0.26	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:37	AMP
Calcium	9000	7.9	1.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Chromium	200	0.53	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Cobalt	79	2.6	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:37	AMP
Copper	15	0.53	0.40	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Iron	120000	260	230	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:37	AMP
Lead	10	0.79	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:37	AMP
Magnesium	220000	790	83	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:37	AMP
Manganese	680	0.53	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:03	SCB
Nickel	450	0.53	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:37	AMP
Potassium	440	110	18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:58	AMP
Selenium	ND	5.3	1.6	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:32	AMP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Sodium	310	110	51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 20:58	AMP
Thallium	ND	2.6	0.88	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Vanadium	20	1.1	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:18	AMP
Zinc	58	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:36	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB218-8-9 | Sampled: 2/6/2015 14:30

Sample ID: 15B0257-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.49	0.44	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	92.5			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-1-2 | Sampled: 2/6/2015 14:05

Sample ID: 15B0257-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	21000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:41	AMP
Arsenic	1.0	2.7	0.98	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 12:41	AMP
Barium	260	2.8	0.34	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Beryllium	0.41	0.28	0.044	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:42	AMP
Calcium	4600	8.3	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Chromium	280	0.55	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Cobalt	79	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:42	AMP
Copper	170	0.55	0.42	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Iron	91000	280	240	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:46	AMP
Lead	11	0.83	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:42	AMP
Magnesium	84000	830	87	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 14:46	AMP
Manganese	610	0.55	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:04	SCB
Nickel	400	0.55	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:42	AMP
Potassium	3600	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:03	AMP
Selenium	ND	5.5	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 14:41	AMP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Sodium	1000	110	54	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:03	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Vanadium	33	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:22	AMP
Zinc	51	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:41	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-1-2 | Sampled: 2/6/2015 14:05

Sample ID: 15B0257-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.39	0.35	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	85.6			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-4-5 | Sampled: 2/6/2015 14:10

Sample ID: 15B0257-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9100	2.9	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Antimony	14	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:46	AMP
Arsenic	4.4	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:46	AMP
Barium	83	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Beryllium	0.19	0.29	0.047	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:47	AMP
Calcium	1300	8.7	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Chromium	290	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Cobalt	130	2.9	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:47	AMP
Copper	14	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Iron	140000	290	250	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:15	AMP
Lead	14	0.87	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:47	AMP
Magnesium	220000	870	91	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:15	AMP
Manganese	1100	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Mercury	ND	0.025	0.0036	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:06	SCB
Nickel	730	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:47	AMP
Potassium	430	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:08	AMP
Selenium	ND	5.8	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:10	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Sodium	160	120	56	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:08	AMP
Thallium	ND	5.8	1.9	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:10	AMP
Vanadium	15	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:26	AMP
Zinc	68	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:46	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-4-5 | Sampled: 2/6/2015 14:10

Sample ID: 15B0257-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	90.6			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-4-5-1 | Sampled: 2/6/2015 14:10

Sample ID: 15B0257-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9800	2.7	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Antimony	14	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:51	AMP
Arsenic	5.8	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:51	AMP
Barium	86	2.7	0.34	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Beryllium	0.21	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:52	AMP
Calcium	1400	8.2	1.5	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Chromium	320	0.55	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Cobalt	120	2.7	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:52	AMP
Copper	18	0.55	0.42	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Iron	120000	270	230	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:23	AMP
Lead	13	0.82	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:52	AMP
Magnesium	180000	820	86	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:23	AMP
Manganese	1100	0.55	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:07	SCB
Nickel	690	0.55	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:52	AMP
Potassium	540	110	19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:33	AMP
Selenium	ND	5.5	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:18	AMP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Sodium	200	110	54	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:33	AMP
Thallium	ND	5.5	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:18	AMP
Vanadium	16	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:31	AMP
Zinc	66	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:51	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-4-5-1 | Sampled: 2/6/2015 14:10

Sample ID: 15B0257-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.33	0.30	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	90.8			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-5-6 | Sampled: 2/6/2015 14:15

Sample ID: 15B0257-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7700	2.6	1.1	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Antimony	13	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:56	AMP
Arsenic	6.1	2.7	0.99	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:56	AMP
Barium	72	2.6	0.33	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Beryllium	0.20	0.26	0.042	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Cadmium	ND	0.26	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:57	AMP
Calcium	1300	7.9	1.4	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Chromium	280	0.53	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Cobalt	130	2.6	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:57	AMP
Copper	6.4	0.53	0.40	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Iron	150000	260	230	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:32	AMP
Lead	15	0.79	0.16	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:57	AMP
Magnesium	250000	790	83	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:32	AMP
Manganese	1100	0.53	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:09	SCB
Nickel	710	0.53	0.13	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 16:57	AMP
Potassium	270	110	18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:38	AMP
Selenium	ND	5.3	1.6	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:27	AMP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Sodium	170	110	51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:38	AMP
Thallium	ND	5.3	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:27	AMP
Vanadium	13	1.1	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:36	AMP
Zinc	76	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 12:56	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-5-6 | Sampled: 2/6/2015 14:15

Sample ID: 15B0257-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.49	0.44	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	91.2			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-6-7 | Sampled: 2/6/2015 14:20

Sample ID: 15B0257-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	2.9	1.2	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Antimony	11	2.6	2.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:01	AMP
Arsenic	4.6	2.6	0.95	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:01	AMP
Barium	70	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Beryllium	0.18	0.29	0.046	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:02	AMP
Calcium	1200	8.6	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Chromium	290	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Cobalt	120	2.9	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:02	AMP
Copper	4.3	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Iron	130000	290	250	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:41	AMP
Lead	14	0.86	0.17	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:02	AMP
Magnesium	210000	860	90	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:41	AMP
Manganese	1000	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Mercury	ND	0.025	0.0036	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:14	SCB
Nickel	660	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:02	AMP
Potassium	190	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:42	AMP
Selenium	ND	5.8	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:37	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Sodium	160	120	56	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:42	AMP
Thallium	ND	5.8	1.9	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:37	AMP
Vanadium	14	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:41	AMP
Zinc	64	1.1	0.27	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:01	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-6-7 | Sampled: 2/6/2015 14:20

Sample ID: 15B0257-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.37	0.33	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.094	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	92.5			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-7-7.5 | Sampled: 2/6/2015 14:25

Sample ID: 15B0257-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8700	3.0	1.3	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Antimony	11	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:06	AMP
Arsenic	4.7	2.7	0.98	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:06	AMP
Barium	68	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Beryllium	0.18	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:05	AMP
Calcium	1200	8.9	1.6	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Chromium	330	0.59	0.15	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Cobalt	120	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:05	AMP
Copper	4.3	0.59	0.45	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Iron	130000	300	250	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:50	AMP
Lead	13	0.89	0.18	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:05	AMP
Magnesium	220000	890	93	mg/Kg dry	100		SW-846 6010C	2/10/15	2/17/15 15:50	AMP
Manganese	1000	0.59	0.19	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Mercury	ND	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	2/10/15	2/11/15 11:15	SCB
Nickel	650	0.59	0.14	mg/Kg dry	1		SW-846 6010C	2/10/15	2/17/15 17:05	AMP
Potassium	190	120	20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:47	AMP
Selenium	ND	5.9	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:45	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Sodium	190	120	58	mg/Kg dry	1		SW-846 6010C	2/10/15	2/13/15 21:47	AMP
Thallium	ND	5.9	2.0	mg/Kg dry	2	DL-04	SW-846 6010C	2/10/15	2/17/15 15:45	AMP
Vanadium	15	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/10/15	2/16/15 22:46	AMP
Zinc	59	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 13:06	AMP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0257

Date Received: 2/7/2015

Field Sample #: UASB219-7-7.5 | Sampled: 2/6/2015 14:25

Sample ID: 15B0257-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.38	0.34	mg/Kg dry	1		SW-846 9014	2/13/15	2/13/15 16:00	ABH
Hexavalent Chromium	ND	0.17	0.093	mg/Kg dry	1		SW-846 7196A	2/13/15	2/13/15 14:00	LL
% Solids	91.2			% Wt	1		SM 2540G	2/10/15	2/11/15 4:07	JJL

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0257-01 [UASB226-2-2.5]	B115009	02/10/15
15B0257-02 [UASB226-4-4.5]	B115009	02/10/15
15B0257-03 [UASB226-6-6.5]	B115009	02/10/15
15B0257-04 [UASB228-2-2.5]	B115009	02/10/15
15B0257-05 [UASB228-7.5-8]	B115009	02/10/15
15B0257-06 [LPSB116-3.5-4]	B115009	02/10/15
15B0257-07 [LPSB116-10-11]	B115009	02/10/15
15B0257-08 [LPSB116-13-14]	B115009	02/10/15
15B0257-09 [UASB218-0-1]	B115009	02/10/15
15B0257-10 [UASB218-1-2]	B115009	02/10/15
15B0257-11 [UASB218-2-3]	B115009	02/10/15
15B0257-12 [UASB218-3-4]	B115009	02/10/15
15B0257-13 [UASB218-7-8]	B115009	02/10/15
15B0257-14 [UASB218-8-9]	B115009	02/10/15
15B0257-15 [UASB219-1-2]	B115009	02/10/15
15B0257-16 [UASB219-4-5]	B115009	02/10/15
15B0257-17 [UASB219-4-5-1]	B115009	02/10/15
15B0257-18 [UASB219-5-6]	B115009	02/10/15
15B0257-19 [UASB219-6-7]	B115009	02/10/15
15B0257-20 [UASB219-7-7.5]	B115009	02/10/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-01 [UASB226-2-2.5]	B114995	1.04	50.0	02/10/15
15B0257-02 [UASB226-4-4.5]	B114995	0.951	50.0	02/10/15
15B0257-03 [UASB226-6-6.5]	B114995	0.924	50.0	02/10/15
15B0257-04 [UASB228-2-2.5]	B114995	0.929	50.0	02/10/15
15B0257-05 [UASB228-7.5-8]	B114995	0.994	50.0	02/10/15
15B0257-06 [LPSB116-3.5-4]	B114995	1.01	50.0	02/10/15
15B0257-07 [LPSB116-10-11]	B114995	0.969	50.0	02/10/15
15B0257-08 [LPSB116-13-14]	B114995	0.970	50.0	02/10/15
15B0257-09 [UASB218-0-1]	B114995	1.07	50.0	02/10/15
15B0257-10 [UASB218-1-2]	B114995	1.05	50.0	02/10/15
15B0257-11 [UASB218-2-3]	B114995	1.02	50.0	02/10/15
15B0257-12 [UASB218-3-4]	B114995	1.06	50.0	02/10/15
15B0257-13 [UASB218-7-8]	B114995	1.08	50.0	02/10/15
15B0257-14 [UASB218-8-9]	B114995	1.02	50.0	02/10/15
15B0257-15 [UASB219-1-2]	B114995	1.06	50.0	02/10/15
15B0257-16 [UASB219-4-5]	B114995	0.952	50.0	02/10/15
15B0257-17 [UASB219-4-5-1]	B114995	1.00	50.0	02/10/15
15B0257-18 [UASB219-5-6]	B114995	1.04	50.0	02/10/15
15B0257-19 [UASB219-6-7]	B114995	0.938	50.0	02/10/15
15B0257-20 [UASB219-7-7.5]	B114995	0.922	50.0	02/10/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-12RE1 [UASB218-3-4]	B115739	1.05	50.0	02/23/15
15B0257-13RE1 [UASB218-7-8]	B115739	1.06	50.0	02/23/15
15B0257-14RE1 [UASB218-8-9]	B115739	0.971	50.0	02/23/15
15B0257-15RE1 [UASB219-1-2]	B115739	1.08	50.0	02/23/15
15B0257-16RE1 [UASB219-4-5]	B115739	0.984	50.0	02/23/15

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-17RE1 [UASB219-4-5-1]	B115739	0.982	50.0	02/23/15
15B0257-18RE1 [UASB219-5-6]	B115739	1.00	50.0	02/23/15
15B0257-19RE1 [UASB219-6-7]	B115739	1.02	50.0	02/23/15
15B0257-20RE1 [UASB219-7-7.5]	B115739	1.00	50.0	02/23/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-01 [UASB226-2-2.5]	B115008	2.58	100	02/10/15
15B0257-02 [UASB226-4-4.5]	B115008	2.57	100	02/10/15
15B0257-03 [UASB226-6-6.5]	B115008	2.52	100	02/10/15
15B0257-04 [UASB228-2-2.5]	B115008	2.57	100	02/10/15
15B0257-05 [UASB228-7.5-8]	B115008	2.55	100	02/10/15
15B0257-06 [LPSB116-3.5-4]	B115008	2.50	100	02/10/15
15B0257-07 [LPSB116-10-11]	B115008	2.54	100	02/10/15
15B0257-08 [LPSB116-13-14]	B115008	2.55	100	02/10/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-09 [UASB218-0-1]	B115254	2.51	100	02/13/15
15B0257-10 [UASB218-1-2]	B115254	2.53	100	02/13/15
15B0257-11 [UASB218-2-3]	B115254	2.58	100	02/13/15
15B0257-12 [UASB218-3-4]	B115254	2.54	100	02/13/15
15B0257-13 [UASB218-7-8]	B115254	2.52	100	02/13/15
15B0257-14 [UASB218-8-9]	B115254	2.51	100	02/13/15
15B0257-15 [UASB219-1-2]	B115254	2.59	100	02/13/15
15B0257-16 [UASB219-4-5]	B115254	2.51	100	02/13/15
15B0257-17 [UASB219-4-5-1]	B115254	2.53	100	02/13/15
15B0257-18 [UASB219-5-6]	B115254	2.54	100	02/13/15
15B0257-19 [UASB219-6-7]	B115254	2.53	100	02/13/15
15B0257-20 [UASB219-7-7.5]	B115254	2.58	100	02/13/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-01 [UASB226-2-2.5]	B115047	0.628	50.0	02/10/15
15B0257-02 [UASB226-4-4.5]	B115047	0.567	50.0	02/10/15
15B0257-03 [UASB226-6-6.5]	B115047	0.631	50.0	02/10/15
15B0257-04 [UASB228-2-2.5]	B115047	0.636	50.0	02/10/15
15B0257-05 [UASB228-7.5-8]	B115047	0.601	50.0	02/10/15
15B0257-06 [LPSB116-3.5-4]	B115047	0.570	50.0	02/10/15
15B0257-07 [LPSB116-10-11]	B115047	0.655	50.0	02/10/15
15B0257-08 [LPSB116-13-14]	B115047	0.652	50.0	02/10/15
15B0257-09 [UASB218-0-1]	B115047	0.641	50.0	02/10/15
15B0257-10 [UASB218-1-2]	B115047	0.668	50.0	02/10/15
15B0257-11 [UASB218-2-3]	B115047	0.599	50.0	02/10/15
15B0257-12 [UASB218-3-4]	B115047	0.616	50.0	02/10/15
15B0257-13 [UASB218-7-8]	B115047	0.633	50.0	02/10/15
15B0257-14 [UASB218-8-9]	B115047	0.605	50.0	02/10/15
15B0257-15 [UASB219-1-2]	B115047	0.644	50.0	02/10/15

con-test® ANALYTICAL LABORATORY
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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-16 [UASB219-4-5]	B115047	0.655	50.0	02/10/15
15B0257-17 [UASB219-4-5-1]	B115047	0.616	50.0	02/10/15
15B0257-18 [UASB219-5-6]	B115047	0.603	50.0	02/10/15
15B0257-19 [UASB219-6-7]	B115047	0.648	50.0	02/10/15
15B0257-20 [UASB219-7-7.5]	B115047	0.584	50.0	02/10/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-01 [UASB226-2-2.5]	B115198	1.07	50.0	02/12/15
15B0257-02 [UASB226-4-4.5]	B115198	1.43	50.0	02/12/15
15B0257-03 [UASB226-6-6.5]	B115198	1.60	50.0	02/12/15
15B0257-04 [UASB228-2-2.5]	B115198	1.16	50.0	02/12/15
15B0257-05 [UASB228-7.5-8]	B115198	1.42	50.0	02/12/15
15B0257-06 [LPSB116-3.5-4]	B115198	1.33	50.0	02/12/15
15B0257-07 [LPSB116-10-11]	B115198	1.47	50.0	02/12/15
15B0257-08 [LPSB116-13-14]	B115198	1.30	50.0	02/12/15
15B0257-09 [UASB218-0-1]	B115198	1.82	50.0	02/12/15
15B0257-10 [UASB218-1-2]	B115198	1.19	50.0	02/12/15
15B0257-11 [UASB218-2-3]	B115198	1.09	50.0	02/12/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0257-12 [UASB218-3-4]	B115281	1.08	50.0	02/13/15
15B0257-13 [UASB218-7-8]	B115281	1.16	50.0	02/13/15
15B0257-14 [UASB218-8-9]	B115281	1.10	50.0	02/13/15
15B0257-15 [UASB219-1-2]	B115281	1.51	50.0	02/13/15
15B0257-16 [UASB219-4-5]	B115281	1.11	50.0	02/13/15
15B0257-17 [UASB219-4-5-1]	B115281	1.66	50.0	02/13/15
15B0257-18 [UASB219-5-6]	B115281	1.13	50.0	02/13/15
15B0257-19 [UASB219-6-7]	B115281	1.48	50.0	02/13/15
15B0257-20 [UASB219-7-7.5]	B115281	1.44	50.0	02/13/15

con-test® ANALYTICAL LABORATORY
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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B114995 - SW-846 3050B										
Blank (B114995-BLK1)			Prepared: 02/10/15 Analyzed: 02/16/15							
Aluminum	1.6	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	2.3	2.5	mg/Kg wet							J
Lead	0.17	0.75	mg/Kg wet							J
Magnesium	1.1	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B114995-BS1)			Prepared: 02/10/15 Analyzed: 02/16/15							
Aluminum	6620	5.3	mg/Kg wet	8100		81.7	51.2-148.1			
Antimony	100	5.3	mg/Kg wet	116		86.4	0-210.3			
Arsenic	127	5.3	mg/Kg wet	122		104	77.8-122.1			
Barium	164	5.3	mg/Kg wet	167		98.4	82-117.4			
Beryllium	56.9	0.53	mg/Kg wet	54.3		105	82.3-117.7			
Cadmium	85.5	0.53	mg/Kg wet	88.0		97.2	81.9-118.2			
Calcium	5760	16	mg/Kg wet	5920		97.4	81.9-118.2			
Chromium	101	1.1	mg/Kg wet	102		98.9	78.7-120.6			
Cobalt	97.1	5.3	mg/Kg wet	99.4		97.7	83-116.7			
Copper	76.4	1.1	mg/Kg wet	78.0		97.9	80.4-119.6			
Iron	13300	5.3	mg/Kg wet	15100		88.0	46.8-153			
Lead	89.0	1.6	mg/Kg wet	94.5		94.2	82.4-117.8			
Magnesium	2920	16	mg/Kg wet	3020		96.7	75.5-124.2			
Manganese	405	1.1	mg/Kg wet	401		101	80.8-119.2			
Nickel	54.0	1.1	mg/Kg wet	56.3		95.9	82.2-117.8			
Potassium	2640	210	mg/Kg wet	2490		106	69.9-130.1			
Selenium	154	5.3	mg/Kg wet	157		97.9	77.1-122.3			
Silver	33.8	1.1	mg/Kg wet	34.2		98.7	74.3-125.4			
Sodium	237	210	mg/Kg wet	246		96.5	69.9-130.5			
Thallium	107	5.3	mg/Kg wet	116		92.2	78.2-121.6			
Vanadium	69.2	2.1	mg/Kg wet	67.1		103	64.8-135.2			
Zinc	211	2.1	mg/Kg wet	207		102	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B114995 - SW-846 3050B										
LCS Dup (B114995-BSD1)				Prepared: 02/10/15 Analyzed: 02/16/15						
Aluminum	6670	5.4	mg/Kg wet	8190		81.4	51.2-148.1	0.743	30	
Antimony	95.3	5.4	mg/Kg wet	117		81.2	0-210.3	5.05	30	
Arsenic	125	5.4	mg/Kg wet	123		101	77.8-122.1	1.49	30	
Barium	161	5.4	mg/Kg wet	169		95.3	82-117.4	2.12	30	
Beryllium	57.0	0.54	mg/Kg wet	54.9		104	82.3-117.7	0.0909	30	
Cadmium	85.2	0.54	mg/Kg wet	89.0		95.7	81.9-118.2	0.368	30	
Calcium	5670	16	mg/Kg wet	5990		94.6	81.9-118.2	1.67	30	
Chromium	101	1.1	mg/Kg wet	103		97.5	78.7-120.6	0.325	30	
Cobalt	96.3	5.4	mg/Kg wet	101		95.7	83-116.7	0.924	30	
Copper	76.5	1.1	mg/Kg wet	78.9		96.9	80.4-119.6	0.112	30	
Iron	13500	5.4	mg/Kg wet	15300		88.4	46.8-153	1.59	30	
Lead	87.1	1.6	mg/Kg wet	95.6		91.1	82.4-117.8	2.22	30	
Magnesium	2890	16	mg/Kg wet	3060		94.6	75.5-124.2	0.968	30	
Manganese	378	1.1	mg/Kg wet	406		93.3	80.8-119.2	6.81	30	
Nickel	53.6	1.1	mg/Kg wet	57.0		94.1	82.2-117.8	0.667	30	
Potassium	2540	220	mg/Kg wet	2520		101	69.9-130.1	3.92	30	
Selenium	153	5.4	mg/Kg wet	159		96.5	77.1-122.3	0.279	30	
Silver	31.5	1.1	mg/Kg wet	34.6		91.1	74.3-125.4	6.86	30	
Sodium	232	220	mg/Kg wet	249		93.1	69.9-130.5	2.34	30	
Thallium	104	5.4	mg/Kg wet	117		88.7	78.2-121.6	2.67	30	
Vanadium	68.7	2.2	mg/Kg wet	67.9		101	64.8-135.2	0.773	30	
Zinc	207	2.2	mg/Kg wet	209		98.7	79.7-120.8	1.84	30	
Duplicate (B114995-DUP1)		**Source: 15B0257-06**		Prepared: 02/10/15 Analyzed: 02/16/15						
Aluminum	18000	2.9	mg/Kg dry		16500			8.32	35	
Antimony	ND	2.9	mg/Kg dry		ND			NC	35	
Arsenic	ND	2.9	mg/Kg dry		ND			NC	35	
Barium	256	2.9	mg/Kg dry		225			12.7	35	
Beryllium	0.837	0.29	mg/Kg dry		0.670			22.1	35	
Cadmium	ND	0.29	mg/Kg dry		ND			NC	35	
Calcium	2360	8.8	mg/Kg dry		2490			5.21	35	
Chromium	91.3	0.59	mg/Kg dry		84.7			7.50	35	
Cobalt	41.6	2.9	mg/Kg dry		35.8			14.8	35	
Copper	37.1	0.59	mg/Kg dry		33.5			10.2	35	
Iron	43900	29	mg/Kg dry		36600			18.2	35	
Lead	8.78	0.88	mg/Kg dry		8.72			0.659	35	
Magnesium	8960	88	mg/Kg dry		7380			19.4	35	
Manganese	716	0.59	mg/Kg dry		731			2.12	35	
Nickel	50.8	0.59	mg/Kg dry		45.7			10.7	35	
Potassium	1120	120	mg/Kg dry		1120			0.179	35	
Selenium	ND	2.9	mg/Kg dry		ND			NC	35	
Silver	ND	0.59	mg/Kg dry		ND			NC	35	
Sodium	254	120	mg/Kg dry		265			3.95	35	
Thallium	ND	2.9	mg/Kg dry		ND			NC	35	
Vanadium	71.2	1.2	mg/Kg dry		65.6			8.22	35	
Zinc	39.3	1.2	mg/Kg dry		34.8			12.0	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B114995 - SW-846 3050B											
MRL Check (B114995-MRL1)				Prepared: 02/10/15 Analyzed: 02/13/15							
Lead	0.842	0.77	mg/Kg wet	0.774		109		80-120			
Matrix Spike (B114995-MS1)		**Source: 15B0257-06**		Prepared: 02/10/15 Analyzed: 02/16/15							
Aluminum	16100	3.0	mg/Kg dry	120	16500	**-386**	*	75-125			MS-19
Antimony	51.6	3.0	mg/Kg dry	120	ND	**43.1**	*	75-125			MS-07
Arsenic	114	3.0	mg/Kg dry	120	ND	95.3		75-125			
Barium	333	3.0	mg/Kg dry	120	225	90.3		75-125			
Beryllium	118	0.30	mg/Kg dry	120	0.670	97.8		75-125			
Cadmium	111	0.30	mg/Kg dry	120	ND	92.4		75-125			
Calcium	2300	9.0	mg/Kg dry	120	2490	**-156**	*	75-125			MS-19
Chromium	191	0.60	mg/Kg dry	120	84.7	89.1		75-125			
Cobalt	138	3.0	mg/Kg dry	120	35.8	84.9		75-125			
Copper	151	0.60	mg/Kg dry	120	33.5	98.1		75-125			
Iron	35400	30	mg/Kg dry	120	36600	**-980**	*	75-125			MS-19
Lead	113	0.90	mg/Kg dry	120	8.72	86.8		75-125			
Magnesium	7020	90	mg/Kg dry	120	7380	**-297**	*	75-125			MS-19
Manganese	601	0.60	mg/Kg dry	120	731	**-109**	*	75-125			MS-19
Nickel	150	0.60	mg/Kg dry	120	45.7	86.9		75-125			
Potassium	2420	120	mg/Kg dry	1200	1120	109		75-125			
Selenium	107	3.0	mg/Kg dry	120	ND	89.3		75-125			
Silver	110	0.60	mg/Kg dry	120	ND	91.8		75-125			
Sodium	408	120	mg/Kg dry	120	265	120		75-125			
Thallium	102	3.0	mg/Kg dry	120	ND	84.9		75-125			
Vanadium	178	1.2	mg/Kg dry	120	65.6	94.1		75-125			
Zinc	147	1.2	mg/Kg dry	120	34.8	94.0		75-125			
Batch B115047 - SW-846 7471											
Blank (B115047-BLK1)				Prepared: 02/10/15 Analyzed: 02/11/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B115047-BS1)				Prepared: 02/10/15 Analyzed: 02/11/15							
Mercury	5.86	0.34	mg/Kg wet	5.76		102		71.2-128.6			
LCS Dup (B115047-BSD1)				Prepared: 02/10/15 Analyzed: 02/11/15							
Mercury	5.33	0.32	mg/Kg wet	5.76		92.6		71.2-128.6	9.42	30	
Duplicate (B115047-DUP1)		**Source: 15B0257-17**		Prepared: 02/10/15 Analyzed: 02/11/15							
Mercury	ND	0.028	mg/Kg dry		ND				NC	35	
Matrix Spike (B115047-MS1)		**Source: 15B0257-17**		Prepared: 02/10/15 Analyzed: 02/11/15							
Mercury	0.168	0.026	mg/Kg dry	0.172	ND	98.1		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115739 - SW-846 3050B										
Blank (B115739-BLK1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Antimony	2.4	2.5	mg/Kg wet							J
Arsenic	ND	2.5	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B115739-BS1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Antimony	101	5.0	mg/Kg wet	116		87.1	0-210.3			
Arsenic	129	5.0	mg/Kg wet	122		106	77.8-122.1			
Zinc	212	2.0	mg/Kg wet	207		103	79.7-120.8			
LCS Dup (B115739-BSD1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Antimony	99.8	5.0	mg/Kg wet	116		86.1	0-210.3	1.16	30	
Arsenic	128	5.0	mg/Kg wet	122		105	77.8-122.1	0.497	30	
Zinc	216	2.0	mg/Kg wet	207		104	79.7-120.8	1.67	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115008 - SW-846 7196A										
Blank (B115008-BLK1)				Prepared & Analyzed: 02/10/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B115008-BS1)				Prepared & Analyzed: 02/10/15						
Hexavalent Chromium	52	1.9	mg/Kg wet	59.2		88.6	80-120			
LCS Dup (B115008-BSD1)				Prepared & Analyzed: 02/10/15						
Hexavalent Chromium	55	1.9	mg/Kg wet	58.7		93.5	80-120	4.51	20	
Batch B115009 - % Solids										
Duplicate (B115009-DUP8)	**Source: 15B0257-01**			Prepared: 02/10/15 Analyzed: 02/11/15						
% Solids	87.0		% Wt		86.0			1.16	20	
Batch B115198 - SW-846 9014										
Blank (B115198-BLK1)				Prepared: 02/12/15 Analyzed: 02/13/15						
Cyanide	ND	0.47	mg/Kg wet							
LCS (B115198-BS1)				Prepared: 02/12/15 Analyzed: 02/13/15						
Cyanide	58	2.4	mg/Kg wet	63.2		91.9	80-120			
LCS Dup (B115198-BSD1)				Prepared: 02/12/15 Analyzed: 02/13/15						
Cyanide	67	2.5	mg/Kg wet	63.2		106	80-120	14.2	20	
Matrix Spike (B115198-MS1)	**Source: 15B0257-11**			Prepared: 02/12/15 Analyzed: 02/13/15						
Cyanide	20	0.53	mg/Kg dry	18.9	ND	106	75-125			
Matrix Spike Dup (B115198-MSD1)	**Source: 15B0257-11**			Prepared: 02/12/15 Analyzed: 02/13/15						
Cyanide	15	0.53	mg/Kg dry	19.0	ND	81.2	75-125	26.3	35	
Batch B115254 - SW-846 7196A										
Blank (B115254-BLK1)				Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B115254-BS1)				Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	59	1.9	mg/Kg wet	59.0		100	80-120			
LCS Dup (B115254-BSD1)				Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	59	1.8	mg/Kg wet	57.8		102	80-120	0.0351	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115254 - SW-846 7196A										
Matrix Spike (B115254-MS1) Soluble MS		**Source: 15B0257-12**		Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	38	0.87	mg/Kg dry	43.3	ND	87.8	75-125			
Matrix Spike (B115254-MS2) PDMS		**Source: 15B0257-12**		Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	49	1.7	mg/Kg dry	42.8	ND	114	75-125			
Matrix Spike (B115254-MS3) Insoluble MS		**Source: 15B0257-12**		Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	550	17	mg/Kg dry	678	ND	81.9	75-125			
Matrix Spike Dup (B115254-MSD1) Soluble MS Dup		**Source: 15B0257-12**		Prepared & Analyzed: 02/13/15						
Hexavalent Chromium	35	0.87	mg/Kg dry	43.4	ND	81.5	75-125	7.22	35	
Batch B115281 - SW-846 9014										
Blank (B115281-BLK1)				Prepared & Analyzed: 02/13/15						
Cyanide	ND	0.42	mg/Kg wet							
LCS (B115281-BS1)				Prepared & Analyzed: 02/13/15						
Cyanide	45	1.9	mg/Kg wet	47.9		94.4	80-120			
LCS Dup (B115281-BSD1)				Prepared & Analyzed: 02/13/15						
Cyanide	49	1.9	mg/Kg wet	47.9		103	80-120	8.48	20	
Matrix Spike (B115281-MS1)		**Source: 15B0257-20**		Prepared & Analyzed: 02/13/15						
Cyanide	13	0.38	mg/Kg dry	13.5	ND	92.7	75-125			
Matrix Spike Dup (B115281-MSD1)		**Source: 15B0257-20**		Prepared & Analyzed: 02/13/15						
Cyanide	12	0.38	mg/Kg dry	13.6	ND	87.9	75-125	4.93	35	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

15B0257

Rev 04.05.12

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www.contestlabs.com
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East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO# 1

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS ○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium										# of Containers	** Preservation	***Container Code
																				1		1
																				A	A	G
01	UASB226-2-2.5	2/3/15	1630		X	S		✓	✓	✓												
02	UASB226-4-4.5	2/3/15	1645		X	S		✓	✓	✓												
03	UASB226-6-6.5	2/3/15	1650		X	S		✓	✓	✓												
04	UASB228-2-2.5	2/4/15	1630		X	S		✓	✓	✓												
05	UASB228-7.5-8	2/4/15	1710		X	S		✓	✓	✓												
06	LPSB116-3.5-4	2/5/15	0950		X	S		✓	✓	✓												
07	LPSB116-10-11	2/5/15	1030		X	S		✓	✓	✓												
08	LPSB116-13-14	2/5/15	1045		X	S		✓	✓	✓												
09	UASB218-0-1	2/5/15	1100		X	S		✓	✓	✓												
10	UASB218-1-2	2/5/15	1105		X	S		✓	✓	✓												

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

ments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

nquished by: (signature)	Date/Time: 2/6/15 5:00	
eived by: (signature) 2/7/15 10:53	Date/Time: 4.5°C	
nquished by: (signature)	Date/Time:	
eived by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

1SB0257

Rev 04.05.12

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◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection: Beginning Date/Time	Collection: Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium
11	UASB218-2-3	2/5/15	1110		X	S		✓	✓	✓
12	UASB218-3-4	2/5/15	1115		X	S		✓	✓	✓
13	UASB218-7-8	2/5/15	1125		X	S		✓	✓	✓
14	UASB218-8-9	2/5/15	1430		X	S		✓	✓	✓
15	UASB219-1-2	2/5/15	1405		X	S		✓	✓	✓
16	UASB219-4-5	2/5/15	1410		X	S		✓	✓	✓
17	UASB219-4-5-1	2/5/15	1410		X	S		✓	✓	✓
18	UASB219-5-6	2/5/15	1415		X	S		✓	✓	✓
19	UASB219-6-7	2/5/15	1420		X	S		✓	✓	✓
20	UASB219-7-7.5	2/5/15	1425		X	S		✓	✓	✓

	1		1									
# of Containers												
** Preservation	I	I	I									
***Container Code	A	A	G									

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
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V= vial
S=summa can
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****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

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WW= wastewater
DW= drinking water
A = air
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SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 2/6/15 1500	
Received by: (signature) 2/7/15 10:53	Date/Time: 4.5°C	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
ACCREDITED IN ACCORDANCE WITH nelac
NELAC & AIHA-LAP, LLC Accredited
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TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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Saturday, 02/07/2015 at 10:53 A.M.

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Shipped By

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Additional Information

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UPS carbon neutral:	Yes
Weight:	55.00 lbs

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East Longmeadow, MA. 01028
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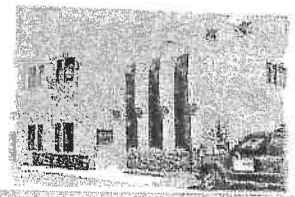
Sample Receipt Checklist



CLIENT NAME: HDR RECEIVED BY: MJ DATE: 2/7/15

1) Was the chain(s) of custody relinquished and signed? (Yes) No No CoC Included
2) Does the chain agree with the samples? (Yes) No
If not, explain:
3) Are all the samples in good condition? (Yes) No
If not, explain:
4) How were the samples received:
On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒
Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
Temperature °C by Temp blank 4.5°C Temperature °C by Temp gun _____
5) Are there Dissolved samples for the lab to filter? Yes (No)
Who was notified _____ Date _____ Time _____
6) Are there any RUSH or SHORT HOLDING TIME samples? Yes (No)
Who was notified _____ Date _____ Time _____
7) Location where samples are stored: 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) Do all samples have the proper Acid pH: Yes No (N/A) _____
9) Do all samples have the proper Base pH: Yes No (N/A) _____
10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No (N/A)

Containers received at Con-Test

	# of containers			# of containers
1 Liter Amber			8 oz amber/clear jar	
500 mL Amber			4 oz amber/clear jar	20
250 mL Amber (8oz amber)			2 oz amber/clear jar	20
1 Liter Plastic			Plastic Bag / Ziploc	
500 mL Plastic			SOC Kit	
250 mL plastic			Non-ConTest Container	
40 mL Vial - type listed below			Perchlorate Kit	
Colisure / bacteria bottle			Flashpoint bottle	
Dissolved Oxygen bottle			Other glass jar	
Encore			Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____ Time and Date Frozen:
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Doc #277 Rev. 4 August 2013

Who notified of False statements?
Log-In Technician Initials: MJ

Date/Time: 2/7/15 10:53
Date/Time:

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

February 27, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0499

Enclosed are results of analyses for samples received by the laboratory on February 16, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB541-0-1	15B0499-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB541-1-2	15B0499-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-2-3	15B0499-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-4-5	15B0499-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-9-9.5	15B0499-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB540-1-2	15B0499-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB540-5-6	15B0499-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB536-0-1	15B0499-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB536-1-2	15B0499-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB536-3-4	15B0499-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB503-1-2	15B0499-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB503-2-3	15B0499-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-1-2	15B0499-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-5-6	15B0499-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-7-8	15B0499-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-13-14	15B0499-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB502-3-4	15B0499-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB502-5-6	15B0499-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB502-9-10	15B0499-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB538-3-4	15B0499-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

con-test® ANALYTICAL LABORATORY

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum

15B0499-01[WTSB541-0-1], 15B0499-02[WTSB541-1-2], 15B0499-03[WTSB542-2-3], 15B0499-04[WTSB542-4-5], 15B0499-05[WTSB542-9-9.5], 15B0499-06[WTSB540-1-2], 15B0499-07[WTSB540-5-6], 15B0499-08[WTSB536-0-1], 15B0499-09[WTSB536-1-2], 15B0499-10[WTSB536-3-4], 15B0499-11[WTSB503-1-2], 15B0499-12[WTSB503-2-3], 15B0499-13[WTSB537-1-2], 15B0499-14[WTSB537-5-6], 15B0499-15[WTSB537-7-8], 15B0499-16[WTSB537-13-14], B115465-BLK1

Iron

15B0499-01[WTSB541-0-1], 15B0499-02[WTSB541-1-2], 15B0499-03[WTSB542-2-3], 15B0499-04[WTSB542-4-5], 15B0499-05[WTSB542-9-9.5], 15B0499-06[WTSB540-1-2], 15B0499-07[WTSB540-5-6], 15B0499-08[WTSB536-0-1], 15B0499-09[WTSB536-1-2], 15B0499-10[WTSB536-3-4], 15B0499-11[WTSB503-1-2], 15B0499-12[WTSB503-2-3], 15B0499-13[WTSB537-1-2], 15B0499-14[WTSB537-5-6], 15B0499-15[WTSB537-7-8], 15B0499-16[WTSB537-13-14], B115465-BLK1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15B0499-07[WTSB540-5-6], B115495-MS1, B115495-MS3, B115495-MSD1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15B0499-01[WTSB541-0-1], 15B0499-02[WTSB541-1-2], 15B0499-03[WTSB542-2-3], 15B0499-04[WTSB542-4-5], 15B0499-05[WTSB542-9-9.5], 15B0499-06[WTSB540-1-2], 15B0499-07[WTSB540-5-6], 15B0499-08[WTSB536-0-1], 15B0499-11[WTSB503-1-2], 15B0499-13[WTSB537-1-2], 15B0499-14[WTSB537-5-6], 15B0499-15[WTSB537-7-8], 15B0499-16[WTSB537-13-14], 15B0499-17[WTSB502-3-4], 15B0499-18[WTSB502-5-6], 15B0499-19[WTSB502-9-10], 15B0499-20[WTSB538-3-4]

SW-846 7471B

Qualifications:

L-07A

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:

Mercury

15B0499-08[WTSB536-0-1], 15B0499-09[WTSB536-1-2], 15B0499-10[WTSB536-3-4], 15B0499-11[WTSB503-1-2], 15B0499-12[WTSB503-2-3], 15B0499-13[WTSB537-1-2], 15B0499-14[WTSB537-5-6], 15B0499-15[WTSB537-7-8], 15B0499-16[WTSB537-13-14], 15B0499-17[WTSB502-3-4], 15B0499-18[WTSB502-5-6], 15B0499-19[WTSB502-9-10], 15B0499-20[WTSB538-3-4], B115406-BS1, B115406-BSD1

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Mercury

15B0499-01[WTSB541-0-1], B115513-MS1

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Tod E. Kopyscinski
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB541-0-1 | Sampled: 2/10/2015 13:20

Sample ID: 15B0499-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	12	5.3	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Arsenic	4.8	12	4.4	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Barium	280	12	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Beryllium	0.72	1.2	0.20	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Cadmium	1.3	1.2	0.72	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Calcium	12000	37	6.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Chromium	32	2.5	0.61	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Cobalt	9.7	12	0.78	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Copper	240	2.5	1.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Iron	12000	12	10	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Lead	79	3.7	0.73	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Magnesium	3500	37	3.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Manganese	310	2.5	0.78	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Mercury	0.10	0.12	0.017	mg/Kg dry	1	MS-07, J	SW-846 7471B	2/18/15	2/19/15 10:38	SCB
Nickel	54	2.5	0.59	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Potassium	500	490	84	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 20:49	AMP
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Sodium	290	490	240	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 20:49	AMP
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Vanadium	38	4.9	0.81	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP
Zinc	130	4.9	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:04	AMP

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB541-0-1 | Sampled: 2/10/2015 13:20

Sample ID: 15B0499-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	94	2.4	2.1	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	7.3	7.9	4.4	mg/Kg dry	10	W-06, J	SW-846 7196A	2/16/15	2/17/15 12:30	LL
% Solids	19.7			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB541-1-2 | Sampled: 2/10/2015 13:25

Sample ID: 15B0499-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8100	11	4.9	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Antimony	ND	11	9.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Barium	210	11	1.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Beryllium	0.59	1.1	0.18	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Cadmium	ND	1.1	0.67	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Calcium	12000	34	6.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Chromium	28	2.3	0.57	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Cobalt	3.2	11	0.73	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Copper	41	2.3	1.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Iron	4000	11	9.8	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Lead	7.0	3.4	0.68	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Magnesium	2000	34	3.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Manganese	58	2.3	0.73	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Mercury	0.11	0.12	0.017	mg/Kg dry	1	J	SW-846 7471B	2/18/15	2/19/15 10:39	SCB
Nickel	24	2.3	0.55	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Potassium	220	460	78	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 20:54	AMP
Selenium	ND	11	3.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Sodium	230	460	220	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 20:54	AMP
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Vanadium	19	4.6	0.75	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP
Zinc	15	4.6	1.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:09	AMP

con-test® ANALYTICAL LABORATORY
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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB541-1-2 | Sampled: 2/10/2015 13:25

Sample ID: 15B0499-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	5.0	2.3	2.1	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	7.1	7.7	4.2	mg/Kg dry	10	W-06, J	SW-846 7196A	2/16/15	2/17/15 12:30	LL
% Solids	20.4			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-2-3 | Sampled: 2/10/2015 13:45

Sample ID: 15B0499-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Barium	83	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Beryllium	0.33	0.31	0.050	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Calcium	1700	9.3	1.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Chromium	33	0.62	0.16	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Cobalt	12	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Copper	25	0.62	0.47	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Iron	17000	31	27	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:19	AMP
Lead	7.2	0.93	0.18	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Magnesium	3800	9.3	0.97	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Manganese	170	0.62	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Mercury	0.016	0.030	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/18/15	2/19/15 10:41	SCB
Nickel	71	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Potassium	700	120	21	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:16	AMP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Sodium	110	120	60	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 21:16	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Vanadium	29	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP
Zinc	26	1.2	0.32	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:13	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-2-3 | Sampled: 2/10/2015 13:45

Sample ID: 15B0499-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.44	0.41	0.37	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	0.97	0.53	mg/Kg dry	5	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	81.2			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-4-5 | Sampled: 2/10/2015 14:00

Sample ID: 15B0499-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	6.9	3.0	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Antimony	ND	6.9	5.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Arsenic	ND	6.9	2.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Barium	420	6.9	0.85	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Beryllium	1.4	0.69	0.11	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Cadmium	0.59	0.69	0.40	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Calcium	12000	21	3.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Chromium	51	1.4	0.34	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Cobalt	5.5	6.9	0.44	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Copper	75	1.4	1.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Iron	8100	6.9	5.9	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Lead	8.1	2.1	0.41	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Magnesium	3500	21	2.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Manganese	58	1.4	0.44	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Mercury	0.059	0.072	0.010	mg/Kg dry	1	J	SW-846 7471B	2/18/15	2/19/15 10:42	SCB
Nickel	77	1.4	0.33	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Potassium	650	270	47	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:21	AMP
Selenium	ND	6.9	2.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Sodium	160	270	130	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 21:21	AMP
Thallium	ND	6.9	2.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Vanadium	31	2.7	0.45	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP
Zinc	12	2.7	0.71	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:18	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-4-5 | Sampled: 2/10/2015 14:00

Sample ID: 15B0499-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	1.7	1.4	1.3	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	4.6	2.5	mg/Kg dry	10	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	33.7			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-9-9.5 | Sampled: 2/11/2015 09:40

Sample ID: 15B0499-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8500	8.6	3.7	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Antimony	ND	8.6	6.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Arsenic	ND	8.6	3.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Barium	100	8.6	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Beryllium	0.32	0.86	0.14	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Cadmium	ND	0.86	0.51	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Calcium	4400	26	4.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Chromium	45	1.7	0.43	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Cobalt	13	8.6	0.55	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Copper	60	1.7	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Iron	15000	8.6	7.3	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Lead	6.0	2.6	0.51	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Magnesium	4900	26	2.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Manganese	84	1.7	0.54	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Mercury	ND	0.080	0.012	mg/Kg dry	1		SW-846 7471B	2/18/15	2/19/15 10:44	SCB
Nickel	93	1.7	0.42	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Potassium	660	340	59	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:26	AMP
Selenium	ND	8.6	2.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Sodium	ND	340	170	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:26	AMP
Thallium	ND	8.6	2.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Vanadium	30	3.4	0.56	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP
Zinc	48	3.4	0.88	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:22	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB542-9-9.5 | Sampled: 2/11/2015 09:40

Sample ID: 15B0499-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	2.2	1.6	1.5	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	2.6	1.5	mg/Kg dry	5	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	29.8			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB540-1-2 | Sampled: 2/11/2015 09:00

Sample ID: 15B0499-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	8.5	3.7	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Antimony	ND	8.5	6.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Arsenic	ND	8.5	3.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Barium	370	8.5	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Beryllium	1.1	0.85	0.14	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Cadmium	0.61	0.85	0.50	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Calcium	9600	25	4.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Chromium	69	1.7	0.42	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Cobalt	3.7	8.5	0.54	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Copper	77	1.7	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Iron	6700	8.5	7.2	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Lead	7.7	2.5	0.50	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Magnesium	2500	25	2.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Manganese	40	1.7	0.54	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Mercury	0.043	0.081	0.012	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:25	SCB
Nickel	86	1.7	0.41	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Potassium	240	340	58	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 21:31	AMP
Selenium	5.5	8.5	2.6	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Sodium	460	340	170	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:31	AMP
Thallium	ND	8.5	2.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Vanadium	38	3.4	0.56	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP
Zinc	9.1	3.4	0.87	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:27	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB540-1-2 | Sampled: 2/11/2015 09:00

Sample ID: 15B0499-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	1.6	1.5	1.4	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	5.3	2.9	mg/Kg dry	10	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	29.8			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB540-5-6 | Sampled: 2/11/2015 09:25

Sample ID: 15B0499-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6100	12	5.2	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Antimony	ND	12	9.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Arsenic	ND	12	4.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Barium	110	12	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Beryllium	0.22	1.2	0.19	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Cadmium	ND	1.2	0.71	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Calcium	4700	36	6.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Chromium	23	2.4	0.60	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Cobalt	10	12	0.77	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Copper	60	2.4	1.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Iron	16000	12	10	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Lead	9.1	3.6	0.71	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Magnesium	3300	36	3.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Manganese	83	2.4	0.76	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Mercury	ND	0.11	0.016	mg/Kg dry	1		SW-846 7471B	2/17/15	2/18/15 9:27	SCB
Nickel	94	2.4	0.58	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Potassium	590	480	82	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:36	AMP
Selenium	ND	12	3.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Silver	ND	2.4	2.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Sodium	ND	480	230	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:36	AMP
Thallium	ND	12	4.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Vanadium	21	4.8	0.79	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP
Zinc	51	4.8	1.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 20:32	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB540-5-6 | Sampled: 2/11/2015 09:25

Sample ID: 15B0499-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.7	1.8	1.6	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	1.4	0.79	mg/Kg dry	2	MS-16, W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	21.4			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-0-1 | Sampled: 2/11/2015 10:20

Sample ID: 15B0499-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	3.5	1.5	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Antimony	ND	3.5	2.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Arsenic	1.7	3.5	1.3	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Barium	110	3.5	0.44	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Beryllium	0.39	0.35	0.057	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Cadmium	ND	0.35	0.21	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Calcium	2200	11	1.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Chromium	47	0.71	0.18	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Cobalt	12	3.5	0.23	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Copper	10	0.71	0.54	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Iron	17000	35	30	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:23	AMP
Lead	15	1.1	0.21	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Magnesium	3500	11	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Manganese	200	0.71	0.22	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Mercury	0.046	0.039	0.0056	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:21	SCB
Nickel	62	0.71	0.17	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Potassium	320	140	24	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:41	AMP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Silver	ND	0.71	0.62	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Sodium	170	140	69	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:41	AMP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Vanadium	22	1.4	0.23	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP
Zinc	26	1.4	0.36	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:06	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-0-1 | Sampled: 2/11/2015 10:20

Sample ID: 15B0499-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.91	0.54	0.48	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	1.2	0.65	mg/Kg dry	5	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	66.3			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-1-2 | Sampled: 2/11/2015 10:25

Sample ID: 15B0499-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Barium	92	2.7	0.34	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Beryllium	0.30	0.27	0.044	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Calcium	1200	8.1	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Chromium	27	0.54	0.14	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Cobalt	5.7	2.7	0.17	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Copper	3.7	0.54	0.41	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Iron	16000	27	23	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:26	AMP
Lead	5.4	0.81	0.16	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Magnesium	2400	8.1	0.85	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Manganese	62	0.54	0.17	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Mercury	0.0061	0.030	0.0043	mg/Kg dry	1	L-07A, J	SW-846 7471B	2/16/15	2/18/15 10:27	SCB
Nickel	24	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Potassium	880	110	19	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:45	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Sodium	130	110	53	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:45	AMP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Vanadium	18	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP
Zinc	17	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:11	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-1-2 | Sampled: 2/11/2015 10:25

Sample ID: 15B0499-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.78	0.46	0.41	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	86.7			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-3-4 | Sampled: 2/11/2015 10:30

Sample ID: 15B0499-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.4	1.5	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Antimony	ND	3.4	2.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Arsenic	ND	3.4	1.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Barium	110	3.4	0.43	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Beryllium	0.47	0.34	0.055	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Cadmium	ND	0.34	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Calcium	2800	10	1.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Chromium	22	0.69	0.17	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Cobalt	12	3.4	0.22	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Copper	17	0.69	0.52	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Iron	26000	34	29	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:31	AMP
Lead	7.3	1.0	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Magnesium	5900	10	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Manganese	260	0.69	0.22	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Mercury	ND	0.031	0.0044	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:28	SCB
Nickel	29	0.69	0.17	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Potassium	6100	140	24	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:50	AMP
Selenium	ND	3.4	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Silver	ND	0.69	0.60	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Sodium	130	140	67	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 21:50	AMP
Thallium	ND	3.4	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Vanadium	31	1.4	0.23	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP
Zinc	61	1.4	0.35	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:16	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB536-3-4 | Sampled: 2/11/2015 10:30

Sample ID: 15B0499-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.38	0.40	0.36	mg/Kg dry	1	J	SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	79.6			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB503-1-2 | Sampled: 2/11/2015 12:45

Sample ID: 15B0499-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	4.4	1.9	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Arsenic	5.3	4.4	1.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Barium	260	4.4	0.54	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Beryllium	0.84	0.44	0.070	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Cadmium	ND	0.44	0.26	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Calcium	3400	13	2.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Chromium	180	0.87	0.22	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Cobalt	7.2	4.4	0.28	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Copper	19	0.87	0.66	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Iron	18000	44	37	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:36	AMP
Lead	19	1.3	0.26	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Magnesium	3500	13	1.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Manganese	120	0.87	0.28	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Mercury	0.092	0.040	0.0057	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:30	SCB
Nickel	37	0.87	0.21	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Potassium	620	170	30	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 21:55	AMP
Selenium	ND	4.4	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Silver	ND	0.87	0.76	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Sodium	150	170	85	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/19/15 21:55	AMP
Thallium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Vanadium	28	1.7	0.29	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP
Zinc	52	1.7	0.45	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:20	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB503-1-2 | Sampled: 2/11/2015 12:45

Sample ID: 15B0499-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	1.8	0.80	0.72	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	2.6	1.4	mg/Kg dry	10	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	61.5			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB503-2-3 | Sampled: 2/11/2015 12:50

Sample ID: 15B0499-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9600	3.1	1.4	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Arsenic	2.0	3.1	1.1	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Barium	150	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Beryllium	0.43	0.31	0.050	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Cadmium	ND	0.31	0.19	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Calcium	2300	9.4	1.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Chromium	95	0.63	0.16	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Cobalt	5.1	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Copper	12	0.63	0.48	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Iron	13000	31	27	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:40	AMP
Lead	7.1	0.94	0.19	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Magnesium	2700	9.4	0.98	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Manganese	74	0.63	0.20	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Mercury	0.019	0.028	0.0040	mg/Kg dry	1	L-07A, J	SW-846 7471B	2/16/15	2/18/15 10:31	SCB
Nickel	19	0.63	0.15	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Potassium	900	130	22	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 22:00	AMP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Sodium	130	130	61	mg/Kg dry	1		SW-846 6010C	2/17/15	2/19/15 22:00	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Vanadium	17	1.3	0.21	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP
Zinc	31	1.3	0.32	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:25	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB503-2-3 | Sampled: 2/11/2015 12:50

Sample ID: 15B0499-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.80	0.54	0.48	mg/Kg dry	1		SW-846 9014	2/18/15	2/19/15 12:15	VAK
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	86.0			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-1-2 | Sampled: 2/11/2015 13:40

Sample ID: 15B0499-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8700	13	5.8	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Arsenic	ND	13	4.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Barium	500	13	1.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Beryllium	0.84	1.3	0.22	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Cadmium	ND	1.3	0.79	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Calcium	18000	40	7.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Chromium	57	2.7	0.67	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Cobalt	4.2	13	0.86	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Copper	160	2.7	2.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Iron	7700	130	110	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:44	AMP
Lead	5.4	4.0	0.79	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Magnesium	3700	40	4.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Manganese	66	2.7	0.85	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Mercury	0.061	0.12	0.017	mg/Kg dry	1	L-07A, J	SW-846 7471B	2/16/15	2/18/15 10:32	SCB
Nickel	130	2.7	0.65	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Potassium	220	540	92	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/23/15 14:27	AMP
Selenium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Sodium	490	540	260	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/23/15 14:27	AMP
Thallium	ND	13	4.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Vanadium	40	5.4	0.88	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP
Zinc	9.3	5.4	1.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:30	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-1-2 | Sampled: 2/11/2015 13:40

Sample ID: 15B0499-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.4	2.1	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	7.9	4.4	mg/Kg dry	10	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	20.2			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-5-6 | Sampled: 2/11/2015 14:05

Sample ID: 15B0499-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2400	22	9.7	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Antimony	ND	22	18	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Arsenic	ND	22	8.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Barium	140	22	2.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Beryllium	ND	2.2	0.36	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Cadmium	ND	2.2	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Calcium	11000	67	12	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Chromium	13	4.5	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Cobalt	2.6	22	1.4	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Copper	120	4.5	3.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Iron	5000	220	190	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:48	AMP
Lead	<6.7	6.7	1.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Magnesium	3000	67	7.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Manganese	57	4.5	1.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Mercury	ND	0.23	0.033	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:34	SCB
Nickel	69	4.5	1.1	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Potassium	ND	900	150	mg/Kg dry	1		SW-846 6010C	2/17/15	2/23/15 14:31	AMP
Selenium	ND	22	6.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Silver	ND	4.5	3.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Sodium	ND	900	440	mg/Kg dry	1		SW-846 6010C	2/17/15	2/23/15 14:31	AMP
Thallium	ND	22	7.4	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Vanadium	17	9.0	1.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:34	AMP
Zinc	8.3	9.0	2.3	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:34	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-5-6 | Sampled: 2/11/2015 14:05

Sample ID: 15B0499-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.5	4.0	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	14	7.7	mg/Kg dry	10	W-06	SW-846 7196A	2/18/15	2/18/15 14:00	LL
% Solids	11.2			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-7-8 | Sampled: 2/11/2015 14:15

Sample ID: 15B0499-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	15	6.5	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Arsenic	ND	15	5.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Barium	110	15	1.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Beryllium	ND	1.5	0.24	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Cadmium	ND	1.5	0.90	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Calcium	5400	46	8.2	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Chromium	25	3.0	0.76	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Cobalt	12	15	0.97	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Copper	86	3.0	2.3	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Iron	19000	150	130	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 13:52	AMP
Lead	5.1	4.6	0.90	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Magnesium	3100	46	4.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Manganese	86	3.0	0.96	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Mercury	ND	0.16	0.023	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:35	SCB
Nickel	140	3.0	0.74	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Potassium	610	610	100	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/23/15 14:36	AMP
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Silver	ND	3.0	2.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Sodium	ND	610	300	mg/Kg dry	1		SW-846 6010C	2/17/15	2/23/15 14:36	AMP
Thallium	ND	15	5.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Vanadium	18	6.1	1.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP
Zinc	58	6.1	1.6	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:38	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-7-8 | Sampled: 2/11/2015 14:15

Sample ID: 15B0499-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.1	2.8	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	5.0	2.8	mg/Kg dry	5	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	15.4			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-13-14 | Sampled: 2/11/2015 14:50

Sample ID: 15B0499-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	5.6	2.4	mg/Kg dry	1	B-07	SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Antimony	ND	5.6	4.5	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Arsenic	ND	5.6	2.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Barium	72	5.6	0.70	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Beryllium	0.35	0.56	0.090	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Cadmium	ND	0.56	0.33	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Calcium	2900	17	3.0	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Chromium	22	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Cobalt	10	5.6	0.36	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Copper	31	1.1	0.86	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Iron	19000	56	48	mg/Kg dry	10	B-07	SW-846 6010C	2/17/15	2/20/15 14:13	AMP
Lead	7.7	1.7	0.33	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Magnesium	4300	17	1.8	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Manganese	120	1.1	0.36	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Mercury	0.0083	0.056	0.0080	mg/Kg dry	1	L-07A, J	SW-846 7471B	2/16/15	2/18/15 10:37	SCB
Nickel	39	1.1	0.27	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Potassium	1300	230	39	mg/Kg dry	1		SW-846 6010C	2/17/15	2/23/15 14:41	AMP
Selenium	ND	5.6	1.7	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Silver	ND	1.1	0.99	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Sodium	140	230	110	mg/Kg dry	1	J	SW-846 6010C	2/17/15	2/23/15 14:41	AMP
Thallium	ND	5.6	1.9	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Vanadium	26	2.3	0.37	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP
Zinc	63	2.3	0.58	mg/Kg dry	1		SW-846 6010C	2/17/15	2/20/15 21:43	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB537-13-14 | Sampled: 2/11/2015 14:50

Sample ID: 15B0499-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.1	0.97	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	1.9	1.0	mg/Kg dry	5	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	43.0			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-3-4 | Sampled: 2/12/2015 09:06

Sample ID: 15B0499-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2500	24	10	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Antimony	ND	24	19	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Arsenic	ND	24	8.6	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Barium	120	24	3.0	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Beryllium	ND	2.4	0.38	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Cadmium	ND	2.4	1.4	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Calcium	13000	72	13	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 12:36	KSH
Chromium	18	4.8	1.2	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Cobalt	6.2	24	1.5	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Copper	360	4.8	3.7	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 12:36	KSH
Iron	8800	24	20	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Lead	6.4	7.2	1.4	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Magnesium	3400	72	7.5	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Manganese	89	4.8	1.5	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Mercury	ND	0.24	0.034	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:38	SCB
Nickel	160	4.8	1.2	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Potassium	170	960	160	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Selenium	ND	24	7.4	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Silver	ND	4.8	4.2	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Sodium	590	960	470	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Thallium	ND	24	7.9	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Vanadium	13	9.6	1.6	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP
Zinc	24	9.6	2.5	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:46	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-3-4 | Sampled: 2/12/2015 09:06

Sample ID: 15B0499-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.8	3.5	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	15	8.2	mg/Kg dry	10	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	10.5			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-5-6 | Sampled: 2/12/2015 09:15

Sample ID: 15B0499-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	12	5.4	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Antimony	ND	12	10	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Arsenic	ND	12	4.5	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Barium	96	12	1.6	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Beryllium	0.22	1.2	0.20	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Cadmium	ND	1.2	0.74	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Calcium	5800	37	6.7	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 12:40	KSH
Chromium	29	2.5	0.62	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Cobalt	12	12	0.80	mg/Kg dry	1	J	SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Copper	93	2.5	1.9	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 12:40	KSH
Iron	14000	12	11	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Lead	5.6	3.7	0.74	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Magnesium	3700	37	3.9	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Manganese	100	2.5	0.79	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Mercury	0.020	0.13	0.019	mg/Kg dry	1	L-07A, J	SW-846 7471B	2/16/15	2/18/15 10:40	SCB
Nickel	140	2.5	0.60	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Potassium	700	500	85	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Sodium	ND	500	240	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Vanadium	17	5.0	0.82	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP
Zinc	59	5.0	1.3	mg/Kg dry	1		SW-846 6010C	2/19/15	2/23/15 15:50	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-5-6 | Sampled: 2/12/2015 09:15

Sample ID: 15B0499-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.4	2.2	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	4.1	2.3	mg/Kg dry	5	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	19.0			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-9-10 | Sampled: 2/12/2015 09:35

Sample ID: 15B0499-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5300	3.0	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:01	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Arsenic	1.4	3.0	1.1	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Barium	36	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Beryllium	0.25	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Calcium	2200	9.0	1.6	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Chromium	11	0.60	0.15	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Cobalt	6.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Copper	17	0.60	0.46	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Iron	12000	30	25	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:17	AMP
Lead	5.3	0.90	0.18	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Magnesium	3000	9.0	0.93	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Manganese	100	0.60	0.19	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:01	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:45	SCB
Nickel	16	0.60	0.14	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Silver	ND	0.60	0.52	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Sodium	85	120	58	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Vanadium	17	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP
Zinc	30	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:11	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB502-9-10 | Sampled: 2/12/2015 09:35

Sample ID: 15B0499-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.56	0.50	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	85.1			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB538-3-4 | Sampled: 2/12/2015 11:10

Sample ID: 15B0499-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	18	8.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:06	AMP
Antimony	ND	18	15	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Arsenic	ND	18	6.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Barium	160	18	2.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Beryllium	ND	1.8	0.30	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Cadmium	ND	1.8	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Calcium	12000	55	10	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Chromium	12	3.7	0.92	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Cobalt	6.7	18	1.2	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Copper	59	3.7	2.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Iron	7700	18	16	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:06	AMP
Lead	2.7	5.5	1.1	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Magnesium	3700	55	5.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Manganese	81	3.7	1.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:06	AMP
Mercury	ND	0.18	0.026	mg/Kg dry	1	L-07A	SW-846 7471B	2/16/15	2/18/15 10:46	SCB
Nickel	99	3.7	0.89	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Potassium	130	740	130	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Selenium	ND	18	5.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Silver	ND	3.7	3.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Sodium	ND	740	360	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Thallium	ND	18	6.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Vanadium	20	7.4	1.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP
Zinc	11	7.4	1.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:16	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0499

Date Received: 2/16/2015

Field Sample #: WTSB538-3-4 | Sampled: 2/12/2015 11:10

Sample ID: 15B0499-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.2	2.9	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	11	6.2	mg/Kg dry	10	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	14.1			% Wt	1		SM 2540G	2/17/15	2/18/15 4:41	JJL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0499-01 [WTSB541-0-1]	B115462	02/17/15
15B0499-02 [WTSB541-1-2]	B115462	02/17/15
15B0499-03 [WTSB542-2-3]	B115462	02/17/15
15B0499-04 [WTSB542-4-5]	B115462	02/17/15
15B0499-05 [WTSB542-9-9.5]	B115462	02/17/15
15B0499-06 [WTSB540-1-2]	B115462	02/17/15
15B0499-07 [WTSB540-5-6]	B115462	02/17/15
15B0499-08 [WTSB536-0-1]	B115462	02/17/15
15B0499-09 [WTSB536-1-2]	B115462	02/17/15
15B0499-10 [WTSB536-3-4]	B115462	02/17/15
15B0499-11 [WTSB503-1-2]	B115462	02/17/15
15B0499-12 [WTSB503-2-3]	B115462	02/17/15
15B0499-13 [WTSB537-1-2]	B115462	02/17/15
15B0499-14 [WTSB537-5-6]	B115462	02/17/15
15B0499-15 [WTSB537-7-8]	B115462	02/17/15
15B0499-16 [WTSB537-13-14]	B115462	02/17/15
15B0499-17 [WTSB502-3-4]	B115462	02/17/15
15B0499-18 [WTSB502-5-6]	B115462	02/17/15
15B0499-19 [WTSB502-9-10]	B115462	02/17/15
15B0499-20 [WTSB538-3-4]	B115462	02/17/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-01 [WTSB541-0-1]	B115465	1.03	50.0	02/17/15
15B0499-02 [WTSB541-1-2]	B115465	1.07	50.0	02/17/15
15B0499-03 [WTSB542-2-3]	B115465	0.992	50.0	02/17/15
15B0499-04 [WTSB542-4-5]	B115465	1.08	50.0	02/17/15
15B0499-05 [WTSB542-9-9.5]	B115465	0.977	50.0	02/17/15
15B0499-06 [WTSB540-1-2]	B115465	0.989	50.0	02/17/15
15B0499-07 [WTSB540-5-6]	B115465	0.973	50.0	02/17/15
15B0499-08 [WTSB536-0-1]	B115465	1.06	50.0	02/17/15
15B0499-09 [WTSB536-1-2]	B115465	1.06	50.0	02/17/15
15B0499-10 [WTSB536-3-4]	B115465	0.915	50.0	02/17/15
15B0499-11 [WTSB503-1-2]	B115465	0.934	50.0	02/17/15
15B0499-12 [WTSB503-2-3]	B115465	0.927	50.0	02/17/15
15B0499-13 [WTSB537-1-2]	B115465	0.924	50.0	02/17/15
15B0499-14 [WTSB537-5-6]	B115465	0.995	50.0	02/17/15
15B0499-15 [WTSB537-7-8]	B115465	1.07	50.0	02/17/15
15B0499-16 [WTSB537-13-14]	B115465	1.03	50.0	02/17/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-19 [WTSB502-9-10]	B115548	0.984	50.0	02/18/15
15B0499-20 [WTSB538-3-4]	B115548	0.959	50.0	02/18/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-17 [WTSB502-3-4]	B115557	0.995	50.0	02/19/15

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-18 [WTSB502-5-6]	B115557	1.06	50.0	02/19/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-01 [WTSB541-0-1]	B115389	2.56	100	02/16/15
15B0499-02 [WTSB541-1-2]	B115389	2.55	100	02/16/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-03 [WTSB542-2-3]	B115495	2.53	100	02/18/15
15B0499-04 [WTSB542-4-5]	B115495	2.57	100	02/18/15
15B0499-05 [WTSB542-9-9.5]	B115495	2.54	100	02/18/15
15B0499-06 [WTSB540-1-2]	B115495	2.53	100	02/18/15
15B0499-07 [WTSB540-5-6]	B115495	2.60	100	02/18/15
15B0499-08 [WTSB536-0-1]	B115495	2.54	100	02/18/15
15B0499-09 [WTSB536-1-2]	B115495	2.53	100	02/18/15
15B0499-10 [WTSB536-3-4]	B115495	2.57	100	02/18/15
15B0499-11 [WTSB503-1-2]	B115495	2.51	100	02/18/15
15B0499-12 [WTSB503-2-3]	B115495	2.53	100	02/18/15
15B0499-13 [WTSB537-1-2]	B115495	2.50	100	02/18/15
15B0499-14 [WTSB537-5-6]	B115495	2.56	100	02/18/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-15 [WTSB537-7-8]	B115576	2.60	100	02/19/15
15B0499-16 [WTSB537-13-14]	B115576	2.50	100	02/19/15
15B0499-17 [WTSB502-3-4]	B115576	2.55	100	02/19/15
15B0499-18 [WTSB502-5-6]	B115576	2.57	100	02/19/15
15B0499-19 [WTSB502-9-10]	B115576	2.59	100	02/19/15
15B0499-20 [WTSB538-3-4]	B115576	2.52	100	02/19/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-08 [WTSB536-0-1]	B115406	0.586	50.0	02/16/15
15B0499-09 [WTSB536-1-2]	B115406	0.583	50.0	02/16/15
15B0499-10 [WTSB536-3-4]	B115406	0.612	50.0	02/16/15
15B0499-11 [WTSB503-1-2]	B115406	0.615	50.0	02/16/15
15B0499-12 [WTSB503-2-3]	B115406	0.623	50.0	02/16/15
15B0499-13 [WTSB537-1-2]	B115406	0.623	50.0	02/16/15
15B0499-14 [WTSB537-5-6]	B115406	0.591	50.0	02/16/15
15B0499-15 [WTSB537-7-8]	B115406	0.600	50.0	02/16/15
15B0499-16 [WTSB537-13-14]	B115406	0.626	50.0	02/16/15
15B0499-17 [WTSB502-3-4]	B115406	0.607	50.0	02/16/15
15B0499-18 [WTSB502-5-6]	B115406	0.588	50.0	02/16/15
15B0499-19 [WTSB502-9-10]	B115406	0.606	50.0	02/16/15
15B0499-20 [WTSB538-3-4]	B115406	0.598	50.0	02/16/15

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-06 [WTSB540-1-2]	B115458	0.625	50.0	02/17/15
15B0499-07 [WTSB540-5-6]	B115458	0.628	50.0	02/17/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-01 [WTSB541-0-1]	B115513	0.630	50.0	02/18/15
15B0499-02 [WTSB541-1-2]	B115513	0.619	50.0	02/18/15
15B0499-03 [WTSB542-2-3]	B115513	0.606	50.0	02/18/15
15B0499-04 [WTSB542-4-5]	B115513	0.620	50.0	02/18/15
15B0499-05 [WTSB542-9-9.5]	B115513	0.627	50.0	02/18/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-01 [WTSB541-0-1]	B115552	1.06	50.0	02/18/15
15B0499-02 [WTSB541-1-2]	B115552	1.05	50.0	02/18/15
15B0499-03 [WTSB542-2-3]	B115552	1.51	50.0	02/18/15
15B0499-04 [WTSB542-4-5]	B115552	1.03	50.0	02/18/15
15B0499-05 [WTSB542-9-9.5]	B115552	1.02	50.0	02/18/15
15B0499-06 [WTSB540-1-2]	B115552	1.10	50.0	02/18/15
15B0499-07 [WTSB540-5-6]	B115552	1.30	50.0	02/18/15
15B0499-08 [WTSB536-0-1]	B115552	1.41	50.0	02/18/15
15B0499-09 [WTSB536-1-2]	B115552	1.26	50.0	02/18/15
15B0499-10 [WTSB536-3-4]	B115552	1.56	50.0	02/18/15
15B0499-11 [WTSB503-1-2]	B115552	1.02	50.0	02/18/15
15B0499-12 [WTSB503-2-3]	B115552	1.08	50.0	02/18/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0499-13 [WTSB537-1-2]	B115590	1.05	50.0	02/19/15
15B0499-14 [WTSB537-5-6]	B115590	1.00	50.0	02/19/15
15B0499-15 [WTSB537-7-8]	B115590	1.05	50.0	02/19/15
15B0499-16 [WTSB537-13-14]	B115590	1.08	50.0	02/19/15
15B0499-17 [WTSB502-3-4]	B115590	1.24	50.0	02/19/15
15B0499-18 [WTSB502-5-6]	B115590	1.09	50.0	02/19/15
15B0499-19 [WTSB502-9-10]	B115590	1.05	50.0	02/19/15
15B0499-20 [WTSB538-3-4]	B115590	1.12	50.0	02/19/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B115406 - SW-846 7471											
Blank (B115406-BLK1)				Prepared: 02/16/15 Analyzed: 02/18/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B115406-BS1)				Prepared: 02/16/15 Analyzed: 02/18/15							
Mercury	8.97	0.78	mg/Kg wet	5.76		**156**	* 71.2-128.6				L-07A
LCS Dup (B115406-BSD1)				Prepared: 02/16/15 Analyzed: 02/18/15							
Mercury	5.51	0.40	mg/Kg wet	5.76		95.7	71.2-128.6	**47.8**	*	30	L-07A
Batch B115458 - SW-846 7471											
Blank (B115458-BLK1)				Prepared: 02/17/15 Analyzed: 02/18/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B115458-BS1)				Prepared: 02/17/15 Analyzed: 02/18/15							
Mercury	5.79	0.38	mg/Kg wet	5.76		101	71.2-128.6				
LCS Dup (B115458-BSD1)				Prepared: 02/17/15 Analyzed: 02/18/15							
Mercury	5.12	0.38	mg/Kg wet	5.76		89.0	71.2-128.6	12.2		30	
Batch B115465 - SW-846 3050B											
Blank (B115465-BLK1)				Prepared: 02/17/15 Analyzed: 02/20/15							
Aluminum	3.8	2.5	mg/Kg wet								B-07
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	5.4	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	6.3	2.5	mg/Kg wet								B-07
Lead	ND	0.75	mg/Kg wet								
Magnesium	2.3	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	0.15	0.50	mg/Kg wet								J
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	0.35	1.0	mg/Kg wet								J

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115465 - SW-846 3050B										
LCS (B115465-BS1)				Prepared: 02/17/15 Analyzed: 02/20/15						
Aluminum	6630	5.1	mg/Kg wet	8100		81.8	51.2-148.1			
Antimony	90.3	5.1	mg/Kg wet	116		77.9	0-210.3			
Arsenic	122	5.1	mg/Kg wet	122		99.6	77.8-122.1			
Barium	165	5.1	mg/Kg wet	167		98.5	82-117.4			
Beryllium	54.2	0.51	mg/Kg wet	54.3		99.8	82.3-117.7			
Cadmium	85.1	0.51	mg/Kg wet	88.0		96.7	81.9-118.2			
Calcium	5570	15	mg/Kg wet	5920		94.0	81.9-118.2			
Chromium	99.6	1.0	mg/Kg wet	102		97.7	78.7-120.6			
Cobalt	96.4	5.1	mg/Kg wet	99.4		97.0	83-116.7			
Copper	77.3	1.0	mg/Kg wet	78.0		99.1	80.4-119.6			
Iron	13100	5.1	mg/Kg wet	15100		87.0	46.8-153			
Lead	90.9	1.5	mg/Kg wet	94.5		96.2	82.4-117.8			
Magnesium	2760	15	mg/Kg wet	3020		91.3	75.5-124.2			
Manganese	387	1.0	mg/Kg wet	401		96.4	80.8-119.2			
Nickel	50.6	1.0	mg/Kg wet	56.3		89.8	82.2-117.8			
Potassium	2410	200	mg/Kg wet	2490		96.6	69.9-130.1			
Selenium	147	5.1	mg/Kg wet	157		93.5	77.1-122.3			
Silver	31.4	1.0	mg/Kg wet	34.2		91.7	74.3-125.4			
Sodium	237	200	mg/Kg wet	246		96.4	69.9-130.5			
Thallium	102	5.1	mg/Kg wet	116		87.9	78.2-121.6			
Vanadium	67.3	2.0	mg/Kg wet	67.1		100	64.8-135.2			
Zinc	208	2.0	mg/Kg wet	207		100	79.7-120.8			
LCS Dup (B115465-BSD1)				Prepared: 02/17/15 Analyzed: 02/20/15						
Aluminum	6620	5.3	mg/Kg wet	8100		81.7	51.2-148.1	0.150	30	
Antimony	92.9	5.3	mg/Kg wet	116		80.1	0-210.3	2.84	30	
Arsenic	121	5.3	mg/Kg wet	122		98.9	77.8-122.1	0.771	30	
Barium	160	5.3	mg/Kg wet	167		95.9	82-117.4	2.69	30	
Beryllium	54.1	0.53	mg/Kg wet	54.3		99.5	82.3-117.7	0.286	30	
Cadmium	84.8	0.53	mg/Kg wet	88.0		96.4	81.9-118.2	0.388	30	
Calcium	5410	16	mg/Kg wet	5920		91.4	81.9-118.2	2.82	30	
Chromium	98.7	1.1	mg/Kg wet	102		96.8	78.7-120.6	0.866	30	
Cobalt	96.3	5.3	mg/Kg wet	99.4		96.9	83-116.7	0.139	30	
Copper	80.2	1.1	mg/Kg wet	78.0		103	80.4-119.6	3.66	30	
Iron	13200	5.3	mg/Kg wet	15100		87.7	46.8-153	0.710	30	
Lead	91.4	1.6	mg/Kg wet	94.5		96.7	82.4-117.8	0.584	30	
Magnesium	2770	16	mg/Kg wet	3020		91.6	75.5-124.2	0.286	30	
Manganese	388	1.1	mg/Kg wet	401		96.6	80.8-119.2	0.229	30	
Nickel	50.3	1.1	mg/Kg wet	56.3		89.3	82.2-117.8	0.554	30	
Potassium	2460	210	mg/Kg wet	2490		98.7	69.9-130.1	2.15	30	
Selenium	149	5.3	mg/Kg wet	157		95.0	77.1-122.3	1.56	30	
Silver	31.1	1.1	mg/Kg wet	34.2		90.8	74.3-125.4	1.02	30	
Sodium	236	210	mg/Kg wet	246		96.0	69.9-130.5	0.376	30	
Thallium	101	5.3	mg/Kg wet	116		87.0	78.2-121.6	1.11	30	
Vanadium	67.1	2.1	mg/Kg wet	67.1		100	64.8-135.2	0.229	30	
Zinc	206	2.1	mg/Kg wet	207		99.6	79.7-120.8	0.808	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115465 - SW-846 3050B											
MRL Check (B115465-MRL1)				Prepared: 02/17/15 Analyzed: 02/20/15							
Lead	0.711	0.77	mg/Kg wet	0.768		92.7		80-120			J
Batch B115513 - SW-846 7471											
Blank (B115513-BLK1)				Prepared: 02/18/15 Analyzed: 02/19/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B115513-BS1)				Prepared: 02/18/15 Analyzed: 02/19/15							
Mercury	5.16	0.39	mg/Kg wet	5.76		89.7		71.2-128.6			
LCS Dup (B115513-BSD1)				Prepared: 02/18/15 Analyzed: 02/19/15							
Mercury	5.02	0.38	mg/Kg wet	5.76		87.1		71.2-128.6	2.89	30	
Duplicate (B115513-DUP1)	**Source: 15B0499-01**			Prepared: 02/18/15 Analyzed: 02/19/15							
Mercury	0.103	0.12	mg/Kg dry		0.105				2.02	35	J
Matrix Spike (B115513-MS1)	**Source: 15B0499-01**			Prepared: 02/18/15 Analyzed: 02/19/15							
Mercury	0.665	0.13	mg/Kg dry	0.845	0.105	**66.2**	*	75-125			MS-07
Batch B115548 - SW-846 3050B											
Blank (B115548-BLK1)				Prepared: 02/18/15 Analyzed: 02/20/15							
Aluminum	1.5	2.5	mg/Kg wet								J
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	6.0	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	0.16	0.75	mg/Kg wet								J
Magnesium	1.3	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115548 - SW-846 3050B										
LCS (B115548-BS1)				Prepared: 02/18/15 Analyzed: 02/20/15						
Aluminum	6220	5.1	mg/Kg wet	8100		76.8	51.2-148.1			
Antimony	81.4	5.1	mg/Kg wet	116		70.2	0-210.3			
Arsenic	114	5.1	mg/Kg wet	122		93.5	77.8-122.1			
Barium	152	5.1	mg/Kg wet	167		91.0	82-117.4			
Beryllium	53.1	0.51	mg/Kg wet	54.3		97.7	82.3-117.7			
Cadmium	81.2	0.51	mg/Kg wet	88.0		92.3	81.9-118.2			
Calcium	5380	15	mg/Kg wet	5920		90.8	81.9-118.2			
Chromium	95.0	1.0	mg/Kg wet	102		93.2	78.7-120.6			
Cobalt	91.6	5.1	mg/Kg wet	99.4		92.2	83-116.7			
Copper	75.4	1.0	mg/Kg wet	78.0		96.7	80.4-119.6			
Iron	12500	5.1	mg/Kg wet	15100		83.0	46.8-153			
Lead	85.1	1.5	mg/Kg wet	94.5		90.1	82.4-117.8			
Magnesium	2590	15	mg/Kg wet	3020		85.9	75.5-124.2			
Manganese	402	1.0	mg/Kg wet	401		100	80.8-119.2			
Nickel	50.0	1.0	mg/Kg wet	56.3		88.9	82.2-117.8			
Potassium	2440	200	mg/Kg wet	2490		98.1	69.9-130.1			
Selenium	144	5.1	mg/Kg wet	157		92.0	77.1-122.3			
Silver	31.0	1.0	mg/Kg wet	34.2		90.6	74.3-125.4			
Sodium	236	200	mg/Kg wet	246		95.9	69.9-130.5			
Thallium	102	5.1	mg/Kg wet	116		88.0	78.2-121.6			
Vanadium	62.4	2.0	mg/Kg wet	67.1		92.9	64.8-135.2			
Zinc	191	2.0	mg/Kg wet	207		92.1	79.7-120.8			
LCS Dup (B115548-BSD1)				Prepared: 02/18/15 Analyzed: 02/20/15						
Aluminum	6160	5.0	mg/Kg wet	8100		76.0	51.2-148.1	1.02	30	
Antimony	81.1	5.0	mg/Kg wet	116		69.9	0-210.3	0.424	30	
Arsenic	119	5.0	mg/Kg wet	122		97.6	77.8-122.1	4.23	30	
Barium	155	5.0	mg/Kg wet	167		92.8	82-117.4	2.00	30	
Beryllium	53.7	0.50	mg/Kg wet	54.3		98.9	82.3-117.7	1.22	30	
Cadmium	83.6	0.50	mg/Kg wet	88.0		95.0	81.9-118.2	2.85	30	
Calcium	5400	15	mg/Kg wet	5920		91.2	81.9-118.2	0.461	30	
Chromium	97.2	1.0	mg/Kg wet	102		95.3	78.7-120.6	2.24	30	
Cobalt	93.9	5.0	mg/Kg wet	99.4		94.4	83-116.7	2.42	30	
Copper	75.9	1.0	mg/Kg wet	78.0		97.3	80.4-119.6	0.621	30	
Iron	12100	5.0	mg/Kg wet	15100		80.1	46.8-153	3.56	30	
Lead	86.8	1.5	mg/Kg wet	94.5		91.8	82.4-117.8	1.92	30	
Magnesium	2610	15	mg/Kg wet	3020		86.5	75.5-124.2	0.627	30	
Manganese	389	1.0	mg/Kg wet	401		97.0	80.8-119.2	3.31	30	
Nickel	51.1	1.0	mg/Kg wet	56.3		90.8	82.2-117.8	2.13	30	
Potassium	2440	200	mg/Kg wet	2490		98.1	69.9-130.1	0.0146	30	
Selenium	149	5.0	mg/Kg wet	157		94.6	77.1-122.3	2.80	30	
Silver	31.5	1.0	mg/Kg wet	34.2		92.1	74.3-125.4	1.67	30	
Sodium	236	200	mg/Kg wet	246		96.1	69.9-130.5	0.233	30	
Thallium	104	5.0	mg/Kg wet	116		90.0	78.2-121.6	2.14	30	
Vanadium	63.9	2.0	mg/Kg wet	67.1		95.2	64.8-135.2	2.39	30	
Zinc	196	2.0	mg/Kg wet	207		94.5	79.7-120.8	2.60	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115548 - SW-846 3050B										
MRL Check (B115548-MRL1)				Prepared: 02/18/15 Analyzed: 02/19/15						
Lead	0.731	0.74	mg/Kg wet	0.738		99.1	80-120			J
Batch B115557 - SW-846 3050B										
Blank (B115557-BLK1)				Prepared: 02/19/15 Analyzed: 02/23/15						
Aluminum	1.6	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	4.7	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.83	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.39	1.0	mg/Kg wet							J
LCS (B115557-BS1)				Prepared: 02/19/15 Analyzed: 02/23/15						
Aluminum	6280	5.0	mg/Kg wet	8100		77.5	51.2-148.1			
Antimony	99.0	5.0	mg/Kg wet	116		85.3	0-210.3			
Arsenic	122	5.0	mg/Kg wet	122		100	77.8-122.1			
Barium	173	5.0	mg/Kg wet	167		104	82-117.4			
Beryllium	60.9	0.50	mg/Kg wet	54.3		112	82.3-117.7			
Cadmium	85.8	0.50	mg/Kg wet	88.0		97.5	81.9-118.2			
Calcium	5560	15	mg/Kg wet	5920		93.9	81.9-118.2			
Chromium	103	1.0	mg/Kg wet	102		101	78.7-120.6			
Cobalt	103	5.0	mg/Kg wet	99.4		104	83-116.7			
Copper	76.5	1.0	mg/Kg wet	78.0		98.1	80.4-119.6			
Iron	13300	5.0	mg/Kg wet	15100		88.3	46.8-153			
Lead	99.8	1.5	mg/Kg wet	94.5		106	82.4-117.8			
Magnesium	2710	15	mg/Kg wet	3020		89.6	75.5-124.2			
Manganese	408	1.0	mg/Kg wet	401		102	80.8-119.2			
Nickel	56.5	1.0	mg/Kg wet	56.3		100	82.2-117.8			
Potassium	2270	200	mg/Kg wet	2490		91.0	69.9-130.1			
Selenium	132	5.0	mg/Kg wet	157		84.2	77.1-122.3			
Silver	30.5	1.0	mg/Kg wet	34.2		89.1	74.3-125.4			
Sodium	248	200	mg/Kg wet	246		101	69.9-130.5			
Thallium	109	5.0	mg/Kg wet	116		94.3	78.2-121.6			
Vanadium	64.7	2.0	mg/Kg wet	67.1		96.5	64.8-135.2			
Zinc	202	2.0	mg/Kg wet	207		97.5	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115557 - SW-846 3050B										
LCS Dup (B115557-BSD1)				Prepared: 02/19/15 Analyzed: 02/23/15						
Aluminum	5970	5.0	mg/Kg wet	8100		73.7	51.2-148.1	5.01	30	
Antimony	94.3	5.0	mg/Kg wet	116		81.3	0-210.3	4.92	30	
Arsenic	119	5.0	mg/Kg wet	122		97.8	77.8-122.1	2.28	30	
Barium	165	5.0	mg/Kg wet	167		99.0	82-117.4	4.66	30	
Beryllium	58.8	0.50	mg/Kg wet	54.3		108	82.3-117.7	3.49	30	
Cadmium	82.4	0.50	mg/Kg wet	88.0		93.7	81.9-118.2	4.04	30	
Calcium	5440	15	mg/Kg wet	5920		92.0	81.9-118.2	2.13	30	
Chromium	99.8	1.0	mg/Kg wet	102		97.9	78.7-120.6	2.68	30	
Cobalt	99.6	5.0	mg/Kg wet	99.4		100	83-116.7	3.60	30	
Copper	75.3	1.0	mg/Kg wet	78.0		96.5	80.4-119.6	1.62	30	
Iron	12900	5.0	mg/Kg wet	15100		85.7	46.8-153	2.97	30	
Lead	97.2	1.5	mg/Kg wet	94.5		103	82.4-117.8	2.63	30	
Magnesium	2590	15	mg/Kg wet	3020		85.8	75.5-124.2	4.39	30	
Manganese	392	1.0	mg/Kg wet	401		97.7	80.8-119.2	4.01	30	
Nickel	54.2	1.0	mg/Kg wet	56.3		96.3	82.2-117.8	4.10	30	
Potassium	2190	200	mg/Kg wet	2490		87.9	69.9-130.1	3.53	30	
Selenium	131	5.0	mg/Kg wet	157		83.1	77.1-122.3	1.30	30	
Silver	30.0	1.0	mg/Kg wet	34.2		87.9	74.3-125.4	1.35	30	
Sodium	242	200	mg/Kg wet	246		98.6	69.9-130.5	2.32	30	
Thallium	105	5.0	mg/Kg wet	116		90.7	78.2-121.6	3.86	30	
Vanadium	63.1	2.0	mg/Kg wet	67.1		94.0	64.8-135.2	2.56	30	
Zinc	197	2.0	mg/Kg wet	207		95.3	79.7-120.8	2.21	30	
MRL Check (B115557-MRL1)				Prepared: 02/19/15 Analyzed: 02/23/15						
Lead	0.841	0.75	mg/Kg wet	0.750		112	80-120			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115389 - SW-846 7196A											
Blank (B115389-BLK1)				Prepared: 02/16/15 Analyzed: 02/17/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B115389-BS1)				Prepared: 02/16/15 Analyzed: 02/17/15							
Hexavalent Chromium	52	1.9	mg/Kg wet	61.0		84.5		80-120			
LCS Dup (B115389-BSD1)				Prepared: 02/16/15 Analyzed: 02/17/15							
Hexavalent Chromium	52	1.9	mg/Kg wet	61.2		85.5		80-120	1.48	20	
Batch B115462 - % Solids											
Duplicate (B115462-DUP4)	**Source: 15B0499-01**			Prepared: 02/17/15 Analyzed: 02/18/15							
% Solids	22.2		% Wt		19.7				11.9	20	
Batch B115495 - SW-846 7196A											
Blank (B115495-BLK1)				Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B115495-BS1)				Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	61	1.7	mg/Kg wet	53.6		113		80-120			
LCS Dup (B115495-BSD1)				Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	58	1.7	mg/Kg wet	53.4		109		80-120	4.09	20	
Matrix Spike (B115495-MS1) Soluble MS	**Source: 15B0499-07**			Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	99	7.4	mg/Kg dry	186	ND	**53.3**	*	75-125			MS-16
Matrix Spike (B115495-MS2) PDMS	**Source: 15B0499-07**			Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	160	7.2	mg/Kg dry	180	ND	90.6		75-125			
Matrix Spike (B115495-MS3) Insoluble MS	**Source: 15B0499-07**			Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	800	73	mg/Kg dry	2900	ND	**27.7**	*	75-125			MS-16
Matrix Spike Dup (B115495-MSD1) Soluble MS Dup	**Source: 15B0499-07**			Prepared & Analyzed: 02/18/15							
Hexavalent Chromium	78	7.2	mg/Kg dry	181	ND	**43.0**	*	75-125	24.0	35	MS-16
Batch B115552 - SW-846 9014											
Blank (B115552-BLK1)				Prepared: 02/18/15 Analyzed: 02/19/15							
Cyanide	ND	0.43	mg/Kg wet								

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115552 - SW-846 9014										
LCS (B115552-BS1)				Prepared: 02/18/15 Analyzed: 02/19/15						
Cyanide	53	2.0	mg/Kg wet	52.3		102	80-120			
LCS Dup (B115552-BSD1)				Prepared: 02/18/15 Analyzed: 02/19/15						
Cyanide	56	2.0	mg/Kg wet	52.3		106	80-120	4.44	20	
Matrix Spike (B115552-MS2)		**Source: 15B0499-11**		Prepared: 02/18/15 Analyzed: 02/19/15						
Cyanide	28	0.80	mg/Kg dry	28.4	1.8	92.0	75-125			
Matrix Spike Dup (B115552-MSD2)		**Source: 15B0499-11**		Prepared: 02/18/15 Analyzed: 02/19/15						
Cyanide	24	0.75	mg/Kg dry	26.8	1.8	83.1	75-125	14.9	35	
Batch B115576 - SW-846 7196A										
Blank (B115576-BLK1)				Prepared & Analyzed: 02/19/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B115576-BS1)				Prepared & Analyzed: 02/19/15						
Hexavalent Chromium	59	1.8	mg/Kg wet	56.0		105	80-120			
LCS Dup (B115576-BSD1)				Prepared & Analyzed: 02/19/15						
Hexavalent Chromium	60	1.8	mg/Kg wet	56.4		106	80-120	1.78	20	
Batch B115590 - SW-846 9014										
Blank (B115590-BLK1)				Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	ND	0.50	mg/Kg wet							
LCS (B115590-BS1)				Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	73	2.5	mg/Kg wet	64.4		114	80-120			
LCS Dup (B115590-BSD1)				Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	67	2.5	mg/Kg wet	64.3		104	80-120	8.89	20	
Matrix Spike (B115590-MS1)		**Source: 15B0499-17**		Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	140	3.9	mg/Kg dry	137	ND	100	75-125			
Matrix Spike Dup (B115590-MSD1)		**Source: 15B0499-17**		Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	130	3.8	mg/Kg dry	137	ND	95.5	75-125	5.00	35	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07A	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

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39 Spruce Street
East longmeadow, MA 01028

15B0499

Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium									# of Containers
								1	1	1									** Preservation
								A	A	G									***Container Code
01	WTSB541-0-1	2/10/15	1320		X	S		✓	✓	✓									
02	WTSB541-1-2	2/10/15	1325		X	S		✓	✓	✓									
03	WTSB542-2-3	2/10/15	1345		X	S		✓	✓	✓									
04	WTSB542-4-5	2/10/15	1400		X	S		✓	✓	✓									
05	WTSB542-9-9.5	2/11/15	0940		X	S		✓	✓	✓									
06	WTSB540-1-2	2/11/15	0900		X	S		✓	✓	✓									
07	WTSB540-5-6	2/11/15	0925		X	S		✓	✓	✓									
08	WTSB536-0-1	2/11/15	1020		X	S		✓	✓	✓									
09	WTSB536-1-2	2/11/15	1025		X	S		✓	✓	✓									
10	WTSB536-3-4	2/11/15	1030		X	S		✓	✓	✓									

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature) Date/Time: 2/13/15 1500
Received by: (signature) 3.0 10:08 Date/Time: 2.16.15
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
ACCREDITED IN ACCORDANCE WITH nelac
NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

***Matrix Code:**
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
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East longmeadow, MA 01028

15B0499

Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
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◉ yes _____ proposal date

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◉ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								I	I	I			
								A	A	G			
11	WTSB503-1-2	2/11/15	1245		X	S		✓	✓	✓			
12	WTSB503-2-3	2/11/15	1250		X	S		✓	✓	✓			
13	WTSB537-1-2	2/11/15	1340		X	S		✓	✓	✓			
14	WTSB-537-5-6	2/11/15	1405		X	S		✓	✓	✓			
15	WTSB537-7-8	2/11/15	1415		X	S		✓	✓	✓			
16	WTSB537-13-14	2/11/15	1450		X	S		✓	✓	✓			
17	WTSB502-3-4	2/12/15	0906		X	S		✓	✓	✓			
18	WTSB502-5-6	2/12/15	0915		X	S		✓	✓	✓			
19	WTSB502-9-10	2/12/15	0935		X	S		✓	✓	✓			
20	WTSB538-3-4	2/12/15	1110		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 2/13/15 1500	
Received by: (signature)	Date/Time: 2.16.15	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
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NELAC & AIHA-LAP, LLC Accredited
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Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

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1ZR34A722210012096

Updated: 02/16/2015 10:08 A.M. Eastern Time

Delivered

Delivered On:
Monday, 02/16/2015 at 9:56 A.M.

Left At:
Front Desk

Signed By:
BLAKE

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Type: Package

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Launch Chat

Shipping Information

To:
EAST LONGMEADOW, MA, US

Shipped By

UPS NEXT DAY AIR



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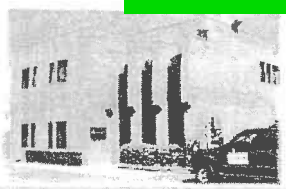
con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HSR RECEIVED BY: PB DATE: 2-16-15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**

On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank 3.0 Temperature °C by Temp gun _____

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** Login

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	20
250 mL Amber (8oz amber)		2 oz amber/clear jar	20
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** PB **Date/Time:** 2-16-15 10:08

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

February 27, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0500

Enclosed are results of analyses for samples received by the laboratory on February 16, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Meghan E. Kelley
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0500

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB538-9-10	15B0500-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB538-15-16	15B0500-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB539-1-2	15B0500-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB539-3-4	15B0500-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB506-5-6	15B0500-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB501-7-8	15B0500-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB501-13-14	15B0500-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB506-10-12	15B0500-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
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Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0500

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB504-4-6	15B0500-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-7-8	15B0500-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-11-12	15B0500-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-13-14	15B0500-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-13-14-1	15B0500-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

MS-14

Matrix spike recovery is outside of control limits. Data validation is not affected since sample result is "not detected" and recovery bias is on the high side for this compound.

Analyte & Samples(s) Qualified:

Sodium
15B0500-05[WTSB506-5-6], B115548-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15B0500-05[WTSB506-5-6], B115548-MS1

Calcium
15B0500-05[WTSB506-5-6], B115548-MS1

Iron
15B0500-05[WTSB506-5-6], B115548-MS1

Magnesium
15B0500-05[WTSB506-5-6], B115548-MS1

R-04

Duplicate relative percent difference (RPD) is a less useful indicator of sample precision for sample results that are <5 times the reporting limit (RL).

Analyte & Samples(s) Qualified:

Beryllium
15B0500-05[WTSB506-5-6], B115548-DUP1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0500-01[WTSB538-9-10], B115576-MS1, B115576-MS3, B115576-MSD1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0500-01[WTSB538-9-10], 15B0500-02[WTSB538-15-16], 15B0500-03[WTSB539-1-2], 15B0500-04[WTSB539-3-4], 15B0500-05[WTSB506-5-6], 15B0500-06[WTSB501-7-8], 15B0500-07[WTSB501-13-14], 15B0500-08[WTSB506-10-12], 15B0500-09[WTSB504-4-6], 15B0500-10[WTSB505-7-8], 15B0500-11[WTSB505-11-12], 15B0500-12[WTSB505-13-14], 15B0500-13[WTSB505-13-14-1]

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Tod E. Kopyscinski
Laboratory Director

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB538-9-10 | Sampled: 2/12/2015 11:40

Sample ID: 15B0500-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	5.4	2.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:10	AMP
Antimony	ND	5.4	4.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Arsenic	ND	5.4	1.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Barium	95	5.4	0.67	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Beryllium	0.52	0.54	0.087	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Cadmium	ND	0.54	0.32	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Calcium	2900	16	2.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Chromium	21	1.1	0.27	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Cobalt	11	5.4	0.34	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Copper	45	1.1	0.82	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Iron	23000	54	46	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:20	AMP
Lead	11	1.6	0.32	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Magnesium	4900	16	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Manganese	150	1.1	0.34	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:10	AMP
Mercury	0.024	0.056	0.0081	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:32	SCB
Nickel	44	1.1	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Potassium	1900	220	37	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Selenium	ND	5.4	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Silver	1.3	1.1	0.95	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Sodium	110	220	110	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Thallium	ND	5.4	1.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Vanadium	29	2.2	0.36	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP
Zinc	71	2.2	0.56	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:39	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB538-9-10 | Sampled: 2/12/2015 11:40

Sample ID: 15B0500-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.99	0.89	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	1.9	1.0	mg/Kg dry	5	MS-16, W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	43.2			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB538-15-16 | Sampled: 2/12/2015 12:40

Sample ID: 15B0500-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	4.1	1.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:33	AMP
Antimony	ND	4.1	3.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Arsenic	2.0	4.1	1.5	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Barium	87	4.1	0.51	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Beryllium	0.54	0.41	0.066	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Cadmium	ND	0.41	0.24	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Calcium	2800	12	2.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Chromium	21	0.83	0.21	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Cobalt	11	4.1	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Copper	43	0.83	0.63	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Iron	27000	41	35	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:24	AMP
Lead	12	1.2	0.25	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Magnesium	5100	12	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Manganese	160	0.83	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:33	AMP
Mercury	0.020	0.042	0.0060	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:33	SCB
Nickel	34	0.83	0.20	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Potassium	2100	170	28	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Selenium	ND	4.1	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Silver	ND	0.83	0.73	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Sodium	120	170	80	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Thallium	ND	4.1	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Vanadium	29	1.7	0.27	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP
Zinc	66	1.7	0.43	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:44	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB538-15-16 | Sampled: 2/12/2015 12:40

Sample ID: 15B0500-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.78	0.70	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	1.4	0.76	mg/Kg dry	5	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	57.0			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB539-1-2 | Sampled: 2/12/2015 14:05

Sample ID: 15B0500-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3700	20	8.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:38	AMP
Antimony	ND	20	16	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Arsenic	ND	20	7.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Barium	190	20	2.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Beryllium	ND	2.0	0.32	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Cadmium	ND	2.0	1.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Calcium	18000	59	11	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Chromium	10	4.0	0.99	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Cobalt	5.2	20	1.3	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Copper	57	4.0	3.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Iron	5900	20	17	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:38	AMP
Lead	1.6	5.9	1.2	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Magnesium	4300	59	6.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Manganese	99	4.0	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:38	AMP
Mercury	0.036	0.19	0.028	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:35	SCB
Nickel	66	4.0	0.96	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Potassium	ND	790	140	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Selenium	ND	20	6.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Silver	ND	4.0	3.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Sodium	ND	790	390	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Thallium	ND	20	6.6	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Vanadium	38	7.9	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:48	AMP
Zinc	6.0	7.9	2.0	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:48	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB539-1-2 | Sampled: 2/12/2015 14:05

Sample ID: 15B0500-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.0	3.6	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	13	7.0	mg/Kg dry	10	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	12.3			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB539-3-4 | Sampled: 2/12/2015 14:10

Sample ID: 15B0500-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3500	22	9.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:41	AMP
Antimony	ND	22	17	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Arsenic	ND	22	7.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Barium	150	22	2.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Beryllium	ND	2.2	0.35	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Cadmium	ND	2.2	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Calcium	14000	65	12	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Chromium	7.2	4.3	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Cobalt	2.4	22	1.4	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Copper	59	4.3	3.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Iron	9000	22	18	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:41	AMP
Lead	1.9	6.5	1.3	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Magnesium	3400	65	6.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Manganese	84	4.3	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:41	AMP
Mercury	ND	0.23	0.033	mg/Kg dry	1		SW-846 7471B	2/17/15	2/18/15 9:36	SCB
Nickel	73	4.3	1.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Potassium	ND	860	150	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Selenium	ND	22	6.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Silver	ND	4.3	3.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Sodium	ND	860	420	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Thallium	ND	22	7.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Vanadium	20	8.6	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:52	AMP
Zinc	6.5	8.6	2.2	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:52	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB539-3-4 | Sampled: 2/12/2015 14:10

Sample ID: 15B0500-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.4	3.9	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	14	7.8	mg/Kg dry	10	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	11.0			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB506-5-6 | Sampled: 2/12/2015 15:00

Sample ID: 15B0500-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	14	5.8	mg/Kg dry	1	MS-19	SW-846 6010C	2/18/15	2/20/15 16:56	AMP
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Arsenic	ND	14	4.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Barium	89	14	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Beryllium	0.22	1.4	0.22	mg/Kg dry	1	R-04, J	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Cadmium	ND	1.4	0.80	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Calcium	4900	41	7.3	mg/Kg dry	1	MS-19	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Chromium	22	2.7	0.68	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Cobalt	11	14	0.86	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Copper	92	2.7	2.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Iron	13000	14	12	mg/Kg dry	1	MS-19	SW-846 6010C	2/18/15	2/20/15 16:56	AMP
Lead	4.4	4.1	0.80	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Magnesium	2700	41	4.2	mg/Kg dry	1	MS-19	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Manganese	91	2.7	0.86	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 16:56	AMP
Mercury	0.027	0.14	0.020	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:38	SCB
Nickel	140	2.7	0.65	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Potassium	490	540	93	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Selenium	ND	14	4.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Silver	ND	2.7	2.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Sodium	ND	540	260	mg/Kg dry	1	MS-14	SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Thallium	ND	14	4.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Vanadium	16	5.4	0.89	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP
Zinc	50	5.4	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:06	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB506-5-6 | Sampled: 2/12/2015 15:00

Sample ID: 15B0500-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.2	2.0	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	4.5	2.5	mg/Kg dry	5	W-06	SW-846 7196A	2/19/15	2/19/15 10:40	ABH
% Solids	17.2			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB501-7-8 | Sampled: 2/12/2015 16:10

Sample ID: 15B0500-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	14	6.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:45	AMP
Antimony	ND	14	12	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Arsenic	ND	14	5.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Barium	110	14	1.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Beryllium	ND	1.4	0.23	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Cadmium	ND	1.4	0.85	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Calcium	5300	43	7.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Chromium	25	2.9	0.72	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Cobalt	11	14	0.92	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Copper	110	2.9	2.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Iron	12000	14	12	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:45	AMP
Lead	4.3	4.3	0.86	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Magnesium	2800	43	4.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Manganese	88	2.9	0.92	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:45	AMP
Mercury	0.022	0.14	0.021	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:39	SCB
Nickel	150	2.9	0.70	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Potassium	460	580	99	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Sodium	ND	580	280	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Thallium	ND	14	4.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Vanadium	16	5.8	0.95	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP
Zinc	54	5.8	1.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 17:56	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB501-7-8 | Sampled: 2/12/2015 16:10

Sample ID: 15B0500-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.5	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	9.4	5.2	mg/Kg dry	10	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	17.0			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB501-13-14 | Sampled: 2/12/2015 16:40

Sample ID: 15B0500-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	4.4	1.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:50	AMP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Arsenic	1.9	4.4	1.6	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Barium	79	4.4	0.54	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Beryllium	0.47	0.44	0.070	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Cadmium	ND	0.44	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Calcium	2600	13	2.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Chromium	19	0.87	0.22	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Cobalt	10	4.4	0.28	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Copper	40	0.87	0.66	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Iron	19000	44	37	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:29	AMP
Lead	10	1.3	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Magnesium	4600	13	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Manganese	150	0.87	0.28	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:50	AMP
Mercury	0.017	0.042	0.0060	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:40	SCB
Nickel	35	0.87	0.21	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Potassium	1800	170	30	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Selenium	ND	4.4	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Silver	ND	0.87	0.76	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Sodium	100	170	85	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Thallium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Vanadium	27	1.7	0.29	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP
Zinc	62	1.7	0.45	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:01	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB501-13-14 | Sampled: 2/12/2015 16:40

Sample ID: 15B0500-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.63	0.57	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	1.3	0.74	mg/Kg dry	5	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	58.8			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB506-10-12 | Sampled: 2/12/2015 15:20

Sample ID: 15B0500-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4700	3.1	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:55	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Barium	35	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Beryllium	0.21	0.31	0.050	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Calcium	3500	9.4	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Chromium	9.1	0.63	0.16	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Cobalt	5.5	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Copper	20	0.63	0.48	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Iron	9900	31	27	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:33	AMP
Lead	4.3	0.94	0.19	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Magnesium	3500	9.4	0.98	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Manganese	100	0.63	0.20	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 17:55	AMP
Mercury	0.0067	0.032	0.0046	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:42	SCB
Nickel	13	0.63	0.15	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Potassium	1100	130	21	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Sodium	100	130	61	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Vanadium	14	1.3	0.21	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP
Zinc	24	1.3	0.32	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:06	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB506-10-12 | Sampled: 2/12/2015 15:20

Sample ID: 15B0500-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	1.0	0.57	mg/Kg dry	5	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	76.0			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB504-4-6 | Sampled: 2/13/2015 10:50

Sample ID: 15B0500-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5900	11	4.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:00	AMP
Antimony	ND	11	8.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Arsenic	ND	11	4.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Barium	90	11	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Beryllium	0.26	1.1	0.18	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Cadmium	ND	1.1	0.65	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Calcium	4100	33	6.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Chromium	26	2.2	0.55	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Cobalt	10	11	0.70	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Copper	57	2.2	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Iron	13000	11	9.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:00	AMP
Lead	5.6	3.3	0.65	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Magnesium	3400	33	3.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Manganese	88	2.2	0.70	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:00	AMP
Mercury	0.019	0.11	0.016	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:43	SCB
Nickel	100	2.2	0.53	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Potassium	540	440	76	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Sodium	220	440	210	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Thallium	ND	11	3.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Vanadium	20	4.4	0.73	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP
Zinc	50	4.4	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:11	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB504-4-6 | Sampled: 2/13/2015 10:50

Sample ID: 15B0500-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.9	1.7	mg/Kg dry	1		SW-846 9014	2/19/15	2/20/15 10:00	ABH
Hexavalent Chromium	ND	3.6	2.0	mg/Kg dry	5	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	22.4			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-7-8 | Sampled: 2/13/2015 09:30

Sample ID: 15B0500-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5100	19	8.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:05	AMP
Antimony	ND	19	16	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Arsenic	ND	19	6.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Barium	120	19	2.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Beryllium	ND	1.9	0.31	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Cadmium	ND	1.9	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Calcium	6000	58	10	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Chromium	22	3.9	0.96	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Cobalt	13	19	1.2	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Copper	190	3.9	2.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Iron	20000	19	16	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:05	AMP
Lead	6.7	5.8	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Magnesium	2700	58	6.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Manganese	100	3.9	1.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:05	AMP
Mercury	0.030	0.19	0.027	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:45	SCB
Nickel	200	3.9	0.93	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Potassium	610	770	130	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Selenium	ND	19	5.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Silver	ND	3.9	3.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Sodium	ND	770	370	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Thallium	ND	19	6.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Vanadium	21	7.7	1.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP
Zinc	67	7.7	2.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:15	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-7-8 | Sampled: 2/13/2015 09:30

Sample ID: 15B0500-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.6	3.3	mg/Kg dry	1		SW-846 9014	2/20/15	2/20/15 18:30	ABH
Hexavalent Chromium	ND	6.1	3.4	mg/Kg dry	5	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	13.1			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-11-12 | Sampled: 2/13/2015 09:50

Sample ID: 15B0500-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	6.5	2.8	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:09	AMP
Antimony	ND	6.5	5.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Arsenic	ND	6.5	2.3	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Barium	75	6.5	0.81	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Beryllium	0.35	0.65	0.10	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Cadmium	ND	0.65	0.38	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Calcium	2700	19	3.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Chromium	20	1.3	0.32	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Cobalt	9.2	6.5	0.41	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Copper	37	1.3	0.99	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Iron	21000	65	55	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:37	AMP
Lead	8.3	1.9	0.39	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Magnesium	3900	19	2.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Manganese	120	1.3	0.41	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:09	AMP
Mercury	0.011	0.060	0.0086	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:50	SCB
Nickel	43	1.3	0.31	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Potassium	1200	260	45	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Selenium	ND	6.5	2.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Silver	ND	1.3	1.1	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Sodium	ND	260	130	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Thallium	ND	6.5	2.2	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Vanadium	22	2.6	0.43	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP
Zinc	60	2.6	0.67	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:20	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-11-12 | Sampled: 2/13/2015 09:50

Sample ID: 15B0500-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.95	0.85	mg/Kg dry	1		SW-846 9014	2/20/15	2/20/15 18:30	ABH
Hexavalent Chromium	1.5	1.9	1.0	mg/Kg dry	5	W-06, J	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	41.8			% Wt	1		SM 2540G	2/17/15	2/19/15 8:21	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-13-14 | Sampled: 2/13/2015 10:05

Sample ID: 15B0500-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	4.4	1.9	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:14	AMP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:14	AMP
Arsenic	ND	4.4	1.6	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Barium	78	4.4	0.55	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Beryllium	0.45	0.44	0.071	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Cadmium	ND	0.44	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Calcium	2800	13	2.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Chromium	19	0.88	0.22	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Cobalt	9.3	4.4	0.28	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Copper	35	0.88	0.67	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Iron	20000	44	38	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:40	AMP
Lead	9.9	1.3	0.26	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Magnesium	4500	13	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Manganese	140	0.88	0.28	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:14	AMP
Mercury	0.014	0.044	0.0064	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:51	SCB
Nickel	36	0.88	0.21	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Potassium	1700	180	30	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Selenium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Silver	1.0	0.88	0.77	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Sodium	100	180	86	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Thallium	ND	4.4	1.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Vanadium	26	1.8	0.29	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP
Zinc	63	1.8	0.45	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:44	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-13-14 | Sampled: 2/13/2015 10:05

Sample ID: 15B0500-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.91	0.82	mg/Kg dry	1		SW-846 9014	2/20/15	2/20/15 18:30	ABH
Hexavalent Chromium	ND	2.9	1.6	mg/Kg dry	10	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	54.3			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-13-14-1 | Sampled: 2/13/2015 10:05

Sample ID: 15B0500-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8800	4.6	2.0	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:39	AMP
Antimony	ND	4.6	3.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:39	AMP
Arsenic	ND	4.6	1.7	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Barium	78	4.6	0.57	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Beryllium	0.43	0.46	0.074	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Cadmium	ND	0.46	0.27	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Calcium	2800	14	2.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Chromium	20	0.92	0.23	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Cobalt	9.4	4.6	0.29	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Copper	35	0.92	0.70	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Iron	19000	46	39	mg/Kg dry	10		SW-846 6010C	2/18/15	2/20/15 14:44	AMP
Lead	9.5	1.4	0.27	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Magnesium	4400	14	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Manganese	140	0.92	0.29	mg/Kg dry	1		SW-846 6010C	2/18/15	2/20/15 18:39	AMP
Mercury	0.012	0.047	0.0068	mg/Kg dry	1	J	SW-846 7471B	2/17/15	2/18/15 9:53	SCB
Nickel	37	0.92	0.22	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Potassium	1600	180	31	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Selenium	ND	4.6	1.4	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Silver	ND	0.92	0.81	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Sodium	100	180	89	mg/Kg dry	1	J	SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Thallium	ND	4.6	1.5	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Vanadium	26	1.8	0.30	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP
Zinc	62	1.8	0.47	mg/Kg dry	1		SW-846 6010C	2/18/15	2/19/15 18:49	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0500

Date Received: 2/16/2015

Field Sample #: WTSB505-13-14-1 | Sampled: 2/13/2015 10:05

Sample ID: 15B0500-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.78	0.70	mg/Kg dry	1		SW-846 9014	2/20/15	2/20/15 18:30	ABH
Hexavalent Chromium	ND	1.5	0.83	mg/Kg dry	5	W-06	SW-846 7196A	2/23/15	2/23/15 14:00	LL
% Solids	52.7			% Wt	1		SM 2540G	2/17/15	2/18/15 11:47	MRL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0500-01 [WTSB538-9-10]	B115486	02/17/15
15B0500-02 [WTSB538-15-16]	B115486	02/17/15
15B0500-03 [WTSB539-1-2]	B115486	02/17/15
15B0500-04 [WTSB539-3-4]	B115486	02/17/15
15B0500-05 [WTSB506-5-6]	B115486	02/17/15
15B0500-06 [WTSB501-7-8]	B115486	02/17/15
15B0500-07 [WTSB501-13-14]	B115486	02/17/15
15B0500-08 [WTSB506-10-12]	B115486	02/17/15
15B0500-09 [WTSB504-4-6]	B115486	02/17/15
15B0500-10 [WTSB505-7-8]	B115486	02/17/15
15B0500-11 [WTSB505-11-12]	B115486	02/17/15
15B0500-12 [WTSB505-13-14]	B115486	02/17/15
15B0500-13 [WTSB505-13-14-1]	B115486	02/17/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-01 [WTSB538-9-10]	B115548	1.07	50.0	02/18/15
15B0500-02 [WTSB538-15-16]	B115548	1.06	50.0	02/18/15
15B0500-03 [WTSB539-1-2]	B115548	1.03	50.0	02/18/15
15B0500-04 [WTSB539-3-4]	B115548	1.05	50.0	02/18/15
15B0500-05 [WTSB506-5-6]	B115548	1.07	50.0	02/18/15
15B0500-06 [WTSB501-7-8]	B115548	1.02	50.0	02/18/15
15B0500-07 [WTSB501-13-14]	B115548	0.977	50.0	02/18/15
15B0500-08 [WTSB506-10-12]	B115548	1.05	50.0	02/18/15
15B0500-09 [WTSB504-4-6]	B115548	1.01	50.0	02/18/15
15B0500-10 [WTSB505-7-8]	B115548	0.991	50.0	02/18/15
15B0500-11 [WTSB505-11-12]	B115548	0.921	50.0	02/18/15
15B0500-12 [WTSB505-13-14]	B115548	1.05	50.0	02/18/15
15B0500-13 [WTSB505-13-14-1]	B115548	1.04	50.0	02/18/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-01 [WTSB538-9-10]	B115576	2.50	100	02/19/15
15B0500-02 [WTSB538-15-16]	B115576	2.55	100	02/19/15
15B0500-03 [WTSB539-1-2]	B115576	2.57	100	02/19/15
15B0500-04 [WTSB539-3-4]	B115576	2.58	100	02/19/15
15B0500-05 [WTSB506-5-6]	B115576	2.58	100	02/19/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-06 [WTSB501-7-8]	B115781	2.51	100	02/23/15
15B0500-07 [WTSB501-13-14]	B115781	2.54	100	02/23/15
15B0500-08 [WTSB506-10-12]	B115781	2.55	100	02/23/15
15B0500-09 [WTSB504-4-6]	B115781	2.50	100	02/23/15
15B0500-10 [WTSB505-7-8]	B115781	2.50	100	02/23/15
15B0500-11 [WTSB505-11-12]	B115781	2.53	100	02/23/15
15B0500-12 [WTSB505-13-14]	B115781	2.51	100	02/23/15
15B0500-13 [WTSB505-13-14-1]	B115781	2.51	100	02/23/15

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-01 [WTSB538-9-10]	B115458	0.618	50.0	02/17/15
15B0500-02 [WTSB538-15-16]	B115458	0.628	50.0	02/17/15
15B0500-03 [WTSB539-1-2]	B115458	0.626	50.0	02/17/15
15B0500-04 [WTSB539-3-4]	B115458	0.600	50.0	02/17/15
15B0500-05 [WTSB506-5-6]	B115458	0.620	50.0	02/17/15
15B0500-06 [WTSB501-7-8]	B115458	0.609	50.0	02/17/15
15B0500-07 [WTSB501-13-14]	B115458	0.608	50.0	02/17/15
15B0500-08 [WTSB506-10-12]	B115458	0.614	50.0	02/17/15
15B0500-09 [WTSB504-4-6]	B115458	0.609	50.0	02/17/15
15B0500-10 [WTSB505-7-8]	B115458	0.601	50.0	02/17/15
15B0500-11 [WTSB505-11-12]	B115458	0.603	50.0	02/17/15
15B0500-12 [WTSB505-13-14]	B115458	0.626	50.0	02/17/15
15B0500-13 [WTSB505-13-14-1]	B115458	0.606	50.0	02/17/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-01 [WTSB538-9-10]	B115590	1.17	50.0	02/19/15
15B0500-02 [WTSB538-15-16]	B115590	1.13	50.0	02/19/15
15B0500-03 [WTSB539-1-2]	B115590	1.02	50.0	02/19/15
15B0500-04 [WTSB539-3-4]	B115590	1.04	50.0	02/19/15
15B0500-05 [WTSB506-5-6]	B115590	1.30	50.0	02/19/15
15B0500-06 [WTSB501-7-8]	B115590	1.08	50.0	02/19/15
15B0500-07 [WTSB501-13-14]	B115590	1.35	50.0	02/19/15
15B0500-08 [WTSB506-10-12]	B115590	1.62	50.0	02/19/15
15B0500-09 [WTSB504-4-6]	B115590	1.16	50.0	02/19/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0500-10 [WTSB505-7-8]	B115703	1.06	50.0	02/20/15
15B0500-11 [WTSB505-11-12]	B115703	1.26	50.0	02/20/15
15B0500-12 [WTSB505-13-14]	B115703	1.01	50.0	02/20/15
15B0500-13 [WTSB505-13-14-1]	B115703	1.22	50.0	02/20/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115458 - SW-846 7471										
Blank (B115458-BLK1)				Prepared: 02/17/15 Analyzed: 02/18/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B115458-BS1)				Prepared: 02/17/15 Analyzed: 02/18/15						
Mercury	5.79	0.38	mg/Kg wet	5.76		101	71.2-128.6			
LCS Dup (B115458-BSD1)				Prepared: 02/17/15 Analyzed: 02/18/15						
Mercury	5.12	0.38	mg/Kg wet	5.76		89.0	71.2-128.6	12.2	30	
Duplicate (B115458-DUP1)	**Source: 15B0500-02**			Prepared: 02/17/15 Analyzed: 02/18/15						
Mercury	0.0167	0.043	mg/Kg dry		0.0204			19.9	35	J
Matrix Spike (B115458-MS1)	**Source: 15B0500-02**			Prepared: 02/17/15 Analyzed: 02/18/15						
Mercury	0.273	0.042	mg/Kg dry	0.279	0.0204	90.6	75-125			
Batch B115548 - SW-846 3050B										
Blank (B115548-BLK1)				Prepared: 02/18/15 Analyzed: 02/20/15						
Aluminum	1.5	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	6.0	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	0.16	0.75	mg/Kg wet							J
Magnesium	1.3	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B115548-BS1)				Prepared: 02/18/15 Analyzed: 02/20/15						
Aluminum	6220	5.1	mg/Kg wet	8100		76.8	51.2-148.1			
Antimony	81.4	5.1	mg/Kg wet	116		70.2	0-210.3			
Arsenic	114	5.1	mg/Kg wet	122		93.5	77.8-122.1			
Barium	152	5.1	mg/Kg wet	167		91.0	82-117.4			
Beryllium	53.1	0.51	mg/Kg wet	54.3		97.7	82.3-117.7			
Cadmium	81.2	0.51	mg/Kg wet	88.0		92.3	81.9-118.2			
Calcium	5380	15	mg/Kg wet	5920		90.8	81.9-118.2			
Chromium	95.0	1.0	mg/Kg wet	102		93.2	78.7-120.6			
Cobalt	91.6	5.1	mg/Kg wet	99.4		92.2	83-116.7			
Copper	75.4	1.0	mg/Kg wet	78.0		96.7	80.4-119.6			
Iron	12500	5.1	mg/Kg wet	15100		83.0	46.8-153			
Lead	85.1	1.5	mg/Kg wet	94.5		90.1	82.4-117.8			
Magnesium	2590	15	mg/Kg wet	3020		85.9	75.5-124.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B115548 - SW-846 3050B											
LCS (B115548-BS1)				Prepared: 02/18/15 Analyzed: 02/20/15							
Manganese	402	1.0	mg/Kg wet	401		100	80.8-119.2				
Nickel	50.0	1.0	mg/Kg wet	56.3		88.9	82.2-117.8				
Potassium	2440	200	mg/Kg wet	2490		98.1	69.9-130.1				
Selenium	144	5.1	mg/Kg wet	157		92.0	77.1-122.3				
Silver	31.0	1.0	mg/Kg wet	34.2		90.6	74.3-125.4				
Sodium	236	200	mg/Kg wet	246		95.9	69.9-130.5				
Thallium	102	5.1	mg/Kg wet	116		88.0	78.2-121.6				
Vanadium	62.4	2.0	mg/Kg wet	67.1		92.9	64.8-135.2				
Zinc	191	2.0	mg/Kg wet	207		92.1	79.7-120.8				
LCS Dup (B115548-BSD1)				Prepared: 02/18/15 Analyzed: 02/20/15							
Aluminum	6160	5.0	mg/Kg wet	8100		76.0	51.2-148.1	1.02		30	
Antimony	81.1	5.0	mg/Kg wet	116		69.9	0-210.3	0.424		30	
Arsenic	119	5.0	mg/Kg wet	122		97.6	77.8-122.1	4.23		30	
Barium	155	5.0	mg/Kg wet	167		92.8	82-117.4	2.00		30	
Beryllium	53.7	0.50	mg/Kg wet	54.3		98.9	82.3-117.7	1.22		30	
Cadmium	83.6	0.50	mg/Kg wet	88.0		95.0	81.9-118.2	2.85		30	
Calcium	5400	15	mg/Kg wet	5920		91.2	81.9-118.2	0.461		30	
Chromium	97.2	1.0	mg/Kg wet	102		95.3	78.7-120.6	2.24		30	
Cobalt	93.9	5.0	mg/Kg wet	99.4		94.4	83-116.7	2.42		30	
Copper	75.9	1.0	mg/Kg wet	78.0		97.3	80.4-119.6	0.621		30	
Iron	12100	5.0	mg/Kg wet	15100		80.1	46.8-153	3.56		30	
Lead	86.8	1.5	mg/Kg wet	94.5		91.8	82.4-117.8	1.92		30	
Magnesium	2610	15	mg/Kg wet	3020		86.5	75.5-124.2	0.627		30	
Manganese	389	1.0	mg/Kg wet	401		97.0	80.8-119.2	3.31		30	
Nickel	51.1	1.0	mg/Kg wet	56.3		90.8	82.2-117.8	2.13		30	
Potassium	2440	200	mg/Kg wet	2490		98.1	69.9-130.1	0.0146		30	
Selenium	149	5.0	mg/Kg wet	157		94.6	77.1-122.3	2.80		30	
Silver	31.5	1.0	mg/Kg wet	34.2		92.1	74.3-125.4	1.67		30	
Sodium	236	200	mg/Kg wet	246		96.1	69.9-130.5	0.233		30	
Thallium	104	5.0	mg/Kg wet	116		90.0	78.2-121.6	2.14		30	
Vanadium	63.9	2.0	mg/Kg wet	67.1		95.2	64.8-135.2	2.39		30	
Zinc	196	2.0	mg/Kg wet	207		94.5	79.7-120.8	2.60		30	
Duplicate (B115548-DUP1)		**Source: 15B0500-05**		Prepared: 02/18/15 Analyzed: 02/20/15							
Aluminum	5380	14	mg/Kg dry		5440			1.23		35	
Antimony	ND	14	mg/Kg dry		ND			NC		35	
Arsenic	ND	14	mg/Kg dry		ND			NC		35	
Barium	93.2	14	mg/Kg dry		89.0			4.57		35	
Beryllium	0.557	1.4	mg/Kg dry		0.225			**85.0**	*	35	R-04, J
Cadmium	ND	1.4	mg/Kg dry		ND			NC		35	
Calcium	5340	41	mg/Kg dry		4950			7.57		35	
Chromium	23.0	2.8	mg/Kg dry		22.3			3.17		35	
Cobalt	11.9	14	mg/Kg dry		11.5			3.45		35	J
Copper	94.1	2.8	mg/Kg dry		92.3			1.99		35	
Iron	12700	14	mg/Kg dry		12600			0.349		35	
Lead	5.43	4.1	mg/Kg dry		4.44			20.0		35	
Magnesium	2850	41	mg/Kg dry		2710			4.84		35	
Manganese	89.9	2.8	mg/Kg dry		90.6			0.692		35	
Nickel	143	2.8	mg/Kg dry		140			2.09		35	
Potassium	510	550	mg/Kg dry		491			3.68		35	J
Selenium	ND	14	mg/Kg dry		ND			NC		35	
Silver	ND	2.8	mg/Kg dry		ND			NC		35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115548 - SW-846 3050B											
Duplicate (B115548-DUP1)		**Source: 15B0500-05**		Prepared: 02/18/15 Analyzed: 02/19/15							
Sodium	ND	550	mg/Kg dry		ND				NC	35	
Thallium	ND	14	mg/Kg dry		ND				NC	35	
Vanadium	16.9	5.5	mg/Kg dry		16.1				5.34	35	
Zinc	52.1	5.5	mg/Kg dry		50.0				4.20	35	
MRL Check (B115548-MRL1)				Prepared: 02/18/15 Analyzed: 02/19/15							
Lead	0.731	0.74	mg/Kg wet	0.738		99.1		80-120			J
Matrix Spike (B115548-MS1)		**Source: 15B0500-05**		Prepared: 02/18/15 Analyzed: 02/20/15							
Aluminum	7310	14	mg/Kg dry	576	5440	**324**	*	75-125			MS-19
Antimony	436	14	mg/Kg dry	576	ND	75.7		75-125			
Arsenic	556	14	mg/Kg dry	576	ND	96.6		75-125			
Barium	659	14	mg/Kg dry	576	89.0	99.0		75-125			
Beryllium	560	1.4	mg/Kg dry	576	0.225	97.2		75-125			
Cadmium	547	1.4	mg/Kg dry	576	ND	95.1		75-125			
Calcium	6120	43	mg/Kg dry	576	4950	**203**	*	75-125			MS-19
Chromium	596	2.9	mg/Kg dry	576	22.3	99.6		75-125			
Cobalt	565	14	mg/Kg dry	576	11.5	96.2		75-125			
Copper	692	2.9	mg/Kg dry	576	92.3	104		75-125			
Iron	14300	14	mg/Kg dry	576	12600	**296**	*	75-125			MS-19
Lead	534	4.3	mg/Kg dry	576	4.44	92.0		75-125			
Magnesium	3640	43	mg/Kg dry	576	2710	**162**	*	75-125			MS-19
Manganese	683	2.9	mg/Kg dry	576	90.6	103		75-125			
Nickel	699	2.9	mg/Kg dry	576	140	97.2		75-125			
Potassium	6560	580	mg/Kg dry	5760	491	105		75-125			
Selenium	554	14	mg/Kg dry	576	ND	96.3		75-125			
Silver	538	2.9	mg/Kg dry	576	ND	93.4		75-125			
Sodium	828	580	mg/Kg dry	576	ND	**144**	*	75-125			MS-14
Thallium	527	14	mg/Kg dry	576	ND	91.6		75-125			
Vanadium	595	5.8	mg/Kg dry	576	16.1	101		75-125			
Zinc	604	5.8	mg/Kg dry	576	50.0	96.3		75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115486 - % Solids											
Duplicate (B115486-DUP1)		**Source: 15B0500-01**		Prepared: 02/17/15 Analyzed: 02/18/15							
% Solids	43.9		% Wt		43.2				1.61	20	
Duplicate (B115486-DUP2)		**Source: 15B0500-11**		Prepared: 02/17/15 Analyzed: 02/19/15							
% Solids	42.3		% Wt		41.8				1.19	20	
Batch B115576 - SW-846 7196A											
Blank (B115576-BLK1)				Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B115576-BS1)				Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	59	1.8	mg/Kg wet	56.0		105		80-120			
LCS Dup (B115576-BSD1)				Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	60	1.8	mg/Kg wet	56.4		106		80-120	1.78	20	
Matrix Spike (B115576-MS1) Soluble MS		**Source: 15B0500-01**		Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	36	1.8	mg/Kg dry	92.1	ND	**38.6**	*	75-125			MS-16
Matrix Spike (B115576-MS2) PDMS		**Source: 15B0500-01**		Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	71	3.6	mg/Kg dry	90.5	ND	78.5		75-125			
Matrix Spike (B115576-MS3) Insoluble MS		**Source: 15B0500-01**		Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	420	36	mg/Kg dry	1430	ND	**29.3**	*	75-125			MS-16
Matrix Spike Dup (B115576-MSD1) Soluble MS Dup		**Source: 15B0500-01**		Prepared & Analyzed: 02/19/15							
Hexavalent Chromium	39	1.8	mg/Kg dry	92.3	ND	**42.4**	*	75-125	9.56	35	MS-16
Batch B115590 - SW-846 9014											
Blank (B115590-BLK1)				Prepared: 02/19/15 Analyzed: 02/20/15							
Cyanide	ND	0.50	mg/Kg wet								
LCS (B115590-BS1)				Prepared: 02/19/15 Analyzed: 02/20/15							
Cyanide	73	2.5	mg/Kg wet	64.4		114		80-120			
LCS Dup (B115590-BSD1)				Prepared: 02/19/15 Analyzed: 02/20/15							
Cyanide	67	2.5	mg/Kg wet	64.3		104		80-120	8.89	20	
Matrix Spike (B115590-MS2)		**Source: 15B0500-08**		Prepared: 02/19/15 Analyzed: 02/20/15							
Cyanide	13	0.39	mg/Kg dry	14.0	ND	92.4		75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115590 - SW-846 9014										
Matrix Spike Dup (B115590-MSD2)	**Source: 15B0500-08**			Prepared: 02/19/15 Analyzed: 02/20/15						
Cyanide	15	0.41	mg/Kg dry	14.4	ND	106	75-125	17.0	35	
Batch B115703 - SW-846 9014										
Blank (B115703-BLK1)				Prepared & Analyzed: 02/20/15						
Cyanide	ND	0.50	mg/Kg wet							
LCS (B115703-BS1)				Prepared & Analyzed: 02/20/15						
Cyanide	59	2.4	mg/Kg wet	61.2		95.9	80-120			
LCS Dup (B115703-BSD1)				Prepared & Analyzed: 02/20/15						
Cyanide	60	2.4	mg/Kg wet	61.4		97.1	80-120	1.39	20	
Batch B115781 - SW-846 7196A										
Blank (B115781-BLK1)				Prepared & Analyzed: 02/23/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B115781-BS1)				Prepared & Analyzed: 02/23/15						
Hexavalent Chromium	67	2.0	mg/Kg wet	62.0		108	80-120			
LCS Dup (B115781-BSD1)				Prepared & Analyzed: 02/23/15						
Hexavalent Chromium	68	2.0	mg/Kg wet	62.8		109	80-120	2.38	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-14	Matrix spike recovery is outside of control limits. Data validation is not affected since sample result is "not detected" and recovery bias is on the high side for this compound.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-04	Duplicate relative percent difference (RPD) is a less useful indicator of sample precision for sample results that are <5 times the reporting limit (RL).
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

15B0500

Rev 04.05.12

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Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								I	I	I			
								A	A	G			
01	WTSB538-9-10	2/12/15	1140		X	S		✓	✓	✓			
02	WTSB538-15-16	2/12/15	1240		X	S		✓	✓	✓			
03	WTSB539-1-2	2/12/15	1405		X	S		✓	✓	✓			
04	WTSB539-3-4	2/12/15	1410		X	S		✓	✓	✓			
05	WTSB506-5-6	2/12/15	1500		X	S		✓	✓	✓			
06	WTSB501-7-8	2/12/15	1610		X	S		✓	✓	✓			
07	WTSB501-13-14	2/12/15	1640		X	S		✓	✓	✓			
08	WTSB506-10-12	2/12/15	1520		X	S		✓	✓	✓			
09	WTSB504-4-6	2/13/15	1050		X	S		✓	✓	✓			
10	WTSB505-7-8	2/13/15	0930		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)		Date/Time: 2/13/15 1800
Received by: (signature)	3.0 10.08	Date/Time: 2.16.15
Relinquished by: (signature)		Date/Time:
Received by: (signature)		Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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ACCREDITED IN ACCORDANCE WITH nelac
NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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CHAIN OF CUSTODY RECORD

15B0500

Rev 04.05.12

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Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
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DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A	A	A	G
11	WTSB 505-11-12	2/13/15	0950		X	S					✓	✓	✓
12	WTSB 505-13-14	2/13/15	1005		X	S					✓	✓	✓
13	WTSB 505-13-14-1	2/13/15	1005		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

	Relinquished by: (signature)	Date/Time:
R	[signature]	2/13/15 1507
R	[signature] 10:08	2/16/15
R	Relinquished by: (signature)	Date/Time:
R	Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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1ZR34A722210012096

Updated: 02/16/2015 10:08 A.M. Eastern Time

Delivered

Delivered On:
Monday, 02/16/2015 at 9:56 A.M.

Left At:
Front Desk

Signed By:
BLAKE

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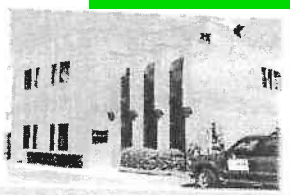

Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: PB DATE: 2.16.15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice [X] Direct from Sampling [ ] Ambient [ ] In Cooler(s) [X]

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank 3.0 Temperature °C by Temp gun _____

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** Log in

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers			# of containers
1 Liter Amber			8 oz amber/clear jar	
500 mL Amber			4 oz amber/clear jar	13
250 mL Amber (8oz amber)			2 oz amber/clear jar	13
1 Liter Plastic			Plastic Bag / Ziploc	
500 mL Plastic			SOC Kit	
250 mL plastic			Non-ConTest Container	
40 mL Vial - type listed below			Perchlorate Kit	
Colisure / bacteria bottle			Flashpoint bottle	
Dissolved Oxygen bottle			Other glass jar	
Encore			Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____ Time and Date Frozen:
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Doc #277 Rev. 4 August 2013

Who notified of False statements?
Log-In Technician Initials: PB

Date/Time:
Date/Time: 2-16-15 10:08

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

March 9, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0718

Enclosed are results of analyses for samples received by the laboratory on February 21, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB545-2-3	15B0718-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB545-4-5	15B0718-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB543-0.5-1.5	15B0718-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB543-1.5-2	15B0718-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB518-3-4	15B0718-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB511-3-4	15B0718-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB512-1-2	15B0718-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB512-5-6	15B0718-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB515-3-4	15B0718-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB544-3-4	15B0718-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB514-5-6	15B0718-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB533-3-4	15B0718-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB534-1-2	15B0718-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB534-3-4	15B0718-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-1-2	15B0718-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-3-4	15B0718-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB546-5-6	15B0718-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-5-6-1	15B0718-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB513-4-5	15B0718-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB513-5-6	15B0718-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

con-test® ANALYTICAL LABORATORY

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony
15B0718-07[WTSB512-1-2], B115832-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15B0718-07[WTSB512-1-2], B115832-MS1

Calcium
15B0718-07[WTSB512-1-2], B115832-MS1

Iron
15B0718-07[WTSB512-1-2], B115832-MS1

Magnesium
15B0718-07[WTSB512-1-2], B115832-MS1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0718-14[WTSB534-3-4], B115999-MS1, B115999-MS3, B115999-MSD1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0718-13[WTSB534-1-2], 15B0718-14[WTSB534-3-4]

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB545-2-3 | Sampled: 2/16/2015 13:00

Sample ID: 15B0718-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Barium	42	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Beryllium	0.44	0.28	0.046	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Cadmium	0.19	0.28	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Calcium	1700	8.5	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Chromium	15	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Cobalt	6.9	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Copper	23	0.57	0.43	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Iron	10000	28	24	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 19:34	AMP
Lead	3.6	0.85	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Magnesium	2800	8.5	0.89	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Manganese	71	0.57	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Mercury	0.0066	0.028	0.0041	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 10:45	SCB
Nickel	20	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Potassium	730	110	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Selenium	ND	2.8	0.88	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Sodium	100	110	55	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:44	AMP
Vanadium	16	1.1	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP
Zinc	25	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:03	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB545-2-3 | Sampled: 2/16/2015 13:00

Sample ID: 15B0718-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.48	0.52	0.47	mg/Kg dry	1	J	SW-846 9014	2/23/15	2/24/15 10:00	ABH
Hexavalent Chromium	ND	0.18	0.098	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	86.9			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB545-4-5 | Sampled: 2/16/2015 13:15

Sample ID: 15B0718-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	2.7	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Barium	41	2.7	0.33	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Beryllium	0.74	0.27	0.043	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Cadmium	0.27	0.27	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Calcium	1700	8.0	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Chromium	13	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Cobalt	7.2	2.7	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Copper	31	0.54	0.41	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Iron	19000	27	23	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 19:38	AMP
Lead	4.7	0.80	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Magnesium	2900	8.0	0.84	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Manganese	180	0.54	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Mercury	0.010	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 10:47	SCB
Nickel	13	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Potassium	1400	110	18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Sodium	88	110	52	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:48	AMP
Vanadium	20	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP
Zinc	27	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:24	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB545-4-5 | Sampled: 2/16/2015 13:15

Sample ID: 15B0718-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.44	0.40	mg/Kg dry	1		SW-846 9014	2/23/15	2/24/15 10:00	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	89.3			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB543-0.5-1.5 | Sampled: 2/16/2015 14:40

Sample ID: 15B0718-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	3.4	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Antimony	ND	3.4	2.8	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Arsenic	ND	3.4	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Barium	200	3.4	0.43	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Beryllium	0.33	0.34	0.055	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Cadmium	0.24	0.34	0.20	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Calcium	1700	10	1.9	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Chromium	40	0.69	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Cobalt	4.6	3.4	0.22	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Copper	46	0.69	0.52	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Iron	6800	34	29	mg/Kg dry	10		SW-846 6010C	2/23/15	2/27/15 14:03	KSH
Lead	4.1	1.0	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Magnesium	2300	10	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Manganese	46	0.69	0.22	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Mercury	0.034	0.032	0.0045	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 10:48	SCB
Nickel	29	0.69	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Potassium	830	140	24	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Selenium	ND	3.4	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Silver	ND	0.69	0.60	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Sodium	150	140	67	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Thallium	ND	3.4	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:53	AMP
Vanadium	14	1.4	0.23	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP
Zinc	19	1.4	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:30	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB543-0.5-1.5 | Sampled: 2/16/2015 14:40

Sample ID: 15B0718-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.57	0.52	mg/Kg dry	1		SW-846 9014	2/23/15	2/24/15 10:00	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	77.4			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB543-1.5-2 | Sampled: 2/16/2015 14:50

Sample ID: 15B0718-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3800	2.9	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Barium	59	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Beryllium	0.22	0.29	0.047	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Calcium	1300	8.7	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Chromium	16	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Cobalt	3.5	2.9	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Copper	23	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Iron	8100	29	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:03	AMP
Lead	2.7	0.87	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Magnesium	2000	8.7	0.91	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Manganese	50	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Mercury	0.0065	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 10:49	SCB
Nickel	17	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Potassium	860	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Sodium	100	120	56	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:58	AMP
Vanadium	7.2	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP
Zinc	18	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:35	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB543-1.5-2 | Sampled: 2/16/2015 14:50

Sample ID: 15B0718-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.66	0.36	0.33	mg/Kg dry	1		SW-846 9014	2/23/15	2/24/15 10:00	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	86.1			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB518-3-4 | Sampled: 2/17/2015 13:00

Sample ID: 15B0718-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	2.7	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Barium	51	2.7	0.34	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Beryllium	0.40	0.27	0.044	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Cadmium	0.18	0.27	0.16	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Calcium	1600	8.2	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Chromium	12	0.54	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Cobalt	5.4	2.7	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Copper	14	0.54	0.41	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Iron	9700	27	23	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:07	AMP
Lead	3.9	0.82	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Magnesium	2600	8.2	0.85	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Manganese	71	0.54	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 10:51	SCB
Nickel	10	0.54	0.13	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Potassium	1100	110	19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Sodium	100	110	53	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:03	AMP
Vanadium	11	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP
Zinc	21	1.1	0.28	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:40	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB518-3-4 | Sampled: 2/17/2015 13:00

Sample ID: 15B0718-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.53	0.48	mg/Kg dry	1		SW-846 9014	2/23/15	2/24/15 10:00	ABH
Hexavalent Chromium	0.13	0.18	0.099	mg/Kg dry	1	J	SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	88.1			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB511-3-4 | Sampled: 2/17/2015 14:10

Sample ID: 15B0718-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	2.9	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Barium	44	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Beryllium	0.58	0.29	0.047	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Cadmium	0.33	0.29	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Calcium	1400	8.7	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Chromium	12	0.58	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Cobalt	7.8	2.9	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Copper	18	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Iron	9900	29	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:11	AMP
Lead	6.0	0.87	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Magnesium	2900	8.7	0.91	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Manganese	77	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Mercury	0.0066	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 10:52	SCB
Nickel	19	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Potassium	870	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Sodium	120	120	57	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:08	AMP
Vanadium	20	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP
Zinc	27	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:46	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB511-3-4 | Sampled: 2/17/2015 14:10

Sample ID: 15B0718-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.44	0.40	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	83.8			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB512-1-2 | Sampled: 2/17/2015 14:40

Sample ID: 15B0718-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	2.8	1.2	mg/Kg dry	1	MS-19	SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1	MS-07	SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Barium	65	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Beryllium	0.38	0.28	0.046	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Calcium	1800	8.5	1.5	mg/Kg dry	1	MS-19	SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Chromium	15	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Cobalt	4.6	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Copper	14	0.57	0.43	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Iron	7900	28	24	mg/Kg dry	10	MS-19	SW-846 6010C	2/23/15	2/25/15 20:15	AMP
Lead	4.1	0.85	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Magnesium	2500	8.5	0.89	mg/Kg dry	1	MS-19	SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Manganese	55	0.57	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Mercury	ND	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 10:54	SCB
Nickel	11	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Potassium	940	110	19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Selenium	ND	2.8	0.88	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Sodium	130	110	55	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 21:39	AMP
Vanadium	13	1.1	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP
Zinc	23	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:51	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB512-1-2 | Sampled: 2/17/2015 14:40

Sample ID: 15B0718-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.57	0.51	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	87.4			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB512-5-6 | Sampled: 2/17/2015 15:30

Sample ID: 15B0718-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3900	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Barium	37	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Beryllium	0.28	0.28	0.045	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Calcium	1300	8.4	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Chromium	7.1	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Cobalt	3.0	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Copper	7.6	0.56	0.43	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Iron	7400	28	24	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:19	AMP
Lead	3.0	0.84	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Magnesium	2100	8.4	0.88	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Manganese	52	0.56	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Mercury	0.0044	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 10:59	SCB
Nickel	5.9	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Potassium	770	110	19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Sodium	85	110	55	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:13	AMP
Vanadium	7.6	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP
Zinc	16	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 21:57	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB512-5-6 | Sampled: 2/17/2015 15:30

Sample ID: 15B0718-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.44	0.40	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	86.1			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB515-3-4 | Sampled: 2/18/2015 09:30

Sample ID: 15B0718-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	2.9	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Barium	34	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Beryllium	0.46	0.29	0.046	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Cadmium	0.26	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Calcium	1600	8.6	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Chromium	10	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Cobalt	5.8	2.9	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Copper	12	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Iron	12000	29	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:22	AMP
Lead	3.2	0.86	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Magnesium	2900	8.6	0.90	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Manganese	83	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:00	SCB
Nickel	14	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Potassium	1000	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Sodium	85	120	56	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Thallium	ND	2.9	0.95	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:38	AMP
Vanadium	12	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP
Zinc	22	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:02	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB515-3-4 | Sampled: 2/18/2015 09:30

Sample ID: 15B0718-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.42	0.38	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	84.1			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB544-3-4 | Sampled: 2/18/2015 10:55

Sample ID: 15B0718-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Barium	46	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Beryllium	0.39	0.29	0.047	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Cadmium	0.18	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Calcium	1500	8.8	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Chromium	10	0.58	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Cobalt	4.8	2.9	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Copper	9.7	0.58	0.45	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Iron	9700	29	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:26	AMP
Lead	4.0	0.88	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Magnesium	2100	8.8	0.91	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Manganese	88	0.58	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Mercury	ND	0.028	0.0040	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:02	SCB
Nickel	11	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Potassium	820	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Sodium	130	120	57	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:43	AMP
Vanadium	11	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP
Zinc	22	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:08	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB544-3-4 | Sampled: 2/18/2015 10:55

Sample ID: 15B0718-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	88.3			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB514-5-6 | Sampled: 2/18/2015 11:40

Sample ID: 15B0718-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6800	3.3	1.4	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Antimony	ND	3.3	2.7	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Arsenic	2.1	3.3	1.2	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Barium	67	3.3	0.41	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Beryllium	0.86	0.33	0.054	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Cadmium	0.41	0.33	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Calcium	2200	10	1.8	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Chromium	19	0.67	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Cobalt	8.5	3.3	0.21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Copper	25	0.67	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Iron	18000	33	28	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:30	AMP
Lead	5.9	1.0	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Magnesium	4000	10	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Manganese	99	0.67	0.21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Mercury	0.0071	0.032	0.0046	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:03	SCB
Nickel	26	0.67	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Potassium	1400	130	23	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Silver	ND	0.67	0.59	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Sodium	140	130	65	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:48	AMP
Vanadium	31	1.3	0.22	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP
Zinc	36	1.3	0.34	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:13	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB514-5-6 | Sampled: 2/18/2015 11:40

Sample ID: 15B0718-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.57	0.51	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	77.0			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB533-3-4 | Sampled: 2/18/2015 14:30

Sample ID: 15B0718-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1900	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Barium	78	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Beryllium	1.8	0.28	0.045	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Cadmium	0.73	0.28	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Calcium	860	8.3	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Chromium	97	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Cobalt	63	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Copper	36	0.56	0.42	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Iron	110000	280	240	mg/Kg dry	100		SW-846 6010C	2/23/15	2/25/15 20:34	AMP
Lead	12	0.83	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 14:06	KSH
Magnesium	160000	830	87	mg/Kg dry	100		SW-846 6010C	2/23/15	2/25/15 20:34	AMP
Manganese	620	0.56	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Mercury	ND	0.026	0.0038	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:05	SCB
Nickel	290	0.56	0.13	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Potassium	160	110	19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Sodium	69	110	54	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:53	AMP
Vanadium	8.7	1.1	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP
Zinc	50	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:34	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB533-3-4 | Sampled: 2/18/2015 14:30

Sample ID: 15B0718-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.40	0.36	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	2/25/15	2/25/15 12:30	LL
% Solids	91.1			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB534-1-2 | Sampled: 2/18/2015 15:00

Sample ID: 15B0718-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5900	13	5.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Arsenic	5.1	13	4.7	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Barium	300	13	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Beryllium	0.74	1.3	0.21	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Cadmium	1.3	1.3	0.76	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Calcium	19000	39	7.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Chromium	90	2.6	0.65	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Cobalt	13	13	0.83	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Copper	190	2.6	2.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Iron	9900	13	11	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Lead	4.3	3.9	0.77	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 14:11	KSH
Magnesium	5700	39	4.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Manganese	260	2.6	0.82	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Mercury	0.075	0.13	0.019	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:06	SCB
Nickel	270	2.6	0.63	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Potassium	290	520	89	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Selenium	ND	13	4.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Sodium	260	520	250	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Thallium	ND	13	4.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 22:58	AMP
Vanadium	34	5.2	0.85	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP
Zinc	12	5.2	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:39	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB534-1-2 | Sampled: 2/18/2015 15:00

Sample ID: 15B0718-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.6	2.6	2.3	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	8.3	4.6	mg/Kg dry	10	W-06	SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	18.9			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB534-3-4 | Sampled: 2/19/2015 08:30

Sample ID: 15B0718-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6400	7.0	3.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Antimony	ND	7.0	5.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Arsenic	ND	7.0	2.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Barium	110	7.0	0.87	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Beryllium	0.47	0.70	0.11	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Cadmium	0.44	0.70	0.41	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Calcium	3700	21	3.8	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Chromium	17	1.4	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Cobalt	5.5	7.0	0.44	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Copper	47	1.4	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Iron	9900	7.0	5.9	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Lead	6.8	2.1	0.41	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 14:57	KSH
Magnesium	3900	21	2.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Manganese	83	1.4	0.44	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Mercury	0.014	0.064	0.0092	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:08	SCB
Nickel	44	1.4	0.34	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Potassium	1100	280	48	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Selenium	ND	7.0	2.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Sodium	180	280	140	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Thallium	ND	7.0	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:02	AMP
Vanadium	18	2.8	0.46	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP
Zinc	37	2.8	0.72	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:45	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB534-3-4 | Sampled: 2/19/2015 08:30

Sample ID: 15B0718-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.1	0.95	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	2.1	1.1	mg/Kg dry	5	MS-16, W-06	SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	38.2			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-1-2 | Sampled: 2/17/2015 08:45

Sample ID: 15B0718-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	3.2	1.4	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Arsenic	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Barium	82	3.2	0.39	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Beryllium	0.23	0.32	0.051	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Cadmium	0.21	0.32	0.19	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Calcium	1200	9.5	1.7	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Chromium	14	0.63	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Cobalt	7.5	3.2	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Copper	16	0.63	0.48	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Iron	5400	3.2	2.7	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Lead	2.5	0.95	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 15:01	KSH
Magnesium	1800	9.5	0.99	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Manganese	50	0.63	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Mercury	0.0046	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:09	SCB
Nickel	30	0.63	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Potassium	430	130	22	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Selenium	ND	3.2	0.98	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Silver	ND	0.63	0.56	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Sodium	130	130	62	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:07	AMP
Vanadium	10	1.3	0.21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP
Zinc	19	1.3	0.33	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:50	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-1-2 | Sampled: 2/17/2015 08:45

Sample ID: 15B0718-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.4	0.62	0.56	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	77.9			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-3-4 | Sampled: 2/17/2015 09:05

Sample ID: 15B0718-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	3.3	1.4	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Antimony	ND	3.3	2.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Barium	36	3.3	0.41	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Beryllium	0.18	0.33	0.053	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Cadmium	ND	0.33	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Calcium	1100	9.9	1.8	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Chromium	10	0.66	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Cobalt	4.2	3.3	0.21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Copper	15	0.66	0.50	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Iron	5900	3.3	2.8	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Lead	2.7	0.99	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 15:45	KSH
Magnesium	1800	9.9	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Manganese	56	0.66	0.21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:11	SCB
Nickel	20	0.66	0.16	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Potassium	550	130	23	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Sodium	110	130	64	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:12	AMP
Vanadium	6.9	1.3	0.22	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP
Zinc	20	1.3	0.34	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 22:56	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-3-4 | Sampled: 2/17/2015 09:05

Sample ID: 15B0718-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	2.6	0.45	0.41	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	82.8			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-5-6 | Sampled: 2/17/2015 09:30

Sample ID: 15B0718-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4400	2.8	1.2	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Barium	36	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Beryllium	0.30	0.28	0.045	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Cadmium	0.17	0.28	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Calcium	1200	8.5	1.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Chromium	9.8	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Cobalt	4.9	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Copper	21	0.57	0.43	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Iron	9500	28	24	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:38	AMP
Lead	3.5	0.85	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 15:55	KSH
Magnesium	2200	8.5	0.88	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Manganese	67	0.57	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Mercury	ND	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:12	SCB
Nickel	13	0.57	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Potassium	800	110	19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Sodium	96	110	55	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:17	AMP
Vanadium	8.6	1.1	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP
Zinc	23	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:01	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-5-6 | Sampled: 2/17/2015 09:30

Sample ID: 15B0718-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	4.7	0.54	0.49	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	86.0			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-5-6-1 | Sampled: 2/17/2015 09:30

Sample ID: 15B0718-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	3.1	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Barium	42	3.1	0.38	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Beryllium	0.40	0.31	0.049	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Cadmium	0.26	0.31	0.18	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Calcium	1700	9.2	1.7	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Chromium	9.5	0.61	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Cobalt	5.0	3.1	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Copper	17	0.61	0.47	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Iron	10000	31	26	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 20:58	AMP
Lead	4.0	0.92	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 15:59	KSH
Magnesium	2400	9.2	0.96	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Manganese	73	0.61	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Mercury	ND	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	2/23/15	2/24/15 11:17	SCB
Nickel	11	0.61	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Potassium	1100	120	21	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Sodium	110	120	59	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:22	AMP
Vanadium	11	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP
Zinc	25	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:07	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB546-5-6-1 | Sampled: 2/17/2015 09:30

Sample ID: 15B0718-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	4.0	0.53	0.48	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	86.0			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB513-4-5 | Sampled: 2/19/2015 10:10

Sample ID: 15B0718-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.9	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Barium	110	2.9	0.36	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Beryllium	0.52	0.29	0.047	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Cadmium	0.22	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Calcium	1900	8.7	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Chromium	17	0.58	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Cobalt	5.8	2.9	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Copper	12	0.58	0.44	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Iron	12000	29	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 21:02	AMP
Lead	7.4	0.87	0.17	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 16:04	KSH
Magnesium	3000	8.7	0.91	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Manganese	60	0.58	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Mercury	0.020	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:19	SCB
Nickel	16	0.58	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Potassium	1000	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Sodium	230	120	57	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:48	AMP
Vanadium	19	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP
Zinc	31	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:12	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB513-4-5 | Sampled: 2/19/2015 10:10

Sample ID: 15B0718-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.58	0.52	mg/Kg dry	1		SW-846 9014	2/25/15	2/26/15 10:50	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	79.9			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB513-5-6 | Sampled: 2/19/2015 10:15

Sample ID: 15B0718-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7200	3.0	1.3	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Barium	62	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Beryllium	0.64	0.30	0.048	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Cadmium	0.28	0.30	0.17	mg/Kg dry	1	J	SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Calcium	1800	8.9	1.6	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Chromium	15	0.59	0.15	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Cobalt	6.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Copper	14	0.59	0.45	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Iron	11000	30	25	mg/Kg dry	10		SW-846 6010C	2/23/15	2/25/15 21:05	AMP
Lead	5.5	0.89	0.18	mg/Kg dry	1		SW-846 6010C	2/23/15	2/27/15 16:09	KSH
Magnesium	3000	8.9	0.93	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Manganese	69	0.59	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Mercury	0.0066	0.029	0.0041	mg/Kg dry	1	J	SW-846 7471B	2/23/15	2/24/15 11:20	SCB
Nickel	14	0.59	0.14	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Potassium	980	120	20	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Selenium	ND	3.0	0.91	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Sodium	170	120	58	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	2/23/15	2/24/15 23:52	AMP
Vanadium	24	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP
Zinc	34	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/23/15	2/26/15 23:18	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0718

Date Received: 2/21/2015

Field Sample #: WTSB513-5-6 | Sampled: 2/19/2015 10:15

Sample ID: 15B0718-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.43	0.39	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 14:30	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	86.3			% Wt	1		SM 2540G	2/23/15	3/9/15 17:04	MRL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0718-01 [WTSB545-2-3]	B115828	02/23/15
15B0718-02 [WTSB545-4-5]	B115828	02/23/15
15B0718-03 [WTSB543-0.5-1.5]	B115828	02/23/15
15B0718-04 [WTSB543-1.5-2]	B115828	02/23/15
15B0718-05 [WTSB518-3-4]	B115828	02/23/15
15B0718-06 [WTSB511-3-4]	B115828	02/23/15
15B0718-07 [WTSB512-1-2]	B115828	02/23/15
15B0718-08 [WTSB512-5-6]	B115828	02/23/15
15B0718-09 [WTSB515-3-4]	B115828	02/23/15
15B0718-10 [WTSB544-3-4]	B115828	02/23/15
15B0718-11 [WTSB514-5-6]	B115828	02/23/15
15B0718-12 [WTSB533-3-4]	B115828	02/23/15
15B0718-13 [WTSB534-1-2]	B115828	02/23/15
15B0718-14 [WTSB534-3-4]	B115828	02/23/15
15B0718-15 [WTSB546-1-2]	B115828	02/23/15
15B0718-16 [WTSB546-3-4]	B115828	02/23/15
15B0718-17 [WTSB546-5-6]	B115828	02/23/15
15B0718-18 [WTSB546-5-6-1]	B115828	02/23/15
15B0718-19 [WTSB513-4-5]	B115828	02/23/15
15B0718-20 [WTSB513-5-6]	B115828	02/23/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-01 [WTSB545-2-3]	B115832	1.01	50.0	02/23/15
15B0718-02 [WTSB545-4-5]	B115832	1.04	50.0	02/23/15
15B0718-03 [WTSB543-0.5-1.5]	B115832	0.941	50.0	02/23/15
15B0718-04 [WTSB543-1.5-2]	B115832	1.00	50.0	02/23/15
15B0718-05 [WTSB518-3-4]	B115832	1.04	50.0	02/23/15
15B0718-06 [WTSB511-3-4]	B115832	1.02	50.0	02/23/15
15B0718-07 [WTSB512-1-2]	B115832	1.01	50.0	02/23/15
15B0718-08 [WTSB512-5-6]	B115832	1.04	50.0	02/23/15
15B0718-09 [WTSB515-3-4]	B115832	1.03	50.0	02/23/15
15B0718-10 [WTSB544-3-4]	B115832	0.969	50.0	02/23/15
15B0718-11 [WTSB514-5-6]	B115832	0.975	50.0	02/23/15
15B0718-12 [WTSB533-3-4]	B115832	0.986	50.0	02/23/15
15B0718-13 [WTSB534-1-2]	B115832	1.02	50.0	02/23/15
15B0718-14 [WTSB534-3-4]	B115832	0.941	50.0	02/23/15
15B0718-15 [WTSB546-1-2]	B115832	1.01	50.0	02/23/15
15B0718-16 [WTSB546-3-4]	B115832	0.918	50.0	02/23/15
15B0718-17 [WTSB546-5-6]	B115832	1.03	50.0	02/23/15
15B0718-18 [WTSB546-5-6-1]	B115832	0.952	50.0	02/23/15
15B0718-19 [WTSB513-4-5]	B115832	1.07	50.0	02/23/15
15B0718-20 [WTSB513-5-6]	B115832	0.980	50.0	02/23/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-01 [WTSB545-2-3]	B115924	2.59	100	02/25/15
15B0718-02 [WTSB545-4-5]	B115924	2.56	100	02/25/15
15B0718-03 [WTSB543-0.5-1.5]	B115924	2.55	100	02/25/15
15B0718-04 [WTSB543-1.5-2]	B115924	2.55	100	02/25/15
15B0718-05 [WTSB518-3-4]	B115924	2.53	100	02/25/15

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Sample Extraction Data

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-06 [WTSB511-3-4]	B115924	2.56	100	02/25/15
15B0718-07 [WTSB512-1-2]	B115924	2.59	100	02/25/15
15B0718-08 [WTSB512-5-6]	B115924	2.56	100	02/25/15
15B0718-09 [WTSB515-3-4]	B115924	2.50	100	02/25/15
15B0718-10 [WTSB544-3-4]	B115924	2.51	100	02/25/15
15B0718-11 [WTSB514-5-6]	B115924	2.56	100	02/25/15
15B0718-12 [WTSB533-3-4]	B115924	2.54	100	02/25/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-13 [WTSB534-1-2]	B115999	2.55	100	02/26/15
15B0718-14 [WTSB534-3-4]	B115999	2.52	100	02/26/15
15B0718-15 [WTSB546-1-2]	B115999	2.59	100	02/26/15
15B0718-16 [WTSB546-3-4]	B115999	2.53	100	02/26/15
15B0718-17 [WTSB546-5-6]	B115999	2.51	100	02/26/15
15B0718-18 [WTSB546-5-6-1]	B115999	2.52	100	02/26/15
15B0718-19 [WTSB513-4-5]	B115999	2.52	100	02/26/15
15B0718-20 [WTSB513-5-6]	B115999	2.51	100	02/26/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-01 [WTSB545-2-3]	B115797	0.611	50.0	02/23/15
15B0718-02 [WTSB545-4-5]	B115797	0.625	50.0	02/23/15
15B0718-03 [WTSB543-0.5-1.5]	B115797	0.614	50.0	02/23/15
15B0718-04 [WTSB543-1.5-2]	B115797	0.604	50.0	02/23/15
15B0718-05 [WTSB518-3-4]	B115797	0.622	50.0	02/23/15
15B0718-06 [WTSB511-3-4]	B115797	0.614	50.0	02/23/15
15B0718-07 [WTSB512-1-2]	B115797	0.604	50.0	02/23/15
15B0718-08 [WTSB512-5-6]	B115797	0.622	50.0	02/23/15
15B0718-09 [WTSB515-3-4]	B115797	0.613	50.0	02/23/15
15B0718-10 [WTSB544-3-4]	B115797	0.611	50.0	02/23/15
15B0718-11 [WTSB514-5-6]	B115797	0.615	50.0	02/23/15
15B0718-12 [WTSB533-3-4]	B115797	0.628	50.0	02/23/15
15B0718-13 [WTSB534-1-2]	B115797	0.608	50.0	02/23/15
15B0718-14 [WTSB534-3-4]	B115797	0.613	50.0	02/23/15
15B0718-15 [WTSB546-1-2]	B115797	0.624	50.0	02/23/15
15B0718-16 [WTSB546-3-4]	B115797	0.617	50.0	02/23/15
15B0718-17 [WTSB546-5-6]	B115797	0.617	50.0	02/23/15
15B0718-18 [WTSB546-5-6-1]	B115797	0.613	50.0	02/23/15
15B0718-19 [WTSB513-4-5]	B115797	0.608	50.0	02/23/15
15B0718-20 [WTSB513-5-6]	B115797	0.607	50.0	02/23/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-01 [WTSB545-2-3]	B115787	1.10	50.0	02/23/15
15B0718-02 [WTSB545-4-5]	B115787	1.26	50.0	02/23/15
15B0718-03 [WTSB543-0.5-1.5]	B115787	1.13	50.0	02/23/15
15B0718-04 [WTSB543-1.5-2]	B115787	1.60	50.0	02/23/15

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Sample Extraction Data

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-05 [WTSB518-3-4]	B115787	1.06	50.0	02/23/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-06 [WTSB511-3-4]	B115951	1.35	50.0	02/25/15
15B0718-07 [WTSB512-1-2]	B115951	1.01	50.0	02/25/15
15B0718-08 [WTSB512-5-6]	B115951	1.32	50.0	02/25/15
15B0718-09 [WTSB515-3-4]	B115951	1.43	50.0	02/25/15
15B0718-10 [WTSB544-3-4]	B115951	1.37	50.0	02/25/15
15B0718-11 [WTSB514-5-6]	B115951	1.14	50.0	02/25/15
15B0718-12 [WTSB533-3-4]	B115951	1.39	50.0	02/25/15
15B0718-13 [WTSB534-1-2]	B115951	1.02	50.0	02/25/15
15B0718-14 [WTSB534-3-4]	B115951	1.25	50.0	02/25/15
15B0718-15 [WTSB546-1-2]	B115951	1.03	50.0	02/25/15
15B0718-16 [WTSB546-3-4]	B115951	1.34	50.0	02/25/15
15B0718-17 [WTSB546-5-6]	B115951	1.07	50.0	02/25/15
15B0718-18 [WTSB546-5-6-1]	B115951	1.09	50.0	02/25/15
15B0718-19 [WTSB513-4-5]	B115951	1.08	50.0	02/25/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0718-20 [WTSB513-5-6]	B116213	1.35	50.0	03/02/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115797 - SW-846 7471										
Blank (B115797-BLK1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B115797-BS1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Mercury	5.11	0.38	mg/Kg wet	5.76		88.7	71.2-128.6			
LCS Dup (B115797-BSD1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Mercury	4.65	0.39	mg/Kg wet	5.76		80.7	71.2-128.6	9.37	30	
Duplicate (B115797-DUP1)	**Source: 15B0718-01**			Prepared: 02/23/15 Analyzed: 02/24/15						
Mercury	0.00503	0.028	mg/Kg dry		0.00663			27.5	35	J
Matrix Spike (B115797-MS1)	**Source: 15B0718-01**			Prepared: 02/23/15 Analyzed: 02/24/15						
Mercury	0.191	0.028	mg/Kg dry	0.189	0.00663	97.5	75-125			
Batch B115832 - SW-846 3050B										
Blank (B115832-BLK1)				Prepared: 02/23/15 Analyzed: 02/26/15						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	1.6	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	0.17	0.75	mg/Kg wet							J
Magnesium	1.3	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.54	1.0	mg/Kg wet							J
LCS (B115832-BS1)				Prepared: 02/23/15 Analyzed: 02/26/15						
Aluminum	6880	5.0	mg/Kg wet	8100		85.0	51.2-148.1			
Antimony	102	5.0	mg/Kg wet	116		87.6	0-210.3			
Arsenic	120	5.0	mg/Kg wet	122		98.7	77.8-122.1			
Barium	166	5.0	mg/Kg wet	167		99.6	82-117.4			
Beryllium	58.0	0.50	mg/Kg wet	54.3		107	82.3-117.7			
Cadmium	85.0	0.50	mg/Kg wet	88.0		96.6	81.9-118.2			
Calcium	5790	15	mg/Kg wet	5920		97.9	81.9-118.2			
Chromium	101	1.0	mg/Kg wet	102		98.7	78.7-120.6			
Cobalt	98.2	5.0	mg/Kg wet	99.4		98.8	83-116.7			
Copper	75.7	1.0	mg/Kg wet	78.0		97.0	80.4-119.6			
Iron	13400	5.0	mg/Kg wet	15100		88.6	46.8-153			
Lead	89.2	1.5	mg/Kg wet	94.5		94.4	82.4-117.8			
Magnesium	2800	15	mg/Kg wet	3020		92.9	75.5-124.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115832 - SW-846 3050B										
LCS (B115832-BS1)				Prepared: 02/23/15 Analyzed: 02/26/15						
Manganese	411	1.0	mg/Kg wet	401		103	80.8-119.2			
Nickel	54.1	1.0	mg/Kg wet	56.3		96.1	82.2-117.8			
Potassium	2750	200	mg/Kg wet	2490		110	69.9-130.1			
Selenium	137	5.0	mg/Kg wet	157		87.6	77.1-122.3			
Silver	31.2	1.0	mg/Kg wet	34.2		91.3	74.3-125.4			
Sodium	266	200	mg/Kg wet	246		108	69.9-130.5			
Thallium	106	5.0	mg/Kg wet	116		91.7	78.2-121.6			
Vanadium	65.5	2.0	mg/Kg wet	67.1		97.6	64.8-135.2			
Zinc	192	2.0	mg/Kg wet	207		93.0	79.7-120.8			
LCS Dup (B115832-BSD1)				Prepared: 02/23/15 Analyzed: 02/26/15						
Aluminum	6430	5.0	mg/Kg wet	8100		79.4	51.2-148.1	6.75	30	
Antimony	104	5.0	mg/Kg wet	116		89.5	0-210.3	2.10	30	
Arsenic	119	5.0	mg/Kg wet	122		97.3	77.8-122.1	1.36	30	
Barium	155	5.0	mg/Kg wet	167		93.1	82-117.4	6.76	30	
Beryllium	55.7	0.50	mg/Kg wet	54.3		103	82.3-117.7	4.03	30	
Cadmium	85.7	0.50	mg/Kg wet	88.0		97.4	81.9-118.2	0.849	30	
Calcium	5520	15	mg/Kg wet	5920		93.3	81.9-118.2	4.81	30	
Chromium	95.7	1.0	mg/Kg wet	102		93.8	78.7-120.6	5.08	30	
Cobalt	95.4	5.0	mg/Kg wet	99.4		96.0	83-116.7	2.88	30	
Copper	71.3	1.0	mg/Kg wet	78.0		91.4	80.4-119.6	5.92	30	
Iron	12400	5.0	mg/Kg wet	15100		82.1	46.8-153	7.62	30	
Lead	87.6	1.5	mg/Kg wet	94.5		92.7	82.4-117.8	1.82	30	
Magnesium	2720	15	mg/Kg wet	3020		90.0	75.5-124.2	3.08	30	
Manganese	383	1.0	mg/Kg wet	401		95.4	80.8-119.2	7.28	30	
Nickel	51.9	1.0	mg/Kg wet	56.3		92.1	82.2-117.8	4.23	30	
Potassium	2580	200	mg/Kg wet	2490		104	69.9-130.1	6.43	30	
Selenium	142	5.0	mg/Kg wet	157		90.3	77.1-122.3	3.08	30	
Silver	29.7	1.0	mg/Kg wet	34.2		86.7	74.3-125.4	5.22	30	
Sodium	249	200	mg/Kg wet	246		101	69.9-130.5	6.42	30	
Thallium	103	5.0	mg/Kg wet	116		88.8	78.2-121.6	3.15	30	
Vanadium	61.6	2.0	mg/Kg wet	67.1		91.9	64.8-135.2	6.07	30	
Zinc	188	2.0	mg/Kg wet	207		90.6	79.7-120.8	2.56	30	
Duplicate (B115832-DUP1)		**Source: 15B0718-07**		Prepared: 02/23/15 Analyzed: 02/26/15						
Aluminum	5780	3.0	mg/Kg dry		5690			1.59	35	
Antimony	ND	3.0	mg/Kg dry		ND			NC	35	
Arsenic	ND	3.0	mg/Kg dry		ND			NC	35	
Barium	69.0	3.0	mg/Kg dry		65.0			5.87	35	
Beryllium	0.447	0.30	mg/Kg dry		0.380			16.1	35	
Cadmium	0.187	0.30	mg/Kg dry		ND			NC	35	J
Calcium	1820	8.9	mg/Kg dry		1810			0.314	35	
Chromium	16.7	0.59	mg/Kg dry		15.0			10.6	35	
Cobalt	5.00	3.0	mg/Kg dry		4.63			7.55	35	
Copper	14.3	0.59	mg/Kg dry		14.3			0.322	35	
Iron	8760	30	mg/Kg dry		7860			10.9	35	
Lead	4.35	0.89	mg/Kg dry		4.09			6.26	35	
Magnesium	2470	8.9	mg/Kg dry		2460			0.319	35	
Manganese	58.3	0.59	mg/Kg dry		55.0			5.92	35	
Nickel	12.3	0.59	mg/Kg dry		11.4			7.47	35	
Potassium	888	120	mg/Kg dry		936			5.20	35	
Selenium	ND	3.0	mg/Kg dry		ND			NC	35	
Silver	ND	0.59	mg/Kg dry		ND			NC	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115832 - SW-846 3050B											
Duplicate (B115832-DUP1)	**Source: 15B0718-07**			Prepared: 02/23/15 Analyzed: 02/24/15							
Sodium	131	120	mg/Kg dry		131				0.272	35	
Thallium	ND	3.0	mg/Kg dry		ND				NC	35	
Vanadium	14.0	1.2	mg/Kg dry		13.1				6.53	35	
Zinc	26.1	1.2	mg/Kg dry		23.3				11.1	35	
MRL Check (B115832-MRL1)				Prepared: 02/23/15 Analyzed: 02/26/15							
Lead	0.738	0.74	mg/Kg wet	0.738		100		80-120			
Matrix Spike (B115832-MS1)	**Source: 15B0718-07**			Prepared: 02/23/15 Analyzed: 02/26/15							
Aluminum	5980	3.0	mg/Kg dry	119	5690	**246**	*	75-125			MS-19
Antimony	70.1	3.0	mg/Kg dry	119	ND	**58.9**	*	75-125			MS-07
Arsenic	107	3.0	mg/Kg dry	119	ND	89.9		75-125			
Barium	173	3.0	mg/Kg dry	119	65.0	90.9		75-125			
Beryllium	114	0.30	mg/Kg dry	119	0.380	95.1		75-125			
Cadmium	105	0.30	mg/Kg dry	119	ND	88.2		75-125			
Calcium	2140	8.9	mg/Kg dry	119	1810	**280**	*	75-125			MS-19
Chromium	124	0.60	mg/Kg dry	119	15.0	91.6		75-125			
Cobalt	111	3.0	mg/Kg dry	119	4.63	89.1		75-125			
Copper	127	0.60	mg/Kg dry	119	14.3	94.4		75-125			
Iron	9600	30	mg/Kg dry	119	7860	**1460**	*	75-125			MS-19
Lead	107	0.89	mg/Kg dry	119	4.09	86.3		75-125			
Magnesium	2750	8.9	mg/Kg dry	119	2460	**240**	*	75-125			MS-19
Manganese	165	0.60	mg/Kg dry	119	55.0	92.3		75-125			
Nickel	115	0.60	mg/Kg dry	119	11.4	87.3		75-125			
Potassium	2170	120	mg/Kg dry	1190	936	104		75-125			
Selenium	97.1	3.0	mg/Kg dry	119	ND	81.6		75-125			
Silver	106	0.60	mg/Kg dry	119	ND	89.0		75-125			
Sodium	275	120	mg/Kg dry	119	131	121		75-125			
Thallium	107	3.0	mg/Kg dry	119	ND	90.2		75-125			
Vanadium	119	1.2	mg/Kg dry	119	13.1	89.2		75-125			
Zinc	123	1.2	mg/Kg dry	119	23.3	84.1		75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115787 - SW-846 9014										
Blank (B115787-BLK1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Cyanide	ND	0.49	mg/Kg wet							
LCS (B115787-BS1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Cyanide	61	2.5	mg/Kg wet	64.1		94.8	80-120			
LCS Dup (B115787-BSD1)				Prepared: 02/23/15 Analyzed: 02/24/15						
Cyanide	59	2.5	mg/Kg wet	64.2		92.3	80-120	2.39	20	
Batch B115828 - % Solids										
Duplicate (B115828-DUP1)	**Source: 15B0718-01**			Prepared: 02/23/15 Analyzed: 03/09/15						
% Solids	85.3		% Wt		86.9			1.86	20	
Duplicate (B115828-DUP2)	**Source: 15B0718-20**			Prepared: 02/23/15 Analyzed: 03/09/15						
% Solids	86.9		% Wt		86.3			0.693	20	
Batch B115924 - SW-846 7196A										
Blank (B115924-BLK1)				Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B115924-BS1)				Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	49	2.0	mg/Kg wet	59.2		83.4	80-120			
LCS Dup (B115924-BSD1)				Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	54	2.0	mg/Kg wet	59.1		91.2	80-120	8.74	20	
Matrix Spike (B115924-MS1) SolubleMS	**Source: 15B0718-01**			Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	37	0.92	mg/Kg dry	46.0	ND	81.1	75-125			
Matrix Spike (B115924-MS2) PDMS	**Source: 15B0718-01**			Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	57	1.8	mg/Kg dry	45.5	ND	125	75-125			
Matrix Spike (B115924-MS3) Insoluble MS	**Source: 15B0718-01**			Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	730	18	mg/Kg dry	730	ND	101	75-125			
Matrix Spike Dup (B115924-MSD1) Soluble MS Dup	**Source: 15B0718-01**			Prepared & Analyzed: 02/25/15						
Hexavalent Chromium	40	0.90	mg/Kg dry	45.1	ND	88.4	75-125	6.67	35	
Batch B115951 - SW-846 9014										
Blank (B115951-BLK1)				Prepared: 02/25/15 Analyzed: 02/26/15						
Cyanide	ND	0.39	mg/Kg wet							

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115951 - SW-846 9014											
LCS (B115951-BS1)				Prepared: 02/25/15 Analyzed: 02/26/15							
Cyanide	71	2.5	mg/Kg wet	64.3		111		80-120			
LCS Dup (B115951-BSD1)				Prepared: 02/25/15 Analyzed: 02/26/15							
Cyanide	72	2.5	mg/Kg wet	63.9		112		80-120	0.631	20	
Matrix Spike (B115951-MS1)	**Source: 15B0718-15**			Prepared: 02/25/15 Analyzed: 02/26/15							
Cyanide	21	0.62	mg/Kg dry	21.2	3.4	84.2		75-125			
Matrix Spike Dup (B115951-MSD1)	**Source: 15B0718-15**			Prepared: 02/25/15 Analyzed: 02/26/15							
Cyanide	23	0.62	mg/Kg dry	21.1	3.4	93.3		75-125	8.32	35	
Batch B115999 - SW-846 7196A											
Blank (B115999-BLK1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	ND	0.15	mg/Kg wet								
LCS (B115999-BS1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	64	2.0	mg/Kg wet	59.3		107		80-120			
LCS Dup (B115999-BSD1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	63	2.0	mg/Kg wet	59.6		106		80-120	0.661	20	
Matrix Spike (B115999-MS1) Soluble MS	**Source: 15B0718-14**			Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	65	2.1	mg/Kg dry	103	ND	**62.8**	*	75-125			MS-16
Matrix Spike (B115999-MS2) PDMS	**Source: 15B0718-14**			Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	130	4.1	mg/Kg dry	104	ND	121		75-125			
Matrix Spike (B115999-MS3) Insoluble MS	**Source: 15B0718-14**			Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	870	41	mg/Kg dry	1630	ND	**53.0**	*	75-125			MS-16
Matrix Spike Dup (B115999-MSD1) Soluble MS Dup	**Source: 15B0718-14**			Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	67	2.0	mg/Kg dry	102	ND	**65.7**	*	75-125	3.51	35	MS-16
Batch B116213 - SW-846 9014											
Blank (B116213-BLK1)				Prepared & Analyzed: 03/02/15							
Cyanide	ND	0.44	mg/Kg wet								
LCS (B116213-BS1)				Prepared & Analyzed: 03/02/15							
Cyanide	74	2.4	mg/Kg wet	63.1		117		80-120			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116213 - SW-846 9014										
LCS Dup (B116213-BSD1)				Prepared & Analyzed: 03/02/15						
Cyanide	70	2.5	mg/Kg wet	63.2		111	80-120	4.62	20	
Duplicate (B116213-DUP1)		**Source: 15B0718-20**		Prepared & Analyzed: 03/02/15						
Cyanide	ND	0.43	mg/Kg dry		ND			NC	35	
Matrix Spike (B116213-MS1)		**Source: 15B0718-20**		Prepared & Analyzed: 03/02/15						
Cyanide	17	0.43	mg/Kg dry	14.8	ND	114	75-125			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

MJ 15B00 15B0718

Rev 04.05.12

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39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	G			
01	WTSB545-2-3	2/16/15	1300		X	S					✓	✓	✓
02	WTSB545-4-5	2/16/15	1315		X	S					✓	✓	✓
03	WTSB543-0.5-1.5	2/16/15	~~1450~~ 1440		X	S					✓	✓	✓
04	WTSB543-1.5-2	2/16/15	1450 ← 1450		X	S					✓	✓	✓
05	WTSB518-3-4	2/17/15	1300		X	S					✓	✓	✓
06	WTSB511-3-4	2/17/15	1410		X	S					✓	✓	✓
07	WTSB512-1-2	2/17/15	1440		X	S					✓	✓	✓
08	WTSB512-5-6	2/17/15	1530		X	S					✓	✓	✓
09	WTSB515-3-4	2/18/15	0930		X	S					✓	✓	✓
10	WTSB544-3-4	2/18/15	1055		X	S					✓	✓	✓

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Relinquished by: (signature)	Date/Time: 2/20/15 13:20	
Received by: (signature) 3.0C	Date/Time: 2/21/15 11:45	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

MS 15B0718
Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
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○ FAX ◉ EMAIL ○ WEBSITE
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○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A	A	A	G
11	WTSB514-5-6	2/18/15	1140		X	S					✓	✓	✓
12	WTSB533-3-4	2/18/15	1430		X	S					✓	✓	✓
13	WTSB534-1-2	2/18/15	1500		X	S					✓	✓	✓
14	WTSB534-3-4	2/19/15	0830		X	S					✓	✓	✓
15	WTSB546-1-2	2/17/15	0845		X	S					✓	✓	✓
16	WTSB546-3-4	2/17/15	0905		X	S					✓	✓	✓
17	WTSB546-5-6	2/17/15	0930		X	S					✓	✓	✓
18	WTSB546-5-6-1	2/17/15	0930		X	S					✓	✓	✓
19	WTSB513-4-5	2/19/15	1010		X	S					✓	✓	✓
20	WTSB513-5-6	2/19/15	1015		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

	Relinquished by: (signature)	Date/Time:
		2/20/15 1300
	Received by: (signature)	Date/Time:
		2/21/15 11:45 3.0°C
	Relinquished by: (signature)	Date/Time:
	Received by: (signature)	Date/Time:

Turnaround ††
❒ 7-Day
◉ 10-Day
❒ Other ____
RUSH †
❒ †24-Hr ❒ †48-Hr
❒ †72-Hr ❒ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts: _____
Connecticut: _____
Other: _____

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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1ZR34A722210011837

Updated: 02/21/2015 12:04 P.M. Eastern Time

Delivered

Delivered On:
Saturday, 02/21/2015 at 11:45 A.M.

Left At:
Dock

Signed By:
JONES

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Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: MT DATE: 2/2/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice [X] Direct from Sampling [ ] Ambient [ ] In Cooler(s) [X]
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank 3.0°C Temperature °C by Temp gun _____
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	20
250 mL Amber (8oz amber)		2 oz amber/clear jar	20
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: **Date/Time:**

MJ 2/24/15

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

March 9, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0719

Enclosed are results of analyses for samples received by the laboratory on February 21, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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15B0719-08 23

15B0719-09 25

15B0719-10 27

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con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0719

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB513-5-6-1	15B0719-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-1-2	15B0719-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-4-5	15B0719-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-5-6	15B0719-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB530-4-5	15B0719-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB530-5-6	15B0719-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB531-5-6	15B0719-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB529-2-3	15B0719-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0719

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB529-5-6	15B0719-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB527-3-4	15B0719-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB527-5-6	15B0719-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB526-2-3	15B0719-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum
15B0719-01[WTSB513-5-6-1], 15B0719-02[WTSB535-1-2], 15B0719-03[WTSB535-4-5], 15B0719-04[WTSB535-5-6], 15B0719-05[WTSB530-4-5], 15B0719-06[WTSB530-5-6], 15B0719-07[WTSB531-5-6], 15B0719-08[WTSB529-2-3], 15B0719-09[WTSB529-5-6], 15B0719-10[WTSB527-3-4], 15B0719-11[WTSB527-5-6], 15B0719-12[WTSB526-2-3], B115872-BLK1

Iron
15B0719-01[WTSB513-5-6-1], 15B0719-02[WTSB535-1-2], 15B0719-03[WTSB535-4-5], 15B0719-04[WTSB535-5-6], 15B0719-05[WTSB530-4-5], 15B0719-06[WTSB530-5-6], 15B0719-07[WTSB531-5-6], 15B0719-08[WTSB529-2-3], 15B0719-09[WTSB529-5-6], 15B0719-10[WTSB527-3-4], 15B0719-11[WTSB527-5-6], 15B0719-12[WTSB526-2-3], B115872-BLK1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Arsenic
B115872-BSD1

Barium
B115872-BSD1

Beryllium
B115872-BSD1

Cadmium
B115872-BSD1

Calcium
B115872-BSD1

Chromium
B115872-BSD1

Cobalt
B115872-BSD1

Copper
B115872-BSD1

Lead
B115872-BSD1

Magnesium
B115872-BSD1

Manganese
B115872-BSD1

Nickel
B115872-BSD1

Potassium
B115872-BSD1

Selenium
B115872-BSD1

Silver
B115872-BSD1

Thallium
B115872-BSD1

Zinc
B115872-BSD1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0719-08[WTSB529-2-3], B116055-MS1, B116055-MS3, B116055-MSD1

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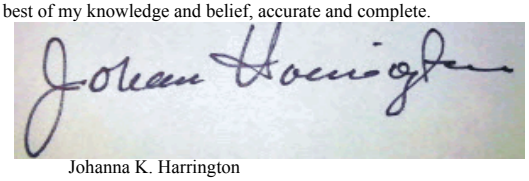
W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0719-03[WTSB535-4-5], 15B0719-04[WTSB535-5-6], 15B0719-05[WTSB530-4-5], 15B0719-07[WTSB531-5-6], 15B0719-08[WTSB529-2-3]

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Johanna K. Harrington
Manager, Laboratory Reporting

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB513-5-6-1 | Sampled: 2/19/2015 10:15

Sample ID: 15B0719-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4100	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Barium	40	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Beryllium	0.24	0.31	0.050	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Calcium	1100	9.3	1.7	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Chromium	8.1	0.62	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Cobalt	4.1	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Copper	9.9	0.62	0.47	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Iron	5300	3.1	2.7	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Lead	3.1	0.93	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Magnesium	1800	9.3	0.97	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Manganese	42	0.62	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Mercury	0.0083	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 10:51	SCB
Nickel	9.7	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Potassium	480	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Sodium	100	120	61	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP
Vanadium	14	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 17:43	AMP
Zinc	24	1.2	0.32	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:50	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB513-5-6-1 | Sampled: 2/19/2015 10:15

Sample ID: 15B0719-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.42	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	84.9			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-1-2 | Sampled: 2/19/2015 10:40

Sample ID: 15B0719-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4400	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Barium	32	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Beryllium	0.23	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Cadmium	0.18	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Calcium	680	9.0	1.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Chromium	7.7	0.60	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Cobalt	4.7	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Copper	12	0.60	0.46	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Iron	12000	30	26	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:14	KSH
Lead	5.2	0.90	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Magnesium	1500	9.0	0.94	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Manganese	100	0.60	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Mercury	0.016	0.030	0.0043	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 10:56	SCB
Nickel	14	0.60	0.14	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Potassium	310	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Sodium	73	120	58	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP
Vanadium	10	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 17:48	AMP
Zinc	15	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 19:55	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-1-2 | Sampled: 2/19/2015 10:40

Sample ID: 15B0719-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.43	0.38	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	81.0			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-4-5 | Sampled: 2/19/2015 11:10

Sample ID: 15B0719-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	4.1	1.8	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Antimony	ND	4.1	3.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Arsenic	ND	4.1	1.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Barium	78	4.1	0.51	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Beryllium	0.22	0.41	0.065	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Cadmium	ND	0.41	0.24	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Calcium	1500	12	2.2	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Chromium	25	0.81	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Cobalt	5.0	4.1	0.26	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Copper	37	0.81	0.62	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Iron	7000	4.1	3.5	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Lead	8.6	1.2	0.24	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Magnesium	1600	12	1.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Manganese	56	0.81	0.26	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Mercury	0.028	0.040	0.0057	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 10:57	SCB
Nickel	33	0.81	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Potassium	320	160	28	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Selenium	ND	4.1	1.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Silver	ND	0.81	0.72	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Sodium	140	160	79	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Thallium	ND	4.1	1.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP
Vanadium	12	1.6	0.27	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 17:52	AMP
Zinc	22	1.6	0.42	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:01	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-4-5 | Sampled: 2/19/2015 11:10

Sample ID: 15B0719-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.70	0.63	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	1.2	0.68	mg/Kg dry	5	W-06	SW-846 7196A	2/26/15	2/26/15 12:45	LL
% Solids	62.7			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-5-6 | Sampled: 2/19/2015 11:15

Sample ID: 15B0719-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	4.4	1.9	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Arsenic	ND	4.4	1.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Barium	120	4.4	0.54	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Beryllium	0.31	0.44	0.070	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Cadmium	0.28	0.44	0.26	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Calcium	2400	13	2.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Chromium	42	0.87	0.22	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Cobalt	4.8	4.4	0.28	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Copper	34	0.87	0.66	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Iron	7700	4.4	3.7	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Lead	7.5	1.3	0.26	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Magnesium	1600	13	1.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Manganese	49	0.87	0.28	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Mercury	0.031	0.043	0.0061	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 10:59	SCB
Nickel	49	0.87	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Potassium	360	170	30	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Selenium	ND	4.4	1.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Silver	ND	0.87	0.77	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Sodium	180	170	85	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Thallium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP
Vanadium	11	1.7	0.29	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 17:57	AMP
Zinc	18	1.7	0.45	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:06	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB535-5-6 | Sampled: 2/19/2015 11:15

Sample ID: 15B0719-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.82	0.74	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	1.3	0.73	mg/Kg dry	5	W-06	SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	58.2			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB530-4-5 | Sampled: 2/19/2015 14:00

Sample ID: 15B0719-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Barium	93	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Beryllium	0.42	0.30	0.048	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Cadmium	0.24	0.30	0.17	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Calcium	1300	8.9	1.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Chromium	23	0.59	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Cobalt	5.9	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Copper	31	0.59	0.45	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Iron	16000	30	25	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:17	KSH
Lead	8.8	0.89	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Magnesium	2000	8.9	0.93	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Manganese	130	0.59	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Mercury	0.017	0.031	0.0045	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:00	SCB
Nickel	39	0.59	0.14	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Potassium	370	120	20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Selenium	ND	3.0	0.91	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Sodium	140	120	58	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP
Vanadium	13	1.2	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:02	AMP
Zinc	28	1.2	0.30	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:11	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB530-4-5 | Sampled: 2/19/2015 14:00

Sample ID: 15B0719-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.45	0.40	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	0.69	1.0	0.56	mg/Kg dry	5	W-06, J	SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	78.1			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB530-5-6 | Sampled: 2/19/2015 14:05

Sample ID: 15B0719-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5200	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Barium	67	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Beryllium	0.22	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Calcium	1400	9.0	1.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Chromium	14	0.60	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Cobalt	4.2	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Copper	20	0.60	0.46	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Iron	11000	30	26	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:21	KSH
Lead	5.2	0.90	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Magnesium	2300	9.0	0.94	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Manganese	59	0.60	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Mercury	0.0096	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:02	SCB
Nickel	16	0.60	0.14	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Potassium	690	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Sodium	100	120	58	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP
Vanadium	10	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:07	AMP
Zinc	28	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:17	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB530-5-6 | Sampled: 2/19/2015 14:05

Sample ID: 15B0719-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.55	0.50	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	88.4			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB531-5-6 | Sampled: 2/19/2015 15:15

Sample ID: 15B0719-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4200	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Barium	69	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Beryllium	0.21	0.31	0.050	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Calcium	900	9.3	1.7	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Chromium	18	0.62	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Cobalt	3.5	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Copper	35	0.62	0.47	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Iron	5300	3.1	2.7	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Lead	4.1	0.93	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Magnesium	1800	9.3	0.97	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Manganese	36	0.62	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Mercury	0.010	0.032	0.0046	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:03	SCB
Nickel	20	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Potassium	540	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Sodium	100	120	61	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP
Vanadium	15	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:12	AMP
Zinc	14	1.2	0.32	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:22	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB531-5-6 | Sampled: 2/19/2015 15:15

Sample ID: 15B0719-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.63	0.57	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	0.69	1.0	0.55	mg/Kg dry	5	W-06, J	SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	78.2			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB529-2-3 | Sampled: 2/19/2015 16:00

Sample ID: 15B0719-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4200	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Barium	31	3.0	0.37	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Beryllium	0.26	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Cadmium	0.22	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Calcium	2000	9.0	1.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Chromium	11	0.60	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Cobalt	7.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Copper	16	0.60	0.46	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Iron	13000	30	26	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:25	KSH
Lead	4.3	0.90	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Magnesium	2900	9.0	0.94	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Manganese	95	0.60	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Mercury	0.0083	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:05	SCB
Nickel	36	0.60	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Potassium	550	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Sodium	64	120	58	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP
Vanadium	11	1.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:16	AMP
Zinc	30	1.2	0.31	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:28	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB529-2-3 | Sampled: 2/19/2015 16:00

Sample ID: 15B0719-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.38	0.21	mg/Kg dry	2	MS-16, W-06	SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	80.4			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB529-5-6 | Sampled: 2/19/2015 16:15

Sample ID: 15B0719-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	3.2	1.4	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Barium	25	3.2	0.40	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Beryllium	0.14	0.32	0.052	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Cadmium	ND	0.32	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Calcium	4200	9.7	1.8	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Chromium	7.8	0.65	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Cobalt	4.6	3.2	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Copper	12	0.65	0.49	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Iron	11000	32	28	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:49	KSH
Lead	3.7	0.97	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Magnesium	4000	9.7	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Manganese	99	0.65	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Mercury	0.013	0.031	0.0045	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:06	SCB
Nickel	24	0.65	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Potassium	290	130	22	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Selenium	ND	3.2	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Silver	ND	0.65	0.57	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Sodium	73	130	63	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP
Vanadium	6.2	1.3	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:21	AMP
Zinc	21	1.3	0.33	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:33	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB529-5-6 | Sampled: 2/19/2015 16:15

Sample ID: 15B0719-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	80.7			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB527-3-4 | Sampled: 2/20/2015 08:25

Sample ID: 15B0719-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3500	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Barium	32	3.1	0.39	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Beryllium	0.18	0.31	0.050	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Cadmium	0.19	0.31	0.18	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Calcium	2100	9.4	1.7	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Chromium	13	0.62	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Cobalt	5.2	3.1	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Copper	16	0.62	0.48	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Iron	12000	31	27	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:53	KSH
Lead	6.1	0.94	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Magnesium	2800	9.4	0.98	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Manganese	73	0.62	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Mercury	0.013	0.033	0.0047	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:08	SCB
Nickel	33	0.62	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Potassium	360	120	21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Sodium	120	120	61	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP
Vanadium	11	1.2	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:26	AMP
Zinc	28	1.2	0.32	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 20:39	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB527-3-4 | Sampled: 2/20/2015 08:25

Sample ID: 15B0719-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.62	0.56	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.21	0.11	mg/Kg dry	1		SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	75.4			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB527-5-6 | Sampled: 2/20/2015 08:35

Sample ID: 15B0719-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Barium	41	2.8	0.35	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Beryllium	0.40	0.28	0.045	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Cadmium	0.26	0.28	0.17	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Calcium	1600	8.5	1.5	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Chromium	12	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Cobalt	6.5	2.8	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Copper	16	0.56	0.43	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Iron	14000	28	24	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 16:56	KSH
Lead	4.3	0.85	0.17	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Magnesium	2600	8.5	0.88	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Manganese	61	0.56	0.18	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Mercury	0.0071	0.028	0.0041	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:09	SCB
Nickel	14	0.56	0.14	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Potassium	690	110	19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Silver	ND	0.56	0.50	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Sodium	100	110	55	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP
Vanadium	16	1.1	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:52	AMP
Zinc	25	1.1	0.29	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:04	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB527-5-6 | Sampled: 2/20/2015 08:35

Sample ID: 15B0719-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.34	0.31	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	88.6			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB526-2-3 | Sampled: 2/20/2015 09:00

Sample ID: 15B0719-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3200	3.2	1.4	mg/Kg dry	1	B-07	SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Barium	30	3.2	0.40	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Beryllium	0.23	0.32	0.051	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Cadmium	0.20	0.32	0.19	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Calcium	2800	9.6	1.7	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Chromium	13	0.64	0.16	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Cobalt	6.6	3.2	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Copper	14	0.64	0.49	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Iron	14000	32	27	mg/Kg dry	10	B-07	SW-846 6010C	2/24/15	2/27/15 17:00	KSH
Lead	4.8	0.96	0.19	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Magnesium	3800	9.6	1.0	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Manganese	100	0.64	0.20	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Mercury	0.011	0.034	0.0048	mg/Kg dry	1	J	SW-846 7471B	2/26/15	2/27/15 11:14	SCB
Nickel	38	0.64	0.15	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Potassium	300	130	22	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Selenium	ND	3.2	0.99	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Sodium	120	130	62	mg/Kg dry	1	J	SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP
Vanadium	8.9	1.3	0.21	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 18:56	AMP
Zinc	29	1.3	0.33	mg/Kg dry	1		SW-846 6010C	2/24/15	2/25/15 21:09	AMP

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15B0719

Date Received: 2/21/2015

Field Sample #: WTSB526-2-3 | Sampled: 2/20/2015 09:00

Sample ID: 15B0719-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.60	0.54	mg/Kg dry	1		SW-846 9014	3/2/15	3/2/15 17:15	ABH
Hexavalent Chromium	ND	0.22	0.12	mg/Kg dry	1		SW-846 7196A	2/27/15	2/27/15 13:55	LL
% Solids	73.3			% Wt	1		SM 2540G	2/24/15	2/25/15 0:54	JJL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0719-01 [WTSB513-5-6-1]	B115876	02/24/15
15B0719-02 [WTSB535-1-2]	B115876	02/24/15
15B0719-03 [WTSB535-4-5]	B115876	02/24/15
15B0719-04 [WTSB535-5-6]	B115876	02/24/15
15B0719-05 [WTSB530-4-5]	B115876	02/24/15
15B0719-06 [WTSB530-5-6]	B115876	02/24/15
15B0719-07 [WTSB531-5-6]	B115876	02/24/15
15B0719-08 [WTSB529-2-3]	B115876	02/24/15
15B0719-09 [WTSB529-5-6]	B115876	02/24/15
15B0719-10 [WTSB527-3-4]	B115876	02/24/15
15B0719-11 [WTSB527-5-6]	B115876	02/24/15
15B0719-12 [WTSB526-2-3]	B115876	02/24/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0719-01 [WTSB513-5-6-1]	B115872	0.947	50.0	02/24/15
15B0719-02 [WTSB535-1-2]	B115872	1.03	50.0	02/24/15
15B0719-03 [WTSB535-4-5]	B115872	0.980	50.0	02/24/15
15B0719-04 [WTSB535-5-6]	B115872	0.986	50.0	02/24/15
15B0719-05 [WTSB530-4-5]	B115872	1.08	50.0	02/24/15
15B0719-06 [WTSB530-5-6]	B115872	0.944	50.0	02/24/15
15B0719-07 [WTSB531-5-6]	B115872	1.03	50.0	02/24/15
15B0719-08 [WTSB529-2-3]	B115872	1.04	50.0	02/24/15
15B0719-09 [WTSB529-5-6]	B115872	0.955	50.0	02/24/15
15B0719-10 [WTSB527-3-4]	B115872	1.06	50.0	02/24/15
15B0719-11 [WTSB527-5-6]	B115872	1.00	50.0	02/24/15
15B0719-12 [WTSB526-2-3]	B115872	1.07	50.0	02/24/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0719-01 [WTSB513-5-6-1]	B115999	2.52	100	02/26/15
15B0719-02 [WTSB535-1-2]	B115999	2.52	100	02/26/15
15B0719-03 [WTSB535-4-5]	B115999	2.58	100	02/26/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0719-04 [WTSB535-5-6]	B116055	2.60	100	02/27/15
15B0719-05 [WTSB530-4-5]	B116055	2.54	100	02/27/15
15B0719-06 [WTSB530-5-6]	B116055	2.59	100	02/27/15
15B0719-07 [WTSB531-5-6]	B116055	2.55	100	02/27/15
15B0719-08 [WTSB529-2-3]	B116055	2.59	100	02/27/15
15B0719-09 [WTSB529-5-6]	B116055	2.51	100	02/27/15
15B0719-10 [WTSB527-3-4]	B116055	2.58	100	02/27/15
15B0719-11 [WTSB527-5-6]	B116055	2.50	100	02/27/15
15B0719-12 [WTSB526-2-3]	B116055	2.51	100	02/27/15

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0719-01 [WTSB513-5-6-1]	B116013	0.602	50.0	02/26/15
15B0719-02 [WTSB535-1-2]	B116013	0.619	50.0	02/26/15
15B0719-03 [WTSB535-4-5]	B116013	0.605	50.0	02/26/15
15B0719-04 [WTSB535-5-6]	B116013	0.606	50.0	02/26/15
15B0719-05 [WTSB530-4-5]	B116013	0.616	50.0	02/26/15
15B0719-06 [WTSB530-5-6]	B116013	0.604	50.0	02/26/15
15B0719-07 [WTSB531-5-6]	B116013	0.602	50.0	02/26/15
15B0719-08 [WTSB529-2-3]	B116013	0.605	50.0	02/26/15
15B0719-09 [WTSB529-5-6]	B116013	0.601	50.0	02/26/15
15B0719-10 [WTSB527-3-4]	B116013	0.606	50.0	02/26/15
15B0719-11 [WTSB527-5-6]	B116013	0.601	50.0	02/26/15
15B0719-12 [WTSB526-2-3]	B116013	0.610	50.0	02/26/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0719-01 [WTSB513-5-6-1]	B116141	1.25	50.0	03/02/15
15B0719-02 [WTSB535-1-2]	B116141	1.44	50.0	03/02/15
15B0719-03 [WTSB535-4-5]	B116141	1.14	50.0	03/02/15
15B0719-04 [WTSB535-5-6]	B116141	1.05	50.0	03/02/15
15B0719-05 [WTSB530-4-5]	B116141	1.43	50.0	03/02/15
15B0719-06 [WTSB530-5-6]	B116141	1.03	50.0	03/02/15
15B0719-07 [WTSB531-5-6]	B116141	1.01	50.0	03/02/15
15B0719-08 [WTSB529-2-3]	B116141	1.24	50.0	03/02/15
15B0719-09 [WTSB529-5-6]	B116141	1.50	50.0	03/02/15
15B0719-10 [WTSB527-3-4]	B116141	1.07	50.0	03/02/15
15B0719-11 [WTSB527-5-6]	B116141	1.66	50.0	03/02/15
15B0719-12 [WTSB526-2-3]	B116141	1.13	50.0	03/02/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B115872 - SW-846 3050B										
Blank (B115872-BLK1)				Prepared: 02/24/15 Analyzed: 02/25/15						
Aluminum	3.9	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	4.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	7.3	2.5	mg/Kg wet							B-07
Lead	ND	0.75	mg/Kg wet							
Magnesium	1.9	7.5	mg/Kg wet							J
Manganese	0.17	0.50	mg/Kg wet							J
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	0.79	2.5	mg/Kg wet							J
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B115872-BS1)				Prepared: 02/24/15 Analyzed: 02/25/15						
Aluminum	5710	5.0	mg/Kg wet	8100		70.4	51.2-148.1			
Antimony	91.3	5.0	mg/Kg wet	116		78.7	0-210.3			
Arsenic	111	5.0	mg/Kg wet	122		90.7	77.8-122.1			
Barium	150	5.0	mg/Kg wet	167		90.0	82-117.4			
Beryllium	51.4	0.50	mg/Kg wet	54.3		94.6	82.3-117.7			
Cadmium	77.8	0.50	mg/Kg wet	88.0		88.4	81.9-118.2			
Calcium	5170	15	mg/Kg wet	5920		87.3	81.9-118.2			
Chromium	88.2	1.0	mg/Kg wet	102		86.5	78.7-120.6			
Cobalt	87.5	5.0	mg/Kg wet	99.4		88.1	83-116.7			
Copper	67.4	1.0	mg/Kg wet	78.0		86.4	80.4-119.6			
Iron	11000	5.0	mg/Kg wet	15100		72.8	46.8-153			
Lead	84.6	1.5	mg/Kg wet	94.5		89.5	82.4-117.8			
Magnesium	2610	15	mg/Kg wet	3020		86.3	75.5-124.2			
Manganese	350	1.0	mg/Kg wet	401		87.3	80.8-119.2			
Nickel	48.0	1.0	mg/Kg wet	56.3		85.2	82.2-117.8			
Potassium	1940	200	mg/Kg wet	2490		77.8	69.9-130.1			
Selenium	140	5.0	mg/Kg wet	157		88.9	77.1-122.3			
Silver	29.2	1.0	mg/Kg wet	34.2		85.3	74.3-125.4			
Sodium	211	200	mg/Kg wet	246		85.8	69.9-130.5			
Thallium	99.2	5.0	mg/Kg wet	116		85.5	78.2-121.6			
Vanadium	58.8	2.0	mg/Kg wet	67.1		87.6	64.8-135.2			
Zinc	180	2.0	mg/Kg wet	207		87.0	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115872 - SW-846 3050B											
LCS Dup (B115872-BSD1)				Prepared: 02/24/15 Analyzed: 02/25/15							
Aluminum	5010	5.0	mg/Kg wet	8100		61.8		51.2-148.1	13.1	30	
Antimony	80.1	5.0	mg/Kg wet	116		69.1		0-210.3	13.1	30	
Arsenic	91.8	5.0	mg/Kg wet	122		**75.2**	*	77.8-122.1	18.6	30	L-07
Barium	122	5.0	mg/Kg wet	167		**73.2**	*	82-117.4	20.6	30	L-07
Beryllium	43.3	0.50	mg/Kg wet	54.3		**79.8**	*	82.3-117.7	17.0	30	L-07
Cadmium	66.7	0.50	mg/Kg wet	88.0		**75.8**	*	81.9-118.2	15.4	30	L-07
Calcium	4380	15	mg/Kg wet	5920		**74.0**	*	81.9-118.2	16.6	30	L-07
Chromium	75.2	1.0	mg/Kg wet	102		**73.7**	*	78.7-120.6	15.9	30	L-07
Cobalt	75.7	5.0	mg/Kg wet	99.4		**76.1**	*	83-116.7	14.5	30	L-07
Copper	57.5	1.0	mg/Kg wet	78.0		**73.8**	*	80.4-119.6	15.8	30	L-07
Iron	9460	5.0	mg/Kg wet	15100		62.7		46.8-153	15.0	30	
Lead	67.6	1.5	mg/Kg wet	94.5		**71.5**	*	82.4-117.8	22.3	30	L-07
Magnesium	2210	15	mg/Kg wet	3020		**73.1**	*	75.5-124.2	16.6	30	L-07
Manganese	302	1.0	mg/Kg wet	401		**75.4**	*	80.8-119.2	14.7	30	L-07
Nickel	41.7	1.0	mg/Kg wet	56.3		**74.1**	*	82.2-117.8	13.9	30	L-07
Potassium	1630	200	mg/Kg wet	2490		**65.3**	*	69.9-130.1	17.5	30	L-07
Selenium	114	5.0	mg/Kg wet	157		**72.8**	*	77.1-122.3	19.9	30	L-07
Silver	24.7	1.0	mg/Kg wet	34.2		**72.1**	*	74.3-125.4	16.8	30	L-07
Sodium	179	200	mg/Kg wet	246		72.6		69.9-130.5	16.7	30	J
Thallium	83.1	5.0	mg/Kg wet	116		**71.7**	*	78.2-121.6	17.6	30	L-07
Vanadium	49.6	2.0	mg/Kg wet	67.1		74.0		64.8-135.2	16.9	30	
Zinc	158	2.0	mg/Kg wet	207		**76.2**	*	79.7-120.8	13.3	30	L-07
MRL Check (B115872-MRL1)				Prepared: 02/24/15 Analyzed: 02/25/15							
Lead	0.707	0.76	mg/Kg wet	0.763		92.7		80-120			J
Batch B116013 - SW-846 7471											
Blank (B116013-BLK1)				Prepared: 02/26/15 Analyzed: 02/27/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B116013-BS1)				Prepared: 02/26/15 Analyzed: 02/27/15							
Mercury	5.50	0.38	mg/Kg wet	5.76		95.5		71.2-128.6			
LCS Dup (B116013-BSD1)				Prepared: 02/26/15 Analyzed: 02/27/15							
Mercury	4.54	0.38	mg/Kg wet	5.76		78.8		71.2-128.6	19.1	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B115876 - % Solids											
Duplicate (B115876-DUP2)	**Source: 15B0719-01**			Prepared: 02/24/15 Analyzed: 02/25/15							
% Solids	85.8		% Wt		84.9				1.05	20	
Batch B115999 - SW-846 7196A											
Blank (B115999-BLK1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	ND	0.15	mg/Kg wet								
LCS (B115999-BS1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	64	2.0	mg/Kg wet	59.3		107		80-120			
LCS Dup (B115999-BSD1)				Prepared & Analyzed: 02/26/15							
Hexavalent Chromium	63	2.0	mg/Kg wet	59.6		106		80-120	0.661	20	
Batch B116055 - SW-846 7196A											
Blank (B116055-BLK1)				Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B116055-BS1)				Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	52	1.8	mg/Kg wet	53.7		96.7		80-120			
LCS Dup (B116055-BSD1)				Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	54	1.8	mg/Kg wet	54.7		97.8		80-120	3.02	20	
Matrix Spike (B116055-MS1) Soluble MS	**Source: 15B0719-08**			Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	28	0.97	mg/Kg dry	48.7	ND	**57.8**	*	75-125			MS-16
Matrix Spike (B116055-MS2) PDMS	**Source: 15B0719-08**			Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	39	2.0	mg/Kg dry	49.6	ND	78.9		75-125			
Matrix Spike (B116055-MS3) Insoluble MS	**Source: 15B0719-08**			Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	530	20	mg/Kg dry	783	ND	**68.2**	*	75-125			MS-16
Matrix Spike Dup (B116055-MSD1) Soluble MS Dup	**Source: 15B0719-08**			Prepared & Analyzed: 02/27/15							
Hexavalent Chromium	30	0.99	mg/Kg dry	49.3	ND	**61.1**	*	75-125	6.89	35	MS-16
Batch B116141 - SW-846 9014											
Blank (B116141-BLK1)				Prepared & Analyzed: 03/02/15							
Cyanide	ND	0.44	mg/Kg wet								

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116141 - SW-846 9014										
LCS (B116141-BS1)				Prepared & Analyzed: 03/02/15						
Cyanide	73	2.4	mg/Kg wet	63.1		116	80-120			
LCS Dup (B116141-BSD1)				Prepared & Analyzed: 03/02/15						
Cyanide	70	2.5	mg/Kg wet	63.2		111	80-120	4.09	20	
Duplicate (B116141-DUP1)		**Source: 15B0719-12**		Prepared & Analyzed: 03/02/15						
Cyanide	ND	0.60	mg/Kg dry		ND			NC	35	
Matrix Spike (B116141-MS1)		**Source: 15B0719-12**		Prepared & Analyzed: 03/02/15						
Cyanide	22	0.60	mg/Kg dry	20.7	ND	107	75-125			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

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www.contestlabs.com
39 Spruce Street
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1SB0719
Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project #: 184578
Client PO#:

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #:
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A	✓	✓	✓
01	WTSB513-5-6-1	2/19/15	1015		X	S		1	I	A	✓	✓	✓
02	WTSB535-1-2	2/19/15	1040		X	S		1	I	A	✓	✓	✓
03	WTSB535-4-5	2/19/15	1110		X	S		1	I	A	✓	✓	✓
04	WTSB535-5-6	2/19/15	1115		X	S		1	I	A	✓	✓	✓
05	WTSB530-4-5	2/19/15	1400		X	S		1	I	A	✓	✓	✓
06	WTSB530-5-6	2/19/15	1405		X	S		1	I	A	✓	✓	✓
07	WTSB531-5-6	2/19/15	1515		X	S		1	I	A	✓	✓	✓
08	WTSB529-2-3	2/19/15	1600		X	S		1	I	A	✓	✓	✓
09	WTSB529-5-6	2/19/15	1615		X	S		1	I	A	✓	✓	✓
10	WTSB527-3-4	2/20/15	0825		X	S		1	I	A	✓	✓	✓

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature) Date/Time: 2/20/15 0900
Received by: (signature) 3.0°C Date/Time: 2/21/15 1045
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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WBE/DBE Certified

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

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East longmeadow, MA 01028

15B0719
Rev 04.05.12

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Attention: Amita Patel
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Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A			
								1	I	A			
								1	I	G			
11	WTSB527-5-6	2/20/15	0835		X	S					✓	✓	✓
12	WTSB526-2-3	2/20/15	0900		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Received by: (signature) 3.0°C	Date/Time: 2/21/15 11:45
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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†† TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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JONES

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39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
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www.contestlabs.com

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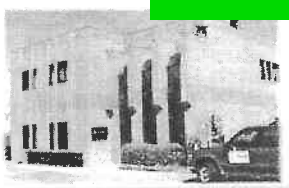

Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: MH DATE: 2/2/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank 3.0°C Temperature °C by Temp gun _____
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	12
250 mL Amber (8oz amber)		2 oz amber/clear jar	12
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: **Date/Time:**

MJ 2/21/15 11:45

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March 16, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0926

Enclosed are results of analyses for samples received by the laboratory on February 28, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0926

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB547-3-4	15B0926-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB547-14-15	15B0926-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB520-3-4	15B0926-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB520-15-16	15B0926-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB521-3-4	15B0926-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB521-13-14	15B0926-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB760-3-4	15B0926-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB760-15-16	15B0926-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0926

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSB763-3-4	15B0926-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB763-15-16	15B0926-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB766-3-4	15B0926-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB766-12-13	15B0926-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB701-15-16	15B0926-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

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SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum
15B0926-01[WTSB547-3-4], 15B0926-02[WTSB547-14-15], 15B0926-03[WTSB520-3-4], 15B0926-04[WTSB520-15-16], 15B0926-05[WTSB521-3-4], 15B0926-06[WTSB521-13-14], 15B0926-07[BRSB760-3-4], 15B0926-08[BRSB760-15-16], B116318-BLK1, B116318-DUP1

Iron
15B0926-01[WTSB547-3-4], 15B0926-02[WTSB547-14-15], 15B0926-03[WTSB520-3-4], 15B0926-04[WTSB520-15-16], 15B0926-05[WTSB521-3-4], 15B0926-06[WTSB521-13-14], 15B0926-07[BRSB760-3-4], 15B0926-08[BRSB760-15-16], B116318-BLK1, B116318-DUP1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Lead
B116563-BS1

Selenium
B116563-BS1

Zinc
B116563-BS1

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony
15B0926-04[WTSB520-15-16], B116318-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15B0926-04[WTSB520-15-16], B116318-MS1

Calcium
15B0926-04[WTSB520-15-16], B116318-MS1

Iron
15B0926-04[WTSB520-15-16], B116318-MS1

Magnesium
15B0926-04[WTSB520-15-16], B116318-MS1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0926-10[BRSB763-15-16], B116200-MS1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0926-01[WTSB547-3-4], 15B0926-02[WTSB547-14-15], 15B0926-03[WTSB520-3-4], 15B0926-05[WTSB521-3-4], 15B0926-07[BRSB760-3-4], 15B0926-11[BRSB766-3-4]

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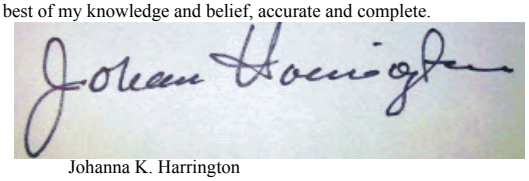
The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Johanna K. Harrington
Manager, Laboratory Reporting

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB547-3-4 | Sampled: 2/25/2015 14:15

Sample ID: 15B0926-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6300	16	6.9	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Arsenic	5.9	16	5.8	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Barium	420	16	2.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Beryllium	1.0	1.6	0.26	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 15:30	MJH
Cadmium	2.7	1.6	0.95	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Calcium	28000	48	8.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Chromium	40	3.2	0.80	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Cobalt	9.8	16	1.0	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Copper	160	3.2	2.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Iron	8500	16	14	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Lead	17	4.8	0.95	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Magnesium	4200	48	5.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Manganese	410	3.2	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Mercury	0.076	0.15	0.021	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:36	SCB
Nickel	130	3.2	0.78	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Potassium	370	640	110	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Selenium	48	16	5.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Silver	ND	3.2	2.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Sodium	370	640	310	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Thallium	ND	16	5.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Vanadium	47	6.4	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:36	MJH
Zinc	30	6.4	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 15:30	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB547-3-4 | Sampled: 2/25/2015 14:15

Sample ID: 15B0926-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.4	2.2	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	2.7	4.7	2.6	mg/Kg dry	5	W-06, J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	16.7			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB547-14-15 | Sampled: 2/25/2015 14:40

Sample ID: 15B0926-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	15	6.5	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Arsenic	ND	15	5.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Barium	120	15	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Beryllium	0.31	1.5	0.24	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 15:33	MJH
Cadmium	ND	1.5	0.89	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Calcium	5300	45	8.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Chromium	20	3.0	0.75	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Cobalt	13	15	0.96	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Copper	70	3.0	2.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Iron	12000	15	13	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Lead	7.6	4.5	0.90	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Magnesium	3100	45	4.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Manganese	120	3.0	0.96	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Mercury	0.036	0.15	0.022	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:37	SCB
Nickel	130	3.0	0.73	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Potassium	790	600	100	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Selenium	ND	15	4.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Silver	ND	3.0	2.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Sodium	ND	600	290	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Thallium	ND	15	5.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Vanadium	18	6.0	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:41	MJH
Zinc	84	6.0	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 15:33	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB547-14-15 | Sampled: 2/25/2015 14:40

Sample ID: 15B0926-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.9	2.6	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	4.7	2.6	mg/Kg dry	5	W-06	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	16.9			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB520-3-4 | Sampled: 2/25/2015 15:30

Sample ID: 15B0926-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7500	17	7.4	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Antimony	ND	17	14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Arsenic	9.3	17	6.2	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Barium	150	17	2.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Beryllium	0.44	1.7	0.28	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 15:37	MJH
Cadmium	ND	1.7	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Calcium	11000	52	9.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Chromium	26	3.5	0.86	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Cobalt	14	17	1.1	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Copper	87	3.5	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Iron	11000	17	15	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Lead	9.4	5.2	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Magnesium	4400	52	5.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Manganese	75	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Mercury	0.057	0.16	0.024	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:40	SCB
Nickel	150	3.5	0.84	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Potassium	750	690	120	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Selenium	ND	17	5.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Silver	ND	3.5	3.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Sodium	380	690	340	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Thallium	ND	17	5.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Vanadium	36	6.9	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:45	MJH
Zinc	53	6.9	1.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 15:37	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB520-3-4 | Sampled: 2/25/2015 15:30

Sample ID: 15B0926-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.8	2.6	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	4.3	4.9	2.7	mg/Kg dry	5	W-06, J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	15.7			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB520-15-16 | Sampled: 2/25/2015 15:45

Sample ID: 15B0926-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	5.7	2.5	mg/Kg dry	1	MS-19, B-07	SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Antimony	ND	5.7	4.6	mg/Kg dry	1	MS-07	SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Arsenic	ND	5.7	2.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Barium	99	5.7	0.71	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Beryllium	0.67	0.57	0.092	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 15:58	MJH
Cadmium	ND	0.57	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Calcium	2800	17	3.1	mg/Kg dry	1	MS-19	SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Chromium	22	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Cobalt	13	5.7	0.36	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Copper	55	1.1	0.87	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Iron	27000	57	49	mg/Kg dry	10	MS-19, B-07	SW-846 6010C	3/4/15	3/6/15 15:11	MJH
Lead	12	1.7	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Magnesium	5700	17	1.8	mg/Kg dry	1	MS-19	SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Manganese	160	1.1	0.36	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Mercury	0.021	0.052	0.0074	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:42	SCB
Nickel	38	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Potassium	2600	230	39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Selenium	ND	5.7	1.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Silver	ND	1.1	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Sodium	150	230	110	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Thallium	ND	5.7	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Vanadium	30	2.3	0.37	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:15	MJH
Zinc	81	2.3	0.59	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 15:58	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB520-15-16 | Sampled: 2/25/2015 15:45

Sample ID: 15B0926-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.85	0.76	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	0.29	0.33	0.18	mg/Kg dry	1	J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	47.3			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB521-3-4 | Sampled: 2/25/2015 15:55

Sample ID: 15B0926-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	15	6.3	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Arsenic	ND	15	5.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Barium	100	15	1.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Beryllium	0.38	1.5	0.24	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 16:02	MJH
Cadmium	ND	1.5	0.87	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Calcium	9000	44	8.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Chromium	23	2.9	0.74	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Cobalt	16	15	0.94	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Copper	70	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Iron	12000	15	13	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Lead	8.7	4.4	0.87	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Magnesium	4400	44	4.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Manganese	89	2.9	0.93	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Mercury	0.053	0.14	0.020	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:47	SCB
Nickel	150	2.9	0.71	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Potassium	700	590	100	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Selenium	ND	15	4.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Silver	ND	2.9	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Sodium	ND	590	290	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Thallium	ND	15	4.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Vanadium	19	5.9	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:49	MJH
Zinc	60	5.9	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 16:02	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB521-3-4 | Sampled: 2/25/2015 15:55

Sample ID: 15B0926-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.4	2.2	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	4.0	4.5	2.5	mg/Kg dry	5	W-06, J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	17.6			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB521-13-14 | Sampled: 2/25/2015 16:10

Sample ID: 15B0926-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2700	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Barium	27	3.0	0.37	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Beryllium	0.12	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 16:07	MJH
Cadmium	ND	0.30	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Calcium	2200	8.9	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Chromium	5.7	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Cobalt	3.4	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Copper	6.4	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Iron	8100	30	25	mg/Kg dry	10	B-07	SW-846 6010C	3/4/15	3/6/15 15:14	MJH
Lead	3.2	0.89	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Magnesium	2300	8.9	0.93	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Manganese	91	0.59	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Mercury	ND	0.030	0.0043	mg/Kg dry	1		SW-846 7471B	3/7/15	3/9/15 10:48	SCB
Nickel	5.7	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Potassium	590	120	20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Selenium	ND	3.0	0.91	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Sodium	ND	120	58	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Thallium	ND	3.0	0.98	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Vanadium	7.8	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 21:57	MJH
Zinc	16	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 16:07	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: WTSB521-13-14 | Sampled: 2/25/2015 16:10

Sample ID: 15B0926-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	0.11	0.18	0.10	mg/Kg dry	1	J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	83.9			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB760-3-4 | Sampled: 2/26/2015 09:40

Sample ID: 15B0926-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	18	7.6	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Antimony	ND	18	14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Arsenic	ND	18	6.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Barium	210	18	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Beryllium	0.42	1.8	0.29	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/6/15 16:11	MJH
Cadmium	1.6	1.8	1.0	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Calcium	18000	53	9.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Chromium	17	3.5	0.89	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Cobalt	13	18	1.1	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Copper	85	3.5	2.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Iron	9100	18	15	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Lead	11	5.3	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Magnesium	3700	53	5.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Manganese	220	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Mercury	0.085	0.16	0.024	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:50	SCB
Nickel	110	3.5	0.86	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Potassium	280	710	120	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Selenium	ND	18	5.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Silver	ND	3.5	3.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Sodium	ND	710	350	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Thallium	ND	18	5.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Vanadium	54	7.1	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:02	MJH
Zinc	14	7.1	1.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 16:11	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB760-3-4 | Sampled: 2/26/2015 09:40

Sample ID: 15B0926-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.2	2.9	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	5.3	2.9	mg/Kg dry	5	W-06	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	15.1			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB760-15-16 | Sampled: 2/26/2015 10:00

Sample ID: 15B0926-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	5.3	2.3	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Antimony	ND	5.3	4.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Arsenic	ND	5.3	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Barium	100	5.3	0.65	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Beryllium	0.57	0.53	0.085	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 16:14	MJH
Cadmium	ND	0.53	0.31	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Calcium	2900	16	2.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Chromium	20	1.1	0.26	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Cobalt	14	5.3	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Copper	51	1.1	0.80	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Iron	23000	53	45	mg/Kg dry	10	B-07	SW-846 6010C	3/4/15	3/6/15 15:17	MJH
Lead	11	1.6	0.31	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Magnesium	5300	16	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Manganese	150	1.1	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Mercury	0.026	0.058	0.0084	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:51	SCB
Nickel	50	1.1	0.25	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Potassium	2200	210	36	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Selenium	ND	5.3	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Silver	ND	1.1	0.92	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Sodium	120	210	100	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Thallium	ND	5.3	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Vanadium	28	2.1	0.35	mg/Kg dry	1		SW-846 6010C	3/4/15	3/5/15 22:05	MJH
Zinc	83	2.1	0.54	mg/Kg dry	1		SW-846 6010C	3/4/15	3/6/15 16:14	MJH

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB760-15-16 | Sampled: 2/26/2015 10:00

Sample ID: 15B0926-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.91	0.81	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	0.36	0.20	mg/Kg dry	1		SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	44.4			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB763-3-4 | Sampled: 2/26/2015 10:10

Sample ID: 15B0926-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	3.3	1.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Antimony	ND	3.3	2.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Barium	30	3.3	0.41	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Beryllium	0.21	0.33	0.053	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Cadmium	0.22	0.33	0.19	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Calcium	1500	9.9	1.8	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Chromium	15	0.66	0.16	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Cobalt	7.0	3.3	0.21	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Copper	5.5	0.66	0.50	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Iron	6200	330	280	mg/Kg dry	100		SW-846 6010C	3/9/15	3/12/15 15:17	MJH
Lead	2.1	0.99	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Magnesium	1900	9.9	1.0	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Manganese	51	0.66	0.21	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Mercury	0.0054	0.034	0.0050	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:53	SCB
Nickel	40	0.66	0.16	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Potassium	360	130	23	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Silver	ND	0.66	0.58	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Sodium	110	130	64	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Vanadium	6.7	1.3	0.22	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP
Zinc	20	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:13	AMP

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB763-3-4 | Sampled: 2/26/2015 10:10

Sample ID: 15B0926-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.66	0.59	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	0.22	0.12	mg/Kg dry	1		SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	73.7			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB763-15-16 | Sampled: 2/26/2015 10:50

Sample ID: 15B0926-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3900	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Arsenic	1.5	2.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Barium	35	2.9	0.37	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Beryllium	0.52	0.29	0.047	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Cadmium	0.28	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Calcium	3300	8.8	1.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Chromium	7.9	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Cobalt	4.1	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Copper	7.5	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Iron	13000	590	500	mg/Kg dry	200		SW-846 6010C	3/9/15	3/12/15 15:21	MJH
Lead	2.9	0.88	0.17	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Magnesium	3300	8.8	0.92	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Manganese	89	0.59	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	3/7/15	3/9/15 10:54	SCB
Nickel	5.9	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Selenium	ND	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Sodium	73	120	57	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Vanadium	13	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP
Zinc	16	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:18	AMP

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB763-15-16 | Sampled: 2/26/2015 10:50

Sample ID: 15B0926-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1	MS-16	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	88.1			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB766-3-4 | Sampled: 2/26/2015 11:00

Sample ID: 15B0926-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5100	15	6.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Arsenic	18	15	5.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Barium	140	15	1.9	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Beryllium	0.69	1.5	0.24	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Cadmium	1.3	1.5	0.88	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Calcium	14000	45	8.0	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Chromium	24	3.0	0.74	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Cobalt	4.0	15	0.95	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Copper	82	3.0	2.3	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Iron	6200	1500	1300	mg/Kg dry	100		SW-846 6010C	3/9/15	3/12/15 15:26	MJH
Lead	4.9	4.5	0.88	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Magnesium	3300	45	4.7	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Manganese	340	3.0	0.94	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Mercury	0.073	0.15	0.022	mg/Kg dry	1	J	SW-846 7471B	3/7/15	3/9/15 10:56	SCB
Nickel	49	3.0	0.72	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Potassium	220	590	100	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Selenium	16	15	4.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Silver	ND	3.0	2.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Sodium	330	590	290	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Thallium	ND	15	4.9	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Vanadium	44	5.9	0.98	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP
Zinc	12	5.9	1.5	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:24	AMP

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB766-3-4 | Sampled: 2/26/2015 11:00

Sample ID: 15B0926-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.4	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	4.1	4.7	2.6	mg/Kg dry	5	W-06, J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	16.9			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB766-12-13 | Sampled: 2/26/2015 11:10

Sample ID: 15B0926-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	11	4.7	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Antimony	ND	11	8.8	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Arsenic	4.5	11	4.0	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Barium	110	11	1.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Beryllium	1.5	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Cadmium	0.98	1.1	0.65	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Calcium	13000	33	5.9	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Chromium	30	2.2	0.55	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Cobalt	18	11	0.70	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Copper	38	2.2	1.7	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Iron	32000	11000	9400	mg/Kg dry	1000		SW-846 6010C	3/9/15	3/12/15 15:45	MJH
Lead	13	3.3	0.65	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Magnesium	12000	33	3.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Manganese	350	2.2	0.70	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Mercury	ND	0.12	0.017	mg/Kg dry	1		SW-846 7471B	3/7/15	3/9/15 10:57	SCB
Nickel	28	2.2	0.53	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Potassium	3300	440	75	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Selenium	ND	11	3.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Silver	ND	2.2	1.9	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Sodium	360	440	210	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Thallium	ND	11	3.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Vanadium	48	4.4	0.72	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP
Zinc	68	4.4	1.1	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:28	AMP

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB766-12-13 | Sampled: 2/26/2015 11:10

Sample ID: 15B0926-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.8	1.6	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	0.42	0.73	0.40	mg/Kg dry	1	J	SW-846 7196A	3/3/15	3/3/15 13:30	LL
% Solids	21.2			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB701-15-16 | Sampled: 2/26/2015 11:45

Sample ID: 15B0926-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3200	3.0	1.3	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Barium	20	3.0	0.37	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Beryllium	0.27	0.30	0.048	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Cadmium	0.20	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Calcium	2200	9.0	1.6	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Chromium	5.7	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Cobalt	3.3	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Copper	7.8	0.60	0.46	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Iron	6400	300	260	mg/Kg dry	100		SW-846 6010C	3/9/15	3/12/15 15:50	MJH
Lead	2.4	0.90	0.18	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Magnesium	2300	9.0	0.94	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Manganese	65	0.60	0.19	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Mercury	ND	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	3/7/15	3/9/15 10:59	SCB
Nickel	5.5	0.60	0.14	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Potassium	680	120	21	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Selenium	ND	3.0	0.92	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Sodium	70	120	58	mg/Kg dry	1	J	SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Thallium	ND	3.0	0.99	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Vanadium	8.6	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP
Zinc	13	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/9/15	3/11/15 20:34	AMP

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Project Location: Cortland NY | Sample Description: | Work Order: 15B0926

Date Received: 2/28/2015

Field Sample #: BRSB701-15-16 | Sampled: 2/26/2015 11:45

Sample ID: 15B0926-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.36	0.33	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	0.15	0.18	0.10	mg/Kg dry	1	J	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	85.0			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0926-01 [WTSB547-3-4]	B116224	03/03/15
15B0926-02 [WTSB547-14-15]	B116224	03/03/15
15B0926-03 [WTSB520-3-4]	B116224	03/03/15
15B0926-04 [WTSB520-15-16]	B116224	03/03/15
15B0926-05 [WTSB521-3-4]	B116224	03/03/15
15B0926-06 [WTSB521-13-14]	B116224	03/03/15
15B0926-07 [BRSB760-3-4]	B116224	03/03/15
15B0926-08 [BRSB760-15-16]	B116224	03/03/15
15B0926-09 [BRSB763-3-4]	B116224	03/03/15
15B0926-10 [BRSB763-15-16]	B116224	03/03/15
15B0926-11 [BRSB766-3-4]	B116224	03/03/15
15B0926-12 [BRSB766-12-13]	B116224	03/03/15
15B0926-13 [BRSB701-15-16]	B116224	03/03/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-01 [WTSB547-3-4]	B116318	0.931	50.0	03/04/15
15B0926-02 [WTSB547-14-15]	B116318	0.980	50.0	03/04/15
15B0926-03 [WTSB520-3-4]	B116318	0.922	50.0	03/04/15
15B0926-04 [WTSB520-15-16]	B116318	0.927	50.0	03/04/15
15B0926-05 [WTSB521-3-4]	B116318	0.965	50.0	03/04/15
15B0926-06 [WTSB521-13-14]	B116318	1.01	50.0	03/04/15
15B0926-07 [BRSB760-3-4]	B116318	0.934	50.0	03/04/15
15B0926-08 [BRSB760-15-16]	B116318	1.07	50.0	03/04/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-09 [BRSB763-3-4]	B116563	1.03	50.0	03/09/15
15B0926-10 [BRSB763-15-16]	B116563	0.966	50.0	03/09/15
15B0926-11 [BRSB766-3-4]	B116563	0.995	50.0	03/09/15
15B0926-12 [BRSB766-12-13]	B116563	1.07	50.0	03/09/15
15B0926-13 [BRSB701-15-16]	B116563	0.982	50.0	03/09/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-01 [WTSB547-3-4]	B116200	2.57	100	03/03/15
15B0926-02 [WTSB547-14-15]	B116200	2.50	100	03/03/15
15B0926-03 [WTSB520-3-4]	B116200	2.59	100	03/03/15
15B0926-04 [WTSB520-15-16]	B116200	2.59	100	03/03/15
15B0926-05 [WTSB521-3-4]	B116200	2.53	100	03/03/15
15B0926-06 [WTSB521-13-14]	B116200	2.58	100	03/03/15
15B0926-07 [BRSB760-3-4]	B116200	2.52	100	03/03/15
15B0926-08 [BRSB760-15-16]	B116200	2.53	100	03/03/15
15B0926-09 [BRSB763-3-4]	B116200	2.52	100	03/03/15
15B0926-10 [BRSB763-15-16]	B116200	2.53	100	03/03/15
15B0926-11 [BRSB766-3-4]	B116200	2.53	100	03/03/15
15B0926-12 [BRSB766-12-13]	B116200	2.57	100	03/03/15

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Sample Extraction Data

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-13 [BRSB701-15-16]	B116261	2.57	100	03/04/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-01RE1 [WTSB547-3-4]	B116395	0.618	50.0	03/07/15
15B0926-02RE1 [WTSB547-14-15]	B116395	0.583	50.0	03/07/15
15B0926-03RE1 [WTSB520-3-4]	B116395	0.582	50.0	03/07/15
15B0926-04RE1 [WTSB520-15-16]	B116395	0.615	50.0	03/07/15
15B0926-05RE1 [WTSB521-3-4]	B116395	0.611	50.0	03/07/15
15B0926-06RE1 [WTSB521-13-14]	B116395	0.605	50.0	03/07/15
15B0926-07RE1 [BRSB760-3-4]	B116395	0.604	50.0	03/07/15
15B0926-08RE1 [BRSB760-15-16]	B116395	0.580	50.0	03/07/15
15B0926-09RE1 [BRSB763-3-4]	B116395	0.591	50.0	03/07/15
15B0926-10RE1 [BRSB763-15-16]	B116395	0.590	50.0	03/07/15
15B0926-11RE1 [BRSB766-3-4]	B116395	0.588	50.0	03/07/15
15B0926-12RE1 [BRSB766-12-13]	B116395	0.601	50.0	03/07/15
15B0926-13RE1 [BRSB701-15-16]	B116395	0.622	50.0	03/07/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0926-01 [WTSB547-3-4]	B116293	1.24	50.0	03/04/15
15B0926-02 [WTSB547-14-15]	B116293	1.01	50.0	03/04/15
15B0926-03 [WTSB520-3-4]	B116293	1.12	50.0	03/04/15
15B0926-04 [WTSB520-15-16]	B116293	1.25	50.0	03/04/15
15B0926-05 [WTSB521-3-4]	B116293	1.16	50.0	03/04/15
15B0926-06 [WTSB521-13-14]	B116293	1.01	50.0	03/04/15
15B0926-07 [BRSB760-3-4]	B116293	1.04	50.0	03/04/15
15B0926-08 [BRSB760-15-16]	B116293	1.24	50.0	03/04/15
15B0926-09 [BRSB763-3-4]	B116293	1.03	50.0	03/04/15
15B0926-10 [BRSB763-15-16]	B116293	1.39	50.0	03/04/15
15B0926-11 [BRSB766-3-4]	B116293	1.10	50.0	03/04/15
15B0926-12 [BRSB766-12-13]	B116293	1.30	50.0	03/04/15
15B0926-13 [BRSB701-15-16]	B116293	1.63	50.0	03/04/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116318 - SW-846 3050B										
Blank (B116318-BLK1)			Prepared: 03/04/15 Analyzed: 03/05/15							
Aluminum	4.0	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	2.1	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	5.0	2.5	mg/Kg wet							B-07
Lead	0.34	0.75	mg/Kg wet							J
Magnesium	1.8	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	0.12	0.50	mg/Kg wet							J
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B116318-BS1)			Prepared: 03/04/15 Analyzed: 03/05/15							
Aluminum	5630	5.0	mg/Kg wet	8100		69.5	51.2-148.1			
Antimony	105	5.0	mg/Kg wet	116		90.5	0-210.3			
Arsenic	114	5.0	mg/Kg wet	122		93.7	77.8-122.1			
Barium	154	5.0	mg/Kg wet	167		92.2	82-117.4			
Beryllium	49.5	0.50	mg/Kg wet	54.3		91.2	82.3-117.7			
Cadmium	85.1	0.50	mg/Kg wet	88.0		96.7	81.9-118.2			
Calcium	5210	15	mg/Kg wet	5920		87.9	81.9-118.2			
Chromium	89.7	1.0	mg/Kg wet	102		87.9	78.7-120.6			
Cobalt	96.3	5.0	mg/Kg wet	99.4		96.9	83-116.7			
Copper	71.2	1.0	mg/Kg wet	78.0		91.3	80.4-119.6			
Iron	11400	5.0	mg/Kg wet	15100		75.3	46.8-153			
Lead	87.8	1.5	mg/Kg wet	94.5		92.9	82.4-117.8			
Magnesium	2560	15	mg/Kg wet	3020		84.8	75.5-124.2			
Manganese	423	1.0	mg/Kg wet	401		105	80.8-119.2			
Nickel	51.9	1.0	mg/Kg wet	56.3		92.2	82.2-117.8			
Potassium	2260	200	mg/Kg wet	2490		90.6	69.9-130.1			
Selenium	166	5.0	mg/Kg wet	157		106	77.1-122.3			
Silver	27.4	1.0	mg/Kg wet	34.2		80.1	74.3-125.4			
Sodium	215	200	mg/Kg wet	246		87.5	69.9-130.5			
Thallium	113	5.0	mg/Kg wet	116		97.4	78.2-121.6			
Vanadium	59.4	2.0	mg/Kg wet	67.1		88.5	64.8-135.2			
Zinc	208	2.0	mg/Kg wet	207		100	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116318 - SW-846 3050B										
LCS Dup (B116318-BSD1)				Prepared: 03/04/15 Analyzed: 03/05/15						
Aluminum	5850	5.0	mg/Kg wet	8100		72.2	51.2-148.1	3.74	30	
Antimony	106	5.0	mg/Kg wet	116		91.7	0-210.3	1.38	30	
Arsenic	118	5.0	mg/Kg wet	122		96.3	77.8-122.1	2.78	30	
Barium	156	5.0	mg/Kg wet	167		93.2	82-117.4	1.04	30	
Beryllium	51.2	0.50	mg/Kg wet	54.3		94.3	82.3-117.7	3.29	30	
Cadmium	86.1	0.50	mg/Kg wet	88.0		97.9	81.9-118.2	1.20	30	
Calcium	5380	15	mg/Kg wet	5920		90.9	81.9-118.2	3.35	30	
Chromium	93.7	1.0	mg/Kg wet	102		91.8	78.7-120.6	4.36	30	
Cobalt	98.4	5.0	mg/Kg wet	99.4		99.0	83-116.7	2.17	30	
Copper	73.7	1.0	mg/Kg wet	78.0		94.4	80.4-119.6	3.36	30	
Iron	11600	5.0	mg/Kg wet	15100		76.7	46.8-153	1.84	30	
Lead	91.6	1.5	mg/Kg wet	94.5		97.0	82.4-117.8	4.25	30	
Magnesium	2660	15	mg/Kg wet	3020		88.2	75.5-124.2	3.96	30	
Manganese	364	1.0	mg/Kg wet	401		90.8	80.8-119.2	15.0	30	
Nickel	54.5	1.0	mg/Kg wet	56.3		96.9	82.2-117.8	4.92	30	
Potassium	2340	200	mg/Kg wet	2490		93.9	69.9-130.1	3.50	30	
Selenium	160	5.0	mg/Kg wet	157		102	77.1-122.3	3.49	30	
Silver	28.3	1.0	mg/Kg wet	34.2		82.8	74.3-125.4	3.35	30	
Sodium	219	200	mg/Kg wet	246		89.2	69.9-130.5	1.91	30	
Thallium	112	5.0	mg/Kg wet	116		96.4	78.2-121.6	1.04	30	
Vanadium	59.9	2.0	mg/Kg wet	67.1		89.2	64.8-135.2	0.773	30	
Zinc	208	2.0	mg/Kg wet	207		101	79.7-120.8	0.334	30	
Duplicate (B116318-DUP1)		**Source: 15B0926-04**		Prepared: 03/04/15 Analyzed: 03/05/15						
Aluminum	11300	4.9	mg/Kg dry		10800			4.47	35	B-07
Antimony	ND	4.9	mg/Kg dry		ND			NC	35	
Arsenic	ND	4.9	mg/Kg dry		ND			NC	35	
Barium	99.7	4.9	mg/Kg dry		98.8			0.956	35	
Beryllium	0.942	0.49	mg/Kg dry		0.675			33.0	35	
Cadmium	ND	0.49	mg/Kg dry		ND			NC	35	
Calcium	2850	15	mg/Kg dry		2780			2.43	35	
Chromium	21.8	0.99	mg/Kg dry		21.6			1.20	35	
Cobalt	13.0	4.9	mg/Kg dry		13.0			0.183	35	
Copper	54.3	0.99	mg/Kg dry		55.2			1.63	35	
Iron	28000	49	mg/Kg dry		26600			5.38	35	B-07
Lead	11.0	1.5	mg/Kg dry		11.8			7.62	35	
Magnesium	5820	15	mg/Kg dry		5720			1.80	35	
Manganese	166	0.99	mg/Kg dry		162			2.59	35	
Nickel	37.9	0.99	mg/Kg dry		38.3			0.952	35	
Potassium	2760	200	mg/Kg dry		2610			5.49	35	
Selenium	ND	4.9	mg/Kg dry		ND			NC	35	
Silver	ND	0.99	mg/Kg dry		ND			NC	35	
Sodium	167	200	mg/Kg dry		155			7.45	35	J
Thallium	ND	4.9	mg/Kg dry		ND			NC	35	
Vanadium	31.0	2.0	mg/Kg dry		30.0			3.21	35	
Zinc	81.2	2.0	mg/Kg dry		80.7			0.666	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B116318 - SW-846 3050B											
MRL Check (B116318-MRL1)				Prepared: 03/04/15 Analyzed: 03/05/15							
Lead	0.891	0.74	mg/Kg wet	0.741		120		80-120			
Matrix Spike (B116318-MS1)		**Source: 15B0926-04**		Prepared: 03/04/15 Analyzed: 03/05/15							
Aluminum	12400	5.0	mg/Kg dry	199	10800	**814**	*	75-125			MS-19
Antimony	105	5.0	mg/Kg dry	199	ND	**53.1**	*	75-125			MS-07
Arsenic	207	5.0	mg/Kg dry	199	ND	104		75-125			
Barium	298	5.0	mg/Kg dry	199	98.8	100		75-125			
Beryllium	197	0.50	mg/Kg dry	199	0.675	99.0		75-125			
Cadmium	201	0.50	mg/Kg dry	199	ND	101		75-125			
Calcium	3120	15	mg/Kg dry	199	2780	**169**	*	75-125			MS-19
Chromium	209	0.99	mg/Kg dry	199	21.6	94.6		75-125			
Cobalt	212	5.0	mg/Kg dry	199	13.0	100		75-125			
Copper	250	0.99	mg/Kg dry	199	55.2	97.8		75-125			
Iron	28000	50	mg/Kg dry	199	26600	**738**	*	75-125			MS-19
Lead	220	1.5	mg/Kg dry	199	11.8	105		75-125			
Magnesium	6070	15	mg/Kg dry	199	5720	**180**	*	75-125			MS-19
Manganese	354	0.99	mg/Kg dry	199	162	96.5		75-125			
Nickel	234	0.99	mg/Kg dry	199	38.3	98.6		75-125			
Potassium	4800	200	mg/Kg dry	1990	2610	110		75-125			
Selenium	224	5.0	mg/Kg dry	199	ND	113		75-125			
Silver	174	0.99	mg/Kg dry	199	ND	87.7		75-125			
Sodium	382	200	mg/Kg dry	199	155	115		75-125			
Thallium	184	5.0	mg/Kg dry	199	ND	92.6		75-125			
Vanadium	218	2.0	mg/Kg dry	199	30.0	94.5		75-125			
Zinc	302	2.0	mg/Kg dry	199	80.7	111		75-125			
Batch B116361 - SW-846 7471											
Blank (B116361-BLK1)				Prepared & Analyzed: 03/05/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B116361-BS1)				Prepared & Analyzed: 03/05/15							
Mercury	5.33	0.38	mg/Kg wet	5.76		92.5		71.2-128.6			
LCS Dup (B116361-BSD1)				Prepared & Analyzed: 03/05/15							
Mercury	4.56	0.38	mg/Kg wet	5.76		79.2		71.2-128.6	15.4	30	
Batch B116395 - SW-846 7471											
Blank (B116395-BLK1)				Prepared: 03/07/15 Analyzed: 03/09/15							
Mercury	ND	0.025	mg/Kg wet								

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B116395 - SW-846 7471											
LCS (B116395-BS1)				Prepared: 03/07/15 Analyzed: 03/09/15							
Mercury	6.11	0.44	mg/Kg wet	5.76		106		71.2-128.6			
LCS Dup (B116395-BSD1)				Prepared: 03/07/15 Analyzed: 03/09/15							
Mercury	5.84	0.41	mg/Kg wet	5.76		101		71.2-128.6	4.57	30	
Duplicate (B116395-DUP1)		**Source: 15B0926-01RE1**		Prepared: 03/07/15 Analyzed: 03/09/15							
Mercury	0.0668	0.15	mg/Kg dry		0.0762				13.1	35	J
Matrix Spike (B116395-MS1)		**Source: 15B0926-01RE1**		Prepared: 03/07/15 Analyzed: 03/09/15							
Mercury	0.293	0.14	mg/Kg dry	0.288	0.0762	75.2		75-125			
Batch B116563 - SW-846 3050B											
Blank (B116563-BLK1)				Prepared: 03/09/15 Analyzed: 03/11/15							
Aluminum	1.3	2.5	mg/Kg wet								J
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	1.6	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	2.4	2.5	mg/Kg wet								J
Lead	ND	0.75	mg/Kg wet								
Magnesium	0.92	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	ND	1.0	mg/Kg wet								
LCS (B116563-BS1)				Prepared: 03/09/15 Analyzed: 03/11/15							
Aluminum	6390	5.0	mg/Kg wet	8100		78.9		51.2-148.1			
Antimony	70.7	5.0	mg/Kg wet	116		60.9		0-210.3			
Arsenic	106	5.0	mg/Kg wet	122		86.8		77.8-122.1			
Barium	154	5.0	mg/Kg wet	167		92.2		82-117.4			
Beryllium	50.8	0.50	mg/Kg wet	54.3		93.5		82.3-117.7			
Cadmium	73.2	0.50	mg/Kg wet	88.0		83.2		81.9-118.2			
Calcium	5300	15	mg/Kg wet	5920		89.5		81.9-118.2			
Chromium	86.7	1.0	mg/Kg wet	102		85.0		78.7-120.6			
Cobalt	84.7	5.0	mg/Kg wet	99.4		85.2		83-116.7			
Copper	68.5	1.0	mg/Kg wet	78.0		87.9		80.4-119.6			
Iron	11200	5.0	mg/Kg wet	15100		73.9		46.8-153			
Lead	76.9	1.5	mg/Kg wet	94.5		**81.4**	*	82.4-117.8			L-07
Magnesium	2620	15	mg/Kg wet	3020		86.7		75.5-124.2			
Manganese	349	1.0	mg/Kg wet	401		87.1		80.8-119.2			
Nickel	46.3	1.0	mg/Kg wet	56.3		82.2		82.2-117.8			
Potassium	2230	200	mg/Kg wet	2490		89.6		69.9-130.1			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B116563 - SW-846 3050B											
LCS (B116563-BS1)				Prepared: 03/09/15 Analyzed: 03/11/15							
Selenium	121	5.0	mg/Kg wet	157		**76.9**	*	77.1-122.3			L-07
Silver	26.5	1.0	mg/Kg wet	34.2		77.6		74.3-125.4			
Sodium	257	200	mg/Kg wet	246		105		69.9-130.5			
Thallium	93.4	5.0	mg/Kg wet	116		80.5		78.2-121.6			
Vanadium	55.3	2.0	mg/Kg wet	67.1		82.4		64.8-135.2			
Zinc	163	2.0	mg/Kg wet	207		**78.9**	*	79.7-120.8			L-07
LCS Dup (B116563-BSD1)				Prepared: 03/09/15 Analyzed: 03/11/15							
Aluminum	6200	5.3	mg/Kg wet	8100		76.6		51.2-148.1	2.98	30	
Antimony	74.0	5.3	mg/Kg wet	116		63.8		0-210.3	4.57	30	
Arsenic	107	5.3	mg/Kg wet	122		87.5		77.8-122.1	0.882	30	
Barium	143	5.3	mg/Kg wet	167		85.8		82-117.4	7.24	30	
Beryllium	52.4	0.53	mg/Kg wet	54.3		96.5		82.3-117.7	3.20	30	
Cadmium	78.2	0.53	mg/Kg wet	88.0		88.9		81.9-118.2	6.67	30	
Calcium	5380	16	mg/Kg wet	5920		90.8		81.9-118.2	1.50	30	
Chromium	90.2	1.1	mg/Kg wet	102		88.4		78.7-120.6	3.94	30	
Cobalt	89.3	5.3	mg/Kg wet	99.4		89.8		83-116.7	5.26	30	
Copper	72.9	1.1	mg/Kg wet	78.0		93.5		80.4-119.6	6.18	30	
Iron	10900	5.3	mg/Kg wet	15100		72.4		46.8-153	2.03	30	
Lead	80.7	1.6	mg/Kg wet	94.5		85.4		82.4-117.8	4.85	30	
Magnesium	2610	16	mg/Kg wet	3020		86.4		75.5-124.2	0.273	30	
Manganese	366	1.1	mg/Kg wet	401		91.3		80.8-119.2	4.74	30	
Nickel	49.4	1.1	mg/Kg wet	56.3		87.7		82.2-117.8	6.46	30	
Potassium	2210	210	mg/Kg wet	2490		88.9		69.9-130.1	0.824	30	
Selenium	125	5.3	mg/Kg wet	157		79.6		77.1-122.3	3.56	30	
Silver	26.5	1.1	mg/Kg wet	34.2		77.5		74.3-125.4	0.151	30	
Sodium	259	210	mg/Kg wet	246		105		69.9-130.5	0.872	30	
Thallium	95.7	5.3	mg/Kg wet	116		82.5		78.2-121.6	2.36	30	
Vanadium	55.4	2.1	mg/Kg wet	67.1		82.6		64.8-135.2	0.221	30	
Zinc	168	2.1	mg/Kg wet	207		81.0		79.7-120.8	2.60	30	
MRL Check (B116563-MRL1)				Prepared: 03/09/15 Analyzed: 03/11/15							
Lead	0.863	0.82	mg/Kg wet	0.820		105		80-120			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B116200 - SW-846 7196A											
Blank (B116200-BLK1)				Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B116200-BS1)				Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	55	2.0	mg/Kg wet	59.3		92.8		80-120			
LCS Dup (B116200-BSD1)				Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	56	2.0	mg/Kg wet	59.2		94.9		80-120	2.22	20	
Matrix Spike (B116200-MS1) Soluble MS	**Source: 15B0926-10**			Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	31	0.89	mg/Kg dry	44.4	ND	**69.4**	*	75-125			MS-16
Matrix Spike (B116200-MS2) PDMS	**Source: 15B0926-10**			Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	42	1.8	mg/Kg dry	43.8	ND	95.8		75-125			
Matrix Spike (B116200-MS3) Insoluble MS	**Source: 15B0926-10**			Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	560	18	mg/Kg dry	723	ND	77.3		75-125			
Matrix Spike Dup (B116200-MSD1) Soluble MS Dup	**Source: 15B0926-10**			Prepared & Analyzed: 03/03/15							
Hexavalent Chromium	35	0.89	mg/Kg dry	44.3	ND	79.5		75-125	13.4	35	
Batch B116224 - % Solids											
Duplicate (B116224-DUP1)	**Source: 15B0926-05**			Prepared: 03/03/15 Analyzed: 03/04/15							
% Solids	18.2		% Wt		17.6				3.35	20	
Duplicate (B116224-DUP2)	**Source: 15B0926-04**			Prepared: 03/03/15 Analyzed: 03/04/15							
% Solids	46.9		% Wt		47.3				0.849	20	
Duplicate (B116224-DUP3)	**Source: 15B0926-03**			Prepared: 03/03/15 Analyzed: 03/04/15							
% Solids	16.3		% Wt		15.7				3.75	20	
Duplicate (B116224-DUP4)	**Source: 15B0926-02**			Prepared: 03/03/15 Analyzed: 03/04/15							
% Solids	16.8		% Wt		16.9				0.593	20	
Duplicate (B116224-DUP5)	**Source: 15B0926-01**			Prepared: 03/03/15 Analyzed: 03/04/15							
% Solids	18.0		% Wt		16.7				7.49	20	
Batch B116261 - SW-846 7196A											
Blank (B116261-BLK1)				Prepared & Analyzed: 03/04/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116261 - SW-846 7196A										
LCS (B116261-BS1)				Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	48	1.7	mg/Kg wet	52.0		92.9	80-120			
LCS Dup (B116261-BSD1)				Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	49	1.7	mg/Kg wet	50.7		96.1	80-120	0.939	20	
Matrix Spike (B116261-MS1) Soluble MS		**Source: 15B0926-13**		Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	39	0.92	mg/Kg dry	45.8	0.15	85.8	75-125			
Matrix Spike (B116261-MS2) PDMS		**Source: 15B0926-13**		Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	44	1.8	mg/Kg dry	45.8	0.15	95.7	75-125			
Matrix Spike (B116261-MS3) Insoluble MS		**Source: 15B0926-13**		Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	690	18	mg/Kg dry	733	0.15	93.5	75-125			
Matrix Spike Dup (B116261-MSD1) Soluble MS Dup		**Source: 15B0926-13**		Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	38	0.93	mg/Kg dry	46.5	0.15	81.9	75-125	3.10	35	
Batch B116293 - SW-846 9014										
Blank (B116293-BLK1)				Prepared & Analyzed: 03/04/15						
Cyanide	ND	0.40	mg/Kg wet							
LCS (B116293-BS1)				Prepared & Analyzed: 03/04/15						
Cyanide	63	2.3	mg/Kg wet	59.0		107	80-120			
LCS Dup (B116293-BSD1)				Prepared & Analyzed: 03/04/15						
Cyanide	59	2.3	mg/Kg wet	59.1		99.7	80-120	6.63	20	
Matrix Spike (B116293-MS1)		**Source: 15B0926-07**		Prepared & Analyzed: 03/04/15						
Cyanide	100	3.2	mg/Kg dry	108	ND	95.9	75-125			
Matrix Spike Dup (B116293-MSD1)		**Source: 15B0926-07**		Prepared & Analyzed: 03/04/15						
Cyanide	110	3.2	mg/Kg dry	109	ND	98.4	75-125	3.61	35	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

15B0926

Rev 04.05.12

con-test® ANALYTICAL LABORATORY
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39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								I	I	I			
								A	A	G			
01	WTSB547-3-4	2/25/2015	14:15		X	S		✓	✓	✓			
02	WTSB547-14-15	2/25/2015	14:40		X	S		✓	✓	✓			
03	WTSB520-3-4	2/25/2015	15:30		X	S		✓	✓	✓			
04	WTSB520-15-16	2/25/2015	15:45		X	S		✓	✓	✓			
05	WTSB521-3-4	2/25/2015	15:55		X	S		✓	✓	✓			
06	WTSB521-13-14	2/25/2015	16:10		X	S		✓	✓	✓			
07	BRSB760-3-4	2/26/2015	9:40		X	S		✓	✓	✓			
08	BRSB760-15-16	2/26/2015	10:00		X	S		✓	✓	✓			
09	BRSB763-3-4	2/26/2015	10:10		X	S		✓	✓	✓			
10	BRSB763-15-16	2/26/2015	10:50		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 2/27/15 1400	
Received by: (signature) 2.0°C	Date/Time: 2/28/15 10:50	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Dissolved Metals
○ Field Filtered
○ Lab to Filter

Table of Contents

CHAIN OF CUSTODY RECORD

con-test® ANALYTICAL LABORATORY
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www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

15B0926

Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS ○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium										# of Containers
								I	I	I										** Preservation
								A	A	G										***Container Code
11	BRSB766-3-4	2/26/2015	11:00		X	S		✓	✓	✓										
12	BRSB766-12-13	2/26/2015	11:10		X	S		✓	✓	✓										
13	BRSB701-15-16	2/26/2015	11:45		X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										
					X	S		✓	✓	✓										

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

nments:

nquished by: (signature) Date/Time: 2/28/15 1400
eived by: (signature) 2.5°C Date/Time: 2/28/15 10:50
nquished by: (signature) Date/Time:
eived by: (signature) Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

AIHA LAP, LLC ACCREDITED LABORATORY
ACCREDITED IN ACCORDANCE WITH nelac
NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

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East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

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Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: MJ DATE: 2/28/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** Yes (No) *
   If not, explain:
4) **How were the samples received:**
   On Ice ☒ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☒
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank 2.0°C Temperature °C by Temp gun _____
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	13
250 mL Amber (8oz amber)		2 oz amber/clear jar	13
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:
4 oz Amber Jars "WTSB521-13-14" and "BRSB766-3-4" arrived broken. MS

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	F	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 2/28/15 10:29

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March 16, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortland, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15B0927

Enclosed are results of analyses for samples received by the laboratory on February 28, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB229-3-4	15B0927-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB229-3-4-1	15B0927-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB216-1-2	15B0927-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB216-3-3.8	15B0927-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB214-1-2	15B0927-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB214-3-3.8	15B0927-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB213-2-3	15B0927-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB213-3-4	15B0927-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB213-5-5.5	15B0927-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB211-1-2	15B0927-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB211-4-5	15B0927-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB551-1-2	15B0927-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB551-12-16	15B0927-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB550-4-10	15B0927-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB550-10-16	15B0927-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB549-4-6	15B0927-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB548-14-16	15B0927-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB627-3-4	15B0927-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB627-5-5.5	15B0927-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB522-13-14	15B0927-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Manganese
15B0927-01[UASB229-3-4], 15B0927-02[UASB229-3-4-1], 15B0927-03[UASB216-1-2], 15B0927-04[UASB216-3-3.8], 15B0927-05[UASB214-1-2], 15B0927-06[UASB214-3-3.8], 15B0927-07[UASB213-2-3], 15B0927-08[UASB213-3-4], 15B0927-09[UASB213-5-5.5], 15B0927-10[UASB211-1-2], 15B0927-11[UASB211-4-5], 15B0927-12[WTSB551-1-2], 15B0927-13[WTSB551-12-16], 15B0927-14[WTSB550-4-10], 15B0927-15[WTSB550-10-16], 15B0927-16[WTSB549-4-6], 15B0927-17[WTSB548-14-16], 15B0927-18[PASB627-3-4], 15B0927-19[PASB627-5-5.5], 15B0927-20[WTSB522-13-14], B116330-BLK1

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony
15B0927-07[UASB213-2-3], B116330-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15B0927-07[UASB213-2-3], B116330-MS1

Calcium
15B0927-07[UASB213-2-3], B116330-MS1

Iron
15B0927-07[UASB213-2-3], B116330-MS1

Magnesium
15B0927-07[UASB213-2-3], B116330-MS1

SW-846 7196A

Qualifications:

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium
15B0927-02[UASB229-3-4-1], 15B0927-03[UASB216-1-2], 15B0927-04[UASB216-3-3.8], 15B0927-05[UASB214-1-2], 15B0927-06[UASB214-3-3.8], 15B0927-12[WTSB551-1-2], 15B0927-13[WTSB551-12-16], 15B0927-14[WTSB550-4-10], 15B0927-15[WTSB550-10-16], 15B0927-17[WTSB548-14-16], 15B0927-18[PASB627-3-4], 15B0927-19[PASB627-5-5.5]

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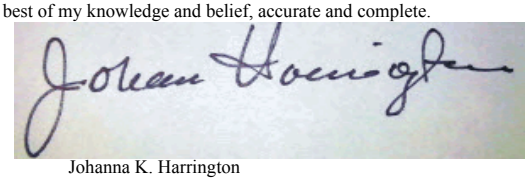
The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Johanna K. Harrington
Manager, Laboratory Reporting

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB229-3-4 | Sampled: 2/23/2015 14:30

Sample ID: 15B0927-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	2.8	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Antimony	3.2	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Arsenic	ND	2.8	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Barium	110	2.8	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Beryllium	0.96	0.28	0.044	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Cadmium	0.42	0.28	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Calcium	2100	8.3	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Chromium	79	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Cobalt	21	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Copper	120	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Iron	22000	28	23	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 19:25	AMP
Lead	5.1	0.83	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Magnesium	6800	83	8.6	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 19:25	AMP
Manganese	130	0.55	0.17	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Mercury	0.011	0.030	0.0043	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:36	SCB
Nickel	150	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Potassium	840	110	19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Sodium	290	110	54	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Thallium	ND	2.8	0.91	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Vanadium	33	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP
Zinc	39	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:21	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB229-3-4 | Sampled: 2/23/2015 14:30

Sample ID: 15B0927-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.58	0.52	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	83.9			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

con-test® ANALYTICAL LABORATORY
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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB229-3-4-1 | Sampled: 2/23/2015 14:30

Sample ID: 15B0927-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9500	3.2	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Antimony	3.1	3.2	2.6	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Barium	110	3.2	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Beryllium	0.97	0.32	0.052	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Cadmium	0.44	0.32	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Calcium	1900	9.6	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Chromium	80	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Cobalt	33	3.2	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Copper	130	0.64	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Iron	22000	32	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 19:30	AMP
Lead	5.5	0.96	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Magnesium	5700	96	10	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 19:30	AMP
Manganese	190	0.64	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Mercury	0.018	0.028	0.0041	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:38	SCB
Nickel	150	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Potassium	820	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Selenium	ND	3.2	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Silver	ND	0.64	0.57	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Sodium	280	130	63	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Vanadium	32	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP
Zinc	41	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:26	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB229-3-4-1 | Sampled: 2/23/2015 14:30

Sample ID: 15B0927-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	3/4/15	3/4/15 16:30	ABH
Hexavalent Chromium	ND	0.38	0.21	mg/Kg dry	2	W-06	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	83.5			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB216-1-2 | Sampled: 2/23/2015 15:00

Sample ID: 15B0927-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9400	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Arsenic	1.2	3.1	1.1	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Barium	85	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Beryllium	0.78	0.31	0.051	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Cadmium	0.46	0.31	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Calcium	1600	9.4	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Chromium	20	0.63	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Cobalt	10	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Copper	38	0.63	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Iron	15000	31	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 19:36	AMP
Lead	19	0.94	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Magnesium	2900	9.4	0.98	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Manganese	340	0.63	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Mercury	0.047	0.031	0.0044	mg/Kg dry	1		SW-846 7471B	3/5/15	3/9/15 9:39	SCB
Nickel	46	0.63	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Potassium	530	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Sodium	170	130	61	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Vanadium	25	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP
Zinc	44	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:32	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB216-1-2 | Sampled: 2/23/2015 15:00

Sample ID: 15B0927-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.99	0.54	mg/Kg dry	5	W-06	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	78.4			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB216-3-3.8 | Sampled: 2/23/2015 15:10

Sample ID: 15B0927-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Barium	120	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Beryllium	0.89	0.31	0.051	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Cadmium	0.37	0.31	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Calcium	1200	9.4	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Chromium	41	0.63	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Cobalt	8.8	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Copper	7.4	0.63	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Iron	19000	31	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:00	AMP
Lead	6.2	0.94	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Magnesium	2100	9.4	0.98	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Manganese	93	0.63	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Mercury	0.019	0.030	0.0043	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:41	SCB
Nickel	99	0.63	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Potassium	450	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Sodium	190	130	61	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Vanadium	27	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP
Zinc	16	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:37	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB216-3-3.8 | Sampled: 2/23/2015 15:10

Sample ID: 15B0927-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.39	0.21	mg/Kg dry	2	W-06	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	81.5			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB214-1-2 | Sampled: 2/24/2015 08:40

Sample ID: 15B0927-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	3.2	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Antimony	2.7	3.2	2.6	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Arsenic	1.7	3.2	1.2	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Barium	96	3.2	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Beryllium	0.98	0.32	0.051	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Cadmium	0.47	0.32	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Calcium	1700	9.6	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Chromium	24	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Cobalt	11	3.2	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Copper	28	0.64	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Iron	19000	32	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:05	AMP
Lead	19	0.96	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Magnesium	3700	9.6	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Manganese	190	0.64	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Mercury	0.073	0.033	0.0047	mg/Kg dry	1		SW-846 7471B	3/5/15	3/9/15 9:42	SCB
Nickel	31	0.64	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Potassium	680	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Selenium	ND	3.2	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Sodium	230	130	62	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Vanadium	31	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP
Zinc	42	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:43	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB214-1-2 | Sampled: 2/24/2015 08:40

Sample ID: 15B0927-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.58	0.53	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	1.1	0.59	mg/Kg dry	5	W-06	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	73.3			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB214-3-3.8 | Sampled: 2/24/2015 08:45

Sample ID: 15B0927-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9400	2.8	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Barium	110	2.8	0.35	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Beryllium	0.89	0.28	0.045	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Cadmium	0.34	0.28	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Calcium	1000	8.4	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Chromium	33	0.56	0.14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Cobalt	6.5	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Copper	6.4	0.56	0.43	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Iron	20000	28	24	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:11	AMP
Lead	5.3	0.84	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Magnesium	3200	8.4	0.87	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Manganese	100	0.56	0.18	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Mercury	0.012	0.029	0.0041	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:44	SCB
Nickel	47	0.56	0.13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Potassium	770	110	19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Sodium	160	110	54	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Vanadium	28	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP
Zinc	24	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:48	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB214-3-3.8 | Sampled: 2/24/2015 08:45

Sample ID: 15B0927-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	2.5	0.37	0.33	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	0.73	0.92	0.51	mg/Kg dry	5	W-06, J	SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	86.1			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-2-3 | Sampled: 2/24/2015 09:25

Sample ID: 15B0927-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.7	1.2	mg/Kg dry	1	MS-19	SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Antimony	2.5	2.7	2.2	mg/Kg dry	1	MS-07, J	SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Barium	49	2.7	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Beryllium	0.64	0.27	0.044	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Cadmium	0.37	0.27	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Calcium	2000	8.2	1.5	mg/Kg dry	1	MS-19	SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Chromium	13	0.55	0.14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Cobalt	5.1	2.7	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Copper	59	0.55	0.42	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Iron	15000	27	23	mg/Kg dry	10	MS-19	SW-846 6010C	3/4/15	3/10/15 20:16	AMP
Lead	13	0.82	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Magnesium	2100	8.2	0.86	mg/Kg dry	1	MS-19	SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Manganese	110	0.55	0.17	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Mercury	0.023	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:45	SCB
Nickel	14	0.55	0.13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Potassium	340	110	19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Sodium	110	110	53	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Vanadium	20	1.1	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP
Zinc	28	1.1	0.28	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 21:56	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-2-3 | Sampled: 2/24/2015 09:25

Sample ID: 15B0927-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.42	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	84.2			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-3-4 | Sampled: 2/24/2015 09:30

Sample ID: 15B0927-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9600	2.9	1.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Barium	55	2.9	0.37	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Beryllium	0.52	0.29	0.047	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Cadmium	0.27	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Calcium	780	8.8	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Chromium	11	0.59	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Cobalt	5.1	2.9	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Copper	29	0.59	0.45	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Iron	13000	29	25	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:22	AMP
Lead	5.0	0.88	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Magnesium	1800	8.8	0.92	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Manganese	71	0.59	0.19	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Mercury	0.016	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:50	SCB
Nickel	17	0.59	0.14	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Potassium	360	120	20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Sodium	120	120	57	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Vanadium	18	1.2	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP
Zinc	17	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:54	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-3-4 | Sampled: 2/24/2015 09:30

Sample ID: 15B0927-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.32	0.29	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	83.0			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-5-5.5 | Sampled: 2/24/2015 09:40

Sample ID: 15B0927-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	3.0	1.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Barium	63	3.0	0.38	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Beryllium	0.57	0.30	0.049	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Cadmium	0.28	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Calcium	880	9.1	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Chromium	9.9	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Cobalt	5.5	3.0	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Copper	17	0.60	0.46	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Iron	12000	30	26	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:26	AMP
Lead	4.0	0.91	0.18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Magnesium	2000	9.1	0.95	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Manganese	150	0.60	0.19	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Mercury	0.0099	0.028	0.0041	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:52	SCB
Nickel	13	0.60	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Potassium	580	120	21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Sodium	120	120	59	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Vanadium	18	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP
Zinc	14	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 22:59	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB213-5-5.5 | Sampled: 2/24/2015 09:40

Sample ID: 15B0927-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.56	0.50	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.18	0.098	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	88.0			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB211-1-2 | Sampled: 2/24/2015 10:25

Sample ID: 15B0927-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.5	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Arsenic	1.4	3.5	1.3	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Barium	54	3.5	0.43	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Beryllium	0.66	0.35	0.056	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Cadmium	0.37	0.35	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Calcium	1200	10	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Chromium	13	0.69	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Cobalt	5.1	3.5	0.22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Copper	65	0.69	0.53	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Iron	13000	35	30	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:31	AMP
Lead	8.7	1.0	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Magnesium	1900	10	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Manganese	73	0.69	0.22	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Mercury	0.049	0.030	0.0044	mg/Kg dry	1		SW-846 7471B	3/5/15	3/9/15 9:53	SCB
Nickel	32	0.69	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Potassium	360	140	24	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Silver	ND	0.69	0.61	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Sodium	160	140	68	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Vanadium	22	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP
Zinc	46	1.4	0.36	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:04	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB211-1-2 | Sampled: 2/24/2015 10:25

Sample ID: 15B0927-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	78.4			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB211-4-5 | Sampled: 2/24/2015 10:45

Sample ID: 15B0927-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	2.6	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Arsenic	9.3	2.6	0.95	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Barium	55	2.6	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Beryllium	0.52	0.26	0.042	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Cadmium	0.43	0.26	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Calcium	740	7.9	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Chromium	16	0.53	0.13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Cobalt	5.1	2.6	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Copper	370	0.53	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Iron	10000	26	22	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:35	AMP
Lead	4.3	0.79	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Magnesium	1300	7.9	0.82	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Manganese	90	0.53	0.17	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Mercury	0.012	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:55	SCB
Nickel	47	0.53	0.13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Potassium	310	110	18	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Sodium	160	110	51	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Vanadium	17	1.1	0.17	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP
Zinc	28	1.1	0.27	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:10	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: UASB211-4-5 | Sampled: 2/24/2015 10:45

Sample ID: 15B0927-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.54	0.49	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	3/4/15	3/4/15 13:00	LL
% Solids	87.6			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB551-1-2 | Sampled: 2/24/2015 13:25

Sample ID: 15B0927-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	9.9	4.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Antimony	ND	9.9	8.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Arsenic	3.7	9.9	3.6	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Barium	360	9.9	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Beryllium	0.69	0.99	0.16	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Cadmium	1.1	0.99	0.59	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Calcium	13000	30	5.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Chromium	52	2.0	0.50	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Cobalt	4.8	9.9	0.63	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Copper	52	2.0	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Iron	6900	9.9	8.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Lead	8.3	3.0	0.59	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Magnesium	2200	30	3.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Manganese	360	2.0	0.63	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Mercury	0.19	0.087	0.013	mg/Kg dry	1		SW-846 7471B	3/5/15	3/9/15 9:56	SCB
Nickel	77	2.0	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Potassium	630	400	68	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Selenium	ND	9.9	3.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Silver	ND	2.0	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Sodium	270	400	190	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Thallium	ND	9.9	3.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Vanadium	21	4.0	0.65	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP
Zinc	18	4.0	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:35	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB551-1-2 | Sampled: 2/24/2015 13:25

Sample ID: 15B0927-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.5	1.3	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	5.9	3.2	mg/Kg dry	10	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	27.3			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB551-12-16 | Sampled: 2/24/2015 14:10

Sample ID: 15B0927-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	16	6.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Antimony	ND	16	13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Arsenic	ND	16	5.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Barium	140	16	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Beryllium	1.1	1.6	0.25	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Cadmium	1.2	1.6	0.92	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Calcium	6500	47	8.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Chromium	25	3.1	0.78	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Cobalt	17	16	0.99	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Copper	98	3.1	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Iron	19000	16	13	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Lead	6.9	4.7	0.92	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Magnesium	4000	47	4.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Manganese	150	3.1	0.99	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Mercury	0.041	0.14	0.020	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:58	SCB
Nickel	140	3.1	0.75	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Potassium	870	620	110	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Selenium	ND	16	4.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Sodium	ND	620	300	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Thallium	ND	16	5.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Vanadium	31	6.2	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP
Zinc	74	6.2	1.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:41	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB551-12-16 | Sampled: 2/24/2015 14:10

Sample ID: 15B0927-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.3	2.1	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	4.6	2.5	mg/Kg dry	5	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	17.2			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB550-4-10 | Sampled: 2/24/2015 15:25

Sample ID: 15B0927-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8900	15	6.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Arsenic	ND	15	5.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Barium	190	15	1.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Beryllium	1.3	1.5	0.23	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Cadmium	1.4	1.5	0.86	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Calcium	12000	44	7.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Chromium	25	2.9	0.73	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Cobalt	14	15	0.93	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Copper	100	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Iron	21000	15	12	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Lead	5.8	4.4	0.86	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Magnesium	4400	44	4.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Manganese	230	2.9	0.92	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Mercury	0.022	0.13	0.019	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 9:59	SCB
Nickel	140	2.9	0.70	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Potassium	510	580	100	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Selenium	ND	15	4.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Silver	ND	2.9	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Sodium	ND	580	280	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Thallium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Vanadium	44	5.8	0.96	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP
Zinc	36	5.8	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:46	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB550-4-10 | Sampled: 2/24/2015 15:25

Sample ID: 15B0927-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.5	2.2	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	8.3	4.6	mg/Kg dry	10	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	18.5			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB550-10-16 | Sampled: 2/24/2015 15:30

Sample ID: 15B0927-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	8.3	3.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Antimony	ND	8.3	6.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Arsenic	ND	8.3	3.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Barium	130	8.3	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Beryllium	0.76	0.83	0.13	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Cadmium	0.85	0.83	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Calcium	4700	25	4.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Chromium	22	1.7	0.42	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Cobalt	12	8.3	0.53	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Copper	52	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Iron	12000	8.3	7.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Lead	5.9	2.5	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Magnesium	4400	25	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Manganese	140	1.7	0.53	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Mercury	0.041	0.086	0.012	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 10:00	SCB
Nickel	78	1.7	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Potassium	880	330	57	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Selenium	ND	8.3	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Sodium	ND	330	160	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Thallium	ND	8.3	2.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Vanadium	21	3.3	0.55	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP
Zinc	61	3.3	0.86	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:51	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB550-10-16 | Sampled: 2/24/2015 15:30

Sample ID: 15B0927-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.5	1.3	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	1.1	0.61	mg/Kg dry	2	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	28.3			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB549-4-6 | Sampled: 2/25/2015 09:40

Sample ID: 15B0927-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9000	3.2	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Arsenic	1.3	3.2	1.2	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Barium	62	3.2	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Beryllium	0.95	0.32	0.051	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Cadmium	0.44	0.32	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Calcium	2700	9.6	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Chromium	16	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Cobalt	9.4	3.2	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Copper	19	0.64	0.49	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Iron	20000	32	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:39	AMP
Lead	4.8	0.96	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Magnesium	6700	96	10	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:39	AMP
Manganese	150	0.64	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Mercury	0.0083	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 10:02	SCB
Nickel	23	0.64	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Potassium	1400	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Selenium	ND	3.2	0.98	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Sodium	120	130	62	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Vanadium	31	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP
Zinc	39	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/10/15 23:57	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB549-4-6 | Sampled: 2/25/2015 09:40

Sample ID: 15B0927-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.35	0.31	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	77.8			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB548-14-16 | Sampled: 2/25/2015 10:40

Sample ID: 15B0927-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	26000	6.9	3.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Antimony	ND	6.9	5.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Arsenic	ND	6.9	2.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Barium	510	6.9	0.85	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Beryllium	1.0	0.69	0.11	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Cadmium	1.0	0.69	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Calcium	7100	21	3.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Chromium	74	1.4	0.34	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Cobalt	17	6.9	0.44	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Copper	60	1.4	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Iron	15000	69	59	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 20:45	AMP
Lead	12	2.1	0.41	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Magnesium	3900	21	2.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Manganese	230	1.4	0.44	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Mercury	0.056	0.068	0.0099	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 10:03	SCB
Nickel	120	1.4	0.33	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Potassium	670	270	47	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Selenium	3.1	6.9	2.1	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Silver	ND	1.4	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Sodium	140	270	130	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Thallium	ND	6.9	2.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Vanadium	41	2.7	0.45	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP
Zinc	37	2.7	0.71	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:02	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB548-14-16 | Sampled: 2/25/2015 10:40

Sample ID: 15B0927-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.2	1.1	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	4.3	2.4	mg/Kg dry	10	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	36.0			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: PASB627-3-4 | Sampled: 2/25/2015 11:20

Sample ID: 15B0927-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9800	7.8	3.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Antimony	ND	7.8	6.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Arsenic	ND	7.8	2.8	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Barium	160	7.8	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Beryllium	0.70	0.78	0.13	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Cadmium	0.77	0.78	0.46	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Calcium	8100	23	4.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Chromium	29	1.6	0.39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Cobalt	11	7.8	0.50	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Copper	50	1.6	1.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Iron	8700	7.8	6.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Lead	5.2	2.3	0.46	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Magnesium	5200	23	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Manganese	140	1.6	0.50	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Mercury	0.031	0.080	0.012	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 10:09	SCB
Nickel	74	1.6	0.38	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Potassium	660	310	54	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Selenium	ND	7.8	2.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Silver	ND	1.6	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Sodium	180	310	150	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Thallium	ND	7.8	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Vanadium	23	3.1	0.51	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP
Zinc	51	3.1	0.81	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:08	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: PASB627-3-4 | Sampled: 2/25/2015 11:20

Sample ID: 15B0927-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.6	1.4	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	2.5	1.4	mg/Kg dry	5	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	30.3			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: PASB627-5-5.5 | Sampled: 2/25/2015 11:25

Sample ID: 15B0927-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7200	6.1	2.6	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Antimony	ND	6.1	4.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Arsenic	ND	6.1	2.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Barium	110	6.1	0.76	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Beryllium	0.53	0.61	0.099	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Cadmium	0.51	0.61	0.36	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Calcium	4100	18	3.3	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Chromium	20	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Cobalt	8.1	6.1	0.39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Copper	32	1.2	0.94	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Iron	7700	6.1	5.2	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Lead	5.9	1.8	0.36	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Magnesium	3400	18	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Manganese	120	1.2	0.39	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Mercury	0.030	0.059	0.0084	mg/Kg dry	1	J	SW-846 7471B	3/5/15	3/9/15 10:10	SCB
Nickel	50	1.2	0.30	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Potassium	520	250	42	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Selenium	ND	6.1	1.9	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Silver	ND	1.2	1.1	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Sodium	150	250	120	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Thallium	ND	6.1	2.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Vanadium	17	2.5	0.40	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP
Zinc	36	2.5	0.63	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:13	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: PASB627-5-5.5 | Sampled: 2/25/2015 11:25

Sample ID: 15B0927-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.1	1.0	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	1.9	1.0	mg/Kg dry	5	W-06	SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	42.5			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB522-13-14 | Sampled: 2/25/2015 13:40

Sample ID: 15B0927-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3500	3.1	1.4	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Arsenic	2.4	3.1	1.1	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Barium	20	3.1	0.39	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Beryllium	0.41	0.31	0.050	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Cadmium	0.26	0.31	0.19	mg/Kg dry	1	J	SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Calcium	4000	9.4	1.7	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Chromium	4.8	0.63	0.16	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Cobalt	3.3	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Copper	9.2	0.63	0.48	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Iron	11000	31	27	mg/Kg dry	10		SW-846 6010C	3/4/15	3/10/15 21:09	AMP
Lead	2.5	0.94	0.19	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Magnesium	3400	9.4	0.98	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Manganese	99	0.63	0.20	mg/Kg dry	1	B-07	SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	3/5/15	3/9/15 10:12	SCB
Nickel	5.3	0.63	0.15	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Potassium	740	130	22	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Selenium	ND	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Silver	ND	0.63	0.55	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Sodium	ND	130	61	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Vanadium	8.4	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP
Zinc	15	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/4/15	3/11/15 0:19	AMP

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Project Location: Cortland, NY | Sample Description: | Work Order: 15B0927

Date Received: 2/28/2015

Field Sample #: WTSB522-13-14 | Sampled: 2/25/2015 13:40

Sample ID: 15B0927-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.41	0.37	mg/Kg dry	1		SW-846 9014	3/5/15	3/6/15 12:00	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	3/5/15	3/5/15 13:00	LL
% Solids	84.5			% Wt	1		SM 2540G	3/3/15	3/4/15 10:24	DRA

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15B0927-01 [UASB229-3-4]	B116224	03/03/15
15B0927-02 [UASB229-3-4-1]	B116224	03/03/15
15B0927-03 [UASB216-1-2]	B116224	03/03/15
15B0927-04 [UASB216-3-3.8]	B116224	03/03/15
15B0927-05 [UASB214-1-2]	B116224	03/03/15
15B0927-06 [UASB214-3-3.8]	B116224	03/03/15
15B0927-07 [UASB213-2-3]	B116224	03/03/15
15B0927-08 [UASB213-3-4]	B116224	03/03/15
15B0927-09 [UASB213-5-5.5]	B116224	03/03/15
15B0927-10 [UASB211-1-2]	B116224	03/03/15
15B0927-11 [UASB211-4-5]	B116224	03/03/15
15B0927-12 [WTSB551-1-2]	B116224	03/03/15
15B0927-13 [WTSB551-12-16]	B116224	03/03/15
15B0927-14 [WTSB550-4-10]	B116224	03/03/15
15B0927-15 [WTSB550-10-16]	B116224	03/03/15
15B0927-16 [WTSB549-4-6]	B116224	03/03/15
15B0927-17 [WTSB548-14-16]	B116224	03/03/15
15B0927-18 [PASB627-3-4]	B116224	03/03/15
15B0927-19 [PASB627-5-5.5]	B116224	03/03/15
15B0927-20 [WTSB522-13-14]	B116224	03/03/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-01 [UASB229-3-4]	B116330	1.08	50.0	03/04/15
15B0927-02 [UASB229-3-4-1]	B116330	0.931	50.0	03/04/15
15B0927-03 [UASB216-1-2]	B116330	1.01	50.0	03/04/15
15B0927-04 [UASB216-3-3.8]	B116330	0.977	50.0	03/04/15
15B0927-05 [UASB214-1-2]	B116330	1.07	50.0	03/04/15
15B0927-06 [UASB214-3-3.8]	B116330	1.04	50.0	03/04/15
15B0927-07 [UASB213-2-3]	B116330	1.08	50.0	03/04/15
15B0927-08 [UASB213-3-4]	B116330	1.03	50.0	03/04/15
15B0927-09 [UASB213-5-5.5]	B116330	0.940	50.0	03/04/15
15B0927-10 [UASB211-1-2]	B116330	0.919	50.0	03/04/15
15B0927-11 [UASB211-4-5]	B116330	1.09	50.0	03/04/15
15B0927-12 [WTSB551-1-2]	B116330	0.924	50.0	03/04/15
15B0927-13 [WTSB551-12-16]	B116330	0.934	50.0	03/04/15
15B0927-14 [WTSB550-4-10]	B116330	0.928	50.0	03/04/15
15B0927-15 [WTSB550-10-16]	B116330	1.06	50.0	03/04/15
15B0927-16 [WTSB549-4-6]	B116330	1.01	50.0	03/04/15
15B0927-17 [WTSB548-14-16]	B116330	1.01	50.0	03/04/15
15B0927-18 [PASB627-3-4]	B116330	1.05	50.0	03/04/15
15B0927-19 [PASB627-5-5.5]	B116330	0.959	50.0	03/04/15
15B0927-20 [WTSB522-13-14]	B116330	0.943	50.0	03/04/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-01 [UASB229-3-4]	B116261	2.52	100	03/04/15
15B0927-02 [UASB229-3-4-1]	B116261	2.55	100	03/04/15
15B0927-03 [UASB216-1-2]	B116261	2.58	100	03/04/15
15B0927-04 [UASB216-3-3.8]	B116261	2.53	100	03/04/15
15B0927-05 [UASB214-1-2]	B116261	2.55	100	03/04/15

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Sample Extraction Data

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-06 [UASB214-3-3.8]	B116261	2.51	100	03/04/15
15B0927-07 [UASB213-2-3]	B116261	2.51	100	03/04/15
15B0927-08 [UASB213-3-4]	B116261	2.55	100	03/04/15
15B0927-09 [UASB213-5-5.5]	B116261	2.55	100	03/04/15
15B0927-10 [UASB211-1-2]	B116261	2.53	100	03/04/15
15B0927-11 [UASB211-4-5]	B116261	2.58	100	03/04/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-12 [WTSB551-1-2]	B116349	2.50	100	03/05/15
15B0927-13 [WTSB551-12-16]	B116349	2.54	100	03/05/15
15B0927-14 [WTSB550-4-10]	B116349	2.59	100	03/05/15
15B0927-15 [WTSB550-10-16]	B116349	2.54	100	03/05/15
15B0927-16 [WTSB549-4-6]	B116349	2.53	100	03/05/15
15B0927-17 [WTSB548-14-16]	B116349	2.58	100	03/05/15
15B0927-18 [PASB627-3-4]	B116349	2.59	100	03/05/15
15B0927-19 [PASB627-5-5.5]	B116349	2.52	100	03/05/15
15B0927-20 [WTSB522-13-14]	B116349	2.56	100	03/05/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-01 [UASB229-3-4]	B116362	0.602	50.0	03/05/15
15B0927-02 [UASB229-3-4-1]	B116362	0.638	50.0	03/05/15
15B0927-03 [UASB216-1-2]	B116362	0.622	50.0	03/05/15
15B0927-04 [UASB216-3-3.8]	B116362	0.614	50.0	03/05/15
15B0927-05 [UASB214-1-2]	B116362	0.627	50.0	03/05/15
15B0927-06 [UASB214-3-3.8]	B116362	0.611	50.0	03/05/15
15B0927-07 [UASB213-2-3]	B116362	0.638	50.0	03/05/15
15B0927-08 [UASB213-3-4]	B116362	0.617	50.0	03/05/15
15B0927-09 [UASB213-5-5.5]	B116362	0.603	50.0	03/05/15
15B0927-10 [UASB211-1-2]	B116362	0.630	50.0	03/05/15
15B0927-11 [UASB211-4-5]	B116362	0.610	50.0	03/05/15
15B0927-12 [WTSB551-1-2]	B116362	0.628	50.0	03/05/15
15B0927-13 [WTSB551-12-16]	B116362	0.618	50.0	03/05/15
15B0927-14 [WTSB550-4-10]	B116362	0.628	50.0	03/05/15
15B0927-15 [WTSB550-10-16]	B116362	0.617	50.0	03/05/15
15B0927-16 [WTSB549-4-6]	B116362	0.625	50.0	03/05/15
15B0927-17 [WTSB548-14-16]	B116362	0.609	50.0	03/05/15
15B0927-18 [PASB627-3-4]	B116362	0.617	50.0	03/05/15
15B0927-19 [PASB627-5-5.5]	B116362	0.603	50.0	03/05/15
15B0927-20 [WTSB522-13-14]	B116362	0.608	50.0	03/05/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-01 [UASB229-3-4]	B116293	1.03	50.0	03/04/15
15B0927-02 [UASB229-3-4-1]	B116293	1.45	50.0	03/04/15

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Sample Extraction Data

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15B0927-03 [UASB216-1-2]	B116368	1.25	50.0	03/05/15
15B0927-04 [UASB216-3-3.8]	B116368	1.04	50.0	03/05/15
15B0927-05 [UASB214-1-2]	B116368	1.17	50.0	03/05/15
15B0927-06 [UASB214-3-3.8]	B116368	1.59	50.0	03/05/15
15B0927-07 [UASB213-2-3]	B116368	1.26	50.0	03/05/15
15B0927-08 [UASB213-3-4]	B116368	1.86	50.0	03/05/15
15B0927-09 [UASB213-5-5.5]	B116368	1.02	50.0	03/05/15
15B0927-10 [UASB211-1-2]	B116368	1.08	50.0	03/05/15
15B0927-11 [UASB211-4-5]	B116368	1.06	50.0	03/05/15
15B0927-12 [WTSB551-1-2]	B116368	1.25	50.0	03/05/15
15B0927-13 [WTSB551-12-16]	B116368	1.27	50.0	03/05/15
15B0927-14 [WTSB550-4-10]	B116368	1.09	50.0	03/05/15
15B0927-15 [WTSB550-10-16]	B116368	1.21	50.0	03/05/15
15B0927-16 [WTSB549-4-6]	B116368	1.86	50.0	03/05/15
15B0927-17 [WTSB548-14-16]	B116368	1.11	50.0	03/05/15
15B0927-18 [PASB627-3-4]	B116368	1.04	50.0	03/05/15
15B0927-19 [PASB627-5-5.5]	B116368	1.03	50.0	03/05/15
15B0927-20 [WTSB522-13-14]	B116368	1.44	50.0	03/05/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116330 - SW-846 3050B										
Blank (B116330-BLK1)				Prepared: 03/04/15 Analyzed: 03/10/15						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	0.35	0.75	mg/Kg wet							J
Magnesium	1.0	7.5	mg/Kg wet							J
Manganese	6.2	0.50	mg/Kg wet							B-07
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.90	1.0	mg/Kg wet							J
LCS (B116330-BS1)				Prepared: 03/04/15 Analyzed: 03/10/15						
Aluminum	6950	5.0	mg/Kg wet	8100		85.8	51.2-148.1			
Antimony	81.6	5.0	mg/Kg wet	116		70.3	0-210.3			
Arsenic	115	5.0	mg/Kg wet	122		94.4	77.8-122.1			
Barium	161	5.0	mg/Kg wet	167		96.3	82-117.4			
Beryllium	57.7	0.50	mg/Kg wet	54.3		106	82.3-117.7			
Cadmium	84.0	0.50	mg/Kg wet	88.0		95.4	81.9-118.2			
Calcium	5630	15	mg/Kg wet	5920		95.0	81.9-118.2			
Chromium	98.6	0.99	mg/Kg wet	102		96.7	78.7-120.6			
Cobalt	96.5	5.0	mg/Kg wet	99.4		97.0	83-116.7			
Copper	79.9	0.99	mg/Kg wet	78.0		102	80.4-119.6			
Iron	12400	5.0	mg/Kg wet	15100		82.2	46.8-153			
Lead	89.8	1.5	mg/Kg wet	94.5		95.0	82.4-117.8			
Magnesium	2890	15	mg/Kg wet	3020		95.6	75.5-124.2			
Manganese	393	0.99	mg/Kg wet	401		98.0	80.8-119.2			
Nickel	52.9	0.99	mg/Kg wet	56.3		94.0	82.2-117.8			
Potassium	2440	200	mg/Kg wet	2490		97.8	69.9-130.1			
Selenium	130	5.0	mg/Kg wet	157		83.0	77.1-122.3			
Silver	30.0	0.99	mg/Kg wet	34.2		87.7	74.3-125.4			
Sodium	291	200	mg/Kg wet	246		118	69.9-130.5			
Thallium	108	5.0	mg/Kg wet	116		93.2	78.2-121.6			
Vanadium	63.5	2.0	mg/Kg wet	67.1		94.7	64.8-135.2			
Zinc	185	2.0	mg/Kg wet	207		89.5	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116330 - SW-846 3050B										
LCS Dup (B116330-BSD1)				Prepared: 03/04/15 Analyzed: 03/10/15						
Aluminum	7100	5.0	mg/Kg wet	8100		87.7	51.2-148.1	2.12	30	
Antimony	79.9	5.0	mg/Kg wet	116		68.8	0-210.3	2.12	30	
Arsenic	115	5.0	mg/Kg wet	122		94.5	77.8-122.1	0.116	30	
Barium	160	5.0	mg/Kg wet	167		95.8	82-117.4	0.508	30	
Beryllium	56.1	0.50	mg/Kg wet	54.3		103	82.3-117.7	2.75	30	
Cadmium	81.4	0.50	mg/Kg wet	88.0		92.5	81.9-118.2	3.14	30	
Calcium	5720	15	mg/Kg wet	5920		96.6	81.9-118.2	1.64	30	
Chromium	96.1	1.0	mg/Kg wet	102		94.2	78.7-120.6	2.61	30	
Cobalt	93.7	5.0	mg/Kg wet	99.4		94.3	83-116.7	2.88	30	
Copper	77.1	1.0	mg/Kg wet	78.0		98.8	80.4-119.6	3.62	30	
Iron	12400	5.0	mg/Kg wet	15100		81.9	46.8-153	0.474	30	
Lead	87.7	1.5	mg/Kg wet	94.5		92.8	82.4-117.8	2.35	30	
Magnesium	2890	15	mg/Kg wet	3020		95.6	75.5-124.2	0.0523	30	
Manganese	383	1.0	mg/Kg wet	401		95.6	80.8-119.2	2.50	30	
Nickel	51.1	1.0	mg/Kg wet	56.3		90.8	82.2-117.8	3.48	30	
Potassium	2490	200	mg/Kg wet	2490		99.9	69.9-130.1	2.06	30	
Selenium	127	5.0	mg/Kg wet	157		81.1	77.1-122.3	2.25	30	
Silver	30.0	1.0	mg/Kg wet	34.2		87.6	74.3-125.4	0.0875	30	
Sodium	312	200	mg/Kg wet	246		127	69.9-130.5	6.79	30	
Thallium	106	5.0	mg/Kg wet	116		91.5	78.2-121.6	1.84	30	
Vanadium	62.2	2.0	mg/Kg wet	67.1		92.7	64.8-135.2	2.07	30	
Zinc	181	2.0	mg/Kg wet	207		87.5	79.7-120.8	2.30	30	
Duplicate (B116330-DUP1)		**Source: 15B0927-07**		Prepared: 03/04/15 Analyzed: 03/10/15						
Aluminum	9960	3.0	mg/Kg dry		10100			1.15	35	
Antimony	ND	3.0	mg/Kg dry		2.51			NC	35	
Arsenic	ND	3.0	mg/Kg dry		ND			NC	35	
Barium	51.7	3.0	mg/Kg dry		49.0			5.52	35	
Beryllium	0.683	0.30	mg/Kg dry		0.643			6.01	35	
Cadmium	0.395	0.30	mg/Kg dry		0.369			6.97	35	
Calcium	2220	9.0	mg/Kg dry		2010			9.86	35	
Chromium	11.8	0.60	mg/Kg dry		13.2			11.5	35	
Cobalt	5.31	3.0	mg/Kg dry		5.09			4.19	35	
Copper	60.2	0.60	mg/Kg dry		58.9			2.34	35	
Iron	12700	30	mg/Kg dry		14600			13.5	35	
Lead	12.6	0.90	mg/Kg dry		12.5			0.253	35	
Magnesium	2630	9.0	mg/Kg dry		2140			20.5	35	
Manganese	118	0.60	mg/Kg dry		107			9.21	35	
Nickel	15.8	0.60	mg/Kg dry		14.3			10.5	35	
Potassium	349	120	mg/Kg dry		337			3.64	35	
Selenium	ND	3.0	mg/Kg dry		ND			NC	35	
Silver	ND	0.60	mg/Kg dry		ND			NC	35	
Sodium	131	120	mg/Kg dry		110			17.5	35	
Thallium	ND	3.0	mg/Kg dry		ND			NC	35	
Vanadium	20.2	1.2	mg/Kg dry		20.3			0.436	35	
Zinc	28.6	1.2	mg/Kg dry		27.9			2.28	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B116330 - SW-846 3050B											
MRL Check (B116330-MRL1)				Prepared: 03/04/15 Analyzed: 03/10/15							
Lead	0.831	0.74	mg/Kg wet	0.739		112		80-120			
Matrix Spike (B116330-MS1)		**Source: 15B0927-07**		Prepared: 03/04/15 Analyzed: 03/10/15							
Aluminum	10600	3.1	mg/Kg dry	124	10100	**438**	*	75-125			MS-19
Antimony	59.6	3.1	mg/Kg dry	124	2.51	**46.1**	*	75-125			MS-07
Arsenic	118	3.1	mg/Kg dry	124	ND	95.3		75-125			
Barium	175	3.1	mg/Kg dry	124	49.0	102		75-125			
Beryllium	132	0.31	mg/Kg dry	124	0.643	106		75-125			
Cadmium	120	0.31	mg/Kg dry	124	0.369	96.6		75-125			
Calcium	2630	9.3	mg/Kg dry	124	2010	**494**	*	75-125			MS-19
Chromium	138	0.62	mg/Kg dry	124	13.2	101		75-125			
Cobalt	126	3.1	mg/Kg dry	124	5.09	97.5		75-125			
Copper	188	0.62	mg/Kg dry	124	58.9	105		75-125			
Iron	13300	31	mg/Kg dry	124	14600	**-986**	*	75-125			MS-19
Lead	131	0.93	mg/Kg dry	124	12.5	95.4		75-125			
Magnesium	2600	9.3	mg/Kg dry	124	2140	**375**	*	75-125			MS-19
Manganese	228	0.62	mg/Kg dry	124	107	97.4		75-125			
Nickel	135	0.62	mg/Kg dry	124	14.3	97.2		75-125			
Potassium	1660	120	mg/Kg dry	1240	337	107		75-125			
Selenium	104	3.1	mg/Kg dry	124	ND	83.7		75-125			
Silver	118	0.62	mg/Kg dry	124	ND	95.1		75-125			
Sodium	257	120	mg/Kg dry	124	110	119		75-125			
Thallium	120	3.1	mg/Kg dry	124	ND	97.0		75-125			
Vanadium	142	1.2	mg/Kg dry	124	20.3	98.5		75-125			
Zinc	141	1.2	mg/Kg dry	124	27.9	91.4		75-125			
Batch B116362 - SW-846 7471											
Blank (B116362-BLK1)				Prepared: 03/05/15 Analyzed: 03/09/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B116362-BS1)				Prepared: 03/05/15 Analyzed: 03/09/15							
Mercury	5.16	0.38	mg/Kg wet	5.76		89.5		71.2-128.6			
LCS Dup (B116362-BSD1)				Prepared: 03/05/15 Analyzed: 03/09/15							
Mercury	5.81	0.38	mg/Kg wet	5.76		101		71.2-128.6	11.9	30	
Duplicate (B116362-DUP1)		**Source: 15B0927-01**		Prepared: 03/05/15 Analyzed: 03/09/15							
Mercury	0.0127	0.029	mg/Kg dry		0.0111				13.2	35	J
Matrix Spike (B116362-MS1)		**Source: 15B0927-01**		Prepared: 03/05/15 Analyzed: 03/09/15							
Mercury	0.209	0.029	mg/Kg dry	0.194	0.0111	102		75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116261 - SW-846 7196A										
Blank (B116261-BLK1)				Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B116261-BS1)				Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	48	1.7	mg/Kg wet	52.0		92.9	80-120			
LCS Dup (B116261-BSD1)				Prepared & Analyzed: 03/04/15						
Hexavalent Chromium	49	1.7	mg/Kg wet	50.7		96.1	80-120	0.939	20	
Batch B116293 - SW-846 9014										
Blank (B116293-BLK1)				Prepared & Analyzed: 03/04/15						
Cyanide	ND	0.40	mg/Kg wet							
LCS (B116293-BS1)				Prepared & Analyzed: 03/04/15						
Cyanide	63	2.3	mg/Kg wet	59.0		107	80-120			
LCS Dup (B116293-BSD1)				Prepared & Analyzed: 03/04/15						
Cyanide	59	2.3	mg/Kg wet	59.1		99.7	80-120	6.63	20	
Matrix Spike (B116293-MS2)		**Source: 15B0927-02**		Prepared & Analyzed: 03/04/15						
Cyanide	12	0.42	mg/Kg dry	14.4	ND	86.4	75-125			
Matrix Spike Dup (B116293-MSD2)		**Source: 15B0927-02**		Prepared & Analyzed: 03/04/15						
Cyanide	14	0.42	mg/Kg dry	14.6	ND	94.8	75-125	10.7	35	
Batch B116349 - SW-846 7196A										
Blank (B116349-BLK1)				Prepared & Analyzed: 03/05/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B116349-BS1)				Prepared & Analyzed: 03/05/15						
Hexavalent Chromium	52	2.0	mg/Kg wet	59.2		88.2	80-120			
LCS Dup (B116349-BSD1)				Prepared & Analyzed: 03/05/15						
Hexavalent Chromium	56	2.0	mg/Kg wet	59.5		93.5	80-120	6.37	20	
Batch B116368 - SW-846 9014										
Blank (B116368-BLK1)				Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	ND	0.44	mg/Kg wet							

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B116368 - SW-846 9014										
LCS (B116368-BS1)				Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	65	2.4	mg/Kg wet	61.4		105	80-120			
LCS Dup (B116368-BSD1)				Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	63	2.4	mg/Kg wet	61.2		103	80-120	1.88	20	
Matrix Spike (B116368-MS1)	**Source: 15B0927-18**			Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	54	1.6	mg/Kg dry	54.5	ND	99.0	75-125			
Matrix Spike (B116368-MS2)	**Source: 15B0927-20**			Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	16	0.41	mg/Kg dry	14.0	ND	114	75-125			
Matrix Spike Dup (B116368-MSD1)	**Source: 15B0927-18**			Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	54	1.6	mg/Kg dry	54.2	ND	100	75-125	0.780	35	
Matrix Spike Dup (B116368-MSD2)	**Source: 15B0927-20**			Prepared: 03/05/15 Analyzed: 03/06/15						
Cyanide	15	0.40	mg/Kg dry	13.8	ND	110	75-125	4.77	35	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2015
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

15B0927

Rev 04.05.12

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Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A	A	A	G
01	UASB229-3-4	2/23/2015	14:30		X	S					✓	✓	✓
02	UASB229-3-4-1	2/23/2015	14:30		X	S					✓	✓	✓
03	UASB216-1-2	2/23/2015	15:00		X	S					✓	✓	✓
04	UASB216-3-3.8	2/23/2015	15:10		X	S					✓	✓	✓
05	UASB214-1-2	2/24/2015	8:40		X	S					✓	✓	✓
06	UASB214-3-3.8	2/24/2015	8:45		X	S					✓	✓	✓
07	UASB213-2-3	2/24/2015	9:25		X	S					✓	✓	✓
08	UASB213-3-4	2/24/2015	9:30		X	S					✓	✓	✓
09	UASB213-5-5.5	2/24/2015	9:40		X	S					✓	✓	✓
10	UASB211-1-2	2/24/2015	10:25		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 2/27/15 1400	
Received by: (signature) 2.0°C	Date/Time: 2/28/15 10:50	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† **Require lab approval**

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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ACCREDITED IN ACCORDANCE WITH nelac
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TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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Rev 04.05.12

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								1	I	A	A	A	G
11	UASB211-4-5	2/24/2015	10:45		X	S					✓	✓	✓
12	WTSB551-1-2	2/24/2015	13:25		X	S					✓	✓	✓
13	WTSB551-12-16	2/24/2015	14:10		X	S					✓	✓	✓
14	WTSB550-4-10	2/24/2015	15:25		X	S					✓	✓	✓
15	WTSB550-10-16	2/24/2015	15:30		X	S					✓	✓	✓
16	WTSB549-4-6	2/25/2015	9:40		X	S					✓	✓	✓
17	WTSB548-14-16	2/25/2015	10:40		X	S					✓	✓	✓
18	PASB627-3-4	2/25/2015	11:20		X	S					✓	✓	✓
19	PASB627-5-5.5	2/25/2015	11:25		X	S					✓	✓	✓
20	WTSB522-13-14	2/25/2015	13:40		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
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S=summa can
T=tedlar bag
O=Other

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T = Na thiosulfate
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WW= wastewater
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SL = sludge
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H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 2/27/15 14:00
Received by: (signature) 20° 2/28/15	Date/Time: 10:50
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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Receiver

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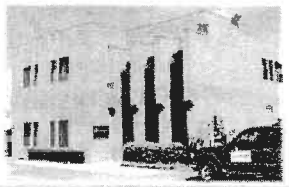

Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: MJ DATE: 2/28/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included
2) **Does the chain agree with the samples?** (Yes) No
   If not, explain:
3) **Are all the samples in good condition?** (Yes) No
   If not, explain:
4) **How were the samples received:**
   On Ice [X] Direct from Sampling [ ] Ambient [ ] In Cooler(s) [X]
   Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A
   Temperature °C by Temp blank 2.0°C Temperature °C by Temp gun _____
5) **Are there Dissolved samples for the lab to filter?** Yes (No)
   Who was notified _____ Date _____ Time _____
6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)
   Who was notified _____ Date _____ Time _____
7) **Location where samples are stored:** 19
   Permission to subcontract samples? Yes No
   (Walk-in clients only) if not already approved
   Client Signature: _____
8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____
9) **Do all samples have the proper Base pH:** Yes No (N/A) _____
10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	20
250 mL Amber (8oz amber)		2 oz amber/clear jar	20
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)
Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MJ 2/28/15 ~~10:29~~ 10:50

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

May 19, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15C1159

Enclosed are results of analyses for samples received by the laboratory on March 28, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB222-6-6.5	15C1159-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-0-1	15C1159-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-5.5-6.5	15C1159-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-6.5-7.5	15C1159-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB223-0-1	15C1159-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB223-4-4.5	15C1159-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-3-4	15C1159-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-7-8	15C1159-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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UASB217-11-12	15C1159-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-16-16.5	15C1159-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB114-3-4	15C1159-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB114-4-5	15C1159-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-3-4	15C1159-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-4-5	15C1159-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-4-5-1	15C1159-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB231-0-2	15C1159-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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UASB231-2-4	15C1159-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB230-4-5	15C1159-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB230-10-11	15C1159-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-3-4	15C1159-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-4-5	15C1159-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-8-9	15C1159-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB232-0-0.5	15C1159-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB233-0-0.5	15C1159-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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UASB234-0-0.5	15C1159-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-3-4	15C1159-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-5-6	15C1159-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-5-6-1	15C1159-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-18-19	15C1159-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-3-4	15C1159-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-7-8	15C1159-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB117-1-2	15C1159-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSB705-10-11	15C1159-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB709-4-5	15C1159-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB702-4-5	15C1159-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB702-6-7	15C1159-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB601-9-10	15C1159-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB601-15-16	15C1159-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB626-8-9	15C1159-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB624-4-5	15C1159-40	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB215-7-8	15C1159-41	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-15-16	15C1159-42	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 05/19/2015: Report revised to correct client sample ID for 15C1159-40 as PASB624-4-5.

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SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum
15C1159-01[UASB222-6-6.5], 15C1159-02[UASB221-0-1], 15C1159-03[UASB221-5.5-6.5], 15C1159-04[UASB221-6.5-7.5], 15C1159-05[UASB223-0-1], 15C1159-06[UASB223-4-4.5], 15C1159-07[UASB217-3-4], 15C1159-08[UASB217-7-8], 15C1159-09[UASB217-11-12], 15C1159-10[UASB217-16-16.5], 15C1159-11[LPSB114-3-4], 15C1159-12[LPSB114-4-5], 15C1159-13[UASB215-3-4], 15C1159-14[UASB215-4-5], 15C1159-15[UASB215-4-5-1], 15C1159-16[UASB231-0-2], 15C1159-17[UASB231-2-4], 15C1159-18[UASB230-4-5], 15C1159-19[UASB230-10-11], 15C1159-20[UASB225-3-4], B118728-BLK1, B118728-DUP1

DL-04

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:

Thallium
15C1159-01[UASB222-6-6.5], 15C1159-06[UASB223-4-4.5], 15C1159-16[UASB231-0-2], 15C1159-17[UASB231-2-4], 15C1159-18[UASB230-4-5], 15C1159-19[UASB230-10-11], B118728-DUP1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Chromium
B118848-BSD1

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Arsenic
15C1159-42[UASB220-15-16], B118786-MS1

Cobalt
15C1159-42[UASB220-15-16], B118786-MS1

Copper
15C1159-01[UASB222-6-6.5], B118728-MS1

Nickel
15C1159-01[UASB222-6-6.5], B118728-MS1

Selenium
15C1159-42[UASB220-15-16], B118786-MS1

Thallium
B118728-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Barium
15C1159-01[UASB222-6-6.5], B118728-MS1

Calcium
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Iron
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Magnesium
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Manganese
15C1159-01[UASB222-6-6.5], 15C1159-42[UASB220-15-16], B118728-MS1, B118786-MS1

Potassium
15C1159-01[UASB222-6-6.5], B118728-MS1

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R-02

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:

Iron

15C1159-01[UASB222-6-6.5], B118728-DUP1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15C1159-10[UASB217-16-16.5], 15C1159-23[UASB232-0-0.5], B118572-MS3, B118690-MS1, B118690-MS2, B118690-MS3, B118690-MSD1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15C1159-02[UASB221-0-1], 15C1159-23[UASB232-0-0.5], 15C1159-24[UASB233-0-0.5], 15C1159-25[UASB234-0-0.5], 15C1159-26[UASB224-3-4], 15C1159-27[UASB224-5-6], 15C1159-33[BRSB705-10-11], 15C1159-37[PASB601-9-10]

SW-846 7471B

Qualifications:

L-07A

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:

Mercury

15C1159-21[UASB225-4-5], 15C1159-22[UASB225-8-9], 15C1159-23[UASB232-0-0.5], 15C1159-24[UASB233-0-0.5], 15C1159-25[UASB234-0-0.5], 15C1159-26[UASB224-3-4], 15C1159-27[UASB224-5-6], 15C1159-28[UASB224-5-6-1], 15C1159-29[UASB224-18-19], 15C1159-30[UASB220-3-4], 15C1159-31[UASB220-7-8], 15C1159-32[LPSB117-1-2], 15C1159-33[BRSB705-10-11], 15C1159-34[BRSB709-4-5], 15C1159-35[BRSB702-4-5], 15C1159-36[BRSB702-6-7], B118849-BSD1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Aaron L. Benoit
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB222-6-6.5 | Sampled: 3/23/2015 15:10

Sample ID: 15C1159-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	2.6	1.1	mg/Kg dry	1	B-07, MS-19	SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Antimony	ND	2.6	2.1	mg/Kg dry	1	MS-07	SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Barium	700	2.6	0.33	mg/Kg dry	1	MS-19	SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Beryllium	ND	0.26	0.042	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Cadmium	ND	0.26	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Calcium	10000	7.9	1.4	mg/Kg dry	1	MS-19	SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Chromium	72	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Cobalt	43	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Copper	120	0.53	0.40	mg/Kg dry	1	MS-07	SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Iron	49000	13	11	mg/Kg dry	5	MS-19, R-02	SW-846 6010C	4/7/15	4/11/15 16:25	MJH
Lead	1.9	0.79	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Magnesium	17000	7.9	0.83	mg/Kg dry	1	MS-19	SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Manganese	430	0.53	0.17	mg/Kg dry	1	MS-19	SW-846 6010C	4/7/15	4/11/15 14:17	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:02	SCB
Nickel	140	0.53	0.13	mg/Kg dry	1	MS-07	SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Potassium	4300	110	18	mg/Kg dry	1	MS-19	SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Sodium	630	110	51	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Thallium	ND	13	4.4	mg/Kg dry	5	DL-04	SW-846 6010C	4/7/15	4/11/15 16:25	MJH
Vanadium	83	1.1	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP
Zinc	63	1.1	0.27	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:28	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB222-6-6.5 | Sampled: 3/23/2015 15:10

Sample ID: 15C1159-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	1.8	0.51	0.46	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.17	0.092	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	92.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-0-1 | Sampled: 3/23/2015 15:30

Sample ID: 15C1159-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9100	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Barium	41	2.8	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Beryllium	0.41	0.28	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Calcium	790	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Chromium	14	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Cobalt	7.7	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Copper	17	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Iron	11000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Lead	3.0	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Magnesium	2200	8.3	0.87	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Manganese	210	0.55	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:21	MJH
Mercury	0.0099	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:03	SCB
Nickel	16	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Potassium	760	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Sodium	77	110	54	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Vanadium	19	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP
Zinc	24	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:32	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-0-1 | Sampled: 3/23/2015 15:30

Sample ID: 15C1159-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.44	0.39	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	0.33	0.36	0.20	mg/Kg dry	2	W-06, J	SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	89.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-5.5-6.5 | Sampled: 3/23/2015 15:32

Sample ID: 15C1159-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Barium	47	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Beryllium	0.27	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Calcium	1200	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Chromium	5.6	0.54	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Cobalt	4.9	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Copper	10	0.54	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Iron	8800	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Lead	2.3	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Magnesium	2000	8.2	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Manganese	280	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:25	MJH
Mercury	ND	0.026	0.0037	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:04	SCB
Nickel	6.3	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Potassium	680	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Sodium	75	110	53	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Vanadium	11	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP
Zinc	16	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:37	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-5.5-6.5 | Sampled: 3/23/2015 15:32

Sample ID: 15C1159-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.48	0.43	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	90.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-6.5-7.5 | Sampled: 3/23/2015 15:35

Sample ID: 15C1159-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9800	2.5	1.1	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Antimony	ND	2.5	2.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Arsenic	ND	2.5	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Barium	510	2.5	0.31	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Beryllium	ND	0.25	0.040	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Cadmium	ND	0.25	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Calcium	6200	7.5	1.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Chromium	26	0.50	0.12	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Cobalt	43	2.5	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Copper	66	0.50	0.38	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Iron	22000	2.5	2.1	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Lead	1.2	0.75	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Magnesium	7300	7.5	0.78	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Manganese	310	0.50	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:29	MJH
Mercury	ND	0.025	0.0036	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:06	SCB
Nickel	190	0.50	0.12	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Potassium	4500	100	17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Selenium	ND	2.5	0.77	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Silver	ND	0.50	0.44	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Sodium	420	100	49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Thallium	ND	2.5	0.83	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Vanadium	41	1.0	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP
Zinc	26	1.0	0.26	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:41	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB221-6.5-7.5 | Sampled: 3/23/2015 15:35

Sample ID: 15C1159-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.37	0.34	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.16	0.089	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	97.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB223-0-1 | Sampled: 3/23/2015 16:10

Sample ID: 15C1159-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Barium	94	2.8	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Beryllium	0.66	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Calcium	1600	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Chromium	40	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Cobalt	18	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Copper	44	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Iron	20000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Lead	3.9	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Magnesium	5500	8.3	0.87	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Manganese	200	0.55	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:50	MJH
Mercury	0.023	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:07	SCB
Nickel	51	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Potassium	1000	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Sodium	180	110	54	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Vanadium	43	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP
Zinc	28	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:45	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB223-0-1 | Sampled: 3/23/2015 16:10

Sample ID: 15C1159-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.48	0.43	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	87.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB223-4-4.5 | Sampled: 3/23/2015 16:15

Sample ID: 15C1159-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Barium	170	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Calcium	1000	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Chromium	35	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Cobalt	23	2.7	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Copper	73	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Iron	57000	14	12	mg/Kg dry	5		SW-846 6010C	4/7/15	4/11/15 16:29	MJH
Lead	1.9	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Magnesium	9500	8.2	0.86	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Manganese	260	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:54	MJH
Mercury	ND	0.028	0.0040	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:09	SCB
Nickel	60	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Potassium	3900	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Selenium	ND	2.7	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Sodium	230	110	53	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Thallium	ND	14	4.6	mg/Kg dry	5	DL-04	SW-846 6010C	4/7/15	4/11/15 16:29	MJH
Vanadium	92	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP
Zinc	65	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:49	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB223-4-4.5 | Sampled: 3/23/2015 16:15

Sample ID: 15C1159-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.45	0.41	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	89.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-3-4 | Sampled: 3/24/2015 08:10

Sample ID: 15C1159-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Barium	57	2.8	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Beryllium	0.49	0.28	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Calcium	1200	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Chromium	12	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Cobalt	6.9	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Copper	9.3	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Iron	13000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Lead	4.9	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Magnesium	2700	8.3	0.86	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Manganese	170	0.55	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 14:58	MJH
Mercury	0.019	0.026	0.0038	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:10	SCB
Nickel	11	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Potassium	810	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Silver	ND	0.55	0.49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Sodium	230	110	54	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Vanadium	22	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP
Zinc	28	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/9/15 23:53	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-3-4 | Sampled: 3/24/2015 08:10

Sample ID: 15C1159-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.43	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	90.3			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-7-8 | Sampled: 3/24/2015 08:15

Sample ID: 15C1159-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Barium	62	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Beryllium	0.62	0.29	0.046	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Calcium	1000	8.6	1.6	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Chromium	53	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Cobalt	15	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Copper	14	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Iron	19000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Lead	28	0.86	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Magnesium	4200	8.6	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Manganese	170	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:02	MJH
Mercury	0.057	0.028	0.0041	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:12	SCB
Nickel	40	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Potassium	390	120	20	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Sodium	340	120	56	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Vanadium	31	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP
Zinc	29	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:14	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-7-8 | Sampled: 3/24/2015 08:15

Sample ID: 15C1159-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.39	0.35	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	84.4			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-11-12 | Sampled: 3/24/2015 08:20

Sample ID: 15C1159-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Arsenic	ND	2.7	0.96	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Barium	47	2.7	0.33	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Beryllium	ND	0.27	0.043	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Calcium	1800	8.0	1.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Chromium	11	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Cobalt	7.1	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Copper	15	0.53	0.41	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Iron	11000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Lead	2.5	0.80	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Magnesium	2400	8.0	0.84	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Manganese	270	0.53	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:06	MJH
Mercury	0.0040	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:13	SCB
Nickel	58	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Potassium	840	110	18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Sodium	220	110	52	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Thallium	ND	2.7	0.89	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Vanadium	17	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP
Zinc	17	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:18	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-11-12 | Sampled: 3/24/2015 08:20

Sample ID: 15C1159-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.35	0.31	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.17	0.094	mg/Kg dry	1		SW-846 7196A	4/1/15	4/2/15 13:00	LL
% Solids	90.9			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-16-16.5 | Sampled: 3/24/2015 08:25

Sample ID: 15C1159-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7100	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Barium	62	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Beryllium	ND	0.27	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Calcium	3000	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Chromium	84	0.54	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Cobalt	33	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Copper	38	0.54	0.41	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Iron	28000	27	23	mg/Kg dry	10		SW-846 6010C	4/7/15	4/13/15 16:10	MJH
Lead	3.3	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Magnesium	13000	8.2	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Manganese	450	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:11	MJH
Mercury	0.0040	0.026	0.0038	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:18	SCB
Nickel	78	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Potassium	1600	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Sodium	310	110	53	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Vanadium	28	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP
Zinc	37	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:23	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB217-16-16.5 | Sampled: 3/24/2015 08:25

Sample ID: 15C1159-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.68	0.43	0.39	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1	MS-16	SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	90.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB114-3-4 | Sampled: 3/24/2015 09:00

Sample ID: 15C1159-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Arsenic	2.0	2.8	1.0	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Barium	58	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Beryllium	0.46	0.28	0.046	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Cadmium	0.17	0.28	0.17	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Calcium	4900	8.5	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Chromium	12	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Cobalt	7.0	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Copper	19	0.57	0.43	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Iron	13000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Lead	11	0.85	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Magnesium	4400	8.5	0.89	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Manganese	210	0.57	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:14	MJH
Mercury	0.015	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:20	SCB
Nickel	17	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Potassium	790	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Sodium	290	110	55	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Vanadium	20	1.1	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP
Zinc	40	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:27	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB114-3-4 | Sampled: 3/24/2015 09:00

Sample ID: 15C1159-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.44	0.35	0.32	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	88.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB114-4-5 | Sampled: 3/24/2015 09:05

Sample ID: 15C1159-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Barium	85	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Beryllium	0.48	0.27	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Calcium	1500	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Chromium	15	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Cobalt	8.5	2.7	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Copper	12	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Iron	15000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Lead	4.4	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Magnesium	3100	8.2	0.86	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Manganese	280	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:19	MJH
Mercury	0.014	0.028	0.0040	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:21	SCB
Nickel	20	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Potassium	1000	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Selenium	ND	2.7	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Sodium	230	110	53	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Vanadium	26	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP
Zinc	26	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:31	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB114-4-5 | Sampled: 3/24/2015 09:05

Sample ID: 15C1159-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	89.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-3-4 | Sampled: 3/24/2015 10:35

Sample ID: 15C1159-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	2.9	1.3	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Barium	67	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Beryllium	0.49	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Calcium	2000	8.7	1.6	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Chromium	15	0.58	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Cobalt	8.3	2.9	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Copper	48	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Iron	15000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Lead	15	0.87	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Magnesium	3500	8.7	0.91	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Manganese	340	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:23	MJH
Mercury	0.026	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:23	SCB
Nickel	18	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Potassium	880	120	20	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Sodium	100	120	57	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Vanadium	24	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP
Zinc	51	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:35	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-3-4 | Sampled: 3/24/2015 10:35

Sample ID: 15C1159-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.58	0.52	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	84.9			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-4-5 | Sampled: 3/24/2015 10:40

Sample ID: 15C1159-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9200	2.6	1.1	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Barium	59	2.6	0.33	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Beryllium	0.40	0.26	0.043	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Cadmium	ND	0.26	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Calcium	1300	7.9	1.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Chromium	12	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Cobalt	8.2	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Copper	12	0.53	0.40	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Iron	13000	2.6	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Lead	3.6	0.79	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Magnesium	2900	7.9	0.83	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Manganese	300	0.53	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:27	MJH
Mercury	0.0086	0.026	0.0038	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:24	SCB
Nickel	16	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Potassium	920	110	18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Sodium	93	110	51	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Thallium	ND	2.6	0.88	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Vanadium	18	1.1	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP
Zinc	25	1.1	0.27	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:40	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-4-5 | Sampled: 3/24/2015 10:40

Sample ID: 15C1159-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.40	0.36	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.17	0.096	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	91.1			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-4-5-1 | Sampled: 3/24/2015 10:40

Sample ID: 15C1159-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Arsenic	ND	2.7	0.98	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Barium	73	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Beryllium	0.45	0.27	0.044	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Calcium	1500	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Chromium	13	0.54	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Cobalt	8.1	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Copper	14	0.54	0.41	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Iron	14000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Lead	4.1	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Magnesium	3100	8.2	0.85	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Manganese	270	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:48	MJH
Mercury	0.010	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	4/7/15	4/8/15 10:26	SCB
Nickel	16	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Potassium	1200	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Silver	ND	0.54	0.48	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Sodium	110	110	53	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Thallium	ND	2.7	0.90	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Vanadium	22	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP
Zinc	26	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:44	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-4-5-1 | Sampled: 3/24/2015 10:40

Sample ID: 15C1159-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.45	0.41	mg/Kg dry	1		SW-846 9014	3/31/15	4/1/15 11:15	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	90.3			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB231-0-2 | Sampled: 3/24/2015 11:50

Sample ID: 15C1159-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Barium	49	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Beryllium	0.37	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Cadmium	ND	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Calcium	1200	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Chromium	88	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Cobalt	37	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Copper	52	0.56	0.42	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Iron	28000	5.6	4.7	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 16:50	MJH
Lead	11	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Magnesium	16000	8.3	0.87	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Manganese	400	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:53	MJH
Mercury	0.028	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:27	SCB
Nickel	110	0.56	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Potassium	420	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Sodium	86	110	54	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Thallium	ND	5.6	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	4/7/15	4/11/15 16:50	MJH
Vanadium	25	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP
Zinc	42	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:49	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB231-0-2 | Sampled: 3/24/2015 11:50

Sample ID: 15C1159-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.52	0.47	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	89.7			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB231-2-4 | Sampled: 3/24/2015 11:55

Sample ID: 15C1159-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	2.6	1.1	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Arsenic	ND	2.6	0.93	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Barium	73	2.6	0.32	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Beryllium	0.18	0.26	0.042	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Cadmium	ND	0.26	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Calcium	2100	7.8	1.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Chromium	140	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Cobalt	60	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Copper	85	0.52	0.39	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Iron	37000	5.2	4.4	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 16:54	MJH
Lead	2.4	0.78	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Magnesium	34000	16	1.6	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 16:54	MJH
Manganese	590	0.52	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 15:57	MJH
Mercury	ND	0.026	0.0037	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:29	SCB
Nickel	210	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Potassium	260	100	18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Silver	ND	0.52	0.45	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Sodium	110	100	50	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Thallium	ND	5.2	1.7	mg/Kg dry	2	DL-04	SW-846 6010C	4/7/15	4/11/15 16:54	MJH
Vanadium	22	1.0	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP
Zinc	38	1.0	0.27	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 0:53	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB231-2-4 | Sampled: 3/24/2015 11:55

Sample ID: 15C1159-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.42	0.38	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.16	0.089	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	96.4			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB230-4-5 | Sampled: 3/24/2015 12:30

Sample ID: 15C1159-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Antimony	ND	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Arsenic	ND	2.7	0.97	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Barium	81	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Beryllium	0.16	0.27	0.043	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Calcium	2200	8.1	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Chromium	120	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Cobalt	67	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Copper	190	0.54	0.41	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Iron	32000	5.4	4.6	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 16:58	MJH
Lead	3.1	0.81	0.16	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Magnesium	22000	16	1.7	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 16:58	MJH
Manganese	490	0.54	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Mercury	ND	0.025	0.0037	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:30	SCB
Nickel	410	0.54	0.13	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Potassium	180	110	18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Selenium	ND	2.7	0.83	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:00	MJH
Silver	ND	0.54	0.47	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Sodium	81	110	52	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Thallium	ND	5.4	1.8	mg/Kg dry	2	DL-04	SW-846 6010C	4/7/15	4/11/15 16:58	MJH
Vanadium	22	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP
Zinc	32	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:13	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB230-4-5 | Sampled: 3/24/2015 12:30

Sample ID: 15C1159-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.36	0.32	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.17	0.094	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	92.1			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB230-10-11 | Sampled: 3/24/2015 12:40

Sample ID: 15C1159-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3900	2.9	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Barium	36	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Beryllium	0.16	0.29	0.047	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Calcium	1300	8.7	1.6	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Chromium	120	0.58	0.15	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Cobalt	75	2.9	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Copper	190	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Iron	31000	5.8	5.0	mg/Kg dry	2		SW-846 6010C	4/7/15	4/11/15 17:02	MJH
Lead	2.8	0.87	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Magnesium	16000	8.7	0.91	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Manganese	470	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:32	SCB
Nickel	160	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Potassium	190	120	20	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Selenium	2.9	2.9	0.89	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/11/15 16:04	MJH
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Sodium	280	120	56	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Thallium	ND	5.8	1.9	mg/Kg dry	2	DL-04	SW-846 6010C	4/7/15	4/11/15 17:02	MJH
Vanadium	20	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP
Zinc	34	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:17	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB230-10-11 | Sampled: 3/24/2015 12:40

Sample ID: 15C1159-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.38	0.34	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	0.15	0.18	0.10	mg/Kg dry	1	J	SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	85.9			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-3-4 | Sampled: 3/24/2015 16:00

Sample ID: 15C1159-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6000	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Antimony	ND	2.8	2.3	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Barium	69	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Beryllium	0.32	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Calcium	910	8.4	1.5	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Chromium	17	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Cobalt	6.0	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Copper	54	0.56	0.43	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Iron	13000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Lead	3.9	0.84	0.17	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Magnesium	2600	8.4	0.88	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Manganese	470	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Mercury	ND	0.026	0.0038	mg/Kg dry	1		SW-846 7471B	4/7/15	4/8/15 10:37	SCB
Nickel	40	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Potassium	900	110	19	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	4/7/15	4/11/15 16:08	MJH
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Sodium	74	110	54	mg/Kg dry	1	J	SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Vanadium	14	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP
Zinc	21	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/7/15	4/10/15 1:21	AMP

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-3-4 | Sampled: 3/24/2015 16:00

Sample ID: 15C1159-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.40	0.36	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.18	0.098	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	89.3			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-4-5 | Sampled: 3/24/2015 16:05

Sample ID: 15C1159-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Arsenic	ND	2.6	0.93	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Barium	41	2.6	0.32	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Beryllium	0.38	0.26	0.042	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Cadmium	0.20	0.26	0.15	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Calcium	1200	7.8	1.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Chromium	8.4	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Cobalt	4.3	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Copper	14	0.52	0.39	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Iron	9500	2.6	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:07	MJH
Lead	2.5	0.78	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Magnesium	2100	7.8	0.81	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:07	MJH
Manganese	180	0.52	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:32	SCB
Nickel	14	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Potassium	630	100	18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Selenium	ND	2.6	0.80	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Silver	ND	0.52	0.45	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Sodium	76	100	50	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Thallium	ND	2.6	0.86	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Vanadium	10	1.0	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH
Zinc	15	1.0	0.27	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 18:57	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-4-5 | Sampled: 3/24/2015 16:05

Sample ID: 15C1159-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.49	0.48	0.43	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	91.5			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-8-9 | Sampled: 3/24/2015 16:10

Sample ID: 15C1159-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2900	3.0	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Barium	24	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Beryllium	0.28	0.30	0.049	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Calcium	1300	9.1	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Chromium	5.1	0.60	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Cobalt	3.3	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Copper	10	0.60	0.46	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Iron	7300	3.0	2.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:12	MJH
Lead	8.5	0.91	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Magnesium	1400	9.1	0.95	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:12	MJH
Manganese	170	0.60	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Mercury	ND	0.027	0.0038	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:33	SCB
Nickel	6.1	0.60	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Potassium	470	120	21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Silver	ND	0.60	0.53	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Sodium	77	120	59	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Vanadium	8.2	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH
Zinc	12	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:03	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB225-8-9 | Sampled: 3/24/2015 16:10

Sample ID: 15C1159-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.52	0.46	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	4/6/15	4/7/15 14:00	LL
% Solids	90.0			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB232-0-0.5 | Sampled: 3/25/2015 06:55

Sample ID: 15C1159-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.2	1.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Arsenic	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Barium	57	3.2	0.40	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Beryllium	1.1	0.32	0.051	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Cadmium	0.55	0.32	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Calcium	1700	9.5	1.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Chromium	88	0.64	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Cobalt	26	3.2	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Copper	49	0.64	0.48	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Iron	26000	3.2	2.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:16	MJH
Lead	29	0.95	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Magnesium	8700	9.5	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:16	MJH
Manganese	350	0.64	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Mercury	0.049	0.031	0.0045	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:35	SCB
Nickel	65	0.64	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Potassium	490	130	22	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Selenium	ND	3.2	0.98	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Sodium	65	130	62	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Vanadium	35	1.3	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH
Zinc	53	1.3	0.33	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:08	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB232-0-0.5 | Sampled: 3/25/2015 06:55

Sample ID: 15C1159-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.56	0.51	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.41	0.22	mg/Kg dry	2	MS-16, W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	77.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB233-0-0.5 | Sampled: 3/25/2015 07:00

Sample ID: 15C1159-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	3.6	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Antimony	3.5	3.6	2.9	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Arsenic	ND	3.6	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Barium	73	3.6	0.45	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Beryllium	0.88	0.36	0.058	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Cadmium	0.55	0.36	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Calcium	4200	11	2.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Chromium	33	0.72	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Cobalt	17	3.6	0.23	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Copper	29	0.72	0.55	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Iron	22000	3.6	3.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:20	MJH
Lead	42	1.1	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Magnesium	11000	11	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:20	MJH
Manganese	380	0.72	0.23	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Mercury	0.067	0.036	0.0053	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:36	SCB
Nickel	54	0.72	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Potassium	710	140	25	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Selenium	ND	3.6	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Silver	ND	0.72	0.64	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Sodium	74	140	70	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Thallium	ND	3.6	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Vanadium	24	1.4	0.24	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH
Zinc	77	1.4	0.37	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:13	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB233-0-0.5 | Sampled: 3/25/2015 07:00

Sample ID: 15C1159-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	0.94	0.60	0.54	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	0.82	1.1	0.62	mg/Kg dry	5	W-06, J	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	69.4			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB234-0-0.5 | Sampled: 3/25/2015 07:05

Sample ID: 15C1159-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	3.3	1.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Antimony	ND	3.3	2.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Arsenic	ND	3.3	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Barium	64	3.3	0.41	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Beryllium	0.83	0.33	0.053	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Cadmium	0.48	0.33	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Calcium	2100	9.8	1.8	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Chromium	27	0.65	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Cobalt	12	3.3	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Copper	22	0.65	0.50	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Iron	19000	3.3	2.8	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:24	MJH
Lead	33	0.98	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Magnesium	5800	9.8	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:24	MJH
Manganese	240	0.65	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Mercury	0.069	0.035	0.0050	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:38	SCB
Nickel	35	0.65	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Potassium	730	130	22	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Silver	ND	0.65	0.57	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Sodium	64	130	64	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Vanadium	28	1.3	0.21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH
Zinc	57	1.3	0.34	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:19	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB234-0-0.5 | Sampled: 3/25/2015 07:05

Sample ID: 15C1159-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.67	0.61	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.44	0.24	mg/Kg dry	2	W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	71.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-3-4 | Sampled: 3/25/2015 07:50

Sample ID: 15C1159-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Barium	84	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Beryllium	1.6	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Cadmium	0.53	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Calcium	800	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Chromium	93	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Cobalt	42	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Copper	23	0.56	0.42	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Iron	44000	28	24	mg/Kg dry	10		SW-846 6010C	4/8/15	4/11/15 18:19	MJH
Lead	5.6	0.83	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Magnesium	25000	83	8.7	mg/Kg dry	10		SW-846 6010C	4/8/15	4/11/15 18:19	MJH
Manganese	580	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Mercury	0.034	0.028	0.0040	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:39	SCB
Nickel	150	0.56	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Potassium	860	110	19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Sodium	130	110	54	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Vanadium	27	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH
Zinc	40	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:24	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-3-4 | Sampled: 3/25/2015 07:50

Sample ID: 15C1159-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.36	0.20	mg/Kg dry	2	W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	87.5			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-5-6 | Sampled: 3/25/2015 08:05

Sample ID: 15C1159-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6100	2.9	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Barium	46	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Beryllium	0.47	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Cadmium	0.22	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Calcium	970	8.8	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Chromium	13	0.59	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Cobalt	5.4	2.9	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Copper	58	0.59	0.45	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Iron	12000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:28	MJH
Lead	3.0	0.88	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Magnesium	2000	8.8	0.92	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:28	MJH
Manganese	260	0.59	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Mercury	0.0080	0.029	0.0041	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 11:44	SCB
Nickel	25	0.59	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Potassium	530	120	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Silver	ND	0.59	0.51	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Sodium	85	120	57	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Vanadium	13	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH
Zinc	14	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:30	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-5-6 | Sampled: 3/25/2015 08:05

Sample ID: 15C1159-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.35	0.19	mg/Kg dry	2	W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	89.4			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-5-6-1 | Sampled: 3/25/2015 08:05

Sample ID: 15C1159-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6200	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Barium	38	2.9	0.35	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Beryllium	0.46	0.29	0.046	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Cadmium	0.20	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Calcium	830	8.6	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Chromium	12	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Cobalt	5.1	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Copper	68	0.57	0.43	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Iron	12000	2.9	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:32	MJH
Lead	3.2	0.86	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Magnesium	1800	8.6	0.89	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:32	MJH
Manganese	250	0.57	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Mercury	0.0045	0.028	0.0040	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 11:46	SCB
Nickel	22	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Potassium	470	110	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Selenium	ND	2.9	0.88	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Sodium	83	110	55	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Thallium	ND	2.9	0.94	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Vanadium	13	1.1	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH
Zinc	13	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 19:35	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-5-6-1 | Sampled: 3/25/2015 08:05

Sample ID: 15C1159-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.30	0.27	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.18	0.098	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	88.7			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-18-19 | Sampled: 3/25/2015 08:45

Sample ID: 15C1159-29

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4500	3.0	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Antimony	ND	3.0	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Barium	50	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Beryllium	2.0	0.30	0.049	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Cadmium	0.77	0.30	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Calcium	1800	9.1	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Chromium	240	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Cobalt	90	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Copper	47	0.61	0.46	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Iron	70000	30	26	mg/Kg dry	10		SW-846 6010C	4/8/15	4/11/15 18:24	MJH
Lead	0.22	0.91	0.18	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Magnesium	49000	91	9.5	mg/Kg dry	10		SW-846 6010C	4/8/15	4/11/15 18:24	MJH
Manganese	870	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Mercury	0.044	0.028	0.0041	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:47	SCB
Nickel	450	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Potassium	100	120	21	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Sodium	150	120	59	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Vanadium	17	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH
Zinc	52	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:00	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB224-18-19 | Sampled: 3/25/2015 08:45

Sample ID: 15C1159-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.56	0.50	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	0.43	0.19	0.10	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	84.5			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-3-4 | Sampled: 3/25/2015 09:05

Sample ID: 15C1159-30

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Barium	430	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Beryllium	1.1	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Cadmium	0.32	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Calcium	1600	8.4	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Chromium	28	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Cobalt	12	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Copper	39	0.56	0.43	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Iron	20000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:53	MJH
Lead	2.9	0.84	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Magnesium	7700	8.4	0.87	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:53	MJH
Manganese	270	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Mercury	0.011	0.027	0.0039	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 11:51	SCB
Nickel	28	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Potassium	3200	110	19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Sodium	110	110	54	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Thallium	ND	2.8	0.93	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Vanadium	45	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH
Zinc	20	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:06	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-3-4 | Sampled: 3/25/2015 09:05

Sample ID: 15C1159-30

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	1.0	0.40	0.36	mg/Kg dry	1		SW-846 9014	4/1/15	4/2/15 13:45	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	90.3			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-7-8 | Sampled: 3/25/2015 09:15

Sample ID: 15C1159-31

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8300	2.6	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Antimony	2.2	2.6	2.1	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Arsenic	ND	2.6	0.94	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Barium	94	2.6	0.33	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Beryllium	0.55	0.26	0.042	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Cadmium	0.28	0.26	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Calcium	1200	7.8	1.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Chromium	7.3	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Cobalt	6.4	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Copper	14	0.52	0.40	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Iron	17000	2.6	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:57	MJH
Lead	2.7	0.78	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Magnesium	4800	7.8	0.82	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 19:57	MJH
Manganese	330	0.52	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:52	SCB
Nickel	11	0.52	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Potassium	2800	100	18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Silver	ND	0.52	0.46	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Sodium	93	100	51	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Vanadium	12	1.0	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH
Zinc	28	1.0	0.27	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:10	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-7-8 | Sampled: 3/25/2015 09:15

Sample ID: 15C1159-31

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	92.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB117-1-2 | Sampled: 3/25/2015 10:40

Sample ID: 15C1159-32

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	2.6	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Antimony	ND	2.6	2.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Arsenic	ND	2.6	0.95	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Barium	79	2.6	0.33	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Beryllium	1.0	0.26	0.042	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Cadmium	0.43	0.26	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Calcium	1300	7.9	1.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Chromium	62	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Cobalt	23	2.6	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Copper	17	0.53	0.40	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Iron	26000	26	22	mg/Kg dry	10		SW-846 6010C	4/8/15	4/13/15 14:13	MJH
Lead	7.3	0.79	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Magnesium	16000	7.9	0.82	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:01	MJH
Manganese	320	0.53	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Mercury	0.025	0.027	0.0039	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 11:54	SCB
Nickel	86	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Potassium	980	110	18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Selenium	ND	2.6	0.81	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Silver	ND	0.53	0.46	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Sodium	88	110	51	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Thallium	ND	2.6	0.87	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Vanadium	27	1.1	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH
Zinc	35	1.1	0.27	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:16	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: LPSB117-1-2 | Sampled: 3/25/2015 10:40

Sample ID: 15C1159-32

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.52	0.47	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	88.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB705-10-11 | Sampled: 3/25/2015 16:00

Sample ID: 15C1159-33

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5500	13	5.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Arsenic	ND	13	4.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Barium	100	13	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Beryllium	0.60	1.3	0.20	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Cadmium	0.85	1.3	0.75	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Calcium	4600	38	6.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Chromium	25	2.5	0.63	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Cobalt	13	13	0.81	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Copper	100	2.5	1.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Iron	15000	13	11	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:05	MJH
Lead	4.6	3.8	0.75	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Magnesium	3600	38	4.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:05	MJH
Manganese	100	2.5	0.80	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Mercury	ND	0.12	0.017	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:55	SCB
Nickel	140	2.5	0.61	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Potassium	740	510	87	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Selenium	ND	13	3.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Sodium	290	510	250	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Thallium	ND	13	4.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Vanadium	17	5.1	0.83	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH
Zinc	65	5.1	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:21	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB705-10-11 | Sampled: 3/25/2015 16:00

Sample ID: 15C1159-33

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.9	1.7	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	3.8	2.1	mg/Kg dry	5	W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	20.8			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB709-4-5 | Sampled: 3/26/2015 09:00

Sample ID: 15C1159-34

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5600	2.9	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Antimony	ND	2.9	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Arsenic	1.3	2.9	1.1	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Barium	45	2.9	0.37	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Beryllium	0.57	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Cadmium	0.31	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Calcium	2900	8.8	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Chromium	12	0.59	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Cobalt	8.9	2.9	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Copper	330	0.59	0.45	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Iron	12000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:09	MJH
Lead	5.4	0.88	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Magnesium	3800	8.8	0.92	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:09	MJH
Manganese	93	0.59	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Mercury	ND	0.029	0.0042	mg/Kg dry	1	L-07A	SW-846 7471B	4/8/15	4/9/15 11:57	SCB
Nickel	19	0.59	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Potassium	810	120	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Selenium	ND	2.9	0.90	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Sodium	110	120	57	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Vanadium	18	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH
Zinc	20	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:27	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB709-4-5 | Sampled: 3/26/2015 09:00

Sample ID: 15C1159-34

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.46	0.42	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	0.13	0.18	0.099	mg/Kg dry	1	J	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	87.4			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB702-4-5 | Sampled: 3/26/2015 10:00

Sample ID: 15C1159-35

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Barium	31	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Beryllium	0.33	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Cadmium	0.20	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Calcium	1600	8.7	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Chromium	6.6	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Cobalt	3.6	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Copper	12	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Iron	8200	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:14	MJH
Lead	2.7	0.87	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Magnesium	2300	8.7	0.91	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 20:14	MJH
Manganese	79	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Mercury	0.0074	0.028	0.0040	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 11:58	SCB
Nickel	6.8	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Potassium	710	120	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Sodium	73	120	56	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Vanadium	11	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH
Zinc	14	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 20:32	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB702-4-5 | Sampled: 3/26/2015 10:00

Sample ID: 15C1159-35

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.33	0.29	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	0.13	0.18	0.10	mg/Kg dry	1	J	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	86.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB702-6-7 | Sampled: 3/26/2015 10:20

Sample ID: 15C1159-36

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	2.9	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Antimony	ND	2.9	2.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Arsenic	ND	2.9	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Barium	42	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Beryllium	0.48	0.29	0.046	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Cadmium	0.21	0.29	0.17	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Calcium	6700	8.7	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Chromium	8.0	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Cobalt	5.5	2.9	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Copper	14	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Iron	11000	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:50	MJH
Lead	3.8	0.87	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Magnesium	5200	8.7	0.90	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:50	MJH
Manganese	150	0.58	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Mercury	0.0049	0.029	0.0042	mg/Kg dry	1	L-07A, J	SW-846 7471B	4/8/15	4/9/15 12:00	SCB
Nickel	12	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Potassium	1100	120	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Selenium	ND	2.9	0.89	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Sodium	110	120	56	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Thallium	ND	2.9	0.96	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Vanadium	13	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH
Zinc	21	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:16	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: BRSB702-6-7 | Sampled: 3/26/2015 10:20

Sample ID: 15C1159-36

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.49	0.44	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	85.6			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB601-9-10 | Sampled: 3/26/2015 11:25

Sample ID: 15C1159-37

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6600	12	5.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Arsenic	ND	12	4.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Barium	110	12	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Beryllium	0.72	1.2	0.20	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Cadmium	0.97	1.2	0.73	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Calcium	5000	37	6.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Chromium	24	2.5	0.62	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Cobalt	16	12	0.79	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Copper	79	2.5	1.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Iron	15000	12	11	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:54	MJH
Lead	5.8	3.7	0.73	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Magnesium	4000	37	3.9	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:54	MJH
Manganese	120	2.5	0.78	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Mercury	0.017	0.12	0.017	mg/Kg dry	1	J	SW-846 7471B	4/8/15	4/9/15 9:59	SCB
Nickel	150	2.5	0.60	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Potassium	700	490	84	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Sodium	ND	490	240	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Vanadium	23	4.9	0.81	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH
Zinc	72	4.9	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:10	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB601-9-10 | Sampled: 3/26/2015 11:25

Sample ID: 15C1159-37

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.0	2.4	2.1	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	4.0	2.2	mg/Kg dry	5	W-06	SW-846 7196A	4/7/15	4/8/15 13:00	LL
% Solids	20.1			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB601-15-16 | Sampled: 3/26/2015 11:30

Sample ID: 15C1159-38

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8200	13	5.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Antimony	ND	13	10	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Arsenic	ND	13	4.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Barium	130	13	1.6	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Beryllium	0.62	1.3	0.21	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Cadmium	0.91	1.3	0.76	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Calcium	5700	39	7.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Chromium	26	2.6	0.65	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Cobalt	15	13	0.83	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Copper	73	2.6	2.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Iron	14000	13	11	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:59	MJH
Lead	5.2	3.9	0.77	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Magnesium	4400	39	4.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 17:59	MJH
Manganese	130	2.6	0.82	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Mercury	0.037	0.13	0.019	mg/Kg dry	1	J	SW-846 7471B	4/8/15	4/9/15 10:00	SCB
Nickel	120	2.6	0.63	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Potassium	690	520	89	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Selenium	ND	13	4.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Sodium	ND	520	250	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Thallium	ND	13	4.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Vanadium	22	5.2	0.85	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH
Zinc	67	5.2	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:16	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB601-15-16 | Sampled: 3/26/2015 11:30

Sample ID: 15C1159-38

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.6	2.4	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	0.67	0.85	0.47	mg/Kg dry	1	J	SW-846 7196A	4/8/15	4/9/15 12:00	LL
% Solids	18.7			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB626-8-9 | Sampled: 3/26/2015 12:00

Sample ID: 15C1159-39

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Antimony	ND	2.8	2.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Arsenic	1.3	2.8	1.0	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Barium	37	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Beryllium	0.58	0.28	0.045	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Cadmium	0.33	0.28	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Calcium	1800	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Chromium	11	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Cobalt	7.8	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Copper	17	0.56	0.42	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Iron	14000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:03	MJH
Lead	3.5	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Magnesium	4500	8.3	0.87	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:03	MJH
Manganese	96	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	4/8/15	4/9/15 10:02	SCB
Nickel	24	0.56	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Potassium	990	110	19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Selenium	ND	2.8	0.86	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Silver	ND	0.56	0.49	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Sodium	60	110	54	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Thallium	ND	2.8	0.92	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Vanadium	16	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH
Zinc	26	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:21	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB626-8-9 | Sampled: 3/26/2015 12:00

Sample ID: 15C1159-39

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.42	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.18	0.099	mg/Kg dry	1		SW-846 7196A	4/8/15	4/9/15 12:00	LL
% Solids	87.6			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB624-4-5 | Sampled: 3/26/2015 15:00

Sample ID: 15C1159-40

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4900	3.1	1.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Barium	50	3.1	0.39	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Beryllium	0.71	0.31	0.050	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Cadmium	0.36	0.31	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Calcium	6100	9.3	1.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Chromium	34	0.62	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Cobalt	13	3.1	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Copper	21	0.62	0.47	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Iron	17000	3.1	2.7	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:07	MJH
Lead	2.9	0.93	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Magnesium	13000	9.3	0.97	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:07	MJH
Manganese	210	0.62	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Mercury	ND	0.031	0.0045	mg/Kg dry	1		SW-846 7471B	4/8/15	4/9/15 10:03	SCB
Nickel	54	0.62	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Potassium	930	120	21	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Selenium	ND	3.1	0.96	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Silver	ND	0.62	0.55	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Sodium	130	120	61	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Vanadium	16	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH
Zinc	27	1.2	0.32	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:27	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: PASB624-4-5 | Sampled: 3/26/2015 15:00

Sample ID: 15C1159-40

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	4/8/15	4/9/15 12:00	LL
% Solids	80.2			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-7-8 | Sampled: 3/24/2015 10:45

Sample ID: 15C1159-41

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Antimony	2.4	2.8	2.2	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Arsenic	ND	2.8	0.99	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Barium	43	2.8	0.34	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Beryllium	0.65	0.28	0.044	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Cadmium	0.27	0.28	0.16	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Calcium	760	8.3	1.5	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Chromium	11	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Cobalt	7.2	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Copper	7.9	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Iron	16000	2.8	2.3	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:11	MJH
Lead	5.3	0.83	0.16	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Magnesium	2300	8.3	0.86	mg/Kg dry	1		SW-846 6010C	4/8/15	4/11/15 18:11	MJH
Manganese	260	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Mercury	0.017	0.027	0.0039	mg/Kg dry	1	J	SW-846 7471B	4/8/15	4/9/15 10:05	SCB
Nickel	13	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Potassium	480	110	19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Selenium	ND	2.8	0.85	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Sodium	61	110	54	mg/Kg dry	1	J	SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Thallium	ND	2.8	0.91	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Vanadium	18	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH
Zinc	19	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 16:32	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB215-7-8 | Sampled: 3/24/2015 10:45

Sample ID: 15C1159-41

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.55	0.50	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	ND	0.18	0.097	mg/Kg dry	1		SW-846 7196A	4/8/15	4/9/15 12:00	LL
% Solids	89.9			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-15-16 | Sampled: 3/25/2015 09:25

Sample ID: 15C1159-42

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8500	2.9	1.3	mg/Kg dry	1	MS-19	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Antimony	ND	2.9	2.4	mg/Kg dry	1	MS-07	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Arsenic	ND	2.9	1.1	mg/Kg dry	1	MS-07	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Barium	88	2.9	0.36	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Beryllium	2.0	0.29	0.047	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Cadmium	0.62	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Calcium	2300	8.8	1.6	mg/Kg dry	1	MS-19	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Chromium	360	0.58	0.15	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Cobalt	95	2.9	0.19	mg/Kg dry	1	MS-07	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Copper	81	0.58	0.44	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Iron	71000	29	25	mg/Kg dry	10	MS-19	SW-846 6010C	4/8/15	4/11/15 17:29	MJH
Lead	1.3	0.88	0.17	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Magnesium	32000	88	9.1	mg/Kg dry	10	MS-19	SW-846 6010C	4/8/15	4/11/15 17:29	MJH
Manganese	860	0.58	0.19	mg/Kg dry	1	MS-19	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	4/8/15	4/9/15 10:10	SCB
Nickel	300	0.58	0.14	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Potassium	220	120	20	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Selenium	ND	2.9	0.90	mg/Kg dry	1	MS-07	SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Silver	ND	0.58	0.51	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Sodium	150	120	57	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Vanadium	35	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH
Zinc	58	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/8/15	4/9/15 15:11	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15C1159

Date Received: 3/28/2015

Field Sample #: UASB220-15-16 | Sampled: 3/25/2015 09:25

Sample ID: 15C1159-42

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.42	mg/Kg dry	1		SW-846 9014	4/2/15	4/2/15 17:00	ABH
Hexavalent Chromium	0.15	0.19	0.10	mg/Kg dry	1	J	SW-846 7196A	4/8/15	4/9/15 12:00	LL
% Solids	83.5			% Wt	1		SM 2540G	4/9/15	4/10/15 11:40	MRL

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Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15C1159-01 [UASB222-6-6.5]	B118891	04/09/15
15C1159-02 [UASB221-0-1]	B118891	04/09/15
15C1159-03 [UASB221-5.5-6.5]	B118891	04/09/15
15C1159-04 [UASB221-6.5-7.5]	B118891	04/09/15
15C1159-05 [UASB223-0-1]	B118891	04/09/15
15C1159-06 [UASB223-4-4.5]	B118891	04/09/15
15C1159-07 [UASB217-3-4]	B118891	04/09/15
15C1159-08 [UASB217-7-8]	B118891	04/09/15
15C1159-09 [UASB217-11-12]	B118891	04/09/15
15C1159-10 [UASB217-16-16.5]	B118891	04/09/15
15C1159-11 [LPSB114-3-4]	B118891	04/09/15
15C1159-12 [LPSB114-4-5]	B118891	04/09/15
15C1159-13 [UASB215-3-4]	B118891	04/09/15
15C1159-14 [UASB215-4-5]	B118891	04/09/15
15C1159-15 [UASB215-4-5-1]	B118891	04/09/15
15C1159-16 [UASB231-0-2]	B118891	04/09/15
15C1159-17 [UASB231-2-4]	B118891	04/09/15
15C1159-18 [UASB230-4-5]	B118891	04/09/15
15C1159-19 [UASB230-10-11]	B118891	04/09/15
15C1159-20 [UASB225-3-4]	B118891	04/09/15
15C1159-21 [UASB225-4-5]	B118891	04/09/15
15C1159-22 [UASB225-8-9]	B118891	04/09/15
15C1159-23 [UASB232-0-0.5]	B118891	04/09/15
15C1159-24 [UASB233-0-0.5]	B118891	04/09/15
15C1159-25 [UASB234-0-0.5]	B118891	04/09/15
15C1159-26 [UASB224-3-4]	B118891	04/09/15
15C1159-27 [UASB224-5-6]	B118891	04/09/15
15C1159-28 [UASB224-5-6-1]	B118891	04/09/15
15C1159-29 [UASB224-18-19]	B118891	04/09/15
15C1159-30 [UASB220-3-4]	B118891	04/09/15
15C1159-31 [UASB220-7-8]	B118891	04/09/15
15C1159-32 [LPSB117-1-2]	B118891	04/09/15
15C1159-33 [BRSB705-10-11]	B118891	04/09/15
15C1159-34 [BRSB709-4-5]	B118891	04/09/15
15C1159-35 [BRSB702-4-5]	B118891	04/09/15
15C1159-36 [BRSB702-6-7]	B118891	04/09/15
15C1159-37 [PASB601-9-10]	B118891	04/09/15
15C1159-38 [PASB601-15-16]	B118891	04/09/15
15C1159-39 [PASB626-8-9]	B118891	04/09/15
15C1159-40 [PASB624-4-5]	B118891	04/09/15
15C1159-41 [UASB215-7-8]	B118891	04/09/15
15C1159-42 [UASB220-15-16]	B118891	04/09/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-01 [UASB222-6-6.5]	B118728	1.03	50.0	04/07/15
15C1159-02 [UASB221-0-1]	B118728	1.01	50.0	04/07/15
15C1159-03 [UASB221-5.5-6.5]	B118728	1.02	50.0	04/07/15
15C1159-04 [UASB221-6.5-7.5]	B118728	1.02	50.0	04/07/15
15C1159-05 [UASB223-0-1]	B118728	1.04	50.0	04/07/15
15C1159-06 [UASB223-4-4.5]	B118728	1.01	50.0	04/07/15
15C1159-07 [UASB217-3-4]	B118728	1.00	50.0	04/07/15
15C1159-08 [UASB217-7-8]	B118728	1.03	50.0	04/07/15

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-09 [UASB217-11-12]	B118728	1.03	50.0	04/07/15
15C1159-10 [UASB217-16-16.5]	B118728	1.01	50.0	04/07/15
15C1159-11 [LPSB114-3-4]	B118728	1.00	50.0	04/07/15
15C1159-12 [LPSB114-4-5]	B118728	1.02	50.0	04/07/15
15C1159-13 [UASB215-3-4]	B118728	1.01	50.0	04/07/15
15C1159-14 [UASB215-4-5]	B118728	1.04	50.0	04/07/15
15C1159-15 [UASB215-4-5-1]	B118728	1.02	50.0	04/07/15
15C1159-16 [UASB231-0-2]	B118728	1.00	50.0	04/07/15
15C1159-17 [UASB231-2-4]	B118728	1.00	50.0	04/07/15
15C1159-18 [UASB230-4-5]	B118728	1.01	50.0	04/07/15
15C1159-19 [UASB230-10-11]	B118728	1.00	50.0	04/07/15
15C1159-20 [UASB225-3-4]	B118728	1.00	50.0	04/07/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-36 [BRSB702-6-7]	B118786	1.01	50.0	04/08/15
15C1159-37 [PASB601-9-10]	B118786	1.01	50.0	04/08/15
15C1159-38 [PASB601-15-16]	B118786	1.03	50.0	04/08/15
15C1159-39 [PASB626-8-9]	B118786	1.03	50.0	04/08/15
15C1159-40 [PASB624-4-5]	B118786	1.00	50.0	04/08/15
15C1159-41 [UASB215-7-8]	B118786	1.01	50.0	04/08/15
15C1159-42 [UASB220-15-16]	B118786	1.03	50.0	04/08/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-21 [UASB225-4-5]	B118848	1.06	50.0	04/08/15
15C1159-22 [UASB225-8-9]	B118848	0.918	50.0	04/08/15
15C1159-23 [UASB232-0-0.5]	B118848	1.02	50.0	04/08/15
15C1159-24 [UASB233-0-0.5]	B118848	0.996	50.0	04/08/15
15C1159-25 [UASB234-0-0.5]	B118848	1.07	50.0	04/08/15
15C1159-26 [UASB224-3-4]	B118848	1.03	50.0	04/08/15
15C1159-27 [UASB224-5-6]	B118848	0.955	50.0	04/08/15
15C1159-28 [UASB224-5-6-1]	B118848	0.989	50.0	04/08/15
15C1159-29 [UASB224-18-19]	B118848	0.977	50.0	04/08/15
15C1159-30 [UASB220-3-4]	B118848	0.992	50.0	04/08/15
15C1159-31 [UASB220-7-8]	B118848	1.04	50.0	04/08/15
15C1159-32 [LPSB117-1-2]	B118848	1.08	50.0	04/08/15
15C1159-33 [BRSB705-10-11]	B118848	0.948	50.0	04/08/15
15C1159-34 [BRSB709-4-5]	B118848	0.975	50.0	04/08/15
15C1159-35 [BRSB702-4-5]	B118848	1.00	50.0	04/08/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-01 [UASB222-6-6.5]	B118250	2.60	100	04/01/15
15C1159-02 [UASB221-0-1]	B118250	2.51	100	04/01/15
15C1159-03 [UASB221-5.5-6.5]	B118250	2.51	100	04/01/15
15C1159-04 [UASB221-6.5-7.5]	B118250	2.52	100	04/01/15
15C1159-05 [UASB223-0-1]	B118250	2.53	100	04/01/15

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Sample Extraction Data

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-06 [UASB223-4-4.5]	B118250	2.55	100	04/01/15
15C1159-07 [UASB217-3-4]	B118250	2.50	100	04/01/15
15C1159-08 [UASB217-7-8]	B118250	2.51	100	04/01/15
15C1159-09 [UASB217-11-12]	B118250	2.57	100	04/01/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-10 [UASB217-16-16.5]	B118572	2.56	100	04/06/15
15C1159-11 [LPSB114-3-4]	B118572	2.52	100	04/06/15
15C1159-12 [LPSB114-4-5]	B118572	2.52	100	04/06/15
15C1159-13 [UASB215-3-4]	B118572	2.54	100	04/06/15
15C1159-14 [UASB215-4-5]	B118572	2.52	100	04/06/15
15C1159-15 [UASB215-4-5-1]	B118572	2.51	100	04/06/15
15C1159-16 [UASB231-0-2]	B118572	2.52	100	04/06/15
15C1159-17 [UASB231-2-4]	B118572	2.55	100	04/06/15
15C1159-18 [UASB230-4-5]	B118572	2.53	100	04/06/15
15C1159-19 [UASB230-10-11]	B118572	2.55	100	04/06/15
15C1159-20 [UASB225-3-4]	B118572	2.52	100	04/06/15
15C1159-21 [UASB225-4-5]	B118572	2.54	100	04/06/15
15C1159-22 [UASB225-8-9]	B118572	2.56	100	04/06/15

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Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-23 [UASB232-0-0.5]	B118690	2.56	100	04/07/15
15C1159-24 [UASB233-0-0.5]	B118690	2.56	100	04/07/15
15C1159-25 [UASB234-0-0.5]	B118690	2.53	100	04/07/15
15C1159-26 [UASB224-3-4]	B118690	2.52	100	04/07/15
15C1159-27 [UASB224-5-6]	B118690	2.53	100	04/07/15
15C1159-28 [UASB224-5-6-1]	B118690	2.53	100	04/07/15
15C1159-29 [UASB224-18-19]	B118690	2.55	100	04/07/15
15C1159-30 [UASB220-3-4]	B118690	2.52	100	04/07/15
15C1159-31 [UASB220-7-8]	B118690	2.51	100	04/07/15
15C1159-32 [LPSB117-1-2]	B118690	2.58	100	04/07/15
15C1159-33 [BRSB705-10-11]	B118690	2.50	100	04/07/15
15C1159-34 [BRSB709-4-5]	B118690	2.55	100	04/07/15
15C1159-35 [BRSB702-4-5]	B118690	2.56	100	04/07/15
15C1159-36 [BRSB702-6-7]	B118690	2.52	100	04/07/15
15C1159-37 [PASB601-9-10]	B118690	2.50	100	04/07/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-38 [PASB601-15-16]	B118767	2.52	100	04/08/15
15C1159-39 [PASB626-8-9]	B118767	2.55	100	04/08/15
15C1159-40 [PASB624-4-5]	B118767	2.52	100	04/08/15
15C1159-41 [UASB215-7-8]	B118767	2.52	100	04/08/15
15C1159-42 [UASB220-15-16]	B118767	2.56	100	04/08/15

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-01 [UASB222-6-6.5]	B118708	0.608	50.0	04/07/15
15C1159-02 [UASB221-0-1]	B118708	0.602	50.0	04/07/15
15C1159-03 [UASB221-5.5-6.5]	B118708	0.642	50.0	04/07/15
15C1159-04 [UASB221-6.5-7.5]	B118708	0.608	50.0	04/07/15
15C1159-05 [UASB223-0-1]	B118708	0.628	50.0	04/07/15
15C1159-06 [UASB223-4-4.5]	B118708	0.603	50.0	04/07/15
15C1159-07 [UASB217-3-4]	B118708	0.628	50.0	04/07/15
15C1159-08 [UASB217-7-8]	B118708	0.625	50.0	04/07/15
15C1159-09 [UASB217-11-12]	B118708	0.602	50.0	04/07/15
15C1159-10 [UASB217-16-16.5]	B118708	0.625	50.0	04/07/15
15C1159-11 [LPSB114-3-4]	B118708	0.628	50.0	04/07/15
15C1159-12 [LPSB114-4-5]	B118708	0.600	50.0	04/07/15
15C1159-13 [UASB215-3-4]	B118708	0.607	50.0	04/07/15
15C1159-14 [UASB215-4-5]	B118708	0.628	50.0	04/07/15
15C1159-15 [UASB215-4-5-1]	B118708	0.616	50.0	04/07/15
15C1159-16 [UASB231-0-2]	B118708	0.613	50.0	04/07/15
15C1159-17 [UASB231-2-4]	B118708	0.600	50.0	04/07/15
15C1159-18 [UASB230-4-5]	B118708	0.639	50.0	04/07/15
15C1159-19 [UASB230-10-11]	B118708	0.603	50.0	04/07/15
15C1159-20 [UASB225-3-4]	B118708	0.637	50.0	04/07/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-37 [PASB601-9-10]	B118783	0.641	50.0	04/08/15
15C1159-38 [PASB601-15-16]	B118783	0.623	50.0	04/08/15
15C1159-39 [PASB626-8-9]	B118783	0.635	50.0	04/08/15
15C1159-40 [PASB624-4-5]	B118783	0.601	50.0	04/08/15
15C1159-41 [UASB215-7-8]	B118783	0.616	50.0	04/08/15
15C1159-42 [UASB220-15-16]	B118783	0.611	50.0	04/08/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-21 [UASB225-4-5]	B118849	0.600	50.0	04/08/15
15C1159-22 [UASB225-8-9]	B118849	0.625	50.0	04/08/15
15C1159-23 [UASB232-0-0.5]	B118849	0.625	50.0	04/08/15
15C1159-24 [UASB233-0-0.5]	B118849	0.592	50.0	04/08/15
15C1159-25 [UASB234-0-0.5]	B118849	0.599	50.0	04/08/15
15C1159-26 [UASB224-3-4]	B118849	0.618	50.0	04/08/15
15C1159-27 [UASB224-5-6]	B118849	0.585	50.0	04/08/15
15C1159-28 [UASB224-5-6-1]	B118849	0.604	50.0	04/08/15
15C1159-29 [UASB224-18-19]	B118849	0.626	50.0	04/08/15
15C1159-30 [UASB220-3-4]	B118849	0.618	50.0	04/08/15
15C1159-31 [UASB220-7-8]	B118849	0.599	50.0	04/08/15
15C1159-32 [LPSB117-1-2]	B118849	0.625	50.0	04/08/15
15C1159-33 [BRSB705-10-11]	B118849	0.620	50.0	04/08/15
15C1159-34 [BRSB709-4-5]	B118849	0.590	50.0	04/08/15
15C1159-35 [BRSB702-4-5]	B118849	0.626	50.0	04/08/15
15C1159-36 [BRSB702-6-7]	B118849	0.607	50.0	04/08/15

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Sample Extraction Data

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Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-01 [UASB222-6-6.5]	B118168	1.05	50.0	03/31/15
15C1159-02 [UASB221-0-1]	B118168	1.28	50.0	03/31/15
15C1159-03 [UASB221-5.5-6.5]	B118168	1.15	50.0	03/31/15
15C1159-04 [UASB221-6.5-7.5]	B118168	1.37	50.0	03/31/15
15C1159-05 [UASB223-0-1]	B118168	1.21	50.0	03/31/15
15C1159-06 [UASB223-4-4.5]	B118168	1.22	50.0	03/31/15
15C1159-07 [UASB217-3-4]	B118168	1.17	50.0	03/31/15
15C1159-08 [UASB217-7-8]	B118168	1.53	50.0	03/31/15
15C1159-09 [UASB217-11-12]	B118168	1.57	50.0	03/31/15
15C1159-10 [UASB217-16-16.5]	B118168	1.28	50.0	03/31/15
15C1159-11 [LPSB114-3-4]	B118168	1.62	50.0	03/31/15
15C1159-12 [LPSB114-4-5]	B118168	1.10	50.0	03/31/15
15C1159-13 [UASB215-3-4]	B118168	1.02	50.0	03/31/15
15C1159-14 [UASB215-4-5]	B118168	1.36	50.0	03/31/15
15C1159-15 [UASB215-4-5-1]	B118168	1.22	50.0	03/31/15

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Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-16 [UASB231-0-2]	B118324	1.08	50.0	04/01/15
15C1159-17 [UASB231-2-4]	B118324	1.24	50.0	04/01/15
15C1159-18 [UASB230-4-5]	B118324	1.51	50.0	04/01/15
15C1159-19 [UASB230-10-11]	B118324	1.55	50.0	04/01/15
15C1159-20 [UASB225-3-4]	B118324	1.38	50.0	04/01/15
15C1159-21 [UASB225-4-5]	B118324	1.14	50.0	04/01/15
15C1159-22 [UASB225-8-9]	B118324	1.08	50.0	04/01/15
15C1159-23 [UASB232-0-0.5]	B118324	1.15	50.0	04/01/15
15C1159-24 [UASB233-0-0.5]	B118324	1.20	50.0	04/01/15
15C1159-25 [UASB234-0-0.5]	B118324	1.03	50.0	04/01/15
15C1159-26 [UASB224-3-4]	B118324	1.12	50.0	04/01/15
15C1159-27 [UASB224-5-6]	B118324	1.09	50.0	04/01/15
15C1159-28 [UASB224-5-6-1]	B118324	1.88	50.0	04/01/15
15C1159-29 [UASB224-18-19]	B118324	1.06	50.0	04/01/15
15C1159-30 [UASB220-3-4]	B118324	1.39	50.0	04/01/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C1159-31 [UASB220-7-8]	B118362	1.06	50.0	04/02/15
15C1159-32 [LPSB117-1-2]	B118362	1.08	50.0	04/02/15
15C1159-33 [BRSB705-10-11]	B118362	1.28	50.0	04/02/15
15C1159-34 [BRSB709-4-5]	B118362	1.24	50.0	04/02/15
15C1159-35 [BRSB702-4-5]	B118362	1.78	50.0	04/02/15
15C1159-36 [BRSB702-6-7]	B118362	1.20	50.0	04/02/15
15C1159-37 [PASB601-9-10]	B118362	1.04	50.0	04/02/15
15C1159-38 [PASB601-15-16]	B118362	1.02	50.0	04/02/15
15C1159-39 [PASB626-8-9]	B118362	1.22	50.0	04/02/15
15C1159-40 [PASB624-4-5]	B118362	1.24	50.0	04/02/15
15C1159-41 [UASB215-7-8]	B118362	1.00	50.0	04/02/15
15C1159-42 [UASB220-15-16]	B118362	1.28	50.0	04/02/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118708 - SW-846 7471										
Blank (B118708-BLK1)				Prepared: 04/07/15 Analyzed: 04/08/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B118708-BS1)				Prepared: 04/07/15 Analyzed: 04/08/15						
Mercury	3.00	0.76	mg/Kg wet	3.98		75.4	73.7-126.3			
LCS Dup (B118708-BSD1)				Prepared: 04/07/15 Analyzed: 04/08/15						
Mercury	3.51	0.77	mg/Kg wet	3.98		88.3	73.7-126.3	15.7	30	
Duplicate (B118708-DUP1)	**Source: 15C1159-01**			Prepared: 04/07/15 Analyzed: 04/08/15						
Mercury	ND	0.026	mg/Kg dry		ND			NC	35	
Matrix Spike (B118708-MS1)	**Source: 15C1159-01**			Prepared: 04/07/15 Analyzed: 04/08/15						
Mercury	0.154	0.026	mg/Kg dry	0.176	ND	87.5	75-125			
Batch B118728 - SW-846 3050B										
Blank (B118728-BLK1)				Prepared: 04/07/15 Analyzed: 04/11/15						
Aluminum	3.1	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	3.7	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	1.2	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.35	1.0	mg/Kg wet							J
LCS (B118728-BS1)				Prepared: 04/07/15 Analyzed: 04/11/15						
Aluminum	7100	5.0	mg/Kg wet	8100		87.6	51.2-148.1			
Antimony	97.7	5.0	mg/Kg wet	116		84.3	0-210.3			
Arsenic	128	5.0	mg/Kg wet	122		105	77.8-122.1			
Barium	162	5.0	mg/Kg wet	167		97.2	82-117.4			
Beryllium	60.6	0.50	mg/Kg wet	54.3		112	82.3-117.7			
Cadmium	94.6	0.50	mg/Kg wet	88.0		108	81.9-118.2			
Calcium	6120	15	mg/Kg wet	5920		103	81.9-118.2			
Chromium	102	1.0	mg/Kg wet	102		99.9	78.7-120.6			
Cobalt	103	5.0	mg/Kg wet	99.4		103	83-116.7			
Copper	76.7	1.0	mg/Kg wet	78.0		98.3	80.4-119.6			
Iron	13600	5.0	mg/Kg wet	15100		89.8	46.8-153			
Lead	88.9	1.5	mg/Kg wet	94.5		94.1	82.4-117.8			
Magnesium	3020	15	mg/Kg wet	3020		99.9	75.5-124.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD		RPD Limit	Notes
Batch B118728 - SW-846 3050B											
LCS (B118728-BS1)				Prepared: 04/07/15 Analyzed: 04/11/15							
Manganese	430	1.0	mg/Kg wet	401		107	80.8-119.2				
Nickel	55.7	1.0	mg/Kg wet	56.3		99.0	82.2-117.8				
Potassium	2750	200	mg/Kg wet	2490		111	69.9-130.1				
Selenium	162	5.0	mg/Kg wet	157		103	77.1-122.3				
Silver	30.5	1.0	mg/Kg wet	34.2		89.3	74.3-125.4				
Sodium	279	200	mg/Kg wet	246		113	69.9-130.5				
Thallium	113	5.0	mg/Kg wet	116		97.7	78.2-121.6				
Vanadium	69.8	2.0	mg/Kg wet	67.1		104	64.8-135.2				
Zinc	209	2.0	mg/Kg wet	207		101	79.7-120.8				
LCS Dup (B118728-BSD1)				Prepared: 04/07/15 Analyzed: 04/11/15							
Aluminum	7480	5.0	mg/Kg wet	8100		92.3	51.2-148.1	5.20		30	
Antimony	104	5.0	mg/Kg wet	116		89.8	0-210.3	6.35		30	
Arsenic	134	5.0	mg/Kg wet	122		110	77.8-122.1	4.62		30	
Barium	167	5.0	mg/Kg wet	167		100	82-117.4	2.99		30	
Beryllium	60.1	0.50	mg/Kg wet	54.3		111	82.3-117.7	0.850		30	
Cadmium	88.6	0.50	mg/Kg wet	88.0		101	81.9-118.2	6.63		30	
Calcium	6150	15	mg/Kg wet	5920		104	81.9-118.2	0.439		30	
Chromium	99.7	1.0	mg/Kg wet	102		97.7	78.7-120.6	2.14		30	
Cobalt	97.8	5.0	mg/Kg wet	99.4		98.4	83-116.7	4.89		30	
Copper	72.7	1.0	mg/Kg wet	78.0		93.2	80.4-119.6	5.33		30	
Iron	14300	5.0	mg/Kg wet	15100		94.4	46.8-153	4.95		30	
Lead	88.8	1.5	mg/Kg wet	94.5		93.9	82.4-117.8	0.160		30	
Magnesium	3170	15	mg/Kg wet	3020		105	75.5-124.2	4.88		30	
Manganese	420	1.0	mg/Kg wet	401		105	80.8-119.2	2.21		30	
Nickel	53.2	1.0	mg/Kg wet	56.3		94.6	82.2-117.8	4.58		30	
Potassium	2930	200	mg/Kg wet	2490		118	69.9-130.1	6.23		30	
Selenium	159	5.0	mg/Kg wet	157		101	77.1-122.3	1.93		30	
Silver	29.4	1.0	mg/Kg wet	34.2		86.1	74.3-125.4	3.68		30	
Sodium	277	200	mg/Kg wet	246		113	69.9-130.5	0.645		30	
Thallium	110	5.0	mg/Kg wet	116		94.7	78.2-121.6	3.14		30	
Vanadium	68.9	2.0	mg/Kg wet	67.1		103	64.8-135.2	1.21		30	
Zinc	205	2.0	mg/Kg wet	207		99.1	79.7-120.8	1.63		30	
Duplicate (B118728-DUP1)		**Source: 15C1159-01**		Prepared: 04/07/15 Analyzed: 04/11/15							
Aluminum	20400	2.7	mg/Kg dry		20300			0.354		35	B-07
Antimony	ND	2.7	mg/Kg dry		ND			NC		35	
Arsenic	ND	2.7	mg/Kg dry		ND			NC		35	
Barium	649	2.7	mg/Kg dry		702			7.89		35	
Beryllium	0.611	0.27	mg/Kg dry		ND			NC		35	
Cadmium	ND	0.27	mg/Kg dry		ND			NC		35	
Calcium	11000	8.0	mg/Kg dry		10500			4.69		35	
Chromium	74.4	0.53	mg/Kg dry		72.2			2.96		35	
Cobalt	39.8	2.7	mg/Kg dry		43.3			8.43		35	
Copper	107	0.53	mg/Kg dry		123			14.3		35	
Iron	86700	13	mg/Kg dry		49200			**55.3**	*	35	R-02
Lead	1.63	0.80	mg/Kg dry		1.91			16.0		35	
Magnesium	17100	8.0	mg/Kg dry		17300			1.15		35	
Manganese	404	0.53	mg/Kg dry		433			7.08		35	
Nickel	133	0.53	mg/Kg dry		140			5.65		35	
Potassium	3900	110	mg/Kg dry		4330			10.4		35	
Selenium	ND	2.7	mg/Kg dry		ND			NC		35	
Silver	ND	0.53	mg/Kg dry		ND			NC		35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B118728 - SW-846 3050B											
Duplicate (B118728-DUP1)	**Source: 15C1159-01**			Prepared: 04/07/15 Analyzed: 04/09/15							
Sodium	664	110	mg/Kg dry		634				4.59	35	
Thallium	ND	13	mg/Kg dry		ND				NC	35	DL-04
Vanadium	77.0	1.1	mg/Kg dry		83.4				7.90	35	
Zinc	61.4	1.1	mg/Kg dry		63.0				2.55	35	
MRL Check (B118728-MRL1)				Prepared: 04/07/15 Analyzed: 04/09/15							
Lead	0.737	0.77	mg/Kg wet	0.768		95.9		80-120			J
Matrix Spike (B118728-MS1)	**Source: 15C1159-01**			Prepared: 04/07/15 Analyzed: 04/11/15							
Aluminum	18300	2.7	mg/Kg dry	108	20300	**-1870**	*	75-125			MS-19
Antimony	39.9	2.7	mg/Kg dry	108	ND	**36.8**	*	75-125			MS-07
Arsenic	99.0	2.7	mg/Kg dry	108	ND	91.3		75-125			
Barium	705	2.7	mg/Kg dry	108	702	**2.60**	*	75-125			MS-19
Beryllium	106	0.27	mg/Kg dry	108	ND	98.1		75-125			
Cadmium	103	0.27	mg/Kg dry	108	ND	94.9		75-125			
Calcium	10200	8.1	mg/Kg dry	108	10500	**-261**	*	75-125			MS-19
Chromium	177	0.54	mg/Kg dry	108	72.2	96.9		75-125			
Cobalt	140	2.7	mg/Kg dry	108	43.3	89.0		75-125			
Copper	200	0.54	mg/Kg dry	108	123	**71.1**	*	75-125			MS-07
Iron	46400	14	mg/Kg dry	108	49200	**-2510**	*	75-125			MS-19
Lead	92.9	0.81	mg/Kg dry	108	1.91	84.0		75-125			
Magnesium	17100	8.1	mg/Kg dry	108	17300	**-143**	*	75-125			MS-19
Manganese	585	0.54	mg/Kg dry	108	433	**140**	*	75-125			MS-19
Nickel	216	0.54	mg/Kg dry	108	140	**69.5**	*	75-125			MS-07
Potassium	4750	110	mg/Kg dry	1080	4330	**38.3**	*	75-125			MS-19
Selenium	107	2.7	mg/Kg dry	108	ND	98.8		75-125			
Silver	91.1	0.54	mg/Kg dry	108	ND	84.1		75-125			
Sodium	727	110	mg/Kg dry	108	634	85.3		75-125			
Thallium	77.8	2.7	mg/Kg dry	108	ND	**71.8**	*	75-125			MS-07
Vanadium	177	1.1	mg/Kg dry	108	83.4	86.7		75-125			
Zinc	158	1.1	mg/Kg dry	108	63.0	88.1		75-125			
Batch B118783 - SW-846 7471											
Blank (B118783-BLK1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Mercury	ND	0.025	mg/Kg wet								
LCS (B118783-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Mercury	7.18	0.75	mg/Kg wet	7.10		101		73.7-126.3			
LCS Dup (B118783-BSD1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Mercury	6.91	0.75	mg/Kg wet	7.10		97.3		73.7-126.3	3.95	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118783 - SW-846 7471										
Duplicate (B118783-DUP1)	**Source: 15C1159-42**			Prepared: 04/08/15 Analyzed: 04/09/15						
Mercury	ND	0.028	mg/Kg dry		ND			NC	35	
Matrix Spike (B118783-MS1)	**Source: 15C1159-42**			Prepared: 04/08/15 Analyzed: 04/09/15						
Mercury	0.177	0.029	mg/Kg dry	0.196	ND	90.2	75-125			
Batch B118786 - SW-846 3050B										
Blank (B118786-BLK1)				Prepared: 04/08/15 Analyzed: 04/09/15						
Aluminum	1.9	2.5	mg/Kg wet							J
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	2.5	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.97	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.50	1.0	mg/Kg wet							J
LCS (B118786-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15						
Aluminum	6090	5.0	mg/Kg wet	8100		75.2	51.2-148.1			
Antimony	88.7	5.0	mg/Kg wet	116		76.4	0-210.3			
Arsenic	106	5.0	mg/Kg wet	122		87.3	77.8-122.1			
Barium	149	5.0	mg/Kg wet	167		89.5	82-117.4			
Beryllium	55.3	0.50	mg/Kg wet	54.3		102	82.3-117.7			
Cadmium	80.8	0.50	mg/Kg wet	88.0		91.8	81.9-118.2			
Calcium	5330	15	mg/Kg wet	5920		90.0	81.9-118.2			
Chromium	93.9	1.0	mg/Kg wet	102		92.1	78.7-120.6			
Cobalt	91.6	5.0	mg/Kg wet	99.4		92.2	83-116.7			
Copper	69.8	1.0	mg/Kg wet	78.0		89.4	80.4-119.6			
Iron	12800	5.0	mg/Kg wet	15100		84.6	46.8-153			
Lead	80.4	1.5	mg/Kg wet	94.5		85.1	82.4-117.8			
Magnesium	2800	15	mg/Kg wet	3020		92.7	75.5-124.2			
Manganese	381	1.0	mg/Kg wet	401		94.9	80.8-119.2			
Nickel	50.1	1.0	mg/Kg wet	56.3		89.0	82.2-117.8			
Potassium	2110	200	mg/Kg wet	2490		84.9	69.9-130.1			
Selenium	124	5.0	mg/Kg wet	157		79.3	77.1-122.3			
Silver	30.2	1.0	mg/Kg wet	34.2		88.4	74.3-125.4			
Sodium	205	200	mg/Kg wet	246		83.5	69.9-130.5			
Thallium	102	5.0	mg/Kg wet	116		88.1	78.2-121.6			
Vanadium	59.4	2.0	mg/Kg wet	67.1		88.5	64.8-135.2			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118786 - SW-846 3050B										
LCS (B118786-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15						
Zinc	176	2.0	mg/Kg wet	207		85.1	79.7-120.8			
LCS Dup (B118786-BSD1)				Prepared: 04/08/15 Analyzed: 04/09/15						
Aluminum	6010	5.0	mg/Kg wet	8100		74.1	51.2-148.1	1.38	30	
Antimony	89.7	5.0	mg/Kg wet	116		77.3	0-210.3	1.15	30	
Arsenic	107	5.0	mg/Kg wet	122		87.4	77.8-122.1	0.171	30	
Barium	149	5.0	mg/Kg wet	167		89.5	82-117.4	0.0137	30	
Beryllium	54.1	0.50	mg/Kg wet	54.3		99.7	82.3-117.7	2.13	30	
Cadmium	78.9	0.50	mg/Kg wet	88.0		89.6	81.9-118.2	2.39	30	
Calcium	5340	15	mg/Kg wet	5920		90.2	81.9-118.2	0.315	30	
Chromium	93.1	0.99	mg/Kg wet	102		91.3	78.7-120.6	0.895	30	
Cobalt	89.5	5.0	mg/Kg wet	99.4		90.0	83-116.7	2.37	30	
Copper	69.7	0.99	mg/Kg wet	78.0		89.4	80.4-119.6	0.0328	30	
Iron	12700	5.0	mg/Kg wet	15100		84.1	46.8-153	0.515	30	
Lead	80.8	1.5	mg/Kg wet	94.5		85.5	82.4-117.8	0.511	30	
Magnesium	2800	15	mg/Kg wet	3020		92.7	75.5-124.2	0.0644	30	
Manganese	374	0.99	mg/Kg wet	401		93.2	80.8-119.2	1.84	30	
Nickel	49.1	0.99	mg/Kg wet	56.3		87.2	82.2-117.8	2.04	30	
Potassium	2100	200	mg/Kg wet	2490		84.3	69.9-130.1	0.735	30	
Selenium	124	5.0	mg/Kg wet	157		79.2	77.1-122.3	0.0453	30	
Silver	30.4	0.99	mg/Kg wet	34.2		88.8	74.3-125.4	0.468	30	
Sodium	205	200	mg/Kg wet	246		83.4	69.9-130.5	0.0796	30	
Thallium	99.9	5.0	mg/Kg wet	116		86.1	78.2-121.6	2.25	30	
Vanadium	58.9	2.0	mg/Kg wet	67.1		87.8	64.8-135.2	0.732	30	
Zinc	175	2.0	mg/Kg wet	207		84.5	79.7-120.8	0.648	30	
Duplicate (B118786-DUP1)		**Source: 15C1159-42**		Prepared: 04/08/15 Analyzed: 04/09/15						
Aluminum	10100	2.9	mg/Kg dry		8470			17.2	35	
Antimony	9.67	2.9	mg/Kg dry		ND			NC	35	
Arsenic	ND	2.9	mg/Kg dry		ND			NC	35	
Barium	101	2.9	mg/Kg dry		88.2			13.4	35	
Beryllium	2.13	0.29	mg/Kg dry		2.02			5.50	35	
Cadmium	0.731	0.29	mg/Kg dry		0.618			16.8	35	
Calcium	2970	8.8	mg/Kg dry		2270			26.7	35	
Chromium	393	0.58	mg/Kg dry		360			8.57	35	
Cobalt	101	2.9	mg/Kg dry		94.9			6.38	35	
Copper	82.7	0.58	mg/Kg dry		80.9			2.11	35	
Iron	68700	29	mg/Kg dry		71200			3.56	35	
Lead	1.64	0.88	mg/Kg dry		1.28			24.2	35	
Magnesium	35500	88	mg/Kg dry		32300			9.57	35	
Manganese	948	0.58	mg/Kg dry		855			10.3	35	
Nickel	311	0.58	mg/Kg dry		296			4.81	35	
Potassium	249	120	mg/Kg dry		217			13.7	35	
Selenium	ND	2.9	mg/Kg dry		ND			NC	35	
Silver	ND	0.58	mg/Kg dry		ND			NC	35	
Sodium	164	120	mg/Kg dry		150			8.86	35	
Thallium	ND	2.9	mg/Kg dry		ND			NC	35	
Vanadium	40.5	1.2	mg/Kg dry		34.9			14.8	35	
Zinc	61.0	1.2	mg/Kg dry		58.4			4.34	35	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B118786 - SW-846 3050B											
MRL Check (B118786-MRL1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Lead	0.722	0.75	mg/Kg wet	0.747		96.6		80-120			J
Matrix Spike (B118786-MS1)		**Source: 15C1159-42**		Prepared: 04/08/15 Analyzed: 04/09/15							
Aluminum	9260	2.9	mg/Kg dry	116	8470	**677**	*	75-125			MS-19
Antimony	38.3	2.9	mg/Kg dry	116	ND	**32.9**	*	75-125			MS-07
Arsenic	85.5	2.9	mg/Kg dry	116	ND	**73.4**	*	75-125			MS-07
Barium	189	2.9	mg/Kg dry	116	88.2	86.5		75-125			
Beryllium	113	0.29	mg/Kg dry	116	2.02	95.6		75-125			
Cadmium	105	0.29	mg/Kg dry	116	0.618	90.1		75-125			
Calcium	2530	8.7	mg/Kg dry	116	2270	**221**	*	75-125			MS-19
Chromium	502	0.58	mg/Kg dry	116	360	122		75-125			
Cobalt	181	2.9	mg/Kg dry	116	94.9	**74.3**	*	75-125			MS-07
Copper	190	0.58	mg/Kg dry	116	80.9	93.7		75-125			
Iron	79200	29	mg/Kg dry	116	71200	**6860**	*	75-125			MS-19
Lead	94.0	0.87	mg/Kg dry	116	1.28	79.7		75-125			
Magnesium	37200	87	mg/Kg dry	116	32300	**4210**	*	75-125			MS-19
Manganese	879	0.58	mg/Kg dry	116	855	**20.9**	*	75-125			MS-19
Nickel	385	0.58	mg/Kg dry	116	296	76.1		75-125			
Potassium	1330	120	mg/Kg dry	1160	217	95.6		75-125			
Selenium	68.6	2.9	mg/Kg dry	116	ND	**58.9**	*	75-125			MS-07
Silver	102	0.58	mg/Kg dry	116	ND	87.8		75-125			
Sodium	269	120	mg/Kg dry	116	150	102		75-125			
Thallium	87.3	2.9	mg/Kg dry	116	ND	75.0		75-125			
Vanadium	139	1.2	mg/Kg dry	116	34.9	89.5		75-125			
Zinc	149	1.2	mg/Kg dry	116	58.4	78.1		75-125			
Batch B118848 - SW-846 3050B											
Blank (B118848-BLK1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Aluminum	1.6	2.5	mg/Kg wet								J
Antimony	ND	2.5	mg/Kg wet								
Arsenic	ND	2.5	mg/Kg wet								
Barium	ND	2.5	mg/Kg wet								
Beryllium	ND	0.25	mg/Kg wet								
Cadmium	ND	0.25	mg/Kg wet								
Calcium	2.6	7.5	mg/Kg wet								J
Chromium	ND	0.50	mg/Kg wet								
Cobalt	ND	2.5	mg/Kg wet								
Copper	ND	0.50	mg/Kg wet								
Iron	ND	2.5	mg/Kg wet								
Lead	ND	0.75	mg/Kg wet								
Magnesium	1.3	7.5	mg/Kg wet								J
Manganese	ND	0.50	mg/Kg wet								
Nickel	ND	0.50	mg/Kg wet								
Potassium	ND	100	mg/Kg wet								
Selenium	ND	2.5	mg/Kg wet								
Silver	ND	0.50	mg/Kg wet								
Sodium	ND	100	mg/Kg wet								
Thallium	ND	2.5	mg/Kg wet								
Vanadium	ND	1.0	mg/Kg wet								
Zinc	0.52	1.0	mg/Kg wet								J

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B118848 - SW-846 3050B											
LCS (B118848-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Aluminum	6100	4.9	mg/Kg wet	8100		75.3		51.2-148.1			
Antimony	97.3	4.9	mg/Kg wet	116		83.9		0-210.3			
Arsenic	107	4.9	mg/Kg wet	122		87.7		77.8-122.1			
Barium	155	4.9	mg/Kg wet	167		93.1		82-117.4			
Beryllium	55.3	0.49	mg/Kg wet	54.3		102		82.3-117.7			
Cadmium	80.6	0.49	mg/Kg wet	88.0		91.6		81.9-118.2			
Calcium	5370	15	mg/Kg wet	5920		90.6		81.9-118.2			
Chromium	94.8	0.98	mg/Kg wet	102		92.9		78.7-120.6			
Cobalt	91.0	4.9	mg/Kg wet	99.4		91.5		83-116.7			
Copper	79.9	0.98	mg/Kg wet	78.0		102		80.4-119.6			
Iron	13700	4.9	mg/Kg wet	15100		91.0		46.8-153			
Lead	84.9	1.5	mg/Kg wet	94.5		89.8		82.4-117.8			
Magnesium	2900	15	mg/Kg wet	3020		95.9		75.5-124.2			
Manganese	380	0.98	mg/Kg wet	401		94.7		80.8-119.2			
Nickel	49.5	0.98	mg/Kg wet	56.3		88.0		82.2-117.8			
Potassium	2160	200	mg/Kg wet	2490		86.6		69.9-130.1			
Selenium	124	4.9	mg/Kg wet	157		79.0		77.1-122.3			
Silver	31.1	0.98	mg/Kg wet	34.2		90.9		74.3-125.4			
Sodium	209	200	mg/Kg wet	246		85.0		69.9-130.5			
Thallium	104	4.9	mg/Kg wet	116		89.3		78.2-121.6			
Vanadium	61.1	2.0	mg/Kg wet	67.1		91.1		64.8-135.2			
Zinc	175	2.0	mg/Kg wet	207		84.5		79.7-120.8			
LCS Dup (B118848-BSD1)				Prepared: 04/08/15 Analyzed: 04/09/15							
Aluminum	6200	5.0	mg/Kg wet	8100		76.5		51.2-148.1	1.67	30	
Antimony	102	5.0	mg/Kg wet	116		87.8		0-210.3	4.56	30	
Arsenic	110	5.0	mg/Kg wet	122		89.9		77.8-122.1	2.52	30	
Barium	155	5.0	mg/Kg wet	167		92.6		82-117.4	0.495	30	
Beryllium	55.4	0.50	mg/Kg wet	54.3		102		82.3-117.7	0.205	30	
Cadmium	81.9	0.50	mg/Kg wet	88.0		93.1		81.9-118.2	1.62	30	
Calcium	5320	15	mg/Kg wet	5920		89.9		81.9-118.2	0.842	30	
Chromium	127	0.99	mg/Kg wet	102		**124**	*	78.7-120.6	28.7	30	L-07
Cobalt	92.0	5.0	mg/Kg wet	99.4		92.6		83-116.7	1.14	30	
Copper	80.5	0.99	mg/Kg wet	78.0		103		80.4-119.6	0.801	30	
Iron	14300	5.0	mg/Kg wet	15100		94.7		46.8-153	4.00	30	
Lead	89.1	1.5	mg/Kg wet	94.5		94.3		82.4-117.8	4.90	30	
Magnesium	2900	15	mg/Kg wet	3020		96.1		75.5-124.2	0.112	30	
Manganese	384	0.99	mg/Kg wet	401		95.9		80.8-119.2	1.23	30	
Nickel	50.5	0.99	mg/Kg wet	56.3		89.7		82.2-117.8	1.90	30	
Potassium	2210	200	mg/Kg wet	2490		88.7		69.9-130.1	2.46	30	
Selenium	126	5.0	mg/Kg wet	157		80.5		77.1-122.3	1.89	30	
Silver	30.9	0.99	mg/Kg wet	34.2		90.3		74.3-125.4	0.640	30	
Sodium	212	200	mg/Kg wet	246		86.2		69.9-130.5	1.36	30	
Thallium	103	5.0	mg/Kg wet	116		88.7		78.2-121.6	0.711	30	
Vanadium	63.0	2.0	mg/Kg wet	67.1		93.9		64.8-135.2	3.03	30	
Zinc	195	2.0	mg/Kg wet	207		94.0		79.7-120.8	10.6	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B118848 - SW-846 3050B												
MRL Check (B118848-MRL1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Lead	0.677	0.72	mg/Kg wet	0.725		93.4		80-120				J
Batch B118849 - SW-846 7471												
Blank (B118849-BLK1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Mercury	ND	0.025	mg/Kg wet									
LCS (B118849-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Mercury	5.46	0.84	mg/Kg wet	7.10		76.8		73.7-126.3				
LCS Dup (B118849-BSD1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Mercury	8.98	0.85	mg/Kg wet	7.10		**127**	*	73.7-126.3	**48.8**	*	30	L-07A

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118168 - SW-846 9014										
Blank (B118168-BLK1)				Prepared: 03/31/15 Analyzed: 04/01/15						
Cyanide	ND	0.47	mg/Kg wet							
LCS (B118168-BS1)				Prepared: 03/31/15 Analyzed: 04/01/15						
Cyanide	62	2.4	mg/Kg wet	60.9		102	80-120			
LCS Dup (B118168-BSD1)				Prepared: 03/31/15 Analyzed: 04/01/15						
Cyanide	58	2.4	mg/Kg wet	60.9		95.9	80-120	6.64	20	
Matrix Spike (B118168-MS1)	**Source: 15C1159-15**			Prepared: 03/31/15 Analyzed: 04/01/15						
Cyanide	17	0.45	mg/Kg dry	16.8	ND	104	75-125			
Matrix Spike Dup (B118168-MSD1)	**Source: 15C1159-15**			Prepared: 03/31/15 Analyzed: 04/01/15						
Cyanide	17	0.45	mg/Kg dry	16.9	ND	102	75-125	1.73	35	
Batch B118250 - SW-846 7196A										
Blank (B118250-BLK1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B118250-BS1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Hexavalent Chromium	52	1.9	mg/Kg wet	56.0		93.2	80-120			
LCS Dup (B118250-BSD1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Hexavalent Chromium	51	1.8	mg/Kg wet	53.2		95.4	80-120	2.91	20	
Batch B118324 - SW-846 9014										
Blank (B118324-BLK1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	ND	0.44	mg/Kg wet							
LCS (B118324-BS1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	53	2.1	mg/Kg wet	54.5		97.3	80-120			
LCS Dup (B118324-BSD1)				Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	52	2.1	mg/Kg wet	55.1		94.3	80-120	2.02	20	
Matrix Spike (B118324-MS1)	**Source: 15C1159-22**			Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	20	0.52	mg/Kg dry	19.5	ND	102	75-125			
Matrix Spike (B118324-MS2)	**Source: 15C1159-30**			Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	16	0.40	mg/Kg dry	14.9	1.0	102	75-125			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118324 - SW-846 9014										
Matrix Spike Dup (B118324-MSD1)	**Source: 15C1159-22**			Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	20	0.52	mg/Kg dry	19.3	ND	103	75-125	0.543	35	
Matrix Spike Dup (B118324-MSD2)	**Source: 15C1159-30**			Prepared: 04/01/15 Analyzed: 04/02/15						
Cyanide	20	0.47	mg/Kg dry	17.7	1.0	105	75-125	18.3	35	
Batch B118362 - SW-846 9014										
Blank (B118362-BLK1)				Prepared & Analyzed: 04/02/15						
Cyanide	ND	0.48	mg/Kg wet							
LCS (B118362-BS1)				Prepared & Analyzed: 04/02/15						
Cyanide	67	2.3	mg/Kg wet	60.1		112	80-120			
LCS Dup (B118362-BSD1)				Prepared & Analyzed: 04/02/15						
Cyanide	60	2.3	mg/Kg wet	60.2		99.7	80-120	11.3	20	
Matrix Spike (B118362-MS1)	**Source: 15C1159-42**			Prepared & Analyzed: 04/02/15						
Cyanide	18	0.48	mg/Kg dry	17.9	ND	101	75-125			
Matrix Spike Dup (B118362-MSD1)	**Source: 15C1159-42**			Prepared & Analyzed: 04/02/15						
Cyanide	18	0.49	mg/Kg dry	18.5	ND	97.7	75-125	0.422	35	
Batch B118572 - SW-846 7196A										
Blank (B118572-BLK1)				Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B118572-BS1)				Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	54	2.0	mg/Kg wet	59.2		91.3	80-120			
LCS Dup (B118572-BSD1)				Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	56	2.0	mg/Kg wet	59.6		93.4	80-120	2.89	20	
Matrix Spike (B118572-MS1) Soluble MS	**Source: 15C1159-10**			Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	35	0.86	mg/Kg dry	42.8	ND	82.3	75-125			
Matrix Spike (B118572-MS2) PDMS	**Source: 15C1159-10**			Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	33	1.7	mg/Kg dry	42.8	ND	76.4	75-125			
Matrix Spike (B118572-MS3) Insoluble MS	**Source: 15C1159-10**			Prepared: 04/06/15 Analyzed: 04/07/15						
Hexavalent Chromium	510	18	mg/Kg dry	702	ND	**72.9** *	75-125			MS-16

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B118572 - SW-846 7196A												
Matrix Spike Dup (B118572-MSD1) Soluble MS Dup	**Source: 15C1159-10**			Prepared: 04/06/15 Analyzed: 04/07/15								
Hexavalent Chromium	41	0.88	mg/Kg dry	43.8	ND	94.3		75-125	15.8		35	
Batch B118690 - SW-846 7196A												
Blank (B118690-BLK1)				Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	ND	0.16	mg/Kg wet									
LCS (B118690-BS1)				Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	50	2.0	mg/Kg wet	59.2		84.1		80-120				
LCS Dup (B118690-BSD1)				Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	50	2.0	mg/Kg wet	58.7		85.2		80-120	0.514		20	
Matrix Spike (B118690-MS1) Soluble MS	**Source: 15C1159-23**			Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	7.3	1.0	mg/Kg dry	51.4	ND	**14.1**	*	75-125				MS-16
Matrix Spike (B118690-MS2) PDMS	**Source: 15C1159-23**			Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	31	2.0	mg/Kg dry	50.9	ND	**60.0**	*	75-125				MS-16
Matrix Spike (B118690-MS3) Insoluble MS	**Source: 15C1159-23**			Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	21	20	mg/Kg dry	8150	ND	**0.260**	*	75-125				MS-16
Matrix Spike Dup (B118690-MSD1) Soluble MS Dup	**Source: 15C1159-23**			Prepared: 04/07/15 Analyzed: 04/08/15								
Hexavalent Chromium	4.0	1.0	mg/Kg dry	51.4	ND	**7.79**	*	75-125	**57.9**	*	35	MS-16
Batch B118767 - SW-846 7196A												
Blank (B118767-BLK1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Hexavalent Chromium	ND	0.16	mg/Kg wet									
LCS (B118767-BS1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Hexavalent Chromium	50	2.0	mg/Kg wet	58.9		85.1		80-120				
LCS Dup (B118767-BSD1)				Prepared: 04/08/15 Analyzed: 04/09/15								
Hexavalent Chromium	49	1.8	mg/Kg wet	53.7		90.5		80-120	3.13		20	
Batch B118891 - % Solids												
Duplicate (B118891-DUP1)	**Source: 15C1159-01**			Prepared: 04/09/15 Analyzed: 04/10/15								
% Solids	94.1		% Wt		92.2				2.04		20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B118891 - % Solids										
Duplicate (B118891-DUP2)	**Source: 15C1159-02**			Prepared: 04/09/15 Analyzed: 04/10/15						
% Solids	91.1		% Wt		89.8			1.44	20	
Duplicate (B118891-DUP3)	**Source: 15C1159-03**			Prepared: 04/09/15 Analyzed: 04/10/15						
% Solids	92.4		% Wt		90.2			2.41	20	
Duplicate (B118891-DUP4)	**Source: 15C1159-04**			Prepared: 04/09/15 Analyzed: 04/10/15						
% Solids	99.0		% Wt		97.8			1.22	20	
Duplicate (B118891-DUP5)	**Source: 15C1159-05**			Prepared: 04/09/15 Analyzed: 04/10/15						
% Solids	88.6		% Wt		87.2			1.59	20	
Duplicate (B118891-DUP6)	**Source: 15C1159-06**			Prepared: 04/09/15 Analyzed: 04/10/15						
% Solids	93.2		% Wt		89.8			3.72	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
L-07A	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

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Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS ○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	TAL Metals	Cyanide	Hexavalent Chromium
								1	I	A	A	A	G
01	UASB222-6-6.5	3/23/2015	15:10		X	S					✓	✓	✓
02	UASB221-0-1	3/23/2015	15:30		X	S					✓	✓	✓
03	UASB221-5.5-6.5	3/23/2015	15:32		X	S					✓	✓	✓
04	UASB221-6.5-7.5	3/23/2015	15:35		X	S					✓	✓	✓
05	UASB223-0-1	3/23/2015	16:10		X	S					✓	✓	✓
06	UASB223-4-4.5	3/23/2015	16:15		X	S					✓	✓	✓
07	UASB217-3-4	3/24/2015	8:10		X	S					✓	✓	✓
08	UASB217-7-8	3/24/2015	8:15		X	S					✓	✓	✓
09	UASB217-11-12	3/24/2015	8:20		X	S					✓	✓	✓
10	~~UASB217-15-16.5~~ UASB217-16-16.5	3/24/2015	8:25		X	S					✓	✓	✓

ANALYSIS REQUESTED

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

****Preservation**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

	Date/Time
Relinquished by: (signature)	3/27/15 1100
Received by: (signature) 2.8°	3/28/15 11:58
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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CHAIN OF CUSTODY RECORD

15C1159

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Telephone: 201.335.9419
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Project #: 184578
Client PO#:
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #:
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

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								1	I	A	✔	✔	✔
11	LPSB114-3-4	3/24/2015	9:00		X	S		1	I	A	✔	✔	✔
12	LPSB114-4-5	3/24/2015	9:05		X	S		1	I	G	✔	✔	✔
13	UASB215-3-4	3/24/2015	10:35		X	S					✔	✔	✔
14	UASB215-4-5	3/24/2015	10:40		X	S					✔	✔	✔
15	UASB215-4-5-1	3/24/2015	10:40		X	S					✔	✔	✔
16	UASB231-0-2	3/24/2015	11:50		X	S					✔	✔	✔
17	UASB231-2-4	3/24/2015	11:55		X	S					✔	✔	✔
18	UASB230-4-5	3/24/2015	12:30		X	S					✔	✔	✔
19	UASB230-10-11	3/24/2015	12:40		X	S					✔	✔	✔
20	UASB225-3-4	3/24/2015	16:00		X	S					✔	✔	✔

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
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Comments:

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H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 3/27/15 1400	
Received by: (signature) 2.8° 3/28/15	Date/Time: 11:58	
Relinquished by: (signature) 2.8° 3/28/15	Date/Time: T	
Received by: (signature) (NB)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
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Connecticut:
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15C1159

Rev 04.05.12

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

Telephone: 201.335.9419
Project # 184578
Client PO#

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
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◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

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								1	I	A	A	A	G
21	UASB225-4-5	3/24/2015	16:05		X	S					✓	✓	✓
22	UASB225-8-9	3/24/2015	16:10		X	S					✓	✓	✓
23	UASB232-0-0.5	3/25/2015	6:55		X	S					✓	✓	✓
24	UASB233-0-0.5	3/25/2015	7:00		X	S					✓	✓	✓
25	UASB234-0-0.5	3/25/2015	7:05		X	S					✓	✓	✓
26	UASB224-3-4	3/25/2015	7:50		X	S					✓	✓	✓
27	UASB224-5-6	3/25/2015	8:05		X	S					✓	✓	✓
28	UASB224-5-6-1	3/25/2015	8:05		X	S					✓	✓	✓
29	UASB224-18-19	3/25/2015	8:45		X	S					✓	✓	✓
30	UASB220-3-4	3/25/2015	9:05		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
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Connecticut:
Other:

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Client PO#
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Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

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31	UASB220-7-8	3/25/2015	9:15		X	S					✔	✔	✔
32	LPSB117-1-2	3/25/2015	10:40		X	S					✔	✔	✔
33	BRSB705-10-11	3/25/2015	1600		X	S					✔	✔	✔
34	BRSB709-4-5	3/26/2015	9:00		X	S					✔	✔	✔
35	BRSB702-4-5	3/26/2015	10:00		X	S					✔	✔	✔
36	BRSB702-6-7	3/26/2015	10:20		X	S					✔	✔	✔
37	PASB601-9-10	3/26/2015	11:25		X	S					✔	✔	✔
38	PASB601-15-16	3/26/2015	11:30		X	S					✔	✔	✔
39	PASB626-8-9	3/26/2015	12:00		X	S					✔	✔	✔
40	PASB624-4-5	3/26/2015	15:00		X	S					✔	✔	✔

ANALYSIS REQUESTED

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Client PO#

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								ANALYSIS REQUESTED														
41	UASB215-7-8	3/24/2015	10:45		X	S		✔	✔	✔										1	I	A
42	UASB220-15-16	3/25/2015	9:25		X	S		✔	✔	✔										1	I	A
																				1	I	G

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
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Updated: 03/28/2015 12:43 P.M. Eastern Time

Delivered

Delivered On:
Saturday, 03/28/2015 at 11:58 A.M.

Left At:
Receiver

Signed By:
BROWN

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Launch Chat

Shipping Information

To:
EAST LONGMEADOW, MA, US

Shipped By

UPS NEXT DAY AIR



Shipment Progress What's This?

Location	Date	Local Time	Activity
W Springfield, MA, United States	03/28/2015	11:58 A.M.	Delivered

Additional Information

Type: Package

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Contact UPS
Browse Online Support
E-mail UPS
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East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com

con-test® ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HDR RECEIVED BY: KB DATE: 3/28/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No

If not, explain:

3) **Are all the samples in good condition?** (Yes) No

If not, explain:

4) **How were the samples received:**

On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 2.8°

5) **Are there Dissolved samples for the lab to filter?** Yes (No)

Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)

Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	42
250 mL Amber (8oz amber)		2 oz amber/clear jar	42
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements?

Log-In Technician Initials: KB

Date/Time: 3/28/15 11:58

Date/Time:

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

March 31, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt, NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15C0559

Enclosed are results of analyses for samples received by the laboratory on March 14, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD855-0-0.5	15C0559-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD856-0-0.5	15C0559-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD859-0-0.5	15C0559-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD860-0-0.5	15C0559-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD860-0-0.5-1	15C0559-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD861-0-0.5	15C0559-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD864-0-0.5	15C0559-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD863-0-0.5	15C0559-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD862-0-0.5	15C0559-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD858-0-0.5	15C0559-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD857-0-0.5	15C0559-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD854-0-0.5	15C0559-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD853-0-0.5	15C0559-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD852-0-0.5	15C0559-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD851-0-0.5	15C0559-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD851-0-0.5-1	15C0559-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD886-0-0.5	15C0559-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD832-0-0.5	15C0559-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD833-0-0.5	15C0559-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD834-0-0.5	15C0559-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD835-0-0.5	15C0559-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD836-0-0.5	15C0559-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD837-0-0.5	15C0559-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD838-0-0.5	15C0559-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD839-0-0.5	15C0559-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD840-0-0.5	15C0559-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD840-0-0.5-1	15C0559-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD846-0-0.5	15C0559-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 03/31/2015: Percent solid result updated for sample 15C0559-22.

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SW-846 6010C

Qualifications:

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum

15C0559-01[BRSD855-0-0.5], 15C0559-02[BRSD856-0-0.5], 15C0559-03[BRSD859-0-0.5], 15C0559-04[BRSD860-0-0.5], 15C0559-05[BRSD860-0-0.5-1], 15C0559-06[BRSD861-0-0.5], 15C0559-07[BRSD864-0-0.5], 15C0559-08[BRSD863-0-0.5], 15C0559-09[BRSD862-0-0.5], 15C0559-10[BRSD858-0-0.5], 15C0559-11[BRSD857-0-0.5], B117169-BLK1

Copper

15C0559-01[BRSD855-0-0.5], 15C0559-02[BRSD856-0-0.5], 15C0559-03[BRSD859-0-0.5], 15C0559-04[BRSD860-0-0.5], 15C0559-05[BRSD860-0-0.5-1], 15C0559-06[BRSD861-0-0.5], 15C0559-07[BRSD864-0-0.5], 15C0559-08[BRSD863-0-0.5], 15C0559-09[BRSD862-0-0.5], 15C0559-10[BRSD858-0-0.5], 15C0559-11[BRSD857-0-0.5], B117169-BLK1

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Antimony

15C0559-27[BRSD840-0-0.5-1], B117779-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Aluminum

15C0559-27[BRSD840-0-0.5-1], B117779-MS1

Calcium

15C0559-27[BRSD840-0-0.5-1], B117779-MS1

Iron

15C0559-27[BRSD840-0-0.5-1], B117779-MS1

Magnesium

15C0559-27[BRSD840-0-0.5-1], B117779-MS1

SW-846 7196A

Qualifications:

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15C0559-07[BRSD864-0-0.5], 15C0559-08[BRSD863-0-0.5], 15C0559-09[BRSD862-0-0.5], 15C0559-18[BRSD832-0-0.5], 15C0559-20[BRSD834-0-0.5], 15C0559-22[BRSD836-0-0.5], 15C0559-23[BRSD837-0-0.5], 15C0559-24[BRSD838-0-0.5], 15C0559-26[BRSD840-0-0.5], 15C0559-27[BRSD840-0-0.5-1]

SW-846 7471B

Qualifications:

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Mercury

B117821-BS1

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The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Daren J. Damboragian
Laboratory Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD855-0-0.5 | Sampled: 3/10/2015 10:20

Sample ID: 15C0559-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3900	3.2	1.4	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Antimony	4.8	3.2	2.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Barium	52	3.2	0.40	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Beryllium	0.18	0.32	0.052	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Cadmium	ND	0.32	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Calcium	4500	9.6	1.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 17:55	KSH
Chromium	46	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Cobalt	33	3.2	0.21	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Copper	84	0.64	0.49	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 17:55	KSH
Iron	49000	32	27	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:17	KSH
Lead	8.9	0.96	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Magnesium	43000	96	10	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:17	KSH
Manganese	580	0.64	0.20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 17:55	KSH
Mercury	0.0089	0.032	0.0046	mg/Kg dry	1	J	SW-846 7471B	3/26/15	3/27/15 10:19	SCB
Nickel	130	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Potassium	200	130	22	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 17:55	KSH
Selenium	ND	3.2	0.99	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Sodium	150	130	62	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 17:55	KSH
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Vanadium	16	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH
Zinc	85	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:15	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD855-0-0.5 | Sampled: 3/10/2015 10:20

Sample ID: 15C0559-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.47	0.43	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	77.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD856-0-0.5 | Sampled: 3/10/2015 10:30

Sample ID: 15C0559-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4100	4.5	1.9	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Antimony	ND	4.5	3.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Arsenic	ND	4.5	1.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Barium	81	4.5	0.55	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Beryllium	0.17	0.45	0.072	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Cadmium	ND	0.45	0.26	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Calcium	1800	13	2.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:00	KSH
Chromium	52	0.89	0.22	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Cobalt	21	4.5	0.28	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Copper	55	0.89	0.68	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:00	KSH
Iron	16000	45	38	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:23	KSH
Lead	15	1.3	0.26	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Magnesium	13000	130	14	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:23	KSH
Manganese	290	0.89	0.28	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:00	KSH
Mercury	0.037	0.046	0.0066	mg/Kg dry	1	J	SW-846 7471B	3/26/15	3/27/15 10:21	SCB
Nickel	69	0.89	0.22	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Potassium	330	180	31	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:00	KSH
Selenium	ND	4.5	1.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Silver	ND	0.89	0.78	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Sodium	260	180	87	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:00	KSH
Thallium	ND	4.5	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Vanadium	16	1.8	0.29	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH
Zinc	70	1.8	0.46	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:19	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD856-0-0.5 | Sampled: 3/10/2015 10:30

Sample ID: 15C0559-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.86	0.77	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	0.30	0.17	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	52.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD859-0-0.5 | Sampled: 3/10/2015 11:20

Sample ID: 15C0559-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2800	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Barium	55	3.1	0.38	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Beryllium	0.13	0.31	0.049	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Calcium	7600	9.2	1.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:06	KSH
Chromium	38	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Cobalt	9.1	3.1	0.20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Copper	20	0.61	0.47	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:06	KSH
Iron	16000	31	26	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:27	KSH
Lead	5.2	0.92	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Magnesium	8600	92	9.6	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:27	KSH
Manganese	770	0.61	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:06	KSH
Mercury	ND	0.031	0.0045	mg/Kg dry	1		SW-846 7471B	3/26/15	3/27/15 10:22	SCB
Nickel	33	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Potassium	240	120	21	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:06	KSH
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Sodium	110	120	60	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/19/15 18:06	KSH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Vanadium	13	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH
Zinc	45	1.2	0.32	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:23	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD859-0-0.5 | Sampled: 3/10/2015 11:20

Sample ID: 15C0559-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.48	0.43	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	79.1			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD860-0-0.5 | Sampled: 3/10/2015 11:40

Sample ID: 15C0559-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2600	3.1	1.3	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Antimony	ND	3.1	2.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Arsenic	ND	3.1	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Barium	29	3.1	0.38	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Beryllium	0.21	0.31	0.049	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Cadmium	ND	0.31	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Calcium	18000	9.2	1.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:11	KSH
Chromium	79	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Cobalt	11	3.1	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Copper	20	0.61	0.47	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:11	KSH
Iron	25000	31	26	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:32	KSH
Lead	10	0.92	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Magnesium	18000	92	9.6	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:32	KSH
Manganese	370	0.61	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:11	KSH
Mercury	0.0056	0.029	0.0042	mg/Kg dry	1	J	SW-846 7471B	3/26/15	3/27/15 10:24	SCB
Nickel	37	0.61	0.15	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Potassium	190	120	21	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:11	KSH
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Sodium	120	120	59	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/19/15 18:11	KSH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Vanadium	20	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH
Zinc	54	1.2	0.31	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:27	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD860-0-0.5 | Sampled: 3/10/2015 11:40

Sample ID: 15C0559-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	0.13	0.20	0.11	mg/Kg dry	1	J	SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	81.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD860-0-0.5-1 | Sampled: 3/10/2015 11:40

Sample ID: 15C0559-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2700	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Antimony	2.9	2.8	2.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Barium	29	2.8	0.35	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Beryllium	0.19	0.28	0.046	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Calcium	3600	8.5	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:17	KSH
Chromium	56	0.57	0.14	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Cobalt	14	2.8	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Copper	37	0.57	0.43	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:17	KSH
Iron	27000	28	24	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:38	KSH
Lead	5.1	0.85	0.17	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Magnesium	7600	85	8.9	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:38	KSH
Manganese	240	0.57	0.18	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:17	KSH
Mercury	ND	0.029	0.0041	mg/Kg dry	1		SW-846 7471B	3/26/15	3/27/15 10:29	SCB
Nickel	43	0.57	0.14	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Potassium	170	110	19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:17	KSH
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Sodium	85	110	55	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/19/15 18:17	KSH
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Vanadium	19	1.1	0.19	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH
Zinc	40	1.1	0.29	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:31	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD860-0-0.5-1 | Sampled: 3/10/2015 11:40

Sample ID: 15C0559-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.51	0.46	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	0.19	0.10	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	83.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD861-0-0.5 | Sampled: 3/10/2015 13:00

Sample ID: 15C0559-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9100	7.6	3.3	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Antimony	ND	7.6	6.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Arsenic	ND	7.6	2.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Barium	150	7.6	0.94	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Beryllium	0.39	0.76	0.12	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Cadmium	ND	0.76	0.45	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Calcium	5300	23	4.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Chromium	58	1.5	0.38	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Cobalt	19	7.6	0.48	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Copper	40	1.5	1.2	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Iron	29000	76	65	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:43	KSH
Lead	27	2.3	0.45	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Magnesium	4800	23	2.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Manganese	350	1.5	0.48	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Mercury	0.093	0.077	0.011	mg/Kg dry	1		SW-846 7471B	3/26/15	3/27/15 10:30	SCB
Nickel	67	1.5	0.37	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Potassium	570	300	52	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Selenium	ND	7.6	2.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Silver	ND	1.5	1.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Sodium	330	300	150	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:42	KSH
Thallium	ND	7.6	2.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Vanadium	33	3.0	0.50	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH
Zinc	140	3.0	0.78	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:36	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD861-0-0.5 | Sampled: 3/10/2015 13:00

Sample ID: 15C0559-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.5	1.4	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	0.49	0.27	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	32.5			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD864-0-0.5 | Sampled: 3/11/2015 09:50

Sample ID: 15C0559-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	5.0	2.2	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Antimony	ND	5.0	4.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Arsenic	ND	5.0	1.8	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Barium	120	5.0	0.62	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Beryllium	0.28	0.50	0.081	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Cadmium	ND	0.50	0.30	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Calcium	2700	15	2.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Chromium	58	1.0	0.25	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Cobalt	22	5.0	0.32	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Copper	26	1.0	0.76	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Iron	12000	50	43	mg/Kg dry	10		SW-846 6010C	3/17/15	3/20/15 14:21	KSH
Lead	4.5	1.5	0.30	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Magnesium	3300	15	1.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Manganese	200	1.0	0.32	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Mercury	0.037	0.052	0.0074	mg/Kg dry	1	J	SW-846 7471B	3/26/15	3/27/15 10:33	SCB
Nickel	74	1.0	0.24	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Potassium	270	200	34	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Selenium	ND	5.0	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Silver	ND	1.0	0.88	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Sodium	240	200	98	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:47	KSH
Thallium	ND	5.0	1.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Vanadium	24	2.0	0.33	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH
Zinc	33	2.0	0.52	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:40	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD864-0-0.5 | Sampled: 3/11/2015 09:50

Sample ID: 15C0559-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.87	0.78	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	1.7	0.95	mg/Kg dry	5	W-06	SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	45.6			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD863-0-0.5 | Sampled: 3/11/2015 10:10

Sample ID: 15C0559-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	6.7	2.9	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Antimony	ND	6.7	5.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Arsenic	ND	6.7	2.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Barium	190	6.7	0.83	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Beryllium	0.38	0.67	0.11	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Cadmium	ND	0.67	0.40	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Calcium	4800	20	3.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Chromium	82	1.3	0.34	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Cobalt	20	6.7	0.43	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Copper	30	1.3	1.0	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Iron	12000	6.7	5.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Lead	4.1	2.0	0.40	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Magnesium	4000	20	2.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Manganese	270	1.3	0.43	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Mercury	0.040	0.068	0.0097	mg/Kg dry	1	J	SW-846 7471B	3/26/15	3/27/15 10:34	SCB
Nickel	76	1.3	0.32	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Potassium	290	270	46	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Selenium	ND	6.7	2.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Silver	ND	1.3	1.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Sodium	360	270	130	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:53	KSH
Thallium	ND	6.7	2.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Vanadium	35	2.7	0.44	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH
Zinc	38	2.7	0.69	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:44	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD863-0-0.5 | Sampled: 3/11/2015 10:10

Sample ID: 15C0559-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.0	0.94	mg/Kg dry	1		SW-846 9014	3/18/15	3/19/15 11:00	VAK
Hexavalent Chromium	ND	2.3	1.2	mg/Kg dry	5	W-06	SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	35.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD862-0-0.5 | Sampled: 3/11/2015 10:25

Sample ID: 15C0559-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	10	4.4	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Antimony	ND	10	8.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Arsenic	ND	10	3.7	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Barium	260	10	1.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Beryllium	0.60	1.0	0.16	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Cadmium	ND	1.0	0.60	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Calcium	7200	31	5.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Chromium	87	2.0	0.51	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Cobalt	25	10	0.65	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Copper	74	2.0	1.6	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Iron	30000	100	87	mg/Kg dry	10		SW-846 6010C	3/17/15	3/19/15 16:48	KSH
Lead	54	3.1	0.61	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Magnesium	6200	31	3.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Manganese	530	2.0	0.65	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Mercury	0.15	0.11	0.015	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:38	SCB
Nickel	98	2.0	0.50	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Potassium	780	410	70	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Selenium	ND	10	3.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Silver	ND	2.0	1.8	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Sodium	550	410	200	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 18:58	KSH
Thallium	ND	10	3.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Vanadium	53	4.1	0.67	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH
Zinc	220	4.1	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 19:49	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD862-0-0.5 | Sampled: 3/11/2015 10:25

Sample ID: 15C0559-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	2.5	1.7	1.5	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	2.2	3.3	1.8	mg/Kg dry	5	W-06, J	SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	23.7			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD858-0-0.5 | Sampled: 3/11/2015 10:40

Sample ID: 15C0559-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	23	9.9	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Antimony	22	23	19	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Arsenic	ND	23	8.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Barium	250	23	2.9	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Beryllium	0.78	2.3	0.37	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Cadmium	1.8	2.3	1.4	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Calcium	6100	69	12	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Chromium	120	4.6	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Cobalt	43	23	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Copper	350	4.6	3.5	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Iron	33000	23	20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Lead	52	6.9	1.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Magnesium	8500	69	7.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Manganese	240	4.6	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Mercury	0.26	0.24	0.035	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:40	SCB
Nickel	190	4.6	1.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Potassium	1000	920	160	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Selenium	ND	23	7.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Silver	ND	4.6	4.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Sodium	490	920	450	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/19/15 19:04	KSH
Thallium	ND	23	7.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Vanadium	68	9.2	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH
Zinc	230	9.2	2.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:10	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD858-0-0.5 | Sampled: 3/11/2015 10:40

Sample ID: 15C0559-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.6	4.1	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	1.5	0.84	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	10.3			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD857-0-0.5 | Sampled: 3/11/2015 10:55

Sample ID: 15C0559-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	14000	24	10	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Antimony	ND	24	20	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Arsenic	ND	24	8.8	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Barium	240	24	3.0	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Beryllium	0.58	2.4	0.39	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Cadmium	ND	2.4	1.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Calcium	5400	73	13	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Chromium	110	4.9	1.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Cobalt	56	24	1.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Copper	1000	4.9	3.7	mg/Kg dry	1	B-07	SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Iron	31000	24	21	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Lead	62	7.3	1.4	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Magnesium	8000	73	7.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Manganese	320	4.9	1.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Mercury	0.24	0.24	0.035	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:41	SCB
Nickel	250	4.9	1.2	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Potassium	1200	970	170	mg/Kg dry	1		SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Selenium	ND	24	7.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Silver	ND	4.9	4.3	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Sodium	760	970	470	mg/Kg dry	1	J	SW-846 6010C	3/17/15	3/19/15 19:09	KSH
Thallium	ND	24	8.1	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Vanadium	55	9.7	1.6	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH
Zinc	250	9.7	2.5	mg/Kg dry	1		SW-846 6010C	3/17/15	3/18/15 20:14	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD857-0-0.5 | Sampled: 3/11/2015 10:55

Sample ID: 15C0559-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.0	2.7	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	1.6	0.88	mg/Kg dry	1		SW-846 7196A	3/16/15	3/17/15 10:00	LL
% Solids	10.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD854-0-0.5 | Sampled: 3/11/2015 12:00

Sample ID: 15C0559-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	15	6.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Arsenic	ND	15	5.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Barium	260	15	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Beryllium	1.5	1.5	0.25	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Cadmium	1.8	1.5	0.90	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Calcium	6000	46	8.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Chromium	120	3.1	0.76	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Cobalt	44	15	0.98	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Copper	230	3.1	2.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Iron	26000	15	13	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Lead	53	4.6	0.91	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Magnesium	6100	46	4.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Manganese	490	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Mercury	0.19	0.16	0.024	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:43	SCB
Nickel	180	3.1	0.74	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Potassium	890	610	100	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Sodium	480	610	300	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Vanadium	48	6.1	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH
Zinc	160	6.1	1.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:23	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD854-0-0.5 | Sampled: 3/11/2015 12:00

Sample ID: 15C0559-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.4	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	1.0	0.56	mg/Kg dry	1		SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	15.5			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD853-0-0.5 | Sampled: 3/11/2015 12:15

Sample ID: 15C0559-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	23	9.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Antimony	ND	23	19	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Arsenic	ND	23	8.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Barium	270	23	2.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Beryllium	1.6	2.3	0.37	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Cadmium	2.0	2.3	1.4	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Calcium	7100	69	12	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Chromium	110	4.6	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Cobalt	40	23	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Copper	380	4.6	3.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Iron	34000	23	20	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Lead	48	6.9	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Magnesium	8100	69	7.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Manganese	440	4.6	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Mercury	0.22	0.22	0.032	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:44	SCB
Nickel	180	4.6	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Potassium	1300	920	160	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Selenium	ND	23	7.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Silver	ND	4.6	4.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Sodium	ND	920	450	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Thallium	ND	23	7.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Vanadium	48	9.2	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH
Zinc	270	9.2	2.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:29	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD853-0-0.5 | Sampled: 3/11/2015 12:15

Sample ID: 15C0559-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.6	2.4	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	1.3	1.4	0.80	mg/Kg dry	1	J	SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	10.7			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD852-0-0.5 | Sampled: 3/11/2015 12:25

Sample ID: 15C0559-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8000	8.7	3.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Antimony	ND	8.7	7.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Arsenic	ND	8.7	3.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Barium	110	8.7	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Beryllium	1.2	0.87	0.14	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Cadmium	1.0	0.87	0.51	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Calcium	3100	26	4.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Chromium	110	1.7	0.43	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Cobalt	34	8.7	0.56	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Copper	150	1.7	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Iron	32000	87	74	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:32	MJH
Lead	21	2.6	0.52	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Magnesium	19000	26	2.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Manganese	390	1.7	0.55	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Mercury	0.069	0.078	0.011	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:46	SCB
Nickel	160	1.7	0.42	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Potassium	760	350	60	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Selenium	ND	8.7	2.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Sodium	170	350	170	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Thallium	ND	8.7	2.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Vanadium	32	3.5	0.57	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH
Zinc	100	3.5	0.90	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:34	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD852-0-0.5 | Sampled: 3/11/2015 12:25

Sample ID: 15C0559-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.2	1.1	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	0.50	0.28	mg/Kg dry	1		SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	31.1			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD851-0-0.5 | Sampled: 3/11/2015 12:35

Sample ID: 15C0559-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	17000	21	9.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Antimony	ND	21	17	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Arsenic	9.1	21	7.7	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Barium	280	21	2.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Beryllium	2.1	2.1	0.34	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Cadmium	2.5	2.1	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Calcium	5700	64	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Chromium	170	4.2	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Cobalt	64	21	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Copper	2800	4.2	3.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Iron	49000	210	180	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:36	MJH
Lead	82	6.4	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Magnesium	7700	64	6.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Manganese	560	4.2	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Mercury	0.23	0.21	0.030	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:47	SCB
Nickel	450	4.2	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Potassium	1500	850	150	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Selenium	ND	21	6.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Silver	ND	4.2	3.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Sodium	520	850	410	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Thallium	ND	21	7.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Vanadium	62	8.5	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH
Zinc	300	8.5	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:40	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD851-0-0.5 | Sampled: 3/11/2015 12:35

Sample ID: 15C0559-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	5.7	3.7	3.4	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	1.3	0.73	mg/Kg dry	1		SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	12.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD851-0-0.5-1 | Sampled: 3/11/2015 12:35

Sample ID: 15C0559-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	21	8.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Antimony	ND	21	17	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Arsenic	ND	21	7.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Barium	300	21	2.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Beryllium	2.3	2.1	0.33	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Cadmium	2.7	2.1	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Calcium	5900	62	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Chromium	170	4.1	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Cobalt	72	21	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Copper	2500	4.1	3.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Iron	52000	210	180	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:39	MJH
Lead	85	6.2	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Magnesium	8400	62	6.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Manganese	600	4.1	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Mercury	0.24	0.21	0.030	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:49	SCB
Nickel	440	4.1	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Potassium	1700	820	140	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Selenium	ND	21	6.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Silver	ND	4.1	3.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Sodium	540	820	400	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Thallium	ND	21	6.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Vanadium	68	8.2	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH
Zinc	320	8.2	2.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:45	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD851-0-0.5-1 | Sampled: 3/11/2015 12:35

Sample ID: 15C0559-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.3	3.9	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.4	0.74	mg/Kg dry	1		SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	11.4			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD886-0-0.5 | Sampled: 3/12/2015 09:05

Sample ID: 15C0559-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	2400	3.2	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Antimony	ND	3.2	2.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Arsenic	ND	3.2	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Barium	36	3.2	0.40	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Beryllium	0.37	0.32	0.052	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Cadmium	0.23	0.32	0.19	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Calcium	1200	9.6	1.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Chromium	25	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Cobalt	6.5	3.2	0.20	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Copper	16	0.64	0.49	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Iron	8500	32	27	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:42	MJH
Lead	4.5	0.96	0.19	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Magnesium	2700	9.6	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Manganese	80	0.64	0.20	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Mercury	0.0071	0.031	0.0044	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:54	SCB
Nickel	32	0.64	0.16	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Potassium	270	130	22	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Selenium	ND	3.2	0.99	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Silver	ND	0.64	0.56	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Sodium	160	130	62	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Thallium	ND	3.2	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Vanadium	12	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH
Zinc	16	1.3	0.33	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:12	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD886-0-0.5 | Sampled: 3/12/2015 09:05

Sample ID: 15C0559-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	78.8			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD832-0-0.5 | Sampled: 3/12/2015 10:10

Sample ID: 15C0559-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9300	14	6.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Antimony	ND	14	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Arsenic	7.7	14	5.1	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Barium	290	14	1.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Beryllium	1.2	1.4	0.23	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Cadmium	1.5	1.4	0.84	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Calcium	18000	43	7.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Chromium	120	2.9	0.71	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Cobalt	8.8	14	0.91	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Copper	170	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Iron	11000	14	12	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Lead	6.9	4.3	0.85	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Magnesium	5400	43	4.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Manganese	630	2.9	0.91	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Mercury	0.097	0.14	0.021	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:55	SCB
Nickel	170	2.9	0.69	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Potassium	380	570	98	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Selenium	ND	14	4.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Sodium	540	570	280	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Thallium	ND	14	4.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Vanadium	49	5.7	0.94	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH
Zinc	6.8	5.7	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:17	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD832-0-0.5 | Sampled: 3/12/2015 10:10

Sample ID: 15C0559-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	7.3	2.6	2.3	mg/Kg dry	1		SW-846 9014	3/23/15	3/24/15 11:00	ABH
Hexavalent Chromium	ND	9.1	5.0	mg/Kg dry	10	W-06	SW-846 7196A	3/19/15	3/19/15 13:00	LL
% Solids	17.4			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD833-0-0.5 | Sampled: 3/12/2015 10:20

Sample ID: 15C0559-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	19	8.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Antimony	ND	19	16	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Arsenic	8.9	19	7.0	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Barium	280	19	2.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Beryllium	1.0	1.9	0.31	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Cadmium	1.3	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Calcium	19000	58	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Chromium	66	3.9	0.97	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Cobalt	14	19	1.2	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Copper	120	3.9	3.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Iron	15000	19	17	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Lead	7.2	5.8	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Magnesium	5400	58	6.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Manganese	1800	3.9	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Mercury	0.12	0.18	0.026	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 10:57	SCB
Nickel	120	3.9	0.94	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Potassium	390	780	130	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Selenium	ND	19	6.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Silver	ND	3.9	3.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Sodium	880	780	380	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Thallium	ND	19	6.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Vanadium	34	7.8	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH
Zinc	13	7.8	2.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:23	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD833-0-0.5 | Sampled: 3/12/2015 10:20

Sample ID: 15C0559-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.4	3.1	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.1	0.62	mg/Kg dry	1		SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	14.0			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD834-0-0.5 | Sampled: 3/12/2015 10:30

Sample ID: 15C0559-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	12	5.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Arsenic	6.0	12	4.4	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Barium	440	12	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Beryllium	1.2	1.2	0.20	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Cadmium	1.6	1.2	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Calcium	12000	37	6.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Chromium	89	2.5	0.61	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Cobalt	13	12	0.79	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Copper	160	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Iron	11000	12	10	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Lead	11	3.7	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Magnesium	4300	37	3.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Manganese	900	2.5	0.78	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Mercury	0.19	0.12	0.018	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 10:58	SCB
Nickel	110	2.5	0.60	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Potassium	550	490	84	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Sodium	970	490	240	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Vanadium	45	4.9	0.81	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH
Zinc	28	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:28	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD834-0-0.5 | Sampled: 3/12/2015 10:30

Sample ID: 15C0559-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.1	1.9	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	2.8	3.8	2.1	mg/Kg dry	5	W-06, J	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	20.3			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD835-0-0.5 | Sampled: 3/12/2015 10:45

Sample ID: 15C0559-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	13	5.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Antimony	ND	13	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Arsenic	8.6	13	4.8	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Barium	470	13	1.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Beryllium	1.5	1.3	0.21	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Cadmium	1.5	1.3	0.78	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Calcium	16000	40	7.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Chromium	68	2.6	0.66	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Cobalt	14	13	0.85	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Copper	120	2.6	2.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Iron	14000	13	11	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Lead	21	4.0	0.79	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Magnesium	5600	40	4.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Manganese	600	2.6	0.84	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Mercury	0.18	0.13	0.019	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 11:00	SCB
Nickel	130	2.6	0.64	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Potassium	450	530	91	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Selenium	ND	13	4.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Sodium	420	530	260	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Thallium	ND	13	4.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Vanadium	51	5.3	0.87	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH
Zinc	36	5.3	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:33	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD835-0-0.5 | Sampled: 3/12/2015 10:45

Sample ID: 15C0559-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.4	2.2	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	0.82	0.45	mg/Kg dry	1		SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	19.3			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD836-0-0.5 | Sampled: 3/12/2015 11:00

Sample ID: 15C0559-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	11000	12	5.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Antimony	ND	12	9.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Arsenic	6.1	12	4.4	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Barium	340	12	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Beryllium	1.8	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Cadmium	1.5	1.2	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Calcium	10000	37	6.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Chromium	110	2.5	0.62	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Cobalt	46	12	0.79	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Copper	310	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Iron	44000	120	110	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:45	MJH
Lead	44	3.7	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Magnesium	6900	37	3.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Manganese	1400	2.5	0.78	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Mercury	0.14	0.12	0.017	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 11:01	SCB
Nickel	190	2.5	0.60	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Potassium	780	490	85	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Sodium	330	490	240	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Vanadium	37	4.9	0.81	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH
Zinc	220	4.9	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:39	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD836-0-0.5 | Sampled: 3/12/2015 11:00

Sample ID: 15C0559-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.3	2.1	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.6	0.87	mg/Kg dry	2	W-06	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	19.7			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD837-0-0.5 | Sampled: 3/12/2015 11:10

Sample ID: 15C0559-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	13000	12	5.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Antimony	ND	12	10	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Arsenic	5.9	12	4.5	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Barium	290	12	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Beryllium	1.5	1.2	0.20	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Cadmium	1.5	1.2	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Calcium	7300	37	6.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Chromium	100	2.5	0.62	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Cobalt	41	12	0.79	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Copper	350	2.5	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Iron	32000	120	110	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:50	MJH
Lead	46	3.7	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Magnesium	6900	37	3.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Manganese	410	2.5	0.79	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Mercury	0.17	0.12	0.017	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 11:03	SCB
Nickel	190	2.5	0.60	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Potassium	1000	500	85	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Selenium	ND	12	3.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Silver	ND	2.5	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Sodium	390	500	240	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Thallium	ND	12	4.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Vanadium	48	5.0	0.81	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH
Zinc	220	5.0	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:44	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD837-0-0.5 | Sampled: 3/12/2015 11:10

Sample ID: 15C0559-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.0	1.8	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	3.8	2.1	mg/Kg dry	5	W-06	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	20.7			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD838-0-0.5 | Sampled: 3/12/2015 11:20

Sample ID: 15C0559-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	15000	15	6.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Arsenic	6.8	15	5.3	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Barium	320	15	1.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Beryllium	2.2	1.5	0.23	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Cadmium	1.8	1.5	0.86	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Calcium	9500	44	7.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Chromium	130	2.9	0.73	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Cobalt	52	15	0.93	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Copper	360	2.9	2.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Iron	64000	150	120	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:53	MJH
Lead	52	4.4	0.86	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Magnesium	9100	44	4.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Manganese	1300	2.9	0.92	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Mercury	0.19	0.16	0.022	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 11:04	SCB
Nickel	210	2.9	0.70	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Potassium	1100	580	100	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Selenium	ND	15	4.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Silver	ND	2.9	2.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Sodium	1100	580	280	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Thallium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Vanadium	49	5.8	0.96	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH
Zinc	310	5.8	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:50	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD838-0-0.5 | Sampled: 3/12/2015 11:20

Sample ID: 15C0559-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.4	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.9	1.0	mg/Kg dry	2	W-06	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	16.3			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD839-0-0.5 | Sampled: 3/12/2015 11:30

Sample ID: 15C0559-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8900	3.5	1.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Antimony	ND	3.5	2.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Arsenic	ND	3.5	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Barium	260	3.5	0.43	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Beryllium	0.49	0.35	0.056	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Cadmium	0.37	0.35	0.21	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Calcium	2400	10	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Chromium	39	0.70	0.17	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Cobalt	6.3	3.5	0.22	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Copper	26	0.70	0.53	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Iron	8600	35	30	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:56	MJH
Lead	6.2	1.0	0.21	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Magnesium	1600	10	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Manganese	290	0.70	0.22	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Mercury	0.073	0.031	0.0045	mg/Kg dry	1		SW-846 7471B	3/25/15	3/26/15 11:06	SCB
Nickel	33	0.70	0.17	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Potassium	400	140	24	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Selenium	ND	3.5	1.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Silver	ND	0.70	0.61	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Sodium	160	140	68	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Thallium	ND	3.5	1.2	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Vanadium	16	1.4	0.23	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH
Zinc	16	1.4	0.36	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 14:55	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD839-0-0.5 | Sampled: 3/12/2015 11:30

Sample ID: 15C0559-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.36	0.32	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	0.16	0.21	0.12	mg/Kg dry	1	J	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	75.9			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD840-0-0.5 | Sampled: 3/12/2015 11:40

Sample ID: 15C0559-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5100	4.4	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Antimony	ND	4.4	3.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Arsenic	ND	4.4	1.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Barium	120	4.4	0.54	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Beryllium	0.33	0.44	0.070	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Cadmium	0.29	0.44	0.26	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Calcium	2200	13	2.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Chromium	32	0.87	0.22	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Cobalt	15	4.4	0.28	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Copper	18	0.87	0.67	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Iron	6300	4.4	3.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Lead	3.1	1.3	0.26	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Magnesium	2000	13	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Manganese	120	0.87	0.28	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Mercury	0.025	0.042	0.0060	mg/Kg dry	1	J	SW-846 7471B	3/25/15	3/26/15 11:07	SCB
Nickel	47	0.87	0.21	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Potassium	290	170	30	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Selenium	ND	4.4	1.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Silver	ND	0.87	0.77	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Sodium	180	170	85	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Thallium	ND	4.4	1.4	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Vanadium	12	1.7	0.29	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH
Zinc	17	1.7	0.45	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:01	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD840-0-0.5 | Sampled: 3/12/2015 11:40

Sample ID: 15C0559-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.67	0.61	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.3	0.73	mg/Kg dry	5	W-06	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	59.1			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD840-0-0.5-1 | Sampled: 3/12/2015 11:40

Sample ID: 15C0559-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6100	5.2	2.2	mg/Kg dry	1	MS-19	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Antimony	ND	5.2	4.2	mg/Kg dry	1	MS-07	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Arsenic	ND	5.2	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Barium	150	5.2	0.65	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Beryllium	0.44	0.52	0.084	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Cadmium	0.37	0.52	0.31	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Calcium	2900	16	2.8	mg/Kg dry	1	MS-19	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Chromium	42	1.0	0.26	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Cobalt	16	5.2	0.33	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Copper	25	1.0	0.80	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Iron	7600	5.2	4.5	mg/Kg dry	1	MS-19	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Lead	4.4	1.6	0.31	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Magnesium	2400	16	1.6	mg/Kg dry	1	MS-19	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Manganese	150	1.0	0.33	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Mercury	0.032	0.047	0.0068	mg/Kg dry	1	J	SW-846 7471B	3/16/15	3/17/15 11:08	SCB
Nickel	57	1.0	0.25	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Potassium	350	210	36	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Selenium	ND	5.2	1.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Silver	ND	1.0	0.92	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Sodium	190	210	100	mg/Kg dry	1	J	SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Thallium	ND	5.2	1.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Vanadium	16	2.1	0.34	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH
Zinc	22	2.1	0.54	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 13:18	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD840-0-0.5-1 | Sampled: 3/12/2015 11:40

Sample ID: 15C0559-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.76	0.68	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	0.63	0.35	mg/Kg dry	2	W-06	SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	50.6			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD846-0-0.5 | Sampled: 3/12/2015 12:00

Sample ID: 15C0559-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	16000	15	6.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Antimony	ND	15	12	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Arsenic	ND	15	5.5	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Barium	330	15	1.9	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Beryllium	2.2	1.5	0.25	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Cadmium	2.0	1.5	0.91	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Calcium	8900	46	8.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Chromium	120	3.1	0.77	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Cobalt	53	15	0.98	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Copper	300	3.1	2.3	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Iron	58000	150	130	mg/Kg dry	10		SW-846 6010C	3/25/15	3/27/15 13:59	MJH
Lead	57	4.6	0.91	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Magnesium	8700	46	4.8	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Manganese	920	3.1	0.97	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Mercury	0.23	0.16	0.024	mg/Kg dry	1		SW-846 7471B	3/16/15	3/17/15 11:09	SCB
Nickel	200	3.1	0.74	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Potassium	1200	610	110	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Selenium	ND	15	4.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Silver	ND	3.1	2.7	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Sodium	ND	610	300	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Thallium	ND	15	5.1	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Vanadium	53	6.1	1.0	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH
Zinc	320	6.1	1.6	mg/Kg dry	1		SW-846 6010C	3/25/15	3/26/15 15:26	KSH

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Project Location: Cortlandt, NY | Sample Description: | Work Order: 15C0559

Date Received: 3/14/2015

Field Sample #: BRSD846-0-0.5 | Sampled: 3/12/2015 12:00

Sample ID: 15C0559-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.1	2.8	mg/Kg dry	1		SW-846 9014	3/25/15	3/25/15 19:10	ABH
Hexavalent Chromium	ND	1.1	0.58	mg/Kg dry	1		SW-846 7196A	3/26/15	3/27/15 12:00	LL
% Solids	15.1			% Wt	1		SM 2540G	3/26/15	3/27/15 9:55	DRA

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15C0559-01 [BRSD855-0-0.5]	B117906	03/26/15
15C0559-02 [BRSD856-0-0.5]	B117906	03/26/15
15C0559-03 [BRSD859-0-0.5]	B117906	03/26/15
15C0559-04 [BRSD860-0-0.5]	B117906	03/26/15
15C0559-05 [BRSD860-0-0.5-1]	B117906	03/26/15
15C0559-06 [BRSD861-0-0.5]	B117906	03/26/15
15C0559-07 [BRSD864-0-0.5]	B117906	03/26/15
15C0559-08 [BRSD863-0-0.5]	B117906	03/26/15
15C0559-09 [BRSD862-0-0.5]	B117906	03/26/15
15C0559-10 [BRSD858-0-0.5]	B117906	03/26/15
15C0559-11 [BRSD857-0-0.5]	B117906	03/26/15
15C0559-12 [BRSD854-0-0.5]	B117906	03/26/15
15C0559-13 [BRSD853-0-0.5]	B117906	03/26/15
15C0559-14 [BRSD852-0-0.5]	B117906	03/26/15
15C0559-15 [BRSD851-0-0.5]	B117906	03/26/15
15C0559-16 [BRSD851-0-0.5-1]	B117906	03/26/15
15C0559-17 [BRSD886-0-0.5]	B117906	03/26/15
15C0559-18 [BRSD832-0-0.5]	B117906	03/26/15
15C0559-19 [BRSD833-0-0.5]	B117906	03/26/15
15C0559-20 [BRSD834-0-0.5]	B117906	03/26/15
15C0559-21 [BRSD835-0-0.5]	B117906	03/26/15
15C0559-22 [BRSD836-0-0.5]	B117906	03/26/15
15C0559-23 [BRSD837-0-0.5]	B117906	03/26/15
15C0559-24 [BRSD838-0-0.5]	B117906	03/26/15
15C0559-25 [BRSD839-0-0.5]	B117906	03/26/15
15C0559-26 [BRSD840-0-0.5]	B117906	03/26/15
15C0559-27 [BRSD840-0-0.5-1]	B117906	03/26/15
15C0559-28 [BRSD846-0-0.5]	B117906	03/26/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-01 [BRSD855-0-0.5]	B117169	1.01	50.0	03/17/15
15C0559-02 [BRSD856-0-0.5]	B117169	1.08	50.0	03/17/15
15C0559-03 [BRSD859-0-0.5]	B117169	1.03	50.0	03/17/15
15C0559-04 [BRSD860-0-0.5]	B117169	1.01	50.0	03/17/15
15C0559-05 [BRSD860-0-0.5-1]	B117169	1.06	50.0	03/17/15
15C0559-06 [BRSD861-0-0.5]	B117169	1.02	50.0	03/17/15
15C0559-07 [BRSD864-0-0.5]	B117169	1.09	50.0	03/17/15
15C0559-08 [BRSD863-0-0.5]	B117169	1.07	50.0	03/17/15
15C0559-09 [BRSD862-0-0.5]	B117169	1.03	50.0	03/17/15
15C0559-10 [BRSD858-0-0.5]	B117169	1.06	50.0	03/17/15
15C0559-11 [BRSD857-0-0.5]	B117169	1.03	50.0	03/17/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-12 [BRSD854-0-0.5]	B117779	1.05	50.0	03/25/15
15C0559-13 [BRSD853-0-0.5]	B117779	1.02	50.0	03/25/15
15C0559-14 [BRSD852-0-0.5]	B117779	0.925	50.0	03/25/15
15C0559-15 [BRSD851-0-0.5]	B117779	0.982	50.0	03/25/15
15C0559-16 [BRSD851-0-0.5-1]	B117779	1.07	50.0	03/25/15
15C0559-17 [BRSD886-0-0.5]	B117779	0.990	50.0	03/25/15

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Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-18 [BRSD832-0-0.5]	B117779	1.01	50.0	03/25/15
15C0559-19 [BRSD833-0-0.5]	B117779	0.917	50.0	03/25/15
15C0559-20 [BRSD834-0-0.5]	B117779	1.00	50.0	03/25/15
15C0559-21 [BRSD835-0-0.5]	B117779	0.978	50.0	03/25/15
15C0559-22 [BRSD836-0-0.5]	B117779	1.03	50.0	03/25/15
15C0559-23 [BRSD837-0-0.5]	B117779	0.976	50.0	03/25/15
15C0559-24 [BRSD838-0-0.5]	B117779	1.05	50.0	03/25/15
15C0559-25 [BRSD839-0-0.5]	B117779	0.944	50.0	03/25/15
15C0559-26 [BRSD840-0-0.5]	B117779	0.968	50.0	03/25/15
15C0559-27 [BRSD840-0-0.5-1]	B117779	0.947	50.0	03/25/15
15C0559-28 [BRSD846-0-0.5]	B117779	1.08	50.0	03/25/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-01 [BRSD855-0-0.5]	B117041	2.55	100	03/16/15
15C0559-02 [BRSD856-0-0.5]	B117041	2.54	100	03/16/15
15C0559-03 [BRSD859-0-0.5]	B117041	2.52	100	03/16/15
15C0559-04 [BRSD860-0-0.5]	B117041	2.52	100	03/16/15
15C0559-05 [BRSD860-0-0.5-1]	B117041	2.60	100	03/16/15
15C0559-06 [BRSD861-0-0.5]	B117041	2.52	100	03/16/15
15C0559-07 [BRSD864-0-0.5]	B117041	2.54	100	03/16/15
15C0559-08 [BRSD863-0-0.5]	B117041	2.52	100	03/16/15
15C0559-09 [BRSD862-0-0.5]	B117041	2.58	100	03/16/15
15C0559-10 [BRSD858-0-0.5]	B117041	2.56	100	03/16/15
15C0559-11 [BRSD857-0-0.5]	B117041	2.51	100	03/16/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-12 [BRSD854-0-0.5]	B117329	2.52	100	03/19/15
15C0559-13 [BRSD853-0-0.5]	B117329	2.58	100	03/19/15
15C0559-14 [BRSD852-0-0.5]	B117329	2.55	100	03/19/15
15C0559-15 [BRSD851-0-0.5]	B117329	2.51	100	03/19/15
15C0559-16 [BRSD851-0-0.5-1]	B117329	2.59	100	03/19/15
15C0559-17 [BRSD886-0-0.5]	B117329	2.53	100	03/19/15
15C0559-18 [BRSD832-0-0.5]	B117329	2.53	100	03/19/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-19 [BRSD833-0-0.5]	B117809	2.54	100	03/26/15
15C0559-20 [BRSD834-0-0.5]	B117809	2.57	100	03/26/15
15C0559-21 [BRSD835-0-0.5]	B117809	2.53	100	03/26/15
15C0559-22 [BRSD836-0-0.5]	B117809	2.55	100	03/26/15
15C0559-23 [BRSD837-0-0.5]	B117809	2.55	100	03/26/15
15C0559-24 [BRSD838-0-0.5]	B117809	2.58	100	03/26/15
15C0559-25 [BRSD839-0-0.5]	B117809	2.51	100	03/26/15
15C0559-26 [BRSD840-0-0.5]	B117809	2.54	100	03/26/15
15C0559-27 [BRSD840-0-0.5-1]	B117809	2.51	100	03/26/15
15C0559-28 [BRSD846-0-0.5]	B117809	2.51	100	03/26/15

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Sample Extraction Data

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-27 [BRSD840-0-0.5-1]	B117052	0.631	50.0	03/16/15
15C0559-28 [BRSD846-0-0.5]	B117052	0.603	50.0	03/16/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-09 [BRSD862-0-0.5]	B117785	0.597	50.0	03/25/15
15C0559-10 [BRSD858-0-0.5]	B117785	0.595	50.0	03/25/15
15C0559-11 [BRSD857-0-0.5]	B117785	0.614	50.0	03/25/15
15C0559-12 [BRSD854-0-0.5]	B117785	0.588	50.0	03/25/15
15C0559-13 [BRSD853-0-0.5]	B117785	0.623	50.0	03/25/15
15C0559-14 [BRSD852-0-0.5]	B117785	0.618	50.0	03/25/15
15C0559-15 [BRSD851-0-0.5]	B117785	0.594	50.0	03/25/15
15C0559-16 [BRSD851-0-0.5-1]	B117785	0.630	50.0	03/25/15
15C0559-17 [BRSD886-0-0.5]	B117785	0.622	50.0	03/25/15
15C0559-18 [BRSD832-0-0.5]	B117785	0.599	50.0	03/25/15
15C0559-19 [BRSD833-0-0.5]	B117785	0.600	50.0	03/25/15
15C0559-20 [BRSD834-0-0.5]	B117785	0.592	50.0	03/25/15
15C0559-21 [BRSD835-0-0.5]	B117785	0.592	50.0	03/25/15
15C0559-22 [BRSD836-0-0.5]	B117785	0.637	50.0	03/25/15
15C0559-23 [BRSD837-0-0.5]	B117785	0.616	50.0	03/25/15
15C0559-24 [BRSD838-0-0.5]	B117785	0.589	50.0	03/25/15
15C0559-25 [BRSD839-0-0.5]	B117785	0.636	50.0	03/25/15
15C0559-26 [BRSD840-0-0.5]	B117785	0.610	50.0	03/25/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-01 [BRSD855-0-0.5]	B117821	0.606	50.0	03/26/15
15C0559-02 [BRSD856-0-0.5]	B117821	0.633	50.0	03/26/15
15C0559-03 [BRSD859-0-0.5]	B117821	0.606	50.0	03/26/15
15C0559-04 [BRSD860-0-0.5]	B117821	0.630	50.0	03/26/15
15C0559-05 [BRSD860-0-0.5-1]	B117821	0.629	50.0	03/26/15
15C0559-06 [BRSD861-0-0.5]	B117821	0.602	50.0	03/26/15
15C0559-07 [BRSD864-0-0.5]	B117821	0.638	50.0	03/26/15
15C0559-08 [BRSD863-0-0.5]	B117821	0.634	50.0	03/26/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-01 [BRSD855-0-0.5]	B117248	1.37	50.0	03/18/15
15C0559-02 [BRSD856-0-0.5]	B117248	1.12	50.0	03/18/15
15C0559-03 [BRSD859-0-0.5]	B117248	1.32	50.0	03/18/15
15C0559-04 [BRSD860-0-0.5]	B117248	1.05	50.0	03/18/15
15C0559-05 [BRSD860-0-0.5-1]	B117248	1.17	50.0	03/18/15
15C0559-06 [BRSD861-0-0.5]	B117248	1.00	50.0	03/18/15
15C0559-07 [BRSD864-0-0.5]	B117248	1.26	50.0	03/18/15
15C0559-08 [BRSD863-0-0.5]	B117248	1.37	50.0	03/18/15

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Sample Extraction Data

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-09 [BRSD862-0-0.5]	B117545	1.25	50.0	03/23/15
15C0559-10 [BRSD858-0-0.5]	B117545	1.06	50.0	03/23/15
15C0559-11 [BRSD857-0-0.5]	B117545	1.65	50.0	03/23/15
15C0559-12 [BRSD854-0-0.5]	B117545	1.19	50.0	03/23/15
15C0559-13 [BRSD853-0-0.5]	B117545	1.77	50.0	03/23/15
15C0559-14 [BRSD852-0-0.5]	B117545	1.33	50.0	03/23/15
15C0559-15 [BRSD851-0-0.5]	B117545	1.12	50.0	03/23/15
15C0559-18 [BRSD832-0-0.5]	B117545	1.12	50.0	03/23/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15C0559-16 [BRSD851-0-0.5-1]	B117738	1.02	50.0	03/25/15
15C0559-17 [BRSD886-0-0.5]	B117738	1.08	50.0	03/25/15
15C0559-19 [BRSD833-0-0.5]	B117738	1.04	50.0	03/25/15
15C0559-20 [BRSD834-0-0.5]	B117738	1.15	50.0	03/25/15
15C0559-21 [BRSD835-0-0.5]	B117738	1.07	50.0	03/25/15
15C0559-22 [BRSD836-0-0.5]	B117738	1.11	50.0	03/25/15
15C0559-23 [BRSD837-0-0.5]	B117738	1.20	50.0	03/25/15
15C0559-24 [BRSD838-0-0.5]	B117738	1.13	50.0	03/25/15
15C0559-25 [BRSD839-0-0.5]	B117738	1.85	50.0	03/25/15
15C0559-26 [BRSD840-0-0.5]	B117738	1.25	50.0	03/25/15
15C0559-27 [BRSD840-0-0.5-1]	B117738	1.30	50.0	03/25/15
15C0559-28 [BRSD846-0-0.5]	B117738	1.08	50.0	03/25/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117052 - SW-846 7471										
Blank (B117052-BLK1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B117052-BS1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Mercury	6.86	0.43	mg/Kg wet	5.76		119	71.2-128.6			
LCS Dup (B117052-BSD1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Mercury	5.68	0.42	mg/Kg wet	5.76		98.7	71.2-128.6	18.7	30	
Batch B117169 - SW-846 3050B										
Blank (B117169-BLK1)				Prepared: 03/17/15 Analyzed: 03/18/15						
Aluminum	3.5	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	1.3	0.50	mg/Kg wet							B-07
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.36	1.0	mg/Kg wet							J
LCS (B117169-BS1)				Prepared: 03/17/15 Analyzed: 03/18/15						
Aluminum	7380	5.0	mg/Kg wet	8100		91.1	51.2-148.1			
Antimony	91.3	5.0	mg/Kg wet	116		78.7	0-210.3			
Arsenic	115	5.0	mg/Kg wet	122		93.9	77.8-122.1			
Barium	166	5.0	mg/Kg wet	167		99.6	82-117.4			
Beryllium	50.5	0.50	mg/Kg wet	54.3		92.9	82.3-117.7			
Cadmium	85.7	0.50	mg/Kg wet	88.0		97.4	81.9-118.2			
Calcium	5570	15	mg/Kg wet	5920		94.1	81.9-118.2			
Chromium	101	1.0	mg/Kg wet	102		99.0	78.7-120.6			
Cobalt	97.2	5.0	mg/Kg wet	99.4		97.7	83-116.7			
Copper	80.7	1.0	mg/Kg wet	78.0		103	80.4-119.6			
Iron	12300	5.0	mg/Kg wet	15100		81.4	46.8-153			
Lead	87.3	1.5	mg/Kg wet	94.5		92.4	82.4-117.8			
Magnesium	2700	15	mg/Kg wet	3020		89.5	75.5-124.2			
Manganese	372	1.0	mg/Kg wet	401		92.8	80.8-119.2			
Nickel	53.4	1.0	mg/Kg wet	56.3		94.8	82.2-117.8			
Potassium	2350	200	mg/Kg wet	2490		94.2	69.9-130.1			
Selenium	163	5.0	mg/Kg wet	157		104	77.1-122.3			
Silver	30.7	1.0	mg/Kg wet	34.2		89.7	74.3-125.4			
Sodium	280	200	mg/Kg wet	246		114	69.9-130.5			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117169 - SW-846 3050B										
LCS (B117169-BS1)				Prepared: 03/17/15 Analyzed: 03/18/15						
Thallium	104	5.0	mg/Kg wet	116		89.4	78.2-121.6			
Vanadium	67.2	2.0	mg/Kg wet	67.1		100	64.8-135.2			
Zinc	195	2.0	mg/Kg wet	207		94.3	79.7-120.8			
LCS Dup (B117169-BSD1)				Prepared: 03/17/15 Analyzed: 03/18/15						
Aluminum	7000	5.0	mg/Kg wet	8100		86.4	51.2-148.1	5.29	30	
Antimony	90.2	5.0	mg/Kg wet	116		77.8	0-210.3	1.18	30	
Arsenic	113	5.0	mg/Kg wet	122		92.4	77.8-122.1	1.54	30	
Barium	166	5.0	mg/Kg wet	167		99.3	82-117.4	0.272	30	
Beryllium	49.8	0.50	mg/Kg wet	54.3		91.7	82.3-117.7	1.32	30	
Cadmium	84.8	0.50	mg/Kg wet	88.0		96.4	81.9-118.2	1.05	30	
Calcium	5570	15	mg/Kg wet	5920		94.1	81.9-118.2	0.0210	30	
Chromium	97.5	1.0	mg/Kg wet	102		95.6	78.7-120.6	3.54	30	
Cobalt	95.4	5.0	mg/Kg wet	99.4		95.9	83-116.7	1.87	30	
Copper	75.5	1.0	mg/Kg wet	78.0		96.8	80.4-119.6	6.69	30	
Iron	11900	5.0	mg/Kg wet	15100		79.1	46.8-153	2.85	30	
Lead	85.8	1.5	mg/Kg wet	94.5		90.8	82.4-117.8	1.71	30	
Magnesium	2620	15	mg/Kg wet	3020		86.6	75.5-124.2	3.24	30	
Manganese	373	1.0	mg/Kg wet	401		93.1	80.8-119.2	0.287	30	
Nickel	52.2	1.0	mg/Kg wet	56.3		92.8	82.2-117.8	2.19	30	
Potassium	2220	200	mg/Kg wet	2490		89.1	69.9-130.1	5.59	30	
Selenium	153	5.0	mg/Kg wet	157		97.3	77.1-122.3	6.68	30	
Silver	30.3	1.0	mg/Kg wet	34.2		88.6	74.3-125.4	1.23	30	
Sodium	270	200	mg/Kg wet	246		110	69.9-130.5	3.70	30	
Thallium	102	5.0	mg/Kg wet	116		88.4	78.2-121.6	1.21	30	
Vanadium	64.3	2.0	mg/Kg wet	67.1		95.9	64.8-135.2	4.37	30	
Zinc	192	2.0	mg/Kg wet	207		92.8	79.7-120.8	1.62	30	
MRL Check (B117169-MRL1)				Prepared: 03/17/15 Analyzed: 03/18/15						
Lead	0.774	0.71	mg/Kg wet	0.706		110	80-120			
Batch B117779 - SW-846 3050B										
Blank (B117779-BLK1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	2.4	2.5	mg/Kg wet							J
Lead	ND	0.75	mg/Kg wet							
Magnesium	0.84	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117779 - SW-846 3050B										
Blank (B117779-BLK1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							
LCS (B117779-BS1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Aluminum	6960	4.9	mg/Kg wet	8100		86.0	51.2-148.1			
Antimony	80.1	4.9	mg/Kg wet	116		69.1	0-210.3			
Arsenic	116	4.9	mg/Kg wet	122		94.8	77.8-122.1			
Barium	163	4.9	mg/Kg wet	167		97.6	82-117.4			
Beryllium	56.6	0.49	mg/Kg wet	54.3		104	82.3-117.7			
Cadmium	86.4	0.49	mg/Kg wet	88.0		98.1	81.9-118.2			
Calcium	5350	15	mg/Kg wet	5920		90.3	81.9-118.2			
Chromium	99.4	0.98	mg/Kg wet	102		97.4	78.7-120.6			
Cobalt	98.2	4.9	mg/Kg wet	99.4		98.8	83-116.7			
Copper	75.0	0.98	mg/Kg wet	78.0		96.1	80.4-119.6			
Iron	12200	4.9	mg/Kg wet	15100		81.1	46.8-153			
Lead	86.5	1.5	mg/Kg wet	94.5		91.5	82.4-117.8			
Magnesium	2720	15	mg/Kg wet	3020		90.2	75.5-124.2			
Manganese	386	0.98	mg/Kg wet	401		96.2	80.8-119.2			
Nickel	53.0	0.98	mg/Kg wet	56.3		94.1	82.2-117.8			
Potassium	2310	200	mg/Kg wet	2490		93.0	69.9-130.1			
Selenium	139	4.9	mg/Kg wet	157		88.7	77.1-122.3			
Silver	30.4	0.98	mg/Kg wet	34.2		89.0	74.3-125.4			
Sodium	239	200	mg/Kg wet	246		97.0	69.9-130.5			
Thallium	108	4.9	mg/Kg wet	116		92.8	78.2-121.6			
Vanadium	62.1	2.0	mg/Kg wet	67.1		92.5	64.8-135.2			
Zinc	188	2.0	mg/Kg wet	207		90.7	79.7-120.8			
LCS Dup (B117779-BSD1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Aluminum	7230	4.9	mg/Kg wet	8100		89.2	51.2-148.1	3.69	30	
Antimony	80.0	4.9	mg/Kg wet	116		69.0	0-210.3	0.111	30	
Arsenic	119	4.9	mg/Kg wet	122		97.9	77.8-122.1	3.16	30	
Barium	167	4.9	mg/Kg wet	167		100	82-117.4	2.48	30	
Beryllium	59.4	0.49	mg/Kg wet	54.3		109	82.3-117.7	4.86	30	
Cadmium	85.6	0.49	mg/Kg wet	88.0		97.3	81.9-118.2	0.827	30	
Calcium	5780	15	mg/Kg wet	5920		97.6	81.9-118.2	7.80	30	
Chromium	102	0.99	mg/Kg wet	102		100	78.7-120.6	2.87	30	
Cobalt	98.6	4.9	mg/Kg wet	99.4		99.2	83-116.7	0.405	30	
Copper	75.6	0.99	mg/Kg wet	78.0		96.9	80.4-119.6	0.774	30	
Iron	12800	4.9	mg/Kg wet	15100		84.4	46.8-153	4.03	30	
Lead	89.1	1.5	mg/Kg wet	94.5		94.3	82.4-117.8	3.00	30	
Magnesium	2770	15	mg/Kg wet	3020		91.8	75.5-124.2	1.80	30	
Manganese	408	0.99	mg/Kg wet	401		102	80.8-119.2	5.58	30	
Nickel	52.7	0.99	mg/Kg wet	56.3		93.7	82.2-117.8	0.488	30	
Potassium	2320	200	mg/Kg wet	2490		93.1	69.9-130.1	0.156	30	
Selenium	139	4.9	mg/Kg wet	157		88.8	77.1-122.3	0.104	30	
Silver	31.3	0.99	mg/Kg wet	34.2		91.4	74.3-125.4	2.67	30	
Sodium	238	200	mg/Kg wet	246		96.9	69.9-130.5	0.116	30	
Thallium	106	4.9	mg/Kg wet	116		91.8	78.2-121.6	1.11	30	
Vanadium	63.8	2.0	mg/Kg wet	67.1		95.2	64.8-135.2	2.79	30	
Zinc	193	2.0	mg/Kg wet	207		93.3	79.7-120.8	2.85	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B117779 - SW-846 3050B											
Duplicate (B117779-DUP1)		**Source: 15C0559-27**		Prepared: 03/25/15 Analyzed: 03/26/15							
Aluminum	6720	4.9	mg/Kg dry		6140				9.04	35	
Antimony	ND	4.9	mg/Kg dry		ND				NC	35	
Arsenic	ND	4.9	mg/Kg dry		ND				NC	35	
Barium	162	4.9	mg/Kg dry		146				10.2	35	
Beryllium	0.429	0.49	mg/Kg dry		0.436				1.56	35	J
Cadmium	0.358	0.49	mg/Kg dry		0.374				4.19	35	J
Calcium	2900	15	mg/Kg dry		2910				0.435	35	
Chromium	44.7	0.97	mg/Kg dry		41.8				6.70	35	
Cobalt	16.2	4.9	mg/Kg dry		15.7				3.18	35	
Copper	23.9	0.97	mg/Kg dry		25.0				4.58	35	
Iron	7840	4.9	mg/Kg dry		7600				3.10	35	
Lead	4.41	1.5	mg/Kg dry		4.36				1.26	35	
Magnesium	2540	15	mg/Kg dry		2360				7.32	35	
Manganese	158	0.97	mg/Kg dry		153				3.42	35	
Nickel	56.5	0.97	mg/Kg dry		57.1				1.19	35	
Potassium	359	190	mg/Kg dry		350				2.62	35	
Selenium	ND	4.9	mg/Kg dry		ND				NC	35	
Silver	ND	0.97	mg/Kg dry		ND				NC	35	
Sodium	210	190	mg/Kg dry		193				8.53	35	
Thallium	ND	4.9	mg/Kg dry		ND				NC	35	
Vanadium	15.2	1.9	mg/Kg dry		16.3				6.60	35	
Zinc	24.1	1.9	mg/Kg dry		22.2				8.23	35	
MRL Check (B117779-MRL1)				Prepared: 03/25/15 Analyzed: 03/26/15							
Lead	0.775	0.74	mg/Kg wet	0.739		105		80-120			
Matrix Spike (B117779-MS1)		**Source: 15C0559-27**		Prepared: 03/25/15 Analyzed: 03/26/15							
Aluminum	7360	4.9	mg/Kg dry	195	6140	**625**	*	75-125			MS-19
Antimony	101	4.9	mg/Kg dry	195	ND	**52.0**	*	75-125			MS-07
Arsenic	187	4.9	mg/Kg dry	195	ND	95.9		75-125			
Barium	351	4.9	mg/Kg dry	195	146	105		75-125			
Beryllium	203	0.49	mg/Kg dry	195	0.436	104		75-125			
Cadmium	189	0.49	mg/Kg dry	195	0.374	96.5		75-125			
Calcium	3210	15	mg/Kg dry	195	2910	**154**	*	75-125			MS-19
Chromium	242	0.97	mg/Kg dry	195	41.8	103		75-125			
Cobalt	209	4.9	mg/Kg dry	195	15.7	99.2		75-125			
Copper	215	0.97	mg/Kg dry	195	25.0	97.6		75-125			
Iron	8100	4.9	mg/Kg dry	195	7600	**259**	*	75-125			MS-19
Lead	189	1.5	mg/Kg dry	195	4.36	94.8		75-125			
Magnesium	2670	15	mg/Kg dry	195	2360	**156**	*	75-125			MS-19
Manganese	348	0.97	mg/Kg dry	195	153	100		75-125			
Nickel	244	0.97	mg/Kg dry	195	57.1	95.9		75-125			
Potassium	2180	190	mg/Kg dry	1950	350	93.9		75-125			
Selenium	179	4.9	mg/Kg dry	195	ND	91.6		75-125			
Silver	176	0.97	mg/Kg dry	195	ND	90.1		75-125			
Sodium	410	190	mg/Kg dry	195	193	111		75-125			
Thallium	182	4.9	mg/Kg dry	195	ND	93.2		75-125			
Vanadium	204	1.9	mg/Kg dry	195	16.3	96.3		75-125			
Zinc	205	1.9	mg/Kg dry	195	22.2	93.8		75-125			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117785 - SW-846 7471										
Blank (B117785-BLK1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B117785-BS1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Mercury	5.31	0.38	mg/Kg wet	5.76		92.2	71.2-128.6			
LCS Dup (B117785-BSD1)				Prepared: 03/25/15 Analyzed: 03/26/15						
Mercury	4.91	0.39	mg/Kg wet	5.76		85.3	71.2-128.6	7.84	30	
Duplicate (B117785-DUP1)		**Source: 15C0559-16**		Prepared: 03/25/15 Analyzed: 03/26/15						
Mercury	0.244	0.22	mg/Kg dry		0.244			0.241	35	
Matrix Spike (B117785-MS1)		**Source: 15C0559-16**		Prepared: 03/25/15 Analyzed: 03/26/15						
Mercury	1.62	0.21	mg/Kg dry	1.41	0.244	98.0	75-125			
Batch B117821 - SW-846 7471										
Blank (B117821-BLK1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B117821-BS1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Mercury	3.64	0.38	mg/Kg wet	5.76		**63.3**	* 71.2-128.6			L-07
LCS Dup (B117821-BSD1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Mercury	4.11	0.38	mg/Kg wet	5.76		71.3	71.2-128.6	11.9	30	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117041 - SW-846 7196A										
Blank (B117041-BLK1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B117041-BS1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Hexavalent Chromium	49	2.0	mg/Kg wet	59.4		83.1	80-120			
LCS Dup (B117041-BSD1)				Prepared: 03/16/15 Analyzed: 03/17/15						
Hexavalent Chromium	52	2.0	mg/Kg wet	59.7		87.1	80-120	5.20	20	
Batch B117248 - SW-846 9014										
Blank (B117248-BLK1)				Prepared: 03/18/15 Analyzed: 03/19/15						
Cyanide	ND	0.50	mg/Kg wet							
LCS (B117248-BS1)				Prepared: 03/18/15 Analyzed: 03/19/15						
Cyanide	69	2.4	mg/Kg wet	61.5		112	80-120			
LCS Dup (B117248-BSD1)				Prepared: 03/18/15 Analyzed: 03/19/15						
Cyanide	69	2.4	mg/Kg wet	61.4		112	80-120	0.0234	20	
Matrix Spike (B117248-MS1)		**Source: 15C0559-08**		Prepared: 03/18/15 Analyzed: 03/19/15						
Cyanide	29	1.0	mg/Kg dry	34.7	ND	84.5	75-125			
Matrix Spike Dup (B117248-MSD1)		**Source: 15C0559-08**		Prepared: 03/18/15 Analyzed: 03/19/15						
Cyanide	30	0.96	mg/Kg dry	32.3	ND	93.8	75-125	3.07	35	
Batch B117329 - SW-846 7196A										
Blank (B117329-BLK1)				Prepared & Analyzed: 03/19/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B117329-BS1)				Prepared & Analyzed: 03/19/15						
Hexavalent Chromium	53	2.0	mg/Kg wet	59.7		89.0	80-120			
LCS Dup (B117329-BSD1)				Prepared & Analyzed: 03/19/15						
Hexavalent Chromium	53	2.0	mg/Kg wet	59.6		89.0	80-120	0.130	20	
Batch B117545 - SW-846 9014										
Blank (B117545-BLK1)				Prepared: 03/23/15 Analyzed: 03/24/15						
Cyanide	ND	0.46	mg/Kg wet							

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B117545 - SW-846 9014										
LCS (B117545-BS1)				Prepared: 03/23/15 Analyzed: 03/24/15						
Cyanide	59	2.0	mg/Kg wet	52.3		112	80-120			
LCS Dup (B117545-BSD1)				Prepared: 03/23/15 Analyzed: 03/24/15						
Cyanide	58	2.0	mg/Kg wet	52.5		110	80-120	2.15	20	
Matrix Spike (B117545-MS1)		**Source: 15C0559-18**		Prepared: 03/23/15 Analyzed: 03/24/15						
Cyanide	77	2.2	mg/Kg dry	72.2	7.3	96.8	75-125			
Matrix Spike Dup (B117545-MSD1)		**Source: 15C0559-18**		Prepared: 03/23/15 Analyzed: 03/24/15						
Cyanide	87	2.5	mg/Kg dry	80.2	7.3	98.9	75-125	11.5	35	
Batch B117738 - SW-846 9014										
Blank (B117738-BLK1)				Prepared & Analyzed: 03/25/15						
Cyanide	ND	0.48	mg/Kg wet							
LCS (B117738-BS1)				Prepared & Analyzed: 03/25/15						
Cyanide	65	2.4	mg/Kg wet	63.1		103	80-120			
LCS Dup (B117738-BSD1)				Prepared & Analyzed: 03/25/15						
Cyanide	64	2.4	mg/Kg wet	63.2		102	80-120	1.49	20	
Matrix Spike (B117738-MS1)		**Source: 15C0559-28**		Prepared & Analyzed: 03/25/15						
Cyanide	96	3.1	mg/Kg dry	102	ND	94.5	75-125			
Matrix Spike Dup (B117738-MSD1)		**Source: 15C0559-28**		Prepared & Analyzed: 03/25/15						
Cyanide	98	3.1	mg/Kg dry	102	ND	95.8	75-125	1.18	35	
Batch B117809 - SW-846 7196A										
Blank (B117809-BLK1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							
LCS (B117809-BS1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Hexavalent Chromium	51	1.9	mg/Kg wet	57.7		87.8	80-120			
LCS Dup (B117809-BSD1)				Prepared: 03/26/15 Analyzed: 03/27/15						
Hexavalent Chromium	51	1.9	mg/Kg wet	57.2		89.8	80-120	1.48	20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

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Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

15C0559

Rev 04.05.12

Company Name: HDR
Telephone: 201.335.9419
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Project # 184578
Client PO#
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, D. Yu

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS ○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								I	I	I			
								A	A	G			
01	BRSD855-0-0.5	3/10/2015	10:20		X	S		✓	✓	✓			
02	BRSD856-0-0.5	3/10/2015	10:30		X	S		✓	✓	✓			
03	BRSD859-0-0.5	3/10/2015	11:20		X	S		✓	✓	✓			
04	BRSD860-0-0.5	3/10/2015	11:40		X	S		✓	✓	✓			
05	BRSD860-0-0.5-1	3/10/2015	11:40		X	S		✓	✓	✓			
06	BRSD861-0-0.5	3/10/2015	13:00		X	S		✓	✓	✓			
07	BRSD864-0-0.5	3/11/2015	9:50		X	S		✓	✓	✓			
08	BRSD863-0-0.5	3/11/2015	10:10		X	S		✓	✓	✓			
09	BRSD862-0-0.5	3/11/2015	10:25		X	S		✓	✓	✓			
10	BRSD858-0-0.5	3/11/2015	10:40		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 3/13/15 1400	
Received by: (signature) 2.0°C	Date/Time: 3/13/15 10:05	
Relinquished by: (signature)	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT. TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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CHAIN OF CUSTODY RECORD

15C0559

Rev 04.05.12

39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Attention: Amita Patel
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								1		1								
								I	I	I								
								A	A	G								
11	BRSD857-0-0.5	3/11/2015	10:55		X	S		✓	✓	✓								
12	BRSD854-0-0.5	3/11/2015	12:00		X	S		✓	✓	✓								
13	BRSD853-0-0.5	3/11/2015	12:15		X	S		✓	✓	✓								
14	BRSD852-0-0.5	3/11/2015	12:25		X	S		✓	✓	✓								
15	BRSD851-0-0.5	3/11/2015	12:35		X	S		✓	✓	✓								
16	BRSD851-0-0.5-1	3/11/2015	12:35		X	S		✓	✓	✓								
17	BRSD886-0-0.5	3/12/15	9:05		X	S		✓	✓	✓								
18	BRSD832-0-0.5	3/12/15	10:10		X	S		✓	✓	✓								
19	BRSD833-0-0.5	3/12/15	10:20		X	S		✓	✓	✓								
20	BRSD834-0-0.5	3/12/15	10:30		X	S		✓	✓	✓								

ANALYSIS REQUESTED

# of Containers
** Preservation
***Container Code

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
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H - High; M - Medium; L - Low; C - Clean; U - Unknown

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Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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								1	I	A	A	A	G
21	BRSD835-0-0.5	3/12/15	10:45		X	S					✓	✓	✓
22	BRSD836-0-0.5	3/12/15	11:00		X	S					✓	✓	✓
23	BRSD837-0-0.5	3/12/15	11:10		X	S					✓	✓	✓
24	BRSD838-0-0.5	3/12/15	11:20		X	S					✓	✓	✓
25	BRSD839-0-0.5	3/12/15	11:30		X	S					✓	✓	✓
26	BRSD840-0-0.5	3/12/15	11:40		X	S					✓	✓	✓
27	BRSD840-0-0.5-1	3/12/15	11:40		X	S					✓	✓	✓
28	BRSD846-0-0.5	3/12/15	12:00		X	S					✓	✓	✓

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
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G=glass
P=plastic
ST=sterile
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	3/13/15
Received by: (signature)	Date/Time:
inquished by: (signature)	Date/Time:
ceived by: (signature)	Date/Time:

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
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1ZR34A722210011668

Updated: 03/14/2015 11:56 A.M. Eastern Time

Delivered

Delivered On:
Saturday, 03/14/2015 at 10:05 A.M.

Left At:
Receiver

Signed By:
JONES

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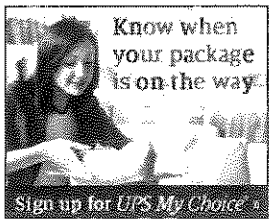

Shipment Progress What's This?

Additional Information

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www.contestlabs.com

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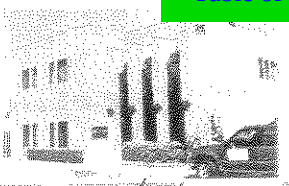
Sample Receipt Checklist



CLIENT NAME: HDR RECEIVED BY: MS DATE: 3/11/15

1) Was the chain(s) of custody relinquished and signed? (Yes) No No CoC included

2) Does the chain agree with the samples? (Yes) No

If not, explain:

3) Are all the samples in good condition? (Yes) No

If not, explain:

4) How were the samples received:

On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank 2.0°C Temperature °C by Temp gun 2.0 (MS)

5) Are there Dissolved samples for the lab to filter? Yes (No)

Who was notified _____ Date _____ Time _____

6) Are there any RUSH or SHORT HOLDING TIME samples? Yes (No)

Who was notified _____ Date _____ Time _____

7) Location where samples are stored: 19

Permission to subcontract samples? Yes No

(Walk-in clients only) if not already approved

Client Signature: _____

8) Do all samples have the proper Acid pH: Yes No (N/A) _____

9) Do all samples have the proper Base pH: Yes No (N/A) _____

10) Was the PC notified of any discrepancies with the CoC vs the samples: Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	28
250 mL Amber (8oz amber)		2 oz amber/clear jar	28
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____

Bisulfate _____ # DI Water _____

Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	T	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	T	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? Date/Time:

Doc #277 Rev. 4 August 2013 Log-In Technician Initials: Date/Time: 10:05

MT 3/19/15

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

April 24, 2015

Amita Patel
HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211

Project Location: Cortlandt NY
Client Job Number:
Project Number: 184578
Laboratory Work Order Number: 15D0541

Enclosed are results of analyses for samples received by the laboratory on April 10, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron L. Benoit
Project Manager

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15D0541

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASB625-1-2	15D0541-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB625-3-4	15D0541-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB625-4-5	15D0541-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-5-6	15D0541-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-10-11	15D0541-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-10-11-1	15D0541-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB617-11-12	15D0541-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB16-11-12	15D0541-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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PASB616-14-15	15D0541-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB615-12-14	15D0541-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB613-15-16	15D0541-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB613-19-20	15D0541-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB721-4-5	15D0541-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB715-6-9	15D0541-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB712-5-6	15D0541-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB712-8-9	15D0541-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB524-5-7	15D0541-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB524-8-10	15D0541-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB524-19-21	15D0541-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-4-7	15D0541-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-7-10	15D0541-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-19-21	15D0541-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB611-4-7	15D0541-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB611-7-10	15D0541-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 4/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15D0541

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASB611-19-21	15D0541-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB603-4-7	15D0541-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB603-19-21	15D0541-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB605-4-7	15D0541-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB605-19-21	15D0541-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6010C

Qualifications:

B-05

Data is not affected by elevated level in blank since sample(s) result is "Not Detected".

Analyte & Samples(s) Qualified:

Antimony

15D0541-12[PASB613-19-20], 15D0541-13[BRSB721-4-5], 15D0541-14[BRSB715-6-9], 15D0541-15[BRSB712-5-6], 15D0541-16[BRSB712-8-9], 15D0541-17[WTSB524-5-7], 15D0541-18[WTSB524-8-10], 15D0541-19[WTSB524-19-21], 15D0541-20[PASB609-4-7], 15D0541-21[PASB609-7-10], 15D0541-22[PASB609-19-21], 15D0541-23[PASB611-4-7], 15D0541-24[PASB611-7-10], 15D0541-25[PASB611-19-21], 15D0541-26[PASB603-4-7], 15D0541-27[PASB603-19-21], 15D0541-28[PASB605-4-7], 15D0541-29[PASB605-19-21], B119837-BLK1

B-07

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:

Aluminum

15D0541-01[PASB625-1-2], 15D0541-02[PASB625-3-4], 15D0541-03[PASB625-4-5], 15D0541-04[PASB618-5-6], 15D0541-05[PASB618-10-11], 15D0541-06[PASB618-10-11-1], 15D0541-07[PASB617-11-12], 15D0541-08[PASB16-11-12], 15D0541-09[PASB616-14-15], 15D0541-10[PASB615-12-14], 15D0541-11[PASB613-15-16], B119947-BLK1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:

Manganese

B119837-BSD1

L-10

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.

Analyte & Samples(s) Qualified:

Lead

B119947-MRL1

SW-846 7196A

Qualifications:

MS-16

For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15D0541-01[PASB625-1-2], 15D0541-21[PASB609-7-10], B119102-MS1, B119102-MS2, B119102-MSD1, B119556-MS2, B119556-MS3, B119556-MSD1

W-06

Elevated method reporting limit due to intense color of sample

Analyte & Samples(s) Qualified:

Hexavalent Chromium

15D0541-04[PASB618-5-6], 15D0541-08[PASB16-11-12], 15D0541-10[PASB615-12-14], 15D0541-11[PASB613-15-16], 15D0541-12[PASB613-19-20], 15D0541-17[WTSB524-5-7], 15D0541-18[WTSB524-8-10], 15D0541-19[WTSB524-19-21], 15D0541-20[PASB609-4-7], 15D0541-21[PASB609-7-10], 15D0541-22[PASB609-19-21], 15D0541-23[PASB611-4-7], 15D0541-24[PASB611-7-10], 15D0541-25[PASB611-19-21], 15D0541-26[PASB603-4-7], 15D0541-28[PASB605-4-7], 15D0541-29[PASB605-19-21], B119230-MS1, B119230-MS3, B119230-MSD1

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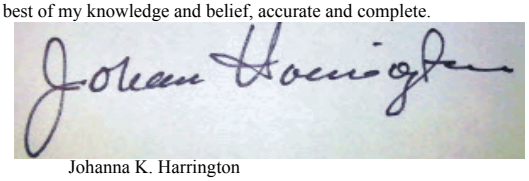
The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Johanna K. Harrington
Manager, Laboratory Reporting

con-test® ANALYTICAL LABORATORY
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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-1-2 | Sampled: 4/7/2015 08:55

Sample ID: 15D0541-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4000	2.8	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Antimony	2.4	2.8	2.3	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Arsenic	ND	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Barium	43	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Beryllium	0.25	0.28	0.045	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Cadmium	ND	0.28	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Calcium	3900	8.5	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Chromium	17	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Cobalt	6.2	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Copper	12	0.56	0.43	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Iron	11000	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Lead	3.5	0.85	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Magnesium	4300	8.5	0.88	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Manganese	96	0.56	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Mercury	0.0057	0.029	0.0041	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 11:47	SCB
Nickel	14	0.56	0.14	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Potassium	1100	110	19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Silver	ND	0.56	0.50	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Sodium	100	110	55	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Vanadium	17	1.1	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH
Zinc	22	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:25	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-1-2 | Sampled: 4/7/2015 08:55

Sample ID: 15D0541-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	0.14	0.18	0.099	mg/Kg dry	1	MS-16, J	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	86.4			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-3-4 | Sampled: 4/7/2015 09:00

Sample ID: 15D0541-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3800	2.7	1.2	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Antimony	4.5	2.7	2.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Arsenic	ND	2.7	0.99	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Barium	37	2.7	0.34	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Beryllium	0.24	0.27	0.044	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Cadmium	ND	0.27	0.16	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Calcium	3700	8.2	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Chromium	14	0.55	0.14	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Cobalt	4.8	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Copper	10	0.55	0.42	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Iron	10000	2.7	2.3	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Lead	3.7	0.82	0.16	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Magnesium	3700	8.2	0.86	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Manganese	120	0.55	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	4/20/15	4/21/15 11:49	SCB
Nickel	7.9	0.55	0.13	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Potassium	970	110	19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Selenium	ND	2.7	0.84	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Silver	ND	0.55	0.48	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Sodium	79	110	53	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Thallium	ND	2.7	0.91	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Vanadium	13	1.1	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH
Zinc	21	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:45	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-3-4 | Sampled: 4/7/2015 09:00

Sample ID: 15D0541-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.46	0.41	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.18	0.096	mg/Kg dry	1		SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	90.0			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-4-5 | Sampled: 4/7/2015 09:05

Sample ID: 15D0541-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	2.9	1.3	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Antimony	2.5	2.9	2.4	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Arsenic	ND	2.9	1.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Barium	32	2.9	0.37	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Beryllium	0.20	0.29	0.047	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Cadmium	ND	0.29	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Calcium	5400	8.8	1.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Chromium	9.9	0.59	0.15	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Cobalt	4.5	2.9	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Copper	8.5	0.59	0.45	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Iron	9300	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Lead	3.3	0.88	0.17	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Magnesium	3700	8.8	0.92	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Manganese	140	0.59	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Mercury	ND	0.029	0.0042	mg/Kg dry	1		SW-846 7471B	4/20/15	4/21/15 11:50	SCB
Nickel	6.9	0.59	0.14	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Potassium	820	120	20	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Selenium	2.6	2.9	0.90	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Silver	ND	0.59	0.52	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Sodium	72	120	57	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Thallium	ND	2.9	0.97	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Vanadium	11	1.2	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH
Zinc	19	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:49	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB625-4-5 | Sampled: 4/7/2015 09:05

Sample ID: 15D0541-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	0.15	0.19	0.10	mg/Kg dry	1	J	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	83.3			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-5-6 | Sampled: 4/7/2015 09:45

Sample ID: 15D0541-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8600	11	4.9	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Antimony	ND	11	9.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Arsenic	ND	11	4.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Barium	120	11	1.4	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Beryllium	0.45	1.1	0.18	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Cadmium	ND	1.1	0.67	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Calcium	5500	34	6.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Chromium	32	2.3	0.57	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Cobalt	14	11	0.73	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Copper	64	2.3	1.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Iron	12000	11	9.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Lead	6.9	3.4	0.67	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Magnesium	4100	34	3.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Manganese	130	2.3	0.72	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Mercury	0.043	0.11	0.015	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 11:52	SCB
Nickel	120	2.3	0.55	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Potassium	710	450	78	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Selenium	5.2	11	3.5	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Silver	ND	2.3	2.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Sodium	ND	450	220	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Thallium	ND	11	3.8	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Vanadium	22	4.5	0.75	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH
Zinc	55	4.5	1.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:53	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-5-6 | Sampled: 4/7/2015 09:45

Sample ID: 15D0541-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.7	1.5	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	2.7	3.5	1.9	mg/Kg dry	5	W-06, J	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	22.9			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-10-11 | Sampled: 4/7/2015 10:00

Sample ID: 15D0541-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7900	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Antimony	4.3	3.0	2.4	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Arsenic	ND	3.0	1.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Barium	67	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Beryllium	0.53	0.30	0.049	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Cadmium	ND	0.30	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Calcium	4300	9.1	1.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Chromium	16	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Cobalt	9.0	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Copper	27	0.61	0.46	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Iron	16000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Lead	7.5	0.91	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Magnesium	5500	9.1	0.95	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Manganese	180	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Mercury	0.010	0.031	0.0045	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 11:53	SCB
Nickel	19	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Potassium	1900	120	21	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Sodium	130	120	59	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Vanadium	24	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH
Zinc	49	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 15:58	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-10-11 | Sampled: 4/7/2015 10:00

Sample ID: 15D0541-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.58	0.53	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.20	0.11	mg/Kg dry	1		SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	79.3			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-10-11-1 | Sampled: 4/7/2015 10:00

Sample ID: 15D0541-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	4.6	2.0	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Antimony	6.3	4.6	3.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Arsenic	ND	4.6	1.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Barium	86	4.6	0.57	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Beryllium	0.70	0.46	0.074	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Cadmium	ND	0.46	0.27	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Calcium	3900	14	2.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Chromium	20	0.92	0.23	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Cobalt	12	4.6	0.29	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Copper	40	0.92	0.70	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Iron	22000	4.6	3.9	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Lead	10	1.4	0.27	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Magnesium	6300	14	1.4	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Manganese	210	0.92	0.29	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Mercury	0.019	0.045	0.0065	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 11:58	SCB
Nickel	28	0.92	0.22	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Potassium	2400	180	32	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Selenium	3.3	4.6	1.4	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Silver	ND	0.92	0.81	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Sodium	150	180	90	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Thallium	ND	4.6	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Vanadium	32	1.8	0.30	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH
Zinc	69	1.8	0.48	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:02	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB618-10-11-1 | Sampled: 4/7/2015 10:00

Sample ID: 15D0541-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.72	0.64	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.30	0.16	mg/Kg dry	1		SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	53.1			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB617-11-12 | Sampled: 4/7/2015 11:25

Sample ID: 15D0541-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5700	3.0	1.3	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Antimony	5.2	3.0	2.4	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Arsenic	7.9	3.0	1.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Barium	96	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Beryllium	0.38	0.30	0.049	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Cadmium	0.33	0.30	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Calcium	7500	9.1	1.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Chromium	16	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Cobalt	11	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Copper	28	0.61	0.46	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Iron	27000	3.0	2.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Lead	10	0.91	0.18	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Magnesium	5700	9.1	0.95	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Manganese	220	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Mercury	0.015	0.032	0.0047	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:00	SCB
Nickel	14	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Potassium	1500	120	21	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Selenium	ND	3.0	0.93	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Silver	ND	0.61	0.53	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Sodium	130	120	59	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Vanadium	22	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH
Zinc	34	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:10	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB617-11-12 | Sampled: 4/7/2015 11:25

Sample ID: 15D0541-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.56	0.50	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	0.16	0.21	0.11	mg/Kg dry	1	J	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	76.5			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB16-11-12 | Sampled: 4/7/2015 11:50

Sample ID: 15D0541-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9800	8.7	3.8	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Antimony	10	8.7	7.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Arsenic	ND	8.7	3.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Barium	100	8.7	1.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Beryllium	0.57	0.87	0.14	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Cadmium	ND	0.87	0.52	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Calcium	3600	26	4.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Chromium	36	1.7	0.44	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Cobalt	18	8.7	0.56	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Copper	60	1.7	1.3	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Iron	38000	8.7	7.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Lead	10	2.6	0.52	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Magnesium	5700	26	2.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Manganese	200	1.7	0.55	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Mercury	0.036	0.078	0.011	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:01	SCB
Nickel	100	1.7	0.42	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Potassium	1600	350	60	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Selenium	8.3	8.7	2.7	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Silver	ND	1.7	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Sodium	ND	350	170	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Thallium	ND	8.7	2.9	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Vanadium	31	3.5	0.57	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH
Zinc	90	3.5	0.90	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:14	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB16-11-12 | Sampled: 4/7/2015 11:50

Sample ID: 15D0541-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.5	1.3	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	1.0	0.56	mg/Kg dry	2	W-06	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	31.0			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB616-14-15 | Sampled: 4/7/2015 12:00

Sample ID: 15D0541-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	6.1	2.6	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Antimony	8.1	6.1	4.9	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Arsenic	ND	6.1	2.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Barium	110	6.1	0.76	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Beryllium	0.80	0.61	0.099	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Cadmium	ND	0.61	0.36	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Calcium	3300	18	3.3	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Chromium	25	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Cobalt	16	6.1	0.39	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Copper	59	1.2	0.93	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Iron	25000	6.1	5.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Lead	11	1.8	0.36	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Magnesium	6100	18	1.9	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Manganese	180	1.2	0.39	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Mercury	0.032	0.060	0.0087	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:03	SCB
Nickel	61	1.2	0.30	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Potassium	2400	250	42	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Selenium	4.0	6.1	1.9	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Silver	ND	1.2	1.1	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Sodium	140	250	120	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Thallium	ND	6.1	2.0	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Vanadium	37	2.5	0.40	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH
Zinc	87	2.5	0.63	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:18	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB616-14-15 | Sampled: 4/7/2015 12:00

Sample ID: 15D0541-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.2	1.1	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.39	0.22	mg/Kg dry	1		SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	40.0			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB615-12-14 | Sampled: 4/7/2015 14:00

Sample ID: 15D0541-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	4.9	2.1	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Antimony	4.1	4.9	4.0	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Arsenic	3.0	4.9	1.8	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Barium	74	4.9	0.61	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Beryllium	0.51	0.49	0.079	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Cadmium	ND	0.49	0.29	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Calcium	6800	15	2.7	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Chromium	19	0.98	0.25	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Cobalt	11	4.9	0.31	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Copper	33	0.98	0.75	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Iron	23000	4.9	4.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Lead	8.2	1.5	0.29	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Magnesium	6500	15	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Manganese	220	0.98	0.31	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Mercury	0.020	0.052	0.0074	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:04	SCB
Nickel	27	0.98	0.24	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Potassium	1700	200	34	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Selenium	ND	4.9	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Silver	ND	0.98	0.87	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Sodium	150	200	96	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Thallium	ND	4.9	1.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Vanadium	31	2.0	0.32	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH
Zinc	47	2.0	0.51	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:23	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB615-12-14 | Sampled: 4/7/2015 14:00

Sample ID: 15D0541-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.99	0.89	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.67	0.37	mg/Kg dry	2	W-06	SW-846 7196A	4/13/15	4/14/15 13:00	LL
% Solids	47.4			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB613-15-16 | Sampled: 4/7/2015 15:05

Sample ID: 15D0541-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	9700	15	6.3	mg/Kg dry	1	B-07	SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Antimony	12	15	12	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Arsenic	ND	15	5.3	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Barium	150	15	1.8	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Beryllium	0.77	1.5	0.23	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Cadmium	ND	1.5	0.86	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Calcium	7500	44	7.9	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Chromium	45	2.9	0.73	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Cobalt	33	15	0.93	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Copper	140	2.9	2.2	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Iron	48000	15	12	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Lead	12	4.4	0.87	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Magnesium	7000	44	4.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Manganese	230	2.9	0.93	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Mercury	0.055	0.15	0.021	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:06	SCB
Nickel	210	2.9	0.71	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Potassium	1500	580	100	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Selenium	15	15	4.5	mg/Kg dry	1	J	SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Silver	ND	2.9	2.6	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Sodium	ND	580	280	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Thallium	ND	15	4.8	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Vanadium	42	5.8	0.96	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH
Zinc	120	5.8	1.5	mg/Kg dry	1		SW-846 6010C	4/22/15	4/23/15 16:27	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB613-15-16 | Sampled: 4/7/2015 15:05

Sample ID: 15D0541-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.9	2.6	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	1.8	1.0	mg/Kg dry	2	W-06	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	16.9			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB613-19-20 | Sampled: 4/7/2015 15:20

Sample ID: 15D0541-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	10000	6.7	2.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Antimony	ND	6.7	5.4	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Arsenic	5.8	6.7	2.4	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Barium	96	6.7	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Beryllium	1.1	0.67	0.11	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Cadmium	0.81	0.67	0.39	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Calcium	3200	20	3.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Chromium	26	1.3	0.33	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Cobalt	14	6.7	0.43	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Copper	52	1.3	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Iron	28000	67	57	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 17:55	MJH
Lead	11	2.0	0.40	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Magnesium	5100	20	2.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:24	MJH
Manganese	150	1.3	0.42	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Mercury	0.028	0.065	0.0094	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:07	SCB
Nickel	67	1.3	0.32	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Potassium	1800	270	46	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Selenium	6.3	6.7	2.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 15:24	MJH
Silver	ND	1.3	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Sodium	170	270	130	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Thallium	ND	6.7	2.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:24	MJH
Vanadium	31	2.7	0.44	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH
Zinc	77	2.7	0.69	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:53	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB613-19-20 | Sampled: 4/7/2015 15:20

Sample ID: 15D0541-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	1.2	1.1	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.85	0.47	mg/Kg dry	2	W-06	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	36.9			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB721-4-5 | Sampled: 4/8/2015 08:30

Sample ID: 15D0541-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4300	3.1	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Antimony	ND	3.1	2.5	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Arsenic	2.3	3.1	1.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Barium	51	3.1	0.38	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Beryllium	0.39	0.31	0.049	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Cadmium	0.27	0.31	0.18	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Calcium	7400	9.2	1.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Chromium	9.5	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Cobalt	4.8	3.1	0.20	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Copper	12	0.61	0.47	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Iron	13000	31	26	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 18:00	MJH
Lead	3.2	0.92	0.18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Magnesium	5000	9.2	0.96	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:45	MJH
Manganese	210	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Mercury	ND	0.032	0.0046	mg/Kg dry	1		SW-846 7471B	4/20/15	4/21/15 12:08	SCB
Nickel	9.1	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Potassium	1000	120	21	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Selenium	ND	3.1	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:45	MJH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Sodium	95	120	60	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Thallium	ND	3.1	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:45	MJH
Vanadium	10	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH
Zinc	20	1.2	0.32	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 12:58	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB721-4-5 | Sampled: 4/8/2015 08:30

Sample ID: 15D0541-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.40	0.36	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	0.12	0.20	0.11	mg/Kg dry	1	J	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	80.1			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB715-6-9 | Sampled: 4/8/2015 09:45

Sample ID: 15D0541-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	6500	2.8	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Antimony	ND	2.8	2.3	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Arsenic	5.9	2.8	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Barium	47	2.8	0.35	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Beryllium	0.74	0.28	0.046	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Cadmium	0.41	0.28	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Calcium	3200	8.5	1.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Chromium	16	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Cobalt	7.4	2.8	0.18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Copper	22	0.57	0.43	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Iron	17000	28	24	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 18:04	MJH
Lead	5.0	0.85	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Magnesium	4600	8.5	0.89	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:50	MJH
Manganese	110	0.57	0.18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Mercury	0.011	0.030	0.0043	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:10	SCB
Nickel	16	0.57	0.14	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Potassium	1300	110	19	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Selenium	ND	2.8	0.87	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:50	MJH
Silver	ND	0.57	0.50	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Sodium	130	110	55	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Thallium	ND	2.8	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:50	MJH
Vanadium	29	1.1	0.19	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH
Zinc	35	1.1	0.29	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:03	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB715-6-9 | Sampled: 4/8/2015 09:45

Sample ID: 15D0541-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.59	0.53	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.18	0.10	mg/Kg dry	1		SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	84.9			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB712-5-6 | Sampled: 4/8/2015 10:25

Sample ID: 15D0541-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	4700	3.0	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Antimony	ND	3.0	2.5	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Arsenic	2.6	3.0	1.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Barium	46	3.0	0.38	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Beryllium	0.58	0.30	0.049	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Cadmium	0.30	0.30	0.18	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Calcium	28000	9.1	1.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Chromium	9.4	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Cobalt	4.9	3.0	0.19	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Copper	18	0.61	0.46	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Iron	12000	30	26	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 18:10	MJH
Lead	5.2	0.91	0.18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Magnesium	15000	9.1	0.95	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:54	MJH
Manganese	260	0.61	0.19	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Mercury	0.0070	0.030	0.0043	mg/Kg dry	1	J	SW-846 7471B	4/20/15	4/21/15 12:11	SCB
Nickel	11	0.61	0.15	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Potassium	1200	120	21	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Selenium	ND	3.0	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:54	MJH
Silver	ND	0.61	0.54	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Sodium	130	120	59	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Thallium	ND	3.0	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:54	MJH
Vanadium	14	1.2	0.20	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH
Zinc	19	1.2	0.31	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:09	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB712-5-6 | Sampled: 4/8/2015 10:25

Sample ID: 15D0541-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.50	0.45	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.19	0.11	mg/Kg dry	1		SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	81.4			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB712-8-9 | Sampled: 4/8/2015 10:30

Sample ID: 15D0541-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3400	2.7	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Antimony	ND	2.7	2.1	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Arsenic	ND	2.7	0.96	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Barium	76	2.7	0.33	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Beryllium	0.31	0.27	0.043	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Cadmium	0.24	0.27	0.16	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Calcium	26000	8.0	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Chromium	4.7	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Cobalt	4.2	2.7	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Copper	18	0.53	0.40	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Iron	9500	27	23	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 18:14	MJH
Lead	1.9	0.80	0.16	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Magnesium	11000	8.0	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:58	MJH
Manganese	480	0.53	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Mercury	ND	0.027	0.0039	mg/Kg dry	1		SW-846 7471B	4/20/15	4/21/15 12:17	SCB
Nickel	6.4	0.53	0.13	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Potassium	1100	110	18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Selenium	ND	2.7	0.82	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:58	MJH
Silver	ND	0.53	0.47	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Sodium	71	110	52	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Thallium	ND	2.7	0.88	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:58	MJH
Vanadium	6.4	1.1	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH
Zinc	13	1.1	0.27	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:14	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: BRSB712-8-9 | Sampled: 4/8/2015 10:30

Sample ID: 15D0541-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.39	0.35	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	0.17	0.095	mg/Kg dry	1		SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	89.8			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-5-7 | Sampled: 4/8/2015 14:10

Sample ID: 15D0541-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3300	21	9.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Antimony	ND	21	17	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Arsenic	ND	21	7.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Barium	220	21	2.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Beryllium	1.4	2.1	0.34	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Cadmium	1.7	2.1	1.3	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Calcium	22000	64	12	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Chromium	23	4.3	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Cobalt	16	21	1.4	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Copper	94	4.3	3.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Iron	24000	21	18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Lead	4.7	6.4	1.3	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Magnesium	4900	64	6.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:02	MJH
Manganese	440	4.3	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Mercury	0.049	0.21	0.031	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:23	SCB
Nickel	180	4.3	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Potassium	480	850	150	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Selenium	ND	21	6.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:02	MJH
Silver	ND	4.3	3.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Sodium	ND	850	420	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Thallium	ND	21	7.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:02	MJH
Vanadium	44	8.5	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH
Zinc	43	8.5	2.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:20	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-5-7 | Sampled: 4/8/2015 14:10

Sample ID: 15D0541-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.4	3.0	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	6.7	7.1	3.9	mg/Kg dry	5	W-06, J	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	11.0			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-8-10 | Sampled: 4/8/2015 14:15

Sample ID: 15D0541-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	1900	21	9.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Antimony	ND	21	17	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Arsenic	ND	21	7.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Barium	170	21	2.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Beryllium	0.87	2.1	0.34	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Cadmium	ND	2.1	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Calcium	19000	63	11	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Chromium	11	4.2	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Cobalt	6.7	21	1.3	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Copper	41	4.2	3.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Iron	11000	21	18	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Lead	1.8	6.3	1.2	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Magnesium	4500	63	6.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:06	MJH
Manganese	360	4.2	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Mercury	ND	0.22	0.031	mg/Kg dry	1		SW-846 7471B	4/21/15	4/22/15 10:24	SCB
Nickel	92	4.2	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Potassium	350	840	140	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Selenium	ND	21	6.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:06	MJH
Silver	ND	4.2	3.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Sodium	ND	840	410	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Thallium	ND	21	6.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:06	MJH
Vanadium	19	8.4	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH
Zinc	25	8.4	2.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:25	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-8-10 | Sampled: 4/8/2015 14:15

Sample ID: 15D0541-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	4.2	3.8	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	14	7.6	mg/Kg dry	10	W-06	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	11.3			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-19-21 | Sampled: 4/8/2015 14:20

Sample ID: 15D0541-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7400	14	6.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Antimony	ND	14	11	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Arsenic	ND	14	5.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Barium	130	14	1.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Beryllium	0.67	1.4	0.22	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Cadmium	1.0	1.4	0.82	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Calcium	7100	42	7.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Chromium	19	2.8	0.69	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Cobalt	10	14	0.89	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Copper	52	2.8	2.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Iron	11000	14	12	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Lead	4.4	4.2	0.82	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Magnesium	3200	42	4.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:09	MJH
Manganese	150	2.8	0.88	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Mercury	0.043	0.14	0.020	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:26	SCB
Nickel	77	2.8	0.67	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Potassium	550	550	95	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Selenium	8.3	14	4.3	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 16:09	MJH
Silver	ND	2.8	2.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Sodium	ND	550	270	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Thallium	ND	14	4.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:09	MJH
Vanadium	16	5.5	0.91	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH
Zinc	52	5.5	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:31	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: WTSB524-19-21 | Sampled: 4/8/2015 14:20

Sample ID: 15D0541-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.4	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	9.2	5.1	mg/Kg dry	10	W-06	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	17.2			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-4-7 | Sampled: 4/8/2015 14:25

Sample ID: 15D0541-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7800	19	8.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Antimony	ND	19	15	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Arsenic	ND	19	6.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Barium	360	19	2.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Beryllium	1.4	1.9	0.30	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Cadmium	1.5	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Calcium	17000	57	10	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Chromium	49	3.8	0.95	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Cobalt	8.4	19	1.2	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Copper	120	3.8	2.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Iron	12000	19	16	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Lead	20	5.7	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Magnesium	4500	57	5.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:14	MJH
Manganese	310	3.8	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Mercury	0.11	0.18	0.026	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:27	SCB
Nickel	140	3.8	0.92	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Potassium	720	760	130	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Selenium	ND	19	5.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:14	MJH
Silver	ND	3.8	3.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Sodium	540	760	370	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Thallium	ND	19	6.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:14	MJH
Vanadium	42	7.6	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH
Zinc	45	7.6	1.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 13:36	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-4-7 | Sampled: 4/8/2015 14:25

Sample ID: 15D0541-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	3.9	3.5	mg/Kg dry	1		SW-846 9014	4/15/15	4/15/15 18:30	ABH
Hexavalent Chromium	ND	12	6.7	mg/Kg dry	10	W-06	SW-846 7196A	4/14/15	4/15/15 11:00	LL
% Solids	12.9			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-7-10 | Sampled: 4/8/2015 14:40

Sample ID: 15D0541-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	3200	14	6.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Antimony	ND	14	12	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Arsenic	ND	14	5.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Barium	260	14	1.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Beryllium	1.1	1.4	0.23	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Cadmium	1.5	1.4	0.85	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Calcium	18000	43	7.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Chromium	29	2.9	0.72	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Cobalt	11	14	0.92	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Copper	130	2.9	2.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Iron	9800	14	12	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Lead	1.9	4.3	0.86	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Magnesium	5200	43	4.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:17	MJH
Manganese	110	2.9	0.92	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Mercury	0.046	0.14	0.021	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:29	SCB
Nickel	240	2.9	0.70	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Potassium	400	580	99	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Selenium	ND	14	4.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:17	MJH
Silver	ND	2.9	2.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Sodium	310	580	280	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Thallium	ND	14	4.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:17	MJH
Vanadium	33	5.8	0.95	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH
Zinc	24	5.8	1.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:01	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-7-10 | Sampled: 4/8/2015 14:40

Sample ID: 15D0541-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.7	2.4	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	1.0	1.8	1.0	mg/Kg dry	2	MS-16, W-06, J	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	17.2			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-19-21 | Sampled: 4/8/2015 14:45

Sample ID: 15D0541-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5400	17	7.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Antimony	ND	17	13	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Arsenic	ND	17	6.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Barium	100	17	2.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Beryllium	0.78	1.7	0.27	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Cadmium	ND	1.7	0.99	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Calcium	5600	50	9.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Chromium	31	3.3	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Cobalt	12	17	1.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Copper	97	3.3	2.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Iron	9700	17	14	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Lead	4.4	5.0	0.99	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Magnesium	3200	50	5.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:21	MJH
Manganese	83	3.3	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Mercury	0.039	0.16	0.024	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:34	SCB
Nickel	160	3.3	0.81	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Potassium	680	670	110	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Selenium	5.4	17	5.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 16:21	MJH
Silver	ND	3.3	2.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Sodium	ND	670	330	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Thallium	ND	17	5.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:21	MJH
Vanadium	14	6.7	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH
Zinc	57	6.7	1.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:25	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB609-19-21 | Sampled: 4/8/2015 14:45

Sample ID: 15D0541-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.0	2.6	2.4	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	5.4	3.0	mg/Kg dry	5	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	14.7			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-4-7 | Sampled: 4/8/2015 14:55

Sample ID: 15D0541-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	19000	9.1	3.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Antimony	ND	9.1	7.3	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Arsenic	4.7	9.1	3.3	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Barium	520	9.1	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Beryllium	1.4	0.91	0.15	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Cadmium	1.1	0.91	0.54	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Calcium	8600	27	4.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Chromium	64	1.8	0.45	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Cobalt	13	9.1	0.58	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Copper	44	1.8	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Iron	9000	9.1	7.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Lead	11	2.7	0.54	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Magnesium	3100	27	2.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:41	MJH
Manganese	170	1.8	0.58	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Mercury	0.081	0.090	0.013	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:35	SCB
Nickel	120	1.8	0.44	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Potassium	630	360	62	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Selenium	ND	9.1	2.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:41	MJH
Silver	ND	1.8	1.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Sodium	220	360	180	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Thallium	ND	9.1	3.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:41	MJH
Vanadium	32	3.6	0.60	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH
Zinc	22	3.6	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:30	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-4-7 | Sampled: 4/8/2015 14:55

Sample ID: 15D0541-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.7	1.4	1.2	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	6.1	3.4	mg/Kg dry	10	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	26.1			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-7-10 | Sampled: 4/8/2015 15:00

Sample ID: 15D0541-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	12000	13	5.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Antimony	ND	13	10	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Arsenic	ND	13	4.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Barium	290	13	1.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Beryllium	1.2	1.3	0.21	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Cadmium	0.86	1.3	0.77	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Calcium	11000	39	7.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Chromium	57	2.6	0.65	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Cobalt	12	13	0.83	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Copper	57	2.6	2.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Iron	6900	13	11	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Lead	6.2	3.9	0.77	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Magnesium	3200	39	4.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:46	MJH
Manganese	110	2.6	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Mercury	0.065	0.13	0.019	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:37	SCB
Nickel	120	2.6	0.63	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Potassium	480	520	89	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Selenium	ND	13	4.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:46	MJH
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Sodium	ND	520	250	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Thallium	ND	13	4.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:46	MJH
Vanadium	28	5.2	0.86	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH
Zinc	17	5.2	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:35	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-7-10 | Sampled: 4/8/2015 15:00

Sample ID: 15D0541-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.5	2.3	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	4.3	2.4	mg/Kg dry	5	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	18.6			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-19-21 | Sampled: 4/8/2015 15:10

Sample ID: 15D0541-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7600	13	5.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Antimony	ND	13	10	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Arsenic	ND	13	4.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Barium	120	13	1.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Beryllium	0.79	1.3	0.21	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Cadmium	0.91	1.3	0.77	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Calcium	4800	39	7.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Chromium	23	2.6	0.65	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Cobalt	13	13	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Copper	67	2.6	2.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Iron	13000	13	11	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Lead	4.8	3.9	0.77	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Magnesium	3400	39	4.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:49	MJH
Manganese	110	2.6	0.83	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Mercury	0.048	0.13	0.019	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:38	SCB
Nickel	110	2.6	0.63	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Potassium	890	520	89	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Selenium	4.3	13	4.0	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 16:49	MJH
Silver	ND	2.6	2.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Sodium	ND	520	250	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Thallium	ND	13	4.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:49	MJH
Vanadium	17	5.2	0.86	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH
Zinc	60	5.2	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:41	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB611-19-21 | Sampled: 4/8/2015 15:10

Sample ID: 15D0541-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	2.4	2.6	2.3	mg/Kg dry	1	J	SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	4.7	8.5	4.7	mg/Kg dry	10	W-06, J	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	18.5			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB603-4-7 | Sampled: 4/8/2015 15:40

Sample ID: 15D0541-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	8500	19	8.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Antimony	ND	19	16	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Arsenic	10	19	7.0	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Barium	130	19	2.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Beryllium	1.3	1.9	0.31	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Cadmium	1.4	1.9	1.1	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Calcium	8000	58	11	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Chromium	31	3.9	0.97	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Cobalt	19	19	1.2	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Copper	130	3.9	3.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Iron	33000	19	17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Lead	9.0	5.8	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Magnesium	4500	58	6.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:54	MJH
Manganese	180	3.9	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Mercury	0.048	0.18	0.026	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:40	SCB
Nickel	240	3.9	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Potassium	1400	780	130	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Selenium	11	19	6.0	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 16:54	MJH
Silver	ND	3.9	3.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Sodium	430	780	380	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Thallium	ND	19	6.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:54	MJH
Vanadium	34	7.8	1.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH
Zinc	84	7.8	2.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:46	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB603-4-7 | Sampled: 4/8/2015 15:40

Sample ID: 15D0541-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	3.5	3.5	3.2	mg/Kg dry	1	J	SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	6.2	3.4	mg/Kg dry	5	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	12.8			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB603-19-21 | Sampled: 4/8/2015 15:45

Sample ID: 15D0541-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	7300	3.3	1.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Antimony	ND	3.3	2.7	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Arsenic	4.1	3.3	1.2	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Barium	63	3.3	0.42	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Beryllium	0.64	0.33	0.054	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Cadmium	0.38	0.33	0.20	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Calcium	2700	10	1.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Chromium	14	0.67	0.17	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Cobalt	8.1	3.3	0.21	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Copper	19	0.67	0.51	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Iron	19000	33	28	mg/Kg dry	10		SW-846 6010C	4/21/15	4/23/15 18:18	MJH
Lead	5.9	1.0	0.20	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Magnesium	3900	10	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:59	MJH
Manganese	160	0.67	0.21	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Mercury	0.0089	0.033	0.0048	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:41	SCB
Nickel	16	0.67	0.16	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Potassium	1800	130	23	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Selenium	ND	3.3	1.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:59	MJH
Silver	ND	0.67	0.59	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Sodium	160	130	65	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Thallium	ND	3.3	1.1	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 16:59	MJH
Vanadium	20	1.3	0.22	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH
Zinc	35	1.3	0.34	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 14:52	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB603-19-21 | Sampled: 4/8/2015 15:45

Sample ID: 15D0541-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.42	0.38	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	0.21	0.12	mg/Kg dry	1		SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	74.2			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB605-4-7 | Sampled: 4/8/2015 16:15

Sample ID: 15D0541-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	20000	5.5	2.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Antimony	5.4	5.5	4.4	mg/Kg dry	1	B-05, J	SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Arsenic	4.4	5.5	2.0	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Barium	650	5.5	0.69	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Beryllium	1.3	0.55	0.089	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Cadmium	0.75	0.55	0.33	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Calcium	4900	17	3.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Chromium	65	1.1	0.28	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Cobalt	10	5.5	0.35	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Copper	26	1.1	0.84	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Iron	9800	5.5	4.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Lead	9.8	1.7	0.33	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Magnesium	3100	17	1.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 17:03	MJH
Manganese	120	1.1	0.35	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Mercury	0.061	0.055	0.0079	mg/Kg dry	1		SW-846 7471B	4/21/15	4/22/15 10:43	SCB
Nickel	82	1.1	0.27	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Potassium	620	220	38	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Selenium	ND	5.5	1.7	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 17:03	MJH
Silver	ND	1.1	0.97	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Sodium	170	220	110	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Thallium	ND	5.5	1.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 17:03	MJH
Vanadium	28	2.2	0.36	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH
Zinc	29	2.2	0.57	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:17	MJH

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB605-4-7 | Sampled: 4/8/2015 16:15

Sample ID: 15D0541-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.90	0.81	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	1.8	0.97	mg/Kg dry	5	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	44.2			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB605-19-21 | Sampled: 4/8/2015 16:20

Sample ID: 15D0541-29

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aluminum	5800	15	6.4	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Antimony	ND	15	12	mg/Kg dry	1	B-05	SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Arsenic	ND	15	5.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Barium	100	15	1.8	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Beryllium	0.84	1.5	0.24	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Cadmium	ND	1.5	0.87	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Calcium	5100	44	8.0	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Chromium	23	3.0	0.74	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Cobalt	13	15	0.95	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Copper	71	3.0	2.3	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Iron	11000	15	13	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Lead	4.8	4.4	0.88	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Magnesium	3300	44	4.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 17:07	MJH
Manganese	110	3.0	0.94	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Mercury	0.036	0.14	0.020	mg/Kg dry	1	J	SW-846 7471B	4/21/15	4/22/15 10:44	SCB
Nickel	130	3.0	0.72	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Potassium	710	590	100	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Selenium	7.9	15	4.6	mg/Kg dry	1	J	SW-846 6010C	4/21/15	4/22/15 17:07	MJH
Silver	ND	3.0	2.6	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Sodium	ND	590	290	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Thallium	ND	15	4.9	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 17:07	MJH
Vanadium	16	5.9	0.97	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH
Zinc	69	5.9	1.5	mg/Kg dry	1		SW-846 6010C	4/21/15	4/22/15 15:22	MJH

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Cortlandt NY | Sample Description: | Work Order: 15D0541

Date Received: 4/10/2015

Field Sample #: PASB605-19-21 | Sampled: 4/8/2015 16:20

Sample ID: 15D0541-29

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	2.2	2.0	mg/Kg dry	1		SW-846 9014	4/16/15	4/17/15 15:30	ABH
Hexavalent Chromium	ND	4.7	2.6	mg/Kg dry	5	W-06	SW-846 7196A	4/17/15	4/20/15 11:00	LL
% Solids	16.7			% Wt	1		SM 2540G	4/22/15	4/23/15 9:57	MRL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
15D0541-01 [PASB625-1-2]	B119908	04/22/15
15D0541-02 [PASB625-3-4]	B119908	04/22/15
15D0541-03 [PASB625-4-5]	B119908	04/22/15
15D0541-04 [PASB618-5-6]	B119908	04/22/15
15D0541-05 [PASB618-10-11]	B119908	04/22/15
15D0541-06 [PASB618-10-11-1]	B119908	04/22/15
15D0541-07 [PASB617-11-12]	B119908	04/22/15
15D0541-08 [PASB16-11-12]	B119908	04/22/15
15D0541-09 [PASB616-14-15]	B119908	04/22/15
15D0541-10 [PASB615-12-14]	B119908	04/22/15
15D0541-11 [PASB613-15-16]	B119908	04/22/15
15D0541-12 [PASB613-19-20]	B119908	04/22/15
15D0541-13 [BRSB721-4-5]	B119908	04/22/15
15D0541-14 [BRSB715-6-9]	B119908	04/22/15
15D0541-15 [BRSB712-5-6]	B119908	04/22/15
15D0541-16 [BRSB712-8-9]	B119908	04/22/15
15D0541-17 [WTSB524-5-7]	B119908	04/22/15
15D0541-18 [WTSB524-8-10]	B119908	04/22/15
15D0541-19 [WTSB524-19-21]	B119908	04/22/15
15D0541-20 [PASB609-4-7]	B119908	04/22/15
15D0541-21 [PASB609-7-10]	B119908	04/22/15
15D0541-22 [PASB609-19-21]	B119908	04/22/15
15D0541-23 [PASB611-4-7]	B119908	04/22/15
15D0541-24 [PASB611-7-10]	B119908	04/22/15
15D0541-25 [PASB611-19-21]	B119908	04/22/15
15D0541-26 [PASB603-4-7]	B119908	04/22/15
15D0541-27 [PASB603-19-21]	B119908	04/22/15
15D0541-28 [PASB605-4-7]	B119908	04/22/15
15D0541-29 [PASB605-19-21]	B119908	04/22/15

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-12 [PASB613-19-20]	B119837	1.01	50.0	04/21/15
15D0541-13 [BRSB721-4-5]	B119837	1.02	50.0	04/21/15
15D0541-14 [BRSB715-6-9]	B119837	1.04	50.0	04/21/15
15D0541-15 [BRSB712-5-6]	B119837	1.01	50.0	04/21/15
15D0541-16 [BRSB712-8-9]	B119837	1.05	50.0	04/21/15
15D0541-17 [WTSB524-5-7]	B119837	1.06	50.0	04/21/15
15D0541-18 [WTSB524-8-10]	B119837	1.06	50.0	04/21/15
15D0541-19 [WTSB524-19-21]	B119837	1.05	50.0	04/21/15
15D0541-20 [PASB609-4-7]	B119837	1.02	50.0	04/21/15
15D0541-21 [PASB609-7-10]	B119837	1.01	50.0	04/21/15
15D0541-22 [PASB609-19-21]	B119837	1.02	50.0	04/21/15
15D0541-23 [PASB611-4-7]	B119837	1.05	50.0	04/21/15
15D0541-24 [PASB611-7-10]	B119837	1.03	50.0	04/21/15
15D0541-25 [PASB611-19-21]	B119837	1.04	50.0	04/21/15
15D0541-26 [PASB603-4-7]	B119837	1.01	50.0	04/21/15
15D0541-27 [PASB603-19-21]	B119837	1.01	50.0	04/21/15
15D0541-28 [PASB605-4-7]	B119837	1.03	50.0	04/21/15
15D0541-29 [PASB605-19-21]	B119837	1.01	50.0	04/21/15

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-01 [PASB625-1-2]	B119947	1.03	50.0	04/22/15
15D0541-02 [PASB625-3-4]	B119947	1.02	50.0	04/22/15
15D0541-03 [PASB625-4-5]	B119947	1.02	50.0	04/22/15
15D0541-04 [PASB618-5-6]	B119947	0.962	50.0	04/22/15
15D0541-05 [PASB618-10-11]	B119947	1.04	50.0	04/22/15
15D0541-06 [PASB618-10-11-1]	B119947	1.02	50.0	04/22/15
15D0541-07 [PASB617-11-12]	B119947	1.08	50.0	04/22/15
15D0541-08 [PASB16-11-12]	B119947	0.923	50.0	04/22/15
15D0541-09 [PASB616-14-15]	B119947	1.02	50.0	04/22/15
15D0541-10 [PASB615-12-14]	B119947	1.07	50.0	04/22/15
15D0541-11 [PASB613-15-16]	B119947	1.01	50.0	04/22/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-01 [PASB625-1-2]	B119102	2.57	100	04/13/15
15D0541-02 [PASB625-3-4]	B119102	2.54	100	04/13/15
15D0541-03 [PASB625-4-5]	B119102	2.52	100	04/13/15
15D0541-04 [PASB618-5-6]	B119102	2.50	100	04/13/15
15D0541-05 [PASB618-10-11]	B119102	2.55	100	04/13/15
15D0541-06 [PASB618-10-11-1]	B119102	2.52	100	04/13/15
15D0541-07 [PASB617-11-12]	B119102	2.51	100	04/13/15
15D0541-08 [PASB16-11-12]	B119102	2.55	100	04/13/15
15D0541-09 [PASB616-14-15]	B119102	2.55	100	04/13/15
15D0541-10 [PASB615-12-14]	B119102	2.51	100	04/13/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-11 [PASB613-15-16]	B119230	2.58	100	04/14/15
15D0541-12 [PASB613-19-20]	B119230	2.55	100	04/14/15
15D0541-13 [BRSB721-4-5]	B119230	2.53	100	04/14/15
15D0541-14 [BRSB715-6-9]	B119230	2.57	100	04/14/15
15D0541-15 [BRSB712-5-6]	B119230	2.53	100	04/14/15
15D0541-16 [BRSB712-8-9]	B119230	2.58	100	04/14/15
15D0541-17 [WTSB524-5-7]	B119230	2.58	100	04/14/15
15D0541-18 [WTSB524-8-10]	B119230	2.58	100	04/14/15
15D0541-19 [WTSB524-19-21]	B119230	2.53	100	04/14/15
15D0541-20 [PASB609-4-7]	B119230	2.56	100	04/14/15

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-21 [PASB609-7-10]	B119556	2.52	100	04/17/15
15D0541-22 [PASB609-19-21]	B119556	2.51	100	04/17/15
15D0541-23 [PASB611-4-7]	B119556	2.51	100	04/17/15
15D0541-24 [PASB611-7-10]	B119556	2.51	100	04/17/15
15D0541-25 [PASB611-19-21]	B119556	2.54	100	04/17/15
15D0541-26 [PASB603-4-7]	B119556	2.54	100	04/17/15
15D0541-27 [PASB603-19-21]	B119556	2.52	100	04/17/15
15D0541-28 [PASB605-4-7]	B119556	2.55	100	04/17/15

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Sample Extraction Data

SW-846 7196A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-29 [PASB605-19-21]	B119556	2.55	100	04/17/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-01 [PASB625-1-2]	B119696	0.609	50.0	04/20/15
15D0541-02 [PASB625-3-4]	B119696	0.620	50.0	04/20/15
15D0541-03 [PASB625-4-5]	B119696	0.615	50.0	04/20/15
15D0541-04 [PASB618-5-6]	B119696	0.621	50.0	04/20/15
15D0541-05 [PASB618-10-11]	B119696	0.605	50.0	04/20/15
15D0541-06 [PASB618-10-11-1]	B119696	0.629	50.0	04/20/15
15D0541-07 [PASB617-11-12]	B119696	0.605	50.0	04/20/15
15D0541-08 [PASB16-11-12]	B119696	0.623	50.0	04/20/15
15D0541-09 [PASB616-14-15]	B119696	0.624	50.0	04/20/15
15D0541-10 [PASB615-12-14]	B119696	0.612	50.0	04/20/15
15D0541-11 [PASB613-15-16]	B119696	0.612	50.0	04/20/15
15D0541-12 [PASB613-19-20]	B119696	0.622	50.0	04/20/15
15D0541-13 [BRSB721-4-5]	B119696	0.591	50.0	04/20/15
15D0541-14 [BRSB715-6-9]	B119696	0.597	50.0	04/20/15
15D0541-15 [BRSB712-5-6]	B119696	0.611	50.0	04/20/15
15D0541-16 [BRSB712-8-9]	B119696	0.624	50.0	04/20/15

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-17 [WTSB524-5-7]	B119807	0.638	50.0	04/21/15
15D0541-18 [WTSB524-8-10]	B119807	0.610	50.0	04/21/15
15D0541-19 [WTSB524-19-21]	B119807	0.638	50.0	04/21/15
15D0541-20 [PASB609-4-7]	B119807	0.644	50.0	04/21/15
15D0541-21 [PASB609-7-10]	B119807	0.607	50.0	04/21/15
15D0541-22 [PASB609-19-21]	B119807	0.619	50.0	04/21/15
15D0541-23 [PASB611-4-7]	B119807	0.642	50.0	04/21/15
15D0541-24 [PASB611-7-10]	B119807	0.609	50.0	04/21/15
15D0541-25 [PASB611-19-21]	B119807	0.622	50.0	04/21/15
15D0541-26 [PASB603-4-7]	B119807	0.643	50.0	04/21/15
15D0541-27 [PASB603-19-21]	B119807	0.611	50.0	04/21/15
15D0541-28 [PASB605-4-7]	B119807	0.617	50.0	04/21/15
15D0541-29 [PASB605-19-21]	B119807	0.638	50.0	04/21/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-01 [PASB625-1-2]	B119362	1.16	50.0	04/15/15
15D0541-02 [PASB625-3-4]	B119362	1.21	50.0	04/15/15
15D0541-03 [PASB625-4-5]	B119362	1.02	50.0	04/15/15
15D0541-04 [PASB618-5-6]	B119362	1.29	50.0	04/15/15
15D0541-05 [PASB618-10-11]	B119362	1.08	50.0	04/15/15
15D0541-06 [PASB618-10-11-1]	B119362	1.31	50.0	04/15/15
15D0541-07 [PASB617-11-12]	B119362	1.17	50.0	04/15/15
15D0541-08 [PASB16-11-12]	B119362	1.08	50.0	04/15/15
15D0541-09 [PASB616-14-15]	B119362	1.00	50.0	04/15/15

con-test® ANALYTICAL LABORATORY
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Sample Extraction Data

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-10 [PASB615-12-14]	B119362	1.07	50.0	04/15/15
15D0541-11 [PASB613-15-16]	B119362	1.02	50.0	04/15/15
15D0541-12 [PASB613-19-20]	B119362	1.14	50.0	04/15/15
15D0541-13 [BRSB721-4-5]	B119362	1.54	50.0	04/15/15
15D0541-14 [BRSB715-6-9]	B119362	1.00	50.0	04/15/15
15D0541-15 [BRSB712-5-6]	B119362	1.23	50.0	04/15/15
15D0541-16 [BRSB712-8-9]	B119362	1.42	50.0	04/15/15
15D0541-17 [WTSB524-5-7]	B119362	1.35	50.0	04/15/15
15D0541-18 [WTSB524-8-10]	B119362	1.05	50.0	04/15/15
15D0541-19 [WTSB524-19-21]	B119362	1.08	50.0	04/15/15
15D0541-20 [PASB609-4-7]	B119362	1.01	50.0	04/15/15

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
15D0541-21 [PASB609-7-10]	B119468	1.08	50.0	04/16/15
15D0541-22 [PASB609-19-21]	B119468	1.29	50.0	04/16/15
15D0541-23 [PASB611-4-7]	B119468	1.38	50.0	04/16/15
15D0541-24 [PASB611-7-10]	B119468	1.06	50.0	04/16/15
15D0541-25 [PASB611-19-21]	B119468	1.04	50.0	04/16/15
15D0541-26 [PASB603-4-7]	B119468	1.10	50.0	04/16/15
15D0541-27 [PASB603-19-21]	B119468	1.62	50.0	04/16/15
15D0541-28 [PASB605-4-7]	B119468	1.25	50.0	04/16/15
15D0541-29 [PASB605-19-21]	B119468	1.35	50.0	04/16/15

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B119696 - SW-846 7471										
Blank (B119696-BLK1)				Prepared: 04/20/15 Analyzed: 04/21/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B119696-BS1)				Prepared: 04/20/15 Analyzed: 04/21/15						
Mercury	7.27	0.77	mg/Kg wet	7.10		102	73.7-126.3			
LCS Dup (B119696-BSD1)				Prepared: 04/20/15 Analyzed: 04/21/15						
Mercury	7.30	0.77	mg/Kg wet	7.10		103	73.7-126.3	0.386	30	
Batch B119807 - SW-846 7471										
Blank (B119807-BLK1)				Prepared: 04/21/15 Analyzed: 04/22/15						
Mercury	ND	0.025	mg/Kg wet							
LCS (B119807-BS1)				Prepared: 04/21/15 Analyzed: 04/22/15						
Mercury	6.83	0.75	mg/Kg wet	7.10		96.2	73.7-126.3			
LCS Dup (B119807-BSD1)				Prepared: 04/21/15 Analyzed: 04/22/15						
Mercury	7.67	0.76	mg/Kg wet	7.10		108	73.7-126.3	11.7	30	
Batch B119837 - SW-846 3050B										
Blank (B119837-BLK1)				Prepared: 04/21/15 Analyzed: 04/22/15						
Aluminum	ND	2.5	mg/Kg wet							
Antimony	2.8	2.5	mg/Kg wet							B-05
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	ND	7.5	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	ND	2.5	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Magnesium	ND	7.5	mg/Kg wet							
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Potassium	ND	100	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Sodium	ND	100	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.27	1.0	mg/Kg wet							J

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B119837 - SW-846 3050B											
LCS (B119837-BS1)				Prepared: 04/21/15 Analyzed: 04/22/15							
Aluminum	6680	5.0	mg/Kg wet	8100		82.4		51.2-148.1			
Antimony	103	5.0	mg/Kg wet	116		88.5		0-210.3			
Arsenic	117	5.0	mg/Kg wet	122		95.8		77.8-122.1			
Barium	154	5.0	mg/Kg wet	167		92.1		82-117.4			
Beryllium	53.9	0.50	mg/Kg wet	54.3		99.3		82.3-117.7			
Cadmium	81.5	0.50	mg/Kg wet	88.0		92.7		81.9-118.2			
Calcium	5340	15	mg/Kg wet	5920		90.2		81.9-118.2			
Chromium	94.2	1.0	mg/Kg wet	102		92.4		78.7-120.6			
Cobalt	92.4	5.0	mg/Kg wet	99.4		93.0		83-116.7			
Copper	69.4	1.0	mg/Kg wet	78.0		89.0		80.4-119.6			
Iron	12300	5.0	mg/Kg wet	15100		81.4		46.8-153			
Lead	83.6	1.5	mg/Kg wet	94.5		88.5		82.4-117.8			
Magnesium	2680	15	mg/Kg wet	3020		88.8		75.5-124.2			
Manganese	370	1.0	mg/Kg wet	401		92.2		80.8-119.2			
Nickel	50.6	1.0	mg/Kg wet	56.3		89.9		82.2-117.8			
Potassium	2300	200	mg/Kg wet	2490		92.4		69.9-130.1			
Selenium	162	5.0	mg/Kg wet	157		103		77.1-122.3			
Silver	27.8	1.0	mg/Kg wet	34.2		81.3		74.3-125.4			
Sodium	246	200	mg/Kg wet	246		99.9		69.9-130.5			
Thallium	113	5.0	mg/Kg wet	116		97.6		78.2-121.6			
Vanadium	60.9	2.0	mg/Kg wet	67.1		90.7		64.8-135.2			
Zinc	186	2.0	mg/Kg wet	207		89.9		79.7-120.8			
LCS Dup (B119837-BSD1)				Prepared: 04/21/15 Analyzed: 04/22/15							
Aluminum	6440	5.0	mg/Kg wet	8100		79.5		51.2-148.1	3.60	30	
Antimony	94.9	5.0	mg/Kg wet	116		81.8		0-210.3	7.92	30	
Arsenic	112	5.0	mg/Kg wet	122		91.9		77.8-122.1	4.20	30	
Barium	150	5.0	mg/Kg wet	167		89.6		82-117.4	2.78	30	
Beryllium	53.1	0.50	mg/Kg wet	54.3		97.8		82.3-117.7	1.50	30	
Cadmium	78.7	0.50	mg/Kg wet	88.0		89.4		81.9-118.2	3.58	30	
Calcium	5260	15	mg/Kg wet	5920		88.8		81.9-118.2	1.52	30	
Chromium	90.7	0.99	mg/Kg wet	102		88.9		78.7-120.6	3.82	30	
Cobalt	89.1	5.0	mg/Kg wet	99.4		89.7		83-116.7	3.67	30	
Copper	68.9	0.99	mg/Kg wet	78.0		88.3		80.4-119.6	0.801	30	
Iron	11700	5.0	mg/Kg wet	15100		77.7		46.8-153	4.64	30	
Lead	80.8	1.5	mg/Kg wet	94.5		85.5		82.4-117.8	3.45	30	
Magnesium	2630	15	mg/Kg wet	3020		87.2		75.5-124.2	1.86	30	
Manganese	484	0.99	mg/Kg wet	401		**121**	*	80.8-119.2	26.8	30	L-07
Nickel	48.6	0.99	mg/Kg wet	56.3		86.4		82.2-117.8	4.00	30	
Potassium	2230	200	mg/Kg wet	2490		89.4		69.9-130.1	3.34	30	
Selenium	158	5.0	mg/Kg wet	157		101		77.1-122.3	2.45	30	
Silver	26.8	0.99	mg/Kg wet	34.2		78.2		74.3-125.4	3.87	30	
Sodium	237	200	mg/Kg wet	246		96.5		69.9-130.5	3.48	30	
Thallium	107	5.0	mg/Kg wet	116		92.1		78.2-121.6	5.81	30	
Vanadium	57.8	2.0	mg/Kg wet	67.1		86.2		64.8-135.2	5.13	30	
Zinc	184	2.0	mg/Kg wet	207		88.8		79.7-120.8	1.17	30	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B119947 - SW-846 3050B										
Blank (B119947-BLK1)				Prepared: 04/22/15 Analyzed: 04/23/15						
Aluminum	3.1	2.5	mg/Kg wet							B-07
Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Calcium	2.1	7.5	mg/Kg wet							J
Chromium	ND	0.50	mg/Kg wet							
Cobalt	ND	2.5	mg/Kg wet							
Copper	ND	0.50	mg/Kg wet							
Iron	2.4	2.5	mg/Kg wet							J
Lead	0.27	0.75	mg/Kg wet							J
Magnesium	1.1	7.5	mg/Kg wet							J
Manganese	ND	0.50	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Selenium	ND	2.5	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	0.75	1.0	mg/Kg wet							J
LCS (B119947-BS1)				Prepared: 04/22/15 Analyzed: 04/23/15						
Aluminum	6050	4.9	mg/Kg wet	8100		74.7	51.2-148.1			
Antimony	113	4.9	mg/Kg wet	116		97.1	0-210.3			
Arsenic	114	4.9	mg/Kg wet	122		93.4	77.8-122.1			
Barium	152	4.9	mg/Kg wet	167		90.8	82-117.4			
Beryllium	52.9	0.49	mg/Kg wet	54.3		97.5	82.3-117.7			
Cadmium	83.8	0.49	mg/Kg wet	88.0		95.2	81.9-118.2			
Calcium	5330	15	mg/Kg wet	5920		90.0	81.9-118.2			
Chromium	94.7	0.99	mg/Kg wet	102		92.8	78.7-120.6			
Cobalt	92.5	4.9	mg/Kg wet	99.4		93.0	83-116.7			
Copper	68.2	0.99	mg/Kg wet	78.0		87.5	80.4-119.6			
Iron	12200	4.9	mg/Kg wet	15100		80.6	46.8-153			
Lead	84.5	1.5	mg/Kg wet	94.5		89.4	82.4-117.8			
Magnesium	2660	15	mg/Kg wet	3020		88.0	75.5-124.2			
Manganese	378	0.99	mg/Kg wet	401		94.2	80.8-119.2			
Nickel	50.7	0.99	mg/Kg wet	56.3		90.0	82.2-117.8			
Selenium	148	4.9	mg/Kg wet	157		94.5	77.1-122.3			
Silver	28.9	0.99	mg/Kg wet	34.2		84.5	74.3-125.4			
Thallium	106	4.9	mg/Kg wet	116		91.0	78.2-121.6			
Vanadium	64.2	2.0	mg/Kg wet	67.1		95.7	64.8-135.2			
Zinc	193	2.0	mg/Kg wet	207		93.3	79.7-120.8			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B119947 - SW-846 3050B										
LCS Dup (B119947-BSD1)				Prepared: 04/22/15 Analyzed: 04/23/15						
Aluminum	6610	5.0	mg/Kg wet	8100		81.7	51.2-148.1	8.88	30	
Antimony	118	5.0	mg/Kg wet	116		102	0-210.3	4.60	30	
Arsenic	126	5.0	mg/Kg wet	122		103	77.8-122.1	9.71	30	
Barium	166	5.0	mg/Kg wet	167		99.4	82-117.4	9.02	30	
Beryllium	59.2	0.50	mg/Kg wet	54.3		109	82.3-117.7	11.1	30	
Cadmium	90.5	0.50	mg/Kg wet	88.0		103	81.9-118.2	7.69	30	
Calcium	5890	15	mg/Kg wet	5920		99.5	81.9-118.2	10.0	30	
Chromium	103	1.0	mg/Kg wet	102		101	78.7-120.6	8.19	30	
Cobalt	100	5.0	mg/Kg wet	99.4		101	83-116.7	8.19	30	
Copper	73.2	1.0	mg/Kg wet	78.0		93.9	80.4-119.6	7.02	30	
Iron	13800	5.0	mg/Kg wet	15100		91.7	46.8-153	12.9	30	
Lead	93.7	1.5	mg/Kg wet	94.5		99.2	82.4-117.8	10.4	30	
Magnesium	2970	15	mg/Kg wet	3020		98.5	75.5-124.2	11.3	30	
Manganese	411	1.0	mg/Kg wet	401		102	80.8-119.2	8.39	30	
Nickel	54.6	1.0	mg/Kg wet	56.3		97.0	82.2-117.8	7.46	30	
Selenium	164	5.0	mg/Kg wet	157		104	77.1-122.3	9.80	30	
Silver	30.6	1.0	mg/Kg wet	34.2		89.4	74.3-125.4	5.70	30	
Thallium	113	5.0	mg/Kg wet	116		97.0	78.2-121.6	6.35	30	
Vanadium	69.9	2.0	mg/Kg wet	67.1		104	64.8-135.2	8.47	30	
Zinc	214	2.0	mg/Kg wet	207		103	79.7-120.8	10.1	30	
MRL Check (B119947-MRL1)				Prepared: 04/22/15 Analyzed: 04/23/15						
Lead	0.918	0.74	mg/Kg wet	0.739		**124** *	80-120			L-10

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B119102 - SW-846 7196A											
Blank (B119102-BLK1)				Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B119102-BS1)				Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	53	2.0	mg/Kg wet	58.8		90.3		80-120			
LCS Dup (B119102-BSD1)				Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	52	2.0	mg/Kg wet	58.5		89.3		80-120	1.74	20	
Matrix Spike (B119102-MS1) Soluble MS	**Source: 15D0541-01**			Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	26	0.90	mg/Kg dry	0.0449	0.14	**59000**	*	75-125			MS-16
Matrix Spike (B119102-MS2) PDMS	**Source: 15D0541-01**			Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	23	1.8	mg/Kg dry	0.0454	0.14	**51200**	*	75-125			MS-16
Matrix Spike (B119102-MS3) Insoluble MS	**Source: 15D0541-01**			Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	660	18	mg/Kg dry	729	0.14	89.9		75-125			
Matrix Spike Dup (B119102-MSD1) Soluble MS Dup	**Source: 15D0541-01**			Prepared: 04/13/15 Analyzed: 04/14/15							
Hexavalent Chromium	27	0.92	mg/Kg dry	0.0459	0.14	**59600**	*	75-125	3.20	35	MS-16
Batch B119230 - SW-846 7196A											
Blank (B119230-BLK1)				Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	ND	0.16	mg/Kg wet								
LCS (B119230-BS1)				Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	49	1.8	mg/Kg wet	54.9		88.5		80-120			
LCS Dup (B119230-BSD1)				Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	51	2.0	mg/Kg wet	58.5		87.5		80-120	5.10	20	
Matrix Spike (B119230-MS1) Soluble MS	**Source: 15D0541-11**			Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	78	4.6	mg/Kg dry	232	ND	**33.8**	*	75-125			W-06
Matrix Spike (B119230-MS2) PDMS	**Source: 15D0541-11**			Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	180	4.7	mg/Kg dry	234	ND	75.3		75-125			
Matrix Spike (B119230-MS3) Insoluble MS	**Source: 15D0541-11**			Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	420	95	mg/Kg dry	3780	ND	**11.2**	*	75-125			W-06
Matrix Spike Dup (B119230-MSD1) Soluble MS Dup	**Source: 15D0541-11**			Prepared: 04/14/15 Analyzed: 04/15/15							
Hexavalent Chromium	74	4.6	mg/Kg dry	229	ND	**32.5**	*	75-125	5.37	35	W-06

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B119362 - SW-846 9014										
Blank (B119362-BLK2)				Prepared & Analyzed: 04/15/15						
Cyanide	ND	0.35	mg/Kg wet							
LCS (B119362-BS1)				Prepared & Analyzed: 04/15/15						
Cyanide	66	2.5	mg/Kg wet	63.3		104	80-120			
LCS Dup (B119362-BSD1)				Prepared & Analyzed: 04/15/15						
Cyanide	65	2.5	mg/Kg wet	63.8		102	80-120	1.72	20	
Matrix Spike (B119362-MS1)	**Source: 15D0541-10**			Prepared & Analyzed: 04/15/15						
Cyanide	28	0.97	mg/Kg dry	35.1	ND	80.6	75-125			
Matrix Spike (B119362-MS2)	**Source: 15D0541-20**			Prepared & Analyzed: 04/15/15						
Cyanide	130	3.7	mg/Kg dry	135	ND	94.8	75-125			
Matrix Spike Dup (B119362-MSD1)	**Source: 15D0541-10**			Prepared & Analyzed: 04/15/15						
Cyanide	29	0.99	mg/Kg dry	35.7	ND	80.0	75-125	1.05	35	
Matrix Spike Dup (B119362-MSD2)	**Source: 15D0541-20**			Prepared & Analyzed: 04/15/15						
Cyanide	120	3.7	mg/Kg dry	134	ND	93.0	75-125	2.57	35	
Batch B119468 - SW-846 9014										
Blank (B119468-BLK1)				Prepared: 04/16/15 Analyzed: 04/17/15						
Cyanide	ND	0.32	mg/Kg wet							
LCS (B119468-BS1)				Prepared: 04/16/15 Analyzed: 04/17/15						
Cyanide	64	2.4	mg/Kg wet	60.9		105	80-120			
LCS Dup (B119468-BSD1)				Prepared: 04/16/15 Analyzed: 04/17/15						
Cyanide	63	2.4	mg/Kg wet	61.2		103	80-120	1.20	20	
Matrix Spike (B119468-MS1)	**Source: 15D0541-27**			Prepared: 04/16/15 Analyzed: 04/17/15						
Cyanide	15	0.39	mg/Kg dry	14.0	ND	107	75-125			
Matrix Spike Dup (B119468-MSD1)	**Source: 15D0541-27**			Prepared: 04/16/15 Analyzed: 04/17/15						
Cyanide	14	0.38	mg/Kg dry	13.8	ND	101	75-125	6.03	35	
Batch B119556 - SW-846 7196A										
Blank (B119556-BLK1)				Prepared: 04/17/15 Analyzed: 04/20/15						
Hexavalent Chromium	ND	0.16	mg/Kg wet							

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD		RPD Limit	Notes
Batch B119556 - SW-846 7196A												
LCS (B119556-BS1)				Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	44	1.9	mg/Kg wet	47.0		93.4		80-120				
LCS Dup (B119556-BSD1)				Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	44	1.9	mg/Kg wet	46.0		94.7		80-120	0.988		20	
Matrix Spike (B119556-MS1) Soluble MS	**Source: 15D0541-21**			Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	220	9.1	mg/Kg dry	228	1.0	96.1		75-125				
Matrix Spike (B119556-MS2) PDMS	**Source: 15D0541-21**			Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	430	9.1	mg/Kg dry	228	1.0	**186**	*	75-125				MS-16
Matrix Spike (B119556-MS3) Insoluble MS	**Source: 15D0541-21**			Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	570	92	mg/Kg dry	3700	1.0	**15.3**	*	75-125				MS-16
Matrix Spike Dup (B119556-MSD1) Soluble MS Dup	**Source: 15D0541-21**			Prepared: 04/17/15 Analyzed: 04/20/15								
Hexavalent Chromium	100	4.5	mg/Kg dry	225	1.0	**44.4**	*	75-125	**74.7**	*	35	MS-16
Batch B119908 - % Solids												
Duplicate (B119908-DUP1)	**Source: 15D0541-01**			Prepared: 04/22/15 Analyzed: 04/23/15								
% Solids	87.1		% Wt		86.4				0.807		20	
Duplicate (B119908-DUP2)	**Source: 15D0541-02**			Prepared: 04/22/15 Analyzed: 04/23/15								
% Solids	89.6		% Wt		90.0				0.445		20	
Duplicate (B119908-DUP3)	**Source: 15D0541-03**			Prepared: 04/22/15 Analyzed: 04/23/15								
% Solids	84.0		% Wt		83.3				0.837		20	
Duplicate (B119908-DUP4)	**Source: 15D0541-04**			Prepared: 04/22/15 Analyzed: 04/23/15								
% Solids	23.8		% Wt		22.9				3.85		20	

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-05	Data is not affected by elevated level in blank since sample(s) result is "Not Detected".
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
L-10	The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.
MS-16	For solid method SW846-7196A, the matrix spike is outside of control limits. pH and ORP results were indicative of reducing conditions. Reanalysis is not required. Analysis is in control based on LCS recoveries.
W-06	Elevated method reporting limit due to intense color of sample

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6010C in Soil	
Aluminum	CT,NH,NY,ME,VA,NC,NJ
Antimony	CT,NH,NY,NC,ME,VA,NJ
Arsenic	CT,NH,NY,ME,NC,VA,NJ
Barium	CT,NH,NY,ME,NC,VA,NJ
Beryllium	CT,NH,NY,ME,NC,VA,NJ
Cadmium	CT,NH,NY,ME,NC,VA,NJ
Calcium	CT,NH,NY,ME,NC,VA,NJ
Chromium	CT,NH,NY,ME,NC,VA,NJ
Cobalt	CT,NH,NY,ME,NC,VA,NJ
Copper	CT,NH,NY,ME,NC,VA,NJ
Iron	CT,NH,NY,ME,NC,VA,NJ
Lead	CT,NH,NY,AIHA,ME,NC,VA,NJ
Magnesium	CT,NH,NY,ME,NC,VA,NJ
Manganese	CT,NH,NY,ME,NC,VA,NJ
Nickel	CT,NH,NY,ME,NC,VA,NJ
Potassium	CT,NH,NY,ME,NC,VA,NJ
Selenium	CT,NH,NY,ME,NC,VA,NJ
Silver	CT,NH,NY,ME,NC,VA,NJ
Sodium	CT,NH,NY,ME,NC,VA,NJ
Thallium	CT,NH,NY,ME,NC,VA,NJ
Vanadium	CT,NH,NY,ME,NC,VA,NJ
Zinc	CT,NH,NY,ME,NC,VA,NJ
SW-846 7196A in Soil	
Hexavalent Chromium	NY,CT,NH,NC,ME,VA,NJ
SW-846 7471B in Soil	
Mercury	CT,NH,NY,NC,ME,VA,NJ
SW-846 9014 in Soil	
Cyanide	NY,CT,NC,ME,NH,VA,NJ

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2015
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2015
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2015
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

CHAIN OF CUSTODY RECORD

15D0541

Rev 04.05.12

con-test® ANALYTICAL LABORATORY
Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

Company Name: HDR
Telephone: 201.335.9419
Address: One International Blvd., 10th Floor, Mahwah NJ, 07495
Project # 184578
Client PO#
Attention: Amita Patel
Project Location: Cortlandt NY
Sampled By: A.Watson, J. Phillips

Project Proposal Provided? (for billing purposes)
◉ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ◉ EMAIL ○ WEBSITE
Fax #
Email: Amita.Patel@hdrinc.com
Format: ○ PDF ◉ EXCEL ○ GIS
○ OTHER NYDEC EDDs
◉ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								1	1	1			
								A	A	G			
01	PASB625-1-2	4/7/2015	8:55		X	S		✓	✓	✓			
02	PASB625-3-4	4/7/2015	9:00		X	S		✓	✓	✓			
03	PASB625-4-5	4/7/2015	9:05		X	S		✓	✓	✓			
04	PASB618-5-6	4/7/2015	9:45		X	S		✓	✓	✓			
05	PASB618-10-11	4/7/2015	10:00		X	S		✓	✓	✓			
06	PASB618-10-11-1	4/7/2015	10:00		X	S		✓	✓	✓			
07	PASB617-11-12	4/7/2015	11:25		X	S		✓	✓	✓			
08	PASB616-11-12	4/7/2015	11:50		X	S		✓	✓	✓			
09	PASB616-14-15	4/7/2015	12:00		X	S		✓	✓	✓			
10	PASB615-12-14	4/7/2015	14:00		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
G=glass
P=plastic
ST=sterile
V= vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other_____

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other_____

Comments:

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 4/9/15
Received by: (signature) Theresa Terrentum	Date/Time: 4/10-15
nquished by: (signature) 10.09	Date/Time: 2.4 °C
eived by: (signature)	Date/Time:

Turnaround ††
❒ 7-Day
◉ 10-Day
❒ Other ____
RUSH †
❒ †24-Hr ❒ †48-Hr
❒ †72-Hr ❒ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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ACCREDITED IN ACCORDANCE WITH nelac
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Format: ○ PDF ◉ EXCEL ○ GIS ○ OTHER NYDEC EDDs
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◉ yes _____ proposal date

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	TAL Metals	Cyanide	Hexavalent Chromium	# of Containers	** Preservation	***Container Code
								1		1			
								I	I	I			
								A	A	G			
11	PASB613-15-16	4/7/2015	15:05		X	S		✓	✓	✓			
12	PASB613-19-20	4/7/2015	15:20		X	S		✓	✓	✓			
13	BRSB721-4-5	4/8/2015	8:30		X	S		✓	✓	✓			
14	BRSB715-6-9	4/8/2015	9:45		X	S		✓	✓	✓			
15	BRSB712-5-6	4/8/2015	10:25		X	S		✓	✓	✓			
16	BRSB712-8-9	4/8/2015	10:30		X	S		✓	✓	✓			
17	WTSB524-5-7	4/8/2015	14:10		X	S		✓	✓	✓			
18	WTSB524-8-10	4/8/2015	14:15		X	S		✓	✓	✓			
19 20 MS	WTSB524-19-21	4/8/2015	14:20		X	S		✓	✓	✓			
20 21 MS	PASB609-4-7	4/8/2015	14:25		X	S		✓	✓	✓			

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:**
A=amber glass
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P=plastic
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V= vial
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H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time: 4/9/15	
Received by: (signature) Theresa Tementura	Date/Time: 4-10-15	
Relinquished by: (signature) 24°C 10.0	Date/Time:	
Received by: (signature)	Date/Time:	

Turnaround ††
☐ 7-Day
◉ 10-Day
☐ Other ____
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
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Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

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								1	I	A			
								1	I	A			
								1	I	G			
21	PASB609-7-10	4/8/2015	14:40		X	S					✓	✓	✓
22	PASB609-19-21	4/8/2015	14:45		X	S					✓	✓	✓
23	PASB611-4-7	4/8/2015	14:55		X	S					✓	✓	✓
24	PASB611-7-10	4/8/2015	15:00		X	S					✓	✓	✓
25	PASB611-19-21	4/8/2015	15:10		X	S					✓	✓	✓
26	PASB603-4-7	4/8/2015	15:40		X	S					✓	✓	✓
27	PASB603-19-21	4/8/2015	15:45		X	S					✓	✓	✓
28	PASB605-4-7	4/8/2015	16:15		X	S					✓	✓	✓
29	PASB605-19-21	4/8/2015	16:20		X	S					✓	✓	✓

Dissolved Metals
○ Field Filtered
○ Lab to Filter

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Turnaround ††
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◉ 10-Day
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RUSH †
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1ZR34A722210011711

Updated: 04/10/2015 11:41 A.M. Eastern Time

Delivered

Delivered On:
Friday, 04/10/2015 at 10:09 A.M.

Left At:
Receiver

Signed By:
COLLINS

Proof of Delivery

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EAST LONGMEADOW, MA, US

Shipped By

UPS NEXT DAY AIR

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Type: Package

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39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
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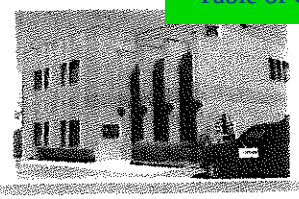
con-test ANALYTICAL LABORATORY



Sample Receipt Checklist

CLIENT NAME: HDR **RECEIVED BY:** TLF **DATE:** 4-10-15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No **No CoC Included**

2) **Does the chain agree with the samples?** (Yes) No
If not, explain:

3) **Are all the samples in good condition?** (Yes) No
If not, explain:

4) **How were the samples received:**
On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank 2.4 Temperature °C by Temp gun _____

5) **Are there Dissolved samples for the lab to filter?** Yes (No)
Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No) NA
Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** 19

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A)

9) **Do all samples have the proper Base pH:** Yes No (N/A) NA

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	42
250 mL Amber (8oz amber)		2 oz amber/clear jar	16
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____
Bisulfate _____ # DI Water _____
Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	~~NA~~ T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	NA	
17) No headspace sample bottles are completely filled.	NA	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Doc #277 Rev. 4 August 2013 **Log-In Technician Initials:** **Date/Time:**

MAJ | TF 4/10/15 10:09

Data Validation Services

120 Cobble Creek Road P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
harry@frontiernet.net

August 5, 2015

Andrew Watson
One International Blvd
Mahwah, NJ 07495

RE: Validation of the Magna Metals Site Analytical Data Packages
Data Usability Summary Report (DUSR)
con-test SDG Nos. 15B0257, 15B0499, 145B0500, 15B0718, 15B0719, 15B0926, 15B0927, 15C0599, 15C1159, 15D0541, and 15F0303

Dear Mr. Watson:

Review has been completed for the data packages noted above, generated by con-test Analytical Laboratory, that pertain to samples collected between 02/03/15 and 06/02/15 at the Magna Metals site. Two hundred thirty seven soil field samples and ten field duplicates were processed for Target Analyte List (TAL) metals, total cyanide, and hexavalent chromium by USEPA SW846 methods 6010C, 7471A, 9015, and 7196A. An additional sample was analyzed for TAL metals and total cyanide.

The data packages submitted contain full deliverables for validation, but this DUSR is generated from review of the summary form information, with full validation review of sample raw data, and limited review of associated QC raw data. The reported summary forms have been reviewed for application of validation qualifiers, using guidance from the USEPA Region 2 validation SOP HW-2, the USEPA CLP National Functional Guidelines for Inorganic Data Review, the specific laboratory methodologies, and professional judgment. The following items were reviewed:

* Laboratory Narrative Discussion
* Custody Documentation
* Holding Times
* Matrix Spike (MS) Recoveries/Duplicate (DUP) Correlations
* Field Duplicate Correlations
* Preparation/Calibration Blanks
* Laboratory Control Samples (LCSs)
* Calibration and Low Level Standards
* Instrument IDLs
* Sample Result Verification

The data review includes evaluation of the specific items noted in The NYS DER-10 Appendix B section 2.0 (c). The items listed above that show deficiencies are discussed within the text of this narrative. The laboratory QC forms illustrating the excursions can be found within the laboratory data packages.

In summary, most of the results are usable either as reported, or with minor qualification. The following items of concern are noted:

- two hexavalent chromium results are not usable due to apparent matrix effects
- the laboratory failed to process the ICP serial dilution evaluations. Therefore, the potential suppression matrix effects on the analyses have not been determined.
- due to low solids content, results for samples with more than 70$% moisture have been qualified as estimated in value. This represents a significant portion of the samples covered in this validation report. The direction of bias cannot be predicted

Other than variances due to low solids content, the data completeness, precision, comparability, representativeness, and sensitivity are good. The accuracy for the metals and cyanide are also good, with minimal matrix effect evident. The accuracy of the hexavalent chromium results indicates a matrix effect may be producing a low bias to sample reported results.

Copies of the client sample identifications are attached to this text, and should be reviewed in conjunction with this report. Also included with the submission is client EDD, with validation edits/qualifiers applied in red.

Chain-of-Custody/Sample Receipt

The following custody variances were noted:

- Write-overs and cross-outs were not initialed/dated
- The second page of the custody for samples reported in 15B0499 does not include the time of laboratory receipt. It is present on the first page.
- The receipt date on the first page of the custodies for samples reported in SDG 15C0559 should be "3/14/15", not "3/13/15". The other two pages of those custodies do not include any laboratory receipt entries.

Samples were held up to four days before shipping to the laboratory. A memorandum to the file should be made attesting to the condition and custody of the samples that were held for more than two days.

Solids Content

A very large proportion of the samples contain solids at a concentration less than 30% (many were about 15%). Due to the potential for nonhomogeneous aliquots during sampling and processing, the results for those samples are qualified as estimated, with an unknown direction of bias.

Field Duplicates

The field duplicates were collected at locations UASB219-4-5, WTSB505-13-14, WTSB546-5-6, WTSB513-5-6, UASB229-3-4, BRSB860-0-0.5, UASB215-4-5, PASB618-10-11, BRSD845-0-0.5, and BRSV873-0-0.5. Correlations were within validation guidelines of 50%RPD or ±2XCRDL, with the exception of those for the following, for which are qualified as estimated in the parent samples and their duplicates:

- aluminum, chromium, lead, magnesium, potassium, and vanadium in WTSB513-5-6
- calcium, copper, lead, and magnesium in BRSB860-0-0.5
- total solids in PASB618-10-11

TAL Metals Analyses by EPA 6010C and 7471

The required ICP serial dilution determinations, which evaluate the effect of sample matrix interferences, were not performed by the laboratory. Therefore, the effect of the matrices on analyte recovery from the samples is not fully known.

The mercury MS/DUPs performed on UASB219-4-5-1, UASB222-6-6.5, UASB220-15-16, WTSB541-0-1, WTSB538-15-16, WTSB545-2-3, WTSB547-3-4, UASB229-3-4, BRSD851-0-0.5, and BRSD868-0-0.5, and the TAL MS/DUP on WTSB506-5-6, show acceptable recoveries and correlations, with the exception of those for WTSB541-0-1 (66%). Results for mercury in that parent sample has been qualified as estimated.

The MSs and DUPs produced the following outlying recoveries and correlations (%RPD), and results for the listed elements are qualified as estimated in the indicated samples:

Parent Sample	Element	%Recovery	%RPD
LPSDB116-3.5-4	antimony	43	
WTSB512-1-2	antimony	59	
WTSB520-15-16	antimony	53	
UASB213-2-3	antimony	46	
BRSD840-0-0.5	antimony	52	
UASB222-6-6.5	antimony	37	
	copper	71	
	nickel	70	
	thallium	72	
	iron		55
UASDB220-15-16	antimony	33	
	arsenic	73	
	cobalt	74	
	selenium	59	
BRSD890-0-0.5	antimony	56	
BRSD884-0-0.5	antimony	61	
BRSD865-0-0.5	antimony	62	

Some of the instrument calibration blanks report responses above the reporting limits, but associated sample detected concentrations are more than tenfold higher than the associated samples, and reported results are unaffected.

ICP Linear Range and Inter Element Correction Factors summaries were not included in the data packages, but were provided on request.

Metals analysis sequence logs do not show the analysis dates or times. Dilution factors are not available on the metals analysis sequence summaries or the raw sequence log.

Wet Chemistry—Hexavalent Chromium and Total Cyanide by 7196A and 9014

Review was conducted for method compliance, holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable to the procedures.

The results for hexavalent chromium in UASB232-0-0.5 and BRSD884-0-0.5 are rejected and not usable due to recoveries below 10% in the soluble and insoluble matrix spikes of those samples.

The following matrix spikes/duplicates were performed, with acceptable recoveries and correlations:

- total cyanide on WTSB513-5-6, BASB760-3-4, WTSB522-13-14, PASB627-3-4, UASB229-3-4-1, BRSD863-0-0.5, BRSD832-0-0.5, BRSD846-0-0.5, UASB225-8-9, UASB220-3-4, UASB-220-15-16, UASB215-4-5-1, PASB603-19-21, PAB615-12-14, PASB609-4-7, BRSD876-0-0.5, BRSD865-0-0.5, and BRSD845-0-0.5
- hexavalent chromium on WTSB502-3-4, UASB218-3-4, WTSB545-2-3, BRSB701-15-16, , BRSB763-15-16, UASB217-16-16.5, and PASB609-7-10

The following hexavalent chromium matrix spike/duplicate evaluations show low recoveries for the soluble (and in all cases except one, insoluble fractions), and results for that analyte in the parent samples are qualified as estimated: WTSB540-5-6 (53%, 43%, 28%), WTSB538-9-10 (39%, 42%, 29%), WTSB534-3-4 (63%, 66%, 53%), WTSB529-2-3 (58%, 61%, 68%), PASB625-1-2 (38%, 40%, 34%), PASB613-15-16 (34%, 32%, 11%), and BRSD870-0-0.5 (40%, 38%, 66%).

The QC summary forms for the matrix spikes do not distinguish between insoluble, soluble, and post digest spikes. The raw data do distinguish between them.

LCS recoveries are acceptable, and blanks show no contamination.

Many of the samples were processed for hexavalent chromium at dilution due to intense color.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Att: Validation Qualifier Definitions
Client and Laboratory Sample Identifications

VALIDATION DATA QUALIFIER DEFINITIONS

U	The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
J	The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased low.
J+	The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
UJ	The analyte was analyzed for, but was not detected. The associated reported quantitation limit is approximate and may be inaccurate or imprecise.
NJ	The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control limits. The analyte may or may not be present.
EMPC	The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample.

CLIENT and LABORATORY SAMPLE IDs

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HDR, Inc.
16 Corporate Woods, Suite 104
Albany, NY 12211
ATTN: Amita Patel

REPORT DATE: 2/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB226-2-2.5	15B0257-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB226-4-4.5	15B0257-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB226-6-6.5	15B0257-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB228-2-2.5	15B0257-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB228-7.5-8	15B0257-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-3.5-4	15B0257-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-10-11	15B0257-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB116-13-14	15B0257-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 2/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB218-0-1	15B0257-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-1-2	15B0257-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-2-3	15B0257-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-3-4	15B0257-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-7-8	15B0257-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB218-8-9	15B0257-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-1-2	15B0257-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-4-5	15B0257-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0257

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PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB219-4-5-1	15B0257-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-5-6	15B0257-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-6-7	15B0257-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB219-7-7.5	15B0257-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB541-0-1	15B0499-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB541-1-2	15B0499-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-2-3	15B0499-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-4-5	15B0499-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB542-9-9.5	15B0499-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB540-1-2	15B0499-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB540-5-6	15B0499-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB536-0-1	15B0499-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB536-1-2	15B0499-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB536-3-4	15B0499-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB503-1-2	15B0499-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB503-2-3	15B0499-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-1-2	15B0499-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-5-6	15B0499-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-7-8	15B0499-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB537-13-14	15B0499-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0499

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB502-3-4	15B0499-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB502-5-6	15B0499-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB502-9-10	15B0499-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB538-3-4	15B0499-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0500

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB538-9-10	15B0500-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB538-15-16	15B0500-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB539-1-2	15B0500-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB539-3-4	15B0500-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB506-5-6	15B0500-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB501-7-8	15B0500-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB501-13-14	15B0500-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB506-10-12	15B0500-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 2/27/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0500

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB504-4-6	15B0500-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-7-8	15B0500-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-11-12	15B0500-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-13-14	15B0500-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB505-13-14-1	15B0500-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB545-2-3	15B0718-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB545-4-5	15B0718-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB543-0.5-1.5	15B0718-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB543-1.5-2	15B0718-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB518-3-4	15B0718-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB511-3-4	15B0718-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB512-1-2	15B0718-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB512-5-6	15B0718-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB515-3-4	15B0718-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB544-3-4	15B0718-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB514-5-6	15B0718-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB533-3-4	15B0718-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB534-1-2	15B0718-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB534-3-4	15B0718-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-1-2	15B0718-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-3-4	15B0718-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0718

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB546-5-6	15B0718-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB546-5-6-1	15B0718-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB513-4-5	15B0718-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB513-5-6	15B0718-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0719

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB513-5-6-1	15B0719-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-1-2	15B0719-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-4-5	15B0719-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB535-5-6	15B0719-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB530-4-5	15B0719-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB530-5-6	15B0719-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB531-5-6	15B0719-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB529-2-3	15B0719-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/9/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0719

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB529-5-6	15B0719-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB527-3-4	15B0719-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB527-5-6	15B0719-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB526-2-3	15B0719-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0926

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB547-3-4	15B0926-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB547-14-15	15B0926-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB520-3-4	15B0926-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB520-15-16	15B0926-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB521-3-4	15B0926-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB521-13-14	15B0926-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB760-3-4	15B0926-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB760-15-16	15B0926-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0926

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSB763-3-4	15B0926-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB763-15-16	15B0926-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB766-3-4	15B0926-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB766-12-13	15B0926-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB701-15-16	15B0926-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB229-3-4	15B0927-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB229-3-4-1	15B0927-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB216-1-2	15B0927-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB216-3-3.8	15B0927-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB214-1-2	15B0927-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB214-3-3.8	15B0927-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB213-2-3	15B0927-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB213-3-4	15B0927-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB213-5-5.5	15B0927-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB211-1-2	15B0927-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB211-4-5	15B0927-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB551-1-2	15B0927-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB551-12-16	15B0927-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB550-4-10	15B0927-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB550-10-16	15B0927-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB549-4-6	15B0927-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/16/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15B0927

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortland, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB548-14-16	15B0927-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB627-3-4	15B0927-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB627-5-5.5	15B0927-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB522-13-14	15B0927-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD855-0-0.5	15C0559-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD856-0-0.5	15C0559-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD859-0-0.5	15C0559-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD860-0-0.5	15C0559-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD860-0-0.5-1	15C0559-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD861-0-0.5	15C0559-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD864-0-0.5	15C0559-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD863-0-0.5	15C0559-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD862-0-0.5	15C0559-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD858-0-0.5	15C0559-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD857-0-0.5	15C0559-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD854-0-0.5	15C0559-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD853-0-0.5	15C0559-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD852-0-0.5	15C0559-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD851-0-0.5	15C0559-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD851-0-0.5-1	15C0559-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD886-0-0.5	15C0559-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD832-0-0.5	15C0559-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD833-0-0.5	15C0559-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD834-0-0.5	15C0559-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD835-0-0.5	15C0559-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD836-0-0.5	15C0559-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD837-0-0.5	15C0559-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD838-0-0.5	15C0559-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 3/31/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C0559

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD839-0-0.5	15C0559-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD840-0-0.5	15C0559-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD840-0-0.5-1	15C0559-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD846-0-0.5	15C0559-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB222-6-6.5	15C1159-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-0-1	15C1159-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-5.5-6.5	15C1159-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB221-6.5-7.5	15C1159-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB223-0-1	15C1159-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB223-4-4.5	15C1159-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-3-4	15C1159-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-7-8	15C1159-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB217-11-12	15C1159-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB217-16-16.5	15C1159-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB114-3-4	15C1159-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB114-4-5	15C1159-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-3-4	15C1159-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-4-5	15C1159-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB215-4-5-1	15C1159-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB231-0-2	15C1159-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ATTN: Amita Patel

REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB231-2-4	15C1159-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB230-4-5	15C1159-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB230-10-11	15C1159-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-3-4	15C1159-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-4-5	15C1159-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB225-8-9	15C1159-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB232-0-0.5	15C1159-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB233-0-0.5	15C1159-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB234-0-0.5	15C1159-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-3-4	15C1159-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-5-6	15C1159-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-5-6-1	15C1159-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB224-18-19	15C1159-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-3-4	15C1159-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-7-8	15C1159-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
LPSB117-1-2	15C1159-32	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSB705-10-11	15C1159-33	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB709-4-5	15C1159-34	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB702-4-5	15C1159-35	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB702-6-7	15C1159-36	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB601-9-10	15C1159-37	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB601-15-16	15C1159-38	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB626-8-9	15C1159-39	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB624-4-5	15C1159-40	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 5/19/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15C1159

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
UASB215-7-8	15C1159-41	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
UASB220-15-16	15C1159-42	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 4/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15D0541

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASB625-1-2	15D0541-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB625-3-4	15D0541-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB625-4-5	15D0541-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-5-6	15D0541-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-10-11	15D0541-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB618-10-11-1	15D0541-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB617-11-12	15D0541-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB16-11-12	15D0541-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 4/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15D0541

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PASB616-14-15	15D0541-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB615-12-14	15D0541-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB613-15-16	15D0541-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB613-19-20	15D0541-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB721-4-5	15D0541-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB715-6-9	15D0541-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB712-5-6	15D0541-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSB712-8-9	15D0541-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 4/24/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15D0541

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WTSB524-5-7	15D0541-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB524-8-10	15D0541-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
WTSB524-19-21	15D0541-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-4-7	15D0541-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-7-10	15D0541-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB609-19-21	15D0541-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB611-4-7	15D0541-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
PASB611-7-10	15D0541-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 6/23/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F0303

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD884-0-0.5	15F0303-01	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD883-0-0.5	15F0303-02	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD882-0-0.5	15F0303-03	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD881-0-0.5	15F0303-04	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD880-0-0.5	15F0303-05	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD879-0-0.5	15F0303-06	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD878-0-0.5	15F0303-07	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD877-0-0.5	15F0303-08	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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REPORT DATE: 6/23/2015

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PROJECT NUMBER: 184578

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F0303

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PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD876-0-0.5	15F0303-09	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD875-0-0.5	15F0303-10	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD874-0-0.5	15F0303-11	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD873-0-0.5	15F0303-12	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD873-0-0.5-1	15F0303-13	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD872-0-0.5	15F0303-14	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD871-0-0.5	15F0303-15	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD870-0-0.5	15F0303-16	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F0303

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PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD869-0-0.5	15F0303-17	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7471B	
				SW-846 9014	
BRSD868-0-0.5	15F0303-18	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD867-0-0.5	15F0303-19	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD866-0-0.5	15F0303-20	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD865-0-0.5	15F0303-21	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD887-0-0.5	15F0303-22	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD888-0-0.5	15F0303-23	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD889-0-0.5	15F0303-24	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F0303

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PROJECT LOCATION: Cortlandt, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
BRSD890-0-0.5	15F0303-25	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD843-0-0.5	15F0303-26	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD842-0-0.5	15F0303-27	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD844-0-0.5	15F0303-28	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD845-0-0.5	15F0303-29	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD845-0-0.5-1	15F0303-30	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	
BRSD885-0-0.5	15F0303-31	Soil		SM 2540G	
				SW-846 6010C	
				SW-846 7196A	
				SW-846 7471B	
				SW-846 9014	

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Using Qualified Data to Document an Observed Release and Observed Contamination

Office of Emergency and Remedial Response (5204G)

Quick Reference Fact Sheet

This fact sheet discusses the use of the U.S. Environmental Protection Agency's (EPA) Contract Laboratory Program (CLP) data and other sources of data qualified with a "J", "U", or "UJ" qualified or flag. This guidance provides a management decision tool for the optional use of qualified data to document all observed release and observed contamination by chemical analysis under EPA's Hazard Ranking System (HRS). The analyte and sample matrix (i.e., soil or water) specific adjustment factors given in this fact sheet allow biased CLP and non-CLP data to be adjusted to meet the HRS criteria documenting an observed release and observed contamination with data that are of known and documented quality. This fact sheet does not address using qualified data for identifying hazardous substances in a source.

INTRODUCTION

The EPA established the HRS to rank hazardous waste sites for National Priorities List (NPL) purposes under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 **(SARA).** This fact sheet was developed in response to a need to determine the usability of qualified data for site assessment and HRS scoring purposes. This fact sheet illustrates that qualified data are often of sufficiently known and documented quality, and may be used in establishing an observed release and observed contamination. This fact sheet explains rationale for why some qualified data may be used for HRS purposes; presents the background information needed to use qualified data, with and without adjustment factors; provides examples of qualified data use, and discusses issues raised during the development of the adjustment factor approach.

Under the HRS, chemical analytical data we are often used to demonstrate an observed release and observed contamination when the release sample concentration is three times the background concentration and background levels are greater than or equal to the appropriate detection limit; or if the release sample concentration is greater than or equal to the appropriate quantitation limit when background levels are below the appropriate detection limit. The release must also be at least partially attributable to the site under investigation *(Hazard Ranking System, Final Rule, 40* CFR Part 300, App. A). The data used to establish the release must be of known and documented quality. *(Hazard Ranking System Guidance Manual,* Interim Final, November 1992, OSWER Directive 9345.1-07). Data that cannot be validated may not be of known and documented quality. For more information on observed release and observed contamination, refer to the fact sheets: *Establishing an Observed Release,* September 1995, PB94-963314; *Establishing Areas of Observed Contamination.* September 1995, PB94-963312; and *Establishing Background Levels,* September 1995, PB94-963313. The factor of three represents the minimum difference in sample results that demonstrate an increase in contaminant concentration above background levels, with reasonable confidence.

Although much of the analytical data used for identifying an observed release is generated under EPA's CLP, this fact sheet applies to all data regardless of the source of the data (non-CLP data). EPA procedures require that

CLP analytical data be reviewed, or validated by EPA or third party reviewers, to ensure the data are of known and documented quality and that the determination be discussed in a data validation report that accompanies the analytical results. Based on this data validation, CLP data are classified into three categories: (1) data for which all quality control (QC) requirements have passed contract required acceptance criteria, (2) data for which at least one QC requirement has not met acceptance criteria; and (3) data for which most or all QC requirements have not met acceptance criteria. Data in the first category typically are not qualified. Data in the second category are often qualified with a "J" qualifier and, as discussed in this fact sheet, are usually usable for HRS purposes. Data in the third category are usually qualified by an "R" qualifier and are not usable for HRS purposes.

Whether data are placed into the second or third category is determined by the amount of bias associated with. the analytical results. Data validation evaluates biases resulting from laboratory analytical deficiencies or sample matrices to determine whether the data are usable. Bias indicates that the reported concentration is either higher or lower than the am concentration, and the data validation report identifies the direction of the bias or if the bias is unknown.

The EPA CLP also sets minimum quantitation limits for all analytes; the Contract Required Quantitation Limit (CRQL) for organic analytes and the Contract Required Detection Limit (CRDL) for inorganic analytes. For HRS purposes and for this fact sheet, the term CRQL refers to both the contract required quantitation limit and am contract required detection limit. (40 CFR Part 300, App. A). The CRQLs are substance specific levels that a CLP laboratory must be able to routinely and reliably detection specific sample matrices (i.e.; soil, water. sediment). The CRQLs are usually set above most instrument detection limits (IDLs) and method detection limits (MDLs).

CONSIDERATIONS FOR NON-CLP DATA

Because various laboratories and analytical methods may be used to develop non-CLP data, the following list provides the general information, sufficient for determining whether non-CLP data are usable for HRS Purposes.

(1) Identification of the method used for analysis. Methods include RCRA methods, SW-846, EPA methods, etc.

(2) Quality control (QC) data. Check each method of analysis to determine if specific QC requirements are defined. If not, seek out another method.

(3) Instrument-generated data sheets for sample results. These data sheets would be the equivalent of Form I's in CLP data.

(4) MDLs and sample quantitation limits (SQLs). The analytical method should provide the MDL. The SQL is an adjusted MDL using sample specific measurements such as percent moisture and weight.

(5) Data validation report.

USE OF BIASED QUALIFIED DATA

In the past, all qualified data have been inappropriately perceived by some people as data of low confidence or poor quality and have not been used for HRS evaluation. With careful assessment of the nature of the analytical biases or QC deficiencies in the data on a case-by-case basis, qualified data can represent an additional resource of data for establishing an observed release. Further, the D.C. District Court of Appeals in 1996 upheld EPA's case-by-case approach to assess data quality. In reviewing the use of qualified data to identify an observed release, the Court stated that if there are deficiencies in the data, "...the appropriate response is to review the deficiencies an a 'case-by-case basis' to determine their impact on 'usability of the data.'" The Court also stated with regards to data quality that, "...EPA does not face a standard of absolute perfection .... Rather, it is statutorily required to 'assure, to the maximum extent *feasible*,' that it 'accurately assesses the relative degree of risk' posed by sites" [*Board of Regents of the University of Washington, et al., v. EPA*, No.95-1324, slip op. at 8-10 (D.C. Cir. June 25, 1996).]

As discussed in this fact sheet, the application of adjustment factors to "J" qualified data can serve as a management decision tool to "adjust," or take into account, the analytical uncertainty in the data indicated by the qualifier, thereby making qualified data usable for HRS evaluation. The use of adjustment factors to account for the larger uncertainty in "J" qualified data is a conservative approach enabling a quantitative comparison of the data for use in documenting an observed release. It should be noted that the use of

adjustment factors only addresses analytical variability and does not take into account variabilities which may be introduced during field sampling. Some guidelines for using the adjustment factor approach are discussed in Exhibit 1.

CLP QA/QC PROCEDURES

CLP qualifiers are applied to analytical data based on the results of various Quality Assurance/Quality Control (QA/QC) procedures used at the laboratory. EPA analytical methods use a number of QA/QC mechanisms during sample analysis in order to assess qualitative and quantitative accuracy *(Contract Laboratory Program Statement of Work for Inorganic Analyses,* Document No. ILM02.0; *Contract Laboratory Program Statement of Work for Organic Analyses,* Document No. OLM1.8; *Quality Assurance/Quality Control Samples,* Environmental Response Team Quality Assurance Technical Information Bulletin; *Test Methods for Evaluating Solid Waste (SW-846): Physical and Chemical Methods,* Document No. SW-846). To assess data quality, the laboratory uses matrix spikes, matrix spike duplicates, laboratory control samples , surrogates, blanks, laboratory duplicates, and quarterly blind performance evaluation (PE) samples. The Agency assumes that if biases are found in the QA/QC samples, the field sample concentrations may also be biased.

Surrogates are chemically similar to the analytes of interest. They are added or "spiked" at a known concentration into the field samples before analysis. Also, selected target analytes are "spiked" into samples at a specified frequency to assess potential interferences from the sample matrix. These samples are called matrix spikes. Comparison of the known concentration of the surrogates and matnx spikes with their actual analytical results reflects the analytical accuracy. Because the surrogates are expected to behave similarly to the target analytes, they may indicate bias caused by interferences from the sample matrices. These type of interferences from the sample matrix are known as matrix effects *(CPL National Functional Guidelines for Inorganic Data Review,* Publication, 9240.1-05-01; *CLP National Functional Guidelines for Orgainic Data Review,* Publication 9240.1-05; *Test Methods for Evaluating Solid Waste (SW-846): Physical and Chemical Methods,* Document No. SW-846).

Laboratory control samples are zero blind samples which contain known concentrations of specific analytes and are analyzed in the same batch as field samples. Their results are used to measure laboratory accuracy. Blanks are analyzed to detect any extraneous contamination introduced either in the field or in the laboratory.

Laboratory duplicates are created when one sample undergoes two separate analyses. The duplicate results are compared to determine laboratory precision. Quarterly blind PE samples are single blind samples that evaluate the laboratory's capability of performing the specified analytical protocol.

CLP and other EPA analytical methods include specifications for acceptable analyte identification, target analytes, and minimum and maximum percent recovery of the QA/QC compounds. Data are validated according to guidelines which set performance criteria for instrument calibration, analyte identification, and identification and recovery of QA/QC compounds *(CLP Statement of Work and SW-846).* The *National Functional Guidelines for Data R*eview, EPA validation, was designed for the assessment of data generated under the CLP organic and inorganic analytical protocols *(CLP Statement of Work; National Functional Guidelines for Data Review).* The guidelines do not preclude the validation of field and other non CLP data. Thus, many EPA Regions have also adapted the *National Functional Guidelines for Data Review* to validate non-CLP data. Data which do not meet the guidelines' performance criteria are qualified to indicate bias or QA/QC deficiencies. The data validation report usually explains why the data were qualified and indicates the bias direction when it can be determined. Validated data that are not qualified are considered unbiased and can be used at their reported numerical value for HRS evaluation.

QUALIFIER DEFINITIONS

Most EPA validation guidelines use the data qualifiers presented in Exhibit 2 *(CLP National Functional Guidelines for Data Review).* Other qualifiers besides these may be used; the validation report should always be checked for the exact list of qualifiers and their meanings.

It should be emphasized that not meeting one or some of the contract required QA/QC acceptance criteria is often an indication that the sample was difficult to analyze, not that there is low confidence in the analysis (i.e., the

EXHIBIT 1 GUIDELINES FOR THE USE OF ADJUSTMENT FACTORS	
!	The use of adjustment factors identified in this fact sheet is a management tool for the optional use of "J" qualified data generated under CLP or other sources of data to document an observed release.
!	Adjustment qualified data should be used with non-qualified data whenever possible.
!	EPA maintains a "worst sites first" policy for placing sites on the NPL (*Additional Guidance on "Worst Sites" and "NPL Caliber Sites" to assist in SACM Implementation,* OSWER Directive 9320.2-07).
!	EPA Regions should use adjustment factors with discretion on a case-by-case basis and should always carefully consider the use of qualified data in borderline cases.
!	Resampling and/or reanalysis may be warranted if qualified data do not appear adequate to document an observed release.
!	EPA Regions may substitute higher adjustment factors based on documented, justifiable reasons but may never use a lower adjustment factor value.
!	The adjustment factors should only be applied to analytes listed in the tables. These adjustment factors should not be interpolated or extrapolated to develop factors for analytes not listed in the tables.
!	The adjustment factors apply only to "J" qualified data above the CRQL.
!	Detection below the CRQL is treated as non-quantifiable for HRS purposes.
!	"UJ" data may be used under strict circumstances as explained in this fact sheet.
!	The adjustment factors only apply to biased "J" qualified data, not to other "J" qualified data.
!	The adjustment factors do not apply to "N", "NJ", or "R" qualified data. These data can not be used to document an observed release for HRS purposes.

analysis is "under control" and can be adequate for HRS decision making). Often "J", "U", and "UJ" qualified data fall into this category.

There are instances when qualified data cannot be used since the uncertainty of the results is unknown. For example, violations of laboratory instrument calibration and tuning requirements, and gross violations of holding times reflect the possibility that the results are of unknown quality (i.e., the analysis is "out of control"). Most often these data would be qualified with an "R" or an "N" (not usable for HRS purposes).

USING "U" QUALIFIED DATA

The "U" qualifier simply means that the reported concentration of the analyte was at or below the CRQL-- there can be confidence that the true concentration is at or below the quantitation limit. Therefore, "U" qualified data can be used for establishing background levels. If the release sample concentration is above this level, as specified in the HRS, an observed release can be established. The quantitation limit for that analyte could be used as a maximum background concentration if a more conservative background level seems appropriate.

USING "J" QUALIFIED DATA

As discussed previously, some "J" qualified data can be used in establishing an observed release if the uncertainty in the reported values is documented. Qualified data should always be carefully examined by the Regions to determine the reasons for qualification before use in HRS evaluation. Resampling and/or reanalysis may be warranted if qualified data only marginally document an observed release. Whenever possible, qualified data should be used in conjunction with non-qualified data.

As described in Exhibit 2, "J" qualified data indicates that bias has been detected in the sample analysis and although the analyte is definitively present, the reported concentration is an estimate. Depending on the reasons and the direction of bias, with the use of adjustment factors, "J" qualified data can represent data of known and documented quality sufficient for use in establishing an observed release and observed contamination under the HRS.

USING "UJ" QUALIFIED DATA

A combination of the "U" and "J" qualifiers indicates that the reported value may not accurately represent the concentration necessary to positively detect the analyte in the sample. Under limited conditions, "UJ" qualified data can be used to represent background concentrations for establishing an observed release. These conditions are: instances when there is confidence that the background concentration is not detectable above the CRQL, the background concentration is biased high, and the sample measurement establishing the observed release equals or exceeds the CRQL.

DIRECTION OF BIAS IN "J" QUALIFIED DATA

It is important to understand the direction of bias associated with "J" qualified data before using the data to document an observed release. Qualified data may have high, low, or unknown bias. A low bias means that the reported concentration is likely an underestimate of the true concentration. For example, data may be biased low when sample holding times for volatile organic compounds (VOCs) are moderately exceeded or when recovery of QA/QC compounds is significantly less than the amount introduced into the sample. Low surrogate recovery would also indicate a low bias. A high bias means the reported concentration, is likely an overestimate of the true concentration. For example, data may be biased high when recovery of QA/QC compounds is significantly higher than the amount in the sample. A bias is unknown when it is impossible to ascertain whether the concentration is an overestimate or an underestimate. For example, an unknown bias could result when surrogate recoveries exceed method recovery criteria and matrix spike/matrix spike duplicate compounds below method recovery criteria fail the relative percent difference (RPD) criteria in the same sample.

Despite the bias, certain qualified data may be used without application of adjustment factors for determining an observed release under certain circumstances. The following examples are of using "J" qualified data without adjustment factors:

- Low bias release samples are likely to be underestimates of true concentrations. If the reported concentration of a low bias release sample is three times above unbiased background levels, these release samples would still meet the HRS criteria. The true concentrations would still be three times above the background level.

- High bias background samples are likely to be overestimates of true concentrations. If the reported concentration of unbiased release samples are three times above the reported background concentration, they would still meet the HRS observed release criteria because they would still be three times above the true background concentration.

The above examples show that both low bias "J" qualified release samples at their reported concentrations and high bias "J" qualified background samples may be used at their reported concentrations in these situations.

High bias release samples may not be used at their reported concentrations because they are an overestimate of true concentrations in this situation; resampling and/or re-analysis of the release samples should be considered. The true difference in the background and release concentration may be less than the HRS criteria for establishing an observed release. The reported concentration for low bias background concentrations may not be compared to release samples because it is most likely an underestimate of background level; the release sample concentration may not significantly exceed the true background concentration. However, in lieu of re-sampling and/or re-analysis, high bias release data and low bias background data may be used with adjustment factors which compensate for the probable uncertainty in the analyses.

ADJUSTMENT FACTORS FOR BIASED "J" QUALIFIED DATA

Applying adjustment factors to "J" qualified data will enable EPA to be more confident that the increase in contaminant concentrations between the background and

EXHIBIT 2 EPA CLP DATA QUALIFIERS AND THEIR USABILITY FOR DOCUMENTING AN OBSERVED RELEASE	
Usable*	**Not Usable**
"U" The substance or analyte was analyzed for, but no quantifiable concentration was found at or above the CRQL *(CLP National Functional Guidelines for Data Review).*	**"N"** The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification" *(CLP National Functional Guidelines for Data Review).*
"J" The analyte was positively identified-the associated numerical value is the approximate concentration of the analyte in the sample. The "J" qualifier indicates that one or more QA/QC requirements have not met contact required acceptance criteria but the instrumentation was functioning properly during the analysis. For example, a "J" qualifier may indicate that the sample was difficult to analyze or that the value may lay near the low end of the linear range of the instrument. "J" data are considered biased, but provide definitive analyte identification *(CLP National Functional Guidelines for Data Review).*	**"R"** The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte can not be verified and the result has been rejected. A sample result may be qualified with an "R" qualifier when the instrument did not remain "in control" or the stability or sensitivity of the instrument were not maintained during the analysis *(CLP National Functional Guidelines for Data Review).*
"UJ" The analyte was not quantifiable at or above the CRQL. In addition to not being quantifiable, one or more QA/QC requirements have not met contract acceptance criteria *(CLP Functional Guidelines for Data Review).*	**"NJ"** The analysis indicates the presence of the analyte that has een "tentatively identified" and the associated numerical value represents it's approximate concentration (CLP *National Functional Guidelines for Data Review).*

* Usable under certain circumstances as explained in this fact sheet.

release samples is due to a release. The adjustment factors are applied as "safety factors" to compensate for analytical uncertainty, allowing biased data to be used for determining an observed release. Dividing the high bias result by an adjustment factor deflates it from the high end of the acceptable range towards a low bias value. Multiplying a low bias concentration by an adjustment factor inflates it to the high end of the acceptable range.

Tables 1 through 4 (pages 11 - 18) present analyte and matrix-specific adjustment factors to address the analytical uncertainty when determining an observed release using high bias release samples and low bias background data. The factors am derived from percent recoveries of matrix spikes, surrogates, and laboratory control samples in the CLP Analytical. Results Database (CARD) from January 1991 to March 1996. A total of 32,447 samples were reviewed for volatile organic analytes; 32,913 samples for semivolatile organic analytes; 59,508 samples for pesticides/PCB analytes; and 5,954 samples for inorganic analytes.

The range of CARD data for each analyte includes 97 percent of all percent recoveries in the database, discarding outliers. The adjustment factors are ratios of percent recovery values at the 98.5 and 1.5 percentiles. The ratios generally show a consistent pattern.

Adjustment factors have been determined for all analytes in the CLP Target Compound List (organic analytes) and Target Analyte List (inorganic analytes). A tiered approach was used to derive the organic adjustment factors. Percent recoveries for surrogates were

examined first, followed by matrix spike recoveries. When both matrix spike and surrogate data were available for the same analyte, the larger adjustment factor (representing more extreme high and low percent recoveries) was used. Laboratory control samples were used to calculate the inorganic adjustment factors. Quarterly blind sample data were not used to determine adjustment factors because of the small data set available. A default adjustment factor of 10 was used for analytes when percent recovery data were unavailable.

Adjustment factors do not correct the biased sample concentration to its true value, as such "correction" is not possible. CARD data do not differentiate and quantify individual sources of variation. Instead, the ratio of percentile used to develop adjustment factors represent a "worst-case" scenario. Adjustment factors either inflate background values to the high end of the range or deflate release data to the low end. Therefore, adjustment factors compensate or adjust for the apparent analytical variability when comparing a high bias value to a low bias value (see Exhibit 3).

USING THE ADJUSTMENT FACTORS

This section of the fact sheet demonstrates how adjustment factors can be used with "J" qualified data for HRS scoring purposes, including documentation and detection limit issues.

Documentation Requirements for Using Qualified Data

In using "J" qualified data to determine an observed release, include a discussion of "J" qualifiers from the data validation report and cite it as a reference in the site assessment report or HRS documentation record. If adjustment factors are applied to "J" qualified data, reference and cite this fact sheet. These steps will ensure that the direction of bias is documented and will demonstrate how biases have been adjusted.

Detection Limit Restrictions

Adjustment factors may only be applied to "J" qualified data with concentrations above the CLP CRQL for organics or CRDL for inorganics. "J" qualified data with concentrations below the CRQL can not be used to document an observed release except as specified in the previous section entitled "Using "UJ" Qualified Data."

Application of Factors

Exhibit 3 shows how to apply the factors to "J" qualified data. Multiply low bias background sample results by the analyte-specific adjustment factor or the default factor 10 when analyte-specific adjustment factor is not available. The resulting new background value effective becomes a high bias value that may be used to determine an observed release. Divide high bias release sample data by the analyte-specific adjustment factor or the default factor of 10 when an analyte-specific adjustment factor is not available. The resulting new release sample value effectively becomes a low bias value that may be used to determine an observed release.

Note: High bias background data, low bias release data, and unbiased data may be used at their reported concentrations.

Note: Adjusted release and background values must still meet HRS criteria (e.g., release concentration must be at, least three times above background level) to determine an observed release.

Examples Using Trichloroethene in Soil and Water

1. *Release water sample is unbiased, background water sample is unbiased but all data are qualified with a "J" due to an contractual laboratory error no: analytical error.*

Background sample value: 12Fg/L (J) *no bias*
Release sample value: 40 Fg/L (J) *no bias*

The CRQL for trichloroethene is 10 Fg/Kg for soil and 10 Fg/L for water.

In this example, the qualification of the data is not related to bias in the reported concentrations. Thus, using adjustment factors is not needed and an observed release is established if all other criteria are met.

2. *Release soil sample data is biased low, background soil sample data is biased high.*

Background sample value: 12 Fg/Kg (J) high bias
Release sample value: 40 Fg/Kg (J) low bias

In this example, the direction of bias indicates that the. true release value may be higher and the true background value may be lower than reported values. The release sample concentration still exceeds background by more than three times, so an observed release is established, provided all other HRS criteria are met. Using adjustment factors is not needed.

EXHIBIT 3 USE OF ADJUSTMENT FACTORS FOR "J" QUALIFIED DATA		
Type of Sample	**Type of Bias**	**Action Required**
Background Sample	No Bias	None: Use concentration without factor
	Low Bias	Multiply concentration by factor
	High Bias	None: Use concentration without factor
	Unknown Bias	Multiply concentration by factor
Release Sample	No Bias	None: Use concentration without factor
	Low Bias	None: Use concentration without factor
	High Bias	Divide concentration by factor
	Unknown Bias	Divide concentration by factor

3. Release soil sample data is unbiased, background soil sample is biased low.

Background sample value: 12 Fg/Kg (J) *low bias*
Release sample value: 30 Fg/Kg *no bias*

In this example, the true background value is assumed to be less than the reported value; however, an observed release may still be possible. To use the data to establish an observed release, multiply the background sample data value by the adjustment factor given for trichloroethene in soil (2.11). No adjustment factor is needed for the release sample.

New background sample value:
(12 Fg/Kg) x (2.11) = 25.32 Fg/Kg (J) *high bias*

The release sample concentration does not meet or exceed the new background level by three time, so an observed release is not established.

4. Release water sample data is biased high, background water sample data is unbiased.

Background sample value: 15 Fg/L *no bias*
Release sample value: 70 Fg/L (J) *high bias*

In this example, the true release value may be lower than the reported value; however, an observed release may still be possible. To use the data to establish an observed release divide the release sample by the adjustment factor for trichloroethene in water (1.66). No adjustment factor is needed for the background sample.

New release sample value:
(70 Fg/L) ÷ (1.66) ~ 42.17 Fg/L (J) *low bias*

The new release sample concentration does not meet or exceed the background level by three times, so an observed release is not established.

5. Release soil sample data has unknown bias; background soil sample data has unknown bias.

The following example is the most conservative approach to using adjustment factors with qualified data.

Background sample value: 20 Fg/Kg (J) *unknown bias*
Release sample value: 325 Fg/Kg (J) *unknown bias*

In this example, it is not possible to determine from the reported values if an observed release is possible. To use the data to establish an observed release, divide the release sample value and multiply the background sample value by the adjustment factor given for trichloroethene in soil (2.11).

New release sample value:
(325 Fg/Kg) ÷ (2.11) = 154.03 Fg/Kg (J) *low bias*

New background sample value:
(20 Fg/Kg) x (2. 11) = 42.2 Fg/Kg (J) *high bias*

The new release sample is at least three times the new background concentration, so an observed release is established, provided all other HRS criteria are met.

ISSUES WITH USING ADJUSTMENT FACTOR APPROACH

Some issues were raised regarding the application of adjustment factors to qualified data during the Agency's internal review process.

One issue is that "J" qualifiers are added to analytical results for many reasons that may or may not affect the accuracy and precision of the analytical result. The application of an adjustment factor to "J" qualified data in which bias is not affected could be considered overly conservative.

All qualified data should be carefully evaluated to determine if the data are biased. Based on the reasons for bias, the use of an adjustment factor should only be considered as a management tool that provides a quick screening of the data for site assessment, not a means for correcting the biased value to a true value. Application of adjustment factors are intended for use with qualified data reported at or above the CRQL and may not be applicable to data which are qualified but technically sound. As stated previously, qualified data should always be carefully reviewed on a case-by-case basis prior to use in HRS evaluation.

Another issue is the validity of "10" as a default adjustment factor. A default adjustment factor of 10 was a policy decision based on the range of adjustment factors and an industry approach. The default was chosen in order to account for the maximum variability regardless of the direction of the bias. Therefore, the default value of 10 is generally considered to be a conservative adjustment factor. EPA reviewed the use of the default value of 10 and determined that this value was conservative.

Even if using adjustment factors is sometimes overly conservative, this approach is preferable to not using the data at all. EPA maintains a "worst sites first" policy that only the sites considered most harmful to human health and/or the environment should be listed. EPA considers the use of adjustment factors appropriate as a management decision tool. However, discretion is needed when applying adjustment factors. The use of adjustment factors may not be appropriate in all cases.

USE OF OTHER ADJUSTMENT FACTORS

EPA Regions may substitute higher, but never lower, adjustment factor values for the ones listed in this fact sheet on a case-by-case basis when technically justified. For example, other adjustment factors may be applied to conform with site-specific Data Quality Objectives (DQOs) or with Regional Standard Operating Procedures (SOPs) *(Data Quality Objectives Process for Superfund, Publication 9355.9-01).*

SUMMARY

For site assessment purposes, EPA Regions should not automatically discard "J" qualified data. However, site-specific data usability determinations may result in the data's not being used.

Data qualified under the EPA's CLP or from other sources of validated data may be used to demonstrate an observed release if certain measures are taken to ensure that the bias of the data qualifier is adjusted using the factor approach specified in this fact sheet. (This fact sheet provides a management decision tool for making qualified data usable for documenting an observed release.) The analyte and matrix-specific adjustment factors provided in Tables 1 through 4 of this fact sheet present these adjustment factors.

The scope of this fact sheet is limited to the situations described in Exhibit 1. The use of qualified analytical data without the adjustment factors presented in this fact sheet is limited. Higher adjustment factors may be substituted by EPA Regions on a case-by-case basis when technically justified by site-specific DQOs or SOPS.

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TABLE 1 FACTORS FOR VOLATILE ORGANIC ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
1,1,1-TRICHLOROETHANE	---	10.0	---	10.0
1,1,2,2-TETRACHLOROETHANE	---	10.0	---	10.0
1,1,2-TRICHLOROETHANE	---	10.0	---	10.0
1,1-DICHLOROETHANE	---	10.0	---	10.0
1,1-DICHLOROETHENE	7,031	2.71	5,015	2.35
1,2-DICHLOROETHANE-D4	32,446	1.52	25,516	1.38
1,2-DICLOROETHENE (TOTAL)	---	10.0	---	10.0
1,2-DICHLOROPROPANE	---	10.0	---	10.0
2-BUTANONE	---	10.0	---	10.0
2-HEXANONE	---	10.0	---	10.0
4-METHYL-2-PENTANONE	---	10.0	---	10.0
ACETONE	---	10.0	---	10.0
BENZENE	7,024	1.97	5,001	1.64
BROMODICHLOROMETHANE	---	10.0	--	10.0
BROMOFORM	---	10.0	---	10.0
BROMOFLUOROBENZENE	32,444	1.7	25,518	1.26
BROMOMETHANE	---	10.0	---	10.0
CARBON DISULFIDE	---	10.0	---	10.0

TABLE 1 FACTORS FOR VOLATILE ORGANIC ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
CARBON TETRACHLORIDE	---	10.0	---	10.0
CHLOROBENZENE	7,018	2.0	5,015	1.54
CHLOROETHANE	---	10.0	---	10.0
CHLOROFORM	---	10.0	---	10.0
CHLOROMETHANE	---	10.0	---	10.0
CIS-1,3-DICHLOROPROPENE	---	10.0	---	10.0
DIBROMOCHLOROMETHANE	---	10.0	---	10.0
ETHYLBENZENE	---	10.0	---	10.0
METHYLENE CHLORIDE	---	10.0	---	10.0
STYRENE	---	10.0	---	10.0
TETRACHLOROETHENE	---	10.0	---	10.0
TOLUENE-D8	32,447	1.63	25,526	1.21
TRANS-1,3-DICHLOROPROPENE	---	10.0	---	10.0
TRICHLOROETHENE	6,988	2.11	4,938	1.66
VINYL CHLORIDE	---	10.0	---	10.0
XYLENE (TOTAL)	---	10.0	---	10.0

TABLE 2 FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES				
	SOIL MATRIX		WATER MATRIX	
SEMIVOLATILE ORGANIC ANALYTES	Number of CARD sample Reviewed	Factor	Number of CARD Samples Reviewed	Factor
1,2,4-TRICHLOROBENZENE	6,792	4.83	4,605	3.71
1,2-DICHLOROBENZENE-D4	32,848	4.22	21,506	3.0
1,3-DICHLOROBENZENE	---	10.0	---	10.0
1,4-DICHLOROBENZENE	6,796	6.0	4,599	3.85
2,2'-OXYBIS(1-CHLOROPROPANE)	---	10.0	---	10.0
2,4,6-TRIBROMOPHENOL	32,605	9.38	21,509	3.57
2,4,5-TRICHLOROPHENOL	---	10.0	---	10.0
2,4,6-TRICHLOROPHENOL	---	10.0	---	10.0
2,4-DICHLOROPHENOL	---	10.0	---	10.0
2,4-DIMEHYLPHENOL	---	10.0	---	10.0
2,4-DINITROPHENOL	---	10.0	---	10.0
2,4-DINITROTOLUENE	6,798	4.88	4,623	3.52
2,6-DINITROTOLUENE	---	10.0	---	10.0
2-CHLORONAPHTHALENE	---	10.0	---	10.0
2-CHLOROPHENOL-D4	32,798	4.08	21,506	2.92
2-FLUOROBIPHENYL	32,913	3.38	21,532	2.84
2-FLUORPHENOL	32,781	5.05	21,511	3.34
2-METHYLNAPHTHALENE	---	10.0	---	10.0
2-METHYLPHENOL	---	10.0	---	10.0
2-NITROANILINE	---	10.0	---	10.0
2-NITROPHENOL	---	10.0	---	10.0
3,3'-DICHLOROBENZIDINE	---	10.0	---	10.0
3-NITROANILINE	---	10.0	---	10.0
4,6-DINITRO-2-METHYLPHENOL	---	10.0	---	10.0
4-BROMOPHENYL-PHENYETHER	---	10.0	---	10.0

TABLE 2
FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES

SEMIVOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Sample Reviewed	Factor	Number of CARD Samples Reviewed	Factor
4-CHLORO-3-METHYLPHENOL	6,715	6.26	4,609	4.46
4-CHLOROANILINE	---	10.0	---	10.0
4-CHLOROPHENYL-PHENYLETHER	---	10.0	---	10.0
4-METHYLPHENOL	---	10.0	---	10.0
4-NITROANILINE	---	10.0	---	10.0
4-NITROPHENOL	6,627	9.33	4,586	5.96
ACENAPHTHENE	6,773	4.68	4,600	3.63
ACENAPHTHYLENE	---	10.0	---	10.0
ANTHRACENE	---	10.0	---	10.0
BENZO(A)ANTHRACENE	---	10.0	---	10.0
BENZO(A)PYRENE	---	10.0	---	10.0
BENZO(B)FLUORANTHENE	---	10.0	---	10.0
BENZO(G,H,I,)PERYLENE	---	10.0	---	10.0
BENZO(K)FLUORANTHENE	---	10.0	---	10.0
BIS(2-CHLOROETHOXY)METHANE	---	10.0	---	10.0
BIS(2-CHLOROETHYL)ETHER	---	10.0	---	10.0
BIS(2-ETHYLHEXYL)PHTHALATE	---	10.0	---	10.0
BUTYLBENZYLPHTHALATE	---	10.0	---	10.0
CARBAZOLE	---	10.0	---	10.0
CHRYSENE	---	10.0	---	10.0
DI-N-BUTYLPHTHALATE	---	10.0	---	10.0
DI-N-OCTYLPHTHALATE	---	10.0	---	10.0
DIBENZ(A,H)ANTHRACENE	---	10.0	---	10.0
DIBENZOFURAN	---	10.0	---	10.0
DIETHYLPHTHALATE	---	10.0	---	10.0

TABLE 2 FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES				
SEMIVOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Sample Reviewed	Factor	Number of CARD Samples Reviewed	Factor
DIMETHYLPHTHALATE	—	10.0	---	10.0
FLUORANTHENE	---	10.0	---	10.0
FLUORENE	---	10.0	---	10.0
HEXACHLOROBENZENE	---	10.0	---	10.0
HEXACHLOROBUTADIENE	---	10.0	--	10.0
HEXACHLOROCYCLOPENTADIENE	---	10.0	---	10.0
HEXACHLOROETHANE	---	10.0	---	10.0
INDENO(1,2,3-CD)PYRENE	---	10.0	---	10.0
ISOPHORONE	---	10.0	---	10.0
N-NITROSO-DI-N-PROPYLAMINE	6,725	4.92	4,513	4.0
N-NITROSODIPHENYLAMINE(1)	---	10.0	---	10.0
NAPHTHALENE	---	10.0	--	10.0
NITROBENZENE-D5	32,867	3.96	21,533	2.73
PENTACHLOROPHENOL	6,597	72.5	4,550	10.12
PHENANTHRENE	---	10.0	---	10.
PHENOL-D5	32,855	3.85	21,489	3.53
PYRENE	6,543	11.86	4,612	5.67
TERPHENYL-D14	32,899	4.35	21,541	6.32

TABLE 3 FACTORS FOR PESTICIDES/PCB ANALTYES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
4,4'-DDD	---	10.0	---	10.0
4,4'-DDE	---	10.0	---	10.0
4,4'-DDT	5,343	12.82	3,850	7.14
ALDRIN	5,526	14.26	3,829	6.63
ALPHA-BHC	---	10.0	---	10.0
ALPHA-CHLORDANE	---	10.0	---	10.0
AROCLOR-1016	---	10.0	---	10.0
AROCLOR-1221	---	10.0	---	10.0
AROCLOR-1232	---	10.0	---	10.0
AROCLOR-1242	---	10.0	---	10.0
AROCLOR-1248	---	10.0	---	10.0
AROCLOR-1254	---	10.0	---	10.0
AROCLOR-1260	---	10.0	---	10.0
BETA-BHC	---	10.0	---	10.0
DECACHLOROBIPHENYL	57,315	17.79	33,592	10.0
DELTA-BHC	---	10.0	---	10.0
DIELDRIN	5,539	11.93	3,861	4.87

TABLE 3 FACTORS FOR PESTICIDES/PCB ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
ENDOSULFAN I	—	10.0	---	10.0
ENDOSULFAN II	—	10.0	---	10.0
ENDOSULFAN SULFATE	---	10.0	---	10.0
ENDRIN	5,521	14.13	3,850	5.33
ENDRIN ALDEHYDE	---	10.0	---	10.0
ENDRIN KETONE	---	10.0	---	10.0
GAMMA-BHC (LINDANE)	5,545	11.79	3,832	10.0
GAMMA-CHLORDANE	---	10.0	---	10.0
HEPTACHLOR	5,548	7.88	3,836	5.26
HEPTACHLOR EPOXIDE	---	10.0	---	10.0
METHOXYCHLOR	---	10.0	---	10.0
TETRACHLORO-M-XYLENE	59,508	8.5	33,787	5.29
TOXAPHENE	---	10.0	---	10.0

TABLE 4 FACTORS FOR INORGANIC ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
ALUMINUM	5387	1.66	6208	1.30
ANTIMONY	5392	1.98	6170	1.27
ARSENIC	5675	1.74	6303	1.35
BARIUM	5360	3.99	6201	1.25
BERYLLIUM	5399	1.28	6208	1.25
CADMIUM	5385	1.41	6166	1.29
CALCIUM	5383	1.28	6201	1.24
CHROMIUM	5389	1.29	6210	1.30
COBALT	5392	1.25	6212	1.27
COPPER	5394	1.22	6205	1.25
CYANIDE	3281	1.55	225	1.36
IRON	5391	1.34	6216	1.27
LEAD	5982	1.44	6384	1.31
MAGNESIUM	5397	1.23	6210	1.24
MANGANESE	5395	1.24	6214	1.28
MERCURY	5954	1.83	256	1.50
NICKEL	5400	1.35	6210	1.29
POTASSIUM	3874	17.49	6175	1.24
SELENIUM	5620	2.38	6278	1.14
SILVER	5392	1.74	6215	1.42
SODIUM	5024	25.43	6195	1.26
THALLIUM	5621	1.86	6253	1.37
VANADIUM	5393	1.34	6212	1.25
ZINC	5404	1.50	6224	1.29

Magna Metals Site

NYSDEC Site No. 360003

CORTLANDT, NEW YORK

Soil Vapor Investigation Report

AKRF Project Number: 40256

Prepared for:

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Figure 2 Sampling Locations

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Appendix C Soil Gas Sampling Logs
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1.0 INTRODUCTION

Investigation at the Magna Metals Site, located in Cortlandt, New York, has been conducted to comply with a New York State Department of Environmental Conservation's (NYSDEC) Consent Order (Site No. 360003). In June 2006, Tetra Tech EC, Inc. (TTI) submitted a letter report to the NYSDEC that summarized the results of soil vapor sampling and additional groundwater sampling. In November 2006, the NYSDEC issued a correspondence requiring sampling of the office/warehouse building located east of the former Magna Metals building to confirm that soil vapor intrusion is not occurring. This report documents the collection of sub-slab soil vapor samples and air samples to satisfy the NYSDEC requirements.

2.0 SITE DESCRIPTION

2.1 Site Location

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. A site location map is included in Figure 1. Nearby towns include Peekskill and Croton-on-Hudson, and the Hudson River is located 3 miles west of the site.

2.2 Site and Vicinity Characteristics

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. The office/warehouse building was reported by the owner to include some manufacturing activities. Baker Properties acquired the property from ISC Properties, Inc. (ISCP) in 1982, and has leased it to various tenants. The identity of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south, and east of the project site are residential areas. A wetland area is located between the site and the residential area southwest of the site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Topography is variable throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from 360 feet MSL along the eastern site boundary to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area.

Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed by TTI on the former site property. This basin is located in the central western portion of the site and collects discharge water from a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was not located. The stormwater collection system on Furnace Dock Road discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The geologic characteristics of the subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock. The bedrock is mapped by the New York State Museum and Science Service as Hornblende Norite, which is a

part of the Cortlandt Mafic Complex. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is in the western direction towards the stream and wetland area.

Results of the slug tests completed by TTI indicate a range in hydraulic conductivity values from 5.3×10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2×10^{-3} cm/sec (6.2 ft/day) at MW-3 in the lower portion of the leach pit area. Previous groundwater sampling by TTI indicates that some monitoring wells were observed to be dry during seasonal low groundwater conditions.

2.4 Review of Site History

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed.

2.5 Previous Studies

Between 1978 and 1984, site investigations were completed by the New York State Department of Health (NYSDOH), the NYSDEC, and William Cosulich to determine if property uses had resulted in contamination. The investigations concluded that soil, groundwater, sediment, and, surface water contamination existed at the site.

In 1998, Foster Wheeler Environmental Corporation (predecessor to TTI) completed a Remedial Investigation/Feasibility Study (RI/FS) to delineate the nature and extent of leach pit/septic tank/holding tank, surface water, sediment, surface soil, subsurface soil, and groundwater contamination at the site, such that an evaluation of (1) the nature and extent of site contamination, (2) the potential impacts, if any, and (3) the remedial measure options could be performed. The field investigation program consisted of the drilling of soil borings, the installation and development of monitoring wells, the performance of a habitat-based assessment, and the sampling and analysis of various environmental media including septic tank/leach pit sludge and water, surface soil, subsurface soil, surface water, sediment, and groundwater. A geophysical survey was added to the field investigation to improve location accuracy of the leach pit/septic tank/holding tank sampling.

In 2004, TTI completed a Draft Supplemental RI/FS to perform horizontal and vertical delineation of the soil and groundwater contamination in the potential source area of the site, the leach pit area. The investigation included a geophysical and excavation survey to locate leach pits, leach pit excavation, a homeowner well survey, installation of overburden monitoring wells and a bedrock monitoring well, and collection of soil, groundwater, surface water and sediment samples. Based on the data compiled in the supplemental investigation, TTI concluded the following:

- Concentrations and distributions of contaminant compounds and analytes detected during the Supplemental RI are consistent with contaminant concentrations and distributions detected during previous investigations.
- Xylenes, semivolatile organic compounds (SVOCs), and metals were detected in leach pit sludge samples. Xylenes were detected in soil samples collected below the leach pits
- TCE was detected in the groundwater sample collected from MW-04 and MW-04D.
- Media sampled were affected by inorganic contaminants of concern at concentrations above soil cleanup criteria. In particular, chromium, copper, mercury, nickel, and zinc are

potentially site related compounds that were detected at concentrations exceeding applicable criteria.

- Thirteen leach pits/septic pits had been discovered at the Magna Metals site.
- There appeared to have been two phases of leach pit/septic tank construction at the site. The first and older set of leach pits was constructed of concrete cinder blocks with a soil or gravel bottom. The second phase of leach pits was constructed of prefabricated concrete cylinders with perforated sides and apparently soil or gravel bottoms. Sludge or sludge cakes were still present in twelve of the thirteen pits at the site.
- Based on inorganic analytical results (particularly copper) for the surface water, groundwater, and surface soil samples collected downgradient of the leach pit area and the former Magna Metals building, it appeared that the wetlands east of Furnace Brook and the unnamed tributary may have been impacted by contaminated groundwater or surface runoff originating in the vicinity of the leach pit area and site building.
- Impacts to pelagic and benthic aquatic life were observed in indigenous and laboratory based analyses. The primary environmental media of concern were surface waters and sediments of Furnace Brook, its unnamed tributary, and the palustrine wetlands associated with the site.

In 2006, TTI completed an additional investigation, which included the collection of groundwater samples from existing wells and two new wells next to the former Magna Metals building, and soil vapor samples from three exterior locations along western side of office/warehouse building, five exterior locations within the area containing the leach pits, and one interior sub-slab sample from the building south of the Magna Metals building and the office/warehouse building.

The sampling results indicated that groundwater collected from the two new monitoring wells did not contain contaminants above NYSDEC water quality standards and the overall samples were consistent with previous data. The soil gas sample results documented that VOCs were detected at concentrations ranging from 1 to 1,900 micrograms per cubic meter (ug/m^3). A site map showing the soil gas sampling locations and the laboratory sampling results is included as Figure 2. TTI concluded that the sampling results were consistent with the findings of the current and previous sampling and did not indicate there were unknown sources.

In November 2006, the NYSDEC issued correspondence requiring the sampling of sub-slab soil vapor from the on-site office/warehouse building to the east of the Magna Metals building to confirm that soil vapor intrusion was not occurring. This was in response to a TCE concentration of 59 micrograms per cubic meter in one soil vapor sample (SV-03) that was collected next to the office/warehouse building.

3.0 FIELD PROGRAM

The objectives of the field-sampling program were to confirm that soil vapor intrusion is not occurring in office/warehouse building located east of the former Magna Metals building. The field procedures and sampling activities were completed in accordance with NYSDOH's requirements (NYSDOH, 2006). The field program is outlined in Section 3.1, and the subsequent sections give the summary of sampling implementation. The field program was conducted in accordance with the detailed methodologies described in the NYSDEC approved Soil Vapor Investigation Work Plan (SVIWP)

3.1 Field Program Summary

Site access for the property and study building was agreed upon between ISCP and the property owner/manager through a signed access agreement. Sub-slab soil-gas samples and indoor air

samples were collected at five locations from the lowest level in the office/warehouse building participating in this study. Figure 2 shows the project site building and the locations for soil gas sampling.

3.2 Pre-Sampling Survey

On March 16, 2007, AKRF initiated the soil-vapor sampling program by completing a pre-sampling survey of the site building. Mr. Marc Godick and Bryan Zieroff of AKRF were accompanied by Nathan Walsh of the NYSDOH, Don Duthaler of Baker Properties (site owner representative), and Ernie Sweet of Environmental Resource Management (ERM) (consultant for the site owner). The survey was completed to document any factors that may affect indoor air quality and to determine the location and quantity of sampling locations. The survey included interviews with a representative of each building occupant. The building occupants and corresponding representative included:

- Polymedco, Inc. – Richard DeAlto
- Motion Labs, Inc. – John Coppolecchia
- International Purchasing Systems – Michael Brooks

Documentation was compiled of the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, building operations, product inventory, and any other known factors that may affect indoor air quality. A mini Rae photoionization detector (PID) was used during the survey to sample ambient air for the presence of VOCs. Prior to conducting the survey, the PID was calibrated with 100 parts per million (ppm) isobutylene in accordance with the manufacturer's instructions. A NYSDOH Indoor Air Quality Questionnaire and Building Inventory form for each occupant was used to document the detailed results of the survey and is included in Appendix A.

Soil Gas Well I.D.	Sampling Rationale
SV-10	Soil gas investigation at the north end of the Polymedco office area. Sub-slab point through floor in corner of copy room. Ambient air sample in at breathing level in copy room.
SV-11	Soil gas investigation in the central area of the Polymedco office. Sub-slab point through floor in employee office. Ambient air sample on shelf in employee office.
SV-12	Soil gas investigation in the south end of the Polymedco office area in lab coat closet. Ambient air sample on shelf in closet.
SV-13	Soil gas investigation in the Motion Labs office and production area. Sub-slap point through 1st floor machine shop. Ambient air sample in 2nd floor office area.
SV-14	Soil gas investigation in the office area of the Polymedco warehouse. Sub-slab point through floor near in northeast corner of warehouse. Ambient air location in small office area in the northeast corner of the warehouse.
SV-15	Soil gas investigation in the International Purchasing Systems area. Sub-slab point through concrete floor in dry goods warehouse. Ambient air sample location in small office area on north side of the warehouse.

The building was constructed with concrete block walls and a concrete slab floor. Sections of the building interior were improved with wood frame construction and drop ceilings. A summary of the survey for each tenant is described in this section. Photographs taken during the survey are included in Appendix B. The building layout and tenant locations are shown on Figure 2.

Polymedco, Inc.

Polymedco occupied two sections of the site building; the western section consisted of a one story office area, laboratory, and a loading dock storage area, and the eastern portion consisted of a bulk warehouse (Figure 2). There was no known chemical storage in the office area. The laboratory was observed to contain a refrigerated storage unit that stored reagents for control testing of the laboratory machines. The loading dock area contained shelved storage units that stored a variety of containerized chemicals and cleaning products. Items of note included buckets of paint, spray paint, turpentine, citrus degreaser, insect spray, varnish cleaner, wood polish, tiki-torch oil, metal polish, and spray adhesive. There were no PID detections in these areas. Storage cabinets were also present in the northern end of the warehouse. The warehouse cabinets contained spray paint and primer, paint remover, citrus degreaser, PVC primer and cement, and an assortment of disinfectants and household cleaners. A slop sink and mop storage area next to the chemical storage contained a five-gallon paint bucket, a one-gallon paint thinner can and disinfectant cleaners. A full list of all stored compounds is attached to the pre-sampling survey in Appendix A. Organic vapors were detected by the PID at a concentrations ranging from 3 to 20 ppm in the slop sink area. A fuel oil boiler was located on the eastern side of the warehouse. The boiler area was secured by a spill containment berm. Fuel oil staining and petroleum absorbent materials were observed on the concrete floor within the containment berm. Fuel oil odors were evident in this area.

Motion Labs, Inc.

Motion labs occupied the section of the site building between the Polymedco office and warehouse, and the space consisted of a ground floor machine shop and a second floor manufacturing and office area. The cutting oils for machine operation were reported as being alcohol based. Burlap bags used for product shipment were spray painted once a week in the western side of the shop. Small mobile shelf units (on wheels) and milk crates used for chemical storage were seen at multiple locations throughout the first floor. Stored items included Emerald Topaz cleaner and degreaser, Excelene polishing oil (containing petroleum distillates), a one-gallon container of concentrated degreaser (containing petroleum and phenols), white board cleaner, a one-gallon container of velocite oil No. 6, and a five-gallon container of kerosene. Organic vapors were detected by the PID at concentrations up to 58 ppm above an open container of petroleum distillates. The second floor manufacturing area contained air driven equipment for product assembly. A commercial spray lubricant was used on the equipment and isopropyl alcohol was used for cleaning the electric panels. A storage area next to the cafeteria contained floor sealer, glass cleaner, ammonia and an assortment of household cleaners. Portable storage shelves were observed containing non-chlorinated degreaser spray, spray paint, a five-gallon container of light aliphatic naptha, and containers of locking cement for nuts/bolts. Flammable material storage cabinets were located on the second floor and contained solder remover, spray lubricants, air tool cleaners (containing petroleum distillates), a five-gallon gasoline container, a one-gallon kerosene container, scotch grip adhesive, paint cans, spray paint, denatured solvent, and contact cement. There were no detections with the PID while screening the indoor air on the second floor.

An external boiler room was enclosed in an outdoor area on the north end of the Motion Labs section of the building. The boiler room contained a fuel oil boiler and a compressor. Multiple

one-gallon paint cans and a five-gallon paint bucket were stored in the boiler room. An open five-gallon bucket was observed to be full of used compressor oil.

International Purchasing Systems

International Purchasing Systems occupied the eastern portion of the site building and consisted of a dry goods warehouse and a small office area. There was no chemical usage or storage reported to be associated with business operations. An oil furnace was used to heat the office area. The warehouse was not heated. A small janitor closet contained a one-gallon container of citrus degreaser, carpet cleaner, a one-gallon container of degreaser (containing petroleum distillates) and an assortment of household cleaners. There were no PID detections in the International Purchasing Systems occupied areas.

A total of six sub-slab sample point locations (SV-10 through SV-15) and six corresponding ambient air locations were approved by the NYSDOH. The sampling locations are shown on Figure 3. The rationale for each soil gas well location is summarized as follows:

3.3 Sub-Slab Soil Gas Sampling

On March 24, 2007, Zebra Environmental, Inc. (Zebra) of Lynbrook, New York, installed the interior soil-gas sampling points (SV-11 through SV-15), with the exception of SV-10. The area selected for SV-10 consisted of a wood framed floor constructed on top of the concrete floor slab. The base bolt used to secure the coring machine was being pulled out of the wood floor during the coring process. An attempt was made to use longer base bolts to secure the coring machine into the underlying concrete slab. After several attempts Zebra indicated they were unable to properly secure the coring machine, which is required by the safety guidelines for proper usage. A dedicated soil gas sampling point was installed at the remaining locations as described in the SVIWP. Photographs showing the vapor point installation are included in Appendix B.

On March 29, 2007, AKRF returned to the site to complete the field sampling program as stated in the SVIWP. AKRF personnel were accompanied by Ernie Sweet of ERM. Prior to initiating sample collection, each sub-slab sampling point was sealed, purged, and screened for the helium tracer gas as indicated in the SVIWP. Sample collection was initiated and during the course of the 8-hour sampling period the field personnel noted that some of the flow regulators were not functioning properly. Since the sample collection was no longer following the SVIWP, the sampling program was immediately stopped and rescheduled.

On April 5, 2007, AKRF returned to the site with new, dedicated sampling equipment to complete the field sampling program. AKRF personnel were accompanied by Ernie Sweet of ERM, Paul Simms of Severn Trent Laboratories (STL), and Sally Dewes of the NYSDEC. Prior to initiating sample collection, each sub-slab sampling point was sealed, purged, and screened for the helium tracer gas as indicated in the SVIWP. Following purging, soil gas samples for VOC analysis were collected by connecting the sample tubing to a six-liter Summa canister equipped with a vacuum gauge and flow regulator set to collect a six-liter sample over an 8-hour sampling period. The sub-slab sampling points ("S.S" label for SV-11 through SV-15 indicates sub-slab sample), were sampled as indicated in the SVIWP. Photographs of the sampling process are included in Appendix B. Sampling logs are included in Appendix C

3.4 Indoor Air Sampling

Indoor air samples [labeled SV-10 (A.A) through SV-15 (A.A)] were collected concurrently with the soil gas sampling. The indoor air samples were placed at the locations agreed upon during the pre-sampling survey and sampling was conducted in accordance with SVIWP.

3.5 Laboratory Methods

The samples were analyzed for VOCs by EPA Method TO-15 with a detection limit of 1 ug/m^3 for all compounds, except for trichloroethylene, which had a detection limit of 0.25 ug/m^3 for indoor air samples. All sample analysis was performed in a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) laboratory certified to perform NYSDEC Analytical Services Protocol (ASP). The laboratory produced Category B deliverables. Samples were shipped to the laboratory with appropriate chain of custody documentation.

3.6 Quality Assurance / Quality Control

In addition to the laboratory analysis of the field samples, additional analysis was included for quality control measures. These samples included one duplicate, reported as "DUP (S.S)", taken at the indoor air location SV-13 and two background ambient (outdoor) air samples, reported as "Outdoor 1 (A.A)" and "Outdoor 2 (A.A)". All three samples were analyzed for VOCs by EPA Method TO-15. Category B deliverables are included in Appendix D.

4.0 ANALYTICAL RESULTS

4.1 Field Results

Levels of helium detected at all locations were either non detect or below 1% indicating no significant short circuiting of outside air into the soil gas sample ports during purging.

4.2 Laboratory Results

Sub-Slab Samples

Sub-slab analytical results are summarized in Table 1. Concentrations of VOCs detected were compared to the action level guidance values (from Matrix 1 and Matrix 2) of the NYSDOH Soil Vapor Intrusion Guidance and EPA BASE 90th percentile value, which provides a means of comparison to background conditions. TCE detections of 1,200 ug/m^3 and 66,000 ug/m^3 were recorded at locations SV-11 and SV-12, respectively, above the action levels in Matrix 1. For PCE, two detections of 5.5 and 7.8 ug/m^3 were both below the lowest action level of 100 ug/m^3 in Matrix 2 and also below the EPA BASE 90th percentile value of 15.9 ug/m^3. 1,1,1-trichloroethane (TCA) was not detected in any of the samples. Carbon tetrachloride was detected in one sample at a concentration of 0.53 ug/m^3, which was similar to the outdoor air samples. At location SV-12, a value of 11,000 ug/m^3 was recorded for cis-1,2-dichloroethene (DCE), a breakdown product of TCE. Toluene was detected in all samples with a maximum value of 3,300 ug/m^3 at location SV-12. Cyclohexane was detected in all but one of the samples with a maximum value of 170 ug/m^3 at location SV-11.

Indoor Air Samples

Indoor air analytical results and guidance values included in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance are included in Table 2. There were no exceedences of the guidance values for either PCE (100 ug/m^3) or TCE (5 ug/m^3). Toluene was detected at all locations with the highest values of 31 ug/m^3 and 19 ug/m^3 at locations SV-13 (Motion Labs) and SV-14 (Polymedco warehouse), respectively. The only other detection greater than 10 ug/m^3 in indoor air samples was for n-heptane with a value of 17 ug/m^3 at location SV-13. With a subslab value of 31 ug/m^3 at this location, the indoor air detection is unlikely to be as a result of vapor intrusion and more likely associated with the sources of VOCs in at Motion Labs detailed above. All detections of other compounds were at levels similar to the outdoor air samples and below the EPA BASE 90th percentile values.

5.0 CONCLUSIONS AND RECOMMENDATIONS

No indoor air values for TCE were above the air guidance value of 5ug/m^3 in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance. Although there is no evidence of exposure to workers at the site based upon the indoor air sampling results, the elevated concentrations of TCE, and to a lesser extent 1,2-DCE and toluene, were detected in the subslab soil gas beneath the Polymedco office area. The updated feasibility should evaluate subslab vapor mitigation to prevent potential future vapor intrusion.

The indoor air sample for SV-13 was taken within the Motion Labs building where a number of possible sources of toluene were present as detailed in section 3.2, and the detected concentration was below the EPA based 90th percentile. Sampling data at locations SV-14 and SV-15 demonstrate that soil vapor intrusion is not occurring and that the potential for soil vapor intrusion to occur is not likely. The detection of 19 ug/m^3 at location SV-14 is three times the subslab value and unlikely to be as a result of vapor intrusion. No further action is recommended in the Polymedco, Motion Labs, and International Purchasing Systems warehouse buildings where these samples were collected.

6.0 REFERENCES

Foster Wheeler Environmental Corporation; *Remedial Investigation/Feasibility Study (RI/FS), Magna Metals Site*, Cortlandt, New York; June 1998.

Tetra Tech FS, Inc.; *Draft Supplements Remedial Investigation Report, Magna Metals Site*, Cortlandt, New York; August 2004.

Tetra Tech EC, Inc.; *Data Findings From the Additional Data Collection Activities for the Former Magna Metals Site (NYSDEC Site No. 360003)*, Cortlandt, New York; June 2006.

New York State Department of Health, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006.

New York State Department of Environmental Conservation, Division of Environmental Remediation, *DER-13/Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York*, October 2006.

New York State Department of Environmental Conservation, Division of Environmental Remediation, *Draft DER-10/Technical Guidance for Site Investigation and Remediation*, December 2002.

New York State Museum and Science Service Geological Survey, Map and Chart Series No. 15; *Geologic Map of New York, Lower Hudson Sheet, New York*; 1970; Reprinted 1995.

TABLES

Table 1
Magna Metals
New York, NY
Soil Vapor Analytical Results

Client ID Date Sampled Lab Sample ID Units Compound	NYSDOH Soil Vapor Intrusion Guidance Values (ug/m3)	EPA BASE 90th percentile (ug/m3)	SV-13 DUP(S.S) 4/5/2007 17:06 JTPH11AD ug/m3	SV-11(S.S) 4/5/2007 16:34 JTPG31AD ug/m3	SV-12(S.S) 4/5/2007 16:38 JTPHF1AD ug/m3	SV-13(S.S) 4/5/2007 17:06 JTPH51AD ug/m3	SV-14(S.S) 4/5/2007 17:28 JTPH91AD ug/m3	SV-15(S.S) 4/5/2007 16:56 JTPJG1AD ug/m3
1,1,1-Trichloroethane	100/1000	20.6	4.4 U	8.7 U	680 U	4.4 U	0.87 U	0.87 U
1,1,2,2-Tetrachloroethane		20.6	5.5 U	11 U	860 U	5.5 U	1.1 U	1.1 U
1,1,2-Trichloroethane		<1.5	4.4 U	8.7 U	680 U	4.4 U	0.87 U	0.87 U
1,1-Dichloroethane		<0.7	3.2 U	6.5 U	500 U	3.2 U	0.65 U	0.65 U
1,1-Dichloroethene		<1.4	3.2 U	6.3 U	490 U	3.2 U	0.63 U	0.63 U
1,2-Dibromoethane (EDB)		<1.5	6.1 U	12 U	960 U	6.1 U	1.2 U	1.2 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane		<1.5	5.6 U	11 U	870 U	5.6 U	1.1 U	1.1 U
1,2-Dichloroethane		<0.9	3.2 U	6.5 U	500 U	3.2 U	0.65 U	0.65 U
1,2-Dichloropropane		<1.6	3.7 U	7.4 U	580 U	3.7 U	0.74 U	0.74 U
1,3,5-Trimethylbenzene		3.7	3.9 U	7.9 U	610 U	3.9 U	0.79 U	0.79 U
1,3-Butadiene		<3.0	3.5 U	7.1 U	550 U	3.5 U	0.71 U	0.71 U
2,2,4-Trimethylpentane		<4.8	9.3 U	19 U	1500 U	9.3 U	1.9 U	1.9 U
3-Chloropropene		250	2.5 U	5 U	390 U	2.5 U	0.5 U	0.5 U
4-Ethyltoluene		3.6	7.9 U	16 U	1200 U	7.9 U	1.6 U	1.6 U
Benzene		9.4	2.6 U	5.1 U	400 U	2.9	2.6	2.2
Bromodichloromethane		<6.8	5.4 U	11 U	840 U	5.4 U	1.1 U	1.1 U
Bromoform		<6.8	8.3 U	17 U	1300 U	8.3 U	1.7 U	1.7 U
Bromomethane		<1.7	3.1 U	6.2 U	480 U	3.1 U	0.62 U	0.62 U
Carbon tetrachloride	5/50/250	<1.3	2.5 U	5 U	390 U	2.5 U	0.5 U	0.53
Chloroethane		<1.1	2.1 U	4.2 U	330 U	2.1 U	0.42 U	0.42 U
Chloroform		1.1	3.9 U	7.8 U	610 U	3.9 U	0.78 U	0.78 U
cis-1,2-Dichloroethene		<1.9	3.2 U	6.3 U	11000	3.2 U	0.63 U	0.63 U
cis-1,3-Dichloropropene		<2.3	3.6 U	7.3 U	570 U	3.6 U	0.73 U	0.73 U
Cyclohexane		<2.3	87	170	1100 U	97	17	56
Dibromochloromethane		<2.3	6.8 U	14 U	1100 U	6.8 U	1.4 U	1.4 U
Dichlorodifluoromethane		16.5	4 U	7.9 U	620 U	4 U	2.3	3.2
Ethylbenzene		5.7	6.1	6.9 U	540 U	9.4	0.69 U	0.69 U
Methyl tert-butyl ether		22.2	14 U	29 U	2200 U	14 U	3.3	4.4
m-Xylene & p-Xylene		10	14	16	540 U	22	0.69 U	0.69 U
n-Heptane		<3.6	27	16 U	1300 U	31	1.6 U	1.6 U
n-Hexane		10.2	86	84	1400	88	18	26
o-Xylene		7.9	6.1	6.9 U	540 U	9.6	0.69 U	0.69 U
Tetrachloroethene	100/1000	15.9	5.5	11 U	850 U	7.8	1.1 U	1.1 U
Toluene		43	450	450	3300	600	6.2	19
trans-1,2-Dichloroethene		43	3.2 U	6.3 U	490 U	3.2 U	0.63 U	0.63 U
trans-1,3-Dichloropropene		<1.3	3.6 U	7.3 U	570 U	3.6 U	0.73 U	0.73 U
Trichloroethene	5/50/250	4.2	3.9	1200	66000	4.8	0.46	0.43 U
Trichlorofluoromethane		18.1	4.5 U	9 U	700 U	4.5 U	1.5	2.3
Vinyl bromide		3.5	3.5 U	7 U	550 U	3.5 U	0.7 U	0.7 U
Vinyl chloride		<1.9	2 U	4.1 U	320 U	2 U	0.41 U	0.41 U

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

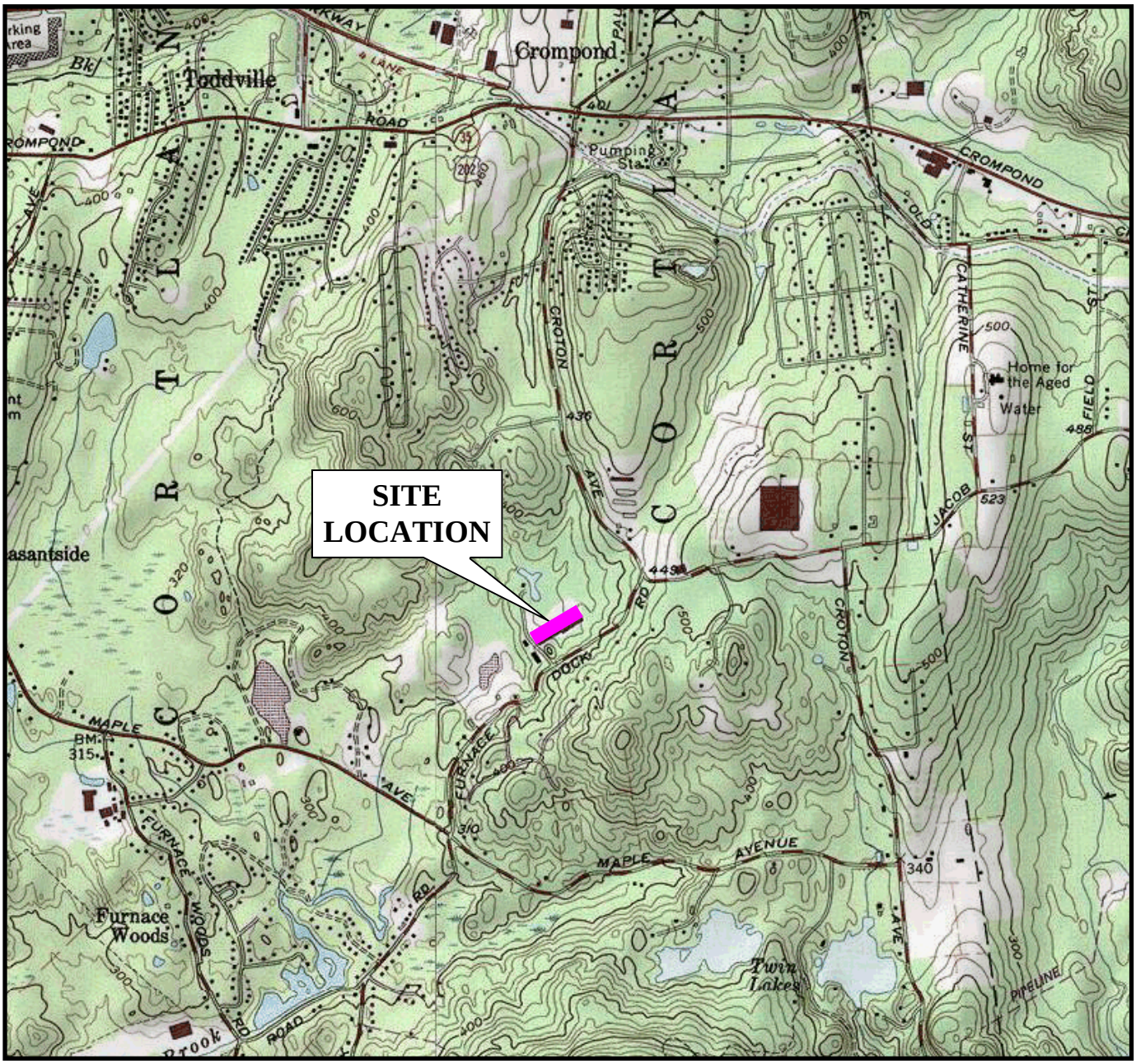
Table 2

Magna Metals
New York, NY
Indoor Air Analytical Results

Client ID Date Sampled Lab Sample ID Units Compound	NYSDOH Indoor Air Guidance Value (ug/m3)	EPA BASE 90th percentile (ug/m3)	OUTDOOR 1 (A.A) 4/5/2007 17:40 JTPJM1AD ug/m3	OUTDOOR 2 (A.A) 4/5/2007 18:10 JTPJR1AD ug/m3	SV-10(A.A) 4/5/2007 16:12 JTPHC1AD ug/m3	SV-11(A.A) 4/5/2007 16:07 JTPHA1AD ug/m3	SV-12(A.A) 4/5/2007 18:15 JTPHX1AD ug/m3	SV-13(A.A) 4/5/2007 17:10 JTPH71AD ug/m3	SV-14(A.A) 4/5/2007 17:20 JTPJE1AD ug/m3	SV-15(A.A) 4/5/2007 16:55 JTPJH1AD ug/m3
1,1,1-Trichloroethane	5	20.6	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1,2,2-Tetrachloroethane		20.6	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U
1,1,2-Trichloroethane		<1.5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
1,1-Dichloroethane		<0.7	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,1-Dichloroethene		<1.4	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dibromoethane (EDB)		<1.5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane		<1.5	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U
1,2-Dichloroethane		<0.9	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane		<1.6	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene		3.7	0.39 U	0.39 U	1.2	1.2	0.78	1.7	0.7	0.71
1,3-Butadiene		<3.0	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
2,2,4-Trimethylpentane		<4.8	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U	0.93 U
3-Chloropropene		250	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene		3.6	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Benzene		9.4	0.48	0.91	0.57	0.55	0.71	1.1	1.5	0.77
Bromodichloromethane		<6.8	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Bromoform		<6.8	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U
Bromomethane		<1.7	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	<1.3	0.51	0.66	0.56	0.53	0.51	0.47	0.77	0.54
Chloroethane		<1.1	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform		1.1	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	1.1	0.95	1.2
cis-1,2-Dichloroethene		<1.9	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
cis-1,3-Dichloropropene		<2.3	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Cyclohexane		<2.3	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	3.3	1.1	0.97
Dibromochloromethane		<2.3	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Dichlorodifluoromethane		16.5	2.2	3.2	2.6	2.3	2.2	2.1	3.6	2.2
Ethylbenzene		5.7	0.35 U	0.35 U	0.41	0.49	0.62	1.8	3.2	1.9
Methyl tert-butyl ether		22.2	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	6	1.4 U	1.4 U
m-Xylene & p-Xylene		10	0.42	0.87	1.3	1.4	1.9	5.9	7.6	4.5
n-Heptane		<3.6	0.82 U	0.94	0.82 U	1.7	0.82 U	17	1.7	4.8
n-Hexane		10.2	0.7 U	0.76	0.7 U	0.7 U	0.7 U	0.89	1	0.7 U
o-Xylene		7.9	0.35 U	0.35 U	0.48	0.6	0.59	2	2.8	1.8
Tetrachloroethene	100	15.9	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	1.3	0.61
Toluene		43	0.97	2.2	3.8	3.6	4	31	19	12
trans-1,2-Dichloroethene		43	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
trans-1,3-Dichloropropene		<1.3	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Trichloroethene	5	4.2	0.21 U	0.21 U	2.1	2.2	2.9	1.4	0.21 U	0.21 U
Trichlorofluoromethane		18.1	1.3	1.8	1.4	1.3	1.7	1.3	2.2	1.4
Vinyl bromide		3.5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride		<1.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Indoor air gudiance values presented in Table 3.1 and Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

FIGURES





SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’

N

SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

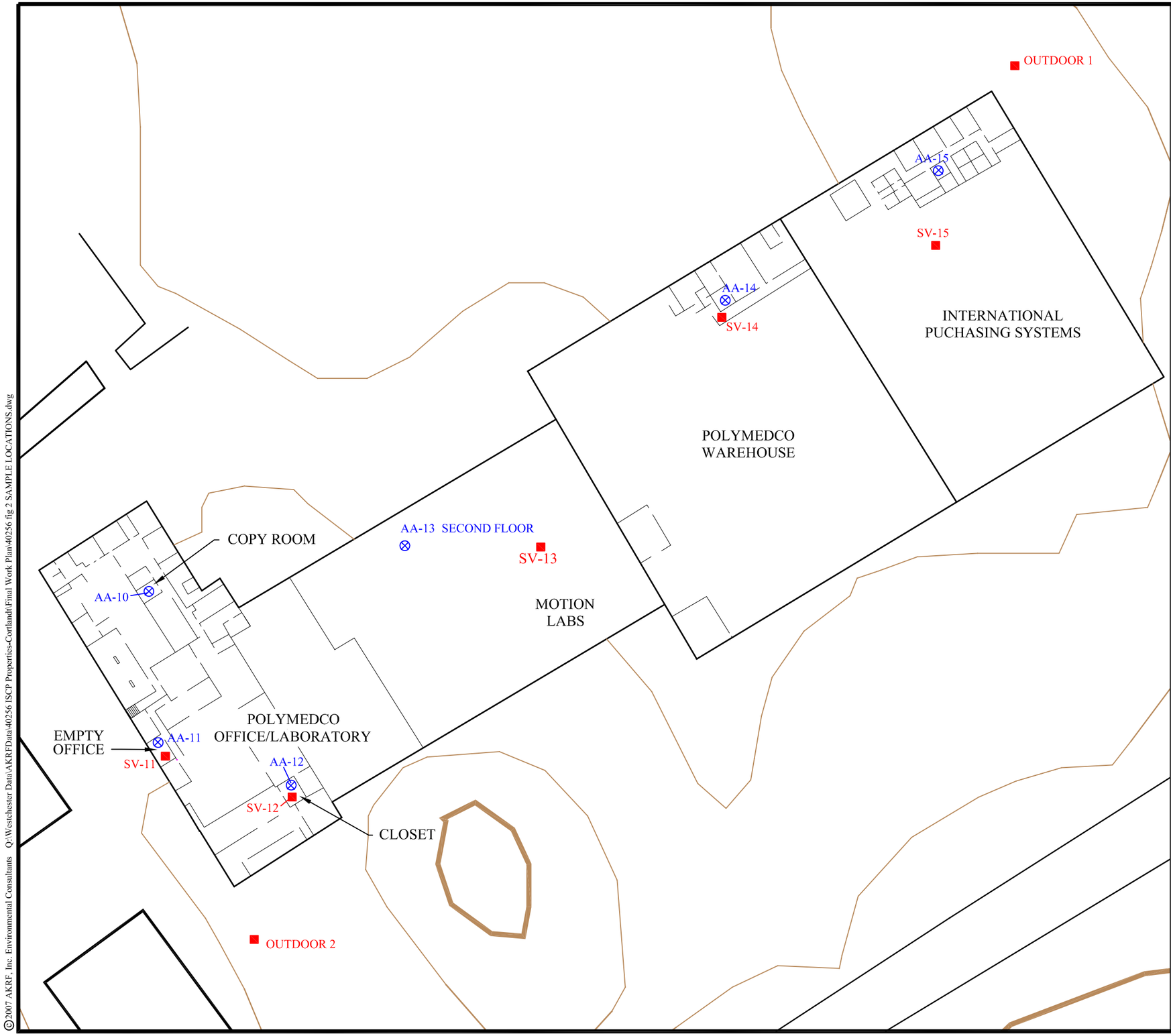
MAGNA METALS
CORTLANDT, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE **1.08.06**
PROJECT No. **40256**
SCALE **AS SHOWN**
FIGURE **1**

© 2007 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\Figures\40256 Fig 1 loc map.pub



SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-14 — SUBSLAB VAPOR SAMPLING LOCATION

⊗ — INDOOR AIR SAMPLING LOCATIONS

320 — CONTOUR LINE (20 FT INTERVAL)

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 30' 60' 120'
SCALE IN FEET

N

AKRF Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGMA METALS
CORTLANDT, NEW YORK

SAMPLING LOCATIONS

DATE
05.25.07

PROJECT NO.
40256

SCALE
1"=60'

FIGURE
2

©2007 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\Final Work Plan\40256 fig 2 SAMPLE LOCATIONS.dwg

APPENDIX A

NYSDOH INDOOR AIR QUALITY QUESTIONNAIRE

AND BUILDING INVENTORY FORM

APPENDIX B

PHOTOGRAPHIC LOG

APPENDIX C

SOIL GAS SAMPLING LOGS

APPENDIX D

ANALYTICAL DATA REPORT

TestAmerica
South Burlington, VT

Sample Data Summary Package

SDG: NY124464

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

March 28, 2008

Mr. Brian Zeiroff
AKRF, Inc.
34 S. Broadway
Suite 314
White Plains, NY 10601

Re: Laboratory Project No. 28000
Case: 28000; SDG: NY124464

Dear Mr. Zeiroff:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on March 11th, 2008. Laboratory identification numbers were assigned, and designated as follows:

Lab ID	Client Sample ID	Sample Date	Sample Matrix
	Received: 03/11/08 ETR No: 124464		
742882	SV-13	03/06/08	AIR
742883	IA-13	03/06/08	AIR
742884	IA-14	03/06/08	AIR
742885	SV-14	03/06/08	AIR
742886	AA-1	03/06/08	AIR
742887	IA-15	03/06/08	AIR
742888	SV-15	03/06/08	AIR
742889	SV-11	03/06/08	AIR
742890	IA-11	03/06/08	AIR
742891	IA-12	03/06/08	AIR
742892	SV-12	03/06/08	AIR
742893	IA-10	03/06/08	AIR
742894	IA-19	03/06/08	AIR
742895	AA-2	03/06/08	AIR

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

The original low level volatile organics analysis for sample IA-13 yielded concentrations of target analytes that exceeded the range of calibrated instrument response. This sample was diluted and re-analyzed yielding acceptable results. The results from both analyses have been formally presented.

The low level volatile organics analysis of the blank spike designated EA031408LCS yielded an elevated recovery for Methylene Chloride.

30 Community Drive Suite #11 South Burlington, VT 05403 **tel** 802.660.1990 **fax** 802.660.1919 **www.testamericainc.com**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

The analyses of the soil vapor samples referenced above were accomplished at dilution based on screen analyses to ensure quantitation of all target constituents within the range of calibrated instrument response.

Any reference within this report to Severn Trent Laboratories, Inc. or STL, should be understood to refer to TestAmerica Laboratories, Inc. (formerly known as Severn Trent Laboratories, Inc.) The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,

Don Dawicki
Project Manager

Enclosure

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742883

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.46		0.040	2.3		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.18		0.080	0.40		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.19		0.040	1.1		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.69		0.040	2.5		0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.31		0.080	1.1		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	1.1		0.040	3.8		0.14
Carbon Tetrachloride	56-23-5	0.060		0.040	0.38		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.33		0.040	1.1		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	22	E	0.040	90	E	0.16
Trichloroethene	79-01-6	0.20		0.040	1.1		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	1.7		0.040	6.4		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742883

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.21		0.040	0.91		0.17
Xylene (m,p)	1330-20-7	0.63		0.080	2.7		0.35
Xylene (o)	95-47-6	0.22		0.040	0.96		0.17
Xylene (total)	1330-20-7	0.84		0.040	3.6		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.29		0.040	1.4		0.20
1,3,5-Trimethylbenzene	108-67-8	0.16		0.080	0.79		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13DL

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 33.30

Sample Matrix: AIR

Lab Sample No.: 742883D1

Date Analyzed: 03/15/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.53	D	0.33	2.6	D	1.6
1,2-Dichlorotetrafluoroethane	76-14-2	0.33	U	0.33	2.3	U	2.3
Vinyl Chloride	75-01-4	0.67	U	0.67	1.7	U	1.7
1,3-Butadiene	106-99-0	0.67	U	0.67	1.5	U	1.5
Bromomethane	74-83-9	0.67	U	0.67	2.6	U	2.6
Chloroethane	75-00-3	0.67	U	0.67	1.8	U	1.8
Bromoethene	593-60-2	0.67	U	0.67	2.9	U	2.9
Trichlorofluoromethane	75-69-4	0.33	U	0.33	1.9	U	1.9
1,1-Dichloroethene	75-35-4	0.33	U	0.33	1.3	U	1.3
3-Chloropropene	107-05-1	0.67	U	0.67	2.1	U	2.1
Methylene Chloride	75-09-2	6.7	U	6.7	23	U	23
Methyl tert-Butyl Ether	1634-04-4	0.91	D	0.33	3.3	D	1.2
trans-1,2-Dichloroethene	156-60-5	0.33	U	0.33	1.3	U	1.3
n-Hexane	110-54-3	0.67	U	0.67	2.4	U	2.4
1,1-Dichloroethane	75-34-3	0.33	U	0.33	1.3	U	1.3
1,2-Dichloroethene (total)	540-59-0	0.33	U	0.33	1.3	U	1.3
cis-1,2-Dichloroethene	156-59-2	0.33	U	0.33	1.3	U	1.3
Chloroform	67-66-3	0.33	U	0.33	1.6	U	1.6
1,1,1-Trichloroethane	71-55-6	0.33	U	0.33	1.8	U	1.8
Cyclohexane	110-82-7	1.3	D	0.33	4.5	D	1.1
Carbon Tetrachloride	56-23-5	0.33	U	0.33	2.1	U	2.1
2,2,4-Trimethylpentane	540-84-1	0.33	U	0.33	1.5	U	1.5
Benzene	71-43-2	0.33	U	0.33	1.1	U	1.1
1,2-Dichloroethane	107-06-2	0.67	U	0.67	2.7	U	2.7
n-Heptane	142-82-5	21	D	0.33	86	D	1.4
Trichloroethene	79-01-6	0.33	U	0.33	1.8	U	1.8
1,2-Dichloropropane	78-87-5	0.67	U	0.67	3.1	U	3.1
Bromodichloromethane	75-27-4	0.33	U	0.33	2.2	U	2.2
cis-1,3-Dichloropropene	10061-01-5	0.33	U	0.33	1.5	U	1.5
Toluene	108-88-3	1.7	D	0.33	6.4	D	1.2
trans-1,3-Dichloropropene	10061-02-6	0.33	U	0.33	1.5	U	1.5
1,1,2-Trichloroethane	79-00-5	0.33	U	0.33	1.8	U	1.8
Tetrachloroethene	127-18-4	0.33	U	0.33	2.2	U	2.2

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13DL

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 33.30

Sample Matrix: AIR

Lab Sample No.: 742883D1

Date Analyzed: 03/15/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.33	U	0.33	2.8	U	2.8
1,2-Dibromoethane	106-93-4	0.33	U	0.33	2.5	U	2.5
Ethylbenzene	100-41-4	0.33	U	0.33	1.4	U	1.4
Xylene (m,p)	1330-20-7	0.67	U	0.67	2.9	U	2.9
Xylene (o)	95-47-6	0.33	U	0.33	1.4	U	1.4
Xylene (total)	1330-20-7	0.33	U	0.33	1.4	U	1.4
Bromoform	75-25-2	0.33	U	0.33	3.4	U	3.4
1,1,2,2-Tetrachloroethane	79-34-5	0.33	U	0.33	2.3	U	2.3
4-Ethyltoluene	622-96-8	0.33	U	0.33	1.6	U	1.6
1,3,5-Trimethylbenzene	108-67-8	0.67	U	0.67	3.3	U	3.3

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-14

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742884

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.46		0.040	2.3		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.20		0.040	1.1		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.37		0.080	1.3		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.079		0.040	0.39		0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.23		0.040	0.79		0.14
Carbon Tetrachloride	56-23-5	0.048		0.040	0.30		0.25
2,2,4-Trimethylpentane	540-84-1	0.13		0.040	0.61		0.19
Benzene	71-43-2	0.21		0.040	0.67		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.23		0.040	0.94		0.16
Trichloroethene	79-01-6	0.040	U	0.040	0.21	U	0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	1.2		0.040	4.5		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.29		0.040	2.0		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-14

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742884

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.18		0.040	0.78		0.17
Xylene (m,p)	1330-20-7	0.34		0.080	1.5		0.35
Xylene (o)	95-47-6	0.16		0.040	0.69		0.17
Xylene (total)	1330-20-7	0.49		0.040	2.1		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.19		0.040	0.93		0.20
1,3,5-Trimethylbenzene	108-67-8	0.081		0.080	0.40		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742886

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.40		0.040	2.0		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.15		0.040	0.84		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.098		0.080	0.35		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.36		0.040	1.2		0.14
Carbon Tetrachloride	56-23-5	0.055		0.040	0.35		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.15		0.040	0.48		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.27		0.040	1.1		0.16
Trichloroethene	79-01-6	0.040	U	0.040	0.21	U	0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.26		0.040	0.98		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.041		0.040	0.28		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742886

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.061		0.040	0.26		0.17
Xylene (m,p)	1330-20-7	0.17		0.080	0.74		0.35
Xylene (o)	95-47-6	0.057		0.040	0.25		0.17
Xylene (total)	1330-20-7	0.22		0.040	0.96		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-15

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742887

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50		0.040	2.5		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.18		0.040	1.0		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.21		0.080	0.74		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.12		0.040	0.59		0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.44		0.040	1.5		0.14
Carbon Tetrachloride	56-23-5	0.056		0.040	0.35		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.18		0.040	0.58		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.79		0.040	3.2		0.16
Trichloroethene	79-01-6	0.040	U	0.040	0.21	U	0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	1.3		0.040	4.9		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-15

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742887

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.24		0.040	1.0		0.17
Xylene (m,p)	1330-20-7	0.42		0.080	1.8		0.35
Xylene (o)	95-47-6	0.15		0.040	0.65		0.17
Xylene (total)	1330-20-7	0.57		0.040	2.5		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.14		0.040	0.69		0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742890

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.52		0.040	2.6		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.18		0.040	1.0		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.16		0.080	0.56		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.072		0.040	0.25		0.14
Carbon Tetrachloride	56-23-5	0.050		0.040	0.31		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.16		0.040	0.51		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.29		0.040	1.2		0.16
Trichloroethene	79-01-6	0.29		0.040	1.6		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.40		0.040	1.5		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.076		0.040	0.52		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742890

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.043		0.040	0.19		0.17
Xylene (m,p)	1330-20-7	0.13		0.080	0.56		0.35
Xylene (o)	95-47-6	0.054		0.040	0.23		0.17
Xylene (total)	1330-20-7	0.18		0.040	0.78		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.12		0.040	0.59		0.20
1,3,5-Trimethylbenzene	108-67-8	0.092		0.080	0.45		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742891

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50		0.040	2.5		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.18		0.040	1.0		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.080	U	0.080	0.28	U	0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.049		0.040	0.19		0.16
cis-1,2-Dichloroethene	156-59-2	0.058		0.040	0.23		0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.040	U	0.040	0.14	U	0.14
Carbon Tetrachloride	56-23-5	0.060		0.040	0.38		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.13		0.040	0.42		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.49		0.040	2.0		0.16
Trichloroethene	79-01-6	0.67		0.040	3.6		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.39		0.040	1.5		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.081		0.040	0.55		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742891

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.040	U	0.040	0.17	U	0.17
Xylene (m,p)	1330-20-7	0.097		0.080	0.42		0.35
Xylene (o)	95-47-6	0.040	U	0.040	0.17	U	0.17
Xylene (total)	1330-20-7	0.095		0.040	0.41		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.11		0.040	0.54		0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742893

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.68		0.040	3.4		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.24		0.040	1.3		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.19		0.080	0.67		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.040	U	0.040	0.14	U	0.14
Carbon Tetrachloride	56-23-5	0.065		0.040	0.41		0.25
2,2,4-Trimethylpentane	540-84-1	0.047		0.040	0.22		0.19
Benzene	71-43-2	0.20		0.040	0.64		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.29		0.040	1.2		0.16
Trichloroethene	79-01-6	0.38		0.040	2.0		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.81		0.040	3.1		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.070		0.040	0.47		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742893

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.087		0.040	0.38		0.17
Xylene (m,p)	1330-20-7	0.27		0.080	1.2		0.35
Xylene (o)	95-47-6	0.10		0.040	0.43		0.17
Xylene (total)	1330-20-7	0.37		0.040	1.6		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.14		0.040	0.69		0.20
1,3,5-Trimethylbenzene	108-67-8	0.10		0.080	0.49		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-19

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742894

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.56		0.040	2.8		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.22		0.040	1.2		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.13		0.080	0.46		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.067		0.040	0.23		0.14
Carbon Tetrachloride	56-23-5	0.055		0.040	0.35		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.20		0.040	0.64		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.28		0.040	1.1		0.16
Trichloroethene	79-01-6	0.38		0.040	2.0		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.57		0.040	2.1		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.067		0.040	0.45		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-19

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742894

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.070		0.040	0.30		0.17
Xylene (m,p)	1330-20-7	0.20		0.080	0.87		0.35
Xylene (o)	95-47-6	0.066		0.040	0.29		0.17
Xylene (total)	1330-20-7	0.26		0.040	1.1		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.13		0.040	0.64		0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-2

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742895

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.42		0.040	2.1		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.11		0.080	0.24		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.21		0.040	1.2		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.17		0.080	0.60		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.040	U	0.040	0.14	U	0.14
Carbon Tetrachloride	56-23-5	0.064		0.040	0.40		0.25
2,2,4-Trimethylpentane	540-84-1	0.044		0.040	0.21		0.19
Benzene	71-43-2	0.21		0.040	0.67		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.094		0.040	0.39		0.16
Trichloroethene	79-01-6	0.040	U	0.040	0.21	U	0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.43		0.040	1.6		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.051		0.040	0.35		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-2

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 742895

Date Analyzed: 03/14/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.068		0.040	0.30		0.17
Xylene (m,p)	1330-20-7	0.20		0.080	0.87		0.35
Xylene (o)	95-47-6	0.075		0.040	0.33		0.17
Xylene (total)	1330-20-7	0.27		0.040	1.2		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.074		0.040	0.36		0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA031408LCS

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA031408

Date Analyzed: 03/14/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.18		0.010	0.89		0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.20		0.010	1.4		0.070
Vinyl Chloride	75-01-4	0.24		0.020	0.61		0.051
1,3-Butadiene	106-99-0	0.23		0.020	0.51		0.044
Bromomethane	74-83-9	0.20		0.020	0.78		0.078
Chloroethane	75-00-3	0.23		0.020	0.61		0.053
Bromoethene	593-60-2	0.20		0.020	0.87		0.087
Trichlorofluoromethane	75-69-4	0.18		0.010	1.0		0.056
1,1-Dichloroethene	75-35-4	0.20		0.010	0.79		0.040
3-Chloropropene	107-05-1	0.22		0.020	0.69		0.063
Methylene Chloride	75-09-2	0.27		0.20	0.94		0.69
Methyl tert-Butyl Ether	1634-04-4	0.21		0.010	0.76		0.036
trans-1,2-Dichloroethene	156-60-5	0.21		0.010	0.83		0.040
n-Hexane	110-54-3	0.21		0.020	0.74		0.070
1,1-Dichloroethane	75-34-3	0.21		0.010	0.85		0.040
1,2-Dichloroethene (total)	540-59-0	0.41		0.010	1.6		0.040
cis-1,2-Dichloroethene	156-59-2	0.20		0.010	0.79		0.040
Chloroform	67-66-3	0.19		0.010	0.93		0.049
1,1,1-Trichloroethane	71-55-6	0.17		0.010	0.93		0.055
Cyclohexane	110-82-7	0.20		0.010	0.69		0.034
Carbon Tetrachloride	56-23-5	0.16		0.010	1.0		0.063
2,2,4-Trimethylpentane	540-84-1	0.21		0.010	0.98		0.047
Benzene	71-43-2	0.20		0.010	0.64		0.032
1,2-Dichloroethane	107-06-2	0.20		0.020	0.81		0.081
n-Heptane	142-82-5	0.19		0.010	0.78		0.041
Trichloroethene	79-01-6	0.18		0.010	0.97		0.054
1,2-Dichloropropane	78-87-5	0.23		0.020	1.1		0.092
Bromodichloromethane	75-27-4	0.19		0.010	1.3		0.067
cis-1,3-Dichloropropene	10061-01-5	0.18		0.010	0.82		0.045
Toluene	108-88-3	0.17		0.010	0.64		0.038
trans-1,3-Dichloropropene	10061-02-6	0.18		0.010	0.82		0.045
1,1,2-Trichloroethane	79-00-5	0.18		0.010	0.98		0.055
Tetrachloroethene	127-18-4	0.18		0.010	1.2		0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA031408LCS

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA031408

Date Analyzed: 03/14/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.17		0.010	1.4		0.085
1,2-Dibromoethane	106-93-4	0.17		0.010	1.3		0.077
Ethylbenzene	100-41-4	0.17		0.010	0.74		0.043
Xylene (m,p)	1330-20-7	0.34		0.020	1.5		0.087
Xylene (o)	95-47-6	0.16		0.010	0.69		0.043
Xylene (total)	1330-20-7	0.50		0.010	2.2		0.043
Bromoform	75-25-2	0.18		0.010	1.9		0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.19		0.010	1.3		0.069
4-Ethyltoluene	622-96-8	0.19		0.010	0.93		0.049
1,3,5-Trimethylbenzene	108-67-8	0.20		0.020	0.98		0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK031408EA

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0314

Date Analyzed: 03/14/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.010	U	0.010	0.049	U	0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.010	U	0.010	0.070	U	0.070
Vinyl Chloride	75-01-4	0.020	U	0.020	0.051	U	0.051
1,3-Butadiene	106-99-0	0.020	U	0.020	0.044	U	0.044
Bromomethane	74-83-9	0.020	U	0.020	0.078	U	0.078
Chloroethane	75-00-3	0.020	U	0.020	0.053	U	0.053
Bromoethene	593-60-2	0.020	U	0.020	0.087	U	0.087
Trichlorofluoromethane	75-69-4	0.010	U	0.010	0.056	U	0.056
1,1-Dichloroethene	75-35-4	0.010	U	0.010	0.040	U	0.040
3-Chloropropene	107-05-1	0.020	U	0.020	0.063	U	0.063
Methylene Chloride	75-09-2	0.20	U	0.20	0.69	U	0.69
Methyl tert-Butyl Ether	1634-04-4	0.010	U	0.010	0.036	U	0.036
trans-1,2-Dichloroethene	156-60-5	0.010	U	0.010	0.040	U	0.040
n-Hexane	110-54-3	0.020	U	0.020	0.070	U	0.070
1,1-Dichloroethane	75-34-3	0.010	U	0.010	0.040	U	0.040
1,2-Dichloroethene (total)	540-59-0	0.010	U	0.010	0.040	U	0.040
cis-1,2-Dichloroethene	156-59-2	0.010	U	0.010	0.040	U	0.040
Chloroform	67-66-3	0.010	U	0.010	0.049	U	0.049
1,1,1-Trichloroethane	71-55-6	0.010	U	0.010	0.055	U	0.055
Cyclohexane	110-82-7	0.010	U	0.010	0.034	U	0.034
Carbon Tetrachloride	56-23-5	0.010	U	0.010	0.063	U	0.063
2,2,4-Trimethylpentane	540-84-1	0.010	U	0.010	0.047	U	0.047
Benzene	71-43-2	0.010	U	0.010	0.032	U	0.032
1,2-Dichloroethane	107-06-2	0.020	U	0.020	0.081	U	0.081
n-Heptane	142-82-5	0.010	U	0.010	0.041	U	0.041
Trichloroethene	79-01-6	0.010	U	0.010	0.054	U	0.054
1,2-Dichloropropane	78-87-5	0.020	U	0.020	0.092	U	0.092
Bromodichloromethane	75-27-4	0.010	U	0.010	0.067	U	0.067
cis-1,3-Dichloropropene	10061-01-5	0.010	U	0.010	0.045	U	0.045
Toluene	108-88-3	0.010	U	0.010	0.038	U	0.038
trans-1,3-Dichloropropene	10061-02-6	0.010	U	0.010	0.045	U	0.045
1,1,2-Trichloroethane	79-00-5	0.010	U	0.010	0.055	U	0.055
Tetrachloroethene	127-18-4	0.010	U	0.010	0.068	U	0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK031408EA

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0314

Date Analyzed: 03/14/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.010	U	0.010	0.085	U	0.085
1,2-Dibromoethane	106-93-4	0.010	U	0.010	0.077	U	0.077
Ethylbenzene	100-41-4	0.010	U	0.010	0.043	U	0.043
Xylene (m,p)	1330-20-7	0.020	U	0.020	0.087	U	0.087
Xylene (o)	95-47-6	0.010	U	0.010	0.043	U	0.043
Xylene (total)	1330-20-7	0.010	U	0.010	0.043	U	0.043
Bromoform	75-25-2	0.010	U	0.010	0.10	U	0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.010	U	0.010	0.069	U	0.069
4-Ethyltoluene	622-96-8	0.010	U	0.010	0.049	U	0.049
1,3,5-Trimethylbenzene	108-67-8	0.020	U	0.020	0.098	U	0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-13

Lab Name: TAL Burlington

SDG Number: NY124464

Lab Sample No.: 742882

Dilution Factor: 15.40

Date Analyzed: 03/27/08

Sample Matrix: AIR

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	7.7	U	7.7	38	U	38
1,2-Dichlorotetrafluoroethane	76-14-2	3.1	U	3.1	22	U	22
Vinyl Chloride	75-01-4	3.1	U	3.1	7.9	U	7.9
1,3-Butadiene	106-99-0	7.7	U	7.7	17	U	17
Bromomethane	74-83-9	3.1	U	3.1	12	U	12
Chloroethane	75-00-3	3.1	U	3.1	8.2	U	8.2
Bromoethene	593-60-2	3.1	U	3.1	14	U	14
Trichlorofluoromethane	75-69-4	3.1	U	3.1	17	U	17
1,1-Dichloroethene	75-35-4	3.1	U	3.1	12	U	12
3-Chloropropene	107-05-1	7.7	U	7.7	24	U	24
Methylene Chloride	75-09-2	7.7	U	7.7	27	U	27
Methyl tert-Butyl Ether	1634-04-4	7.7	U	7.7	28	U	28
trans-1,2-Dichloroethene	156-60-5	3.1	U	3.1	12	U	12
n-Hexane	110-54-3	9.3		7.7	33		27
1,1-Dichloroethane	75-34-3	3.1	U	3.1	13	U	13
1,2-Dichloroethene (total)	540-59-0	3.1	U	3.1	12	U	12
cis-1,2-Dichloroethene	156-59-2	3.1	U	3.1	12	U	12
Chloroform	67-66-3	3.1	U	3.1	15	U	15
1,1,1-Trichloroethane	71-55-6	3.1	U	3.1	17	U	17
Cyclohexane	110-82-7	33		3.1	110		11
Carbon Tetrachloride	56-23-5	3.1	U	3.1	20	U	20
2,2,4-Trimethylpentane	540-84-1	3.1	U	3.1	14	U	14
Benzene	71-43-2	3.1	U	3.1	9.9	U	9.9
1,2-Dichloroethane	107-06-2	3.1	U	3.1	13	U	13
n-Heptane	142-82-5	4.4		3.1	18		13
Trichloroethene	79-01-6	26		3.1	140		17
1,2-Dichloropropane	78-87-5	3.1	U	3.1	14	U	14
Bromodichloromethane	75-27-4	3.1	U	3.1	21	U	21
cis-1,3-Dichloropropene	10061-01-5	3.1	U	3.1	14	U	14
Toluene	108-88-3	460		3.1	1700		12
trans-1,3-Dichloropropene	10061-02-6	3.1	U	3.1	14	U	14
1,1,2-Trichloroethane	79-00-5	3.1	U	3.1	17	U	17
Tetrachloroethene	127-18-4	3.1	U	3.1	21	U	21

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-13

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 15.40

Sample Matrix: AIR

Lab Sample No.: 742882

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	3.1	U	3.1	26	U	26
1,2-Dibromoethane	106-93-4	3.1	U	3.1	24	U	24
Ethylbenzene	100-41-4	3.8		3.1	17		13
Xylene (m,p)	1330-20-7	12		7.7	52		33
Xylene (o)	95-47-6	4.0		3.1	17		13
Xylene (total)	1330-20-7	16		3.1	69		13
Bromoform	75-25-2	3.1	U	3.1	32	U	32
1,1,2,2-Tetrachloroethane	79-34-5	3.1	U	3.1	21	U	21
4-Ethyltoluene	622-96-8	3.1	U	3.1	15	U	15
1,3,5-Trimethylbenzene	108-67-8	3.1	U	3.1	15	U	15

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-14

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.50

Sample Matrix: AIR

Lab Sample No.: 742885

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.75	U	0.75	3.7	U	3.7
1,2-Dichlorotetrafluoroethane	76-14-2	0.30	U	0.30	2.1	U	2.1
Vinyl Chloride	75-01-4	0.30	U	0.30	0.77	U	0.77
1,3-Butadiene	106-99-0	0.75	U	0.75	1.7	U	1.7
Bromomethane	74-83-9	0.30	U	0.30	1.2	U	1.2
Chloroethane	75-00-3	0.30	U	0.30	0.79	U	0.79
Bromoethene	593-60-2	0.30	U	0.30	1.3	U	1.3
Trichlorofluoromethane	75-69-4	0.30	U	0.30	1.7	U	1.7
1,1-Dichloroethene	75-35-4	0.30	U	0.30	1.2	U	1.2
3-Chloropropene	107-05-1	0.75	U	0.75	2.3	U	2.3
Methylene Chloride	75-09-2	0.75	U	0.75	2.6	U	2.6
Methyl tert-Butyl Ether	1634-04-4	0.75	U	0.75	2.7	U	2.7
trans-1,2-Dichloroethene	156-60-5	0.30	U	0.30	1.2	U	1.2
n-Hexane	110-54-3	4.2		0.75	15		2.6
1,1-Dichloroethane	75-34-3	0.30	U	0.30	1.2	U	1.2
1,2-Dichloroethene (total)	540-59-0	0.30	U	0.30	1.2	U	1.2
cis-1,2-Dichloroethene	156-59-2	0.30	U	0.30	1.2	U	1.2
Chloroform	67-66-3	0.30	U	0.30	1.5	U	1.5
1,1,1-Trichloroethane	71-55-6	0.30	U	0.30	1.6	U	1.6
Cyclohexane	110-82-7	4.8		0.30	17		1.0
Carbon Tetrachloride	56-23-5	0.30	U	0.30	1.9	U	1.9
2,2,4-Trimethylpentane	540-84-1	0.64		0.30	3.0		1.4
Benzene	71-43-2	0.30	U	0.30	0.96	U	0.96
1,2-Dichloroethane	107-06-2	0.30	U	0.30	1.2	U	1.2
n-Heptane	142-82-5	0.44		0.30	1.8		1.2
Trichloroethene	79-01-6	0.30	U	0.30	1.6	U	1.6
1,2-Dichloropropane	78-87-5	0.30	U	0.30	1.4	U	1.4
Bromodichloromethane	75-27-4	0.30	U	0.30	2.0	U	2.0
cis-1,3-Dichloropropene	10061-01-5	0.30	U	0.30	1.4	U	1.4
Toluene	108-88-3	43		0.30	160		1.1
trans-1,3-Dichloropropene	10061-02-6	0.30	U	0.30	1.4	U	1.4
1,1,2-Trichloroethane	79-00-5	0.30	U	0.30	1.6	U	1.6
Tetrachloroethene	127-18-4	0.30	U	0.30	2.0	U	2.0

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-14

Lab Name: TAL Burlington

SDG Number: NY124464

Lab Sample No.: 742885

Dilution Factor: 1.50

Date Analyzed: 03/27/08

Sample Matrix: AIR

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.30	U	0.30	2.6	U	2.6
1,2-Dibromoethane	106-93-4	0.30	U	0.30	2.3	U	2.3
Ethylbenzene	100-41-4	0.55		0.30	2.4		1.3
Xylene (m,p)	1330-20-7	1.4		0.75	6.1		3.3
Xylene (o)	95-47-6	0.54		0.30	2.3		1.3
Xylene (total)	1330-20-7	2.0		0.30	8.7		1.3
Bromoform	75-25-2	0.30	U	0.30	3.1	U	3.1
1,1,2,2-Tetrachloroethane	79-34-5	0.30	U	0.30	2.1	U	2.1
4-Ethyltoluene	622-96-8	0.30	U	0.30	1.5	U	1.5
1,3,5-Trimethylbenzene	108-67-8	0.30	U	0.30	1.5	U	1.5

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-15

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 3.89

Sample Matrix: AIR

Lab Sample No.: 742888

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	1.9	U	1.9	9.4	U	9.4
1,2-Dichlorotetrafluoroethane	76-14-2	0.78	U	0.78	5.5	U	5.5
Vinyl Chloride	75-01-4	0.78	U	0.78	2.0	U	2.0
1,3-Butadiene	106-99-0	1.9	U	1.9	4.2	U	4.2
Bromomethane	74-83-9	0.78	U	0.78	3.0	U	3.0
Chloroethane	75-00-3	0.78	U	0.78	2.1	U	2.1
Bromoethene	593-60-2	0.78	U	0.78	3.4	U	3.4
Trichlorofluoromethane	75-69-4	0.78	U	0.78	4.4	U	4.4
1,1-Dichloroethene	75-35-4	0.78	U	0.78	3.1	U	3.1
3-Chloropropene	107-05-1	1.9	U	1.9	5.9	U	5.9
Methylene Chloride	75-09-2	1.9	U	1.9	6.6	U	6.6
Methyl tert-Butyl Ether	1634-04-4	1.9	U	1.9	6.9	U	6.9
trans-1,2-Dichloroethene	156-60-5	0.78	U	0.78	3.1	U	3.1
n-Hexane	110-54-3	1.9	U	1.9	6.7	U	6.7
1,1-Dichloroethane	75-34-3	0.78	U	0.78	3.2	U	3.2
1,2-Dichloroethene (total)	540-59-0	0.78	U	0.78	3.1	U	3.1
cis-1,2-Dichloroethene	156-59-2	0.78	U	0.78	3.1	U	3.1
Chloroform	67-66-3	0.78	U	0.78	3.8	U	3.8
1,1,1-Trichloroethane	71-55-6	0.78	U	0.78	4.3	U	4.3
Cyclohexane	110-82-7	0.78	U	0.78	2.7	U	2.7
Carbon Tetrachloride	56-23-5	0.78	U	0.78	4.9	U	4.9
2,2,4-Trimethylpentane	540-84-1	0.78	U	0.78	3.6	U	3.6
Benzene	71-43-2	0.78	U	0.78	2.5	U	2.5
1,2-Dichloroethane	107-06-2	0.78	U	0.78	3.2	U	3.2
n-Heptane	142-82-5	0.78	U	0.78	3.2	U	3.2
Trichloroethene	79-01-6	0.78	U	0.78	4.2	U	4.2
1,2-Dichloropropane	78-87-5	0.78	U	0.78	3.6	U	3.6
Bromodichloromethane	75-27-4	0.78	U	0.78	5.2	U	5.2
cis-1,3-Dichloropropene	10061-01-5	0.78	U	0.78	3.5	U	3.5
Toluene	108-88-3	2.9		0.78	11		2.9
trans-1,3-Dichloropropene	10061-02-6	0.78	U	0.78	3.5	U	3.5
1,1,2-Trichloroethane	79-00-5	0.78	U	0.78	4.3	U	4.3
Tetrachloroethene	127-18-4	0.78	U	0.78	5.3	U	5.3

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-15

Lab Name: TAL Burlington

SDG Number: NY124464

Lab Sample No.: 742888

Dilution Factor: 3.89

Date Analyzed: 03/27/08

Sample Matrix: AIR

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.78	U	0.78	6.6	U	6.6
1,2-Dibromoethane	106-93-4	0.78	U	0.78	6.0	U	6.0
Ethylbenzene	100-41-4	0.78	U	0.78	3.4	U	3.4
Xylene (m,p)	1330-20-7	1.9	U	1.9	8.3	U	8.3
Xylene (o)	95-47-6	0.78	U	0.78	3.4	U	3.4
Xylene (total)	1330-20-7	0.78	U	0.78	3.4	U	3.4
Bromoform	75-25-2	0.78	U	0.78	8.1	U	8.1
1,1,2,2-Tetrachloroethane	79-34-5	0.78	U	0.78	5.4	U	5.4
4-Ethyltoluene	622-96-8	0.78	U	0.78	3.8	U	3.8
1,3,5-Trimethylbenzene	108-67-8	0.78	U	0.78	3.8	U	3.8

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-11

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 5.56

Sample Matrix: AIR

Lab Sample No.: 742889

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	2.8	U	2.8	14	U	14
1,2-Dichlorotetrafluoroethane	76-14-2	1.1	U	1.1	7.7	U	7.7
Vinyl Chloride	75-01-4	1.1	U	1.1	2.8	U	2.8
1,3-Butadiene	106-99-0	2.8	U	2.8	6.2	U	6.2
Bromomethane	74-83-9	1.1	U	1.1	4.3	U	4.3
Chloroethane	75-00-3	1.1	U	1.1	2.9	U	2.9
Bromoethene	593-60-2	1.1	U	1.1	4.8	U	4.8
Trichlorofluoromethane	75-69-4	1.1	U	1.1	6.2	U	6.2
1,1-Dichloroethene	75-35-4	1.1	U	1.1	4.4	U	4.4
3-Chloropropene	107-05-1	2.8	U	2.8	8.8	U	8.8
Methylene Chloride	75-09-2	2.8	U	2.8	9.7	U	9.7
Methyl tert-Butyl Ether	1634-04-4	2.8	U	2.8	10	U	10
trans-1,2-Dichloroethene	156-60-5	1.1	U	1.1	4.4	U	4.4
n-Hexane	110-54-3	2.8	U	2.8	9.9	U	9.9
1,1-Dichloroethane	75-34-3	1.1	U	1.1	4.5	U	4.5
1,2-Dichloroethene (total)	540-59-0	1.1	U	1.1	4.4	U	4.4
cis-1,2-Dichloroethene	156-59-2	1.1	U	1.1	4.4	U	4.4
Chloroform	67-66-3	1.1	U	1.1	5.4	U	5.4
1,1,1-Trichloroethane	71-55-6	1.1	U	1.1	6.0	U	6.0
Cyclohexane	110-82-7	1.2		1.1	4.1		3.8
Carbon Tetrachloride	56-23-5	1.1	U	1.1	6.9	U	6.9
2,2,4-Trimethylpentane	540-84-1	1.1	U	1.1	5.1	U	5.1
Benzene	71-43-2	1.1	U	1.1	3.5	U	3.5
1,2-Dichloroethane	107-06-2	1.1	U	1.1	4.5	U	4.5
n-Heptane	142-82-5	1.1	U	1.1	4.5	U	4.5
Trichloroethene	79-01-6	170		1.1	910		5.9
1,2-Dichloropropane	78-87-5	1.1	U	1.1	5.1	U	5.1
Bromodichloromethane	75-27-4	1.1	U	1.1	7.4	U	7.4
cis-1,3-Dichloropropene	10061-01-5	1.1	U	1.1	5.0	U	5.0
Toluene	108-88-3	12		1.1	45		4.1
trans-1,3-Dichloropropene	10061-02-6	1.1	U	1.1	5.0	U	5.0
1,1,2-Trichloroethane	79-00-5	1.1	U	1.1	6.0	U	6.0
Tetrachloroethene	127-18-4	1.1	U	1.1	7.5	U	7.5

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-11

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 5.56

Sample Matrix: AIR

Lab Sample No.: 742889

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	1.1	U	1.1	9.4	U	9.4
1,2-Dibromoethane	106-93-4	1.1	U	1.1	8.5	U	8.5
Ethylbenzene	100-41-4	1.1	U	1.1	4.8	U	4.8
Xylene (m,p)	1330-20-7	2.8	U	2.8	12	U	12
Xylene (o)	95-47-6	1.1	U	1.1	4.8	U	4.8
Xylene (total)	1330-20-7	1.1	U	1.1	4.8	U	4.8
Bromoform	75-25-2	1.1	U	1.1	11	U	11
1,1,2,2-Tetrachloroethane	79-34-5	1.1	U	1.1	7.6	U	7.6
4-Ethyltoluene	622-96-8	1.1	U	1.1	5.4	U	5.4
1,3,5-Trimethylbenzene	108-67-8	1.1	U	1.1	5.4	U	5.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-12

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 533.00

Sample Matrix: AIR

Lab Sample No.: 742892

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	270	U	270	1300	U	1300
1,2-Dichlorotetrafluoroethane	76-14-2	110	U	110	770	U	770
Vinyl Chloride	75-01-4	110	U	110	280	U	280
1,3-Butadiene	106-99-0	270	U	270	600	U	600
Bromomethane	74-83-9	110	U	110	430	U	430
Chloroethane	75-00-3	110	U	110	290	U	290
Bromoethene	593-60-2	110	U	110	480	U	480
Trichlorofluoromethane	75-69-4	110	U	110	620	U	620
1,1-Dichloroethene	75-35-4	110	U	110	440	U	440
3-Chloropropene	107-05-1	270	U	270	850	U	850
Methylene Chloride	75-09-2	270	U	270	940	U	940
Methyl tert-Butyl Ether	1634-04-4	270	U	270	970	U	970
trans-1,2-Dichloroethene	156-60-5	110	U	110	440	U	440
n-Hexane	110-54-3	270	U	270	950	U	950
1,1-Dichloroethane	75-34-3	110	U	110	450	U	450
1,2-Dichloroethene (total)	540-59-0	2900		110	11000		440
cis-1,2-Dichloroethene	156-59-2	2900		110	11000		440
Chloroform	67-66-3	110	U	110	540	U	540
1,1,1-Trichloroethane	71-55-6	110	U	110	600	U	600
Cyclohexane	110-82-7	150		110	520		380
Carbon Tetrachloride	56-23-5	110	U	110	690	U	690
2,2,4-Trimethylpentane	540-84-1	110	U	110	510	U	510
Benzene	71-43-2	110	U	110	350	U	350
1,2-Dichloroethane	107-06-2	110	U	110	450	U	450
n-Heptane	142-82-5	110	U	110	450	U	450
Trichloroethene	79-01-6	18000		110	97000		590
1,2-Dichloropropane	78-87-5	110	U	110	510	U	510
Bromodichloromethane	75-27-4	110	U	110	740	U	740
cis-1,3-Dichloropropene	10061-01-5	110	U	110	500	U	500
Toluene	108-88-3	1800		110	6800		410
trans-1,3-Dichloropropene	10061-02-6	110	U	110	500	U	500
1,1,2-Trichloroethane	79-00-5	110	U	110	600	U	600
Tetrachloroethene	127-18-4	110	U	110	750	U	750

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SV-12

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 533.00

Sample Matrix: AIR

Lab Sample No.: 742892

Date Analyzed: 03/27/08

Date Received: 03/11/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	110	U	110	940	U	940
1,2-Dibromoethane	106-93-4	110	U	110	850	U	850
Ethylbenzene	100-41-4	110	U	110	480	U	480
Xylene (m,p)	1330-20-7	270	U	270	1200	U	1200
Xylene (o)	95-47-6	110	U	110	480	U	480
Xylene (total)	1330-20-7	110	U	110	480	U	480
Bromoform	75-25-2	110	U	110	1100	U	1100
1,1,2,2-Tetrachloroethane	79-34-5	110	U	110	760	U	760
4-Ethyltoluene	622-96-8	110	U	110	540	U	540
1,3,5-Trimethylbenzene	108-67-8	110	U	110	540	U	540

TO-14/15
Result Summary

CLIENT SAMPLE NO.

CA032608LCS

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA032608

Date Analyzed: 03/26/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	8.3		0.50	41		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	8.2		0.20	57		1.4
Vinyl Chloride	75-01-4	8.4		0.20	21		0.51
1,3-Butadiene	106-99-0	8.8		0.50	19		1.1
Bromomethane	74-83-9	8.3		0.20	32		0.78
Chloroethane	75-00-3	8.6		0.20	23		0.53
Bromoethene	593-60-2	9.3		0.20	41		0.87
Trichlorofluoromethane	75-69-4	8.2		0.20	46		1.1
1,1-Dichloroethene	75-35-4	9.9		0.20	39		0.79
3-Chloropropene	107-05-1	8.7		0.50	27		1.6
Methylene Chloride	75-09-2	9.0		0.50	31		1.7
Methyl tert-Butyl Ether	1634-04-4	8.8		0.50	32		1.8
trans-1,2-Dichloroethene	156-60-5	8.6		0.20	34		0.79
n-Hexane	110-54-3	8.9		0.50	31		1.8
1,1-Dichloroethane	75-34-3	8.5		0.20	34		0.81
1,2-Dichloroethene (total)	540-59-0	18		0.20	71		0.79
cis-1,2-Dichloroethene	156-59-2	9.2		0.20	36		0.79
Chloroform	67-66-3	8.6		0.20	42		0.98
1,1,1-Trichloroethane	71-55-6	7.7		0.20	42		1.1
Cyclohexane	110-82-7	8.2		0.20	28		0.69
Carbon Tetrachloride	56-23-5	7.8		0.20	49		1.3
2,2,4-Trimethylpentane	540-84-1	8.2		0.20	38		0.93
Benzene	71-43-2	8.3		0.20	27		0.64
1,2-Dichloroethane	107-06-2	7.6		0.20	31		0.81
n-Heptane	142-82-5	8.1		0.20	33		0.82
Trichloroethene	79-01-6	8.0		0.20	43		1.1
1,2-Dichloropropane	78-87-5	8.4		0.20	39		0.92
Bromodichloromethane	75-27-4	8.4		0.20	56		1.3
cis-1,3-Dichloropropene	10061-01-5	8.4		0.20	38		0.91
Toluene	108-88-3	8.1		0.20	31		0.75
trans-1,3-Dichloropropene	10061-02-6	8.3		0.20	38		0.91
1,1,2-Trichloroethane	79-00-5	7.6		0.20	41		1.1
Tetrachloroethene	127-18-4	7.9		0.20	54		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

CA032608LCS

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA032608

Date Analyzed: 03/26/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	8.4		0.20	72		1.7
1,2-Dibromoethane	106-93-4	8.2		0.20	63		1.5
Ethylbenzene	100-41-4	7.8		0.20	34		0.87
Xylene (m,p)	1330-20-7	16		0.50	69		2.2
Xylene (o)	95-47-6	7.8		0.20	34		0.87
Xylene (total)	1330-20-7	24		0.20	100		0.87
Bromoform	75-25-2	8.1		0.20	84		2.1
1,1,2,2-Tetrachloroethane	79-34-5	7.4		0.20	51		1.4
4-Ethyltoluene	622-96-8	8.0		0.20	39		0.98
1,3,5-Trimethylbenzene	108-67-8	7.8		0.20	38		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

CA032608LCSD

Lab Name: TAL Burlington

SDG Number: NY124464

Lab Sample No.: CA032608

Dilution Factor: 1.00

Date Analyzed: 03/26/08

Sample Matrix: AIR

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	9.1		0.50	45		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	9.3		0.20	65		1.4
Vinyl Chloride	75-01-4	9.6		0.20	25		0.51
1,3-Butadiene	106-99-0	10		0.50	22		1.1
Bromomethane	74-83-9	9.5		0.20	37		0.78
Chloroethane	75-00-3	9.6		0.20	25		0.53
Bromoethene	593-60-2	10		0.20	44		0.87
Trichlorofluoromethane	75-69-4	9.2		0.20	52		1.1
1,1-Dichloroethene	75-35-4	11		0.20	44		0.79
3-Chloropropene	107-05-1	9.9		0.50	31		1.6
Methylene Chloride	75-09-2	10		0.50	35		1.7
Methyl tert-Butyl Ether	1634-04-4	10		0.50	36		1.8
trans-1,2-Dichloroethene	156-60-5	9.6		0.20	38		0.79
n-Hexane	110-54-3	10		0.50	35		1.8
1,1-Dichloroethane	75-34-3	9.6		0.20	39		0.81
1,2-Dichloroethene (total)	540-59-0	20		0.20	79		0.79
cis-1,2-Dichloroethene	156-59-2	10		0.20	40		0.79
Chloroform	67-66-3	9.5		0.20	46		0.98
1,1,1-Trichloroethane	71-55-6	8.8		0.20	48		1.1
Cyclohexane	110-82-7	9.5		0.20	33		0.69
Carbon Tetrachloride	56-23-5	8.8		0.20	55		1.3
2,2,4-Trimethylpentane	540-84-1	9.4		0.20	44		0.93
Benzene	71-43-2	9.5		0.20	30		0.64
1,2-Dichloroethane	107-06-2	8.6		0.20	35		0.81
n-Heptane	142-82-5	9.3		0.20	38		0.82
Trichloroethene	79-01-6	9.3		0.20	50		1.1
1,2-Dichloropropane	78-87-5	9.5		0.20	44		0.92
Bromodichloromethane	75-27-4	9.6		0.20	64		1.3
cis-1,3-Dichloropropene	10061-01-5	9.5		0.20	43		0.91
Toluene	108-88-3	8.9		0.20	34		0.75
trans-1,3-Dichloropropene	10061-02-6	9.5		0.20	43		0.91
1,1,2-Trichloroethane	79-00-5	8.4		0.20	46		1.1
Tetrachloroethene	127-18-4	8.7		0.20	59		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

CA032608LCSD

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA032608

Date Analyzed: 03/26/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	9.3		0.20	79		1.7
1,2-Dibromoethane	106-93-4	8.8		0.20	68		1.5
Ethylbenzene	100-41-4	9.0		0.20	39		0.87
Xylene (m,p)	1330-20-7	19		0.50	83		2.2
Xylene (o)	95-47-6	9.1		0.20	40		0.87
Xylene (total)	1330-20-7	28		0.20	120		0.87
Bromoform	75-25-2	9.2		0.20	95		2.1
1,1,2,2-Tetrachloroethane	79-34-5	8.7		0.20	60		1.4
4-Ethyltoluene	622-96-8	10		0.20	49		0.98
1,3,5-Trimethylbenzene	108-67-8	8.7		0.20	43		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK032608CA

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0326

Date Analyzed: 03/26/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.20	U	0.20	0.53	U	0.53
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.20	U	0.20	1.1	U	1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	0.20	U	0.20	0.69	U	0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	0.20	U	0.20	0.75	U	0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK032608CA

Lab Name: TAL Burlington

SDG Number: NY124464

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0326

Date Analyzed: 03/26/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.20	U	0.20	0.87	U	0.87
Xylene (m,p)	1330-20-7	0.50	U	0.50	2.2	U	2.2
Xylene (o)	95-47-6	0.20	U	0.20	0.87	U	0.87
Xylene (total)	1330-20-7	0.20	U	0.20	0.87	U	0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TestAmerica Burlington Data Qualifier Definitions

Organic

U: Compound analyzed but not detected at a concentration above the reporting limit.

J: Estimated value.

N: Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds (TICs) where the identification of a compound is based on a mass spectral library search.

P: SW-846: The relative percent difference for detected concentrations between two GC columns is greater than 40%. Unless otherwise specified the higher of the two values is reported on the Form I.

CLP SOW: Greater than 25% difference for detected concentrations between two GC columns. Unless otherwise specified the lower of the two values is reported on the Form I.

C: Pesticide result whose identification has been confirmed by GC/MS.

B: Analyte is found in the sample and the associated method blank. The flag is used for tentatively identified compounds as well as positively identified compounds.

E: Compounds whose concentrations exceed the upper limit of the calibration range of the instrument for that specific analysis.

D: Concentrations identified from analysis of the sample at a secondary dilution.

A: Tentatively identified compound is a suspected aldol condensation product.

X,Y,Z: Laboratory defined flags that may be used alone or combined, as needed. If used, the description of the flag is defined in the project narrative.

Inorganic/Metals

E: Reported value is estimated due to the presence of interference.

N: Matrix spike sample recovery is not within control limits.

*: Duplicate sample analysis is not within control limits.

B: The result reported is less than the reporting limit but greater than the instrument detection limit.

U: Analyte was analyzed for but not detected above the reporting limit.

Method Codes:

P ICP-AES
MS ICP-MS
CV Cold Vapor AA
AS Semi-Automated Spectrophotometric

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client	Project Manager	Date	Chain of Custody Number
AKRF, Inc	Bryan Zierolf	3/7/08	351785
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 2
34 South Broadway #314	(914) 922-2382		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
White Plains / NY / 10601	Eric Rubin	Erin Gans	
Project Name and Location (State)	**Carrier/Waybill Number**		
Magna Metals (NY)			
Contract/Purchase Order/Quote No.			
40256			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): TO-15	Special Instructions/ Conditions of Receipt
SV-13	3/6/08	0743	X										X	Meet 0.25 ug/m³
IA-13		0751	X										X	detection limit
IA-14		0812	X										X	for TCE *
SV-14		0818	X										X	
AA-1		0835	X										X	
IA-15		0845	X										X	
SV-15		0938	X										X	
SV-11		1016	X										X	
IA-11		1020	X										X	
IA-12		1041	X										X	
SV-12		1041	X										X	
IA-10		1042	X										X	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Std

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	3/7/08	1345	1. Received By Richard L Trad	3/10/08	1345
2. Relinquished By			2. Received By	3/10/08	1535
3. Relinquished By			3. Received By	3/11/08	0930

Comments

PASSED RAD SCREEN

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: AKRF, Inc	Project Manager: Bryan Zierdt	Date: 3/7/08	Chain of Custody Number: 351786
Address: 34 South Broadway Suite 314	Telephone Number (Area Code)/Fax Number: (914) 922-2382	Lab Number:	Page 2 of 2
City: White Plains / State: NY / Zip Code: 10601	Site Contact: Eric Rubin	Lab Contact: Erin Gaus	
Project Name and Location (State): Magna Metals (NY)	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: 40256			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: TO-15	Special Instructions/ Conditions of Receipt
IA-19	3/6/08	1043	X										X	meet 0.25 mg/m³
AA-2	3/6/08	1102	X										X	detection limit
														for TCE *

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Std

QC Requirements (Specify):

1. Relinquished By	Date: 3/7/08	Time: 1345	1. Received By: Richard J Pod	Date: 3/10/08	Time: 1345
2. Relinquished By	Date:	Time:	2. Received By:	Date: 3/10/08	Time: 15:53
3. Relinquished By	Date:	Time:	3. Received By:	Date: 3/11/08	Time: 0930

Comments: PASSED RAD SCREEN

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Data Summary – TO-15 Low Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742886

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742886

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.40	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.15	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.098	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.36	
56-23-5	Carbon Tetrachloride	0.055	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.15	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.27	
79-01-6	Trichloroethene	0.040	U
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.26	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.041	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742886

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742886

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.061	
1330-20-7	Xylene (m,p)	0.17	
95-47-6	Xylene (o)	0.057	
1330-20-7	Xylene (total)	0.22	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-2

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742895

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742895

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.42	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.11	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.21	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.17	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.040	U
56-23-5	Carbon Tetrachloride	0.064	
540-84-1	2,2,4-Trimethylpentane	0.044	
71-43-2	Benzene	0.21	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.094	
79-01-6	Trichloroethene	0.040	U
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.43	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.051	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-2

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742895

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742895

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.068	
1330-20-7	Xylene (m,p)	0.20	
95-47-6	Xylene (o)	0.075	
1330-20-7	Xylene (total)	0.27	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.074	
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742893

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742893

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.68	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.24	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.19	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.040	U
56-23-5	Carbon Tetrachloride	0.065	
540-84-1	2,2,4-Trimethylpentane	0.047	
71-43-2	Benzene	0.20	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.29	
79-01-6	Trichloroethene	0.38	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.81	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.070	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742893

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742893

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.087	
1330-20-7	Xylene (m,p)	0.27	
95-47-6	Xylene (o)	0.10	
1330-20-7	Xylene (total)	0.37	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.14	
108-67-8	1,3,5-Trimethylbenzene	0.10	

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AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742890

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742890

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.52	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.18	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.16	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.072	
56-23-5	Carbon Tetrachloride	0.050	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.16	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.29	
79-01-6	Trichloroethene	0.29	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.40	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.076	

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AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742890

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742890

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.043	
1330-20-7	Xylene (m,p)	0.13	
95-47-6	Xylene (o)	0.054	
1330-20-7	Xylene (total)	0.18	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.12	
108-67-8	1,3,5-Trimethylbenzene	0.092	

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AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742891

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742891

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.18	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.080	U
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.049	
156-59-2	cis-1,2-Dichloroethene	0.058	
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.040	U
56-23-5	Carbon Tetrachloride	0.060	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.13	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.49	
79-01-6	Trichloroethene	0.67	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.39	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.081	

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742891

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742891

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.040	U
1330-20-7	Xylene (m,p)	0.097	
95-47-6	Xylene (o)	0.040	U
1330-20-7	Xylene (total)	0.095	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.11	
108-67-8	1,3,5-Trimethylbenzene	0.080	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742883

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742883

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.46	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.18	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.19	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.69	
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.31	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	1.1	
56-23-5	Carbon Tetrachloride	0.060	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.33	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	22	E
79-01-6	Trichloroethene	0.20	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	1.7	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

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AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742883

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742883

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.21	
1330-20-7	Xylene (m,p)	0.63	
95-47-6	Xylene (o)	0.22	
1330-20-7	Xylene (total)	0.84	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.29	
108-67-8	1,3,5-Trimethylbenzene	0.16	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13DL

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742883D1

Sample wt/vol: 15.00 (g/mL) ML Lab File ID: 742883D

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/15/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 33.3

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.53	D
76-14-2	1,2-Dichlorotetrafluoroethan	0.33	U
75-01-4	Vinyl Chloride	0.67	U
106-99-0	1,3-Butadiene	0.67	U
74-83-9	Bromomethane	0.67	U
75-00-3	Chloroethane	0.67	U
593-60-2	Bromoethene	0.67	U
75-69-4	Trichlorofluoromethane	0.33	U
75-35-4	1,1-Dichloroethene	0.33	U
107-05-1	3-Chloropropene	0.67	U
75-09-2	Methylene Chloride	6.7	U
1634-04-4	Methyl tert-Butyl Ether	0.91	D
156-60-5	trans-1,2-Dichloroethene	0.33	U
110-54-3	n-Hexane	0.67	U
75-34-3	1,1-Dichloroethane	0.33	U
540-59-0	1,2-Dichloroethene (total)	0.33	U
156-59-2	cis-1,2-Dichloroethene	0.33	U
67-66-3	Chloroform	0.33	U
71-55-6	1,1,1-Trichloroethane	0.33	U
110-82-7	Cyclohexane	1.3	D
56-23-5	Carbon Tetrachloride	0.33	U
540-84-1	2,2,4-Trimethylpentane	0.33	U
71-43-2	Benzene	0.33	U
107-06-2	1,2-Dichloroethane	0.67	U
142-82-5	n-Heptane	21	D
79-01-6	Trichloroethene	0.33	U
78-87-5	1,2-Dichloropropane	0.67	U
75-27-4	Bromodichloromethane	0.33	U
10061-01-5	cis-1,3-Dichloropropene	0.33	U
108-88-3	Toluene	1.7	D
10061-02-6	trans-1,3-Dichloropropene	0.33	U
79-00-5	1,1,2-Trichloroethane	0.33	U
127-18-4	Tetrachloroethene	0.33	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13DL

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742883D1

Sample wt/vol: 15.00 (g/mL) ML Lab File ID: 742883D

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/15/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 33.3

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.33	U
106-93-4	1,2-Dibromoethane	0.33	U
100-41-4	Ethylbenzene	0.33	U
1330-20-7	Xylene (m,p)	0.67	U
95-47-6	Xylene (o)	0.33	U
1330-20-7	Xylene (total)	0.33	U
75-25-2	Bromoform	0.33	U
79-34-5	1,1,2,2-Tetrachloroethane	0.33	U
622-96-8	4-Ethyltoluene	0.33	U
108-67-8	1,3,5-Trimethylbenzene	0.67	U

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AKRF2 SAMPLE NO.

IA-14

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742884

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742884

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.46	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.20	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.37	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.079	
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.23	
56-23-5	Carbon Tetrachloride	0.048	
540-84-1	2,2,4-Trimethylpentane	0.13	
71-43-2	Benzene	0.21	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.23	
79-01-6	Trichloroethene	0.040	U
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	1.2	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.29	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-14

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742884

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742884

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.18	
1330-20-7	Xylene (m,p)	0.34	
95-47-6	Xylene (o)	0.16	
1330-20-7	Xylene (total)	0.49	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.19	
108-67-8	1,3,5-Trimethylbenzene	0.081	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-15

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742887

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742887

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.18	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.21	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.12	
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.44	
56-23-5	Carbon Tetrachloride	0.056	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.18	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.79	
79-01-6	Trichloroethene	0.040	U
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	1.3	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

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AKRF2 SAMPLE NO.

IA-15

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742887

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742887

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.24	
1330-20-7	Xylene (m,p)	0.42	
95-47-6	Xylene (o)	0.15	
1330-20-7	Xylene (total)	0.57	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.14	
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-19

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742894

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742894

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.56	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.22	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.13	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.067	
56-23-5	Carbon Tetrachloride	0.055	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.20	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.28	
79-01-6	Trichloroethene	0.38	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.57	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.067	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-19

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742894

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 742894

Level: (low/med) LOW Date Received: 03/11/08

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.070	
1330-20-7	Xylene (m,p)	0.20	
95-47-6	Xylene (o)	0.066	
1330-20-7	Xylene (total)	0.26	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.13	
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK031408EA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: MBLK031408EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: ECXB01M

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.010	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.010	U
75-01-4	Vinyl Chloride	0.020	U
106-99-0	1,3-Butadiene	0.020	U
74-83-9	Bromomethane	0.020	U
75-00-3	Chloroethane	0.020	U
593-60-2	Bromoethene	0.020	U
75-69-4	Trichlorofluoromethane	0.010	U
75-35-4	1,1-Dichloroethene	0.010	U
107-05-1	3-Chloropropene	0.020	U
75-09-2	Methylene Chloride	0.20	U
1634-04-4	Methyl tert-Butyl Ether	0.010	U
156-60-5	trans-1,2-Dichloroethene	0.010	U
110-54-3	n-Hexane	0.020	U
75-34-3	1,1-Dichloroethane	0.010	U
540-59-0	1,2-Dichloroethene (total)	0.010	U
156-59-2	cis-1,2-Dichloroethene	0.010	U
67-66-3	Chloroform	0.010	U
71-55-6	1,1,1-Trichloroethane	0.010	U
110-82-7	Cyclohexane	0.010	U
56-23-5	Carbon Tetrachloride	0.010	U
540-84-1	2,2,4-Trimethylpentane	0.010	U
71-43-2	Benzene	0.010	U
107-06-2	1,2-Dichloroethane	0.020	U
142-82-5	n-Heptane	0.010	U
79-01-6	Trichloroethene	0.010	U
78-87-5	1,2-Dichloropropane	0.020	U
75-27-4	Bromodichloromethane	0.010	U
10061-01-5	cis-1,3-Dichloropropene	0.010	U
108-88-3	Toluene	0.010	U
10061-02-6	trans-1,3-Dichloropropene	0.010	U
79-00-5	1,1,2-Trichloroethane	0.010	U
127-18-4	Tetrachloroethene	0.010	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK031408EA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: MBLK031408EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: ECXB01M

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.010	U
106-93-4	1,2-Dibromoethane	0.010	U
100-41-4	Ethylbenzene	0.010	U
1330-20-7	Xylene (m,p)	0.020	U
95-47-6	Xylene (o)	0.010	U
1330-20-7	Xylene (total)	0.010	U
75-25-2	Bromoform	0.010	U
79-34-5	1,1,2,2-Tetrachloroethane	0.010	U
622-96-8	4-Ethyltoluene	0.010	U
108-67-8	1,3,5-Trimethylbenzene	0.020	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA031408LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: EA031408LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: ECX20MQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.18	
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	
75-01-4	Vinyl Chloride	0.24	
106-99-0	1,3-Butadiene	0.23	
74-83-9	Bromomethane	0.20	
75-00-3	Chloroethane	0.23	
593-60-2	Bromoethene	0.20	
75-69-4	Trichlorofluoromethane	0.18	
75-35-4	1,1-Dichloroethene	0.20	
107-05-1	3-Chloropropene	0.22	
75-09-2	Methylene Chloride	0.27	
1634-04-4	Methyl tert-Butyl Ether	0.21	
156-60-5	trans-1,2-Dichloroethene	0.21	
110-54-3	n-Hexane	0.21	
75-34-3	1,1-Dichloroethane	0.21	
540-59-0	1,2-Dichloroethene (total)	0.41	
156-59-2	cis-1,2-Dichloroethene	0.20	
67-66-3	Chloroform	0.19	
71-55-6	1,1,1-Trichloroethane	0.17	
110-82-7	Cyclohexane	0.20	
56-23-5	Carbon Tetrachloride	0.16	
540-84-1	2,2,4-Trimethylpentane	0.21	
71-43-2	Benzene	0.20	
107-06-2	1,2-Dichloroethane	0.20	
142-82-5	n-Heptane	0.19	
79-01-6	Trichloroethene	0.18	
78-87-5	1,2-Dichloropropane	0.23	
75-27-4	Bromodichloromethane	0.19	
10061-01-5	cis-1,3-Dichloropropene	0.18	
108-88-3	Toluene	0.17	
10061-02-6	trans-1,3-Dichloropropene	0.18	
79-00-5	1,1,2-Trichloroethane	0.18	
127-18-4	Tetrachloroethene	0.18	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA031408LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: EA031408LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: ECX20MQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/14/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.17	
106-93-4	1,2-Dibromoethane	0.17	
100-41-4	Ethylbenzene	0.17	
1330-20-7	Xylene (m,p)	0.34	
95-47-6	Xylene (o)	0.16	
1330-20-7	Xylene (total)	0.50	
75-25-2	Bromoform	0.18	
79-34-5	1,1,2,2-Tetrachloroethane	0.19	
622-96-8	4-Ethyltoluene	0.19	
108-67-8	1,3,5-Trimethylbenzene	0.20	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: EA031408LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	0.20		0.18	90	70-130
1,2-Dichlorotetrafluoro	0.20		0.20	100	70-130
Vinyl Chloride	0.20		0.24	120	70-130
1,3-Butadiene	0.20		0.23	115	70-130
Bromomethane	0.20		0.20	100	70-130
Chloroethane	0.20		0.23	115	70-130
Bromoethene	0.20		0.20	100	70-130
Trichlorofluoromethane	0.20		0.18	90	70-130
1,1-Dichloroethene	0.20		0.20	100	70-130
3-Chloropropene	0.20		0.22	110	70-130
Methylene Chloride	0.20		0.27	135*	70-130
Methyl tert-Butyl Ether	0.20		0.21	105	70-130
trans-1,2-Dichloroethen	0.20		0.21	105	70-130
n-Hexane	0.20		0.21	105	70-130
1,1-Dichloroethane	0.20		0.21	105	70-130
1,2-Dichloroethene (tot	0.40		0.41	102	70-130
cis-1,2-Dichloroethene	0.20		0.20	100	70-130
Chloroform	0.20		0.19	95	70-130
1,1,1-Trichloroethane	0.20		0.17	85	70-130
Cyclohexane	0.20		0.20	100	70-130
Carbon Tetrachloride	0.20		0.16	80	70-130
2,2,4-Trimethylpentane	0.20		0.21	105	70-130
Benzene	0.20		0.20	100	70-130
1,2-Dichloroethane	0.20		0.20	100	70-130
n-Heptane	0.20		0.19	95	70-130
Trichloroethene	0.20		0.18	90	70-130
1,2-Dichloropropane	0.20		0.23	115	70-130
Bromodichloromethane	0.20		0.19	95	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: EA031408LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	0.20		0.18	90	70-130
Toluene	0.20		0.17	85	70-130
trans-1,3-Dichloroprope	0.20		0.18	90	70-130
1,1,2-Trichloroethane	0.20		0.18	90	70-130
Tetrachloroethene	0.20		0.18	90	70-130
Dibromochloromethane	0.20		0.17	85	70-130
1,2-Dibromoethane	0.20		0.17	85	70-130
Ethylbenzene	0.20		0.17	85	70-130
Xylene (m,p)	0.40		0.34	85	70-130
Xylene (o)	0.20		0.16	80	70-130
Xylene (total)	0.60		0.50	83	70-130
Bromoform	0.20		0.18	90	70-130
1,1,2,2-Tetrachloroetha	0.20		0.19	95	70-130
4-Ethyltoluene	0.20		0.19	95	70-130
1,3,5-Trimethylbenzene	0.20		0.20	100	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 1 out of 43 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK031408EA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Lab File ID: ECXB01M Lab Sample ID: MBLK031408EA

Date Analyzed: 03/14/08 Time Analyzed: 1111

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: E

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	EA031408LCS	EA031408LCS	ECX20MQ	1022
02	IA-13	742883	742883	1510
03	IA-14	742884	742884	1559
04	AA-1	742886	742886	1647
05	IA-15	742887	742887	1735
06	IA-11	742890	742890	1823
07	IA-12	742891	742891	1911
08	IA-10	742893	742893	1959
09	IA-19	742894	742894	2047
10	AA-2	742895	742895	2135
11	IA-13DL	742883D1	742883D	0406
12				
13				
14				
15				
16				
17				
18				
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23				
24				
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26				
27				
28				
29				
30				

COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Lab File ID: ECX01PV BFB Injection Date: 02/20/08

Instrument ID: E BFB Injection Time: 1012

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	19.4
75	30.0 - 66.0% of mass 95	60.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.6 (0.6)1
174	50.0 - 120.0% of mass 95	107.8
175	4.0 - 9.0% of mass 174	7.6 (7.0)1
176	93.0 - 101.0% of mass 174	103.1 (95.6)1
177	5.0 - 9.0% of mass 176	6.6 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0010	ASTD0010	ECX10V	02/20/08	1245
02	ASTD0020	ASTD0020	ECX20V	02/20/08	1333
03	ASTD0050	ASTD0050	ECX50V	02/20/08	1421
04	ASTD0100	ASTD0100	ECX100V	02/20/08	1509
05	ASTD0200	ASTD0200	ECX200V	02/20/08	1558
06	ASTD0500	ASTD0500	ECX500V	02/20/08	1646
07	ASTD0750	ASTD0750	ECX750V	02/20/08	1733
08	ASTD1000	ASTD1000	ECX1000V	02/20/08	1822
09	ASTD1500	ASTD1500	ECX1500V	02/20/08	1910
10	ASTD2000	ASTD2000	ECX2000V	02/20/08	1957
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Lab File ID: ECX22PV BFB Injection Date: 03/14/08

Instrument ID: E BFB Injection Time: 0843

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	22.7
75	30.0 - 66.0% of mass 95	61.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.3 (0.3)1
174	50.0 - 120.0% of mass 95	101.7
175	4.0 - 9.0% of mass 174	7.4 (7.2)1
176	93.0 - 101.0% of mass 174	98.5 (96.8)1
177	5.0 - 9.0% of mass 176	6.2 (6.3)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0200	ASTD0200	ECX20MV	03/14/08	0933
02	EA031408LCS	EA031408LCS	ECX20MQ	03/14/08	1022
03	MBLK031408EA	MBLK031408EA	ECXB01M	03/14/08	1111
04	IA-13	742883	742883	03/14/08	1510
05	IA-14	742884	742884	03/14/08	1559
06	AA-1	742886	742886	03/14/08	1647
07	IA-15	742887	742887	03/14/08	1735
08	IA-11	742890	742890	03/14/08	1823
09	IA-12	742891	742891	03/14/08	1911
10	IA-10	742893	742893	03/14/08	1959
11	IA-19	742894	742894	03/14/08	2047
12	AA-2	742895	742895	03/14/08	2135
13	IA-13DL	742883D1	742883D	03/15/08	0406
14					
15					
16					
17					
18					
19					
20					
21					
22					

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Calibration Time(s): 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=ECX10V RRF0.02=ECX20V
RRF0.05=ECX50V RRF0.1=ECX100V RRF0.2=ECX200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	5.811	5.195	5.119	5.356	5.054		
1,2-Dichlorotetrafluoroethan	4.352	3.972	4.068	4.121	4.155		
Vinyl Chloride		1.142	1.018	1.036	1.033		
1,3-Butadiene		0.848	0.643	0.724	0.678		
Bromomethane		1.069	1.086	1.031	1.023		
Chloroethane		0.511	0.493	0.449	0.440		
Bromoethene		1.275	1.116	1.110	1.052		
Trichlorofluoromethane	5.651	4.732	4.668	4.943	4.836		
1,1-Dichloroethene	1.255	0.834	0.789	0.842	0.790		
3-Chloropropene		1.875	1.355	1.262	1.255		
Methylene Chloride					1.000		
Methyl tert-Butyl Ether	2.703	2.749	3.012	2.889	2.890		
trans-1,2-Dichloroethene	1.499	1.295	1.325	1.337	1.330		
n-Hexane		1.155	1.161	1.152	1.176		
1,1-Dichloroethane *	1.871	1.568	1.602	1.625	1.587		*
1,2-Dichloroethene (total)	1.347	1.199	1.111	1.116	1.142		
cis-1,2-Dichloroethene	1.194	1.104	0.898	0.896	0.955		
Chloroform	2.825	2.722	2.496	2.686	2.569		
1,1,1-Trichloroethane	0.820	0.780	0.762	0.746	0.736		
Cyclohexane	0.278	0.264	0.256	0.257	0.271		
Carbon Tetrachloride	0.990	0.860	0.848	0.847	0.879		
2,2,4-Trimethylpentane	0.893	0.777	0.747	0.778	0.802		
Benzene	0.746	0.553	0.505	0.538	0.555		
1,2-Dichloroethane		0.414	0.443	0.422	0.435		
n-Heptane	0.418	0.321	0.325	0.306	0.298		
Trichloroethene	0.413	0.346	0.302	0.319	0.327		
1,2-Dichloropropane		0.221	0.202	0.209	0.213		
Bromodichloromethane	0.564	0.549	0.548	0.554	0.598		
cis-1,3-Dichloropropene	0.386	0.337	0.372	0.326	0.348		
Toluene	0.660	0.462	0.491	0.452	0.448		
trans-1,3-Dichloropropene	0.374	0.366	0.376	0.378	0.386		
1,1,2-Trichloroethane	0.200	0.207	0.228	0.214	0.211		
Tetrachloroethene	0.704	0.559	0.564	0.588	0.589		
Dibromochloromethane	0.679	0.566	0.573	0.591	0.621		
1,2-Dibromoethane	0.407	0.446	0.427	0.416	0.438		
Ethylbenzene	1.331	1.108	1.088	1.106	1.143		
Xylene (m,p)	0.416	0.382	0.429	0.414	0.428		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Calibration Time(s): 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=ECX10V RRF0.02=ECX20V
RRF0.05=ECX50V RRF0.1=ECX100V RRF0.2=ECX200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Xylene (o)	0.474	0.406	0.428	0.410	0.422		
Xylene (total)	0.474	0.406	0.428	0.410	0.422		
Bromoform	0.507	0.527	0.553	0.571	0.603		
1,1,2,2-Tetrachloroethane	0.387	0.381	0.412	0.428	0.440		
4-Ethyltoluene	1.019	1.030	1.013	1.028	1.197		
1,3,5-Trimethylbenzene		0.604	0.909	0.834	1.074		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Calibration Time(s): 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=ECX500V RRF0.75=ECX750V
RRF1 =ECX1000V RRF1.5=ECX1500V RRF2 =ECX2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	5.100		4.889			5.218	5.7
1,2-Dichlorotetrafluoroethan	4.248		4.058			4.139	3.1
Vinyl Chloride	1.012		0.970			1.035	5.5
1,3-Butadiene	0.694		0.639			0.704	11.0
Bromomethane	1.023		1.000			1.039	3.1
Chloroethane	0.412		0.422			0.454	8.7
Bromoethene	1.074		1.035			1.110	7.8
Trichlorofluoromethane	4.983		4.731			4.935	6.8
1,1-Dichloroethene	0.828		0.794			0.876	19.2
3-Chloropropene	1.302		1.280			1.388	17.4
Methylene Chloride	0.968	0.939	0.902	0.837	0.752	0.900	10.2
Methyl tert-Butyl Ether	2.984		3.027			2.893	4.4
trans-1,2-Dichloroethene	1.406		1.373			1.366	5.0
n-Hexane	1.177		1.167			1.165	0.9
1,1-Dichloroethane *	1.687		1.633			1.653	6.2*
1,2-Dichloroethene (total)	1.195		1.178			1.184	6.8
cis-1,2-Dichloroethene	0.985		0.983			1.002	11.0
Chloroform	2.595		2.569			2.637	4.3
1,1,1-Trichloroethane	0.752		0.741			0.762	3.8
Cyclohexane	0.274		0.280			0.268	3.6
Carbon Tetrachloride	0.896		0.871			0.884	5.6
2,2,4-Trimethylpentane	0.800		0.803			0.800	5.7
Benzene	0.559		0.559			0.574	13.7
1,2-Dichloroethane	0.441		0.431			0.431	2.6
n-Heptane	0.289		0.294			0.322	13.8
Trichloroethene	0.332		0.333			0.339	10.5
1,2-Dichloropropane	0.189		0.189			0.204	6.5
Bromodichloromethane	0.619		0.624			0.579	5.7
cis-1,3-Dichloropropene	0.357		0.360			0.355	5.8
Toluene	0.453		0.462			0.490	15.6
trans-1,3-Dichloropropene	0.417		0.425			0.389	5.8
1,1,2-Trichloroethane	0.212		0.212			0.212	4.0
Tetrachloroethene	0.618		0.598			0.603	8.1
Dibromochloromethane	0.664		0.678			0.624	7.9
1,2-Dibromoethane	0.460		0.469			0.438	5.1
Ethylbenzene	1.178		1.161			1.159	7.1
Xylene (m,p)	0.446		0.448			0.423	5.3

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Calibration Time(s): 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=ECX500V RRF0.75=ECX750V
RRF1 =ECX1000V RRF1.5=ECX1500V RRF2 =ECX2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Xylene (o)	0.442		0.444			0.432	5.4
Xylene (total)	0.442		0.444			0.432	5.4
Bromoform	0.687		0.709			0.594	13.1
1,1,2,2-Tetrachloroethane	0.521		0.507			0.439	12.6
4-Ethyltoluene	1.418		1.380			1.155	15.5
1,3,5-Trimethylbenzene	1.179		1.174			0.962	23.4

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date: 03/14/08 Time: 0933

Lab File ID: ECX20MV Init. Calib. Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Init. Calib. Times: 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	5.218	4.332	0.01	17.0	30.0
1,2-Dichlorotetrafluoroethan	4.139	3.961	0.01	4.3	30.0
Vinyl Chloride	1.035	1.198	0.01	15.7	30.0
1,3-Butadiene	0.704	0.743	0.01	5.5	30.0
Bromomethane	1.039	1.064	0.01	2.4	30.0
Chloroethane	0.454	0.503	0.01	10.8	30.0
Bromoethene	1.110	1.037	0.01	6.6	30.0
Trichlorofluoromethane	4.935	4.121	0.01	16.5	30.0
1,1-Dichloroethene	0.876	0.830	0.01	5.2	30.0
3-Chloropropene	1.388	1.480	0.01	6.6	30.0
Methylene Chloride	0.900	1.102	0.01	22.4	30.0
Methyl tert-Butyl Ether	2.893	2.912	0.01	0.6	30.0
trans-1,2-Dichloroethene	1.366	1.428	0.01	4.5	30.0
n-Hexane	1.165	1.264	0.01	8.5	30.0
1,1-Dichloroethane	1.653	1.676	0.1	1.4	30.0
1,2-Dichloroethene (total)	1.184	1.167	0.01	1.4	30.0
cis-1,2-Dichloroethene	1.002	0.905	0.01	9.7	30.0
Chloroform	2.637	2.484	0.01	5.8	30.0
1,1,1-Trichloroethane	0.762	0.588	0.01	22.8	30.0
Cyclohexane	0.268	0.259	0.01	3.4	30.0
Carbon Tetrachloride	0.884	0.662	0.01	25.1	30.0
2,2,4-Trimethylpentane	0.800	0.782	0.01	2.2	30.0
Benzene	0.574	0.534	0.01	7.0	30.0
1,2-Dichloroethane	0.431	0.400	0.01	7.2	30.0
n-Heptane	0.322	0.287	0.01	10.9	30.0
Trichloroethene	0.339	0.281	0.01	17.1	30.0
1,2-Dichloropropane	0.204	0.205	0.01	0.5	30.0
Bromodichloromethane	0.579	0.498	0.01	14.0	30.0
cis-1,3-Dichloropropene	0.355	0.317	0.01	10.7	30.0
Toluene	0.490	0.447	0.01	8.8	30.0
trans-1,3-Dichloropropene	0.389	0.326	0.01	16.2	30.0
1,1,2-Trichloroethane	0.212	0.195	0.01	8.0	30.0
Tetrachloroethene	0.603	0.538	0.01	10.8	30.0
Dibromochloromethane	0.624	0.485	0.01	22.3	30.0
1,2-Dibromoethane	0.438	0.383	0.01	12.6	30.0
Ethylbenzene	1.159	1.000	0.01	13.7	30.0
Xylene (m,p)	0.423	0.378	0.01	10.6	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: E Calibration Date: 03/14/08 Time: 0933

Lab File ID: ECX20MV Init. Calib. Date(s): 02/20/08 02/20/08

Heated Purge: (Y/N) N Init. Calib. Times: 1245 1957

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D
Xylene (o)	0.432	0.382	0.01	11.6	30.0
Xylene (total)	0.432	0.382	0.01	11.6	30.0
Bromoform	0.594	0.469	0.01	21.0	30.0
1,1,2,2-Tetrachloroethane	0.439	0.381	0.01	13.2	30.0
4-Ethyltoluene	1.155	0.930	0.01	19.5	30.0
1,3,5-Trimethylbenzene	0.962	0.775	0.01	19.4	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Lab File ID (Standard): ECX20MV Date Analyzed: 03/14/08

Instrument ID: E Time Analyzed: 0933

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	414244	8.87	2118568	9.79	2001511	12.25
	UPPER LIMIT	579942	9.20	2965995	10.12	2802115	12.58
	LOWER LIMIT	248546	8.54	1271141	9.46	1200907	11.92
	CLIENT SAMPLE NO.						
01	EA031408LCS	400991	8.88	1940092	9.79	1920715	12.25
02	MBLK031408EA	431482	8.88	2239252	9.80	1767042	12.25
03	IA-13	375942	8.87	1913838	9.79	1847056	12.25
04	IA-14	461224	8.87	2198928	9.80	2146266	12.25
05	AA-1	443494	8.88	2144327	9.80	2046827	12.25
06	IA-15	422654	8.87	2095551	9.79	2012749	12.25
07	IA-11	414322	8.87	2090570	9.79	1981781	12.25
08	IA-12	399811	8.88	1894226	9.80	1885949	12.25
09	IA-10	360704	8.87	1712605	9.79	1693769	12.25
10	IA-19	426312	8.87	2158304	9.79	2094493	12.25
11	AA-2	356277	8.87	1724893	9.79	1720524	12.25
12	IA-13DL	431785	8.87	2177698	9.79	1990758	12.24
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

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Sample Data Summary – TO-15 Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-11

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742889

Sample wt/vol: 36.00 (g/mL) ML Lab File ID: 743889D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.6

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	2.8	U
76-14-2	1,2-Dichlorotetrafluoroethan	1.1	U
75-01-4	Vinyl Chloride	1.1	U
106-99-0	1,3-Butadiene	2.8	U
74-83-9	Bromomethane	1.1	U
75-00-3	Chloroethane	1.1	U
593-60-2	Bromoethene	1.1	U
75-69-4	Trichlorofluoromethane	1.1	U
75-35-4	1,1-Dichloroethene	1.1	U
107-05-1	3-Chloropropene	2.8	U
75-09-2	Methylene Chloride	2.8	U
1634-04-4	Methyl tert-Butyl Ether	2.8	U
156-60-5	trans-1,2-Dichloroethene	1.1	U
110-54-3	n-Hexane	2.8	U
75-34-3	1,1-Dichloroethane	1.1	U
540-59-0	1,2-Dichloroethene (total)	1.1	U
156-59-2	cis-1,2-Dichloroethene	1.1	U
67-66-3	Chloroform	1.1	U
71-55-6	1,1,1-Trichloroethane	1.1	U
110-82-7	Cyclohexane	1.2	
56-23-5	Carbon Tetrachloride	1.1	U
540-84-1	2,2,4-Trimethylpentane	1.1	U
71-43-2	Benzene	1.1	U
107-06-2	1,2-Dichloroethane	1.1	U
142-82-5	n-Heptane	1.1	U
79-01-6	Trichloroethene	170	
78-87-5	1,2-Dichloropropane	1.1	U
75-27-4	Bromodichloromethane	1.1	U
10061-01-5	cis-1,3-Dichloropropene	1.1	U
108-88-3	Toluene	12	
10061-02-6	trans-1,3-Dichloropropene	1.1	U
79-00-5	1,1,2-Trichloroethane	1.1	U
127-18-4	Tetrachloroethene	1.1	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-11

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742889

Sample wt/vol: 36.00 (g/mL) ML Lab File ID: 743889D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.6

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	1.1	U
106-93-4	1,2-Dibromoethane	1.1	U
100-41-4	Ethylbenzene	1.1	U
1330-20-7	Xylene (m,p)	2.8	U
95-47-6	Xylene (o)	1.1	U
1330-20-7	Xylene (total)	1.1	U
75-25-2	Bromoform	1.1	U
79-34-5	1,1,2,2-Tetrachloroethane	1.1	U
622-96-8	4-Ethyltoluene	1.1	U
108-67-8	1,3,5-Trimethylbenzene	1.1	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-12

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742892

Sample wt/vol: 24.00 (g/mL) ML Lab File ID: 743892D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 533.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	270	U
76-14-2	1,2-Dichlorotetrafluoroethan	110	U
75-01-4	Vinyl Chloride	110	U
106-99-0	1,3-Butadiene	270	U
74-83-9	Bromomethane	110	U
75-00-3	Chloroethane	110	U
593-60-2	Bromoethene	110	U
75-69-4	Trichlorofluoromethane	110	U
75-35-4	1,1-Dichloroethene	110	U
107-05-1	3-Chloropropene	270	U
75-09-2	Methylene Chloride	270	U
1634-04-4	Methyl tert-Butyl Ether	270	U
156-60-5	trans-1,2-Dichloroethene	110	U
110-54-3	n-Hexane	270	U
75-34-3	1,1-Dichloroethane	110	U
540-59-0	1,2-Dichloroethene (total)	2900	
156-59-2	cis-1,2-Dichloroethene	2900	
67-66-3	Chloroform	110	U
71-55-6	1,1,1-Trichloroethane	110	U
110-82-7	Cyclohexane	150	
56-23-5	Carbon Tetrachloride	110	U
540-84-1	2,2,4-Trimethylpentane	110	U
71-43-2	Benzene	110	U
107-06-2	1,2-Dichloroethane	110	U
142-82-5	n-Heptane	110	U
79-01-6	Trichloroethene	18000	
78-87-5	1,2-Dichloropropane	110	U
75-27-4	Bromodichloromethane	110	U
10061-01-5	cis-1,3-Dichloropropene	110	U
108-88-3	Toluene	1800	
10061-02-6	trans-1,3-Dichloropropene	110	U
79-00-5	1,1,2-Trichloroethane	110	U
127-18-4	Tetrachloroethene	110	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-12

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742892

Sample wt/vol: 24.00 (g/mL) ML Lab File ID: 743892D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 533.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	110	U
106-93-4	1,2-Dibromoethane	110	U
100-41-4	Ethylbenzene	110	U
1330-20-7	Xylene (m,p)	270	U
95-47-6	Xylene (o)	110	U
1330-20-7	Xylene (total)	110	U
75-25-2	Bromoform	110	U
79-34-5	1,1,2,2-Tetrachloroethane	110	U
622-96-8	4-Ethyltoluene	110	U
108-67-8	1,3,5-Trimethylbenzene	110	U

FORM 1
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CLIENT SAMPLE NO.

SV-13

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742882

Sample wt/vol: 13.00 (g/mL) ML Lab File ID: 743882D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 15.4

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	7.7	U
76-14-2	1,2-Dichlorotetrafluoroethan	3.1	U
75-01-4	Vinyl Chloride	3.1	U
106-99-0	1,3-Butadiene	7.7	U
74-83-9	Bromomethane	3.1	U
75-00-3	Chloroethane	3.1	U
593-60-2	Bromoethene	3.1	U
75-69-4	Trichlorofluoromethane	3.1	U
75-35-4	1,1-Dichloroethene	3.1	U
107-05-1	3-Chloropropene	7.7	U
75-09-2	Methylene Chloride	7.7	U
1634-04-4	Methyl tert-Butyl Ether	7.7	U
156-60-5	trans-1,2-Dichloroethene	3.1	U
110-54-3	n-Hexane	9.3	
75-34-3	1,1-Dichloroethane	3.1	U
540-59-0	1,2-Dichloroethene (total)	3.1	U
156-59-2	cis-1,2-Dichloroethene	3.1	U
67-66-3	Chloroform	3.1	U
71-55-6	1,1,1-Trichloroethane	3.1	U
110-82-7	Cyclohexane	33	
56-23-5	Carbon Tetrachloride	3.1	U
540-84-1	2,2,4-Trimethylpentane	3.1	U
71-43-2	Benzene	3.1	U
107-06-2	1,2-Dichloroethane	3.1	U
142-82-5	n-Heptane	4.4	
79-01-6	Trichloroethene	26	
78-87-5	1,2-Dichloropropane	3.1	U
75-27-4	Bromodichloromethane	3.1	U
10061-01-5	cis-1,3-Dichloropropene	3.1	U
108-88-3	Toluene	460	
10061-02-6	trans-1,3-Dichloropropene	3.1	U
79-00-5	1,1,2-Trichloroethane	3.1	U
127-18-4	Tetrachloroethene	3.1	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-13

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742882

Sample wt/vol: 13.00 (g/mL) ML Lab File ID: 743882D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 15.4

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	3.1	U
106-93-4	1,2-Dibromoethane	3.1	U
100-41-4	Ethylbenzene	3.8	
1330-20-7	Xylene (m,p)	12	
95-47-6	Xylene (o)	4.0	
1330-20-7	Xylene (total)	16	
75-25-2	Bromoform	3.1	U
79-34-5	1,1,2,2-Tetrachloroethane	3.1	U
622-96-8	4-Ethyltoluene	3.1	U
108-67-8	1,3,5-Trimethylbenzene	3.1	U

FORM 1
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CLIENT SAMPLE NO.

SV-14

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742885

Sample wt/vol: 133.0 (g/mL) ML Lab File ID: 743885D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.5

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.75	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.30	U
75-01-4	Vinyl Chloride	0.30	U
106-99-0	1,3-Butadiene	0.75	U
74-83-9	Bromomethane	0.30	U
75-00-3	Chloroethane	0.30	U
593-60-2	Bromoethene	0.30	U
75-69-4	Trichlorofluoromethane	0.30	U
75-35-4	1,1-Dichloroethene	0.30	U
107-05-1	3-Chloropropene	0.75	U
75-09-2	Methylene Chloride	0.75	U
1634-04-4	Methyl tert-Butyl Ether	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.30	U
110-54-3	n-Hexane	4.2	
75-34-3	1,1-Dichloroethane	0.30	U
540-59-0	1,2-Dichloroethene (total)	0.30	U
156-59-2	cis-1,2-Dichloroethene	0.30	U
67-66-3	Chloroform	0.30	U
71-55-6	1,1,1-Trichloroethane	0.30	U
110-82-7	Cyclohexane	4.8	
56-23-5	Carbon Tetrachloride	0.30	U
540-84-1	2,2,4-Trimethylpentane	0.64	
71-43-2	Benzene	0.30	U
107-06-2	1,2-Dichloroethane	0.30	U
142-82-5	n-Heptane	0.44	
79-01-6	Trichloroethene	0.30	U
78-87-5	1,2-Dichloropropane	0.30	U
75-27-4	Bromodichloromethane	0.30	U
10061-01-5	cis-1,3-Dichloropropene	0.30	U
108-88-3	Toluene	43	
10061-02-6	trans-1,3-Dichloropropene	0.30	U
79-00-5	1,1,2-Trichloroethane	0.30	U
127-18-4	Tetrachloroethene	0.30	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-14

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742885

Sample wt/vol: 133.0 (g/mL) ML Lab File ID: 743885D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.5

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.30	U
106-93-4	1,2-Dibromoethane	0.30	U
100-41-4	Ethylbenzene	0.55	
1330-20-7	Xylene (m,p)	1.4	
95-47-6	Xylene (o)	0.54	
1330-20-7	Xylene (total)	2.0	
75-25-2	Bromoform	0.30	U
79-34-5	1,1,2,2-Tetrachloroethane	0.30	U
622-96-8	4-Ethyltoluene	0.30	U
108-67-8	1,3,5-Trimethylbenzene	0.30	U

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CLIENT SAMPLE NO.

SV-15

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742888

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 743888D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 3.9

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	1.9	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.78	U
75-01-4	Vinyl Chloride	0.78	U
106-99-0	1,3-Butadiene	1.9	U
74-83-9	Bromomethane	0.78	U
75-00-3	Chloroethane	0.78	U
593-60-2	Bromoethene	0.78	U
75-69-4	Trichlorofluoromethane	0.78	U
75-35-4	1,1-Dichloroethene	0.78	U
107-05-1	3-Chloropropene	1.9	U
75-09-2	Methylene Chloride	1.9	U
1634-04-4	Methyl tert-Butyl Ether	1.9	U
156-60-5	trans-1,2-Dichloroethene	0.78	U
110-54-3	n-Hexane	1.9	U
75-34-3	1,1-Dichloroethane	0.78	U
540-59-0	1,2-Dichloroethene (total)	0.78	U
156-59-2	cis-1,2-Dichloroethene	0.78	U
67-66-3	Chloroform	0.78	U
71-55-6	1,1,1-Trichloroethane	0.78	U
110-82-7	Cyclohexane	0.78	U
56-23-5	Carbon Tetrachloride	0.78	U
540-84-1	2,2,4-Trimethylpentane	0.78	U
71-43-2	Benzene	0.78	U
107-06-2	1,2-Dichloroethane	0.78	U
142-82-5	n-Heptane	0.78	U
79-01-6	Trichloroethene	0.78	U
78-87-5	1,2-Dichloropropane	0.78	U
75-27-4	Bromodichloromethane	0.78	U
10061-01-5	cis-1,3-Dichloropropene	0.78	U
108-88-3	Toluene	2.9	
10061-02-6	trans-1,3-Dichloropropene	0.78	U
79-00-5	1,1,2-Trichloroethane	0.78	U
127-18-4	Tetrachloroethene	0.78	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SV-15

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: 742888

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 743888D

Level: (low/med) LOW Date Received: 03/20/08

% Moisture: not dec. _____ Date Analyzed: 03/27/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 3.9

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.78	U
106-93-4	1,2-Dibromoethane	0.78	U
100-41-4	Ethylbenzene	0.78	U
1330-20-7	Xylene (m,p)	1.9	U
95-47-6	Xylene (o)	0.78	U
1330-20-7	Xylene (total)	0.78	U
75-25-2	Bromoform	0.78	U
79-34-5	1,1,2,2-Tetrachloroethane	0.78	U
622-96-8	4-Ethyltoluene	0.78	U
108-67-8	1,3,5-Trimethylbenzene	0.78	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK032608CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: MBLK032608CA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJB01J

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.20	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
540-59-0	1,2-Dichloroethene (total)	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	0.20	U
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK032608CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: MBLK032608CA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJB01J

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.20	U
1330-20-7	Xylene (m,p)	0.50	U
95-47-6	Xylene (o)	0.20	U
1330-20-7	Xylene (total)	0.20	U
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA032608LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: CA032608LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJ10JQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	8.3	
76-14-2	1,2-Dichlorotetrafluoroethan	8.2	
75-01-4	Vinyl Chloride	8.4	
106-99-0	1,3-Butadiene	8.8	
74-83-9	Bromomethane	8.3	
75-00-3	Chloroethane	8.6	
593-60-2	Bromoethene	9.3	
75-69-4	Trichlorofluoromethane	8.2	
75-35-4	1,1-Dichloroethene	9.9	
107-05-1	3-Chloropropene	8.7	
75-09-2	Methylene Chloride	9.0	
1634-04-4	Methyl tert-Butyl Ether	8.8	
156-60-5	trans-1,2-Dichloroethene	8.6	
110-54-3	n-Hexane	8.9	
75-34-3	1,1-Dichloroethane	8.5	
540-59-0	1,2-Dichloroethene (total)	18	
156-59-2	cis-1,2-Dichloroethene	9.2	
67-66-3	Chloroform	8.6	
71-55-6	1,1,1-Trichloroethane	7.7	
110-82-7	Cyclohexane	8.2	
56-23-5	Carbon Tetrachloride	7.8	
540-84-1	2,2,4-Trimethylpentane	8.2	
71-43-2	Benzene	8.3	
107-06-2	1,2-Dichloroethane	7.6	
142-82-5	n-Heptane	8.1	
79-01-6	Trichloroethene	8.0	
78-87-5	1,2-Dichloropropane	8.4	
75-27-4	Bromodichloromethane	8.4	
10061-01-5	cis-1,3-Dichloropropene	8.4	
108-88-3	Toluene	8.1	
10061-02-6	trans-1,3-Dichloropropene	8.3	
79-00-5	1,1,2-Trichloroethane	7.6	
127-18-4	Tetrachloroethene	7.9	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA032608LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: CA032608LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJ10JQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	8.4	
106-93-4	1,2-Dibromoethane	8.2	
100-41-4	Ethylbenzene	7.8	
1330-20-7	Xylene (m,p)	16	
95-47-6	Xylene (o)	7.8	
1330-20-7	Xylene (total)	24	
75-25-2	Bromoform	8.1	
79-34-5	1,1,2,2-Tetrachloroethane	7.4	
622-96-8	4-Ethyltoluene	8.0	
108-67-8	1,3,5-Trimethylbenzene	7.8	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA032608LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: CA032608LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJ10JQD

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	9.1	
76-14-2	1,2-Dichlorotetrafluoroethan	9.3	
75-01-4	Vinyl Chloride	9.6	
106-99-0	1,3-Butadiene	10	
74-83-9	Bromomethane	9.5	
75-00-3	Chloroethane	9.6	
593-60-2	Bromoethene	10	
75-69-4	Trichlorofluoromethane	9.2	
75-35-4	1,1-Dichloroethene	11	
107-05-1	3-Chloropropene	9.9	
75-09-2	Methylene Chloride	10	
1634-04-4	Methyl tert-Butyl Ether	10	
156-60-5	trans-1,2-Dichloroethene	9.6	
110-54-3	n-Hexane	10	
75-34-3	1,1-Dichloroethane	9.6	
540-59-0	1,2-Dichloroethene (total)	20	
156-59-2	cis-1,2-Dichloroethene	10	
67-66-3	Chloroform	9.5	
71-55-6	1,1,1-Trichloroethane	8.8	
110-82-7	Cyclohexane	9.5	
56-23-5	Carbon Tetrachloride	8.8	
540-84-1	2,2,4-Trimethylpentane	9.4	
71-43-2	Benzene	9.5	
107-06-2	1,2-Dichloroethane	8.6	
142-82-5	n-Heptane	9.3	
79-01-6	Trichloroethene	9.3	
78-87-5	1,2-Dichloropropane	9.5	
75-27-4	Bromodichloromethane	9.6	
10061-01-5	cis-1,3-Dichloropropene	9.5	
108-88-3	Toluene	8.9	
10061-02-6	trans-1,3-Dichloropropene	9.5	
79-00-5	1,1,2-Trichloroethane	8.4	
127-18-4	Tetrachloroethene	8.7	

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VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA032608LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix: (soil/water) AIR Lab Sample ID: CA032608LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGJ10JQD

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	9.3	
106-93-4	1,2-Dibromoethane	8.8	
100-41-4	Ethylbenzene	9.0	
1330-20-7	Xylene (m,p)	19	
95-47-6	Xylene (o)	9.1	
1330-20-7	Xylene (total)	28	
75-25-2	Bromoform	9.2	
79-34-5	1,1,2,2-Tetrachloroethane	8.7	
622-96-8	4-Ethyltoluene	10	
108-67-8	1,3,5-Trimethylbenzene	8.7	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: CA032608LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	10		8.3	83	70-130
1,2-Dichlorotetrafluoro	10		8.2	82	70-130
Vinyl Chloride	10		8.4	84	70-130
1,3-Butadiene	10		8.8	88	70-130
Bromomethane	10		8.3	83	70-130
Chloroethane	10		8.6	86	70-130
Bromoethene	10		9.3	93	70-130
Trichlorofluoromethane	10		8.2	82	70-130
1,1-Dichloroethene	10		9.9	99	70-130
3-Chloropropene	10		8.7	87	70-130
Methylene Chloride	10		9.0	90	70-130
Methyl tert-Butyl Ether	10		8.8	88	70-130
trans-1,2-Dichloroethen	10		8.6	86	70-130
n-Hexane	10		8.9	89	70-130
1,1-Dichloroethane	10		8.5	85	70-130
1,2-Dichloroethene (tot	20		18	90	70-130
cis-1,2-Dichloroethene	10		9.2	92	70-130
Chloroform	10		8.6	86	70-130
1,1,1-Trichloroethane	10		7.7	77	70-130
Cyclohexane	10		8.2	82	70-130
Carbon Tetrachloride	10		7.8	78	70-130
2,2,4-Trimethylpentane	10		8.2	82	70-130
Benzene	10		8.3	83	70-130
1,2-Dichloroethane	10		7.6	76	70-130
n-Heptane	10		8.1	81	70-130
Trichloroethene	10		8.0	80	70-130
1,2-Dichloropropane	10		8.4	84	70-130
Bromodichloromethane	10		8.4	84	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: CA032608LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	10		8.4	84	70-130
Toluene	10		8.1	81	70-130
trans-1,3-Dichloroprope	10		8.3	83	70-130
1,1,2-Trichloroethane	10		7.6	76	70-130
Tetrachloroethene	10		7.9	79	70-130
Dibromochloromethane	10		8.4	84	70-130
1,2-Dibromoethane	10		8.2	82	70-130
Ethylbenzene	10		7.8	78	70-130
Xylene (m,p)	20		16	80	70-130
Xylene (o)	10		7.8	78	70-130
Xylene (total)	30		24	80	70-130
Bromoform	10		8.1	81	70-130
1,1,2,2-Tetrachloroetha	10		7.4	74	70-130
4-Ethyltoluene	10		8.0	80	70-130
1,3,5-Trimethylbenzene	10		7.8	78	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: CA032608LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	10	9.1	91	9	25	70-130
1,2-Dichlorotetrafluoro	10	9.3	93	12	25	70-130
Vinyl Chloride	10	9.6	96	13	25	70-130
1,3-Butadiene	10	10	100	13	25	70-130
Bromomethane	10	9.5	95	13	25	70-130
Chloroethane	10	9.6	96	11	25	70-130
Bromoethene	10	10	100	7	25	70-130
Trichlorofluoromethane	10	9.2	92	11	25	70-130
1,1-Dichloroethene	10	11	110	10	25	70-130
3-Chloropropene	10	9.9	99	13	25	70-130
Methylene Chloride	10	10	100	10	25	70-130
Methyl tert-Butyl Ether	10	10	100	13	25	70-130
trans-1,2-Dichloroethen	10	9.6	96	11	25	70-130
n-Hexane	10	10	100	12	25	70-130
1,1-Dichloroethane	10	9.6	96	12	25	70-130
1,2-Dichloroethene (tot	20	20	100	10	25	70-130
cis-1,2-Dichloroethene	10	10	100	8	25	70-130
Chloroform	10	9.5	95	10	25	70-130
1,1,1-Trichloroethane	10	8.8	88	13	25	70-130
Cyclohexane	10	9.5	95	15	25	70-130
Carbon Tetrachloride	10	8.8	88	12	25	70-130
2,2,4-Trimethylpentane	10	9.4	94	14	25	70-130
Benzene	10	9.5	95	13	25	70-130
1,2-Dichloroethane	10	8.6	86	12	25	70-130
n-Heptane	10	9.3	93	14	25	70-130
Trichloroethene	10	9.3	93	15	25	70-130
1,2-Dichloropropane	10	9.5	95	12	25	70-130
Bromodichloromethane	10	9.6	96	13	25	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Matrix Spike - Sample No.: CA032608LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
cis-1,3-Dichloropropene	10	9.5	95	12	25	70-130
Toluene	10	8.9	89	9	25	70-130
trans-1,3-Dichloroprope	10	9.5	95	13	25	70-130
1,1,2-Trichloroethane	10	8.4	84	10	25	70-130
Tetrachloroethene	10	8.7	87	10	25	70-130
Dibromochloromethane	10	9.3	93	10	25	70-130
1,2-Dibromoethane	10	8.8	88	7	25	70-130
Ethylbenzene	10	9.0	90	14	25	70-130
Xylene (m,p)	20	19	95	17	25	70-130
Xylene (o)	10	9.1	91	15	25	70-130
Xylene (total)	30	28	93	15	25	70-130
Bromoform	10	9.2	92	13	25	70-130
1,1,2,2-Tetrachloroetha	10	8.7	87	16	25	70-130
4-Ethyltoluene	10	10	100	22	25	70-130
1,3,5-Trimethylbenzene	10	8.7	87	11	25	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 43 outside limits
Spike Recovery: 0 out of 86 outside limits

COMMENTS: _____

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Lab File ID: CGJ03PV BFB Injection Date: 03/16/08

Instrument ID: C BFB Injection Time: 2250

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	22.0
75	30.0 - 66.0% of mass 95	55.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	50.0 - 120.0% of mass 95	71.2
175	4.0 - 9.0% of mass 174	4.9 (6.9)1
176	93.0 - 101.0% of mass 174	68.6 (96.3)1
177	5.0 - 9.0% of mass 176	4.6 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0002	ASTD0002	CGJ002V	03/17/08	0112
02	ASTD0005	ASTD0005	CGJ005V	03/17/08	0203
03	ASTD005	ASTD005	CGJ05V	03/17/08	0254
04	ASTD010	ASTD010	CGJ10V	03/17/08	0345
05	ASTD015	ASTD015	CGJ15V	03/17/08	0436
06	ASTD020	ASTD020	CGJ20V	03/17/08	0527
07	ASTD040	ASTD040	CGJ40V	03/17/08	0618
08					
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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Calibration Time(s): 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=CGJ002V RRF0.5=CGJ005V
RRF2 = RRF5 =CGJ05V RRF10 =CGJ10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD	
Dichlorodifluoromethane		5.765		5.100	4.855			
1,2-Dichlorotetrafluoroethan	6.001	5.798		5.162	5.063			
Vinyl Chloride	2.102	2.167		1.961	1.990			
1,3-Butadiene		1.597		1.490	1.547			
Bromomethane	1.551	1.548		1.367	1.376			
Chloroethane		1.014		0.895	0.897			
Bromoethene	1.167	1.147		1.077	1.058			
Trichlorofluoromethane	5.059	4.854		4.384	4.202			
1,1-Dichloroethene	1.249	1.245		1.139	1.126			
3-Chloropropene		2.711		2.573	2.528			
Methylene Chloride		2.620		2.042	1.944			
Methyl tert-Butyl Ether		3.834		3.345	3.336			
trans-1,2-Dichloroethene	2.865	2.886		2.682	2.612			
n-Hexane		3.059		2.887	2.841			
1,1-Dichloroethane	* 3.694	3.540		3.222	3.156			*
1,2-Dichloroethene (total)	2.199	2.186		2.031	1.996			
cis-1,2-Dichloroethene	1.534	1.486		1.381	1.381			
Chloroform	3.948	3.894		3.540	3.454			
1,1,1-Trichloroethane	0.889	0.864		0.823	0.796			
Cyclohexane	0.486	0.460		0.448	0.446			
Carbon Tetrachloride	0.932	0.884		0.867	0.838			
2,2,4-Trimethylpentane	1.939	1.945		1.880	1.846			
Benzene	1.060	1.004		0.942	0.926			
1,2-Dichloroethane	0.628	0.650		0.605	0.581			
n-Heptane	0.880	0.850		0.843	0.820			
Trichloroethene	0.454	0.441		0.423	0.416			
1,2-Dichloropropane	0.377	0.378		0.362	0.358			
Bromodichloromethane	0.792	0.807		0.806	0.787			
cis-1,3-Dichloropropene	0.509	0.557		0.544	0.549			
Toluene	0.683	0.698		0.652	0.628			
trans-1,3-Dichloropropene	0.478	0.460		0.550	0.557			
1,1,2-Trichloroethane	0.336	0.349		0.328	0.311			
Tetrachloroethene	0.587	0.588		0.553	0.538			
Dibromochloromethane	0.659	0.741		0.734	0.705			
1,2-Dibromoethane	0.552	0.581		0.584	0.556			
Ethylbenzene	1.395	1.472		1.412	1.366			
Xylene (m,p)	0.488	0.461		0.498	0.491			

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Calibration Time(s): 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=CGJ002V RRF0.5=CGJ005V
RRF2 = RRF5 =CGJ05V RRF10 =CGJ10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD
Xylene (o)	0.471	0.490		0.482	0.466		
Xylene (total)	0.471	0.490		0.482	0.466		
Bromoform	0.535	0.603		0.653	0.642		
1,1,2,2-Tetrachloroethane	0.763	0.831		0.791	0.747		
4-Ethyltoluene	1.186	1.370		1.428	1.421		
1,3,5-Trimethylbenzene	1.110	1.304		1.290	1.183		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Calibration Time(s): 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =CGJ15V RRF20 =CGJ20V
RRF40 =CGJ40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Dichlorodifluoromethane		4.235	3.719			4.735	16.7
1,2-Dichlorotetrafluoroethan		4.607	4.123			5.126	13.8
Vinyl Chloride		1.784	1.588			1.932	11.1
1,3-Butadiene		1.395	1.225			1.451	10.1
Bromomethane		1.338	1.252			1.405	8.5
Chloroethane		0.879	0.799			0.897	8.6
Bromoethene		1.092	1.025			1.094	4.9
Trichlorofluoromethane		3.934	3.582			4.336	12.8
1,1-Dichloroethene		1.140	1.081			1.163	5.9
3-Chloropropene		2.416	2.220			2.490	7.4
Methylene Chloride		1.852	1.687			2.029	17.5
Methyl tert-Butyl Ether		3.142	3.139			3.359	8.4
trans-1,2-Dichloroethene		2.529	2.328			2.650	8.0
n-Hexane		2.813	2.622			2.844	5.5
1,1-Dichloroethane *		3.006	2.809			3.238	10.2*
1,2-Dichloroethene (total)		1.964	1.856			2.039	6.5
cis-1,2-Dichloroethene		1.400	1.384			1.428	4.6
Chloroform		3.211	3.078			3.521	10.0
1,1,1-Trichloroethane		0.875	0.764			0.835	5.9
Cyclohexane		0.534	0.485			0.476	7.0
Carbon Tetrachloride		0.926	0.794			0.874	6.0
2,2,4-Trimethylpentane		2.015	1.772			1.900	4.5
Benzene		0.987	0.925			0.974	5.5
1,2-Dichloroethane		0.564	0.496			0.587	9.3
n-Heptane		0.862	0.738			0.832	6.1
Trichloroethene		0.465	0.424			0.437	4.4
1,2-Dichloropropane		0.375	0.358			0.368	2.7
Bromodichloromethane		0.798	0.740			0.788	3.2
cis-1,3-Dichloropropene		0.583	0.548			0.548	4.4
Toluene		0.649	0.564			0.646	7.3
trans-1,3-Dichloropropene		0.614	0.584			0.540	11.1
1,1,2-Trichloroethane		0.324	0.274			0.320	8.1
Tetrachloroethene		0.568	0.528			0.560	4.4
Dibromochloromethane		0.729	0.635			0.700	6.2
1,2-Dibromoethane		0.571	0.499			0.557	5.6
Ethylbenzene		1.489	1.361			1.416	3.8
Xylene (m,p)		0.558	0.568			0.511	8.3

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Calibration Time(s): 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =CGJ15V RRF20 =CGJ20V
RRF40 =CGJ40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Xylene (o)		0.525	0.528			0.494	5.4
Xylene (total)		0.525	0.528			0.494	5.4
Bromoform		0.728	0.721			0.647	11.3
1,1,2,2-Tetrachloroethane		0.818	0.753			0.784	4.5
4-Ethyltoluene		1.527	1.442			1.396	8.2
1,3,5-Trimethylbenzene		1.342	1.277			1.251	6.9

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date: 03/26/08 Time: 1753

Lab File ID: CGJ10JV Init. Calib. Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Init. Calib. Times: 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	4.735	4.373	0.01	7.6	30.0
1,2-Dichlorotetrafluoroethan	5.126	4.636	0.01	9.6	30.0
Vinyl Chloride	1.932	1.740	0.01	9.9	30.0
1,3-Butadiene	1.451	1.326	0.01	8.6	30.0
Bromomethane	1.405	1.274	0.01	9.3	30.0
Chloroethane	0.897	0.818	0.01	8.8	30.0
Bromoethene	1.094	1.064	0.01	2.7	30.0
Trichlorofluoromethane	4.336	3.897	0.01	10.1	30.0
1,1-Dichloroethene	1.163	1.118	0.01	3.9	30.0
3-Chloropropene	2.490	2.318	0.01	6.9	30.0
Methylene Chloride	2.029	1.848	0.01	8.9	30.0
Methyl tert-Butyl Ether	3.359	3.514	0.01	4.6	30.0
trans-1,2-Dichloroethene	2.650	2.453	0.01	7.4	30.0
n-Hexane	2.844	2.670	0.01	6.1	30.0
1,1-Dichloroethane	3.238	2.977	0.1	8.1	30.0
1,2-Dichloroethene (total)	2.039	1.943	0.01	4.7	30.0
cis-1,2-Dichloroethene	1.428	1.433	0.01	0.4	30.0
Chloroform	3.521	3.312	0.01	5.9	30.0
1,1,1-Trichloroethane	0.835	0.723	0.01	13.4	30.0
Cyclohexane	0.476	0.423	0.01	11.1	30.0
Carbon Tetrachloride	0.874	0.850	0.01	2.7	30.0
2,2,4-Trimethylpentane	1.900	1.691	0.01	11.0	30.0
Benzene	0.974	0.875	0.01	10.2	30.0
1,2-Dichloroethane	0.587	0.502	0.01	14.5	30.0
n-Heptane	0.832	0.738	0.01	11.3	30.0
Trichloroethene	0.437	0.421	0.01	3.7	30.0
1,2-Dichloropropane	0.368	0.356	0.01	3.3	30.0
Bromodichloromethane	0.788	0.728	0.01	7.6	30.0
cis-1,3-Dichloropropene	0.548	0.527	0.01	3.8	30.0
Toluene	0.646	0.580	0.01	10.2	30.0
trans-1,3-Dichloropropene	0.540	0.544	0.01	0.7	30.0
1,1,2-Trichloroethane	0.320	0.280	0.01	12.5	30.0
Tetrachloroethene	0.560	0.481	0.01	14.1	30.0
Dibromochloromethane	0.700	0.626	0.01	10.6	30.0
1,2-Dibromoethane	0.557	0.505	0.01	9.3	30.0
Ethylbenzene	1.416	1.322	0.01	6.6	30.0
Xylene (m,p)	0.511	0.499	0.01	2.3	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: NY124464

Instrument ID: C Calibration Date: 03/26/08 Time: 1753

Lab File ID: CGJ10JV Init. Calib. Date(s): 03/17/08 03/17/08

Heated Purge: (Y/N) N Init. Calib. Times: 0112 0618

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Xylene (o)	0.494	0.482	0.01	2.4	30.0
Xylene (total)	0.494	0.482	0.01	2.4	30.0
Bromoform	0.647	0.599	0.01	7.4	30.0
1,1,2,2-Tetrachloroethane	0.784	0.741	0.01	5.5	30.0
4-Ethyltoluene	1.396	1.478	0.01	5.9	30.0
1,3,5-Trimethylbenzene	1.251	1.238	0.01	1.0	30.0

Magna Metals Site

NYSDEC Site No. 360003

CORTLANDT, NEW YORK

Soil Vapor Investigation Report

AKRF Project Number: 40256

Prepared by:

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1.0 INTRODUCTION

Investigation at the Magna Metals Site, located in Cortlandt, New York, has been conducted to comply with a New York State Department of Environmental Conservation's (NYSDEC) Consent Order (Site No. 360003). In November 2006, the NYSDEC issued correspondence requesting sampling of the office/warehouse building located east of the former Magna Metals building to confirm that soil vapor intrusion is not occurring. In June 2007, AKRF, Inc. (AKRF) submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In September 2007, the NYSDEC issued correspondence requesting that additional work be performed. In May 2008, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In February 2009, the NYSDEC issued correspondence requesting a third sampling event be performed in accordance with the December 2007 Soil Vapor Investigation Work Plan. This report documents the collection and analysis of sub-slab soil vapor and ambient air samples collected during the 2008-2009 heating season to satisfy the NYSDEC requirements.

2.0 SITE DESCRIPTION

2.1 Site Location

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. A site location map is included in Figure 1. Nearby towns include Peekskill and Croton-on-Hudson, and the Hudson River is located 3 miles west of the site.

2.2 Site and Vicinity Characteristics

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. The office/warehouse building was reported by the owner to include some manufacturing activities. Baker Properties acquired the property from ISC Properties, Inc. (ISCP) in 1982, and has leased it to various tenants. The identity of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south, and east of the project site are residential areas. A wetland area is located between the site and the residential area southwest of the site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Topography is variable throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from 360 feet MSL along the eastern site boundary to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area.

Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed by Tetra Tech FW, Inc. (TTI) on the former site property. This basin is located in the central western portion of the site and collects discharge water from a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was

not located. The stormwater collection system on Furnace Dock Road discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The geologic characteristics of the subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock. The bedrock is mapped by the New York State Museum and Science Service as Hornblende Norite, which is a part of the Cortlandt Mafic Complex. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is in the western direction towards the stream and wetland area.

Results of the slug tests completed by TTI indicate a range in hydraulic conductivity values from 5.3×10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2×10^{-3} cm/sec (6.2 ft/day) at MW-3 in the lower portion of the leach pit area. Previous groundwater sampling by TTI indicated that some monitoring wells were observed to be dry during seasonal low groundwater conditions.

2.4 Review of Site History

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed. The site building is currently utilized as commercial rental space and includes three tenants: Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. Polymedo, Inc. is a marketer and distributer of medical testing instruments and business activities include corporate management, laboratory testing of equipment, and warehouse storage. Motion Labs, Inc. is a development and manufacturing company specializing in electrical power distribution and motor/hoist control systems for rigging, lighting, staging and sound. International Purchasing Systems operates as a wholesale distributer of retail merchandise.

2.5 Previous Studies

Between 1978 and 1984, site investigations were completed by the New York State Department of Health (NYSDOH), the NYSDEC, and William Cosulich to determine if property uses had resulted in contamination. The investigations concluded that soil, groundwater, sediment, and, surface water contamination existed at the site. Subsequently, additional environmental investigations have occurred to determine the extent of contamination. The results are as follows:

RI/FS - Foster Wheeler Environmental Corp. (1998)

In 1998, Foster Wheeler Environmental Corporation (predecessor to TTI) completed a Remedial Investigation/Feasibility Study (RI/FS) to delineate the nature and extent of leach pit/septic tank/holding tank, surface water, sediment, surface soil, subsurface soil, and groundwater contamination at the site, such that an evaluation of (1) the nature and extent of site contamination, (2) the potential impacts, if any, and (3) the remedial measure options could be performed. The field investigation program consisted of the drilling of soil borings, the installation and development of monitoring wells, the performance of a habitat-based assessment, and the sampling and analysis of various environmental media including septic tank/leach pit sludge and water, surface soil, subsurface soil, surface water, sediment, and groundwater. A geophysical survey was added to the field investigation to improve location accuracy of the leach pit/septic tank/holding tank sampling.

Draft Supplemental RI/FS – Tetra Tech EC, Inc. (2004)

In 2004, TTI completed a Draft Supplemental RI/FS to perform horizontal and vertical delineation of the soil and groundwater contamination in the potential source area of the site, the leach pit area. The investigation included a geophysical and excavation survey to locate leach pits, leach pit excavation, a homeowner well survey, installation of overburden monitoring wells and a bedrock monitoring well, and collection of soil, groundwater, surface water and sediment samples. Based on the data compiled in the supplemental investigation, TTI concluded that 13 leach pits had been discovered at the site and the concentrations and distributions of contaminant compounds and analytes detected during the Supplemental RI are consistent with contaminant concentrations and distributions detected during previous investigations. A complete listing of the detailed results and conclusions for each area of concern is included in the Supplemental RI/FS.

Supplemental Investigations - Tetra Tech EC, Inc. (2006)

In 2006, TTI completed an additional investigation, which included the collection of groundwater samples from existing wells and two new wells next to the former Magna Metals building, and soil vapor samples from three exterior locations along western side of office/warehouse building, five exterior locations within the area containing the leach pits, and one interior sub-slab sample from the building south of the Magna Metals building and the office/warehouse building.

The sampling results indicated that groundwater collected from the two new monitoring wells did not contain contaminants above NYSDEC water quality standards and the overall samples were consistent with previous data. The soil gas sample results documented that VOCs were detected at concentrations ranging from 1 to 1,900 micrograms per cubic meter ($\mu g/m^3$). TTI concluded that the sampling results were consistent with the findings of the current and previous sampling.

In November 2006, the NYSDEC issued correspondence requesting the sampling of sub-slab soil vapor from the on-site office/warehouse building to the east of the Magna Metals building to confirm that soil vapor intrusion was not occurring. This was in response to a TCE concentration of 59 micrograms per cubic meter in one soil vapor sample (SV-03) that was collected next to the office/warehouse building.

Soil Vapor Investigation – AKRF, Inc. (March 2007)

In February 2007, AKRF submitted a Soil Vapor Investigation Work Plan to outline sampling procedures for sub-slab soil vapor and indoor ambient air. The Work Plan was approved by the New York State Department of Health (NYSDOH) and NYSDEC and implementation began in March 2007.

The findings for the sub-slab sampling included TCE detections of 1,200 $\mu g/m^3$ and 66,000 $\mu g/m^3$ at locations SV-11 and SV-12, respectively, above the action levels in Matrix 1 of NYSDOH Guidance for Evaluating Soil Vapor Intrusion (October 2006). For PCE, two detections of 5.5 and 7.8 $\mu g/m^3$ were both below the lowest action level of 100 $\mu g/m^3$ in Matrix 2. 1,1,1-Trichloroethane (TCA) was not detected in any of the samples. Carbon tetrachloride was detected in one sample at a concentration of 0.53 $\mu g/m^3$, which was similar to the outdoor air samples. At location SV-12, cis-1,2-dichloroethene (DCE), a breakdown product of TCE, was detected at a concentration of 11,000 $\mu g/m^3$. Toluene was detected in all samples, with a maximum value of 3,300 $\mu g/m^3$ at location SV-12. Cyclohexane was detected in all but one of the samples, with a maximum value of 170 $\mu g/m^3$ at location SV-11.

Within the indoor air, there were no exceedences of the guidance values for either PCE (100 $\mu g/m^3$) or TCE (5 $\mu g/m^3$). Toluene was detected at all locations with the highest values of 31

µg/m^3 and 19 µg/m^3 at locations SV-13 (Motion Labs) and SV-14 (Polymedco warehouse), respectively. The only other detection greater than 10 µg/m^3 in indoor air samples was for n-heptane, with a value of 17 µg/m^3 at location SV-13. With a sub-slab value of 31 µg/m^3 at this location, the indoor air detection was unlikely to be as a result of vapor intrusion and more likely associated with the sources of VOCs associated with Motion Labs operations. All detections of other compounds were at levels similar to the outdoor air samples and below the EPA BASE 90th percentile values.

A report of the findings was prepared and submitted to NYSDEC in June 2007. In July 2007, the NYSDEC issued correspondence that included comments on the report. A revised report that addressed the NYSDEC comments was prepared and submitted to NYSDEC in July 2007.

Soil Vapor Investigation – AKRF, Inc. (March 2008)

In September 2007, The NYSDEC issued correspondence indicating additional work be performed. In October 2007, AKRF submitted a Soil Vapor Sampling Plan to collect sub-slab and indoor air samples during the 2007-2008 heating season. The Sampling Plan was approved by NYSDOH and NYSDEC and implementation began in March 2008.

The findings for the sub-slab sampling included TCE detections of 910 µg/m^3, 97,000 µg/m^3, 140 µg/m^3 at locations SV-11, SV-12, and SV-13, respectively, above the action levels in Matrix 1 of NYSDOH Guidance for Evaluating Soil Vapor Intrusion (October 2006). There were no detections of PCE, 1,1,1- (TCA), or carbon tetrachloride in any of the collected sub-slab samples. At location SV-12, cis-1,2-dichloroethene (DCE), a breakdown product of TCE, was detected at a concentration of 11,000 µg/m^3. Toluene was detected in all samples, with a maximum value of 6,800 µg/m^3 at location SV-12. Cyclohexane was detected in all but one of the samples, with a maximum value of 520 µg/m^3 at location SV-11. The laboratory results were consistent with the March 2007 sampling event.

Within the indoor air, there were no exceedences of the guidance values for either PCE (100 µg/m^3) or TCE (5 µg/m^3). PCE was detected in two samples, IA-10 (Polymedco lab room) and IA-14 (Polymedco warehouse) at concentrations of 0.47 µg/m^3 and 2.0 µg/m^3, respectively. TCE was detected in four of six indoor air samples at concentrations ranging from 1.1µg/m^3 to 3.6 µg/m^3. Toluene was detected at all locations, with the highest values of 6.4 µg/m^3 and 4.9 µg/m^3 at locations IA-13 (Motion Labs) and SV-15 (International Purchasing Systems warehouse), respectively. The only other detection greater than 10 µg/m^3 in indoor air samples was for n-heptane, with a value of 90 µg/m^3 at location IA-13. With a sub-slab value of 18 µg/m^3 at location SV-13, the indoor air detection was unlikely to be as a result of vapor intrusion and more likely associated with the sources of VOCs in Motion Labs detailed in Section 3.2. The remaining detections were at levels consistent with the outdoor air sample results and below the NYSDOH Upper Fence values.

A report of the findings was prepared and submitted to NYSDEC in April 2008.

3.0 FIELD PROGRAM

The objectives of the field-sampling program were to confirm that soil vapor intrusion is not occurring in office/warehouse building located east of the former Magna Metals building. The field procedures and sampling activities were completed in accordance with NYSDOH's requirements (NYSDOH, 2006). The field program is outlined in Section 3.1, and the subsequent sections give the summary of sampling implementation. The field program was conducted in accordance with the detailed methodologies

described in the NYSDEC approved Soil Vapor Sampling Plan (SVSP), which was approved by the NYSDEC on February 8, 2008.

3.1 Field Program Summary

Site access for the property and study building was agreed upon between ISCP and the property owner/manager through an access agreement. Sub-slab soil-gas samples and indoor air samples were collected at five locations from the lowest level in the office/warehouse building participating in this study. Figure 2 shows the project site building and the locations for soil gas sampling.

3.2 Pre-Sampling Survey

A pre-sampling survey was previously conducted on March 16, 2007, prior to initiating the March 2007 soil vapor sampling program. The survey was completed to document any factors that may affect indoor air quality and included interviews with building owners and/or building occupants, documentation of the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, building operations, product inventory, and any other known factors that may affect indoor air quality. Copies of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory forms and a summary of the inspection results were included in the June 2007 Soil Vapor Investigation Report. On February 21, 2008, a pre-sampling inspection walkthrough was complete prior to the March 2008 sampling event to document any material changes associated with facility operations, chemical storage, and/or structural/building components that may have occurred since the initial pre-sampling survey conducted in March 2007. Copies of the building inventory forms and a summary of the walk through results were included in the May 2008 Soil Vapor Investigation Report.

On March 16, 2009, AKRF completed a pre-sampling inspection walkthrough to document any material changes associated with the facility and to confirm that the sampling locations were accessible. Mr. Bryan Zieroff and Greg Baird of AKRF were accompanied by Ernie Sweet of Environmental Resource Management (ERM) (consultant for the site owner). The building occupants and facility operations were observed to be unchanged from the previous inspection. The tenants included:

- Polymedco, Inc. – Richard DeAlto
- Motion Labs, Inc. – John Coppolecchia
- International Purchasing Systems – Michael Brooks

A photoionization detector (PID) was used during the survey to sample ambient air for the presence of VOCs. Prior to conducting the survey, the PID was calibrated with 100 parts per million (ppm) isobutylene in accordance with the manufacturer's instructions. Compared to the previous pre-sampling inspections in February 2007 and March 2008, there were no observed changes to the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, or building operations that would change the sampling parameters. A review of product storage areas indicated that product inventory was consistent with the March 17, 2007 inspection, with the exception of some additional items that are noted in this section for each tenant. A copy of the product inventory form for each tenant documenting changes in the product inventory from the previous inspections is included in Appendix A. Photographs taken during the survey are included in Appendix B. The building layout and tenant locations are shown on Figure 2.

Polymedco, Inc.

Polymedco occupied two sections of the site building; the western section consisted of a one story office area, laboratory, and a loading dock storage area, and the eastern portion consisted of a bulk warehouse (Figure 2). There was no known chemical storage in the office area. The lab coats that were stored in the area that contains sampling points SV-12 and AA-12 were reported as being laundered and not dry cleaned. The laboratory was observed to contain a refrigerated storage unit that stored reagents for control testing of the laboratory machines. The loading dock area contained shelved storage units that stored a variety of containerized chemicals and cleaning products. Items of note included buckets of paint, spray paint, turpentine, citrus degreaser, insect spray, varnish cleaner, greased lightning degreaser, stainless steel cleaner, wood polish, tiki-torch oil, metal polish, and spray adhesive. A PID detection of 1 ppm was noted in the lab area. There were no PID detections in the remaining areas. Storage cabinets were also present in the northern end of the warehouse. The warehouse cabinets contained spray paint and primer, paint remover, citrus degreaser, PVC primer and cement, and an assortment of disinfectants and household cleaners. Additional items of note observed in the warehouse cabinet included a one-gallon can of xylenes, one can of paint remover, and one can of power lube. The paint remover was listed as containing methylene chloride, and the power lube was listed as containing petroleum distillates. In the southern corner of the building near the floor drain, items of note included one 16-ounce can of Klean Strip and a lawn mower with a gasoline tank. The Klean Strip was listed as containing methylene chloride, xylenes, and toluene. A new shop room in the southern area of the warehouse contained a can of petroleum based lubricant and a can of CDC® brand contact cleaner. A full list of all stored compounds is attached in Appendix A. Organic vapors were not detected using the PID. A fuel oil boiler was located on the eastern side of the warehouse. The boiler area was secured by a spill containment berm. The fuel oil staining and petroleum absorbent materials that were observed on the concrete floor within the containment berm in March 2007 were still present. Fuel oil odors were evident in this area.

Motion Labs, Inc.

Motion labs occupied the section of the site building between the Polymedco office and warehouse, and the space consisted of a ground floor machine shop and a second floor manufacturing and office area. Cutting oils used for machine operation were reported as being alcohol based. Site personnel indicated that spray painting of burlap bags used for product shipment (observed in February 2007) was no longer being conducted. Small mobile shelf units (on wheels) and milk crates used for chemical storage were seen at multiple locations throughout the first floor. Stored items included polishing oil (containing petroleum distillates), cutting oil, lubricants, degreasers, and multiple types of cleaners. Stored chemicals near the sheet metal fabrication area included a five-gallon container of kerosene and a half-gallon milk container that contained gasoline. Additional shelved items included a three-gallon container of gasoline and a one-gallon container of liquid nails that contained benzene and ethylbenzene. Two 55-gallon drums of used cutting oil were stored next to the stairwell on the eastern side of the building. Additional items observed that were not documented during the March 2008 survey included ten (10) five-gallon containers of Vactra gear oil and a can of Baldwin solvent (alcohol based). Organic vapors were detected by the PID at concentrations up to 87 ppm in the area above the open container of gasoline. The second floor manufacturing area contained air driven equipment for product assembly. A commercial spray lubricant was used on the equipment and isopropyl alcohol was used for cleaning the electric panels. A storage area next to the cafeteria contained floor sealer, glass cleaner, ammonia and an assortment of household cleaners. Portable storage shelves were observed containing non-chlorinated degreaser spray, spray paint, a five-gallon container of light aliphatic naptha, and containers of locking cement for nuts/bolts. Flammable material storage cabinets were located on the second floor and contained solder remover, spray

lubricants, air tool cleaners (containing petroleum distillates), a five-gallon gasoline container, a one-gallon kerosene container, scotch grip adhesive, paint cans, spray paint, denatured solvent, and contact cement. The only items on the second floor that were not documented during the March 2007 survey included a can of Rustoleum® paint, a can of Misty® spray adhesive, and a can of air tool cleaner containing heptanes. There were no detections with the PID while screening the indoor air on the second floor.

An external boiler room was enclosed in an outdoor area on the north end of the Motion Labs section of the building. The boiler room contained a fuel oil boiler and a compressor. Multiple one-gallon paint cans and a five-gallon paint bucket were stored in the boiler room.

International Purchasing Systems

International Purchasing Systems occupied the eastern portion of the site building and consisted of a dry goods warehouse and a small office area. There was no chemical usage or storage reported to be associated with business operations. An oil furnace was used to heat the office area. The warehouse was not heated. A small janitor closet contained mop buckets and a bottle of carpet cleaner. A supply closet was found to contain carpet cleaner, a one-gallon container of degreaser (containing petroleum distillates), and an assortment of household cleaners. The office area contained containers of Simple Green®, deck cleaner, de-icer, carb and choke cleaner, and window cleaner. The deck cleaner and de-icer contained alcohols, ethers, and glycols, and the carb and choke cleaner was listed as containing toluene, acetone, and methanol. Items not documented during the March 2008 inspection included one can of Goof Off (containing toluene and xylenes) and hydraulic fluid on the floor of the warehouse due to a leaking fork lift. There were no PID detections in the International Purchasing Systems occupied areas.

Sample Point/Sample Location Inspection

The five permanent sub-slab sample point locations (SV-11 through SV-15) were observed to be in good condition and were accessible. The six indoor air sampling locations (IA-10 through IA-15) that were confirmed by the NYSDEC in March 2008 were also accessible and cleared for sampling. The sampling locations are shown on Figure 2. The rationale for each sampling location is summarized as follows:

Soil Gas Well I.D.	Sampling Rationale
IA-10	Indoor air sample located in the southeastern corner of the office building
SV-11/IA-11	Soil gas investigation in the central area of the Polymedco office. Sub-slab point (SV-11) through floor in employee office. Indoor air sample (IA-11) on shelf in employee office.
SV-12/IA-12	Soil gas investigation in the south end of the Polymedco office area. Sub-slab point (SV-12) through concrete floor in lab coat closet. Indoor air sample (IA-12) on shelf in closet.
SV-13/IA-13	Soil gas investigation in the Motion Labs office and production area. Sub-slab point (SV-13) through 1st floor machine shop. Indoor air sample (IA-13) in 2nd floor office area.
SV-14/IA-14	Soil gas investigation in the office area of the Polymedco warehouse. Sub-slab point (SV-14) through floor near in northeast corner of warehouse. Indoor air location (IA-14) in small office area in the northeast corner of the warehouse.
SV-15/IA-15	Soil gas investigation in the International Purchasing Systems area. Sub-slab point (SV-15) through concrete floor in dry goods warehouse. Indoor air sample (IA-15) located in office area on north side of the warehouse.

3.3 Sub-Slab Soil Gas Sampling

On March 17, 2009, AKRF returned to the site to complete the field sampling program as stated in the SVSP. AKRF personnel were accompanied by Ernie Sweet of ERM and a representative of the NYSDEC. Prior to initiating sample collection, each sub-slab sampling point was sealed, purged, and screened for the helium tracer gas and VOCs as indicated in the SVSP. Following purging, soil gas samples were collected for VOC analysis by connecting the sample tubing to a six-liter Summa canister equipped with a vacuum gauge and flow regulator set by the laboratory to collect a six-liter sample over an 8-hour sampling period. The sampling period was stopped after 8 hours or when the vacuum inside the summa canister was between 4 and 7 inches of mercury ("Hg). Photographs of the sampling process are included in Appendix B. Sampling logs are included in Appendix C. Field screening results and sampling parameters are summarized as follows:

Sample Location	Sample ID	PID Reading (ppm)	Helium Tracer Detection	Sampling Period (hrs)	Ending Vacuum ("Hg)
SV-11	SS-11	1.0	No	7.5	4
SV-12	SS-12	93.3	No	8	10
SV-13	SS-13	2.6	No	7.5	7
SV-14	SS-14	0.4	No	8	7
SV-15	SS-15	0.3	No	7.75	10
SV-15	SS-16 (duplicate of SS-15)	93.3	No	8	7

3.4 Indoor Air Sampling

Indoor air samples (labeled IA-10 through IA-15) were collected concurrently with the soil gas sampling. Five of the six indoor air sampling locations (IA-11 through IA-15) were placed in the locations agreed upon by the NYSDOH during the March 2008 Survey. The sampling was conducted in accordance with SVSP, and the parameters are summarized in the following table.

Sample ID	PID Reading (ppm)	Sampling Period (hrs)	Ending Vacuum ("Hg)
IA-10	0	8	6
IA-11	0	8	6
IA-12	0	8	22
IA-13	0	8	8
IA-14	0	8	6
IA-15	0	7.5	6
AA-1	0	7.75	8
AA-2	0	5.75	5

4.0 ANALYTICAL RESULTS

4.1 Laboratory Methods

The samples were analyzed for VOCs by EPA Method TO-15 with a detection limit of 1 µg/m^3 for all compounds, except for trichloroethylene, which had a detection limit of 0.25 µg/m^3 for indoor air samples. All sample analysis was performed in a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) laboratory certified to perform NYSDEC Analytical Services Protocol (ASP). The laboratory produced Category B deliverables. Samples were shipped to the laboratory with appropriate chain of custody documentation.

4.2 Quality Assurance / Quality Control

In addition to the laboratory analysis of the field samples, additional analysis was included for quality control measures. These samples included one duplicate, reported as SV-16, taken at the sub-slab location SV-12 and two background ambient (outdoor) air samples, reported as AA-1 and AA-2, which were collected on the northeastern and southwestern corners of the building, respectively. All three samples were analyzed for VOCs by EPA Method TO-15. Category B deliverables are included in Appendix D.

4.3 Laboratory Results

Sub-Slab Samples

Sub-slab analytical results are summarized in Table 1. The sampling results from March 2007 and March 2008 are included in the table for comparison. Concentrations of detected VOCs were compared to the action level guidance values (from Matrix 1 and Matrix 2) of the NYSDOH Soil Vapor Intrusion Guidance and values in NYSDOH Summary of Indoor Levels of Volatile Organic Compounds from Fuel Oil Heated Homes in New York State, 1997-2003, which provides a means of comparison of indoor air to background conditions.

TCE detections of 750 µg/m^3, 110,000 µg/m^3, and 59 µg/m^3 were recorded at locations SV-11, SV-12, and SV-13, respectively, above the action levels in Matrix 1. PCE detections of 2.4 µg/m^3 and 6.6 µg/m^3 were detected at locations SV-13 and SV-14, respectively, below the action levels in Matrix 1. 1,1,1-trichloroethane (TCA) was detected at location SV-13 at 4.4 µg/m^3, which is below the action levels in Matrix 1. Carbon tetrachloride was not detected in any of the collected sub-slab samples. At location SV-12, a value of 18,000 µg/m^3 was recorded for cis-1,2-dichloroethene (DCE), a breakdown product of TCE. Benzene was detected at location SV-13 at a concentration of 0.7 µg/m^3. Toluene was detected in all samples with a maximum value of 980 µg/m^3 at location SV-12. Cyclohexane was detected in all but two of the samples with a maximum value of 110 µg/m^3 at location SV-13. The laboratory results were consistent with the March 2007 and March 2008 sampling events.

Indoor Air Samples

Indoor air analytical results and guidance values included in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance are included in Table 2. There were no exceedences of the guidance values for either PCE (100 µg/m^3) or TCE (5 µg/m^3). PCE was detected in two samples, IA-14 (Polymedco warehouse) and IA-15 (IPS Warehouse), at concentrations of 1.6 µg/m^3 and 0.59 µg/m^3, respectively. TCE was detected in each of the six indoor air samples at concentrations ranging from 0.36 µg/m^3 to 4.0 µg/m^3. Toluene was detected at all locations, with the highest values of 34 µg/m^3 and 11 µg/m^3 at locations IA-13 (Motion Labs) and SV-15 (International Purchasing Systems warehouse), respectively. The only other detection greater than 10 µg/m^3 in

indoor air samples was for n-heptane, with a value of 94 µg/m^3 at location IA-13. With a subslab value of 0.86 µg/m^3 at location SV-13, the indoor air detection is unlikely to be as a result of vapor intrusion and more likely associated with the sources of VOCs in Motion Labs detailed in Section 3.2. The remaining detections were at levels consistent with the outdoor air sample results and below the NYSDOH Upper Fence values.

5.0 CONCLUSIONS

No indoor air values for TCE were above the air guidance value of 5 µg/m^3 in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance. Although there is no evidence of exposure to workers at the site based upon indoor air sampling results, elevated concentrations of TCE, and to a lesser extent 1,2-DCE and toluene, were detected in the subslab soil gas beneath the Polymedco office area and the Motion labs warehouse area. The indoor air sample for SV-13 was taken within the Motion Labs building where a number of possible sources of toluene and other petroleum compounds were present as detailed in Section 3.2, but the detected concentration was below the NYSDOH Indoor Air Upper Fence value. Sampling data indicates that soil vapor intrusion is not occurring within the Motion Labs and International Purchasing Systems spaces and that the potential for soil vapor intrusion to occur is not likely. The Feasibility Study should evaluate future vapor intrusion monitoring and/or mitigation requirements for the site.

6.0 REFERENCES

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TABLES

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-11 (Polymedco Office)			SV-12 (Polymedco Office)			
Sample ID	Soil Vapor	Indoor Air	SV-11(S.S)	SV-11	SS-11	SV-12(S.S)	SV-12	SS-12	SS-16
Lab Sample ID	Guidance Values	Value	JTPG31AD	742889	789544	JTPHF1AD	742892	789545	789553
Date Sampled	Intrusion	Upper Fence	4/5/2007	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009	3/17/2009
Dilution					5			734	657
									(Duplicate of SS-12)
µg/m^3	µg/m^3	µg/m^3							
1,1,1-Trichloroethane	100/1000	2.5	8.7 U	6 U	5.5 U	680 U	600 U	820 U	710 U
1,1,2,2-Tetrachloroethane	NS	0.38	11 U	7.6 U	6.9 U	860 U	760 U	1000 U	890 U
1,1,2-Trichloroethane	NS	0.38	8.7 U	6 U	5.5 U	680 U	600 U	820 U	710 U
1,1-Dichloroethane	NS	0.38	6.5 U	4.5 U	4 U	500 U	450 U	610 U	530 U
1,1-Dichloroethene	NS	0.4	6.3 U	4.4 U	4 U	490 U	440 U	590 U	520 U
1,2-Dibromoethane (EDB)	NS	0.38	12 U	8.5 U	7.7 U	960 U	850 U	1200 U	1000 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	11 U	7.7 U	7 U	870 U	770 U	1000 U	910 U
1,2-Dichloroethane	NS	0.37	6.5 U	4.5 U	4 U	500 U	450 U	610 U	530 U
1,2-Dichloropropane	NS	0.39	7.4 U	5.1 U	4.6 U	580 U	510 U	690 U	600 U
1,3,5-Trimethylbenzene	NS	3.9	7.9 U	5.4 U	4.9 U	610 U	540 U	740 U	640 U
1,3-Butadiene	NS	0.49	7.1 U	6.2 U	5.5 U	550 U	600 U	820 U	730 U
2,2,4-Trimethylpentane	NS	NL	19 U	5.1 U	4.7 U	1500 U	510 U	700 U	610 U
3-Chloropropene	NS	NL	5	8.8 U	7.8 U	390 U	850 U	1200 U	1000 U
4-Ethyltoluene	NS	NL	16 U	5.4 U	4.9 U	1200 U	540 U	740 U	640 U
Benzene	NS	13	5.1 U	3.5 U	3.2 U	400 U	350 U	480 U	420 U
Bromodichloromethane	NS	NL	11 U	7.4 U	6.7 U	840 U	740 U	1000 U	870 U
Bromoform	NS	NL	17 U	11 U	10 U	1300 U	1100 U	1600 U	1300 U
Bromomethane	NS	0.48	6.2 U	4.3 U	3.9 U	480 U	430 U	580 U	500 U
Carbon tetrachloride	5/50/250	1.3	5 U	6.9 U	6.3 U	390 U	690 U	940 U	820 U
Chloroethane	NS	0.39	4.2 U	2.9 U	6.6 U	330 U	290 U	980 U	870 U
Chloroform	NS	1.2	7.8 U	5.4 U	4.9 U	610 U	540 U	730 U	630 U
cis-1,2-Dichloroethene	NS	0.41	6.3 U	4.4 U	4 U	11000	11000	18000	16000
cis-1,3-Dichloropropene	NS	0.38	7.3 U	5 U	4.5 U	570 U	500 U	680 U	590 U
Cyclohexane	NS	6.3	170	4.1	12	1100 U	520	520 U	450 U
Dibromochloromethane	NS	NL	14 U	9.4 U	8.5 U	1100 U	940 U	1300 U	1100 U
Dichlorodifluoromethane	NS	10	7.9 U	14 U	12 U	620 U	1300 U	1800 U	1600 U
Ethylbenzene	NS	6.4	6.9 U	4.8 U	4.3 U	540 U	480 U	650 U	560 U
Methyl tert-butyl ether	NS	14	29 U	10 U	9 U	2200 U	970 U	1300 U	1200 U
Methylene Chloride	NS	16	NA	9.7 U	8.7 U	NA	940 U	1300 U	1100 U
m-Xylene & p-Xylene	NS	11	16	4.8 U	11 U	540 U	480 U	1600 U	1400 U
n-Heptane	NS	18	16 U	4.5 U	4.1 U	1300 U	450 U	610 U	530 U
n-Hexane	NS	14	84	9.9 U	8.8 U	1400	950 U	1300 U	1200 U
o-Xylene	NS	7.1	6.9 U	4.8 U	4.3 U	540 U	480 U	650 U	560 U
Tetrachloroethene	100/1000	2.5	11 U	7.5 U	6.8 U	850 U	750 U	1000 U	880 U
Toluene	NS	57	450	45	10	3300	6800	980	940
trans-1,2-Dichloroethene	NS	NL	6.3 U	4.4 U	4 U	490 U	440 U	590 U	520 U
trans-1,3-Dichloropropene	NS	0.4	7.3 U	5 U	4.5 U	570 U	500 U	680 U	590 U
Trichloroethene	5/50/250	0.46	1200	910	750	66000	97000	130000	110000
Trichlorofluoromethane	NS	12	9 U	6.2 U	5.6 U	700 U	620 U	840 U	730 U
Vinyl bromide	NS	NL	7 U	4.8 U	4.4 U	550 U	480 U	660 U	570 U
Vinyl chloride	NS	0.37	4.1 U	2.8 U	2.6 U	320 U	280 U	380 U	330 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-13 (Motion Labs)				SV-14 (Polymedco Warehouse)		
Sample ID	Soil Vapor	Indoor Air	SV-13(S.S)	SV-13 DUP(S.S)	SV-13	SS-13	SV-14(S.S)	SV-14	SS-14
Lab Sample ID	Guidance Values	Value	JTPH51AD	JTPH11AD	742882	789547	JTPH91AD	742885	789549
Date Sampled	Intrusion	Upper Fence	4/5/2007	4/5/2007	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009
Dilution						1			1
µg/m^3	µg/m^3	µg/m^3							
1,1,1-Trichloroethane	100/1000	2.5	4.4 U	4.4 U	17 U	4.4	0.87 U	1.6 U	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.38	5.5 U	5.5 U	21 U	1.4 U	1.1 U	2.1 U	1.4 U
1,1,2-Trichloroethane	NS	0.38	4.4 U	4.4 U	17 U	1.1 U	0.87 U	1.6 U	1.1 U
1,1-Dichloroethane	NS	0.38	3.2 U	3.2 U	13 U	0.81 U	0.65 U	1.2 U	0.81 U
1,1-Dichloroethene	NS	0.4	3.2 U	3.2 U	12 U	0.79 U	0.63 U	1.2 U	0.79 U
1,2-Dibromoethane (EDB)	NS	0.38	6.1 U	6.1 U	24 U	1.5 U	1.2 U	2.3 U	1.5 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	5.6 U	5.6 U	22 U	1.4 U	1.1 U	2.1 U	1.4 U
1,2-Dichloroethane	NS	0.37	3.2 U	3.2 U	13 U	0.81 U	0.65 U	1.2 U	0.81 U
1,2-Dichloropropane	NS	0.39	3.7 U	3.7 U	14 U	0.92 U	0.74 U	1.4 U	0.92 U
1,3,5-Trimethylbenzene	NS	3.9	3.9 U	3.9 U	15 U	1	0.79 U	1.5 U	0.98 U
1,3-Butadiene	NS	0.49	3.5 U	3.5 U	17 U	1.1 U	0.71 U	1.7 U	1.1 U
2,2,4-Trimethylpentane	NS	NL	9.3 U	9.3 U	14 U	0.93 U	1.9 U	3	0.93 U
3-Chloropropene	NS	NL	2.5 U	2.5 U	24 U	1.6 U	0.5 U	2.3 U	1.6 U
4-Ethyltoluene	NS	NL	7.9 U	7.9 U	15 U	0.98 U	1.6 U	1.5 U	0.98 U
Benzene	NS	13	2.9	2.6 U	9.9 U	0.7	2.6	0.96 U	0.64 U
Bromodichloromethane	NS	NL	5.4 U	5.4 U	21 U	1.3 U	1.1 U	2 U	1.3 U
Bromoform	NS	NL	8.3 U	8.3 U	32 U	2.1 U	1.7 U	3.1 U	2.1 U
Bromomethane	NS	0.48	3.1 U	3.1 U	12 U	0.78 U	0.62 U	1.2 U	0.78 U
Carbon tetrachloride	5/50/250	1.3	2.5 U	2.5 U	20 U	1.3 U	0.5 U	1.9 U	1.3 U
Chloroethane	NS	0.39	2.1 U	2.1 U	8.2 U	1.3 U	0.42 U	0.79 U	1.3 U
Chloroform	NS	1.2	3.9 U	3.9 U	15 U	0.98 U	0.78 U	1.5 U	0.98 U
cis-1,2-Dichloroethene	NS	0.41	3.2 U	3.2 U	12 U	0.79 U	0.63 U	1.2 U	0.79 U
cis-1,3-Dichloropropene	NS	0.38	3.6 U	3.6 U	14 U	0.91 U	0.73 U	1.4 U	0.91 U
Cyclohexane	NS	6.3	97	87	110	0.69 U	17	17	8.6
Dibromochloromethane	NS	NL	6.8 U	6.8 U	26 U	1.7 U	1.4 U	2.6 U	1.7 U
Dichlorodifluoromethane	NS	10	4 U	4 U	38 U	2.5 U	2.3	3.7 U	2.5
Ethylbenzene	NS	6.4	9.4	6.1	17	2	0.69 U	2.4	2.5
Methyl tert-butyl ether	NS	14	14 U	14 U	28 U	1.8 U	3.3	2.7 U	1.8 U
Methylene Chloride	NS	16	NA	NA	27 U	1.7 U	NA	2.6 U	1.7 U
m-Xylene & p-Xylene	NS	11	22	14	69	6.1	0.69 U	8.7	6.1
n-Heptane	NS	18	31	27	18	0.86	1.6 U	1.8	0.82 U
n-Hexane	NS	14	88	86	33	1.8 U	18	15	1.8 U
o-Xylene	NS	7.1	9.6	6.1	17	1.9	0.69 U	2.3	1.6
Tetrachloroethene	100/1000	2.5	7.8	5.5	21 U	2.4	1.1 U	2 U	6.6
Toluene	NS	57	600	450	1700	35	6.2	160	19
trans-1,2-Dichloroethene	NS	NL	3.2 U	3.2 U	12 U	0.79 U	0.63 U	1.2 U	0.79 U
trans-1,3-Dichloropropene	NS	0.4	3.6 U	3.6 U	14 U	0.91 U	0.73 U	1.4 U	0.91 U
Trichloroethene	5/50/250	0.46	4.8	3.9	140	59	0.46	1.6 U	1.1 U
Trichlorofluoromethane	NS	12	4.5 U	4.5 U	17 U	1.6	1.5	1.7 U	1.7
Vinyl bromide	NS	NL	3.5 U	3.5 U	14 U	0.87 U	0.7 U	1.3 U	0.87 U
Vinyl chloride	NS	0.37	2 U	2 U	7.9 U	0.51 U	0.41 U	0.77 U	0.51 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2
New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion
the State of New York, October 2006.

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-15 (IPS Warehouse)		
Sample ID	Soil Vapor	Indoor Air	SV-15(S.S)	SV-15	SS-15
Lab Sample ID	Guidance Values	Value	JTPJG1AD	742888	789552
Date Sampled	Intrusion	Upper Fence	4/5/2007	3/6/2008	3/17/2009
Dilution					1
µg/m^3	µg/m^3	µg/m^3			
1,1,1-Trichloroethane	100/1000	2.5	0.87 U	4.3 U	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.38	1.1 U	5.4 U	1.4 U
1,1,2-Trichloroethane	NS	0.38	0.87 U	4.3 U	1.1 U
1,1-Dichloroethane	NS	0.38	0.65 U	3.2 U	0.81 U
1,1-Dichloroethene	NS	0.4	0.63 U	3.1 U	0.79 U
1,2-Dibromoethane (EDB)	NS	0.38	1.2 U	6 U	1.5 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	1.1 U	5.5 U	1.4 U
1,2-Dichloroethane	NS	0.37	0.65 U	3.2 U	0.81 U
1,2-Dichloropropane	NS	0.39	0.74 U	3.6 U	0.92 U
1,3,5-Trimethylbenzene	NS	3.9	0.79 U	3.8 U	0.98 U
1,3-Butadiene	NS	0.49	0.71 U	4.2 U	1.1 U
2,2,4-Trimethylpentane	NS	NL	1.9 U	3.6 U	0.93 U
3-Chloropropene	NS	NL	0.5 U	5.9 U	1.6 U
4-Ethyltoluene	NS	NL	1.6 U	3.8 U	0.98 U
Benzene	NS	13	2.2	2.5 U	0.64 U
Bromodichloromethane	NS	NL	1.1 U	5.2 U	1.3 U
Bromoform	NS	NL	1.7 U	8.1 U	2.1 U
Bromomethane	NS	0.48	0.62 U	3 U	0.78 U
Carbon tetrachloride	5/50/250	1.3	0.53	4.9 U	1.3 U
Chloroethane	NS	0.39	0.42 U	2.1 U	1.3 U
Chloroform	NS	1.2	0.78 U	3.8 U	0.98 U
cis-1,2-Dichloroethene	NS	0.41	0.63 U	3.1 U	0.79 U
cis-1,3-Dichloropropene	NS	0.38	0.73 U	3.5 U	0.91 U
Cyclohexane	NS	6.3	56	2.7 U	59
Dibromochloromethane	NS	NL	1.4 U	6.6 U	1.7 U
Dichlorodifluoromethane	NS	10	3.2	9.4 U	2.5 U
Ethylbenzene	NS	6.4	0.69 U	3.4 U	2.3
Methyl tert-butyl ether	NS	14	4.4	6.9 U	1.8 U
Methylene Chloride	NS	16	NA	6.6 U	1.7 U
m-Xylene & p-Xylene	NS	11	0.69 U	3.4 U	3.7
n-Heptane	NS	18	1.6 U	3.2 U	0.82 U
n-Hexane	NS	14	26	6.7 U	1.8 U
o-Xylene	NS	7.1	0.69 U	3.4 U	1.4
Tetrachloroethene	100/1000	2.5	1.1 U	5.3 U	1.4 U
Toluene	NS	57	19	11	3.4
trans-1,2-Dichloroethene	NS	NL	0.63 U	3.1 U	0.79 U
trans-1,3-Dichloropropene	NS	0.4	0.73 U	3.5 U	0.91 U
Trichloroethene	5/50/250	0.46	0.43 U	4.2 U	1.1 U
Trichlorofluoromethane	NS	12	2.3	4.4 U	1.4
Vinyl bromide	NS	NL	0.7 U	3.4 U	0.87 U
Vinyl chloride	NS	0.37	0.41 U	2 U	0.51 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2
New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion
the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Outdoor Location 1			Outdoor Location 2			PM Copy Room
Sample ID	Indoor Air	Indoor Air	OUTDOOR 1 (A.A)	AA-1	AA-1	OUTDOOR 2 (A.A)	AA-2	AA-2	SV-10(A.A)
Lab Sample ID	Guidance	Upper Fence	JTPJM1AD	742886	789540	JTPJR1AD	742895	789541	JTPHC1AD
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009	4/5/2007
Dilution					4			4	
µg/m^3	µg/m^3	µg/m^3							
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U	0.44 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.55 U	0.27 U	0.27 U	0.55 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U	0.44 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.32 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.32 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.61 U	0.31 U	0.31 U	0.61 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.56 U	0.28 U	0.28 U	0.56 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U	1.2
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.35 U	0.24	0.18 U	0.35 U
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.19 U	0.93 U	0.21	0.19 U	0.93 U
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.2 U	0.2 U	0.79 U	0.36	0.2 U	0.79 U
Benzene	NS	13	0.48	0.48	0.54	0.91	0.67	0.61	0.57
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.54 U	0.27 U	0.27 U	0.54 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.83 U	0.41 U	0.41 U	0.83 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.51	0.35	0.56	0.66	0.4	0.53	0.56
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.2 U	0.39 U	0.2 U	0.2 U	0.39 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.32 U
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.36 U
Cyclohexane	NS	6.3	0.69 U	1.2	0.22	0.69 U	0.14 U	0.41	0.69 U
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.68 U	0.34 U	0.34 U	0.68 U
Dichlorodifluoromethane	NS	10	2.2	2	3.3	3.2	2.1	3.2	2.6
Ethylbenzene	NS	6.4	0.35 U	0.26	0.17 U	0.35 U	0.3	0.19	0.41
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	1.4 U	0.14 U	0.14 U	1.4 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	NA	2.8 U	2.8 U	NA
m-Xylene & p-Xylene	NS	11	0.42	0.96	0.37	0.87	1.2	0.42	1.3
n-Heptane	NS	18	0.82 U	1.1	0.34	0.94	0.39	0.3	0.82 U
n-Hexane	NS	14	0.7 U	0.35	0.53	0.76	0.6	0.46	0.7 U
o-Xylene	NS	7.1	0.35 U	0.25	0.17 U	0.35 U	0.33	0.18	0.48
Tetrachloroethene	100	2.5	0.54 U	0.28	0.27 U	0.54 U	0.35	0.27 U	0.54 U
Toluene	NS	57	0.97	0.98	0.75	2.2	1.6	0.94	3.8
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.32 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.36 U
Trichloroethene	5	0.46	0.21 U	0.21 U	0.25	0.21 U	0.21 U	0.38	2.1
Trichlorofluoromethane	NS	12	1.3	0.84	1.6	1.8	1.2	1.5	1.4
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Polymedco Southern Lab Room			SV-11 (Polymedco Office)		
Sample ID	Indoor Air	Indoor Air	IA-10	IA-19	IA-10	SV-11(A.A)	IA-11	IA-11
Lab Sample ID	Guidance	Upper Fence	742893	742894	789542	JTPHA1AD	742890	789543
Date Sampled	Value	Value	3/6/2008	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009
Dilution				(Duplicate of IA-10)	4			4
µg/m^3	µg/m^3	µg/m^3						
1,1,1-Trichloroethane	5	2.5	0.22 U	0.22 U	0.33	0.44 U	0.22 U	0.41
1,1,2,2-Tetrachloroethane	NS	0.38	0.27 U	0.27 U	0.27 U	0.55 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.22 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.16 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.16 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.31 U	0.31 U	0.31 U	0.61 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.28 U	0.28 U	0.28 U	0.56 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.49	0.39 U	0.42	1.2	0.45	0.54
1,3-Butadiene	NS	0.49	0.18 U	0.18 U	0.18 U	0.35 U	0.18 U	0.18 U
2,2,4-Trimethylpentane	NS	NL	0.22	0.19 U	0.19 U	0.93 U	0.19 U	0.19 U
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.69	0.64	0.2	0.79 U	0.59	0.26
Benzene	NS	13	0.64	0.64	0.48	0.55	0.51	0.61
Bromodichloromethane	NS	NL	0.27 U	0.27 U	0.27 U	0.54 U	0.27 U	0.27 U
Bromoform	NS	NL	0.41 U	0.41 U	0.41 U	0.83 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.41	0.35	0.49	0.53	0.31	0.56
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.2 U	0.2 U	0.34	0.39 U	0.2 U	0.46
cis-1,2-Dichloroethene	NS	0.41	0.16 U	0.16 U	0.21	0.32 U	0.16 U	0.26
cis-1,3-Dichloropropene	NS	0.38	0.18 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.14 U	0.23	0.83	0.69 U	0.25	0.38
Dibromochloromethane	NS	NL	0.34 U	0.34 U	0.34 U	0.68 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	3.4	2.8	3.5	2.3	2.6	3
Ethylbenzene	NS	6.4	0.38	0.3	0.24	0.49	0.19	0.22
Methyl tert-butyl ether	NS	14	0.14 U	0.14 U	0.14 U	1.4 U	0.14 U	0.14 U
Methylene Chloride	NS	16	2.8 U	2.8 U	2.8 U	NA	2.8 U	2.8 U
m-Xylene & p-Xylene	NS	11	1.6	1.1	0.56	1.4	0.78	0.56
n-Heptane	NS	18	1.2	1.1	0.45	1.7	1.2	0.66
n-Hexane	NS	14	0.67	0.46	0.35	0.7 U	0.56	0.42
o-Xylene	NS	7.1	0.43	0.29	0.23	0.6	0.23	0.25
Tetrachloroethene	100	2.5	0.47	0.45	0.27 U	0.54 U	0.52	0.27 U
Toluene	NS	57	3.1	2.1	1.6	3.6	1.5	2
trans-1,2-Dichloroethene	NS	NL	0.16 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.18 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U
Trichloroethene	5	0.46	2	2	2.4	2.2	1.6	3
Trichlorofluoromethane	NS	12	1.3	1.2	1.4	1.3	1	1.3
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-12 (Polymedco Office)			SV-13 (Motion Labs)		
Sample ID	Indoor Air	Indoor Air	SV-12(A.A)	IA-12	IA-12	SV-13(A.A)	IA-13	IA-13
Lab Sample ID	Guidance	Upper Fence	JTPHX1AD	742891	789546	JTPH71AD	742883	789548
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009
Dilution					4			1
µg/m^3	µg/m^3	µg/m^3						
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.41	0.44 U	0.22 U	160
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.55 U	0.27 U	1.4 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.44 U	0.22 U	1.1 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.81 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.79 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.61 U	0.31 U	1.5 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.56 U	0.28 U	1.4 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.81 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.92 U
1,3,5-Trimethylbenzene	NS	3.9	0.78	0.39 U	0.39 U	1.7	0.79	1.4
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.35 U	0.4	1.1 U
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.28	0.93 U	0.19 U	1.5
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.6 U
4-Ethyltoluene	NS	NL	0.79 U	0.54	0.2 U	0.79 U	1.4	1
Benzene	NS	13	0.71	0.42	0.58	1.1	1.1	1.6
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.54 U	0.27 U	1.3 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.83 U	0.41 U	2.1 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.89
Carbon tetrachloride	100	1.3	0.51	0.38	0.52	0.47	0.38	1.3 U
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	1.3 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.38	1.1	0.2 U	0.98 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.23	0.35	0.32 U	0.16 U	0.79 U
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.91 U
Cyclohexane	NS	6.3	0.69 U	0.14 U	0.76	3.3	3.8	4.8
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.68 U	0.34 U	1.7 U
Dichlorodifluoromethane	NS	10	2.2	2.5	3.4	2.1	2.3	3.4
Ethylbenzene	NS	6.4	0.62	0.17 U	0.29	1.8	0.91	2.3
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	6	2.5	5.8
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	NA	2.8 U	1.7 U
m-Xylene & p-Xylene	NS	11	1.9	0.41	0.78	5.9	3.6	7.8
n-Heptane	NS	18	0.82 U	2	1.3	17	90 E	94
n-Hexane	NS	14	0.7 U	0.28 U	1.4	0.89	1.1	1.8 U
o-Xylene	NS	7.1	0.59	0.17 U	0.37	2	0.96	2.3
Tetrachloroethene	100	2.5	0.54 U	0.55	0.27 U	0.54 U	0.27 U	1.4 U
Toluene	NS	57	4	1.5	2.3	31	6.4	34
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.79 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.91 U
Trichloroethene	5	0.46	2.9	3.6	4	1.4	1.1	2.6
Trichlorofluoromethane	NS	12	1.7	1	1.5	1.3	1.1	1.6
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.87 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.51 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

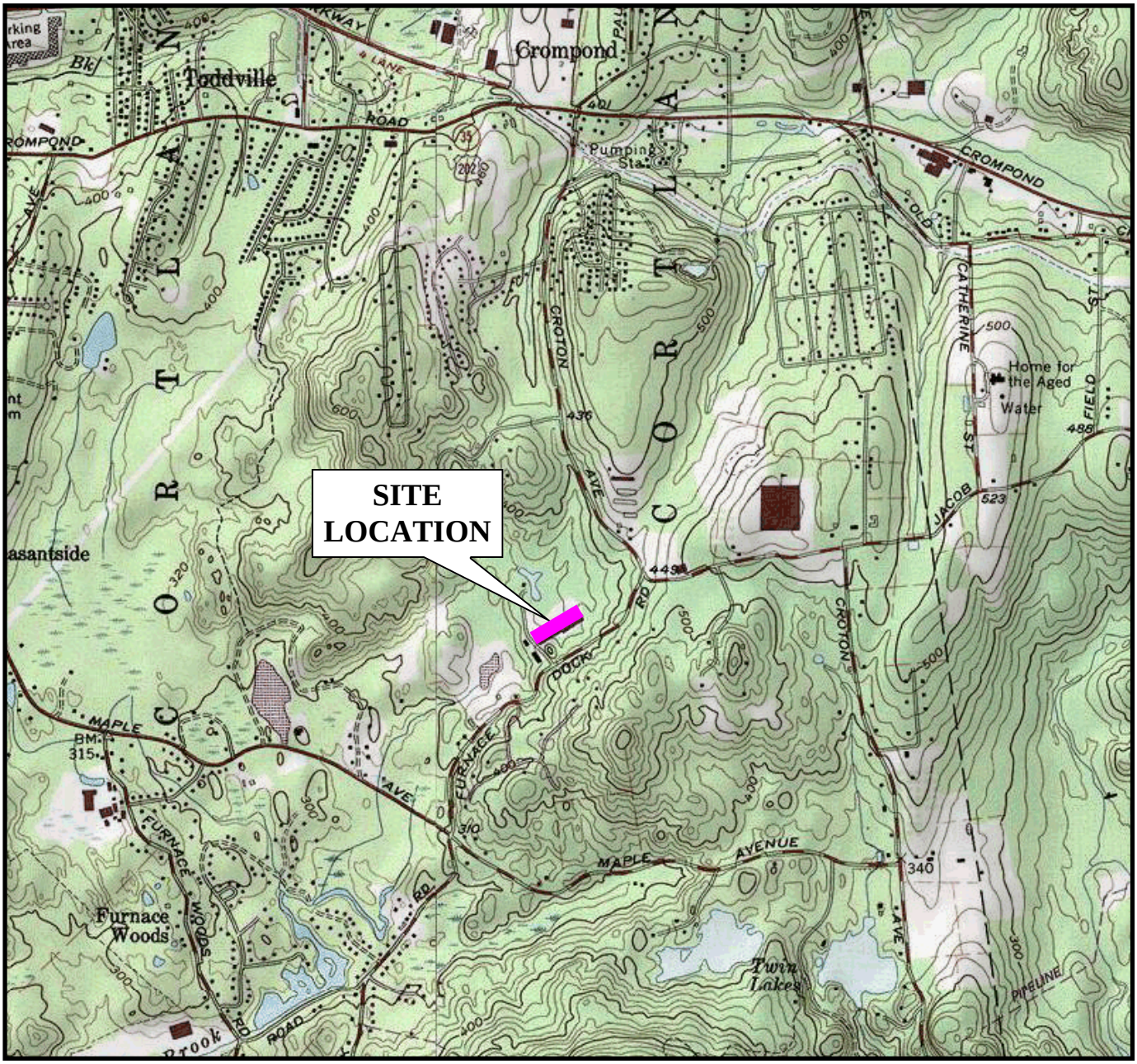
Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-14 (Polymedco Warehouse)			SV-15 (IPS Warehouse)		
Sample ID	Indoor Air	Indoor Air	SV-14(A.A)	IA-14	IA-14	SV-15(A.A)	IA-15	IA-15
Lab Sample ID	Guidance	Upper Fence	JTPJE1AD	742884	789550	JTPJH1AD	742887	789551
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	4/5/2007	3/6/2008	3/17/2009
Dilution					4			4
µg/m^3	µg/m^3	µg/m^3						
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.55 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.61 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.56 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	4.9
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.7	0.4	0.39 U	0.71	0.39 U	0.64
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.35 U	0.18 U	0.18
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.61	0.43	0.93 U	0.19 U	0.35
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.93	0.24	0.79 U	0.69	0.59
Benzene	NS	13	1.5	0.67	1.1	0.77	0.58	1.2
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.54 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.83 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.77	0.3	0.5	0.54	0.35	0.63
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.95	0.39	0.83	1.2	0.59	2.2
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	1.1	0.79	1.7	0.97	1.5	1.4
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.68 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	3.6	2.3	3.2	2.2	2.5	1
Ethylbenzene	NS	6.4	3.2	0.78	1.4	1.9	1	3.9
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	1.4 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	NA	2.8 U	2.8 U
m-Xylene & p-Xylene	NS	11	7.6	2.1	2.2	4.5	2.5	5.6
n-Heptane	NS	18	1.7	0.94	0.78	4.8	3.2	1.6
n-Hexane	NS	14	1	1.3	1.4	0.7 U	0.74	0.95
o-Xylene	NS	7.1	2.8	0.69	0.78	1.8	0.65	2.3
Tetrachloroethene	100	2.5	1.3	2	1.6	0.61	0.27 U	0.59
Toluene	NS	57	19	4.5	4.5	12	4.9	11
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U
Trichloroethene	5	0.46	0.21 U	0.21 U	0.4	0.21 U	0.21 U	0.36
Trichlorofluoromethane	NS	12	2.2	1.1	1.7	1.4	1	1.7
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

FIGURES





SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’

N

SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

MAGNA METALS
CORTLANDT, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE	1.08.06
PROJECT No.	40256
SCALE	AS SHOWN
FIGURE	1

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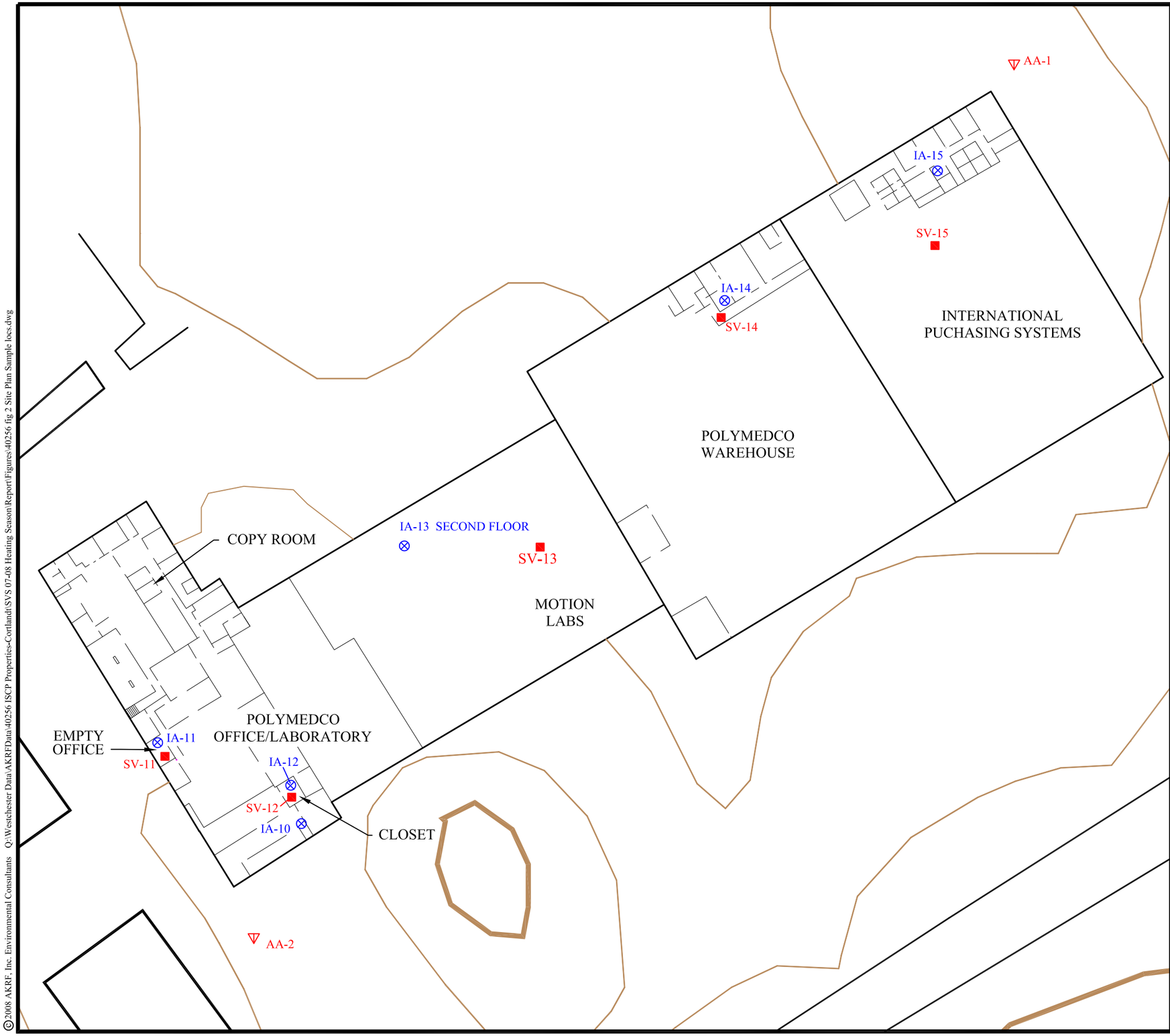

SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

- SV-14 — SUBSLAB VAPOR SAMPLING LOCATION
- IA-11 — INDOOR AIR SAMPLING LOCATIONS
- AA-1 — OUTDOOR AIR SAMPLING LOCATION
- 320 — CONTOUR LINE (20 FT INTERVAL)

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 30' 60' 120'
SCALE IN FEET

N

AKRF Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGMA METALS
CORTLANDT, NEW YORK

SITE PLAN SHOWING SAMPLING LOCATIONS

DATE: **5.02.08**
PROJECT NO.: **40256**
SCALE: **1"=60'**
FIGURE: **2**

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APPENDIX A

BUILDING INVENTORY FORMS

POLYMEDCO'S CHEMICAL LIST. (OFFICE) (P1)

CLOROX / DISINFECTING WIPES
LYSOL / DISINFECTANT SPRAY
AIR WICK WIZARD / SPRAY
PLEDGE / WOOD POLISH
WINDEX / WINDOW CLEANER
409 / GLASS AND SURFACE CLEANER
ZEP CITRUS / CLEANER AND DEGREASER
MURPHY / OIL SOAP
NOVUS / PLASTIC POLISH
SWELL / HOSPITAL DISINFECTANT SPRAY
DIRTEX / SPRAY CLEANER
GUARDSMAN / WAX REMOVER WOOD CLEANER
SHEETROCK JOIN COMPOUND
PIVOT / HEAVY DUTY LIQUID DETERGENT
RUGDOCTOR / STEAM CLEANER
RUGDOCTOR / ANTI-FOAM
RUGDOCTOR / HITRAFFIC PRE-TREATMENT
ZEP / UPHOLSTERY CLEANER
CF / DISINFECTANT BOWL AND BATHROOM CLEANER
CLR / CALCIUM, LIME, RUST REMOVER
GOOF OFF / REMOVER
WD 40 / 3 IN 1 OIL / TURTLEWAX / BUG AND TAR REMOVER
ARMORALL / PROTECTANT
STP / FUEL INJECTOR CLEANER
STP / GAS TREATMENT
3M SUPER 77 / MULTIPURPOSE ADHESIVE
3M SPRAY MOUNT / ARTIST ADHESIVE
KRYLON / VARNISH SPRAY
ROBERTS / SEAM SEALER

PEAK / WINDSHIELD WASH
EZ / TURPENTINE
REAL KILL / WASP AND HORNET KILLER
SHOO FLY / HORNET KILLER
RAID / ANT AND ROACH KILLER
STRAIT LINE / MARKING CHALK
OATEY PLUMBER'S PUTTY

PAINT
RUST-OLEUM / TRAFFIC STRIPING PAINT
BEHR PAINT LATEX / KILZ 2 / STAIN BLOCKER
BENJAMIN MOORE LATEX
PAINTER'S TOUCH LATEX
RUST-OLEUM LATEX
RUST-OLEUM SPRAY PAINT
KRYLON SPRAY PAINT
REVERE / EPOXI COAT FLOOR PAINT WATER BASE

DAP / CAULK
PHENOSEAL VINYL ADHESIVE CAULK
STA-BIL / CONCENTRATED FUEL STABILIZER
BERNZOMATIC / PROPANE
EXPO / WHITE BOARD CLEANER
TIKI / TORCH FUEL
EZ / BOILED LINSEED OIL
COROX. / COROX CLEAN UP / COROX TOILET BOWL CLEANER
SOFT SCRUB / BLEACH CLEANSER
PALMOLIVE / DISHWASHING LIQUID
HOME SELECT / DISHWASHING LIQUID
PALMOLIVE / DISHWASHER DETERGENT
CASCADE / DISHWASHER DETERGENT
ZEP / STAINLESS STEEL CLEANER
ELECTRASOL / DISHWASHER JET DRY POWERBALL

Poly MEDCO'S WAREHOUSE CHEMICAL LIST

(P3)

CLOROX / CLOROX WIPES
ZEP / CITRUS CLEANER AND DEGREASER
PEAK / WINDSHIELD WASH
BLUE CORAL / CAR WASH AND WAX CLEANER
PINE SOL / DISINFECTANT CLEANER
PAINT THINNER
GREAT STUFF / FOAM SEALANT
UGL / DRYLOK ETCH MASONRY CLEANER
THERMATE / DEFOAMER
THERMATE / STEAM CARPET CLEANER
ZEP / UPHOLSTERY CLEANER
ZIP STRIP / PAINT REMOVER
OATEY / PVC PRIMER
OATEY / PVC CEMENT
KF / BOWL AND BATHROOM DISINFECTANT
HENRY / CERAMIC TILE ADHESIVE
PRE MIXED TILE GROUT
OOPS / MULTI PURPOSE REMOVER
NO 7 / POLISHING COMPOUND
RUSTOLEUM / SPRAY PAINT
RUSTOLEUM / PRIMER
PAINTER'S TOUCH / SPRAY PAINT
XYLENE
MULTI PURPOSE GREASE
REVERE / CRETE-ETCH
BEHR FLOOR PAINT
BEHR / PRIMER

WAREHOUSE

P4

ZEP / ORANGE HAND CLEANER
GREAT VALUE / BLEACH
DAWN / DISHWASHING LIQUID
GUARDSMAN / WOOD POLISH

OSS CLEANING CO. CHEMICAL LIST

SP. SPL. ELITE / GLASS AND WINDOW CLEANER
PRONTO / NON ACID DISINFECTANT BOWL AND BATHROOM CLEANER
JAN. Q. PUBLIK / NON ACID DISINFECTANT BOWL AND BATHROOM CLEANER
SOLUTION SERIES SUNSHINE / NEUTRAL ALL PURPOSE CLEANER
PROSAll UNITECH / UNIVERSAL CLEANER
PROSAll STERLING / STAINLESS STEEL AND METAL POLISH
WINDEX / WINDOW CLEANER
LEMON PLUS / NEUTRAL All PURPOSE FLOOR AND WALL CLEANER
SOLUTION SERIES / PINK LOTION HAND SOAP
PROSAll / RICH WOOD POLISH
SPECTROWAX / FURNITURE CLEANER AND POLISH
OID DUTCH / CLEANSER
PROSAll / CLINI CLEAN FOAMING DISINFECTANT
SOLUTION SERIES / WINDOW AND GLASS CLEANER
GREAT VALUE / All PURPOSE CLEANER

13. PRODUCT INVENTORY FORM – Polymedco Warehouse

Make & Model of field instrument used: Mini Rae 2000

List of specific products found at the site that have the potential to affect indoor air quality.

Products highlighted are new items not documented during the 2007 and 2008 Pre-Sampling Survey. Products listed in grey scale were documented during the 2007 and/or 2008 survey, but not observed during the March 2009 Pre-Sampling Survey.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
Metal Closet next to Office	Liquid Wrench – White Lithium Grease	1 can	Good	Tetrachlorethylene	0	Y
	Paint Remover	1 can	Good	Methylene Chloride	0	Y
	Power Lube	1 can	Good	Petroleum Distillates	0	Y
Storage Area near Floor Drain	Klean Strip	1 can	Good	Methylene Chloride, xylene, toluene	0	Y
	Lawn Mower	1	Average	Gasoline Fuel Tank	0	N
Shop Area	CDC Contact Cleaner	1 can	Good	Petroleum Distillates	0	Y

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**

** Photographs of the **front and back** of the product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

13. PRODUCT INVENTORY FORM – Motion Labs, Inc. (Second Floor)

Make & Model of field instrument used: Mini Rae 2000

Products highlighted are new items not documented during the 2007 and 2008 Pre-Sampling Survey. Products listed in grey scale were documented during the 2007 and/or 2008 survey, but were not observed during the March 2009 Pre-Sampling Survey.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
2nd Floor	Zepp floor cleaner	4 gal	U		0	Y
2nd Floor	Glass cleaner	4 gal	U			
2nd Floor	Elite ammonia	3 gal	U	Ammonia		
2nd Floor	Bleach	6 gal	U			
2nd Floor	Hand soap	8 gal	U		0	
2nd Floor	Ajax	1 box	U			
2nd Floor	Lysol	Many cans	U/UO			
2nd Floor	Soft scrub	1 bottle	U			
2nd Floor	Mr. Clean		U			
2nd Floor	Spray lube		U	Aliphatic hydrocarbons		
2nd Floor	Isopropyl alcohol		U			
2nd Floor	Soldering flux		U			
2nd Floor	Degreaser spray		U			
2nd Floor	Spray paint		U			
2nd Floor	Light aliphatic naptha		U			
2nd Floor	Spray polish		U	Petroleum distillates	0	
2nd Floor	Air Tool Cleaner	1 can	U	Heptane	0	
2nd Floor	Misty Spray Adhesive	1 can	U	Isobutane, acetone, heptane	0	Y
2nd Floor	Flux off		U	Petroleum distillates	0	Y
2nd Floor	WD-40	Many cans	U	Petroleum distillates		Y
2nd Floor	Air tool cleaner	5 gal	U	Petroleum distillates	0	
2nd Floor	Ammonia Cleaner	3 cans	U	Ammonia		

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**
** Photographs of the **front and back** of the product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

13. PRODUCT INVENTORY FORM – Motion Labs (First Floor)

Make & Model of field instrument used: Mini Rae 2000

List of specific products found at the site that have the potential to affect indoor air quality.

Products highlighted are new items not documented during the 2007 and 2008 Pre-Sampling Survey. Products listed in grey scale were documented during the 2007 and/or 2008 survey, but were not observed during the March 2009 Pre-Sampling Survey.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
1st Floor	Emerald topaz	1 gal	U	Degreaser		
1st Floor	Excelene	1 can	U	Petroleum distillates		Y
1st Floor	Cutting Oil	15 gal	U	Oil		
1st Floor	Spray adhesive	10 cans	U	Foam Fast 74		
1st Floor	Multiple cans of paint	1 gal	U	Paint		Y
1st Floor	Relton Tread		U	Cutting oil		
1st Floor	Cleaner/Degreaser	2 gal	U	Petroleum distillates	0	
1st Floor	Tripropylene glycol methyl ether	1 bottle	U	Ether	0	
1st Floor	Used Oil	55-gal drum	U	Oil	0	Y
1st Floor	Lube oil	(8)-5 gal	U/UO	Oil	0	
1st Floor	Liquid Nail	1 gal	U	Petroleum distillates, benzene, ethylbenzene	0	
1st Floor	WD-40	1 gal		Petroleum distillates		Y
1st Floor	WD-40	Mult. cans		Petroleum distillates		
1st Floor	Gasoline	3 gal	U	Gas - open top on can	87	Y
1st Floor	Rubber dip	1 can		Hexane, petroleum solvents		
1st Floor	Gasoline – in plastic milk container	1gal	U	Gas	20	Y
1st Floor	Vactra Gear Oil	5 gal	U	Petroleum	0	Y
1st Floor	Denatured Solvent			Petroleum distillates	0	Y

***** Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**

****** Photographs of the **front and back** of the product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

13. PRODUCT INVENTORY FORM – International Purchasing Systems

Make & Model of field instrument used: Mini Rae 2000

List of specific products found at the site that have the potential to affect indoor air quality.

Products highlighted are new items not documented during the 2007 and 2008 Pre-Sampling Survey. Products listed in grey scale were documented during the 2007 and/or 2008 survey, but were not observed during the March 2009 Pre-Sampling Survey.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y/N
First Floor Janitors Closet	Windex	1 bottle	U		0	
	Citrus degreaser	1 gal	U	(no chlorinated compounds)	0	
	Zepp carpet cleaner	1 gal	U	Petroleum distillates	0	
	Pine Sol	1 gal	U		0	
	Pledge	1 can	U		0	
	Lysol	1 can	U		0	
	Comet	1 can	U		0	
	CRC contact cleaner	1 can	U	1,1,1,2 tetrafluoroethane, decafluoropentane	0	Y
	Chlorox cleaner	1 bottle	U	Sodium Hypochlorite	0	
	Goof Off Cleaner	1 can	U	Xylene, Toluene	0	
Office Closet	Chlorox wipes	6 cans	UO		0	
	Liquid Plumber	1 bottle	U		0	
	Formula 409	1 bottle	U	2-butoxyethanol	0	Y
	Drain out	2 cans	U		0	
Office Desks	Simple Green	1 can	U			
	Deck Cleaner	1 bottle	U	Alcohols, Ethers, Ethylene	0	
	De-icer	1 can	U	Ethylene glycol, alcohols	0	
	Carb & choke cleaner	1 can	U	Toluene, acetone, methanol	0	
Ware-house	Hydraulic Fluid – spill onto floor from leaking forklift.	1		Petroleum	0	Y

***** Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**

****** Photographs of the **front and back** of the product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

APPENDIX B

PHOTOGRAPHIC LOG



Photograph 1: Soil vapor sampling location SV-11.



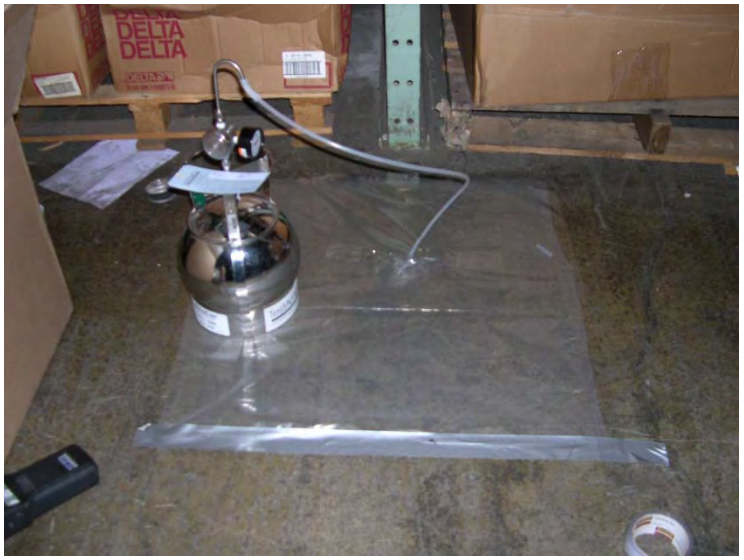
Photograph 2: Purging set-up with helium tracer gas at SV-15.



Photograph 3: Soil vapor sampling location SV-13.



Photograph 4: Soil vapor sampling location SV-14.



Photograph 5: Soil vapor sampling location SV-15.



Photograph 6: Ambient air sampling AA-1.



Photograph 7: Indoor air sample IA-13.



Photograph 8: Indoor Air sample IA-14.

APPENDIX C

SAMPLING LOGS

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-11**

Summa #: 4366 **Gage #:** N/A **Flow Control #** 2768

Purging

Time Started: 08:46 **Vol. Purged:** 0.4/liters

Time Stopped: 08:48 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 08:51 **Vacuum:** 36 inHg

Time Stopped: 16:28 **Vacuum:** 4 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 1.0 ppm

Time Started: 08:48 **He Reading:** 100 ppm

Time Stopped: 08:48

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-12**

Summa #: 2734 **Gage #:** N/A **Flow Control #** 4492

Purging

Time Started: 09:32 **Vol. Purged:** 0.4/liters

Time Stopped: 09:34 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 09:42 **Vacuum:** 30 inHg

Time Stopped: 17:35 **Vacuum:** 10 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 93.3 ppm

Time Started: 09:40 **He Reading:** 0 ppm

Time Stopped: 09:40

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-13**

Summa #: 3866 **Gage #:** N/A **Flow Control #** 3179

Purging

Time Started: 10:05 **Vol. Purged:** 0.4/liters

Time Stopped: 10:08 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 10:10 **Vacuum:** 26 inHg

Time Stopped: 17:55 **Vacuum:** 7 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 2.6 ppm

Time Started: 10:09 **He Reading:** 125 ppm

Time Stopped: 10:09

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-14**

Summa #: 3660 **Gage #:** N/A **Flow Control #** 3128

Purging

Time Started: 10:20 **Vol. Purged:** 0.4/liters

Time Stopped: 10:22 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 10:34 **Vacuum:** 29 inHg

Time Stopped: 18:20 **Vacuum:** 7 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 0.4 ppm

Time Started: 10:22 **He Reading:** 0 ppm

Time Stopped: 10:23

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-15**

Summa #: 3477 **Gage #:** N/A **Flow Control #** 3852

Purging

Time Started: 09:10 **Vol. Purged:** 0.4/liters

Time Stopped: 09:13 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 09:16 **Vacuum:** 30 inHg

Time Stopped: 16:55 **Vacuum:** 10 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 0.3 ppm

Time Started: 09:10 **He Reading:** 0 ppm

Time Stopped: 09:12

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **SS-16**

Summa #: 4371 **Gage #:** N/A **Flow Control #** 2829

Purging

Time Started: 09:32 **Vol. Purged:** 0.4/liters

Time Stopped: 09:34 **Flow Rate:** 0.2L/min

Laboratory Sample (Summa Canister)

Time Started: 09:42 **Vacuum:** 30 inHg

Time Stopped: 17:35 **Vacuum:** 7 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 93.3 ppm

Time Started: 09:40 **He Reading:** 0 ppm

Time Stopped: 09:40

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-10**

Summa #: 3552 **Gage #:** N/A **Flow Control #** 3119

Laboratory Sample (Summa Canister)

Time Started: 09:44 **Vacuum:** 30 inHg

Time Stopped: 17:40 **Vacuum:** 6 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-11**

Summa #: 3623 **Gage #:** N/A **Flow Control #** 4394

Laboratory Sample (Summa Canister)

Time Started: 08:52 **Vacuum:** 29 inHg

Time Stopped: 16:40 **Vacuum:** 6 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-12**

Summa #: 4827 **Gage #:** N/A **Flow Control #** 3753

Laboratory Sample (Summa Canister)

Time Started: 09:30 **Vacuum:** 29 inHg

Time Stopped: 17:35 **Vacuum:** 22 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-13**

Summa #: 3278 **Gage #:** N/A **Flow Control #** 4511

Laboratory Sample (Summa Canister)

Time Started: 10:07 **Vacuum:** 29 inHg

Time Stopped: 17:55 **Vacuum:** 8 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-14**

Summa #: 4138 **Gage #:** N/A **Flow Control #** 4013

Laboratory Sample (Summa Canister)

Time Started: 10:30 **Vacuum:** 30 inHg

Time Stopped: 18:20 **Vacuum:** 6 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **IA-15**

Summa #: 2849 **Gage #:** N/A **Flow Control #** 4757

Laboratory Sample (Summa Canister)

Time Started: 09:17 **Vacuum:** 30 inHg

Time Stopped: 16:45 **Vacuum:** 6 inHg

Outdoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **AA-1**

Summa #: 2584 **Gage #:** N/A **Flow Control #** 3075

Laboratory Sample (Summa Canister)

Time Started: 10:45 **Vacuum:** 30 inHg

Time Stopped: 18:30 **Vacuum:** 8 inHg

Outdoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: GB **Date:** 3/17/2009

Sample ID #: **AA-2**

Summa #: 4432 **Gage #:** N/A **Flow Control #** 3117

Laboratory Sample (Summa Canister)

Time Started: 10:50 **Vacuum:** 30 inHg

Time Stopped: 16:35 **Vacuum:** 5 inHg

APPENDIX D

ANALYTICAL DATA REPORT

TestAmerica
South Burlington, VT

Sample Data Summary Package

NY130780

TestAmerica Laboratories, Inc.

April 15, 2009

Mr. Brian Zieroff
AKRF, Inc.
34 S. Broadway
Suite 314
White Plains, NY 10601

Re: Laboratory Project No. 29000
Case: 29000; SDG: NY130780

Dear Mr. Zieroff:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on March 20th, 2009. Laboratory identification numbers were assigned, and designated as follows:

Lab ID	Client Sample ID	Sample Date	Sample Matrix
	Received: 03/20/09 ETR No: 130780		
789540	AA-1	03/17/09	AIR
789541	AA-2	03/17/09	AIR
789542	IA-10	03/17/09	AIR
789543	IA-11	03/17/09	AIR
789544	SS-11	03/17/09	AIR
789545	SS-12	03/17/09	AIR
789546	IA-12	03/17/09	AIR
789547	SS-13	03/17/09	AIR
789548	IA-13	03/17/09	AIR
789549	SS-14	03/17/09	AIR
789550	IA-14	03/17/09	AIR
789551	IA-15	03/17/09	AIR
789552	SS-15	03/17/09	AIR
789553	SS-16	03/17/09	AIR

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

The volatile organics analyses for certain of the samples in this delivery group were accomplished at dilution based on screen analyses, to ensure quantitation of all target constituents within the range of calibrated instrument response.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Any reference within this report to Severn Trent Laboratories, Inc. or STL, should be understood to refer to TestAmerica Laboratories, Inc. (formerly known as Severn Trent Laboratories, Inc.) The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,



Don Dawicki
Project Manager

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789540

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.66		0.040	3.3		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.28		0.040	1.6		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.15		0.080	0.53		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.065		0.040	0.22		0.14
Carbon Tetrachloride	56-23-5	0.089		0.040	0.56		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.17		0.040	0.54		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.084		0.040	0.34		0.16
Trichloroethene	79-01-6	0.047		0.040	0.25		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.20		0.040	0.75		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789540

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.040	U	0.040	0.17	U	0.17
Xylene (m,p)	1330-20-7	0.086		0.080	0.37		0.35
Xylene (o)	95-47-6	0.040	U	0.040	0.17	U	0.17
Xylene (total)	1330-20-7	0.084		0.040	0.36		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-2

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789541

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.64		0.040	3.2		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.26		0.040	1.5		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.13		0.080	0.46		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.12		0.040	0.41		0.14
Carbon Tetrachloride	56-23-5	0.084		0.040	0.53		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.19		0.040	0.61		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.073		0.040	0.30		0.16
Trichloroethene	79-01-6	0.070		0.040	0.38		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.25		0.040	0.94		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-2

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789541

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.043		0.040	0.19		0.17
Xylene (m,p)	1330-20-7	0.097		0.080	0.42		0.35
Xylene (o)	95-47-6	0.041		0.040	0.18		0.17
Xylene (total)	1330-20-7	0.13		0.040	0.56		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789542

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.71		0.040	3.5		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.25		0.040	1.4		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.099		0.080	0.35		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.052		0.040	0.21		0.16
cis-1,2-Dichloroethene	156-59-2	0.052		0.040	0.21		0.16
Chloroform	67-66-3	0.069		0.040	0.34		0.20
1,1,1-Trichloroethane	71-55-6	0.061		0.040	0.33		0.22
Cyclohexane	110-82-7	0.24		0.040	0.83		0.14
Carbon Tetrachloride	56-23-5	0.078		0.040	0.49		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.15		0.040	0.48		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.11		0.040	0.45		0.16
Trichloroethene	79-01-6	0.45		0.040	2.4		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.42		0.040	1.6		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789542

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.056		0.040	0.24		0.17
Xylene (m,p)	1330-20-7	0.13		0.080	0.56		0.35
Xylene (o)	95-47-6	0.052		0.040	0.23		0.17
Xylene (total)	1330-20-7	0.18		0.040	0.78		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040		0.040	0.20		0.20
1,3,5-Trimethylbenzene	108-67-8	0.085		0.080	0.42		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789543

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.60		0.040	3.0		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.23		0.040	1.3		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.12		0.080	0.42		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.066		0.040	0.26		0.16
cis-1,2-Dichloroethene	156-59-2	0.066		0.040	0.26		0.16
Chloroform	67-66-3	0.094		0.040	0.46		0.20
1,1,1-Trichloroethane	71-55-6	0.075		0.040	0.41		0.22
Cyclohexane	110-82-7	0.11		0.040	0.38		0.14
Carbon Tetrachloride	56-23-5	0.089		0.040	0.56		0.25
2,2,4-Trimethylpentane	540-84-1	0.040	U	0.040	0.19	U	0.19
Benzene	71-43-2	0.19		0.040	0.61		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.16		0.040	0.66		0.16
Trichloroethene	79-01-6	0.55		0.040	3.0		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.53		0.040	2.0		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789543

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.050		0.040	0.22		0.17
Xylene (m,p)	1330-20-7	0.13		0.080	0.56		0.35
Xylene (o)	95-47-6	0.058		0.040	0.25		0.17
Xylene (total)	1330-20-7	0.18		0.040	0.78		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.052		0.040	0.26		0.20
1,3,5-Trimethylbenzene	108-67-8	0.11		0.080	0.54		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789546

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.68		0.040	3.4		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.26		0.040	1.5		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.41		0.080	1.4		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.088		0.040	0.35		0.16
cis-1,2-Dichloroethene	156-59-2	0.088		0.040	0.35		0.16
Chloroform	67-66-3	0.078		0.040	0.38		0.20
1,1,1-Trichloroethane	71-55-6	0.075		0.040	0.41		0.22
Cyclohexane	110-82-7	0.22		0.040	0.76		0.14
Carbon Tetrachloride	56-23-5	0.083		0.040	0.52		0.25
2,2,4-Trimethylpentane	540-84-1	0.059		0.040	0.28		0.19
Benzene	71-43-2	0.18		0.040	0.58		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.31		0.040	1.3		0.16
Trichloroethene	79-01-6	0.74		0.040	4.0		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.61		0.040	2.3		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.040	U	0.040	0.27	U	0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789546

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.066		0.040	0.29		0.17
Xylene (m,p)	1330-20-7	0.18		0.080	0.78		0.35
Xylene (o)	95-47-6	0.085		0.040	0.37		0.17
Xylene (total)	1330-20-7	0.26		0.040	1.1		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789548

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.69		0.50	3.4		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.23		0.20	0.89		0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.29		0.20	1.6		1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	1.6		0.50	5.8		1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	30		0.20	160		1.1
Cyclohexane	110-82-7	1.4		0.20	4.8		0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.32		0.20	1.5		0.93
Benzene	71-43-2	0.49		0.20	1.6		0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	23		0.20	94		0.82
Trichloroethene	79-01-6	0.49		0.20	2.6		1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	9.0		0.20	34		0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789548

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.53		0.20	2.3		0.87
Xylene (m,p)	1330-20-7	1.8		0.50	7.8		2.2
Xylene (o)	95-47-6	0.54		0.20	2.3		0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	2.3		0.20	10		0.87
4-Ethyltoluene	622-96-8	0.21		0.20	1.0		0.98
1,3,5-Trimethylbenzene	108-67-8	0.29		0.20	1.4		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-14

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789550

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.65		0.040	3.2		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.31		0.040	1.7		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.40		0.080	1.4		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.17		0.040	0.83		0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.48		0.040	1.7		0.14
Carbon Tetrachloride	56-23-5	0.079		0.040	0.50		0.25
2,2,4-Trimethylpentane	540-84-1	0.093		0.040	0.43		0.19
Benzene	71-43-2	0.35		0.040	1.1		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.19		0.040	0.78		0.16
Trichloroethene	79-01-6	0.074		0.040	0.40		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	1.2		0.040	4.5		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.23		0.040	1.6		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-14

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789550

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.33		0.040	1.4		0.17
Xylene (m,p)	1330-20-7	0.50		0.080	2.2		0.35
Xylene (o)	95-47-6	0.18		0.040	0.78		0.17
Xylene (total)	1330-20-7	0.66		0.040	2.9		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.048		0.040	0.24		0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-15

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789551

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.21		0.040	1.0		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.081		0.080	0.18		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.30		0.040	1.7		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.27		0.080	0.95		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.45		0.040	2.2		0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.41		0.040	1.4		0.14
Carbon Tetrachloride	56-23-5	0.10		0.040	0.63		0.25
2,2,4-Trimethylpentane	540-84-1	0.075		0.040	0.35		0.19
Benzene	71-43-2	0.38		0.040	1.2		0.13
1,2-Dichloroethane	107-06-2	1.2		0.080	4.9		0.32
n-Heptane	142-82-5	0.38		0.040	1.6		0.16
Trichloroethene	79-01-6	0.067		0.040	0.36		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	2.8		0.040	11		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.087		0.040	0.59		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-15

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 789551

Date Analyzed: 04/10/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.90		0.040	3.9		0.17
Xylene (m,p)	1330-20-7	1.3		0.080	5.6		0.35
Xylene (o)	95-47-6	0.52		0.040	2.3		0.17
Xylene (total)	1330-20-7	1.8		0.040	7.8		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.12		0.040	0.59		0.20
1,3,5-Trimethylbenzene	108-67-8	0.13		0.080	0.64		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA040909LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA040909

Date Analyzed: 04/09/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.20		0.010	0.99		0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.18		0.010	1.3		0.070
Vinyl Chloride	75-01-4	0.18		0.020	0.46		0.051
1,3-Butadiene	106-99-0	0.16		0.020	0.35		0.044
Bromomethane	74-83-9	0.16		0.020	0.62		0.078
Chloroethane	75-00-3	0.17		0.020	0.45		0.053
Bromoethene	593-60-2	0.17		0.020	0.74		0.087
Trichlorofluoromethane	75-69-4	0.18		0.010	1.0		0.056
1,1-Dichloroethene	75-35-4	0.17		0.010	0.67		0.040
3-Chloropropene	107-05-1	0.17		0.020	0.53		0.063
Methylene Chloride	75-09-2	0.22		0.20	0.76		0.69
Methyl tert-Butyl Ether	1634-04-4	0.20		0.010	0.72		0.036
trans-1,2-Dichloroethene	156-60-5	0.16		0.010	0.63		0.040
n-Hexane	110-54-3	0.18		0.020	0.63		0.070
1,1-Dichloroethane	75-34-3	0.18		0.010	0.73		0.040
1,2-Dichloroethene (total)	540-59-0	0.34		0.010	1.3		0.040
cis-1,2-Dichloroethene	156-59-2	0.17		0.010	0.67		0.040
Chloroform	67-66-3	0.18		0.010	0.88		0.049
1,1,1-Trichloroethane	71-55-6	0.18		0.010	0.98		0.055
Cyclohexane	110-82-7	0.17		0.010	0.59		0.034
Carbon Tetrachloride	56-23-5	0.18		0.010	1.1		0.063
2,2,4-Trimethylpentane	540-84-1	0.19		0.010	0.89		0.047
Benzene	71-43-2	0.17		0.010	0.54		0.032
1,2-Dichloroethane	107-06-2	0.18		0.020	0.73		0.081
n-Heptane	142-82-5	0.18		0.010	0.74		0.041
Trichloroethene	79-01-6	0.17		0.010	0.91		0.054
1,2-Dichloropropane	78-87-5	0.17		0.020	0.79		0.092
Bromodichloromethane	75-27-4	0.19		0.010	1.3		0.067
cis-1,3-Dichloropropene	10061-01-5	0.16		0.010	0.73		0.045
Toluene	108-88-3	0.18		0.010	0.68		0.038
trans-1,3-Dichloropropene	10061-02-6	0.17		0.010	0.77		0.045
1,1,2-Trichloroethane	79-00-5	0.17		0.010	0.93		0.055
Tetrachloroethene	127-18-4	0.16		0.010	1.1		0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA040909LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA040909

Date Analyzed: 04/09/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.17		0.010	1.4		0.085
1,2-Dibromoethane	106-93-4	0.17		0.010	1.3		0.077
Ethylbenzene	100-41-4	0.18		0.010	0.78		0.043
Xylene (m,p)	1330-20-7	0.37		0.020	1.6		0.087
Xylene (o)	95-47-6	0.18		0.010	0.78		0.043
Xylene (total)	1330-20-7	0.53		0.010	2.3		0.043
Bromoform	75-25-2	0.17		0.010	1.8		0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.15		0.010	1.0		0.069
4-Ethyltoluene	622-96-8	0.18		0.010	0.88		0.049
1,3,5-Trimethylbenzene	108-67-8	0.16		0.020	0.79		0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA041009LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA041009

Date Analyzed: 04/10/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	11		0.50	54		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	11		0.20	77		1.4
Vinyl Chloride	75-01-4	10		0.20	26		0.51
1,3-Butadiene	106-99-0	11		0.50	24		1.1
Bromomethane	74-83-9	10		0.20	39		0.78
Chloroethane	75-00-3	10		0.50	26		1.3
Bromoethene	593-60-2	11		0.20	48		0.87
Trichlorofluoromethane	75-69-4	11		0.20	62		1.1
1,1-Dichloroethene	75-35-4	11		0.20	44		0.79
3-Chloropropene	107-05-1	10		0.50	31		1.6
Methylene Chloride	75-09-2	11		0.50	38		1.7
Methyl tert-Butyl Ether	1634-04-4	11		0.50	40		1.8
trans-1,2-Dichloroethene	156-60-5	11		0.20	44		0.79
n-Hexane	110-54-3	10		0.50	35		1.8
1,1-Dichloroethane	75-34-3	11		0.20	45		0.81
cis-1,2-Dichloroethene	156-59-2	11		0.20	44		0.79
Chloroform	67-66-3	11		0.20	54		0.98
1,1,1-Trichloroethane	71-55-6	11		0.20	60		1.1
Cyclohexane	110-82-7	11		0.20	38		0.69
Carbon Tetrachloride	56-23-5	11		0.20	69		1.3
2,2,4-Trimethylpentane	540-84-1	11		0.20	51		0.93
Benzene	71-43-2	10		0.20	32		0.64
1,2-Dichloroethene (total)	540-59-0	22		0.20	87		0.79
1,2-Dichloroethane	107-06-2	11		0.20	45		0.81
n-Heptane	142-82-5	10		0.20	41		0.82
Trichloroethene	79-01-6	11		0.20	59		1.1
1,2-Dichloropropane	78-87-5	10		0.20	46		0.92
Bromodichloromethane	75-27-4	12		0.20	80		1.3
cis-1,3-Dichloropropene	10061-01-5	11		0.20	50		0.91
Toluene	108-88-3	10		0.20	38		0.75
trans-1,3-Dichloropropene	10061-02-6	11		0.20	50		0.91
1,1,2-Trichloroethane	79-00-5	10		0.20	55		1.1
Tetrachloroethene	127-18-4	11		0.20	75		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA041009LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA041009

Date Analyzed: 04/10/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	12		0.20	100		1.7
1,2-Dibromoethane	106-93-4	11		0.20	85		1.5
Ethylbenzene	100-41-4	11		0.20	48		0.87
Xylene (m,p)	1330-20-7	22		0.50	96		2.2
Xylene (o)	95-47-6	11		0.20	48		0.87
Bromoform	75-25-2	12		0.20	120		2.1
1,1,2,2-Tetrachloroethane	79-34-5	11		0.20	76		1.4
Xylene (total)	1330-20-7	33		0.20	140		0.87
4-Ethyltoluene	622-96-8	12		0.20	59		0.98
1,3,5-Trimethylbenzene	108-67-8	12		0.20	59		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK040909EA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0409

Date Analyzed: 04/09/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.010	U	0.010	0.049	U	0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.010	U	0.010	0.070	U	0.070
Vinyl Chloride	75-01-4	0.020	U	0.020	0.051	U	0.051
1,3-Butadiene	106-99-0	0.020	U	0.020	0.044	U	0.044
Bromomethane	74-83-9	0.020	U	0.020	0.078	U	0.078
Chloroethane	75-00-3	0.020	U	0.020	0.053	U	0.053
Bromoethene	593-60-2	0.020	U	0.020	0.087	U	0.087
Trichlorofluoromethane	75-69-4	0.010	U	0.010	0.056	U	0.056
1,1-Dichloroethene	75-35-4	0.010	U	0.010	0.040	U	0.040
3-Chloropropene	107-05-1	0.020	U	0.020	0.063	U	0.063
Methylene Chloride	75-09-2	0.20	U	0.20	0.69	U	0.69
Methyl tert-Butyl Ether	1634-04-4	0.010	U	0.010	0.036	U	0.036
trans-1,2-Dichloroethene	156-60-5	0.010	U	0.010	0.040	U	0.040
n-Hexane	110-54-3	0.020	U	0.020	0.070	U	0.070
1,1-Dichloroethane	75-34-3	0.010	U	0.010	0.040	U	0.040
1,2-Dichloroethene (total)	540-59-0	0.010	U	0.010	0.040	U	0.040
cis-1,2-Dichloroethene	156-59-2	0.010	U	0.010	0.040	U	0.040
Chloroform	67-66-3	0.010	U	0.010	0.049	U	0.049
1,1,1-Trichloroethane	71-55-6	0.010	U	0.010	0.055	U	0.055
Cyclohexane	110-82-7	0.010	U	0.010	0.034	U	0.034
Carbon Tetrachloride	56-23-5	0.010	U	0.010	0.063	U	0.063
2,2,4-Trimethylpentane	540-84-1	0.010	U	0.010	0.047	U	0.047
Benzene	71-43-2	0.010	U	0.010	0.032	U	0.032
1,2-Dichloroethane	107-06-2	0.020	U	0.020	0.081	U	0.081
n-Heptane	142-82-5	0.010	U	0.010	0.041	U	0.041
Trichloroethene	79-01-6	0.010	U	0.010	0.054	U	0.054
1,2-Dichloropropane	78-87-5	0.020	U	0.020	0.092	U	0.092
Bromodichloromethane	75-27-4	0.010	U	0.010	0.067	U	0.067
cis-1,3-Dichloropropene	10061-01-5	0.010	U	0.010	0.045	U	0.045
Toluene	108-88-3	0.010	U	0.010	0.038	U	0.038
trans-1,3-Dichloropropene	10061-02-6	0.010	U	0.010	0.045	U	0.045
1,1,2-Trichloroethane	79-00-5	0.010	U	0.010	0.055	U	0.055
Tetrachloroethene	127-18-4	0.010	U	0.010	0.068	U	0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK040909EA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0409

Date Analyzed: 04/09/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.010	U	0.010	0.085	U	0.085
1,2-Dibromoethane	106-93-4	0.010	U	0.010	0.077	U	0.077
Ethylbenzene	100-41-4	0.010	U	0.010	0.043	U	0.043
Xylene (m,p)	1330-20-7	0.020	U	0.020	0.087	U	0.087
Xylene (o)	95-47-6	0.010	U	0.010	0.043	U	0.043
Xylene (total)	1330-20-7	0.010	U	0.010	0.043	U	0.043
Bromoform	75-25-2	0.010	U	0.010	0.10	U	0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.010	U	0.010	0.069	U	0.069
4-Ethyltoluene	622-96-8	0.010	U	0.010	0.049	U	0.049
1,3,5-Trimethylbenzene	108-67-8	0.020	U	0.020	0.098	U	0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK041009GA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0410

Date Analyzed: 04/10/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.20	U	0.20	1.1	U	1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	0.20	U	0.20	0.69	U	0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	0.20	U	0.20	0.75	U	0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK041009GA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0410

Date Analyzed: 04/10/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.20	U	0.20	0.87	U	0.87
Xylene (m,p)	1330-20-7	0.50	U	0.50	2.2	U	2.2
Xylene (o)	95-47-6	0.20	U	0.20	0.87	U	0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	0.20	U	0.20	0.87	U	0.87
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-11

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 5.00

Sample Matrix: AIR

Lab Sample No.: 789544

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	2.5	U	2.5	12	U	12
1,2-Dichlorotetrafluoroethane	76-14-2	1.0	U	1.0	7.0	U	7.0
Vinyl Chloride	75-01-4	1.0	U	1.0	2.6	U	2.6
1,3-Butadiene	106-99-0	2.5	U	2.5	5.5	U	5.5
Bromomethane	74-83-9	1.0	U	1.0	3.9	U	3.9
Chloroethane	75-00-3	2.5	U	2.5	6.6	U	6.6
Bromoethene	593-60-2	1.0	U	1.0	4.4	U	4.4
Trichlorofluoromethane	75-69-4	1.0	U	1.0	5.6	U	5.6
1,1-Dichloroethene	75-35-4	1.0	U	1.0	4.0	U	4.0
3-Chloropropene	107-05-1	2.5	U	2.5	7.8	U	7.8
Methylene Chloride	75-09-2	2.5	U	2.5	8.7	U	8.7
Methyl tert-Butyl Ether	1634-04-4	2.5	U	2.5	9.0	U	9.0
trans-1,2-Dichloroethene	156-60-5	1.0	U	1.0	4.0	U	4.0
n-Hexane	110-54-3	2.5	U	2.5	8.8	U	8.8
1,1-Dichloroethane	75-34-3	1.0	U	1.0	4.0	U	4.0
cis-1,2-Dichloroethene	156-59-2	1.0	U	1.0	4.0	U	4.0
Chloroform	67-66-3	1.0	U	1.0	4.9	U	4.9
1,1,1-Trichloroethane	71-55-6	1.0	U	1.0	5.5	U	5.5
Cyclohexane	110-82-7	3.4		1.0	12		3.4
Carbon Tetrachloride	56-23-5	1.0	U	1.0	6.3	U	6.3
2,2,4-Trimethylpentane	540-84-1	1.0	U	1.0	4.7	U	4.7
Benzene	71-43-2	1.0	U	1.0	3.2	U	3.2
1,2-Dichloroethene (total)	540-59-0	1.0	U	1.0	4.0	U	4.0
1,2-Dichloroethane	107-06-2	1.0	U	1.0	4.0	U	4.0
n-Heptane	142-82-5	1.0	U	1.0	4.1	U	4.1
Trichloroethene	79-01-6	140		1.0	750		5.4
1,2-Dichloropropane	78-87-5	1.0	U	1.0	4.6	U	4.6
Bromodichloromethane	75-27-4	1.0	U	1.0	6.7	U	6.7
cis-1,3-Dichloropropene	10061-01-5	1.0	U	1.0	4.5	U	4.5
Toluene	108-88-3	2.7		1.0	10		3.8
trans-1,3-Dichloropropene	10061-02-6	1.0	U	1.0	4.5	U	4.5
1,1,2-Trichloroethane	79-00-5	1.0	U	1.0	5.5	U	5.5
Tetrachloroethene	127-18-4	1.0	U	1.0	6.8	U	6.8

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-11

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 5.00

Sample Matrix: AIR

Lab Sample No.: 789544

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	1.0	U	1.0	8.5	U	8.5
1,2-Dibromoethane	106-93-4	1.0	U	1.0	7.7	U	7.7
Ethylbenzene	100-41-4	1.0	U	1.0	4.3	U	4.3
Xylene (m,p)	1330-20-7	2.5	U	2.5	11	U	11
Xylene (o)	95-47-6	1.0	U	1.0	4.3	U	4.3
Bromoform	75-25-2	1.0	U	1.0	10	U	10
1,1,2,2-Tetrachloroethane	79-34-5	1.0	U	1.0	6.9	U	6.9
Xylene (total)	1330-20-7	1.0	U	1.0	4.3	U	4.3
4-Ethyltoluene	622-96-8	1.0	U	1.0	4.9	U	4.9
1,3,5-Trimethylbenzene	108-67-8	1.0	U	1.0	4.9	U	4.9

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-12

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 734.00

Sample Matrix: AIR

Lab Sample No.: 789545

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	370	U	370	1800	U	1800
1,2-Dichlorotetrafluoroethane	76-14-2	150	U	150	1000	U	1000
Vinyl Chloride	75-01-4	150	U	150	380	U	380
1,3-Butadiene	106-99-0	370	U	370	820	U	820
Bromomethane	74-83-9	150	U	150	580	U	580
Chloroethane	75-00-3	370	U	370	980	U	980
Bromoethene	593-60-2	150	U	150	660	U	660
Trichlorofluoromethane	75-69-4	150	U	150	840	U	840
1,1-Dichloroethene	75-35-4	150	U	150	590	U	590
3-Chloropropene	107-05-1	370	U	370	1200	U	1200
Methylene Chloride	75-09-2	370	U	370	1300	U	1300
Methyl tert-Butyl Ether	1634-04-4	370	U	370	1300	U	1300
trans-1,2-Dichloroethene	156-60-5	150	U	150	590	U	590
n-Hexane	110-54-3	370	U	370	1300	U	1300
1,1-Dichloroethane	75-34-3	150	U	150	610	U	610
cis-1,2-Dichloroethene	156-59-2	4500		150	18000		590
Chloroform	67-66-3	150	U	150	730	U	730
1,1,1-Trichloroethane	71-55-6	150	U	150	820	U	820
Cyclohexane	110-82-7	150	U	150	520	U	520
Carbon Tetrachloride	56-23-5	150	U	150	940	U	940
2,2,4-Trimethylpentane	540-84-1	150	U	150	700	U	700
Benzene	71-43-2	150	U	150	480	U	480
1,2-Dichloroethene (total)	540-59-0	4500		150	18000		590
1,2-Dichloroethane	107-06-2	150	U	150	610	U	610
n-Heptane	142-82-5	150	U	150	610	U	610
Trichloroethene	79-01-6	25000		150	130000		810
1,2-Dichloropropane	78-87-5	150	U	150	690	U	690
Bromodichloromethane	75-27-4	150	U	150	1000	U	1000
cis-1,3-Dichloropropene	10061-01-5	150	U	150	680	U	680
Toluene	108-88-3	260		150	980		570
trans-1,3-Dichloropropene	10061-02-6	150	U	150	680	U	680
1,1,2-Trichloroethane	79-00-5	150	U	150	820	U	820
Tetrachloroethene	127-18-4	150	U	150	1000	U	1000

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-12

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 734.00

Sample Matrix: AIR

Lab Sample No.: 789545

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	150	U	150	1300	U	1300
1,2-Dibromoethane	106-93-4	150	U	150	1200	U	1200
Ethylbenzene	100-41-4	150	U	150	650	U	650
Xylene (m,p)	1330-20-7	370	U	370	1600	U	1600
Xylene (o)	95-47-6	150	U	150	650	U	650
Bromoform	75-25-2	150	U	150	1600	U	1600
1,1,2,2-Tetrachloroethane	79-34-5	150	U	150	1000	U	1000
Xylene (total)	1330-20-7	150	U	150	650	U	650
4-Ethyltoluene	622-96-8	150	U	150	740	U	740
1,3,5-Trimethylbenzene	108-67-8	150	U	150	740	U	740

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-13

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789547

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.29		0.20	1.6		1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.80		0.20	4.4		1.1
Cyclohexane	110-82-7	0.20	U	0.20	0.69	U	0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.22		0.20	0.70		0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.21		0.20	0.86		0.82
Trichloroethene	79-01-6	11		0.20	59		1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	9.4		0.20	35		0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.36		0.20	2.4		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-13

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789547

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.46		0.20	2.0		0.87
Xylene (m,p)	1330-20-7	1.4		0.50	6.1		2.2
Xylene (o)	95-47-6	0.44		0.20	1.9		0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	1.9		0.20	8.3		0.87
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.21		0.20	1.0		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-14

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789549

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.51		0.50	2.5		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.31		0.20	1.7		1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	2.5		0.20	8.6		0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	5.0		0.20	19		0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.97		0.20	6.6		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-14

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789549

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.58		0.20	2.5		0.87
Xylene (m,p)	1330-20-7	1.4		0.50	6.1		2.2
Xylene (o)	95-47-6	0.37		0.20	1.6		0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	1.8		0.20	7.8		0.87
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-15

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789552

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.25		0.20	1.4		1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	17		0.20	59		0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	0.89		0.20	3.4		0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-15

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 789552

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.52		0.20	2.3		0.87
Xylene (m,p)	1330-20-7	0.86		0.50	3.7		2.2
Xylene (o)	95-47-6	0.32		0.20	1.4		0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	1.2		0.20	5.2		0.87
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-16

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 657.00

Sample Matrix: AIR

Lab Sample No.: 789553

Date Analyzed: 03/26/09

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	330	U	330	1600	U	1600
1,2-Dichlorotetrafluoroethane	76-14-2	130	U	130	910	U	910
Vinyl Chloride	75-01-4	130	U	130	330	U	330
1,3-Butadiene	106-99-0	330	U	330	730	U	730
Bromomethane	74-83-9	130	U	130	500	U	500
Chloroethane	75-00-3	330	U	330	870	U	870
Bromoethene	593-60-2	130	U	130	570	U	570
Trichlorofluoromethane	75-69-4	130	U	130	730	U	730
1,1-Dichloroethene	75-35-4	130	U	130	520	U	520
3-Chloropropene	107-05-1	330	U	330	1000	U	1000
Methylene Chloride	75-09-2	330	U	330	1100	U	1100
Methyl tert-Butyl Ether	1634-04-4	330	U	330	1200	U	1200
trans-1,2-Dichloroethene	156-60-5	130	U	130	520	U	520
n-Hexane	110-54-3	330	U	330	1200	U	1200
1,1-Dichloroethane	75-34-3	130	U	130	530	U	530
cis-1,2-Dichloroethene	156-59-2	4000		130	16000		520
Chloroform	67-66-3	130	U	130	630	U	630
1,1,1-Trichloroethane	71-55-6	130	U	130	710	U	710
Cyclohexane	110-82-7	130	U	130	450	U	450
Carbon Tetrachloride	56-23-5	130	U	130	820	U	820
2,2,4-Trimethylpentane	540-84-1	130	U	130	610	U	610
Benzene	71-43-2	130	U	130	420	U	420
1,2-Dichloroethene (total)	540-59-0	4000		130	16000		520
1,2-Dichloroethane	107-06-2	130	U	130	530	U	530
n-Heptane	142-82-5	130	U	130	530	U	530
Trichloroethene	79-01-6	21000		130	110000		700
1,2-Dichloropropane	78-87-5	130	U	130	600	U	600
Bromodichloromethane	75-27-4	130	U	130	870	U	870
cis-1,3-Dichloropropene	10061-01-5	130	U	130	590	U	590
Toluene	108-88-3	250		130	940		490
trans-1,3-Dichloropropene	10061-02-6	130	U	130	590	U	590
1,1,2-Trichloroethane	79-00-5	130	U	130	710	U	710
Tetrachloroethene	127-18-4	130	U	130	880	U	880

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-16

Lab Name: TAL Burlington

SDG Number: NY130780

Lab Sample No.: 789553

Dilution Factor: 657.00

Date Analyzed: 03/26/09

Sample Matrix: AIR

Date Received: 03/20/09

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	130	U	130	1100	U	1100
1,2-Dibromoethane	106-93-4	130	U	130	1000	U	1000
Ethylbenzene	100-41-4	130	U	130	560	U	560
Xylene (m,p)	1330-20-7	330	U	330	1400	U	1400
Xylene (o)	95-47-6	130	U	130	560	U	560
Bromoform	75-25-2	130	U	130	1300	U	1300
1,1,2,2-Tetrachloroethane	79-34-5	130	U	130	890	U	890
Xylene (total)	1330-20-7	130	U	130	560	U	560
4-Ethyltoluene	622-96-8	130	U	130	640	U	640
1,3,5-Trimethylbenzene	108-67-8	130	U	130	640	U	640

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA032609LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA032609

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	10		0.50	49		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	9.9		0.20	69		1.4
Vinyl Chloride	75-01-4	9.0		0.20	23		0.51
1,3-Butadiene	106-99-0	9.3		0.50	21		1.1
Bromomethane	74-83-9	10		0.20	39		0.78
Chloroethane	75-00-3	9.5		0.50	25		1.3
Bromoethene	593-60-2	11		0.20	48		0.87
Trichlorofluoromethane	75-69-4	11		0.20	62		1.1
1,1-Dichloroethene	75-35-4	11		0.20	44		0.79
3-Chloropropene	107-05-1	9.2		0.50	29		1.6
Methylene Chloride	75-09-2	9.5		0.50	33		1.7
Methyl tert-Butyl Ether	1634-04-4	11		0.50	40		1.8
trans-1,2-Dichloroethene	156-60-5	10		0.20	40		0.79
n-Hexane	110-54-3	9.5		0.50	33		1.8
1,1-Dichloroethane	75-34-3	9.9		0.20	40		0.81
cis-1,2-Dichloroethene	156-59-2	11		0.20	44		0.79
Chloroform	67-66-3	10		0.20	49		0.98
1,1,1-Trichloroethane	71-55-6	10		0.20	55		1.1
Cyclohexane	110-82-7	10		0.20	34		0.69
Carbon Tetrachloride	56-23-5	11		0.20	69		1.3
2,2,4-Trimethylpentane	540-84-1	9.7		0.20	45		0.93
Benzene	71-43-2	10		0.20	32		0.64
1,2-Dichloroethene (total)	540-59-0	21		0.20	83		0.79
1,2-Dichloroethane	107-06-2	10		0.20	40		0.81
n-Heptane	142-82-5	9.2		0.20	38		0.82
Trichloroethene	79-01-6	10		0.20	54		1.1
1,2-Dichloropropane	78-87-5	9.9		0.20	46		0.92
Bromodichloromethane	75-27-4	11		0.20	74		1.3
cis-1,3-Dichloropropene	10061-01-5	10		0.20	45		0.91
Toluene	108-88-3	10		0.20	38		0.75
trans-1,3-Dichloropropene	10061-02-6	10		0.20	45		0.91
1,1,2-Trichloroethane	79-00-5	9.9		0.20	54		1.1
Tetrachloroethene	127-18-4	11		0.20	75		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA032609LCS

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA032609

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	12		0.20	100		1.7
1,2-Dibromoethane	106-93-4	11		0.20	85		1.5
Ethylbenzene	100-41-4	11		0.20	48		0.87
Xylene (m,p)	1330-20-7	21		0.50	91		2.2
Xylene (o)	95-47-6	11		0.20	48		0.87
Bromoform	75-25-2	12		0.20	120		2.1
1,1,2,2-Tetrachloroethane	79-34-5	10		0.20	69		1.4
Xylene (total)	1330-20-7	33		0.20	140		0.87
4-Ethyltoluene	622-96-8	12		0.20	59		0.98
1,3,5-Trimethylbenzene	108-67-8	12		0.20	59		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA032609LCSD

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA032609

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	10		0.50	49		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	9.5		0.20	66		1.4
Vinyl Chloride	75-01-4	8.6		0.20	22		0.51
1,3-Butadiene	106-99-0	8.8		0.50	19		1.1
Bromomethane	74-83-9	9.8		0.20	38		0.78
Chloroethane	75-00-3	9.1		0.50	24		1.3
Bromoethene	593-60-2	11		0.20	48		0.87
Trichlorofluoromethane	75-69-4	10		0.20	56		1.1
1,1-Dichloroethene	75-35-4	11		0.20	44		0.79
3-Chloropropene	107-05-1	8.8		0.50	28		1.6
Methylene Chloride	75-09-2	9.0		0.50	31		1.7
Methyl tert-Butyl Ether	1634-04-4	10		0.50	36		1.8
trans-1,2-Dichloroethene	156-60-5	9.6		0.20	38		0.79
n-Hexane	110-54-3	9.2		0.50	32		1.8
1,1-Dichloroethane	75-34-3	9.5		0.20	38		0.81
cis-1,2-Dichloroethene	156-59-2	10		0.20	40		0.79
Chloroform	67-66-3	9.9		0.20	48		0.98
1,1,1-Trichloroethane	71-55-6	10		0.20	55		1.1
Cyclohexane	110-82-7	9.7		0.20	33		0.69
Carbon Tetrachloride	56-23-5	10		0.20	63		1.3
2,2,4-Trimethylpentane	540-84-1	9.2		0.20	43		0.93
Benzene	71-43-2	9.3		0.20	30		0.64
1,2-Dichloroethene (total)	540-59-0	20		0.20	79		0.79
1,2-Dichloroethane	107-06-2	9.6		0.20	39		0.81
n-Heptane	142-82-5	8.6		0.20	35		0.82
Trichloroethene	79-01-6	9.7		0.20	52		1.1
1,2-Dichloropropane	78-87-5	9.1		0.20	42		0.92
Bromodichloromethane	75-27-4	10		0.20	67		1.3
cis-1,3-Dichloropropene	10061-01-5	9.5		0.20	43		0.91
Toluene	108-88-3	9.8		0.20	37		0.75
trans-1,3-Dichloropropene	10061-02-6	9.6		0.20	44		0.91
1,1,2-Trichloroethane	79-00-5	9.5		0.20	52		1.1
Tetrachloroethene	127-18-4	10		0.20	68		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA032609LCSD

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA032609

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	11		0.20	94		1.7
1,2-Dibromoethane	106-93-4	10		0.20	77		1.5
Ethylbenzene	100-41-4	10		0.20	43		0.87
Xylene (m,p)	1330-20-7	20		0.50	87		2.2
Xylene (o)	95-47-6	10		0.20	43		0.87
Bromoform	75-25-2	12		0.20	120		2.1
1,1,2,2-Tetrachloroethane	79-34-5	9.9		0.20	68		1.4
Xylene (total)	1330-20-7	31		0.20	130		0.87
4-Ethyltoluene	622-96-8	11		0.20	54		0.98
1,3,5-Trimethylbenzene	108-67-8	11		0.20	54		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK032609GA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0326

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.20	U	0.20	1.1	U	1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene Chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	0.20	U	0.20	0.69	U	0.69
Carbon Tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethene (total)	540-59-0	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	0.20	U	0.20	0.75	U	0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK032609GA

Lab Name: TAL Burlington

SDG Number: NY130780

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0326

Date Analyzed: 03/26/09

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.20	U	0.20	0.87	U	0.87
Xylene (m,p)	1330-20-7	0.50	U	0.50	2.2	U	2.2
Xylene (o)	95-47-6	0.20	U	0.20	0.87	U	0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
Xylene (total)	1330-20-7	0.20	U	0.20	0.87	U	0.87
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TestAmerica Burlington Data Qualifier Definitions

Organic

U: Compound analyzed but not detected at a concentration above the reporting limit.

J: Estimated value.

N: Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds (TICs) where the identification of a compound is based on a mass spectral library search.

P: SW-846: The relative percent difference for detected concentrations between two GC columns is greater than 40%. Unless otherwise specified the higher of the two values is reported on the Form I.

CLP SOW: Greater than 25% difference for detected concentrations between two GC columns. Unless otherwise specified the lower of the two values is reported on the Form I.

C: Pesticide result whose identification has been confirmed by GC/MS.

B: Analyte is found in the sample and the associated method blank. The flag is used for tentatively identified compounds as well as positively identified compounds.

E: Compounds whose concentrations exceed the upper limit of the calibration range of the instrument for that specific analysis.

D: Concentrations identified from analysis of the sample at a secondary dilution.

A: Tentatively identified compound is a suspected aldol conden sation product.

X,Y,Z: Laboratory defined flags that may be used alone or combined, as needed. If used, the description of the flag is defined in the project narrative.

Inorganic/Metals

E: Reported value is estimated due to the presence of interference.

N: Matrix spike sample recovery is not within control limits.

*: Duplicate sample analysis is not within control limits.

B: The result reported is less than the reporting limit but greater than the instrument detection limit.

U: Analyte was analyzed for but not detected above the reporting limit.

Method Codes:

P	ICP-AES
MS	ICP-MS
CV	Cold Vapor AA
AS	Semi-Automated Spectrophotometric

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information
Company: AKRF
Address: ~~440~~ 34 South Broadway Suite 314
City/State/Zip: White Plains, NY 10601
Phone: 914-922-2382
FAX: 914-949-7559
Project Name: Magna Metals
Site: Cortlandt, NY
PO #: 40256

Project Manager: Bryan Zieroff
Phone: 914-922-2382
Email: bryan_zieroff@akrf.com
Site Contact: B. Zieroff
STL Contact: E. Gaus

Analysis Turnaround Time
Standard (Specify) Standard CAT B
Rush (Specify)

Samples Collected By: GB

1 of 3 COCs

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
AA-1	3/17/09	1045	1830	-30	-8	3075	2584	X								X			
AA-2		1050	1635	-30	-5	3117	4432	X								X			
IA-10		0944	1740	-30	-6	3119	3552	X							X				
IA-11		0852	1640	-29	-6	4394	3623	X							X				
SS-11		0851	1628	-26	-4	2768	4366	X									X		
SS-12		0942	~~[illegible]~~ 1735	-30	-10	4492	2734	X									X		

Temperature (Fahrenheit)

	Interior	Ambient
Start	60°F	40°F
Stop	60°F	55°F

Pressure (inches of Hg)

	Interior	Ambient
Start		
Stop		

Special Instructions/QC Requirements & Comments:
Category B deliverables

Samples Shipped by:	Date/Time: 3/18/09 1000	Samples Received by:
Samples Relinquished by:	Date/Time: 3/18/09 10:00	Received by: TA 03/20/09 1010
Relinquished by:	Date/Time:	Received by:

Lab Use Only Shipper Name: Opened by: Condition:

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Zierolf	Samples Collected By: GB	2 of 3 COCs
Company: AKRF	Phone: 914-922-2382		
Address: 34 South Broadway Suite 314	Email: bryan_zierolf@akrf.com		
City/State/Zip White Plains, NY 10601			
Phone: 914-922-2382	Site Contact: B. Zierolf		
FAX: 914-449-7559	STL Contact: E. Gould		
Project Name: Magna Metals	**Analysis Turnaround Time**		
Site: Cortlandt, NY	Standard (Specify) Standard Cat B		
PO # 40256	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type: Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-12	3/17/09	0930	1735	-28	-22	3753	4827	X						X				
SS-13		1010	1755	-26	-7	3179	3860	X								X		
IA-13		1007	1755	-29	-8	4511	3278	X						X				
SS-14		1034	1800	-29	-7	3128	3660	X								X		
~~SS~~ IA-14		1030	1800	-30	-6	4013	4138	X						X				
IA-15		0917	1618	-30	-6	4757	2849	X						X				

Temperature (Fahrenheit)	Interior	Ambient
Start	60°F	60°F
Stop	60°F	55°F

Pressure (inches of Hg)	Interior	Ambient
Start		
Stop		

Special Instructions/QC Requirements & Comments:

Category B deliverables

Samples Shipped by:	Date/Time: 3/18/09 0000	Samples Received by:
Samples Relinquished by:	Date/Time: 3/18/09 10:00	Received by: TA 03/20/09 1010
Relinquished by:	Date/Time:	Received by:

Lab Use Only Shipper Name: Opened by: Condition:

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Zierott	Samples Collected By: GV	3 of 3 COCs
Company: AKRF	Phone: 914-922-2382		
Address: 34 South Broadway Suite 314	Email: bryan-zierott@akrf.com		
City/State/Zip: White Plains, NY 10601			
Phone: 914 922-2382	Site Contact: B. Zierott		
FAX: 914-949-7559	STL Contact: E. Davis		
Project Name: Magnus Metals	**Analysis Turnaround Time**		
Site: Cortlandt, NY	Standard (Specify) Stnd Cat B		
PO # 40256	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
SS-15	3/17/09	0916	1655	-30	-10	3852	3477	X									X		
SS-16	3/17/09	0942	1755	-30	-7	2829	4571	X									X		

Temperature (Fahrenheit)	Interior	Ambient
Start	60°F	45°F
Stop	60°F	55°F

Pressure (inches of Hg)	Interior	Ambient
Start		
Stop		

Special Instructions/QC Requirements & Comments:

Category B deliverables

Samples Shipped by:	Date/Time: 3/18/09 1000	Samples Received by:
Samples Relinquished by:	Date/Time: 3/18/09 10:00	Received by: TA 03/20/09 1010
Relinquished by:	Date/Time:	Received by:

Lab Use Only **Shipper Name:** **Opened by:** **Condition:**

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Data Summary – TO-15 Low Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789540

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789540

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.66	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.28	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.15	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.065	
56-23-5	Carbon Tetrachloride	0.089	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.17	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.084	
79-01-6	Trichloroethene	0.047	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.20	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789540

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789540

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.040	U
1330-20-7	Xylene (m,p)	0.086	
95-47-6	Xylene (o)	0.040	U
1330-20-7	Xylene (total)	0.084	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-2

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789541

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789541

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.64	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.26	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.13	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.12	
56-23-5	Carbon Tetrachloride	0.084	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.19	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.073	
79-01-6	Trichloroethene	0.070	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.25	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-2

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789541

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789541

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.043	
1330-20-7	Xylene (m,p)	0.097	
95-47-6	Xylene (o)	0.041	
1330-20-7	Xylene (total)	0.13	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789542

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789542

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.71	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.25	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.099	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.052	
156-59-2	cis-1,2-Dichloroethene	0.052	
67-66-3	Chloroform	0.069	
71-55-6	1,1,1-Trichloroethane	0.061	
110-82-7	Cyclohexane	0.24	
56-23-5	Carbon Tetrachloride	0.078	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.15	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.11	
79-01-6	Trichloroethene	0.45	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.42	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789542

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789542

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.056	
1330-20-7	Xylene (m,p)	0.13	
95-47-6	Xylene (o)	0.052	
1330-20-7	Xylene (total)	0.18	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	
108-67-8	1,3,5-Trimethylbenzene	0.085	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789543

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789543

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.60	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.23	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.12	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.066	
156-59-2	cis-1,2-Dichloroethene	0.066	
67-66-3	Chloroform	0.094	
71-55-6	1,1,1-Trichloroethane	0.075	
110-82-7	Cyclohexane	0.11	
56-23-5	Carbon Tetrachloride	0.089	
540-84-1	2,2,4-Trimethylpentane	0.040	U
71-43-2	Benzene	0.19	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.16	
79-01-6	Trichloroethene	0.55	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.53	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

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AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789543

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789543

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.050	
1330-20-7	Xylene (m,p)	0.13	
95-47-6	Xylene (o)	0.058	
1330-20-7	Xylene (total)	0.18	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.052	
108-67-8	1,3,5-Trimethylbenzene	0.11	

FORM 1
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AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789546

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 789546

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.68	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.26	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.41	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.088	
156-59-2	cis-1,2-Dichloroethene	0.088	
67-66-3	Chloroform	0.078	
71-55-6	1,1,1-Trichloroethane	0.075	
110-82-7	Cyclohexane	0.22	
56-23-5	Carbon Tetrachloride	0.083	
540-84-1	2,2,4-Trimethylpentane	0.059	
71-43-2	Benzene	0.18	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.31	
79-01-6	Trichloroethene	0.74	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.61	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.040	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789546

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 789546

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.066	
1330-20-7	Xylene (m,p)	0.18	
95-47-6	Xylene (o)	0.085	
1330-20-7	Xylene (total)	0.26	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

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AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789548

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789548I2

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.69	
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.23	
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.29	
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	1.6	
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	30	
110-82-7	Cyclohexane	1.4	
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.32	
71-43-2	Benzene	0.49	
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	23	
79-01-6	Trichloroethene	0.49	
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	9.0	
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789548

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789548I2

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.53	
1330-20-7	Xylene (m,p)	1.8	
95-47-6	Xylene (o)	0.54	
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	2.3	
622-96-8	4-Ethyltoluene	0.21	
108-67-8	1,3,5-Trimethylbenzene	0.29	

FORM 1
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AKRF2 SAMPLE NO.

IA-14

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789550

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789550

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.65	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.31	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.40	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.17	
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.48	
56-23-5	Carbon Tetrachloride	0.079	
540-84-1	2,2,4-Trimethylpentane	0.093	
71-43-2	Benzene	0.35	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.19	
79-01-6	Trichloroethene	0.074	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	1.2	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.23	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-14

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789550

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789550

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.33	
1330-20-7	Xylene (m,p)	0.50	
95-47-6	Xylene (o)	0.18	
1330-20-7	Xylene (total)	0.66	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.048	
108-67-8	1,3,5-Trimethylbenzene	0.080	U

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AKRF2 SAMPLE NO.

IA-15

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789551

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789551

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.21	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.081	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.30	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.27	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.45	
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.41	
56-23-5	Carbon Tetrachloride	0.10	
540-84-1	2,2,4-Trimethylpentane	0.075	
71-43-2	Benzene	0.38	
107-06-2	1,2-Dichloroethane	1.2	
142-82-5	n-Heptane	0.38	
79-01-6	Trichloroethene	0.067	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	2.8	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.087	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-15

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789551

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 789551

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.90	
1330-20-7	Xylene (m,p)	1.3	
95-47-6	Xylene (o)	0.52	
1330-20-7	Xylene (total)	1.8	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.12	
108-67-8	1,3,5-Trimethylbenzene	0.13	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK040909EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK040909EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EDSB01D

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/09/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.010	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.010	U
75-01-4	Vinyl Chloride	0.020	U
106-99-0	1,3-Butadiene	0.020	U
74-83-9	Bromomethane	0.020	U
75-00-3	Chloroethane	0.020	U
593-60-2	Bromoethene	0.020	U
75-69-4	Trichlorofluoromethane	0.010	U
75-35-4	1,1-Dichloroethene	0.010	U
107-05-1	3-Chloropropene	0.020	U
75-09-2	Methylene Chloride	0.20	U
1634-04-4	Methyl tert-Butyl Ether	0.010	U
156-60-5	trans-1,2-Dichloroethene	0.010	U
110-54-3	n-Hexane	0.020	U
75-34-3	1,1-Dichloroethane	0.010	U
540-59-0	1,2-Dichloroethene (total)	0.010	U
156-59-2	cis-1,2-Dichloroethene	0.010	U
67-66-3	Chloroform	0.010	U
71-55-6	1,1,1-Trichloroethane	0.010	U
110-82-7	Cyclohexane	0.010	U
56-23-5	Carbon Tetrachloride	0.010	U
540-84-1	2,2,4-Trimethylpentane	0.010	U
71-43-2	Benzene	0.010	U
107-06-2	1,2-Dichloroethane	0.020	U
142-82-5	n-Heptane	0.010	U
79-01-6	Trichloroethene	0.010	U
78-87-5	1,2-Dichloropropane	0.020	U
75-27-4	Bromodichloromethane	0.010	U
10061-01-5	cis-1,3-Dichloropropene	0.010	U
108-88-3	Toluene	0.010	U
10061-02-6	trans-1,3-Dichloropropene	0.010	U
79-00-5	1,1,2-Trichloroethane	0.010	U
127-18-4	Tetrachloroethene	0.010	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK040909EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK040909EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EDSB01D

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/09/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.010	U
106-93-4	1,2-Dibromoethane	0.010	U
100-41-4	Ethylbenzene	0.010	U
1330-20-7	Xylene (m,p)	0.020	U
95-47-6	Xylene (o)	0.010	U
1330-20-7	Xylene (total)	0.010	U
75-25-2	Bromoform	0.010	U
79-34-5	1,1,2,2-Tetrachloroethane	0.010	U
622-96-8	4-Ethyltoluene	0.010	U
108-67-8	1,3,5-Trimethylbenzene	0.020	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK041009GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK041009GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDIB01H

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	0.20	U
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK041009GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK041009GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDIB01H

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.20	U
1330-20-7	Xylene (m,p)	0.50	U
95-47-6	Xylene (o)	0.20	U
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	0.20	U
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA040909LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: EA040909LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EDS20DQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/09/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.20	
76-14-2	1,2-Dichlorotetrafluoroethan	0.18	
75-01-4	Vinyl Chloride	0.18	
106-99-0	1,3-Butadiene	0.16	
74-83-9	Bromomethane	0.16	
75-00-3	Chloroethane	0.17	
593-60-2	Bromoethene	0.17	
75-69-4	Trichlorofluoromethane	0.18	
75-35-4	1,1-Dichloroethene	0.17	
107-05-1	3-Chloropropene	0.17	
75-09-2	Methylene Chloride	0.22	
1634-04-4	Methyl tert-Butyl Ether	0.20	
156-60-5	trans-1,2-Dichloroethene	0.16	
110-54-3	n-Hexane	0.18	
75-34-3	1,1-Dichloroethane	0.18	
540-59-0	1,2-Dichloroethene (total)	0.34	
156-59-2	cis-1,2-Dichloroethene	0.17	
67-66-3	Chloroform	0.18	
71-55-6	1,1,1-Trichloroethane	0.18	
110-82-7	Cyclohexane	0.17	
56-23-5	Carbon Tetrachloride	0.18	
540-84-1	2,2,4-Trimethylpentane	0.19	
71-43-2	Benzene	0.17	
107-06-2	1,2-Dichloroethane	0.18	
142-82-5	n-Heptane	0.18	
79-01-6	Trichloroethene	0.17	
78-87-5	1,2-Dichloropropane	0.17	
75-27-4	Bromodichloromethane	0.19	
10061-01-5	cis-1,3-Dichloropropene	0.16	
108-88-3	Toluene	0.18	
10061-02-6	trans-1,3-Dichloropropene	0.17	
79-00-5	1,1,2-Trichloroethane	0.17	
127-18-4	Tetrachloroethene	0.16	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA040909LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: EA040909LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EDS20DQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/09/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.17	
106-93-4	1,2-Dibromoethane	0.17	
100-41-4	Ethylbenzene	0.18	
1330-20-7	Xylene (m,p)	0.37	
95-47-6	Xylene (o)	0.18	
1330-20-7	Xylene (total)	0.53	
75-25-2	Bromoform	0.17	
79-34-5	1,1,2,2-Tetrachloroethane	0.15	
622-96-8	4-Ethyltoluene	0.18	
108-67-8	1,3,5-Trimethylbenzene	0.16	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA041009LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA041009LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDI10HQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	11	
76-14-2	1,2-Dichlorotetrafluoroethan	11	
75-01-4	Vinyl Chloride	10	
106-99-0	1,3-Butadiene	11	
74-83-9	Bromomethane	10	
75-00-3	Chloroethane	10	
593-60-2	Bromoethene	11	
75-69-4	Trichlorofluoromethane	11	
75-35-4	1,1-Dichloroethene	11	
107-05-1	3-Chloropropene	10	
75-09-2	Methylene Chloride	11	
1634-04-4	Methyl tert-Butyl Ether	11	
156-60-5	trans-1,2-Dichloroethene	11	
110-54-3	n-Hexane	10	
75-34-3	1,1-Dichloroethane	11	
156-59-2	cis-1,2-Dichloroethene	11	
67-66-3	Chloroform	11	
71-55-6	1,1,1-Trichloroethane	11	
110-82-7	Cyclohexane	11	
56-23-5	Carbon Tetrachloride	11	
540-84-1	2,2,4-Trimethylpentane	11	
71-43-2	Benzene	10	
540-59-0	1,2-Dichloroethene (total)	22	
107-06-2	1,2-Dichloroethane	11	
142-82-5	n-Heptane	10	
79-01-6	Trichloroethene	11	
78-87-5	1,2-Dichloropropane	10	
75-27-4	Bromodichloromethane	12	
10061-01-5	cis-1,3-Dichloropropene	11	
108-88-3	Toluene	10	
10061-02-6	trans-1,3-Dichloropropene	11	
79-00-5	1,1,2-Trichloroethane	10	
127-18-4	Tetrachloroethene	11	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA041009LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA041009LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDI10HQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/10/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	12	
106-93-4	1,2-Dibromoethane	11	
100-41-4	Ethylbenzene	11	
1330-20-7	Xylene (m,p)	22	
95-47-6	Xylene (o)	11	
75-25-2	Bromoform	12	
79-34-5	1,1,2,2-Tetrachloroethane	11	
1330-20-7	Xylene (total)	33	
622-96-8	4-Ethyltoluene	12	
108-67-8	1,3,5-Trimethylbenzene	12	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: EA040909LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	0.20		0.20	100	70-130
1,2-Dichlorotetrafluoro	0.20		0.18	90	70-130
Vinyl Chloride	0.20		0.18	90	70-130
1,3-Butadiene	0.20		0.16	80	70-130
Bromomethane	0.20		0.16	80	70-130
Chloroethane	0.20		0.17	85	70-130
Bromoethene	0.20		0.17	85	70-130
Trichlorofluoromethane	0.20		0.18	90	70-130
1,1-Dichloroethene	0.20		0.17	85	70-130
3-Chloropropene	0.20		0.17	85	70-130
Methylene Chloride	0.20		0.22	110	70-130
Methyl tert-Butyl Ether	0.20		0.20	100	70-130
trans-1,2-Dichloroethen	0.20		0.16	80	70-130
n-Hexane	0.20		0.18	90	70-130
1,1-Dichloroethane	0.20		0.18	90	70-130
1,2-Dichloroethene (tot	0.40		0.34	85	70-130
cis-1,2-Dichloroethene	0.20		0.17	85	70-130
Chloroform	0.20		0.18	90	70-130
1,1,1-Trichloroethane	0.20		0.18	90	70-130
Cyclohexane	0.20		0.17	85	70-130
Carbon Tetrachloride	0.20		0.18	90	70-130
2,2,4-Trimethylpentane	0.20		0.19	95	70-130
Benzene	0.20		0.17	85	70-130
1,2-Dichloroethane	0.20		0.18	90	70-130
n-Heptane	0.20		0.18	90	70-130
Trichloroethene	0.20		0.17	85	70-130
1,2-Dichloropropane	0.20		0.17	85	70-130
Bromodichloromethane	0.20		0.19	95	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

_____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: EA040909LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	0.20		0.16	80	70-130
Toluene	0.20		0.18	90	70-130
trans-1,3-Dichloroprope	0.20		0.17	85	70-130
1,1,2-Trichloroethane	0.20		0.17	85	70-130
Tetrachloroethene	0.20		0.16	80	70-130
Dibromochloromethane	0.20		0.17	85	70-130
1,2-Dibromoethane	0.20		0.17	85	70-130
Ethylbenzene	0.20		0.18	90	70-130
Xylene (m,p)	0.40		0.37	92	70-130
Xylene (o)	0.20		0.18	90	70-130
Bromoform	0.20		0.17	85	70-130
1,1,2,2-Tetrachloroetha	0.20		0.15	75	70-130
4-Ethyltoluene	0.20		0.18	90	70-130
1,3,5-Trimethylbenzene	0.20		0.16	80	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 42 outside limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA041009LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	10		11	110	70-130
1,2-Dichlorotetrafluoro	10		11	110	70-130
Vinyl Chloride	10		10	100	70-130
1,3-Butadiene	10		11	110	70-130
Bromomethane	10		10	100	70-130
Chloroethane	10		10	100	70-130
Bromoethene	10		11	110	70-130
Trichlorofluoromethane	10		11	110	70-130
1,1-Dichloroethene	10		11	110	70-130
3-Chloropropene	10		10	100	70-130
Methylene Chloride	10		11	110	70-130
Methyl tert-Butyl Ether	10		11	110	70-130
trans-1,2-Dichloroethen	10		11	110	70-130
n-Hexane	10		10	100	70-130
1,1-Dichloroethane	10		11	110	70-130
cis-1,2-Dichloroethene	10		11	110	70-130
Chloroform	10		11	110	70-130
1,1,1-Trichloroethane	10		11	110	70-130
Cyclohexane	10		11	110	70-130
Carbon Tetrachloride	10		11	110	70-130
2,2,4-Trimethylpentane	10		11	110	70-130
Benzene	10		10	100	70-130
1,2-Dichloroethene (tot	20		22	110	70-130
1,2-Dichloroethane	10		11	110	70-130
n-Heptane	10		10	100	70-130
Trichloroethene	10		11	110	70-130
1,2-Dichloropropane	10		10	100	70-130
Bromodichloromethane	10		12	120	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA041009LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	10		11	110	70-130
Toluene	10		10	100	70-130
trans-1,3-Dichloroprope	10		11	110	70-130
1,1,2-Trichloroethane	10		10	100	70-130
Tetrachloroethene	10		11	110	70-130
Dibromochloromethane	10		12	120	70-130
1,2-Dibromoethane	10		11	110	70-130
Ethylbenzene	10		11	110	70-130
Xylene (m,p)	20		22	110	70-130
Xylene (o)	10		11	110	70-130
Bromoform	10		12	120	70-130
1,1,2,2-Tetrachloroetha	10		11	110	70-130
Xylene (total)	30		33	110	70-130
4-Ethyltoluene	10		12	120	70-130
1,3,5-Trimethylbenzene	10		12	120	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 43 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK040909EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: EDSB01D Lab Sample ID: MBLK040909EA

Date Analyzed: 04/09/09 Time Analyzed: 1352

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: E

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	EA040909LCS	EA040909LCS	EDS20DQ	1255
02	AA-1	789540	789540	0301
03	AA-2	789541	789541	0358
04	IA-10	789542	789542	0454
05	IA-11	789543	789543	0551
06	IA-12	789546	789546	0648
07	IA-14	789550	789550	0841
08	IA-15	789551	789551	0938
09				
10				
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COMMENTS:

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK041009GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDIB01H Lab Sample ID: MBLK041009GA

Date Analyzed: 04/10/09 Time Analyzed: 1138

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	GA041009LCS	GA041009LCS	GDI10HQ	1038
02	IA-13	789548	789548I2	1540
03				
04				
05				
06				
07				
08				
09				
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDI01PV BFB Injection Date: 03/31/09

Instrument ID: G BFB Injection Time: 0858

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	17.5
75	30.0 - 66.0% of mass 95	49.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.6 (0.5)1
174	50.0 - 120.0% of mass 95	102.7
175	4.0 - 9.0% of mass 174	7.1 (6.9)1
176	93.0 - 101.0% of mass 174	99.7 (97.1)1
177	5.0 - 9.0% of mass 176	6.7 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0002	ASTD0002	GDI002V	03/31/09	1034
02	ASTD0005	ASTD0005	GDI005V	03/31/09	1122
03	ASTD005	ASTD005	GDI05V	03/31/09	1210
04	ASTD010	ASTD010	GDI10V	03/31/09	1259
05	ASTD015	ASTD015	GDI15V	03/31/09	1347
06	ASTD020	ASTD020	GDI20V	03/31/09	1435
07	ASTD040	ASTD040	GDI40V	03/31/09	1523
08					
09					
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12					
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22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: EDS01PV BFB Injection Date: 04/03/09

Instrument ID: E BFB Injection Time: 1350

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	23.5
75	30.0 - 66.0% of mass 95	62.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	88.8
175	4.0 - 9.0% of mass 174	6.4 (7.2)1
176	93.0 - 101.0% of mass 174	86.8 (97.8)1
177	5.0 - 9.0% of mass 176	5.8 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0010	ASTD0010	EDS10V	04/03/09	1634
02	ASTD0020	ASTD0020	EDS20V	04/03/09	1730
03	ASTD0050	ASTD0050	EDS50V	04/03/09	1826
04	ASTD0100	ASTD0100	EDS100V	04/03/09	1922
05	ASTD0200	ASTD0200	EDS200V	04/03/09	2018
06	ASTD0500	ASTD0500	EDS500V	04/03/09	2114
07	ASTD0750	ASTD0750	EDS750V	04/03/09	2210
08	ASTD1000	ASTD1000	EDS1000V	04/03/09	2305
09	ASTD1500	ASTD1500	EDS1500V	04/04/09	0002
10	ASTD2000	ASTD2000	EDS2000V	04/04/09	0058
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12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: EDS05PV BFB Injection Date: 04/09/09

Instrument ID: E BFB Injection Time: 1052

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	23.2
75	30.0 - 66.0% of mass 95	62.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	50.0 - 120.0% of mass 95	86.9
175	4.0 - 9.0% of mass 174	6.1 (7.0)1
176	93.0 - 101.0% of mass 174	86.2 (99.1)1
177	5.0 - 9.0% of mass 176	5.6 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0200	ASTD0200	EDS20DV	04/09/09	1155
02	EA040909LCS	EA040909LCS	EDS20DQ	04/09/09	1255
03	MBLK040909EA	MBLK040909EA	EDSB01D	04/09/09	1352
04	AA-1	789540	789540	04/10/09	0301
05	AA-2	789541	789541	04/10/09	0358
06	IA-10	789542	789542	04/10/09	0454
07	IA-11	789543	789543	04/10/09	0551
08	IA-12	789546	789546	04/10/09	0648
09	IA-14	789550	789550	04/10/09	0841
10	IA-15	789551	789551	04/10/09	0938
11					
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDI09PV BFB Injection Date: 04/10/09

Instrument ID: G BFB Injection Time: 0748

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	16.6
75	30.0 - 66.0% of mass 95	48.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.6 (0.5)1
174	50.0 - 120.0% of mass 95	111.3
175	4.0 - 9.0% of mass 174	7.9 (7.1)1
176	93.0 - 101.0% of mass 174	108.1 (97.1)1
177	5.0 - 9.0% of mass 176	6.9 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	GDI10HV2	04/10/09	0943
02	GA041009LCS	GA041009LCS	GDI10HQ	04/10/09	1038
03	MBLK041009GA	MBLK041009GA	GDIB01H	04/10/09	1138
04	IA-13	789548	789548I2	04/10/09	1540
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FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GDI002V RRF0.5=GDI005V
RRF2 = RRF5 =GDI05V RRF10 =GDI10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD	
Dichlorodifluoromethane		1.946		2.143	1.727			
1,2-Dichlorotetrafluoroethan	1.969	2.030		2.198	1.769			
Vinyl Chloride	0.584	0.613		0.637	0.524			
1,3-Butadiene		0.352		0.407	0.340			
Bromomethane	0.794	0.752		0.798	0.658			
Chloroethane		0.286		0.324	0.268			
Bromoethene	0.788	0.834		0.866	0.707			
Trichlorofluoromethane	2.508	2.572		2.777	2.230			
1,1-Dichloroethene	0.714	0.634		0.697	0.574			
3-Chloropropene		0.707		0.706	0.586			
Methylene Chloride		0.906		0.758	0.598			
Methyl tert-Butyl Ether		1.688		1.877	1.557			
trans-1,2-Dichloroethene	1.053	1.026		1.141	0.926			
n-Hexane		0.878		0.985	0.812			
1,1-Dichloroethane	* 1.309	1.272		1.380	1.117			*
cis-1,2-Dichloroethene	0.762	0.760		0.813	0.665			
Chloroform	1.779	1.721		1.896	1.520			
1,1,1-Trichloroethane	0.426	0.413		0.458	0.365			
Cyclohexane	0.193	0.194		0.214	0.174			
Carbon Tetrachloride	0.456	0.445		0.528	0.420			
2,2,4-Trimethylpentane	0.659	0.605		0.697	0.557			
Benzene	0.520	0.459		0.494	0.394			
1,2-Dichloroethene (total)	0.907	0.893		0.977	0.795			
1,2-Dichloroethane	0.257	0.240		0.265	0.210			
n-Heptane	0.232	0.217		0.243	0.195			
Trichloroethene	0.267	0.237		0.266	0.210			
1,2-Dichloropropane	0.162	0.148		0.167	0.134			
Bromodichloromethane	0.359	0.361		0.429	0.347			
cis-1,3-Dichloropropene	0.251	0.246		0.286	0.230			
Toluene	0.363	0.350		0.369	0.300			
trans-1,3-Dichloropropene	0.279	0.258		0.304	0.245			
1,1,2-Trichloroethane	0.181	0.177		0.189	0.154			
Tetrachloroethene	0.411	0.391		0.434	0.357			
Dibromochloromethane	0.387	0.382		0.491	0.412			
1,2-Dibromoethane	0.338	0.333		0.377	0.312			
Ethylbenzene	0.798	0.771		0.842	0.681			
Xylene (m,p)	0.296	0.293		0.328	0.268			

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GDI002V RRF0.5=GDI005V
RRF2 = RRF5 =GDI05V RRF10 =GDI10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD
Xylene (o)	0.285	0.286		0.321	0.262		
Bromoform	0.376	0.401		0.557	0.472		
1,1,2,2-Tetrachloroethane	0.434	0.427		0.487	0.394		
Xylene (total)	0.285	0.286		0.321	0.262		
4-Ethyltoluene	0.734	0.750		0.970	0.802		
1,3,5-Trimethylbenzene	0.565	0.624		0.829	0.684		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =GDI15V RRF20 =GDI20V
RRF40 =GDI40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Dichlorodifluoromethane		1.905	1.869			1.918	7.8
1,2-Dichlorotetrafluoroethan		2.010	1.977			1.992	6.9
Vinyl Chloride		0.604	0.604			0.594	6.5
1,3-Butadiene		0.397	0.402			0.380	8.3
Bromomethane		0.767	0.757			0.754	6.8
Chloroethane		0.309	0.306			0.299	7.3
Bromoethene		0.831	0.836			0.810	7.0
Trichlorofluoromethane		2.536	2.514			2.523	6.9
1,1-Dichloroethene		0.680	0.698			0.666	7.9
3-Chloropropene		0.683	0.691			0.675	7.5
Methylene Chloride		0.687	0.687			0.727	15.8
Methyl tert-Butyl Ether		1.852	1.830			1.761	7.7
trans-1,2-Dichloroethene		1.086	1.086			1.053	7.0
n-Hexane		0.959	0.961			0.919	7.9
1,1-Dichloroethane *		1.295	1.296			1.278	6.8*
cis-1,2-Dichloroethene		0.793	0.809			0.767	7.2
Chloroform		1.742	1.745			1.734	7.0
1,1,1-Trichloroethane		0.454	0.470			0.431	9.0
Cyclohexane		0.219	0.228			0.204	9.9
Carbon Tetrachloride		0.528	0.552			0.488	11.2
2,2,4-Trimethylpentane		0.687	0.702			0.651	8.9
Benzene		0.482	0.500			0.475	9.4
1,2-Dichloroethene (total)		0.940	0.948			0.910	7.0
1,2-Dichloroethane		0.256	0.260			0.248	8.2
n-Heptane		0.235	0.236			0.226	7.7
Trichloroethene		0.266	0.273			0.253	9.7
1,2-Dichloropropane		0.166	0.166			0.157	8.5
Bromodichloromethane		0.435	0.447			0.396	11.4
cis-1,3-Dichloropropene		0.296	0.303			0.269	11.2
Toluene		0.382	0.384			0.358	8.6
trans-1,3-Dichloropropene		0.319	0.325			0.288	11.5
1,1,2-Trichloroethane		0.194	0.192			0.181	8.3
Tetrachloroethene		0.455	0.472			0.420	10.1
Dibromochloromethane		0.543	0.554			0.462	16.9
1,2-Dibromoethane		0.404	0.409			0.362	11.1
Ethylbenzene		0.880	0.877			0.808	9.4
Xylene (m,p)		0.350	0.350			0.314	10.7

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =GDI15V RRF20 =GDI20V
RRF40 =GDI40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Xylene (o)		0.340	0.339			0.306	10.7
Bromoform		0.636	0.656			0.516	22.9
1,1,2,2-Tetrachloroethane		0.504	0.499			0.458	10.0
Xylene (total)		0.340	0.339			0.306	10.7
4-Ethyltoluene		1.051	1.076			0.897	17.1
1,3,5-Trimethylbenzene		0.887	0.913			0.750	19.4

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Calibration Time(s): 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=EDS10V RRF0.02=EDS20V
RRF0.05=EDS50V RRF0.1=EDS100V RRF0.2=EDS200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	2.000	1.642	1.684	1.506	1.605		
1,2-Dichlorotetrafluoroethan	1.921	1.698	1.652	1.626	1.652		
Vinyl Chloride		0.606	0.543	0.527	0.550		
1,3-Butadiene		0.462	0.396	0.402	0.372		
Bromomethane		0.664	0.526	0.507	0.521		
Chloroethane		0.341	0.246	0.220	0.216		
Bromoethene		0.552	0.467	0.476	0.485		
Trichlorofluoromethane	2.467	2.153	2.041	2.108	2.107		
1,1-Dichloroethene	0.647	0.635	0.528	0.449	0.457		
3-Chloropropene		0.526	0.620	0.473	0.497		
Methylene Chloride					0.612		
Methyl tert-Butyl Ether	1.005	1.456	1.341	1.281	1.430		
trans-1,2-Dichloroethene	0.966	0.847	0.760	0.770	0.772		
n-Hexane		0.929	0.835	0.733	0.750		
1,1-Dichloroethane *	1.082	0.941	0.819	0.822	0.834		*
1,2-Dichloroethene (total)	0.733	0.685	0.631	0.602	0.605		
cis-1,2-Dichloroethene	0.500	0.523	0.502	0.434	0.439		
Chloroform	1.229	1.288	1.125	1.100	1.149		
1,1,1-Trichloroethane	0.293	0.328	0.298	0.285	0.290		
Cyclohexane	0.184	0.164	0.156	0.141	0.142		
Carbon Tetrachloride	0.410	0.390	0.338	0.322	0.342		
2,2,4-Trimethylpentane	0.507	0.536	0.453	0.408	0.427		
Benzene	0.342	0.349	0.297	0.238	0.260		
1,2-Dichloroethane		0.200	0.177	0.176	0.178		
n-Heptane	0.217	0.188	0.207	0.168	0.174		
Trichloroethene	0.157	0.184	0.149	0.140	0.141		
1,2-Dichloropropane		0.109	0.092	0.090	0.088		
Bromodichloromethane	0.229	0.248	0.235	0.208	0.231		
cis-1,3-Dichloropropene	0.177	0.158	0.155	0.145	0.147		
Toluene	0.199	0.234	0.210	0.185	0.194		
trans-1,3-Dichloropropene	0.193	0.183	0.174	0.149	0.164		
1,1,2-Trichloroethane	0.107	0.104	0.105	0.088	0.097		
Tetrachloroethene	0.224	0.245	0.219	0.212	0.223		
Dibromochloromethane	0.207	0.218	0.218	0.205	0.224		
1,2-Dibromoethane	0.184	0.190	0.190	0.172	0.181		
Ethylbenzene	0.472	0.458	0.472	0.454	0.482		
Xylene (m,p)	0.141	0.172	0.170	0.157	0.175		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Calibration Time(s): 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=EDS10V RRF0.02=EDS20V
RRF0.05=EDS50V RRF0.1=EDS100V RRF0.2=EDS200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Xylene (o)	0.174	0.173	0.176	0.165	0.174		
Xylene (total)	0.174	0.173	0.176	0.165	0.174		
Bromoform	0.189	0.191	0.210	0.200	0.211		
1,1,2,2-Tetrachloroethane	0.244	0.217	0.243	0.232	0.246		
4-Ethyltoluene	0.445	0.497	0.514	0.497	0.552		
1,3,5-Trimethylbenzene		0.416	0.440	0.427	0.481		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Calibration Time(s): 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=EDS500V RRF0.75=EDS750V
RRF1 =EDS1000V RRF1.5=EDS1500V RRF2 =EDS2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	1.822		1.462			1.674	11.1
1,2-Dichlorotetrafluoroethan	1.911		1.759			1.746	7.1
Vinyl Chloride	0.597		0.558			0.564	5.5
1,3-Butadiene	0.408		0.376			0.403	8.1
Bromomethane	0.554		0.507			0.546	11.0
Chloroethane	0.228		0.212			0.244	20.1
Bromoethene	0.545		0.496			0.504	7.2
Trichlorofluoromethane	2.377		2.196			2.207	7.1
1,1-Dichloroethene	0.511		0.450			0.525	16.2
3-Chloropropene	0.506		0.512			0.522	9.8
Methylene Chloride	0.586	0.569	0.558	0.401	0.564	0.548	13.6
Methyl tert-Butyl Ether	1.403		1.485			1.343	12.2
trans-1,2-Dichloroethene	0.860		0.800			0.825	8.9
n-Hexane	0.786		0.738			0.795	9.5
1,1-Dichloroethane *	0.848		0.854			0.886	10.8*
1,2-Dichloroethene (total)	0.661		0.630			0.650	7.3
cis-1,2-Dichloroethene	0.462		0.460			0.474	7.2
Chloroform	1.216		1.172			1.183	5.5
1,1,1-Trichloroethane	0.311		0.292			0.300	5.0
Cyclohexane	0.158		0.140			0.155	10.2
Carbon Tetrachloride	0.382		0.344			0.361	9.0
2,2,4-Trimethylpentane	0.457		0.432			0.460	10.0
Benzene	0.258		0.258			0.286	15.5
1,2-Dichloroethane	0.187		0.180			0.183	5.1
n-Heptane	0.177		0.167			0.185	10.6
Trichloroethene	0.155		0.145			0.153	10.0
1,2-Dichloropropane	0.092		0.092			0.094	8.2
Bromodichloromethane	0.259		0.252			0.237	7.2
cis-1,3-Dichloropropene	0.162		0.160			0.158	6.9
Toluene	0.195		0.202			0.203	7.9
trans-1,3-Dichloropropene	0.172		0.179			0.173	8.0
1,1,2-Trichloroethane	0.098		0.100			0.100	6.5
Tetrachloroethene	0.232		0.222			0.225	4.7
Dibromochloromethane	0.232		0.248			0.222	6.8
1,2-Dibromoethane	0.189		0.196			0.186	4.2
Ethylbenzene	0.464		0.486			0.470	2.5
Xylene (m,p)	0.166		0.182			0.166	8.2

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Calibration Time(s): 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=EDS500V RRF0.75=EDS750V
RRF1 =EDS1000V RRF1.5=EDS1500V RRF2 =EDS2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Xylene (o)	0.162		0.179			0.172	3.6
Xylene (total)	0.162		0.179			0.172	3.6
Bromoform	0.213		0.247			0.209	9.3
1,1,2,2-Tetrachloroethane	0.186		0.252			0.231	10.0
4-Ethyltoluene	0.488		0.576			0.510	8.5
1,3,5-Trimethylbenzene	0.416		0.495			0.446	7.7

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date: 04/09/09 Time: 1155

Lab File ID: EDS20DV Init. Calib. Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Init. Calib. Times: 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	1.674	1.680	0.01	0.4	30.0
1,2-Dichlorotetrafluoroethan	1.746	1.684	0.01	3.6	30.0
Vinyl Chloride	0.564	0.514	0.01	8.9	30.0
1,3-Butadiene	0.403	0.349	0.01	13.4	30.0
Bromomethane	0.546	0.462	0.01	15.4	30.0
Chloroethane	0.244	0.210	0.01	13.9	30.0
Bromoethene	0.504	0.443	0.01	12.1	30.0
Trichlorofluoromethane	2.207	2.057	0.01	6.8	30.0
1,1-Dichloroethene	0.525	0.390	0.01	25.7	30.0
3-Chloropropene	0.522	0.474	0.01	9.2	30.0
Methylene Chloride	0.548	0.600	0.01	9.5	30.0
Methyl tert-Butyl Ether	1.343	1.277	0.01	4.9	30.0
trans-1,2-Dichloroethene	0.825	0.747	0.01	9.4	30.0
n-Hexane	0.795	0.701	0.01	11.8	30.0
1,1-Dichloroethane	0.886	0.820	0.1	7.4	30.0
1,2-Dichloroethene (total)	0.650	0.589	0.01	9.4	30.0
cis-1,2-Dichloroethene	0.474	0.430	0.01	9.3	30.0
Chloroform	1.183	1.148	0.01	3.0	30.0
1,1,1-Trichloroethane	0.300	0.292	0.01	2.7	30.0
Cyclohexane	0.155	0.137	0.01	11.6	30.0
Carbon Tetrachloride	0.361	0.335	0.01	7.2	30.0
2,2,4-Trimethylpentane	0.460	0.421	0.01	8.5	30.0
Benzene	0.286	0.251	0.01	12.2	30.0
1,2-Dichloroethane	0.183	0.178	0.01	2.7	30.0
n-Heptane	0.185	0.166	0.01	10.3	30.0
Trichloroethene	0.153	0.141	0.01	7.8	30.0
1,2-Dichloropropane	0.094	0.093	0.01	1.1	30.0
Bromodichloromethane	0.237	0.226	0.01	4.6	30.0
cis-1,3-Dichloropropene	0.158	0.142	0.01	10.1	30.0
Toluene	0.203	0.184	0.01	9.4	30.0
trans-1,3-Dichloropropene	0.173	0.151	0.01	12.7	30.0
1,1,2-Trichloroethane	0.100	0.089	0.01	11.0	30.0
Tetrachloroethene	0.225	0.216	0.01	4.0	30.0
Dibromochloromethane	0.222	0.202	0.01	9.0	30.0
1,2-Dibromoethane	0.186	0.167	0.01	10.2	30.0
Ethylbenzene	0.470	0.447	0.01	4.9	30.0
Xylene (m,p)	0.166	0.158	0.01	4.8	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: E Calibration Date: 04/09/09 Time: 1155

Lab File ID: EDS20DV Init. Calib. Date(s): 04/03/09 04/04/09

Heated Purge: (Y/N) N Init. Calib. Times: 1634 0058

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D
Xylene (o)	0.172	0.161	0.01	6.4	30.0
Xylene (total)	0.172	0.161	0.01	6.4	30.0
Bromoform	0.209	0.193	0.01	7.6	30.0
1,1,2,2-Tetrachloroethane	0.231	0.216	0.01	6.5	30.0
4-Ethyltoluene	0.510	0.496	0.01	2.7	30.0
1,3,5-Trimethylbenzene	0.446	0.414	0.01	7.2	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date: 04/10/09 Time: 0943

Lab File ID: GDI10HV2 Init. Calib. Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Init. Calib. Times: 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	1.918	2.058	0.01	7.3	30.0
1,2-Dichlorotetrafluoroethan	1.992	2.022	0.01	1.5	30.0
Vinyl Chloride	0.594	0.565	0.01	4.9	30.0
1,3-Butadiene	0.380	0.364	0.01	4.2	30.0
Bromomethane	0.754	0.745	0.01	1.2	30.0
Chloroethane	0.299	0.292	0.01	2.3	30.0
Bromoethene	0.810	0.795	0.01	1.8	30.0
Trichlorofluoromethane	2.523	2.590	0.01	2.6	30.0
1,1-Dichloroethene	0.666	0.651	0.01	2.2	30.0
3-Chloropropene	0.675	0.653	0.01	3.2	30.0
Methylene Chloride	0.727	0.680	0.01	6.5	30.0
Methyl tert-Butyl Ether	1.761	1.686	0.01	4.2	30.0
trans-1,2-Dichloroethene	1.053	1.051	0.01	0.2	30.0
n-Hexane	0.919	0.911	0.01	0.9	30.0
1,1-Dichloroethane	1.278	1.267	0.1	0.9	30.0
cis-1,2-Dichloroethene	0.767	0.769	0.01	0.3	30.0
Chloroform	1.734	1.782	0.01	2.8	30.0
1,1,1-Trichloroethane	0.431	0.440	0.01	2.1	30.0
Cyclohexane	0.204	0.205	0.01	0.5	30.0
Carbon Tetrachloride	0.488	0.520	0.01	6.6	30.0
2,2,4-Trimethylpentane	0.651	0.642	0.01	1.4	30.0
Benzene	0.475	0.459	0.01	3.4	30.0
1,2-Dichloroethene (total)	0.910	0.910	0.01	0.0	30.0
1,2-Dichloroethane	0.248	0.252	0.01	1.6	30.0
n-Heptane	0.226	0.223	0.01	1.3	30.0
Trichloroethene	0.253	0.251	0.01	0.8	30.0
1,2-Dichloropropane	0.157	0.154	0.01	1.9	30.0
Bromodichloromethane	0.396	0.422	0.01	6.6	30.0
cis-1,3-Dichloropropene	0.269	0.269	0.01	0.0	30.0
Toluene	0.358	0.347	0.01	3.1	30.0
trans-1,3-Dichloropropene	0.288	0.285	0.01	1.0	30.0
1,1,2-Trichloroethane	0.181	0.179	0.01	1.1	30.0
Tetrachloroethene	0.420	0.433	0.01	3.1	30.0
Dibromochloromethane	0.462	0.502	0.01	8.6	30.0
1,2-Dibromoethane	0.362	0.370	0.01	2.2	30.0
Ethylbenzene	0.808	0.772	0.01	4.4	30.0
Xylene (m,p)	0.314	0.304	0.01	3.2	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date: 04/10/09 Time: 0943

Lab File ID: GDI10HV2 Init. Calib. Date(s): 03/31/09 03/31/09

Heated Purge: (Y/N) N Init. Calib. Times: 1034 1523

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Xylene (o)	0.306	0.294	0.01	3.9	30.0
Bromoform	0.516	0.572	0.01	10.8	30.0
1,1,2,2-Tetrachloroethane	0.458	0.438	0.01	4.4	30.0
Xylene (total)	0.306	0.294	0.01	3.9	30.0
4-Ethyltoluene	0.897	0.869	0.01	3.1	30.0
1,3,5-Trimethylbenzene	0.750	0.738	0.01	1.6	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID (Standard): EDS20DV Date Analyzed: 04/09/09

Instrument ID: E Time Analyzed: 1155

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	1265264	10.47	6225740	11.88	5921944	15.94
	UPPER LIMIT	1771370	10.80	8716036	12.21	8290722	16.27
	LOWER LIMIT	759158	10.14	3735444	11.55	3553166	15.61
	CLIENT SAMPLE NO.						
01	EA040909LCS	1303394	10.47	6490631	11.88	6168687	15.93
02	MBLK040909EA	1399786	10.47	7410826	11.88	6335988	15.94
03	AA-1	1149920	10.47	5800580	11.87	5300231	15.93
04	AA-2	1154457	10.47	5810939	11.87	5236541	15.93
05	IA-10	1282928	10.47	6525630	11.87	6069481	15.93
06	IA-11	1313532	10.47	6564231	11.87	6237956	15.93
07	IA-12	1225543	10.47	6235840	11.87	5618440	15.93
08	IA-14	1347332	10.47	6847535	11.87	6462251	15.93
09	IA-15	1248216	10.47	6369913	11.87	5905791	15.93
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID (Standard): GDI10HV2 Date Analyzed: 04/10/09

Instrument ID: G Time Analyzed: 0943

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	384750	9.85	1792499	11.23	1744999	15.30
	UPPER LIMIT	538650	10.18	2509499	11.56	2442999	15.63
	LOWER LIMIT	230850	9.52	1075499	10.90	1046999	14.97
	CLIENT SAMPLE NO.						
01	GA041009LCS	399104	9.85	1833110	11.23	1793429	15.30
02	MBLK041009GA	340214	9.85	1826784	11.23	1582564	15.30
03	IA-13	362292	9.85	1713975	11.23	1694015	15.30
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

TestAmerica

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Sample Data Summary – TO-15 Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789544

Sample wt/vol: 40.00 (g/mL) ML Lab File ID: 789544D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	2.5	U
76-14-2	1,2-Dichlorotetrafluoroethan	1.0	U
75-01-4	Vinyl Chloride	1.0	U
106-99-0	1,3-Butadiene	2.5	U
74-83-9	Bromomethane	1.0	U
75-00-3	Chloroethane	2.5	U
593-60-2	Bromoethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
107-05-1	3-Chloropropene	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl tert-Butyl Ether	2.5	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
110-54-3	n-Hexane	2.5	U
75-34-3	1,1-Dichloroethane	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
67-66-3	Chloroform	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
110-82-7	Cyclohexane	3.4	
56-23-5	Carbon Tetrachloride	1.0	U
540-84-1	2,2,4-Trimethylpentane	1.0	U
71-43-2	Benzene	1.0	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
142-82-5	n-Heptane	1.0	U
79-01-6	Trichloroethene	140	
78-87-5	1,2-Dichloropropane	1.0	U
75-27-4	Bromodichloromethane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
108-88-3	Toluene	2.7	
10061-02-6	trans-1,3-Dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789544

Sample wt/vol: 40.00 (g/mL) ML Lab File ID: 789544D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	1.0	U
106-93-4	1,2-Dibromoethane	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylene (m,p)	2.5	U
95-47-6	Xylene (o)	1.0	U
75-25-2	Bromoform	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
1330-20-7	Xylene (total)	1.0	U
622-96-8	4-Ethyltoluene	1.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789545

Sample wt/vol: 18.00 (g/mL) ML Lab File ID: 789545D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 734.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	370	U
76-14-2	1,2-Dichlorotetrafluoroethan	150	U
75-01-4	Vinyl Chloride	150	U
106-99-0	1,3-Butadiene	370	U
74-83-9	Bromomethane	150	U
75-00-3	Chloroethane	370	U
593-60-2	Bromoethene	150	U
75-69-4	Trichlorofluoromethane	150	U
75-35-4	1,1-Dichloroethene	150	U
107-05-1	3-Chloropropene	370	U
75-09-2	Methylene Chloride	370	U
1634-04-4	Methyl tert-Butyl Ether	370	U
156-60-5	trans-1,2-Dichloroethene	150	U
110-54-3	n-Hexane	370	U
75-34-3	1,1-Dichloroethane	150	U
156-59-2	cis-1,2-Dichloroethene	4500	
67-66-3	Chloroform	150	U
71-55-6	1,1,1-Trichloroethane	150	U
110-82-7	Cyclohexane	150	U
56-23-5	Carbon Tetrachloride	150	U
540-84-1	2,2,4-Trimethylpentane	150	U
71-43-2	Benzene	150	U
540-59-0	1,2-Dichloroethene (total)	4500	
107-06-2	1,2-Dichloroethane	150	U
142-82-5	n-Heptane	150	U
79-01-6	Trichloroethene	25000	
78-87-5	1,2-Dichloropropane	150	U
75-27-4	Bromodichloromethane	150	U
10061-01-5	cis-1,3-Dichloropropene	150	U
108-88-3	Toluene	260	
10061-02-6	trans-1,3-Dichloropropene	150	U
79-00-5	1,1,2-Trichloroethane	150	U
127-18-4	Tetrachloroethene	150	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789545

Sample wt/vol: 18.00 (g/mL) ML Lab File ID: 789545D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 734.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	150	U
106-93-4	1,2-Dibromoethane	150	U
100-41-4	Ethylbenzene	150	U
1330-20-7	Xylene (m,p)	370	U
95-47-6	Xylene (o)	150	U
75-25-2	Bromoform	150	U
79-34-5	1,1,2,2-Tetrachloroethane	150	U
1330-20-7	Xylene (total)	150	U
622-96-8	4-Ethyltoluene	150	U
108-67-8	1,3,5-Trimethylbenzene	150	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789547

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789547

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.29	
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.80	
110-82-7	Cyclohexane	0.20	U
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.22	
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.21	
79-01-6	Trichloroethene	11	
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	9.4	
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.36	

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789547

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789547

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.46	
1330-20-7	Xylene (m,p)	1.4	
95-47-6	Xylene (o)	0.44	
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	1.9	
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.21	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-14

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789549

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789549

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.51	
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.31	
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	2.5	
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	5.0	
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.97	

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-14

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789549

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789549

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.58	
1330-20-7	Xylene (m,p)	1.4	
95-47-6	Xylene (o)	0.37	
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	1.8	
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-15

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789552

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789552

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.25	
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	17	
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	0.89	
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-15

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789552

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 789552

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.52	
1330-20-7	Xylene (m,p)	0.86	
95-47-6	Xylene (o)	0.32	
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	1.2	
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-16

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789553

Sample wt/vol: 20.00 (g/mL) ML Lab File ID: 789553D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 657.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	330	U
76-14-2	1,2-Dichlorotetrafluoroethan	130	U
75-01-4	Vinyl Chloride	130	U
106-99-0	1,3-Butadiene	330	U
74-83-9	Bromomethane	130	U
75-00-3	Chloroethane	330	U
593-60-2	Bromoethene	130	U
75-69-4	Trichlorofluoromethane	130	U
75-35-4	1,1-Dichloroethene	130	U
107-05-1	3-Chloropropene	330	U
75-09-2	Methylene Chloride	330	U
1634-04-4	Methyl tert-Butyl Ether	330	U
156-60-5	trans-1,2-Dichloroethene	130	U
110-54-3	n-Hexane	330	U
75-34-3	1,1-Dichloroethane	130	U
156-59-2	cis-1,2-Dichloroethene	4000	
67-66-3	Chloroform	130	U
71-55-6	1,1,1-Trichloroethane	130	U
110-82-7	Cyclohexane	130	U
56-23-5	Carbon Tetrachloride	130	U
540-84-1	2,2,4-Trimethylpentane	130	U
71-43-2	Benzene	130	U
540-59-0	1,2-Dichloroethene (total)	4000	
107-06-2	1,2-Dichloroethane	130	U
142-82-5	n-Heptane	130	U
79-01-6	Trichloroethene	21000	
78-87-5	1,2-Dichloropropane	130	U
75-27-4	Bromodichloromethane	130	U
10061-01-5	cis-1,3-Dichloropropene	130	U
108-88-3	Toluene	250	
10061-02-6	trans-1,3-Dichloropropene	130	U
79-00-5	1,1,2-Trichloroethane	130	U
127-18-4	Tetrachloroethene	130	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-16

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: 789553

Sample wt/vol: 20.00 (g/mL) ML Lab File ID: 789553D

Level: (low/med) LOW Date Received: 03/20/09

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 657.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	130	U
106-93-4	1,2-Dibromoethane	130	U
100-41-4	Ethylbenzene	130	U
1330-20-7	Xylene (m,p)	330	U
95-47-6	Xylene (o)	130	U
75-25-2	Bromoform	130	U
79-34-5	1,1,2,2-Tetrachloroethane	130	U
1330-20-7	Xylene (total)	130	U
622-96-8	4-Ethyltoluene	130	U
108-67-8	1,3,5-Trimethylbenzene	130	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK032609GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK032609GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDHB01AG

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene Chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	0.20	U
56-23-5	Carbon Tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
540-59-0	1,2-Dichloroethene (total)	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK032609GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: MBLK032609GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDHB01AG

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.20	U
1330-20-7	Xylene (m,p)	0.50	U
95-47-6	Xylene (o)	0.20	U
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
1330-20-7	Xylene (total)	0.20	U
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA032609LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA032609LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDH1AGQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	10	
76-14-2	1,2-Dichlorotetrafluoroethan	9.9	
75-01-4	Vinyl Chloride	9.0	
106-99-0	1,3-Butadiene	9.3	
74-83-9	Bromomethane	10	
75-00-3	Chloroethane	9.5	
593-60-2	Bromoethene	11	
75-69-4	Trichlorofluoromethane	11	
75-35-4	1,1-Dichloroethene	11	
107-05-1	3-Chloropropene	9.2	
75-09-2	Methylene Chloride	9.5	
1634-04-4	Methyl tert-Butyl Ether	11	
156-60-5	trans-1,2-Dichloroethene	10	
110-54-3	n-Hexane	9.5	
75-34-3	1,1-Dichloroethane	9.9	
156-59-2	cis-1,2-Dichloroethene	11	
67-66-3	Chloroform	10	
71-55-6	1,1,1-Trichloroethane	10	
110-82-7	Cyclohexane	10	
56-23-5	Carbon Tetrachloride	11	
540-84-1	2,2,4-Trimethylpentane	9.7	
71-43-2	Benzene	10	
540-59-0	1,2-Dichloroethene (total)	21	
107-06-2	1,2-Dichloroethane	10	
142-82-5	n-Heptane	9.2	
79-01-6	Trichloroethene	10	
78-87-5	1,2-Dichloropropane	9.9	
75-27-4	Bromodichloromethane	11	
10061-01-5	cis-1,3-Dichloropropene	10	
108-88-3	Toluene	10	
10061-02-6	trans-1,3-Dichloropropene	10	
79-00-5	1,1,2-Trichloroethane	9.9	
127-18-4	Tetrachloroethene	11	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA032609LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA032609LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDH1AGQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	12	
106-93-4	1,2-Dibromoethane	11	
100-41-4	Ethylbenzene	11	
1330-20-7	Xylene (m,p)	21	
95-47-6	Xylene (o)	11	
75-25-2	Bromoform	12	
79-34-5	1,1,2,2-Tetrachloroethane	10	
1330-20-7	Xylene (total)	33	
622-96-8	4-Ethyltoluene	12	
108-67-8	1,3,5-Trimethylbenzene	12	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA032609LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA032609LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDH1AGQD

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	10	
76-14-2	1,2-Dichlorotetrafluoroethan	9.5	
75-01-4	Vinyl Chloride	8.6	
106-99-0	1,3-Butadiene	8.8	
74-83-9	Bromomethane	9.8	
75-00-3	Chloroethane	9.1	
593-60-2	Bromoethene	11	
75-69-4	Trichlorofluoromethane	10	
75-35-4	1,1-Dichloroethene	11	
107-05-1	3-Chloropropene	8.8	
75-09-2	Methylene Chloride	9.0	
1634-04-4	Methyl tert-Butyl Ether	10	
156-60-5	trans-1,2-Dichloroethene	9.6	
110-54-3	n-Hexane	9.2	
75-34-3	1,1-Dichloroethane	9.5	
156-59-2	cis-1,2-Dichloroethene	10	
67-66-3	Chloroform	9.9	
71-55-6	1,1,1-Trichloroethane	10	
110-82-7	Cyclohexane	9.7	
56-23-5	Carbon Tetrachloride	10	
540-84-1	2,2,4-Trimethylpentane	9.2	
71-43-2	Benzene	9.3	
540-59-0	1,2-Dichloroethene (total)	20	
107-06-2	1,2-Dichloroethane	9.6	
142-82-5	n-Heptane	8.6	
79-01-6	Trichloroethene	9.7	
78-87-5	1,2-Dichloropropane	9.1	
75-27-4	Bromodichloromethane	10	
10061-01-5	cis-1,3-Dichloropropene	9.5	
108-88-3	Toluene	9.8	
10061-02-6	trans-1,3-Dichloropropene	9.6	
79-00-5	1,1,2-Trichloroethane	9.5	
127-18-4	Tetrachloroethene	10	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA032609LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix: (soil/water) AIR Lab Sample ID: GA032609LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GDH1AGQD

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 03/26/09

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	11	
106-93-4	1,2-Dibromoethane	10	
100-41-4	Ethylbenzene	10	
1330-20-7	Xylene (m,p)	20	
95-47-6	Xylene (o)	10	
75-25-2	Bromoform	12	
79-34-5	1,1,2,2-Tetrachloroethane	9.9	
1330-20-7	Xylene (total)	31	
622-96-8	4-Ethyltoluene	11	
108-67-8	1,3,5-Trimethylbenzene	11	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA032609LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	10		10	100	70-130
1,2-Dichlorotetrafluoro	10		9.9	99	70-130
Vinyl Chloride	10		9.0	90	70-130
1,3-Butadiene	10		9.3	93	70-130
Bromomethane	10		10	100	70-130
Chloroethane	10		9.5	95	70-130
Bromoethene	10		11	110	70-130
Trichlorofluoromethane	10		11	110	70-130
1,1-Dichloroethene	10		11	110	70-130
3-Chloropropene	10		9.2	92	70-130
Methylene Chloride	10		9.5	95	70-130
Methyl tert-Butyl Ether	10		11	110	70-130
trans-1,2-Dichloroethen	10		10	100	70-130
n-Hexane	10		9.5	95	70-130
1,1-Dichloroethane	10		9.9	99	70-130
cis-1,2-Dichloroethene	10		11	110	70-130
Chloroform	10		10	100	70-130
1,1,1-Trichloroethane	10		10	100	70-130
Cyclohexane	10		10	100	70-130
Carbon Tetrachloride	10		11	110	70-130
2,2,4-Trimethylpentane	10		9.7	97	70-130
Benzene	10		10	100	70-130
1,2-Dichloroethene (tot	20		21	105	70-130
1,2-Dichloroethane	10		10	100	70-130
n-Heptane	10		9.2	92	70-130
Trichloroethene	10		10	100	70-130
1,2-Dichloropropane	10		9.9	99	70-130
Bromodichloromethane	10		11	110	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA032609LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	10		10	100	70-130
Toluene	10		10	100	70-130
trans-1,3-Dichloroprope	10		10	100	70-130
1,1,2-Trichloroethane	10		9.9	99	70-130
Tetrachloroethene	10		11	110	70-130
Dibromochloromethane	10		12	120	70-130
1,2-Dibromoethane	10		11	110	70-130
Ethylbenzene	10		11	110	70-130
Xylene (m,p)	20		21	105	70-130
Xylene (o)	10		11	110	70-130
Bromoform	10		12	120	70-130
1,1,2,2-Tetrachloroetha	10		10	100	70-130
Xylene (total)	30		33	110	70-130
4-Ethyltoluene	10		12	120	70-130
1,3,5-Trimethylbenzene	10		12	120	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA032609LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	10	10	100	0	25	70-130
1,2-Dichlorotetrafluoro	10	9.5	95	4	25	70-130
Vinyl Chloride	10	8.6	86	4	25	70-130
1,3-Butadiene	10	8.8	88	6	25	70-130
Bromomethane	10	9.8	98	2	25	70-130
Chloroethane	10	9.1	91	4	25	70-130
Bromoethene	10	11	110	0	25	70-130
Trichlorofluoromethane	10	10	100	10	25	70-130
1,1-Dichloroethene	10	11	110	0	25	70-130
3-Chloropropene	10	8.8	88	4	25	70-130
Methylene Chloride	10	9.0	90	5	25	70-130
Methyl tert-Butyl Ether	10	10	100	10	25	70-130
trans-1,2-Dichloroethen	10	9.6	96	4	25	70-130
n-Hexane	10	9.2	92	3	25	70-130
1,1-Dichloroethane	10	9.5	95	4	25	70-130
cis-1,2-Dichloroethene	10	10	100	10	25	70-130
Chloroform	10	9.9	99	1	25	70-130
1,1,1-Trichloroethane	10	10	100	0	25	70-130
Cyclohexane	10	9.7	97	3	25	70-130
Carbon Tetrachloride	10	10	100	10	25	70-130
2,2,4-Trimethylpentane	10	9.2	92	5	25	70-130
Benzene	10	9.3	93	7	25	70-130
1,2-Dichloroethene (tot	20	20	100	5	25	70-130
1,2-Dichloroethane	10	9.6	96	4	25	70-130
n-Heptane	10	8.6	86	7	25	70-130
Trichloroethene	10	9.7	97	3	25	70-130
1,2-Dichloropropane	10	9.1	91	8	25	70-130
Bromodichloromethane	10	10	100	10	25	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Matrix Spike - Sample No.: GA032609LCS

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
cis-1,3-Dichloropropene	10	9.5	95	5	25	70-130
Toluene	10	9.8	98	2	25	70-130
trans-1,3-Dichloroprope	10	9.6	96	4	25	70-130
1,1,2-Trichloroethane	10	9.5	95	4	25	70-130
Tetrachloroethene	10	10	100	10	25	70-130
Dibromochloromethane	10	11	110	9	25	70-130
1,2-Dibromoethane	10	10	100	10	25	70-130
Ethylbenzene	10	10	100	10	25	70-130
Xylene (m,p)	20	20	100	5	25	70-130
Xylene (o)	10	10	100	10	25	70-130
Bromoform	10	12	120	0	25	70-130
1,1,2,2-Tetrachloroetha	10	9.9	99	1	25	70-130
Xylene (total)	30	31	103	6	25	70-130
4-Ethyltoluene	10	11	110	9	25	70-130
1,3,5-Trimethylbenzene	10	11	110	9	25	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 43 outside limits
Spike Recovery: 0 out of 86 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK032609GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDHB01AG Lab Sample ID: MBLK032609GA

Date Analyzed: 03/26/09 Time Analyzed: 1349

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	GA032609LCS	GA032609LCS	GDH1AGQ	1212
02	GA032609LCSD	GA032609LCSD	GDH1AGQD	1301
03	SS-11	789544	789544D	1525
04	SS-12	789545	789545D	1614
05	SS-13	789547	789547	1702
06	SS-14	789549	789549	1750
07	SS-15	789552	789552	1839
08	SS-16	789553	789553D	1927
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COMMENTS:

FORM IV VOA

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDH01PV BFB Injection Date: 02/16/09

Instrument ID: G BFB Injection Time: 1709

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	16.2
75	30.0 - 66.0% of mass 95	46.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.5 (0.5)1
174	50.0 - 120.0% of mass 95	101.6
175	4.0 - 9.0% of mass 174	7.0 (6.9)1
176	93.0 - 101.0% of mass 174	99.2 (97.6)1
177	5.0 - 9.0% of mass 176	6.4 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0.2	ASTD0.2	GDH002V	02/16/09	1901
02	ASTD0.5	ASTD0.5	GDH005V	02/16/09	1949
03	ASTD005	ASTD005	GDH05V	02/16/09	2037
04	ASTD010	ASTD010	GDH10V	02/16/09	2125
05	ASTD015	ASTD015	GDH15V	02/16/09	2213
06	ASTD040	ASTD040	GDH40V	02/16/09	2350
07	ASTD020	ASTD020	GDH20V2	02/17/09	0038
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09					
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID: GDH34PV BFB Injection Date: 03/26/09

Instrument ID: G BFB Injection Time: 0944

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	15.2
75	30.0 - 66.0% of mass 95	45.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.6 (0.5)1
174	50.0 - 120.0% of mass 95	109.0
175	4.0 - 9.0% of mass 174	7.5 (6.9)1
176	93.0 - 101.0% of mass 174	106.5 (97.7)1
177	5.0 - 9.0% of mass 176	6.9 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	GDH1AGV2	03/26/09	1124
02	GA032609LCS	GA032609LCS	GDH1AGQ	03/26/09	1212
03	GA032609LCSD	GA032609LCSD	GDH1AGQD	03/26/09	1301
04	MBLK032609GA	MBLK032609GA	GDHB01AG	03/26/09	1349
05	SS-11	789544	789544D	03/26/09	1525
06	SS-12	789545	789545D	03/26/09	1614
07	SS-13	789547	789547	03/26/09	1702
08	SS-14	789549	789549	03/26/09	1750
09	SS-15	789552	789552	03/26/09	1839
10	SS-16	789553	789553D	03/26/09	1927
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FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Calibration Time(s): 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GDH002V RRF0.5=GDH005V
RRF2 = RRF5 =GDH05V RRF10 =GDH10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD	
Dichlorodifluoromethane		1.816		1.706	1.865			
1,2-Dichlorotetrafluoroethan	1.854	1.919		1.809	1.992			
Vinyl Chloride	0.626	0.639		0.597	0.656			
1,3-Butadiene		0.390		0.384	0.435			
Bromomethane	0.788	0.804		0.733	0.813			
Chloroethane		0.356		0.316	0.358			
Bromoethene	0.767	0.802		0.762	0.842			
Trichlorofluoromethane	2.369	2.511		2.339	2.548			
1,1-Dichloroethene	0.705	0.676		0.621	0.690			
3-Chloropropene		0.826		0.714	0.781			
Methylene Chloride		1.090		0.748	0.796			
Methyl tert-Butyl Ether		1.610		1.596	1.678			
trans-1,2-Dichloroethene	1.022	1.130		1.062	1.164			
n-Hexane		1.043		0.952	1.059			
1,1-Dichloroethane	* 1.348	1.395		1.288	1.405			*
cis-1,2-Dichloroethene	0.786	0.788		0.732	0.808			
Chloroform	1.743	1.769		1.663	1.770			
1,1,1-Trichloroethane	0.396	0.488		0.408	0.458			
Cyclohexane	0.193	0.236		0.203	0.227			
Carbon Tetrachloride	0.432	0.536		0.467	0.524			
2,2,4-Trimethylpentane	0.696	0.810		0.677	0.750			
Benzene	0.491	0.556		0.446	0.489			
1,2-Dichloroethene (total)	0.904	0.959		0.897	0.986			
1,2-Dichloroethane	0.234	0.280		0.235	0.255			
n-Heptane	0.270	0.313		0.246	0.269			
Trichloroethene	0.236	0.290		0.239	0.266			
1,2-Dichloropropane	0.170	0.190		0.160	0.176			
Bromodichloromethane	0.354	0.443		0.391	0.439			
cis-1,3-Dichloropropene	0.263	0.296		0.262	0.295			
Toluene	0.350	0.371		0.333	0.356			
trans-1,3-Dichloropropene	0.275	0.304		0.276	0.305			
1,1,2-Trichloroethane	0.182	0.205		0.179	0.189			
Tetrachloroethene	0.380	0.432		0.370	0.404			
Dibromochloromethane	0.388	0.459		0.457	0.508			
1,2-Dibromoethane	0.335	0.377		0.353	0.383			
Ethylbenzene	0.781	0.814		0.740	0.778			
Xylene (m,p)	0.281	0.298		0.286	0.300			

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Calibration Time(s): 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GDH002V RRF0.5=GDH005V
RRF2 = RRF5 =GDH05V RRF10 =GDH10V

COMPOUND	RRF0.2	RRF0.5	RRF2	RRF5	RRF10	$\overline{RRF}$	% RSD
Xylene (o)	0.274	0.288		0.280	0.292		
Bromoform	0.379	0.454		0.496	0.550		
1,1,2,2-Tetrachloroethane	0.442	0.471		0.449	0.468		
Xylene (total)	0.274	0.288		0.280	0.292		
4-Ethyltoluene	0.724	0.756		0.814	0.850		
1,3,5-Trimethylbenzene	0.546	0.631		0.679	0.714		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Calibration Time(s): 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =GDH15V RRF20 =GDH20V2
RRF40 =GDH40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Dichlorodifluoromethane		1.721	1.706			1.763	4.2
1,2-Dichlorotetrafluoroethan		1.865	1.830			1.878	3.6
Vinyl Chloride		0.626	0.624			0.628	3.1
1,3-Butadiene		0.414	0.409			0.406	5.0
Bromomethane		0.790	0.798			0.788	3.6
Chloroethane		0.342	0.346			0.344	4.9
Bromoethene		0.843	0.843			0.810	4.7
Trichlorofluoromethane		2.377	2.434			2.430	3.5
1,1-Dichloroethene		0.720	0.704			0.686	5.1
3-Chloropropene		0.778	0.768			0.773	5.2
Methylene Chloride		0.772	0.756			0.832	17.4
Methyl tert-Butyl Ether		1.885	1.876			1.729	8.2
trans-1,2-Dichloroethene		1.147	1.134			1.110	5.0
n-Hexane		1.046	1.029			1.026	4.1
1,1-Dichloroethane *		1.403	1.381			1.370	3.3*
cis-1,2-Dichloroethene		0.832	0.826			0.795	4.6
Chloroform		1.788	1.784			1.753	2.7
1,1,1-Trichloroethane		0.438	0.462			0.442	7.8
Cyclohexane		0.224	0.233			0.219	8.0
Carbon Tetrachloride		0.505	0.534			0.500	8.4
2,2,4-Trimethylpentane		0.739	0.765			0.740	6.5
Benzene		0.498	0.522			0.500	7.4
1,2-Dichloroethene (total)		0.990	0.980			0.953	4.4
1,2-Dichloroethane		0.248	0.260			0.252	6.8
n-Heptane		0.258	0.261			0.270	8.5
Trichloroethene		0.262	0.275			0.261	8.0
1,2-Dichloropropane		0.183	0.188			0.178	6.5
Bromodichloromethane		0.436	0.456			0.420	9.2
cis-1,3-Dichloropropene		0.311	0.322			0.292	8.5
Toluene		0.390	0.376			0.363	5.7
trans-1,3-Dichloropropene		0.327	0.342			0.305	8.8
1,1,2-Trichloroethane		0.206	0.199			0.193	6.0
Tetrachloroethene		0.434	0.434			0.409	7.1
Dibromochloromethane		0.542	0.537			0.482	12.2
1,2-Dibromoethane		0.414	0.409			0.378	8.1
Ethylbenzene		0.874	0.828			0.802	5.8
Xylene (m,p)		0.347	0.333			0.308	8.6

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Calibration Time(s): 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF15 =GDH15V RRF20 =GDH20V2
RRF40 =GDH40V

COMPOUND	RRF15	RRF20	RRF40			$\overline{RRF}$	% RSD
Xylene (o)		0.339	0.324			0.300	8.6
Bromoform		0.620	0.622			0.520	18.5
1,1,2,2-Tetrachloroethane		0.524	0.503			0.476	6.6
Xylene (total)		0.339	0.324			0.300	8.6
4-Ethyltoluene		1.011	1.002			0.860	14.2
1,3,5-Trimethylbenzene		0.848	0.846			0.711	16.8

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date: 03/26/09 Time: 1124

Lab File ID: GDH1AGV2 Init. Calib. Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Init. Calib. Times: 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	RRF	RRF10	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	1.763	1.792	0.01	1.6	30.0
1,2-Dichlorotetrafluoroethan	1.878	1.800	0.01	4.2	30.0
Vinyl Chloride	0.628	0.555	0.01	11.6	30.0
1,3-Butadiene	0.406	0.356	0.01	12.3	30.0
Bromomethane	0.788	0.804	0.01	2.0	30.0
Chloroethane	0.344	0.325	0.01	5.5	30.0
Bromoethene	0.810	0.863	0.01	6.5	30.0
Trichlorofluoromethane	2.430	2.601	0.01	7.0	30.0
1,1-Dichloroethene	0.686	0.685	0.01	0.1	30.0
3-Chloropropene	0.773	0.689	0.01	10.9	30.0
Methylene Chloride	0.832	0.725	0.01	12.9	30.0
Methyl tert-Butyl Ether	1.729	1.805	0.01	4.4	30.0
trans-1,2-Dichloroethene	1.110	1.076	0.01	3.1	30.0
n-Hexane	1.026	0.964	0.01	6.0	30.0
1,1-Dichloroethane	1.370	1.320	0.1	3.6	30.0
cis-1,2-Dichloroethene	0.795	0.808	0.01	1.6	30.0
Chloroform	1.753	1.754	0.01	0.0	30.0
1,1,1-Trichloroethane	0.442	0.446	0.01	0.9	30.0
Cyclohexane	0.219	0.212	0.01	3.2	30.0
Carbon Tetrachloride	0.500	0.518	0.01	3.6	30.0
2,2,4-Trimethylpentane	0.740	0.679	0.01	8.2	30.0
Benzene	0.500	0.467	0.01	6.6	30.0
1,2-Dichloroethene (total)	0.953	0.942	0.01	1.2	30.0
1,2-Dichloroethane	0.252	0.243	0.01	3.6	30.0
n-Heptane	0.270	0.237	0.01	12.2	30.0
Trichloroethene	0.261	0.257	0.01	1.5	30.0
1,2-Dichloropropane	0.178	0.169	0.01	5.0	30.0
Bromodichloromethane	0.420	0.422	0.01	0.5	30.0
cis-1,3-Dichloropropene	0.292	0.288	0.01	1.4	30.0
Toluene	0.363	0.366	0.01	0.8	30.0
trans-1,3-Dichloropropene	0.305	0.305	0.01	0.0	30.0
1,1,2-Trichloroethane	0.193	0.196	0.01	1.6	30.0
Tetrachloroethene	0.409	0.434	0.01	6.1	30.0
Dibromochloromethane	0.482	0.534	0.01	10.8	30.0
1,2-Dibromoethane	0.378	0.402	0.01	6.3	30.0
Ethylbenzene	0.802	0.831	0.01	3.6	30.0
Xylene (m,p)	0.308	0.330	0.01	7.1	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Instrument ID: G Calibration Date: 03/26/09 Time: 1124

Lab File ID: GDH1AGV2 Init. Calib. Date(s): 02/16/09 02/17/09

Heated Purge: (Y/N) N Init. Calib. Times: 1901 0038

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Xylene (o)	0.300	0.325	0.01	8.3	30.0
Bromoform	0.520	0.617	0.01	18.6	30.0
1,1,2,2-Tetrachloroethane	0.476	0.511	0.01	7.4	30.0
Xylene (total)	0.300	0.325	0.01	8.3	30.0
4-Ethyltoluene	0.860	0.979	0.01	13.8	30.0
1,3,5-Trimethylbenzene	0.711	0.819	0.01	15.2	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY130780

Lab File ID (Standard): GDH1AGV2 Date Analyzed: 03/26/09

Instrument ID: G Time Analyzed: 1124

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	353745	9.86	1599647	11.24	1536747	15.31
	UPPER LIMIT	495243	10.19	2239506	11.57	2151446	15.64
	LOWER LIMIT	212247	9.53	959788	10.91	922048	14.98
	CLIENT SAMPLE NO.						
01	GA032609LCS	355195	9.86	1591130	11.24	1546493	15.31
02	GA032609LCSD	358371	9.86	1606468	11.24	1532049	15.31
03	MBLK032609GA	348017	9.86	1542056	11.24	1353801	15.31
04	SS-11	324013	9.85	1505081	11.24	1444436	15.31
05	SS-12	303969	9.85	1463644	11.24	1323547	15.31
06	SS-13	312692	9.86	1426239	11.24	1387094	15.31
07	SS-14	314672	9.86	1272803	11.23	1265609	15.31
08	SS-15	327443	9.85	1488509	11.23	1405880	15.31
09	SS-16	299805	9.85	1451364	11.23	1289542	15.31
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

AKRF

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April 1, 2010

Sally Dewes
NYSDEC – Remedial Bureau C
625 Broadway
Albany, New York 12233-7016

Re: Soil Vapor Investigation Report
Magna Metals Site
NYSDEC Site No. 360003
Cortlandt, New York

Dear Ms. Dewes:

On behalf of ISC Properties, enclosed are two hard copies and a CD containing one electronic copy of the Soil Vapor Investigation Report for the Magna Metals site. If you have any question or require additional information, please contact me at 914-922-9356.

Sincerely,

AKRF , Inc.

Marc S. Godick, LEP
Senior Vice President

cc: N. Walz – NYSDOH
E. Wactlar – Moomjian, Waite, Wactlar & Coleman
N. Ward-Willis – Keane & Beane
M. Sielski – TTECI
D. Duthaler – Baker Properties
B. Zieroff – AKRF

Magna Metals Site

NYSDEC Site No. 360003

CORTLANDT, NEW YORK

Soil Vapor Investigation Report

AKRF Project Number: 40256

Prepared by:

AKRF, Inc.
34 South Broadway, Suite 314
White Plains, NY 10601

APRIL 2010

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1.0 INTRODUCTION

Investigation at the Magna Metals Site, located in Cortlandt, New York, has been conducted to comply with a New York State Department of Environmental Conservation's (NYSDEC) Consent Order (Site No. 360003). In November 2006, the NYSDEC issued correspondence requesting sampling of the office/warehouse building located east of the former Magna Metals building to confirm that soil vapor intrusion is not occurring. In June 2007, AKRF, Inc. (AKRF) submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In September 2007, the NYSDEC issued correspondence requesting that additional work be performed. In May 2008, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In February 2009, the NYSDEC issued correspondence requesting a third sampling event be performed in accordance with the December 2007 Soil Vapor Investigation Work Plan. In June 2009, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed in March 2009 to satisfy the NYSDEC requirements. On July 3, 2009, the NYSDEC issued correspondence requesting that a Soil Vapor Monitoring Work Plan for the Polymedco office facility be submitted to the NYSDEC and the New York Department of Health (NYSDOH) for review and approval. This report documents the collection and analysis of sub-slab soil vapor and ambient air samples collected during the January 2010 to satisfy the NYSDEC requirements.

2.0 SITE DESCRIPTION

2.1 Site Location

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. A site location map is included in Figure 1. Nearby towns include Peekskill and Croton-on-Hudson, and the Hudson River is located 3 miles west of the site.

2.2 Site and Vicinity Characteristics

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. The office/warehouse building was reported by the owner to include some manufacturing activities. Baker Properties acquired the property from ISC Properties, Inc. (ISCP) in 1982, and has leased it to various tenants. The identity of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south, and east of the project site are residential areas. A wetland area is located between the site and the residential area southwest of the site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Topography is variable throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from 360 feet MSL along the eastern site boundary to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area.

Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed by Tetra Tech FW, Inc. (TTI) on the former site property. This basin is located in the central western portion of the site and collects discharge water from a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was not located. The stormwater collection system on Furnace Dock Road discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The geologic characteristics of the subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock. The bedrock is mapped by the New York State Museum and Science Service as Hornblende Norite, which is a part of the Cortlandt Mafic Complex. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is in the western direction towards the stream and wetland area.

Results of the slug tests completed by TTI indicate a range in hydraulic conductivity values from 5.3×10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2×10^{-3} cm/sec (6.2 ft/day) at MW-3 in the lower portion of the leach pit area. Previous groundwater sampling by TTI indicated that some monitoring wells were observed to be dry during seasonal low groundwater conditions.

2.4 Review of Site History

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed. The site building is currently utilized as commercial rental space and includes three tenants: Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. Polymedo, Inc. is a marketer and distributer of medical testing instruments and business activities include corporate management, laboratory testing of equipment, and warehouse storage. Motion Labs, Inc. is a development and manufacturing company specializing in electrical power distribution and motor/hoist control systems for rigging, lighting, staging and sound. International Purchasing Systems operates as a wholesale distributer of retail merchandise.

2.5 Previous Studies

Between 1978 and 1984, site investigations were completed by the New York State Department of Health (NYSDOH), the NYSDEC, and William Cosulich of William Cosulich Associates to determine if property uses had resulted in contamination. The investigations concluded that soil, groundwater, sediment, and, surface water contamination existed at the site. Between 1998 and 2009, several phases of investigation were completed by Foster Wheeler Environmental Corporation (predecessor to TTI), TTI, and AKRF to delineate the nature and extent of contamination, review the potential remedial options that could be performed, and to complete a vapor intrusion assessment at the site. Copies of reports containing the results for each phase of investigation are available for review at NYSDEC.

3.0 FIELD PROGRAM

The objectives of the field-sampling program were to confirm that soil vapor intrusion is not occurring in office/warehouse building located east of the former Magna Metals building. The field procedures and sampling activities were completed in accordance with NYSDOH's Guidance for Evaluating Soil Vapor

Instruction in the State of New York, October 2006. The field program is outlined in Section 3.1, and the subsequent sections give the summary of sampling implementation. The field program was conducted in accordance with the detailed methodologies described in the NYSDEC approved Soil Vapor Sampling Plan (SVSP), which was approved by the NYSDEC on August 21, 2009.

3.1 Field Program Summary

Site access for the property and study building was agreed upon between ISCP and the property owner/manager through an access agreement. Sub-slab soil-gas samples were collected at two locations and indoor air samples were collected at three locations from the lowest level of the Polymedco, Inc office building area. Figure 2 shows the project site building and the locations for soil gas sampling.

3.2 Pre-Sampling Survey

A pre-sampling survey was previously conducted on March 16, 2007, prior to initiating the March 2007 soil vapor sampling program. The survey was completed to document any factors that may affect indoor air quality and included interviews with building owners and/or building occupants, documentation of the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, building operations, product inventory, and any other known factors that may affect indoor air quality. Copies of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory forms and a summary of the inspection results were included in the June 2007 Soil Vapor Investigation Report. On February 21, 2008, a pre-sampling inspection walkthrough was complete prior to the March 2008 sampling event to document any material changes associated with facility operations, chemical storage, and/or structural/building components that may have occurred since the initial pre-sampling survey conducted in March 2007. Copies of the building inventory forms and a summary of the walk through results were included in the May 2008 Soil Vapor Investigation Report.

On January 19, 2010, AKRF completed a sampling inspection walkthrough of the Polymedco office to document any material changes associated with the facility and to confirm that the sampling locations were accessible. Mr. Bryan Zieroff and Ms. Elizabeth Baird of AKRF were accompanied by Ernie Sweet of Environmental Resource Management (ERM) and Michael Haggerty of NYSDEC. The building occupants and facility operations were observed to be unchanged from the previous inspection.

A photoionization detector (PID) capable of measuring in parts per billion (ppb) was used during the survey to sample ambient air for the presence of VOCs. Prior to conducting the survey, the PID was calibrated with 100 parts per million (ppm) isobutylene in accordance with the manufacturer's instructions. Compared to the previous pre-sampling inspections in February 2007, March 2008, and March 2009, there were no observed changes to the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, or building operations that would change the sampling parameters. A review of product storage areas indicated that product inventory was consistent with past inspections. A comprehensive product inventory of the Polymedco office is included in Appendix A. Photographs taken during the survey are included in Appendix B. The building layout and tenant locations on the entire property are shown on Figure 2.

Polymedco, Inc.

Polymedco occupied one section of the site building; the western section consisted of a one story office area (see Figure 2). There was no known chemical storage in the office area. The lab coats that were stored in the laboratory were reported as being laundered and not dry cleaned. The

laboratory was observed to contain a refrigerated storage unit that stored reagents for control testing of the laboratory machines. The maintenance room contained shelved storage units that stored a variety of containerized chemicals and cleaning products. Items of note included buckets of paint, spray paint, turpentine, citrus degreaser, insect spray, varnish cleaner, greased lightning degreaser, wood polish, tiki-torch oil, metal polish, and spray adhesive. A locked storage cabinet was present in the storage room and contained an unknown amount and type of containerized chemicals. A PID detection of 0.5 ppm was noted in the maintenance room.

Sample Point/Sample Location Inspection

The two permanent sub-slab sample point locations (SV-11 and SV-12) were observed to be in good condition and were accessible. The three indoor air sampling locations (IA-10 through IA-12) that were confirmed by the NYSDEC in August 2009 were also accessible and cleared for sampling. The sampling locations are shown on Figure 2. The rationale for each sampling location is summarized as follows:

Soil Gas Well I.D.	Sampling Rationale
IA-10	Indoor air sample located in the southeastern corner of the office building
SV-11/IA-11	Soil gas investigation in the central area of the Polymedco office. Sub-slab point (SV-11) through floor in employee office. Indoor air sample (IA-11) on shelf in employee office.
SV-12/IA-12	Soil gas investigation in the south end of the Polymedco office area. Sub-slab point (SV-12) through concrete floor in lab coat closet. Indoor air sample (IA-12) on shelf in closet.

3.3 Sub-Slab Soil Gas Sampling

On January 19, 2010, AKRF conducted the field sampling program in accordance with the SVSP. AKRF personnel were accompanied by Ernie Sweet of ERM and Michael Haggerty of the NYSDEC. Prior to initiating sample collection, each sub-slab sampling point was sealed, purged, and screened for the helium tracer gas and VOCs as indicated in the SVSP. Following purging, soil gas samples were collected for VOC analysis by connecting the sample tubing to a six-liter Summa canister equipped with a vacuum gauge and flow regulator set by the laboratory to collect a six-liter sample over an 8-hour sampling period. The sampling period was stopped after 8 hours or when the vacuum inside the summa canister was between 4 and 7 inches of mercury (“Hg). Photographs of the sampling process are included in Appendix B. Sampling logs are included in Appendix C. Field screening results and sampling parameters are summarized as follows:

Sample Location	Sample ID	PID Reading (ppm)	Helium Tracer Detection	Sampling Period (hrs)	Ending Vacuum ("Hg)
SV-11	SS-11	8.6	No	8	19
SV-12	SS-12	72.2	No	8	6

3.4 Indoor Air Sampling

Indoor air samples (labeled IA-10 through IA-12 on Figure 2) were collected concurrently with the soil gas sampling. Sample IA-13 was collected as a duplicate of IA-12. All three indoor air sampling locations were placed in the locations confirmed by the NYSDOH in August 2009. The

sampling was conducted in accordance with SVSP, and the parameters are summarized in the following table:

Sample ID	PID Reading (ppm)	Sampling Period (hrs)	Ending Vacuum ("Hg)
IA-10	0	8	4
IA-11	0	8	4.5
IA-12	0	8	4
IA-13	0	8	4

3.5 Quality Assurance / Quality Control

In addition to the laboratory analysis of the field samples, additional analysis was included for quality control measures. These samples included one duplicate, reported as IA-13, taken at the indoor air location IA-12, and one background ambient (outdoor) air sample, reported as AA-1, which was collected on the southwestern corner of the building.

3.6 Laboratory Methods

The samples were analyzed for VOCs by EPA Method TO-15 with a detection limit of 1 µg/m^3 for all compounds, except for trichloroethylene, which had a detection limit of 0.25 µg/m^3 for indoor air samples. All sample analysis was performed by TestAmerica of South Burlington, Vermont, a New York State Department of Health Environmental Laboratory Approval Program (NYSDOH-ELAP) laboratory certified to perform NYSDEC Analytical Services Protocol (ASP). The laboratory produced Category B deliverables. Samples were shipped to the laboratory with appropriate chain of custody documentation. The laboratory report is included in Appendix D.

4.0 ANALYTICAL RESULTS

4.1 Laboratory Results

Sub-Slab Samples

Sub-slab analytical results are summarized in Table 1. The sampling results from March 2007, March 2008, and March 2009 are included in the table for comparison. Concentrations of detected VOCs were compared to the action level guidance values (from Matrix 1 and Matrix 2) of the NYSDOH Soil Vapor Intrusion Guidance and values in NYSDOH Summary of Indoor Levels of Volatile Organic Compounds from Fuel Oil Heated Homes in New York State, 1997-2003, which provides a means of comparison of indoor air to background conditions.

TCE detections of 860 µg/m^3 and 81,000 µg/m^3were recorded at locations SV-11 and SV-12, respectively, above the action levels in Matrix 1. PCE was not detected in either of the SV-11 and SV-12 locations. 1,1,1-TCA was detected at location SV-11 at 45 µg/m^3, which is below the action levels in Matrix 2. Carbon tetrachloride was not detected in any of the collected sub-slab samples. Cis-1,2-DCE was detected at locations SV-11 and SV-12 at concentrations of 87 µg/m^3 and 13,000 µg/m^3, respectively. Toluene was detected in both samples with a maximum value of 1,500 µg/m^3 at location SV-12. Cyclohexane was detected in SV-11 at a concentration of 13 µg/m^3. The laboratory results were consistent with the March 2007, March 2008, and March 2009 sampling events.

Indoor Air Samples

Indoor air analytical results and guidance values included in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance are included in Table 2. TCE was detected in the indoor air samples at concentrations ranging from 2.0 to 5.1 µg/m^3. The concentration of TCE (5.1 µg/m^3) in sample IA-12 exceeded the NYSDOH guidance values of 5 µg/m^3. The concentration of TCE (4.8 µg/m^3) in sample IA-13 (duplicate of IA-12) was below the NYSDOH guidance value. The remaining TCE detections were below the NYSDOH guidance values for indoor air. PCE was detected in the four indoor air samples at concentrations ranging from 0.37 to 0.65 µg/m^3, which were below the NYSDOH guidance value of 100 µg/m^3. Cis-1,2-DCE was detected in indoor air sample IA-12 at a concentration 0.48 µg/m3, which exceeded the Indoor Air Upper Fence value of 0.41 µg/m^3. Toluene was detected at all locations, with the highest value of 11 µg/m^3 in indoor air sample IA-12 (toluene was detected in duplicate sample IA-13 at 14 µg/m^3) . Several aromatic VOCs, including benzene, ethylbenzene, xylenes, and 1,3,5-trimethylbenzene, were detected in the indoor samples at concentrations ranging from 0.43 to 39 µg/m^3. Each of these compounds was not detected in the sub-slab samples and are not considered a result of vapor intrusion. Each of these compounds was also detected in the ambient air (outdoor) sample. Carbon tetrachloride was detected in all three indoor air samples at concentrations ranging from 0.53 to 0.63 µg/m^3. In accordance with Matrix 1, these levels typically necessitate taking reasonable and practical actions to identify source(s) and reduce exposures. However, this compound was detected in the outdoor air sample at a concentration of 0.6 µg/m^3 and is not considered to be a result of vapor intrusion. The remaining detections were at levels consistent with the outdoor air sample results and below the NYSDOH Upper Fence values.

5.0 SUMMARY OF FINDINGS

TCE was detected in indoor air sample IA-12 at a concentration of 5.1 µg/m^3, which exceeded the indoor air guidance of 5 µg/m^3 in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance. TCE was detected in the duplicate sample for IA-12 (IA-13) at a concentration of 4.8 µg/m^3, which is below the indoor air guidance value. The remaining indoor air samples contained TCE at concentrations of 2.4 and 4.5 µg/m^3, which were below the NYSDOH's guidance for TCE. Elevated concentrations of TCE, and to a lesser extent several other volatile organic compounds, were detected in the sub-slab soil gas in both SV-11 and SV-12.

6.0 REFERENCES

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TABLES

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-11 (Polymedco Office)				SV-12 (Polymedco Office)				
Sample ID	Soil Vapor	Indoor Air	SV-11(S.S)	SV-11	SS-11	SS-11	SV-12(S.S)	SV-12	SS-12	SS-12	SS-16
Lab Sample ID	Guidance Values	Value	JTPG31AD	742889	789544	818507	JTPHF1AD	742892	789545	818510	789553
Date Sampled	Intrusion	Upper Fence	4/5/2007	3/6/2008	3/17/2009	1/19/2010	4/5/2007	3/6/2008	3/17/2009	1/19/2010	3/17/2009
Dilution					5	12.8			734	401	657 (Duplicate of SS-12)
µg/m^3	µg/m^3	µg/m^3									
1,1,1-Trichloroethane	100/1000	2.5	8.7 U	6 U	5.5 U	45	680 U	600 U	820 U	440 U	710 U
1,1,2,2-Tetrachloroethane	NS	0.38	11 U	7.6 U	6.9 U	18 U	860 U	760 U	1000 U	550 U	890 U
1,1,2-Trichloroethane	NS	0.38	8.7 U	6 U	5.5 U	14 U	680 U	600 U	820 U	440 U	710 U
1,1-Dichloroethane	NS	0.38	6.5 U	4.5 U	4 U	93	500 U	450 U	610 U	320 U	530 U
1,1-Dichloroethene	NS	0.4	6.3 U	4.4 U	4 U	10 U	490 U	440 U	590 U	360	520 U
1,2-Dibromoethane (EDB)	NS	0.38	12 U	8.5 U	7.7 U	20 U	960 U	850 U	1200 U	610 U	1000 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	11 U	7.7 U	7 U	18 U	870 U	770 U	1000 U	560 U	910 U
1,2-Dichloroethane	NS	0.37	6.5 U	4.5 U	4 U	11 U	500 U	450 U	610 U	320 U	530 U
1,2-Dichloropropane	NS	0.39	7.4 U	5.1 U	4.6 U	12 U	580 U	510 U	690 U	370 U	600 U
1,3,5-Trimethylbenzene	NS	3.9	7.9 U	5.4 U	4.9 U	13 U	610 U	540 U	740 U	390 U	640 U
1,3-Butadiene	NS	0.49	7.1 U	6.2 U	5.5 U	14 U	550 U	600 U	820 U	440 U	730 U
2,2,4-Trimethylpentane	NS	NL	19 U	5.1 U	4.7 U	12 U	1500 U	510 U	700 U	370 U	610 U
3-Chloropropene	NS	NL	5	8.8 U	7.8 U	20 U	390 U	850 U	1200 U	630 U	1000 U
4-Ethyltoluene	NS	NL	16 U	5.4 U	4.9 U	13 U	1200 U	540 U	740 U	390 U	640 U
Benzene	NS	13	5.1 U	3.5 U	3.2 U	8.3 U	400 U	350 U	480 U	260 U	420 U
Bromodichloromethane	NS	NL	11 U	7.4 U	6.7 U	17 U	840 U	740 U	1000 U	540 U	870 U
Bromoform	NS	NL	17 U	11 U	10 U	27 U	1300 U	1100 U	1600 U	830 U	1300 U
Bromomethane	NS	0.48	6.2 U	4.3 U	3.9 U	10 U	480 U	430 U	580 U	310 U	500 U
Carbon tetrachloride	5/50/250	1.3	5 U	6.9 U	6.3 U	16 U	390 U	690 U	940 U	500 U	820 U
Chloroethane	NS	0.39	4.2 U	2.9 U	6.6 U	17 U	330 U	290 U	980 U	530 U	870 U
Chloroform	NS	1.2	7.8 U	5.4 U	4.9 U	13 U	610 U	540 U	730 U	390 U	630 U
cis-1,2-Dichloroethene	NS	0.41	6.3 U	4.4 U	4 U	87	11000	11000	18000	13000	16000
cis-1,3-Dichloropropene	NS	0.38	7.3 U	5 U	4.5 U	12 U	570 U	500 U	680 U	360 U	590 U
Cyclohexane	NS	6.3	170	4.1	12	13	1100 U	520	520 U	280 U	450 U
Dibromochloromethane	NS	NL	14 U	9.4 U	8.5 U	22 U	1100 U	940 U	1300 U	680 U	1100 U
Dichlorodifluoromethane	NS	10	7.9 U	14 U	12 U	43	620 U	1300 U	1800 U	990 U	1600 U
Ethylbenzene	NS	6.4	6.9 U	4.8 U	4.3 U	11 U	540 U	480 U	650 U	350 U	560 U
Methyl tert-butyl ether	NS	14	29 U	10 U	9 U	23 U	2200 U	970 U	1300 U	720 U	1200 U
Methylene Chloride	NS	16	NA	9.7 U	8.7 U	22 U	NA	940 U	1300 U	690 U	1100 U
m-Xylene & p-Xylene	NS	11	16	4.8 U	11 U	22 U	540 U	480 U	1600 U	690 U	1400 U
n-Heptane	NS	18	16 U	4.5 U	4.1 U	11 U	1300 U	450 U	610 U	330 U	530 U
n-Hexane	NS	14	84	9.9 U	8.8 U	23 U	1400	950 U	1300 U	700 U	1200 U
o-Xylene	NS	7.1	6.9 U	4.8 U	4.3 U	11 U	540 U	480 U	650 U	350 U	560 U
Tetrachloroethene	100/1000	2.5	11 U	7.5 U	6.8 U	18 U	850 U	750 U	1000 U	540 U	880 U
Toluene	NS	57	450	45	10	16	3300	6800	980	1500	940
trans-1,2-Dichloroethene	NS	NL	6.3 U	4.4 U	4 U	10 U	490 U	440 U	590 U	320 U	520 U
trans-1,3-Dichloropropene	NS	0.4	7.3 U	5 U	4.5 U	12 U	570 U	500 U	680 U	360 U	590 U
Trichloroethene	5/50/250	0.46	1200	910	750	860	66000	97000	130000	81000	110000
Trichlorofluoromethane	NS	12	9 U	6.2 U	5.6 U	15	700 U	620 U	840 U	450 U	730 U
Vinyl bromide	NS	NL	7 U	4.8 U	4.4 U	11 U	550 U	480 U	660 U	350 U	570 U
Vinyl chloride	NS	0.37	4.1 U	2.8 U	2.6 U	6.6 U	320 U	280 U	380 U	200 U	330 U

NL - Not listed.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Outdoor Location 1			
Sample ID	Indoor Air	Indoor Air	OUTDOOR 1 (A.A)	AA-1	AA-1	AA-1
Lab Sample ID	Guidance	Upper Fence	JTPJM1AD	742886	789540	818508
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	1/19/2010
Dilution					4	4
µg/m^3	µg/m^3	µg/m^3				
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.39 U	0.39 U	0.39 U	0.39 U
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.4
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.19 U	0.75
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.2 U	0.2 U	0.2 U
Benzene	NS	13	0.48	0.48	0.54	1.9
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.51	0.35	0.56	0.6
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.2 U	0.2 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.16 U	0.16 U	0.16 U
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.69 U	1.2	0.22	0.3
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	2.2	2	3.3	3.2
Ethylbenzene	NS	6.4	0.35 U	0.26	0.17 U	0.52
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	2.8 U
m-Xylene & p-Xylene	NS	11	0.42	0.96	0.37	1.5
n-Heptane	NS	18	0.82 U	1.1	0.34	0.57
n-Hexane	NS	14	0.7 U	0.35	0.53	1.1
o-Xylene	NS	7.1	0.35 U	0.25	0.17 U	0.52
Tetrachloroethene	100	2.5	0.54 U	0.28	0.27 U	0.48
Toluene	NS	57	0.97	0.98	0.75	3.3
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	0.21 U	0.21 U	0.25	0.21 U
Trichlorofluoromethane	NS	12	1.3	0.84	1.6	1.6
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Polymedco Southern Lab Room				SV-11 (Polymedco Office)			
Sample ID	Indoor Air	Indoor Air	IA-10	IA-19	IA-10	IA-10	SV-11(A.A)	IA-11	IA-11	IA-11
Lab Sample ID	Guidance	Upper Fence	742893	742894	789542	818512	JTPHA1AD	742890	789543	818509
Date Sampled	Value	Value	3/6/2008	3/6/2008	3/17/2009	1/19/2010	4/5/2007	3/6/2008	3/17/2009	1/19/2010
Dilution				(Duplicate of IA-10)	4	4			4	4
µg/m³	µg/m³	µg/m³								
1,1,1-Trichloroethane	5	2.5	0.22 U	45	0.33	0.22 U	0.44 U	0.22 U	0.41	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.27 U	18 U	0.27 U	0.27 U	0.55 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.22 U	14 U	0.22 U	0.22 U	0.44 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.16 U	93	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.16 U	10 U	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.31 U	20 U	0.31 U	0.31 U	0.61 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.28 U	18 U	0.28 U	0.28 U	0.56 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	11 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	12 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	5.9	13 U	0.42	0.39 U	1.2	0.45	0.54	0.45
1,3-Butadiene	NS	0.49	0.27	14 U	0.18 U	0.18 U	0.35 U	0.18 U	0.18 U	0.31
2,2,4-Trimethylpentane	NS	NL	1.4	12 U	0.19 U	0.43	0.93 U	0.19 U	0.19 U	0.61
3-Chloropropene	NS	NL	0.25 U	20 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	5.9	13 U	0.2	0.2 U	0.79 U	0.59	0.26	0.29
Benzene	NS	13	1.7	8.3 U	0.48	1.2	0.55	0.51	0.61	1.6
Bromodichloromethane	NS	NL	0.27 U	17 U	0.27 U	0.27 U	0.54 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.41 U	27 U	0.41 U	0.41 U	0.83 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	10 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.62	16 U	0.49	0.53	0.53	0.31	0.56	0.63
Chloroethane	NS	0.39	0.21 U	17 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.2 U	13 U	0.34	0.2 U	0.39 U	0.2 U	0.46	0.2
cis-1,2-Dichloroethene	NS	0.41	0.36	87	0.21	0.19	0.32 U	0.16 U	0.26	0.36
cis-1,3-Dichloropropene	NS	0.38	0.18 U	12 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.41	13	0.83	0.24	0.69 U	0.25	0.38	0.34
Dibromochloromethane	NS	NL	0.34 U	22 U	0.34 U	0.34 U	0.68 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	3.2	43	3.5	3.6	2.3	2.6	3	3.9
Ethylbenzene	NS	6.4	6.5	11 U	0.24	0.43	0.49	0.19	0.22	0.52
Methyl tert-butyl ether	NS	14	0.14 U	23 U	0.14 U	0.14 U	1.4 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	2.8 U	22 U	2.8 U	2.8 U	NA	2.8 U	2.8 U	2.8 U
m-Xylene & p-Xylene	NS	11	27	22 U	0.56	1.2	1.4	0.78	0.56	1.5
n-Heptane	NS	18	1.3	11 U	0.45	0.53	1.7	1.2	0.66	0.94
n-Hexane	NS	14	1.1	23 U	0.35	1.2	0.7 U	0.56	0.42	1.2
o-Xylene	NS	7.1	12	11 U	0.23	0.39	0.6	0.23	0.25	0.52
Tetrachloroethene	100	2.5	0.58	18 U	0.27 U	0.37	0.54 U	0.52	0.27 U	0.52
Toluene	NS	57	14	16	1.6	3	3.6	1.5	2	3.8
trans-1,2-Dichloroethene	NS	NL	0.3	87	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.18 U	12 U	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	4.8	860	2.4	2	2.2	1.6	3	4.5
Trichlorofluoromethane	NS	12	1.6	15	1.4	1.6	1.3	1	1.3	1.8
Vinyl bromide	NS	NL	0.35 U	11 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	6.6 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

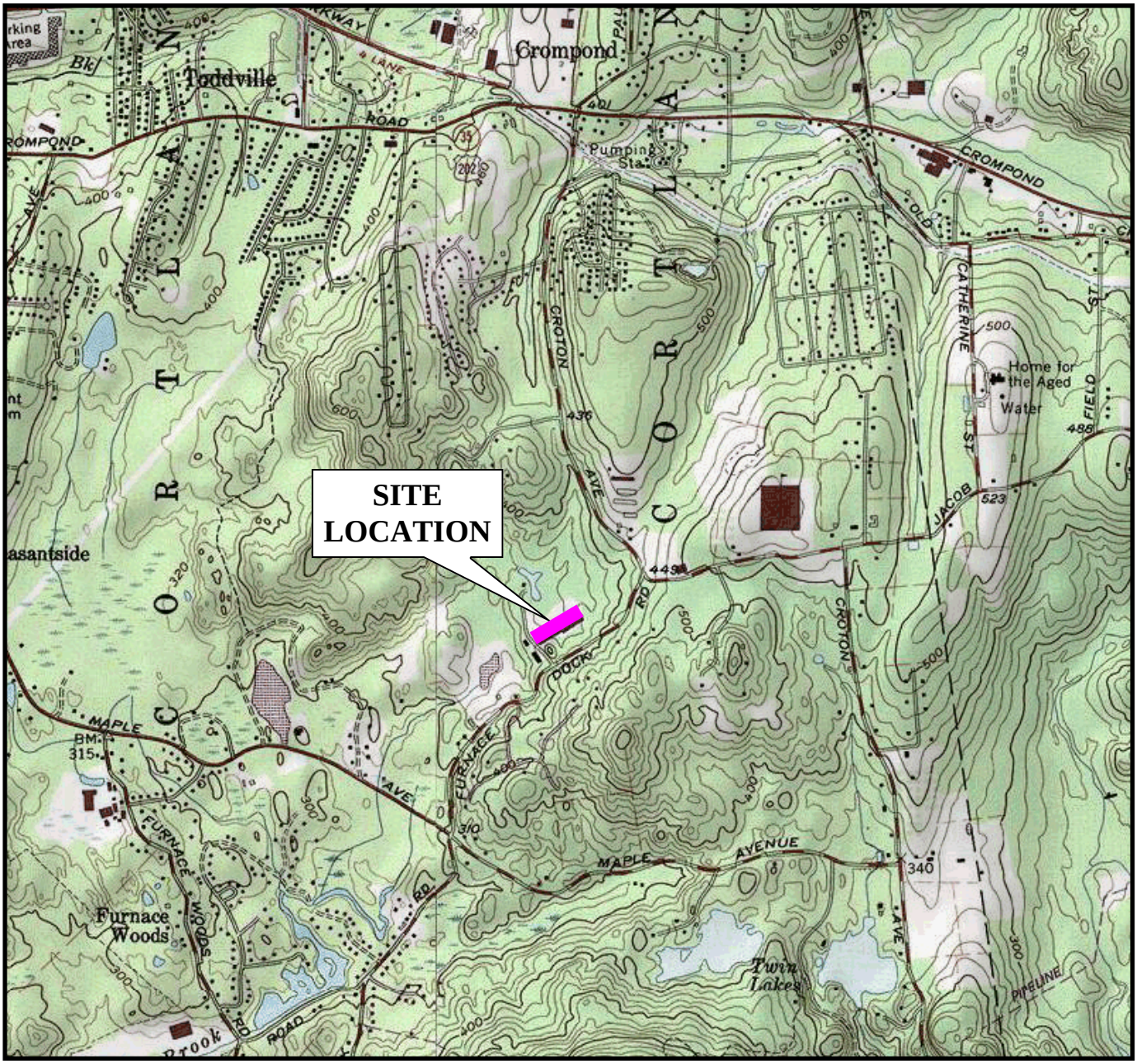
Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-12 (Polymedco Office)				
Sample ID	Indoor Air	Indoor Air	SV-12(A.A)	IA-12	IA-12	IA-12	IA-13
Lab Sample ID	Guidance	Upper Fence	JTPHX1AD	742891	789546	818512	818513
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2010
Dilution					4	4	4
µg/m^3	µg/m^3	µg/m^3					
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.41	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.78	0.39 U	0.39 U	5.9	5.9
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.27	0.27
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.28	1.1	1.4
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.54	0.2 U	7.4	5.9
Benzene	NS	13	0.71	0.42	0.58	1.5	1.7
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.51	0.38	0.52	0.54	0.62
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.38	0.2 U	0.2 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.23	0.35	0.48	0.36
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.69 U	0.14 U	0.76	0.34	0.41
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	2.2	2.5	3.4	3	3.2
Ethylbenzene	NS	6.4	0.62	0.17 U	0.29	5.2	6.5
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	2.8 U	2.8 U
m-Xylene & p-Xylene	NS	11	1.9	0.41	0.78	22	27
n-Heptane	NS	18	0.82 U	2	1.3	1	1.3
n-Hexane	NS	14	0.7 U	0.28 U	1.4	1	1.1
o-Xylene	NS	7.1	0.59	0.17 U	0.37	10	12
Tetrachloroethene	100	2.5	0.54 U	0.55	0.27 U	0.65	0.58
Toluene	NS	57	4	1.5	2.3	11	14
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.2	0.3
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	2.9	3.6	4	5.1	4.8
Trichlorofluoromethane	NS	12	1.7	1	1.5	1.5	1.6
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

NL - Not listed.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

FIGURES

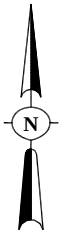




SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’



SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

MAGNA METALS
CORTLANDT, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE	1.08.06
PROJECT No.	40256
SCALE	AS SHOWN
FIGURE	1

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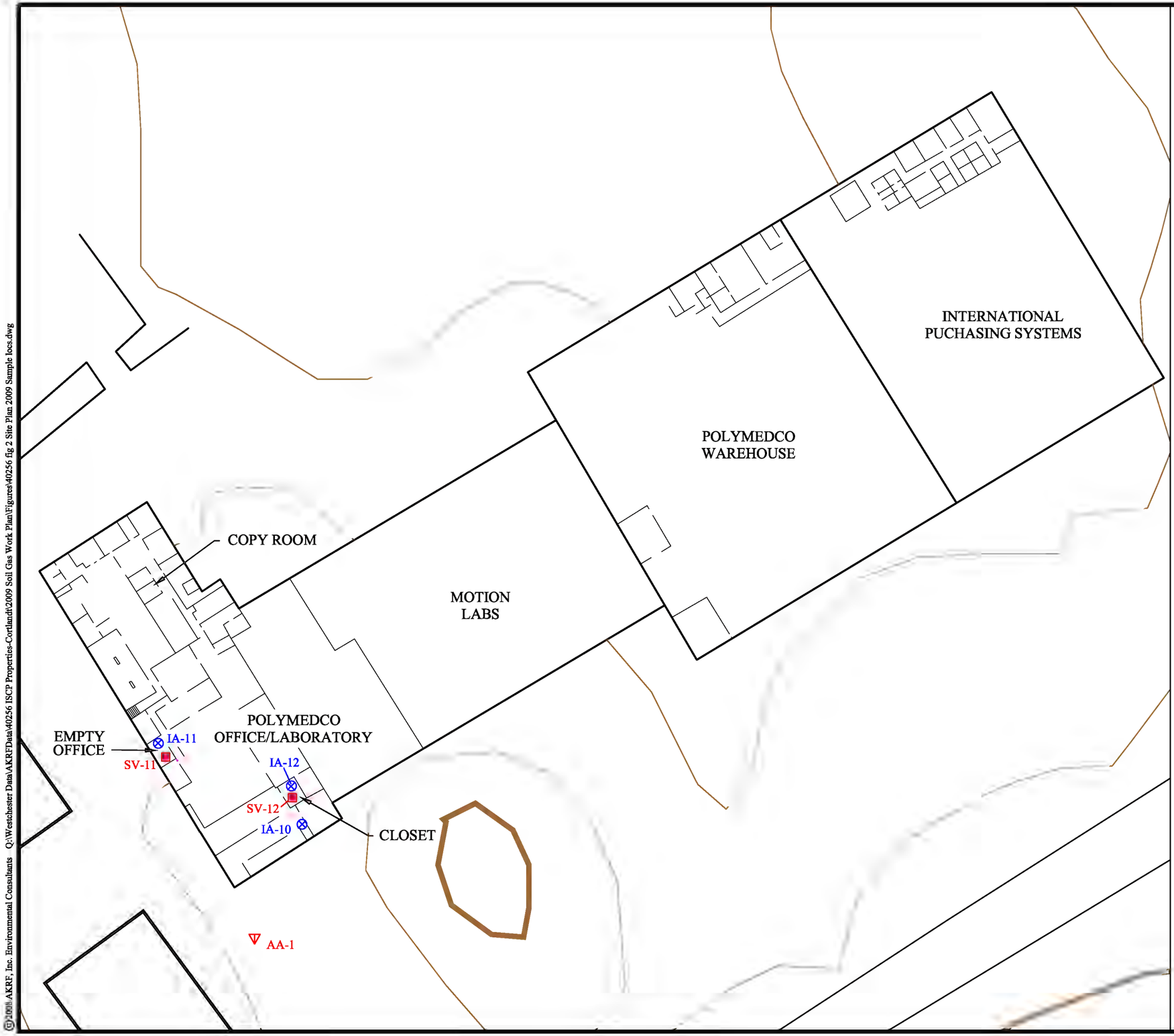

SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-11	SUBSLAB VAPOR SAMPLING LOCATION
IA-11	INDOOR AIR SAMPLING LOCATIONS
AA-1	OUTDOOR AIR SAMPLING LOCATION
320	CONTOUR LINE (20 FT INTERVAL)

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 30' 60' 120'
SCALE IN FEET

AKRF Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGNA METALS
CORTLANDT, NEW YORK

SITE PLAN SHOWING SAMPLING LOCATIONS

DATE: 7.20.09
PROJECT NO.: 40256
SCALE: 1"=60'
FIGURE: 2

© 2008 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\2009 Soil Gas Work Plan\Figures\40256 fig 2 Site Plan 2009 Sample locs.dwg

APPENDIX A

BUILDING INVENTORY FORMS

13. PRODUCT INVENTORY FORM – Polymedco Office

Make & Model of field instrument used: ppbRAE Model PGM-7240

List of specific products found at the site that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Maintenance Room	Clorox – Disinfecting Wipes	2	U/UO	NA	0	Y
	Lysol – Disinfectant Spray	8	U/UO	NA	0	Y
	Airwick Wizard – Room Spray	1	U/UO	NA	0	Y
	Pledge – Wood Polish	5	U/UO	NA	0	Y
	Windex – Window Cleaner	8	U/UO	NA	0	Y
	ZEP Citrus – Cleaner and Degreaser	2	U/UO	NA	0	Y
	Murphy – Oil Soap	3	U/UO	NA	0	Y
	Novus – Plastic Polish	1	U/UO	NA	0	Y
	Sheetrock Joint Compound	1	U	Vinyl acetate monomer, acetaldehyde, formaldehyde	0	Y
	RugDoctor – Steam Cleaner	1	U	NA	0	Y
	RugDoctor – High Traffic Pre-treatment	1	U	NA	0	Y
	ZEP – Upholstery Cleaner	1	U	NA	0	Y
	WD-40	1	U	Petroleum Distillates	0	Y
	Armorall - Protectant	Unknown	Unknown	NA	0	N
	STP – Fuel Injector Cleaner	Unknown	Unknown	Petroleum distillates, naphthalene	0	N
	STP – Gas Treatment	Unknown	Unknown	Petroleum distillates, naphthalene	0	N
	3M Super 77 – Multipurpose Adhesive	1	UO	Acetone, hydrotreated light naphtha, propane, hexane, cyclohexane	0	Y
	3M Spray Mount – Artist Adhesive	1	UO	Acetone, hydrotreated light naphtha, propane, hexane, cyclohexane	1	Y

Maintenance Room	Krylon – Varnish Spray	1	U	Propane, butane, heptanes, naphthalene, naphtha, acetone, methyl cyclohexane	0.5	Y
	Roberts – Seam Sealer	1	U	Lacolene, toluene	0	Y
	SoftSoap – Dishwashing Soap	10	U/UO	NA	0	Y
	Febreeze – Air Freshener	14	U/UO	NA	0	Y
	Real Kill – Hornet and Wasp Killer	1	U	Propane, heptane, chlorpyrifos	0	Y
	Peak – Windshield Washer Fluid	1	U	NA	0	Y
	EZ - Turpentine	1	U	Turpentine	0	Y
	Ortho-Total – Wasp and Hornet Killer	4	U/UO	Propane, heptane, chlorpyrifos	0	Y
	Raid – Ant and Roach Killer	2	UO	Propane, heptane, chlorpyrifos	0	Y
	Strait Line – Marking Chalk	2	UO	NA	0	Y
	Rust-o-leum – Traffic Striping Paint	1	U	Propane, butane, toluene, acetone, 2-methyl-1-propanol	0	Y
	BEHR Latex Paint	8	U/UO	Ethylene glycol	0	Y
	Benjamin Moore Latex Paint	5	U/UO	Ethylene glycol	0	Y
	Painter's Touch Latex Paint	1	UO	Ethylene glycol	0	Y
	Rust-o-leum - Latex Paint	1	U	Ethylene glycol	0	Y
	Rust-o-leum Spray Paint	1	U	Propane, butane, toluene, acetone, 2-methyl-1-propanol	0	Y
	Krylon Spray Paint	1	UO	Propane, butane, toluene, acetone, 2-methyl-1-propanol	0	Y
	Sta-Bil – Concentrated Fuel Stabilizer	1	U	Petroleum distillates	0	Y
	Tiki Torch Fuel	1	U	Aliphatic solvent napthla	0	Y
	EZ Boiled Linseed Oil	1	U	NA	0	Y
	Clorox Bleach	3	UO	NA	0	Y

Maintenance Room	Soft Scrub – Bleach Cleanser	1	UO	NA	0	Y
	Palmolive – Dishwashing Detergent	3	UO	NA	0	Y
	Cascade – Dishwashing Detergent	2	UO	NA	0	Y
	ZEP – Stainless Steel Cleaner	4	UO	NA	0	Y
	Pledge – Floor Finish	3	U/UO	Butane, propane	0	Y
	Pine Sol – Disinfecting Cleaner	1	U	NA	0	Y
	Paint Thinner	1	U	Stoddard Solvent, 1,2,4-trimethylbenzene	0	Y
	Great Stuff – Insulating Foam Sealant	1	D	Methyl ether, propane, isobutane	0	Y
	Henry Ceramic Tile Adhesive	2	UO	Petroleum distillates	0	Y
	Premixed Tile Grout	1	U	Ethylene glycol	0	Y
	Rust-o-leum Primer	1	U	Propane, butane, toluene, acetone, 2-methyl-1-propanol	0	Y
	Multipurpose Grease	1	U	Petroleum Distillates	0	Y
	Revere – Crete Etch	1	U	Glycols, polyethylene, ether	0	Y
	Crown Janitorial Products – Citrus Neutral Cleaner	5	UO	Potassium hydroxide	0	Y
	Simple Green	1	UO	2-butoxyethanol	0	Y
	Greased Lightning	2	U	Sodium hydroxide, 2-butoxyethanol	0	Y
	Spartan – Non-Acid Disinfectant Bathroom Cleaner	1	U	Ammonium chloride	0	Y
	InstaPak Port Cleaner	1	U	Gamma butyralactone	0	Y
	Jasco – Floor Patch and Level Compound	1	UO	Silica quartz, acrylic styrene polymer, methanol	0	Y
	Turtle Wax – Carpet Cleaner	1	UO	Oxygen containing surfactants	0	Y

Maintenance Room	MinWax – Polyurethane	1	U	Aliphatic hydrocarbons	0	Y
	Acrylic Pro-Ceramic Tile Adhesive	1	U	Petroleum distillates	0	Y
	Simple Grout	1	UO	Petroleum distillates	0	Y
	High Performance Water-Based Epoxy Resin	1	UO	Modified diglycidyl ether bispheno – A, alkyl glycidyl ether	0	Y
	High Performance Water-Based Epoxy	1	UO	Tetraethylene Pentamine, Ethylenediamine, Propylene glycol monomethyl, glycol ether, 2-butoxyethanol	0	Y
Storage Closet	Alcohol Swabs	Several Boxes	U/UO	NA	0	Y
	Clorox Disinfecting Wipes	Several	U/UO	NA	0	Y
	Printer Cartridges and Toners	Several	UO	NA	0	Y

APPENDIX B

PHOTOGRAPHIC LOG



Photograph 1: Soil vapor sampling location SV-11.



Photograph 2: Purging set-up with helium tracer gas at SV-12.



Photograph 3: Indoor air sampling IA-11.



Photograph 4: Ambient air sampling AA-1.



Photograph 5: Maintenance room of Polymedco office.



Photograph 6: Locked storage cabinet in maintenance room of Polymedco office.



Photograph 7:Product inventory in maintenance room of Polymedco office.



Photograph 8: Refrigerator in Polymedco equipment laboratory.

APPENDIX C

SAMPLING LOGS

Outdoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: LB **Date:** 01/19/2010

Sample ID #: **AA-1**

Summa #: 4804 **Gage #:** N/A **Flow Control #** 2768

Laboratory Sample (Summa Canister)

Time Started: 09:57 **Vacuum:** 30 inHg

Time Stopped: 17:57 **Vacuum:** 4 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: LB **Date:** 01/19/2010

Sample ID #: **IA-10**

Summa #: 4378 **Gage #:** N/A **Flow Control #** 3240

Laboratory Sample (Summa Canister)

Time Started: 09:33 **Vacuum:** 29 inHg

Time Stopped: 17:17 **Vacuum:** 4 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: LB **Date:** 01/19/2010

Sample ID #: **IA-11**

Summa #: 3374 **Gage #:** N/A **Flow Control #** 4025

Laboratory Sample (Summa Canister)

Time Started: 09:48 **Vacuum:** 30 inHg

Time Stopped: 17:49 **Vacuum:** 4.5 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: EB **Date:** 01/19/2010

Sample ID #: **IA-12**

Summa #: 4381 **Gage #:** N/A **Flow Control #** 3736

Laboratory Sample (Summa Canister)

Time Started: 09:23 **Vacuum:** 30 inHg

Time Stopped: 17:13 **Vacuum:** 4 inHg

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: EB **Date:** 01/19/2010

Sample ID #: **IA-13 (Blind Duplicate for Laboratory QA/QC)**

Summa #: 4918 **Gage #:** N/A **Flow Control #** 2296

Laboratory Sample (Summa Canister)

Time Started: 09:32 **Vacuum:** 29.5 inHg

Time Stopped: 17:12 **Vacuum:** 4 inHg

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: LB **Date:** 01/19/2010

Sample ID #: **SS-11**

Summa #: 4071 **Gage #:** N/A **Flow Control #** 3948

Purging

Time Started: 09:42 **Vol. Purged:** 0.5/liters

Time Stopped: 09:45 **Flow Rate:** 0.1667L/min

Laboratory Sample (Summa Canister)

Time Started: 09:47 **Vacuum:** 30 inHg

Time Stopped: 17:48 **Vacuum:** 19 inHg

Field Sample

PID Calibration: 07:30 **Pid Reading:** 8613.0 ppm

Time Started: 09:46 **He Reading:** 0.0 ppm

Time Stopped: 09:46

Soil Gas Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: LB **Date:** 01/19/2010

Sample ID #: **SS-12**

Summa #: 3347 **Gage #:** N/A **Flow Control #** 4207

Purging

Time Started: 09:07 **Vol. Purged:** 0.4/liters

Time Stopped: 09:10 **Flow Rate:** 0.1667L/min

Laboratory Sample (Summa Canister)

Time Started: 09:20 **Vacuum:** 30 inHg

Time Stopped: 17:33 **Vacuum:** 6 inHg

Field Sample

PID Calibration: 08:05 **Pid Reading:** 72.2 ppm

Time Started: 09:11 **He Reading:** 0.0 ppm

Time Stopped: 09:11

APPENDIX D

ANALYTICAL DATA REPORT

TestAmerica
South Burlington, VT

Sample Data Summary Package

NY135606

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

February 11, 2010

Mr. Brian Zieroff
AKRF, Inc.
34 S. Broadway
Suite 314
White Plains, NY 10601

Re: Laboratory Project No. 29000
Case: 29000; SDG: NY135606

Dear Mr. Zieroff:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on January 22nd, 2010. Laboratory identification numbers were assigned, and designated as follows:

Lab ID	Client Sample ID	Sample Date	Sample Matrix
	Received: 01/22/10 ETR No: 135606		
818507	SS-11	01/19/10	AIR
818508	AA-1	01/19/10	AIR
818509	IA-11	01/19/10	AIR
818510	SS-12	01/19/10	AIR
818511	IA-10	01/19/10	AIR
818512	IA-12	01/19/10	AIR
818513	IA-13	01/19/10	AIR

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

The low level volatile organics analysis of the calibration check standard designated EEC20IV yielded increased response for 1,2-dichlorotetrafluoroethane, resulting in a percent difference that exceeded control criteria. This compound was not detected in the associated field samples above the reporting limit.

The volatile organics analyses for samples SS-11 and SS-12 were accomplished at dilution based on screen analyses, to ensure quantitation of all target constituents within the range of calibrated instrument response.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Any reference within this report to Severn Trent Laboratories, Inc. or STL, should be understood to refer to TestAmerica Laboratories, Inc. (formerly known as Severn Trent Laboratories, Inc.) The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,



Don Dawicki
Project Manager

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818508

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.64		0.040	3.2		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.18		0.080	0.40		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.29		0.040	1.6		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.32		0.080	1.1		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.040	U	0.040	0.16	U	0.16
cis-1,2-Dichloroethene	156-59-2	0.040	U	0.040	0.16	U	0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.087		0.040	0.30		0.14
Carbon Tetrachloride	56-23-5	0.095		0.040	0.60		0.25
2,2,4-Trimethylpentane	540-84-1	0.16		0.040	0.75		0.19
Benzene	71-43-2	0.58		0.040	1.9		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.14		0.040	0.57		0.16
Trichloroethene	79-01-6	0.040	U	0.040	0.21	U	0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.88		0.040	3.3		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.071		0.040	0.48		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

AA-1

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818508

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.12		0.040	0.52		0.17
Xylene (m,p)	1330-20-7	0.35		0.080	1.5		0.35
Xylene (o)	95-47-6	0.12		0.040	0.52		0.17
Xylene (total)	1330-20-7	0.47		0.040	2.0		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY135606

Lab Sample No.: 818509

Dilution Factor: 4.00

Date Analyzed: 02/02/10

Sample Matrix: AIR

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.79		0.040	3.9		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.14		0.080	0.31		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.32		0.040	1.8		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.34		0.080	1.2		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.091		0.040	0.36		0.16
cis-1,2-Dichloroethene	156-59-2	0.091		0.040	0.36		0.16
Chloroform	67-66-3	0.040		0.040	0.20		0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.10		0.040	0.34		0.14
Carbon Tetrachloride	56-23-5	0.10		0.040	0.63		0.25
2,2,4-Trimethylpentane	540-84-1	0.13		0.040	0.61		0.19
Benzene	71-43-2	0.49		0.040	1.6		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.23		0.040	0.94		0.16
Trichloroethene	79-01-6	0.83		0.040	4.5		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	1.0		0.040	3.8		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.076		0.040	0.52		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-11

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818509

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.12		0.040	0.52		0.17
Xylene (m,p)	1330-20-7	0.34		0.080	1.5		0.35
Xylene (o)	95-47-6	0.12		0.040	0.52		0.17
Xylene (total)	1330-20-7	0.47		0.040	2.0		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.059		0.040	0.29		0.20
1,3,5-Trimethylbenzene	108-67-8	0.092		0.080	0.45		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818511

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.72		0.040	3.6		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.080	U	0.080	0.18	U	0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.28		0.040	1.6		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.040	U	0.040	0.16	U	0.16
n-Hexane	110-54-3	0.35		0.080	1.2		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.048		0.040	0.19		0.16
cis-1,2-Dichloroethene	156-59-2	0.048		0.040	0.19		0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.070		0.040	0.24		0.14
Carbon Tetrachloride	56-23-5	0.084		0.040	0.53		0.25
2,2,4-Trimethylpentane	540-84-1	0.092		0.040	0.43		0.19
Benzene	71-43-2	0.37		0.040	1.2		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.13		0.040	0.53		0.16
Trichloroethene	79-01-6	0.38		0.040	2.0		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	0.80		0.040	3.0		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.055		0.040	0.37		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-10

Lab Name: TAL Burlington

SDG Number: NY135606

Lab Sample No.: 818511

Dilution Factor: 4.00

Date Analyzed: 02/02/10

Sample Matrix: AIR

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	0.10		0.040	0.43		0.17
Xylene (m,p)	1330-20-7	0.28		0.080	1.2		0.35
Xylene (o)	95-47-6	0.090		0.040	0.39		0.17
Xylene (total)	1330-20-7	0.37		0.040	1.6		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	0.040	U	0.040	0.20	U	0.20
1,3,5-Trimethylbenzene	108-67-8	0.080	U	0.080	0.39	U	0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818512

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.60		0.040	3.0		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.12		0.080	0.27		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.27		0.040	1.5		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.050		0.040	0.20		0.16
n-Hexane	110-54-3	0.29		0.080	1.0		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.16		0.040	0.63		0.16
cis-1,2-Dichloroethene	156-59-2	0.12		0.040	0.48		0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.10		0.040	0.34		0.14
Carbon Tetrachloride	56-23-5	0.086		0.040	0.54		0.25
2,2,4-Trimethylpentane	540-84-1	0.23		0.040	1.1		0.19
Benzene	71-43-2	0.47		0.040	1.5		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.25		0.040	1.0		0.16
Trichloroethene	79-01-6	0.94		0.040	5.1		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	2.8		0.040	11		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.096		0.040	0.65		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-12

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818512

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	1.2		0.040	5.2		0.17
Xylene (m,p)	1330-20-7	5.0		0.080	22		0.35
Xylene (o)	95-47-6	2.3		0.040	10		0.17
Xylene (total)	1330-20-7	7.4		0.040	32		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	1.5		0.040	7.4		0.20
1,3,5-Trimethylbenzene	108-67-8	1.2		0.080	5.9		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 4.00

Sample Matrix: AIR

Lab Sample No.: 818513

Date Analyzed: 02/02/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.65		0.040	3.2		0.20
1,2-Dichlorotetrafluoroethane	76-14-2	0.040	U	0.040	0.28	U	0.28
Vinyl Chloride	75-01-4	0.080	U	0.080	0.20	U	0.20
1,3-Butadiene	106-99-0	0.12		0.080	0.27		0.18
Bromomethane	74-83-9	0.080	U	0.080	0.31	U	0.31
Chloroethane	75-00-3	0.080	U	0.080	0.21	U	0.21
Bromoethene	593-60-2	0.080	U	0.080	0.35	U	0.35
Trichlorofluoromethane	75-69-4	0.29		0.040	1.6		0.22
1,1-Dichloroethene	75-35-4	0.040	U	0.040	0.16	U	0.16
3-Chloropropene	107-05-1	0.080	U	0.080	0.25	U	0.25
Methylene Chloride	75-09-2	0.80	U	0.80	2.8	U	2.8
Methyl tert-Butyl Ether	1634-04-4	0.040	U	0.040	0.14	U	0.14
trans-1,2-Dichloroethene	156-60-5	0.075		0.040	0.30		0.16
n-Hexane	110-54-3	0.30		0.080	1.1		0.28
1,1-Dichloroethane	75-34-3	0.040	U	0.040	0.16	U	0.16
1,2-Dichloroethene (total)	540-59-0	0.16		0.040	0.63		0.16
cis-1,2-Dichloroethene	156-59-2	0.090		0.040	0.36		0.16
Chloroform	67-66-3	0.040	U	0.040	0.20	U	0.20
1,1,1-Trichloroethane	71-55-6	0.040	U	0.040	0.22	U	0.22
Cyclohexane	110-82-7	0.12		0.040	0.41		0.14
Carbon Tetrachloride	56-23-5	0.098		0.040	0.62		0.25
2,2,4-Trimethylpentane	540-84-1	0.31		0.040	1.4		0.19
Benzene	71-43-2	0.53		0.040	1.7		0.13
1,2-Dichloroethane	107-06-2	0.080	U	0.080	0.32	U	0.32
n-Heptane	142-82-5	0.31		0.040	1.3		0.16
Trichloroethene	79-01-6	0.89		0.040	4.8		0.21
1,2-Dichloropropane	78-87-5	0.080	U	0.080	0.37	U	0.37
Bromodichloromethane	75-27-4	0.040	U	0.040	0.27	U	0.27
cis-1,3-Dichloropropene	10061-01-5	0.040	U	0.040	0.18	U	0.18
Toluene	108-88-3	3.6		0.040	14		0.15
trans-1,3-Dichloropropene	10061-02-6	0.040	U	0.040	0.18	U	0.18
1,1,2-Trichloroethane	79-00-5	0.040	U	0.040	0.22	U	0.22
Tetrachloroethene	127-18-4	0.086		0.040	0.58		0.27

TO-14/15
Result Summary

CLIENT SAMPLE NO.

IA-13

Lab Name: TAL Burlington

SDG Number: NY135606

Lab Sample No.: 818513

Dilution Factor: 4.00

Date Analyzed: 02/02/10

Sample Matrix: AIR

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.040	U	0.040	0.34	U	0.34
1,2-Dibromoethane	106-93-4	0.040	U	0.040	0.31	U	0.31
Ethylbenzene	100-41-4	1.5		0.040	6.5		0.17
Xylene (m,p)	1330-20-7	6.2		0.080	27		0.35
Xylene (o)	95-47-6	2.7		0.040	12		0.17
Xylene (total)	1330-20-7	9.0		0.040	39		0.17
Bromoform	75-25-2	0.040	U	0.040	0.41	U	0.41
1,1,2,2-Tetrachloroethane	79-34-5	0.040	U	0.040	0.27	U	0.27
4-Ethyltoluene	622-96-8	1.2		0.040	5.9		0.20
1,3,5-Trimethylbenzene	108-67-8	1.2		0.080	5.9		0.39

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA020110LCS

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA020110

Date Analyzed: 02/01/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.21		0.010	1.0		0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.24		0.010	1.7		0.070
Vinyl Chloride	75-01-4	0.21		0.020	0.54		0.051
1,3-Butadiene	106-99-0	0.19		0.020	0.42		0.044
Bromomethane	74-83-9	0.19		0.020	0.74		0.078
Chloroethane	75-00-3	0.18		0.020	0.47		0.053
Bromoethene	593-60-2	0.21		0.020	0.92		0.087
Trichlorofluoromethane	75-69-4	0.21		0.010	1.2		0.056
1,1-Dichloroethene	75-35-4	0.22		0.010	0.87		0.040
3-Chloropropene	107-05-1	0.19		0.020	0.59		0.063
Methylene Chloride	75-09-2	0.24		0.20	0.83		0.69
Methyl tert-Butyl Ether	1634-04-4	0.24		0.010	0.87		0.036
trans-1,2-Dichloroethene	156-60-5	0.21		0.010	0.83		0.040
n-Hexane	110-54-3	0.20		0.020	0.70		0.070
1,1-Dichloroethane	75-34-3	0.21		0.010	0.85		0.040
1,2-Dichloroethene (total)	540-59-0	0.41		0.010	1.6		0.040
cis-1,2-Dichloroethene	156-59-2	0.20		0.010	0.79		0.040
Chloroform	67-66-3	0.21		0.010	1.0		0.049
1,1,1-Trichloroethane	71-55-6	0.20		0.010	1.1		0.055
Cyclohexane	110-82-7	0.20		0.010	0.69		0.034
Carbon Tetrachloride	56-23-5	0.19		0.010	1.2		0.063
2,2,4-Trimethylpentane	540-84-1	0.20		0.010	0.93		0.047
Benzene	71-43-2	0.20		0.010	0.64		0.032
1,2-Dichloroethane	107-06-2	0.20		0.020	0.81		0.081
n-Heptane	142-82-5	0.18		0.010	0.74		0.041
Trichloroethene	79-01-6	0.19		0.010	1.0		0.054
1,2-Dichloropropane	78-87-5	0.20		0.020	0.92		0.092
Bromodichloromethane	75-27-4	0.20		0.010	1.3		0.067
cis-1,3-Dichloropropene	10061-01-5	0.19		0.010	0.86		0.045
Toluene	108-88-3	0.21		0.010	0.79		0.038
trans-1,3-Dichloropropene	10061-02-6	0.19		0.010	0.86		0.045
1,1,2-Trichloroethane	79-00-5	0.21		0.010	1.1		0.055
Tetrachloroethene	127-18-4	0.19		0.010	1.3		0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

EA020110LCS

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: EA020110

Date Analyzed: 02/01/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20		0.010	1.7		0.085
1,2-Dibromoethane	106-93-4	0.20		0.010	1.5		0.077
Ethylbenzene	100-41-4	0.22		0.010	0.96		0.043
Xylene (m,p)	1330-20-7	0.44		0.020	1.9		0.087
Xylene (o)	95-47-6	0.21		0.010	0.91		0.043
Xylene (total)	1330-20-7	0.65		0.010	2.8		0.043
Bromoform	75-25-2	0.18		0.010	1.9		0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.22		0.010	1.5		0.069
4-Ethyltoluene	622-96-8	0.23		0.010	1.1		0.049
1,3,5-Trimethylbenzene	108-67-8	0.21		0.020	1.0		0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK020110EA

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0201

Date Analyzed: 02/01/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.010	U	0.010	0.049	U	0.049
1,2-Dichlorotetrafluoroethane	76-14-2	0.010	U	0.010	0.070	U	0.070
Vinyl Chloride	75-01-4	0.020	U	0.020	0.051	U	0.051
1,3-Butadiene	106-99-0	0.020	U	0.020	0.044	U	0.044
Bromomethane	74-83-9	0.020	U	0.020	0.078	U	0.078
Chloroethane	75-00-3	0.020	U	0.020	0.053	U	0.053
Bromoethene	593-60-2	0.020	U	0.020	0.087	U	0.087
Trichlorofluoromethane	75-69-4	0.010	U	0.010	0.056	U	0.056
1,1-Dichloroethene	75-35-4	0.010	U	0.010	0.040	U	0.040
3-Chloropropene	107-05-1	0.020	U	0.020	0.063	U	0.063
Methylene Chloride	75-09-2	0.20	U	0.20	0.69	U	0.69
Methyl tert-Butyl Ether	1634-04-4	0.010	U	0.010	0.036	U	0.036
trans-1,2-Dichloroethene	156-60-5	0.010	U	0.010	0.040	U	0.040
n-Hexane	110-54-3	0.020	U	0.020	0.070	U	0.070
1,1-Dichloroethane	75-34-3	0.010	U	0.010	0.040	U	0.040
1,2-Dichloroethene (total)	540-59-0	0.010	U	0.010	0.040	U	0.040
cis-1,2-Dichloroethene	156-59-2	0.010	U	0.010	0.040	U	0.040
Chloroform	67-66-3	0.010	U	0.010	0.049	U	0.049
1,1,1-Trichloroethane	71-55-6	0.010	U	0.010	0.055	U	0.055
Cyclohexane	110-82-7	0.010	U	0.010	0.034	U	0.034
Carbon Tetrachloride	56-23-5	0.010	U	0.010	0.063	U	0.063
2,2,4-Trimethylpentane	540-84-1	0.010	U	0.010	0.047	U	0.047
Benzene	71-43-2	0.010	U	0.010	0.032	U	0.032
1,2-Dichloroethane	107-06-2	0.020	U	0.020	0.081	U	0.081
n-Heptane	142-82-5	0.010	U	0.010	0.041	U	0.041
Trichloroethene	79-01-6	0.010	U	0.010	0.054	U	0.054
1,2-Dichloropropane	78-87-5	0.020	U	0.020	0.092	U	0.092
Bromodichloromethane	75-27-4	0.010	U	0.010	0.067	U	0.067
cis-1,3-Dichloropropene	10061-01-5	0.010	U	0.010	0.045	U	0.045
Toluene	108-88-3	0.010	U	0.010	0.038	U	0.038
trans-1,3-Dichloropropene	10061-02-6	0.010	U	0.010	0.045	U	0.045
1,1,2-Trichloroethane	79-00-5	0.010	U	0.010	0.055	U	0.055
Tetrachloroethene	127-18-4	0.010	U	0.010	0.068	U	0.068

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK020110EA

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0201

Date Analyzed: 02/01/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.010	U	0.010	0.085	U	0.085
1,2-Dibromoethane	106-93-4	0.010	U	0.010	0.077	U	0.077
Ethylbenzene	100-41-4	0.010	U	0.010	0.043	U	0.043
Xylene (m,p)	1330-20-7	0.020	U	0.020	0.087	U	0.087
Xylene (o)	95-47-6	0.010	U	0.010	0.043	U	0.043
Xylene (total)	1330-20-7	0.010	U	0.010	0.043	U	0.043
Bromoform	75-25-2	0.010	U	0.010	0.10	U	0.10
1,1,2,2-Tetrachloroethane	79-34-5	0.010	U	0.010	0.069	U	0.069
4-Ethyltoluene	622-96-8	0.010	U	0.010	0.049	U	0.049
1,3,5-Trimethylbenzene	108-67-8	0.020	U	0.020	0.098	U	0.098

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-11

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 12.80

Sample Matrix: AIR

Lab Sample No.: 818507

Date Analyzed: 02/04/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	8.6		6.4	43		32
1,2-Dichlorotetrafluoroethane	76-14-2	2.6	U	2.6	18	U	18
Vinyl Chloride	75-01-4	2.6	U	2.6	6.6	U	6.6
1,3-Butadiene	106-99-0	6.4	U	6.4	14	U	14
Bromomethane	74-83-9	2.6	U	2.6	10	U	10
Chloroethane	75-00-3	6.4	U	6.4	17	U	17
Bromoethene	593-60-2	2.6	U	2.6	11	U	11
Trichlorofluoromethane	75-69-4	2.6		2.6	15		15
1,1-Dichloroethene	75-35-4	2.6	U	2.6	10	U	10
3-Chloropropene	107-05-1	6.4	U	6.4	20	U	20
Methylene chloride	75-09-2	6.4	U	6.4	22	U	22
Methyl tert-Butyl Ether	1634-04-4	6.4	U	6.4	23	U	23
trans-1,2-Dichloroethene	156-60-5	2.6	U	2.6	10	U	10
n-Hexane	110-54-3	6.4	U	6.4	23	U	23
1,1-Dichloroethane	75-34-3	23		2.6	93		11
cis-1,2-Dichloroethene	156-59-2	22		2.6	87		10
1,2-Dichloroethene,Total	540-59-0	22		2.6	87		10
Chloroform	67-66-3	2.6	U	2.6	13	U	13
1,1,1-Trichloroethane	71-55-6	8.2		2.6	45		14
Cyclohexane	110-82-7	3.8		2.6	13		8.9
Carbon tetrachloride	56-23-5	2.6	U	2.6	16	U	16
2,2,4-Trimethylpentane	540-84-1	2.6	U	2.6	12	U	12
Benzene	71-43-2	2.6	U	2.6	8.3	U	8.3
1,2-Dichloroethane	107-06-2	2.6	U	2.6	11	U	11
n-Heptane	142-82-5	2.6	U	2.6	11	U	11
Trichloroethene	79-01-6	160		2.6	860		14
1,2-Dichloropropane	78-87-5	2.6	U	2.6	12	U	12
Bromodichloromethane	75-27-4	2.6	U	2.6	17	U	17
cis-1,3-Dichloropropene	10061-01-5	2.6	U	2.6	12	U	12
Toluene	108-88-3	4.3		2.6	16		9.8
trans-1,3-Dichloropropene	10061-02-6	2.6	U	2.6	12	U	12
1,1,2-Trichloroethane	79-00-5	2.6	U	2.6	14	U	14
Tetrachloroethene	127-18-4	2.6	U	2.6	18	U	18

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-11

Lab Name: TAL Burlington

SDG Number: NY135606

Lab Sample No.: 818507

Dilution Factor: 12.80

Date Analyzed: 02/04/10

Sample Matrix: AIR

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	2.6	U	2.6	22	U	22
1,2-Dibromoethane	106-93-4	2.6	U	2.6	20	U	20
Ethylbenzene	100-41-4	2.6	U	2.6	11	U	11
Xylene (m,p)	1330-20-7	5.1	U	5.1	22	U	22
Xylene (o)	95-47-6	2.6	U	2.6	11	U	11
Xylenes, Total	1330-20-7	2.6	U	2.6	11	U	11
Bromoform	75-25-2	2.6	U	2.6	27	U	27
1,1,2,2-Tetrachloroethane	79-34-5	2.6	U	2.6	18	U	18
4-Ethyltoluene	622-96-8	2.6	U	2.6	13	U	13
1,3,5-Trimethylbenzene	108-67-8	2.6	U	2.6	13	U	13

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-12

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 401.00

Sample Matrix: AIR

Lab Sample No.: 818510

Date Analyzed: 02/03/10

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	200	U	200	990	U	990
1,2-Dichlorotetrafluoroethane	76-14-2	80	U	80	560	U	560
Vinyl Chloride	75-01-4	80	U	80	200	U	200
1,3-Butadiene	106-99-0	200	U	200	440	U	440
Bromomethane	74-83-9	80	U	80	310	U	310
Chloroethane	75-00-3	200	U	200	530	U	530
Bromoethene	593-60-2	80	U	80	350	U	350
Trichlorofluoromethane	75-69-4	80	U	80	450	U	450
1,1-Dichloroethene	75-35-4	90		80	360		320
3-Chloropropene	107-05-1	200	U	200	630	U	630
Methylene chloride	75-09-2	200	U	200	690	U	690
Methyl tert-Butyl Ether	1634-04-4	200	U	200	720	U	720
trans-1,2-Dichloroethene	156-60-5	80	U	80	320	U	320
n-Hexane	110-54-3	200	U	200	700	U	700
1,1-Dichloroethane	75-34-3	80	U	80	320	U	320
cis-1,2-Dichloroethene	156-59-2	3300		80	13000		320
1,2-Dichloroethene,Total	540-59-0	3300		80	13000		320
Chloroform	67-66-3	80	U	80	390	U	390
1,1,1-Trichloroethane	71-55-6	80	U	80	440	U	440
Cyclohexane	110-82-7	80	U	80	280	U	280
Carbon tetrachloride	56-23-5	80	U	80	500	U	500
2,2,4-Trimethylpentane	540-84-1	80	U	80	370	U	370
Benzene	71-43-2	80	U	80	260	U	260
1,2-Dichloroethane	107-06-2	80	U	80	320	U	320
n-Heptane	142-82-5	80	U	80	330	U	330
Trichloroethene	79-01-6	15000		80	81000		430
1,2-Dichloropropane	78-87-5	80	U	80	370	U	370
Bromodichloromethane	75-27-4	80	U	80	540	U	540
cis-1,3-Dichloropropene	10061-01-5	80	U	80	360	U	360
Toluene	108-88-3	390		80	1500		300
trans-1,3-Dichloropropene	10061-02-6	80	U	80	360	U	360
1,1,2-Trichloroethane	79-00-5	80	U	80	440	U	440
Tetrachloroethene	127-18-4	80	U	80	540	U	540

TO-14/15
Result Summary

CLIENT SAMPLE NO.

SS-12

Lab Name: TAL Burlington

SDG Number: NY135606

Lab Sample No.: 818510

Dilution Factor: 401.00

Date Analyzed: 02/03/10

Sample Matrix: AIR

Date Received: 01/22/10

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	80	U	80	680	U	680
1,2-Dibromoethane	106-93-4	80	U	80	610	U	610
Ethylbenzene	100-41-4	80	U	80	350	U	350
Xylene (m,p)	1330-20-7	160	U	160	690	U	690
Xylene (o)	95-47-6	80	U	80	350	U	350
Xylenes, Total	1330-20-7	80	U	80	350	U	350
Bromoform	75-25-2	80	U	80	830	U	830
1,1,2,2-Tetrachloroethane	79-34-5	80	U	80	550	U	550
4-Ethyltoluene	622-96-8	80	U	80	390	U	390
1,3,5-Trimethylbenzene	108-67-8	80	U	80	390	U	390

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA020310LCS

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA020310

Date Analyzed: 02/03/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	10		0.50	49		2.5
1,2-Dichlorotetrafluoroethane	76-14-2	9.5		0.20	66		1.4
Vinyl Chloride	75-01-4	9.8		0.20	25		0.51
1,3-Butadiene	106-99-0	11		0.50	24		1.1
Bromomethane	74-83-9	9.9		0.20	38		0.78
Chloroethane	75-00-3	10		0.50	26		1.3
Bromoethene	593-60-2	9.8		0.20	43		0.87
Trichlorofluoromethane	75-69-4	9.6		0.20	54		1.1
1,1-Dichloroethene	75-35-4	11		0.20	44		0.79
3-Chloropropene	107-05-1	10		0.50	31		1.6
Methylene chloride	75-09-2	10		0.50	35		1.7
Methyl tert-Butyl Ether	1634-04-4	9.6		0.50	35		1.8
trans-1,2-Dichloroethene	156-60-5	10		0.20	40		0.79
n-Hexane	110-54-3	9.6		0.50	34		1.8
1,1-Dichloroethane	75-34-3	9.9		0.20	40		0.81
cis-1,2-Dichloroethene	156-59-2	9.8		0.20	39		0.79
1,2-Dichloroethene,Total	540-59-0	20		0.20	79		0.79
Chloroform	67-66-3	9.5		0.20	46		0.98
1,1,1-Trichloroethane	71-55-6	10		0.20	55		1.1
Cyclohexane	110-82-7	11		0.20	38		0.69
Carbon tetrachloride	56-23-5	10		0.20	63		1.3
2,2,4-Trimethylpentane	540-84-1	10		0.20	47		0.93
Benzene	71-43-2	9.4		0.20	30		0.64
1,2-Dichloroethane	107-06-2	9.9		0.20	40		0.81
n-Heptane	142-82-5	10		0.20	41		0.82
Trichloroethene	79-01-6	9.8		0.20	53		1.1
1,2-Dichloropropane	78-87-5	9.4		0.20	43		0.92
Bromodichloromethane	75-27-4	10		0.20	67		1.3
cis-1,3-Dichloropropene	10061-01-5	9.5		0.20	43		0.91
Toluene	108-88-3	8.7		0.20	33		0.75
trans-1,3-Dichloropropene	10061-02-6	9.4		0.20	43		0.91
1,1,2-Trichloroethane	79-00-5	8.9		0.20	49		1.1
Tetrachloroethene	127-18-4	8.9		0.20	60		1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

GA020310LCS

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: GA020310

Date Analyzed: 02/03/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	10		0.20	85		1.7
1,2-Dibromoethane	106-93-4	9.2		0.20	71		1.5
Ethylbenzene	100-41-4	8.8		0.20	38		0.87
Xylene (m,p)	1330-20-7	17		0.40	74		1.7
Xylene (o)	95-47-6	8.3		0.20	36		0.87
Xylenes, Total	1330-20-7	25		0.20	110		0.87
Bromoform	75-25-2	9.6		0.20	99		2.1
1,1,2,2-Tetrachloroethane	79-34-5	9.0		0.20	62		1.4
4-Ethyltoluene	622-96-8	9.8		0.20	48		0.98
1,3,5-Trimethylbenzene	108-67-8	9.6		0.20	47		0.98

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK020310GA

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0203

Date Analyzed: 02/03/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dichlorodifluoromethane	75-71-8	0.50	U	0.50	2.5	U	2.5
1,2-Dichlorotetrafluoroethane	76-14-2	0.20	U	0.20	1.4	U	1.4
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
1,3-Butadiene	106-99-0	0.50	U	0.50	1.1	U	1.1
Bromomethane	74-83-9	0.20	U	0.20	0.78	U	0.78
Chloroethane	75-00-3	0.50	U	0.50	1.3	U	1.3
Bromoethene	593-60-2	0.20	U	0.20	0.87	U	0.87
Trichlorofluoromethane	75-69-4	0.20	U	0.20	1.1	U	1.1
1,1-Dichloroethene	75-35-4	0.20	U	0.20	0.79	U	0.79
3-Chloropropene	107-05-1	0.50	U	0.50	1.6	U	1.6
Methylene chloride	75-09-2	0.50	U	0.50	1.7	U	1.7
Methyl tert-Butyl Ether	1634-04-4	0.50	U	0.50	1.8	U	1.8
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
n-Hexane	110-54-3	0.50	U	0.50	1.8	U	1.8
1,1-Dichloroethane	75-34-3	0.20	U	0.20	0.81	U	0.81
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
1,2-Dichloroethene,Total	540-59-0	0.20	U	0.20	0.79	U	0.79
Chloroform	67-66-3	0.20	U	0.20	0.98	U	0.98
1,1,1-Trichloroethane	71-55-6	0.20	U	0.20	1.1	U	1.1
Cyclohexane	110-82-7	0.20	U	0.20	0.69	U	0.69
Carbon tetrachloride	56-23-5	0.20	U	0.20	1.3	U	1.3
2,2,4-Trimethylpentane	540-84-1	0.20	U	0.20	0.93	U	0.93
Benzene	71-43-2	0.20	U	0.20	0.64	U	0.64
1,2-Dichloroethane	107-06-2	0.20	U	0.20	0.81	U	0.81
n-Heptane	142-82-5	0.20	U	0.20	0.82	U	0.82
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1
1,2-Dichloropropane	78-87-5	0.20	U	0.20	0.92	U	0.92
Bromodichloromethane	75-27-4	0.20	U	0.20	1.3	U	1.3
cis-1,3-Dichloropropene	10061-01-5	0.20	U	0.20	0.91	U	0.91
Toluene	108-88-3	0.20	U	0.20	0.75	U	0.75
trans-1,3-Dichloropropene	10061-02-6	0.20	U	0.20	0.91	U	0.91
1,1,2-Trichloroethane	79-00-5	0.20	U	0.20	1.1	U	1.1
Tetrachloroethene	127-18-4	0.20	U	0.20	1.4	U	1.4

TO-14/15
Result Summary

CLIENT SAMPLE NO.

MBLK020310GA

Lab Name: TAL Burlington

SDG Number: NY135606

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0203

Date Analyzed: 02/03/10

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Dibromochloromethane	124-48-1	0.20	U	0.20	1.7	U	1.7
1,2-Dibromoethane	106-93-4	0.20	U	0.20	1.5	U	1.5
Ethylbenzene	100-41-4	0.20	U	0.20	0.87	U	0.87
Xylene (m,p)	1330-20-7	0.40	U	0.40	1.7	U	1.7
Xylene (o)	95-47-6	0.20	U	0.20	0.87	U	0.87
Xylenes, Total	1330-20-7	0.20	U	0.20	0.87	U	0.87
Bromoform	75-25-2	0.20	U	0.20	2.1	U	2.1
1,1,2,2-Tetrachloroethane	79-34-5	0.20	U	0.20	1.4	U	1.4
4-Ethyltoluene	622-96-8	0.20	U	0.20	0.98	U	0.98
1,3,5-Trimethylbenzene	108-67-8	0.20	U	0.20	0.98	U	0.98

TestAmerica Burlington Data Qualifier Definitions

Organic

U: Compound analyzed but not detected at a concentration above the reporting limit.

J: Estimated value.

N: Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds (TICs) where the identification of a compound is based on a mass spectral library search.

P: SW-846: The relative percent difference for detected concentrations between two GC columns is greater than 40%. Unless otherwise specified the higher of the two values is reported on the Form I.

CLP SOW: Greater than 25% difference for detected concentrations between two GC columns. Unless otherwise specified the lower of the two values is reported on the Form I.

C: Pesticide result whose identification has been confirmed by GC/MS.

B: Analyte is found in the sample and the associated method blank. The flag is used for tentatively identified compounds as well as positively identified compounds.

E: Compounds whose concentrations exceed the upper limit of the calibration range of the instrument for that specific analysis.

D: Concentrations identified from analysis of the sample at a secondary dilution.

A: Tentatively identified compound is a suspected aldol condensation product.

X,Y,Z: Laboratory defined flags that may be used alone or combined, as needed. If used, the description of the flag is defined in the project narrative.

Inorganic/Metals

E: Reported value is estimated due to the presence of interference.

N: Matrix spike sample recovery is not within control limits.

*: Duplicate sample analysis is not within control limits.

B: The result reported is less than the reporting limit but greater than the instrument detection limit.

U: Analyte was analyzed for but not detected above the reporting limit.

Method Codes:

P	ICP-AES
MS	ICP-MS
CV	Cold Vapor AA
AS	Semi-Automated Spectrophotometric

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Zweoff	**Samples Collected By:** EB	1 of 2 COCs
Company: AKRF	Phone: 917-583-4924		
Address: 34 S. Broadway	Email: BZweoff@akrf.com		
City/State/Zip: White Plains, NY 10601			
Phone:	Site Contact: Liz Baird		
FAX:	TA Contact: Erin Nealon		
Project Name: Magna Metals	**Analysis Turnaround Time**		
Site: Magna Metals	Standard (Specify) 5 day		
PO # 402526	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
SS-11	1.19.10	0942	1748	30	19	3948	4071	X											
AA-1		0957	1757	30	4	2768	4804	X											
IA-11		0948	1749	30	4.5	4025	3374	X											
SS-12		0920	1733	30	6	4207	3347	X											
IA-10		0933	1713	29	4	3240	4378	X											
IA-12		0923	1713	30	4	3736	4381	X											

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (Inches of Hg)	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:
Reporting limit of 1 ug/m3 for all compounds except trichloroethylene, vinyl chloride, + carbon tetrachloride at 0.25 ug/m3 for

Samples Shipped by:	Date/Time: 1.20.10 0900	Samples Received by: 1-20-10 0900
Samples Relinquished by:	Date/Time: 1-20-10 1800	Received by: 1/20/10 1800
Relinquished by:	Date/Time: 1/21/10 830	Received by: 1/22/10 1031

IA-10
IA-11,
IA-12
IA-13

Lab Use Only **Shipper Name:** **Opened by:** **Condition:**

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Zecoff	**Samples Collected By:** EB	2 of 2 COCs
Company: AKRF	Phone: 917-583-4924		
Address: 34 S. Broadway	Email: bzecoff@akrf.com		
City/State/Zip White Plains, NY 10601			
Phone:	Site Contact: Liz Baird		
FAX:	TA Contact: Erin Arasate		
Project Name: Magna Metals	**Analysis Turnaround Time**		
Site: Magna Metals	Standard (Specify) 5 day		
PO # 40256	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
1A-13	1.19.10	0932	1712	29	4	2296	4918	X											

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:
same as previous page

Samples Shipped by: [signature]	Date/Time: 1-20-10 0900	Samples Received by: [signature] 1-20-10 0900
Samples Relinquished by: [signature]	Date/Time: 1-20-10 1800	Received by: K Blockler 1/20/10 1800
Relinquished by: K Blockler	Date/Time: 1/21/10 830	Received by: [signature] 1/22/10 1631

Lab Use Only **Shipper Name:** **Opened by:** **Condition:**

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Data Summary – TO-15 Low Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818508

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818508

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.64	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.18	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.29	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.32	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.040	U
156-59-2	cis-1,2-Dichloroethene	0.040	U
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.087	
56-23-5	Carbon Tetrachloride	0.095	
540-84-1	2,2,4-Trimethylpentane	0.16	
71-43-2	Benzene	0.58	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.14	
79-01-6	Trichloroethene	0.040	U
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.88	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.071	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

AA-1

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818508

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818508

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.12	
1330-20-7	Xylene (m,p)	0.35	
95-47-6	Xylene (o)	0.12	
1330-20-7	Xylene (total)	0.47	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818511

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818511

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.72	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.080	U
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.28	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.35	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.048	
156-59-2	cis-1,2-Dichloroethene	0.048	
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.070	
56-23-5	Carbon Tetrachloride	0.084	
540-84-1	2,2,4-Trimethylpentane	0.092	
71-43-2	Benzene	0.37	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.13	
79-01-6	Trichloroethene	0.38	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	0.80	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.055	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-10

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818511

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818511

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.10	
1330-20-7	Xylene (m,p)	0.28	
95-47-6	Xylene (o)	0.090	
1330-20-7	Xylene (total)	0.37	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.040	U
108-67-8	1,3,5-Trimethylbenzene	0.080	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818509

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818509

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.79	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.14	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.32	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.040	U
110-54-3	n-Hexane	0.34	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.091	
156-59-2	cis-1,2-Dichloroethene	0.091	
67-66-3	Chloroform	0.040	
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.10	
56-23-5	Carbon Tetrachloride	0.10	
540-84-1	2,2,4-Trimethylpentane	0.13	
71-43-2	Benzene	0.49	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.23	
79-01-6	Trichloroethene	0.83	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	1.0	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.076	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818509

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818509

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	0.12	
1330-20-7	Xylene (m,p)	0.34	
95-47-6	Xylene (o)	0.12	
1330-20-7	Xylene (total)	0.47	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	0.059	
108-67-8	1,3,5-Trimethylbenzene	0.092	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818512

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818512I2

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.60	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.12	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.27	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.050	
110-54-3	n-Hexane	0.29	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.16	
156-59-2	cis-1,2-Dichloroethene	0.12	
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.10	
56-23-5	Carbon Tetrachloride	0.086	
540-84-1	2,2,4-Trimethylpentane	0.23	
71-43-2	Benzene	0.47	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.25	
79-01-6	Trichloroethene	0.94	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	2.8	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.096	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818512

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818512I2

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	1.2	
1330-20-7	Xylene (m,p)	5.0	
95-47-6	Xylene (o)	2.3	
1330-20-7	Xylene (total)	7.4	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	1.5	
108-67-8	1,3,5-Trimethylbenzene	1.2	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818513

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818513I2

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.65	
76-14-2	1,2-Dichlorotetrafluoroethan	0.040	U
75-01-4	Vinyl Chloride	0.080	U
106-99-0	1,3-Butadiene	0.12	
74-83-9	Bromomethane	0.080	U
75-00-3	Chloroethane	0.080	U
593-60-2	Bromoethene	0.080	U
75-69-4	Trichlorofluoromethane	0.29	
75-35-4	1,1-Dichloroethene	0.040	U
107-05-1	3-Chloropropene	0.080	U
75-09-2	Methylene Chloride	0.80	U
1634-04-4	Methyl tert-Butyl Ether	0.040	U
156-60-5	trans-1,2-Dichloroethene	0.075	
110-54-3	n-Hexane	0.30	
75-34-3	1,1-Dichloroethane	0.040	U
540-59-0	1,2-Dichloroethene (total)	0.16	
156-59-2	cis-1,2-Dichloroethene	0.090	
67-66-3	Chloroform	0.040	U
71-55-6	1,1,1-Trichloroethane	0.040	U
110-82-7	Cyclohexane	0.12	
56-23-5	Carbon Tetrachloride	0.098	
540-84-1	2,2,4-Trimethylpentane	0.31	
71-43-2	Benzene	0.53	
107-06-2	1,2-Dichloroethane	0.080	U
142-82-5	n-Heptane	0.31	
79-01-6	Trichloroethene	0.89	
78-87-5	1,2-Dichloropropane	0.080	U
75-27-4	Bromodichloromethane	0.040	U
10061-01-5	cis-1,3-Dichloropropene	0.040	U
108-88-3	Toluene	3.6	
10061-02-6	trans-1,3-Dichloropropene	0.040	U
79-00-5	1,1,2-Trichloroethane	0.040	U
127-18-4	Tetrachloroethene	0.086	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

IA-13

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818513

Sample wt/vol: 125.0 (g/mL) ML Lab File ID: 818513I2

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/02/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 4.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.040	U
106-93-4	1,2-Dibromoethane	0.040	U
100-41-4	Ethylbenzene	1.5	
1330-20-7	Xylene (m,p)	6.2	
95-47-6	Xylene (o)	2.7	
1330-20-7	Xylene (total)	9.0	
75-25-2	Bromoform	0.040	U
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U
622-96-8	4-Ethyltoluene	1.2	
108-67-8	1,3,5-Trimethylbenzene	1.2	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK020110EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: MBLK020110EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EECB01I

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/01/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.010	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.010	U
75-01-4	Vinyl Chloride	0.020	U
106-99-0	1,3-Butadiene	0.020	U
74-83-9	Bromomethane	0.020	U
75-00-3	Chloroethane	0.020	U
593-60-2	Bromoethene	0.020	U
75-69-4	Trichlorofluoromethane	0.010	U
75-35-4	1,1-Dichloroethene	0.010	U
107-05-1	3-Chloropropene	0.020	U
75-09-2	Methylene Chloride	0.20	U
1634-04-4	Methyl tert-Butyl Ether	0.010	U
156-60-5	trans-1,2-Dichloroethene	0.010	U
110-54-3	n-Hexane	0.020	U
75-34-3	1,1-Dichloroethane	0.010	U
540-59-0	1,2-Dichloroethene (total)	0.010	U
156-59-2	cis-1,2-Dichloroethene	0.010	U
67-66-3	Chloroform	0.010	U
71-55-6	1,1,1-Trichloroethane	0.010	U
110-82-7	Cyclohexane	0.010	U
56-23-5	Carbon Tetrachloride	0.010	U
540-84-1	2,2,4-Trimethylpentane	0.010	U
71-43-2	Benzene	0.010	U
107-06-2	1,2-Dichloroethane	0.020	U
142-82-5	n-Heptane	0.010	U
79-01-6	Trichloroethene	0.010	U
78-87-5	1,2-Dichloropropane	0.020	U
75-27-4	Bromodichloromethane	0.010	U
10061-01-5	cis-1,3-Dichloropropene	0.010	U
108-88-3	Toluene	0.010	U
10061-02-6	trans-1,3-Dichloropropene	0.010	U
79-00-5	1,1,2-Trichloroethane	0.010	U
127-18-4	Tetrachloroethene	0.010	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK020110EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: MBLK020110EA

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EECB01I

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/01/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.010	U
106-93-4	1,2-Dibromoethane	0.010	U
100-41-4	Ethylbenzene	0.010	U
1330-20-7	Xylene (m,p)	0.020	U
95-47-6	Xylene (o)	0.010	U
1330-20-7	Xylene (total)	0.010	U
75-25-2	Bromoform	0.010	U
79-34-5	1,1,2,2-Tetrachloroethane	0.010	U
622-96-8	4-Ethyltoluene	0.010	U
108-67-8	1,3,5-Trimethylbenzene	0.020	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA020110LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: EA020110LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EEC20IQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/01/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.21	
76-14-2	1,2-Dichlorotetrafluoroethan	0.24	
75-01-4	Vinyl Chloride	0.21	
106-99-0	1,3-Butadiene	0.19	
74-83-9	Bromomethane	0.19	
75-00-3	Chloroethane	0.18	
593-60-2	Bromoethene	0.21	
75-69-4	Trichlorofluoromethane	0.21	
75-35-4	1,1-Dichloroethene	0.22	
107-05-1	3-Chloropropene	0.19	
75-09-2	Methylene Chloride	0.24	
1634-04-4	Methyl tert-Butyl Ether	0.24	
156-60-5	trans-1,2-Dichloroethene	0.21	
110-54-3	n-Hexane	0.20	
75-34-3	1,1-Dichloroethane	0.21	
540-59-0	1,2-Dichloroethene (total)	0.41	
156-59-2	cis-1,2-Dichloroethene	0.20	
67-66-3	Chloroform	0.21	
71-55-6	1,1,1-Trichloroethane	0.20	
110-82-7	Cyclohexane	0.20	
56-23-5	Carbon Tetrachloride	0.19	
540-84-1	2,2,4-Trimethylpentane	0.20	
71-43-2	Benzene	0.20	
107-06-2	1,2-Dichloroethane	0.20	
142-82-5	n-Heptane	0.18	
79-01-6	Trichloroethene	0.19	
78-87-5	1,2-Dichloropropane	0.20	
75-27-4	Bromodichloromethane	0.20	
10061-01-5	cis-1,3-Dichloropropene	0.19	
108-88-3	Toluene	0.21	
10061-02-6	trans-1,3-Dichloropropene	0.19	
79-00-5	1,1,2-Trichloroethane	0.21	
127-18-4	Tetrachloroethene	0.19	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EA020110LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: EA020110LCS

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: EEC20IQ

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/01/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	
106-93-4	1,2-Dibromoethane	0.20	
100-41-4	Ethylbenzene	0.22	
1330-20-7	Xylene (m,p)	0.44	
95-47-6	Xylene (o)	0.21	
1330-20-7	Xylene (total)	0.65	
75-25-2	Bromoform	0.18	
79-34-5	1,1,2,2-Tetrachloroethane	0.22	
622-96-8	4-Ethyltoluene	0.23	
108-67-8	1,3,5-Trimethylbenzene	0.21	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix Spike - Sample No.: EA020110LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	0.20		0.21	105	70-130
1,2-Dichlorotetrafluoro	0.20		0.24	120	70-130
Vinyl Chloride	0.20		0.21	105	70-130
1,3-Butadiene	0.20		0.19	95	70-130
Bromomethane	0.20		0.19	95	70-130
Chloroethane	0.20		0.18	90	70-130
Bromoethene	0.20		0.21	105	70-130
Trichlorofluoromethane	0.20		0.21	105	70-130
1,1-Dichloroethene	0.20		0.22	110	70-130
3-Chloropropene	0.20		0.19	95	70-130
Methylene Chloride	0.20		0.24	120	70-130
Methyl tert-Butyl Ether	0.20		0.24	120	70-130
trans-1,2-Dichloroethen	0.20		0.21	105	70-130
n-Hexane	0.20		0.20	100	70-130
1,1-Dichloroethane	0.20		0.21	105	70-130
1,2-Dichloroethene (tot	0.40		0.41	102	70-130
cis-1,2-Dichloroethene	0.20		0.20	100	70-130
Chloroform	0.20		0.21	105	70-130
1,1,1-Trichloroethane	0.20		0.20	100	70-130
Cyclohexane	0.20		0.20	100	70-130
Carbon Tetrachloride	0.20		0.19	95	70-130
2,2,4-Trimethylpentane	0.20		0.20	100	70-130
Benzene	0.20		0.20	100	70-130
1,2-Dichloroethane	0.20		0.20	100	70-130
n-Heptane	0.20		0.18	90	70-130
Trichloroethene	0.20		0.19	95	70-130
1,2-Dichloropropane	0.20		0.20	100	70-130
Bromodichloromethane	0.20		0.20	100	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix Spike - Sample No.: EA020110LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	0.20		0.19	95	70-130
Toluene	0.20		0.21	105	70-130
trans-1,3-Dichloroprope	0.20		0.19	95	70-130
1,1,2-Trichloroethane	0.20		0.21	105	70-130
Tetrachloroethene	0.20		0.19	95	70-130
Dibromochloromethane	0.20		0.20	100	70-130
1,2-Dibromoethane	0.20		0.20	100	70-130
Ethylbenzene	0.20		0.22	110	70-130
Xylene (m,p)	0.40		0.44	110	70-130
Xylene (o)	0.20		0.21	105	70-130
Bromoform	0.20		0.18	90	70-130
1,1,2,2-Tetrachloroetha	0.20		0.22	110	70-130
4-Ethyltoluene	0.20		0.23	115	70-130
1,3,5-Trimethylbenzene	0.20		0.21	105	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 42 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK020110EA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: EECB01I Lab Sample ID: MBLK020110EA

Date Analyzed: 02/01/10 Time Analyzed: 1633

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: E

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	EA020110LCS	EA020110LCS	EEC20IQ	1538
02	AA-1	818508	818508	0040
03	IA-11	818509	818509	0135
04	IA-10	818511	818511	0230
05	IA-12	818512	818512I2	0949
06	IA-13	818513	818513I2	1139
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: EEC01PV BFB Injection Date: 12/31/09

Instrument ID: E BFB Injection Time: 1153

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	10.5
75	30.0 - 66.0% of mass 95	37.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	50.0 - 120.0% of mass 95	82.8
175	4.0 - 9.0% of mass 174	5.8 (7.0)1
176	93.0 - 101.0% of mass 174	79.3 (95.7)1
177	5.0 - 9.0% of mass 176	5.2 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0.01	ASTD0.01	EEC10V2	12/31/09	1336
02	ASTD0.02	ASTD0.02	EEC20V	12/31/09	1431
03	ASTD0.05	ASTD0.05	EEC50V	12/31/09	1529
04	ASTD0.10	ASTD0.10	EEC100V	12/31/09	1624
05	ASTD0.20	ASTD0.20	EEC200V	12/31/09	1720
06	ASTD0.50	ASTD0.50	EEC500V	12/31/09	1816
07	ASTD0.75	ASTD0.75	EEC750V	12/31/09	1911
08	ASTD1.00	ASTD1.00	EEC1000V	12/31/09	2007
09	ASTD1.50	ASTD1.50	EEC1500V	12/31/09	2102
10	ASTD2.00	ASTD2.00	EEC2000V	12/31/09	2158
11					
12					
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17					
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22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: EEC10PV BFB Injection Date: 02/01/10

Instrument ID: E BFB Injection Time: 1350

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	11.1
75	30.0 - 66.0% of mass 95	39.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.4
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	50.0 - 120.0% of mass 95	76.8
175	4.0 - 9.0% of mass 174	5.3 (6.8)1
176	93.0 - 101.0% of mass 174	73.2 (95.4)1
177	5.0 - 9.0% of mass 176	4.8 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0.20	ASTD0.20	EEC20IV	02/01/10	1443
02	EA020110LCS	EA020110LCS	EEC20IQ	02/01/10	1538
03	MBLK020110EA	MBLK020110EA	EECB01I	02/01/10	1633
04	AA-1	818508	818508	02/02/10	0040
05	IA-11	818509	818509	02/02/10	0135
06	IA-10	818511	818511	02/02/10	0230
07	IA-12	818512	818512I2	02/02/10	0949
08	IA-13	818513	818513I2	02/02/10	1139
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FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=EEC10V2 RRF0.02=EEC20V
RRF0.05=EEC50V RRF0.1=EEC100V RRF0.2=EEC200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	0.584	0.583	0.543	0.636	0.524		
1,2-Dichlorotetrafluoroethan	0.392	0.431	0.436	0.411	0.358		
Vinyl Chloride		0.163	0.153	0.171	0.144		
1,3-Butadiene		0.077	0.121	0.116	0.090		
Bromomethane		0.281	0.250	0.251	0.204		
Chloroethane		0.182	0.161	0.156	0.131		
Bromoethene		0.566	0.501	0.579	0.457		
Trichlorofluoromethane	1.357	1.293	1.151	1.355	1.114		
1,1-Dichloroethene	0.491	0.514	0.454	0.512	0.410		
3-Chloropropene		0.387	0.288	0.326	0.260		
Methylene Chloride					0.338		
Methyl tert-Butyl Ether	0.739	0.829	0.902	0.859	0.824		
trans-1,2-Dichloroethene	0.577	0.585	0.558	0.593	0.466		
n-Hexane		0.642	0.600	0.634	0.510		
1,1-Dichloroethane *	0.592	0.678	0.636	0.682	0.544		*
1,2-Dichloroethene (total)	0.529	0.562	0.536	0.547	0.448		
cis-1,2-Dichloroethene	0.482	0.539	0.513	0.501	0.430		
Chloroform	0.806	0.885	0.833	0.912	0.736		
1,1,1-Trichloroethane	0.181	0.190	0.186	0.206	0.168		
Cyclohexane	0.155	0.156	0.143	0.156	0.125		
Carbon Tetrachloride	0.210	0.211	0.199	0.227	0.186		
2,2,4-Trimethylpentane	0.346	0.373	0.336	0.386	0.302		
Benzene	0.301	0.288	0.270	0.286	0.232		
1,2-Dichloroethane		0.089	0.084	0.092	0.075		
n-Heptane	0.124	0.127	0.117	0.114	0.093		
Trichloroethene	0.128	0.135	0.132	0.140	0.112		
1,2-Dichloropropane		0.090	0.081	0.084	0.066		
Bromodichloromethane	0.144	0.152	0.148	0.168	0.137		
cis-1,3-Dichloropropene	0.135	0.123	0.114	0.122	0.096		
Toluene	0.216	0.213	0.193	0.207	0.175		
trans-1,3-Dichloropropene	0.100	0.108	0.106	0.113	0.091		
1,1,2-Trichloroethane	0.082	0.094	0.087	0.098	0.078		
Tetrachloroethene	0.200	0.190	0.182	0.199	0.163		
Dibromochloromethane	0.153	0.166	0.149	0.170	0.143		
1,2-Dibromoethane	0.147	0.174	0.162	0.183	0.148		
Ethylbenzene	0.379	0.388	0.395	0.424	0.354		
Xylene (m,p)	0.139	0.149	0.154	0.169	0.144		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.01=EEC10V2 RRF0.02=EEC20V
RRF0.05=EEC50V RRF0.1=EEC100V RRF0.2=EEC200V

COMPOUND	RRF 0.01	RRF 0.02	RRF 0.05	RRF0.1	RRF0.2	$\overline{RRF}$	% RSD
Xylene (o)	0.142	0.150	0.158	0.166	0.142		
Xylene (total)	0.142	0.150	0.158	0.166	0.142		
Bromoform	0.107	0.114	0.112	0.128	0.109		
1,1,2,2-Tetrachloroethane	0.187	0.195	0.194	0.211	0.182		
4-Ethyltoluene	0.306	0.365	0.386	0.400	0.376		
1,3,5-Trimethylbenzene		0.301	0.304	0.339	0.308		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=EEC500V RRF0.75=EEC750V
RRF1 =EEC1000V RRF1.5=EEC1500V RRF2 =EEC2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	0.532		0.578			0.568	6.8
1,2-Dichlorotetrafluoroethan	0.338		0.380			0.392	9.3
Vinyl Chloride	0.142		0.167			0.157	7.7
1,3-Butadiene	0.083		0.096			0.097	18.6
Bromomethane	0.196		0.227			0.235	13.7
Chloroethane	0.135		0.138			0.150	12.9
Bromoethene	0.504		0.544			0.525	8.8
Trichlorofluoromethane	1.203		1.304			1.254	7.8
1,1-Dichloroethene	0.456		0.490			0.475	7.9
3-Chloropropene	0.278		0.275			0.302	15.5
Methylene Chloride	0.334	0.376	0.327	0.326	0.359	0.343	5.8
Methyl tert-Butyl Ether	0.803		0.972			0.847	8.8
trans-1,2-Dichloroethene	0.534		0.540			0.550	7.8
n-Hexane	0.550		0.557			0.582	8.9
1,1-Dichloroethane *	0.593		0.591			0.616	8.3*
1,2-Dichloroethene (total)	0.499		0.507			0.518	7.3
cis-1,2-Dichloroethene	0.463		0.473			0.486	7.3
Chloroform	0.812		0.813			0.828	6.9
1,1,1-Trichloroethane	0.186		0.188			0.186	6.0
Cyclohexane	0.140		0.142			0.145	7.9
Carbon Tetrachloride	0.206		0.212			0.207	6.1
2,2,4-Trimethylpentane	0.337		0.322			0.343	8.4
Benzene	0.248		0.252			0.268	9.4
1,2-Dichloroethane	0.083		0.082			0.084	7.1
n-Heptane	0.101		0.096			0.110	12.3
Trichloroethene	0.128		0.127			0.129	6.7
1,2-Dichloropropane	0.072		0.074			0.078	11.2
Bromodichloromethane	0.162		0.166			0.154	7.7
cis-1,3-Dichloropropene	0.114		0.122			0.118	10.1
Toluene	0.182		0.203			0.198	7.8
trans-1,3-Dichloropropene	0.106		0.115			0.106	7.7
1,1,2-Trichloroethane	0.084		0.094			0.088	8.5
Tetrachloroethene	0.175		0.181			0.184	7.1
Dibromochloromethane	0.164		0.189			0.162	9.4
1,2-Dibromoethane	0.166		0.184			0.166	9.0
Ethylbenzene	0.355		0.414			0.387	7.0
Xylene (m,p)	0.147		0.177			0.154	9.0

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Calibration Time(s): 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.5=EEC500V RRF0.75=EEC750V
RRF1 =EEC1000V RRF1.5=EEC1500V RRF2 =EEC2000V

COMPOUND	RRF0.5	RRF 0.75	RRF1	RRF1.5	RRF2	$\overline{RRF}$	% RSD
Xylene (o)	0.143		0.172			0.153	8.0
Xylene (total)	0.143		0.172			0.153	8.0
Bromoform	0.124		0.156			0.121	14.1
1,1,2,2-Tetrachloroethane	0.195		0.234			0.200	8.7
4-Ethyltoluene	0.384		0.481			0.385	13.4
1,3,5-Trimethylbenzene	0.320		0.396			0.328	10.9

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM VI VOA

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date: 02/01/10 Time: 1443

Lab File ID: EEC20IV Init. Calib. Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Init. Calib. Times: 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D	
Dichlorodifluoromethane	0.568	0.537	0.01	5.4	30.0	
1,2-Dichlorotetrafluoroethan	0.392	0.511	0.01	30.4	30.0	<-
Vinyl Chloride	0.157	0.142	0.01	9.6	30.0	
1,3-Butadiene	0.097	0.075	0.01	22.7	30.0	
Bromomethane	0.235	0.204	0.01	13.2	30.0	
Chloroethane	0.150	0.112	0.01	25.3	30.0	
Bromoethene	0.525	0.467	0.01	11.0	30.0	
Trichlorofluoromethane	1.254	1.156	0.01	7.8	30.0	
1,1-Dichloroethene	0.475	0.424	0.01	10.7	30.0	
3-Chloropropene	0.302	0.238	0.01	21.2	30.0	
Methylene Chloride	0.343	0.338	0.01	1.4	30.0	
Methyl tert-Butyl Ether	0.847	0.915	0.01	8.0	30.0	
trans-1,2-Dichloroethene	0.550	0.478	0.01	13.1	30.0	
n-Hexane	0.582	0.521	0.01	10.5	30.0	
1,1-Dichloroethane	0.616	0.550	0.1	10.7	30.0	
1,2-Dichloroethene (total)	0.518	0.448	0.01	13.5	30.0	
cis-1,2-Dichloroethene	0.486	0.417	0.01	14.2	30.0	
Chloroform	0.828	0.749	0.01	9.5	30.0	
1,1,1-Trichloroethane	0.186	0.162	0.01	12.9	30.0	
Cyclohexane	0.145	0.130	0.01	10.3	30.0	
Carbon Tetrachloride	0.207	0.180	0.01	13.0	30.0	
2,2,4-Trimethylpentane	0.343	0.286	0.01	16.6	30.0	
Benzene	0.268	0.232	0.01	13.4	30.0	
1,2-Dichloroethane	0.084	0.074	0.01	11.9	30.0	
n-Heptane	0.110	0.083	0.01	24.5	30.0	
Trichloroethene	0.129	0.109	0.01	15.5	30.0	
1,2-Dichloropropane	0.078	0.070	0.01	10.2	30.0	
Bromodichloromethane	0.154	0.134	0.01	13.0	30.0	
cis-1,3-Dichloropropene	0.118	0.102	0.01	13.6	30.0	
Toluene	0.198	0.198	0.01	0.0	30.0	
trans-1,3-Dichloropropene	0.106	0.092	0.01	13.2	30.0	
1,1,2-Trichloroethane	0.088	0.090	0.01	2.3	30.0	
Tetrachloroethene	0.184	0.168	0.01	8.7	30.0	
Dibromochloromethane	0.162	0.150	0.01	7.4	30.0	
1,2-Dibromoethane	0.166	0.155	0.01	6.6	30.0	
Ethylbenzene	0.387	0.397	0.01	2.6	30.0	
Xylene (m,p)	0.154	0.166	0.01	7.8	30.0	

FORM VII VOA

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: E Calibration Date: 02/01/10 Time: 1443

Lab File ID: EEC20IV Init. Calib. Date(s): 12/31/09 12/31/09

Heated Purge: (Y/N) N Init. Calib. Times: 1336 2158

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF0.2	MIN RRF	%D	MAX %D
Xylene (o)	0.153	0.158	0.01	3.3	30.0
Xylene (total)	0.153	0.158	0.01	3.3	30.0
Bromoform	0.121	0.102	0.01	15.7	30.0
1,1,2,2-Tetrachloroethane	0.200	0.190	0.01	5.0	30.0
4-Ethyltoluene	0.385	0.382	0.01	0.8	30.0
1,3,5-Trimethylbenzene	0.328	0.306	0.01	6.7	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID (Standard): EEC20IV Date Analyzed: 02/01/10

Instrument ID: E Time Analyzed: 1443

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	2679632	10.34	13364876	11.78	11588300	15.88
	UPPER LIMIT	3751485	10.67	18710826	12.11	16223620	16.21
	LOWER LIMIT	1607779	10.01	8018926	11.45	6952980	15.55
	CLIENT SAMPLE NO.						
01	EA020110LCS	2342840	10.34	11521218	11.78	10307890	15.88
02	MBLK020110EA	2280515	10.34	11454269	11.78	10098069	15.88
03	AA-1	2212270	10.34	11086252	11.78	9764164	15.88
04	IA-11	1970152	10.34	9802655	11.78	8702944	15.88
05	IA-10	2232839	10.34	11222612	11.77	8942407	15.88
06	IA-12	2246202	10.34	11332248	11.77	10266546	15.88
07	IA-13	2164700	10.34	10947779	11.77	9718531	15.88
08							
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22							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sample Data Summary – TO-15 Volatile

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818507

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 818507D3

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/04/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 12.8

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	8.6	
76-14-2	1,2-Dichlorotetrafluoroethan	2.6	U
75-01-4	Vinyl Chloride	2.6	U
106-99-0	1,3-Butadiene	6.4	U
74-83-9	Bromomethane	2.6	U
75-00-3	Chloroethane	6.4	U
593-60-2	Bromoethene	2.6	U
75-69-4	Trichlorofluoromethane	2.6	
75-35-4	1,1-Dichloroethene	2.6	U
107-05-1	3-Chloropropene	6.4	U
75-09-2	Methylene chloride	6.4	U
1634-04-4	Methyl tert-Butyl Ether	6.4	U
156-60-5	trans-1,2-Dichloroethene	2.6	U
110-54-3	n-Hexane	6.4	U
75-34-3	1,1-Dichloroethane	23	
156-59-2	cis-1,2-Dichloroethene	22	
540-59-0	1,2-Dichloroethene,Total	22	
67-66-3	Chloroform	2.6	U
71-55-6	1,1,1-Trichloroethane	8.2	
110-82-7	Cyclohexane	3.8	
56-23-5	Carbon tetrachloride	2.6	U
540-84-1	2,2,4-Trimethylpentane	2.6	U
71-43-2	Benzene	2.6	U
107-06-2	1,2-Dichloroethane	2.6	U
142-82-5	n-Heptane	2.6	U
79-01-6	Trichloroethene	160	
78-87-5	1,2-Dichloropropane	2.6	U
75-27-4	Bromodichloromethane	2.6	U
10061-01-5	cis-1,3-Dichloropropene	2.6	U
108-88-3	Toluene	4.3	
10061-02-6	trans-1,3-Dichloropropene	2.6	U
79-00-5	1,1,2-Trichloroethane	2.6	U
127-18-4	Tetrachloroethene	2.6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-11

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818507

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: 818507D3

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/04/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 12.8

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	2.6	U
106-93-4	1,2-Dibromoethane	2.6	U
100-41-4	Ethylbenzene	2.6	U
1330-20-7	Xylene (m,p)	5.1	U
95-47-6	Xylene (o)	2.6	U
1330-20-7	Xylenes, Total	2.6	U
75-25-2	Bromoform	2.6	U
79-34-5	1,1,2,2-Tetrachloroethane	2.6	U
622-96-8	4-Ethyltoluene	2.6	U
108-67-8	1,3,5-Trimethylbenzene	2.6	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818510

Sample wt/vol: 33.00 (g/mL) ML Lab File ID: 818510D

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 401.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	200	U
76-14-2	1,2-Dichlorotetrafluoroethan	80	U
75-01-4	Vinyl Chloride	80	U
106-99-0	1,3-Butadiene	200	U
74-83-9	Bromomethane	80	U
75-00-3	Chloroethane	200	U
593-60-2	Bromoethene	80	U
75-69-4	Trichlorofluoromethane	80	U
75-35-4	1,1-Dichloroethene	90	
107-05-1	3-Chloropropene	200	U
75-09-2	Methylene chloride	200	U
1634-04-4	Methyl tert-Butyl Ether	200	U
156-60-5	trans-1,2-Dichloroethene	80	U
110-54-3	n-Hexane	200	U
75-34-3	1,1-Dichloroethane	80	U
156-59-2	cis-1,2-Dichloroethene	3300	
540-59-0	1,2-Dichloroethene,Total	3300	
67-66-3	Chloroform	80	U
71-55-6	1,1,1-Trichloroethane	80	U
110-82-7	Cyclohexane	80	U
56-23-5	Carbon tetrachloride	80	U
540-84-1	2,2,4-Trimethylpentane	80	U
71-43-2	Benzene	80	U
107-06-2	1,2-Dichloroethane	80	U
142-82-5	n-Heptane	80	U
79-01-6	Trichloroethene	15000	
78-87-5	1,2-Dichloropropane	80	U
75-27-4	Bromodichloromethane	80	U
10061-01-5	cis-1,3-Dichloropropene	80	U
108-88-3	Toluene	390	
10061-02-6	trans-1,3-Dichloropropene	80	U
79-00-5	1,1,2-Trichloroethane	80	U
127-18-4	Tetrachloroethene	80	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

AKRF2 SAMPLE NO.

SS-12

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: 818510

Sample wt/vol: 33.00 (g/mL) ML Lab File ID: 818510D

Level: (low/med) LOW Date Received: 01/22/10

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 401.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	80	U
106-93-4	1,2-Dibromoethane	80	U
100-41-4	Ethylbenzene	80	U
1330-20-7	Xylene (m,p)	160	U
95-47-6	Xylene (o)	80	U
1330-20-7	Xylenes, Total	80	U
75-25-2	Bromoform	80	U
79-34-5	1,1,2,2-Tetrachloroethane	80	U
622-96-8	4-Ethyltoluene	80	U
108-67-8	1,3,5-Trimethylbenzene	80	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK020310GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: MBLK020310GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GEAB01I

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	0.50	U
76-14-2	1,2-Dichlorotetrafluoroethan	0.20	U
75-01-4	Vinyl Chloride	0.20	U
106-99-0	1,3-Butadiene	0.50	U
74-83-9	Bromomethane	0.20	U
75-00-3	Chloroethane	0.50	U
593-60-2	Bromoethene	0.20	U
75-69-4	Trichlorofluoromethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
107-05-1	3-Chloropropene	0.50	U
75-09-2	Methylene chloride	0.50	U
1634-04-4	Methyl tert-Butyl Ether	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
110-54-3	n-Hexane	0.50	U
75-34-3	1,1-Dichloroethane	0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	U
540-59-0	1,2-Dichloroethene,Total	0.20	U
67-66-3	Chloroform	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
110-82-7	Cyclohexane	0.20	U
56-23-5	Carbon tetrachloride	0.20	U
540-84-1	2,2,4-Trimethylpentane	0.20	U
71-43-2	Benzene	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
142-82-5	n-Heptane	0.20	U
79-01-6	Trichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
75-27-4	Bromodichloromethane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
108-88-3	Toluene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK020310GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: MBLK020310GA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GEAB01I

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	0.20	U
106-93-4	1,2-Dibromoethane	0.20	U
100-41-4	Ethylbenzene	0.20	U
1330-20-7	Xylene (m,p)	0.40	U
95-47-6	Xylene (o)	0.20	U
1330-20-7	Xylenes, Total	0.20	U
75-25-2	Bromoform	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
622-96-8	4-Ethyltoluene	0.20	U
108-67-8	1,3,5-Trimethylbenzene	0.20	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA020310LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: GA020310LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GEA10IQ2

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
75-71-8	Dichlorodifluoromethane	10	
76-14-2	1,2-Dichlorotetrafluoroethan	9.5	
75-01-4	Vinyl Chloride	9.8	
106-99-0	1,3-Butadiene	11	
74-83-9	Bromomethane	9.9	
75-00-3	Chloroethane	10	
593-60-2	Bromoethene	9.8	
75-69-4	Trichlorofluoromethane	9.6	
75-35-4	1,1-Dichloroethene	11	
107-05-1	3-Chloropropene	10	
75-09-2	Methylene chloride	10	
1634-04-4	Methyl tert-Butyl Ether	9.6	
156-60-5	trans-1,2-Dichloroethene	10	
110-54-3	n-Hexane	9.6	
75-34-3	1,1-Dichloroethane	9.9	
156-59-2	cis-1,2-Dichloroethene	9.8	
540-59-0	1,2-Dichloroethene,Total	20	
67-66-3	Chloroform	9.5	
71-55-6	1,1,1-Trichloroethane	10	
110-82-7	Cyclohexane	11	
56-23-5	Carbon tetrachloride	10	
540-84-1	2,2,4-Trimethylpentane	10	
71-43-2	Benzene	9.4	
107-06-2	1,2-Dichloroethane	9.9	
142-82-5	n-Heptane	10	
79-01-6	Trichloroethene	9.8	
78-87-5	1,2-Dichloropropane	9.4	
75-27-4	Bromodichloromethane	10	
10061-01-5	cis-1,3-Dichloropropene	9.5	
108-88-3	Toluene	8.7	
10061-02-6	trans-1,3-Dichloropropene	9.4	
79-00-5	1,1,2-Trichloroethane	8.9	
127-18-4	Tetrachloroethene	8.9	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GA020310LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix: (soil/water) AIR Lab Sample ID: GA020310LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: GEA10IQ2

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 02/03/10

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
124-48-1	Dibromochloromethane	10	
106-93-4	1,2-Dibromoethane	9.2	
100-41-4	Ethylbenzene	8.8	
1330-20-7	Xylene (m,p)	17	
95-47-6	Xylene (o)	8.3	
1330-20-7	Xylenes, Total	25	
75-25-2	Bromoform	9.6	
79-34-5	1,1,2,2-Tetrachloroethane	9.0	
622-96-8	4-Ethyltoluene	9.8	
108-67-8	1,3,5-Trimethylbenzene	9.6	

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix Spike - Sample No.: GA020310LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	10		10	100	70-130
1,2-Dichlorotetrafluoro	10		9.5	95	70-130
Vinyl Chloride	10		9.8	98	70-130
1,3-Butadiene	10		11	110	70-130
Bromomethane	10		9.9	99	70-130
Chloroethane	10		10	100	70-130
Bromoethene	10		9.8	98	70-130
Trichlorofluoromethane	10		9.6	96	70-130
1,1-Dichloroethene	10		11	110	70-130
3-Chloropropene	10		10	100	70-130
Methylene chloride	10		10	100	70-130
Methyl tert-Butyl Ether	10		9.6	96	70-130
trans-1,2-Dichloroethen	10		10	100	70-130
n-Hexane	10		9.6	96	70-130
1,1-Dichloroethane	10		9.9	99	70-130
cis-1,2-Dichloroethene	10		9.8	98	70-130
1,2-Dichloroethene,Tota	20		20	100	70-130
Chloroform	10		9.5	95	70-130
1,1,1-Trichloroethane	10		10	100	70-130
Cyclohexane	10		11	110	70-130
Carbon tetrachloride	10		10	100	70-130
2,2,4-Trimethylpentane	10		10	100	70-130
Benzene	10		9.4	94	70-130
1,2-Dichloroethane	10		9.9	99	70-130
n-Heptane	10		10	100	70-130
Trichloroethene	10		9.8	98	70-130
1,2-Dichloropropane	10		9.4	94	70-130
Bromodichloromethane	10		10	100	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Matrix Spike - Sample No.: GA020310LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
cis-1,3-Dichloropropene	10		9.5	95	70-130
Toluene	10		8.7	87	70-130
trans-1,3-Dichloroprope	10		9.4	94	70-130
1,1,2-Trichloroethane	10		8.9	89	70-130
Tetrachloroethene	10		8.9	89	70-130
Dibromochloromethane	10		10	100	70-130
1,2-Dibromoethane	10		9.2	92	70-130
Ethylbenzene	10		8.8	88	70-130
Xylene (m,p)	20		17	85	70-130
Xylene (o)	10		8.3	83	70-130
Xylenes, Total	30		25	83	70-130
Bromoform	10		9.6	96	70-130
1,1,2,2-Tetrachloroetha	10		9.0	90	70-130
4-Ethyltoluene	10		9.8	98	70-130
1,3,5-Trimethylbenzene	10		9.6	96	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 43 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK020310GA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: GEAB01I Lab Sample ID: MBLK020310GA

Date Analyzed: 02/03/10 Time Analyzed: 1944

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: G

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	GA020310LCS	GA020310LCS	GEA10IQ2	1857
02	SS-12	818510	818510D	2350
03	SS-11	818507	818507D3	1619
04				
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COMMENTS:

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: GEA01PV BFB Injection Date: 01/25/10

Instrument ID: G BFB Injection Time: 1621

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	14.8
75	30.0 - 66.0% of mass 95	44.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.4 (0.4)1
174	50.0 - 120.0% of mass 95	96.9
175	4.0 - 9.0% of mass 174	6.6 (6.8)1
176	93.0 - 101.0% of mass 174	93.5 (96.5)1
177	5.0 - 9.0% of mass 176	6.0 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0.2	ASTD0.2	GEA002V	01/25/10	1754
02	ASTD0.5	ASTD0.5	GEA005V	01/25/10	1843
03	ASTD005	ASTD005	GEA05V	01/25/10	1931
04	ASTD010	ASTD010	GEA10V	01/25/10	2020
05	ASTD015	ASTD015	GEA15V	01/25/10	2109
06	ASTD020	ASTD020	GEA20V	01/25/10	2157
07	ASTD040	ASTD040	GEA40V	01/25/10	2245
08					
09					
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FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID: GEA10PV BFB Injection Date: 02/03/10

Instrument ID: G BFB Injection Time: 1625

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	14.9
75	30.0 - 66.0% of mass 95	44.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	50.0 - 120.0% of mass 95	90.7
175	4.0 - 9.0% of mass 174	6.2 (6.9)1
176	93.0 - 101.0% of mass 174	88.9 (98.0)1
177	5.0 - 9.0% of mass 176	5.4 (6.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	GEA10IV	02/03/10	1710
02	GA020310LCS	GA020310LCS	GEA10IQ2	02/03/10	1857
03	MBLK020310GA	MBLK020310GA	GEAB01I	02/03/10	1944
04	SS-12	818510	818510D	02/03/10	2350
05	SS-11	818507	818507D3	02/04/10	1619
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FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Calibration Time(s): 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GEA002V RRF0.5=GEA005V
RRF5 =GEA05V RRF10 =GEA10V RRF15 =GEA15V

COMPOUND	RRF0.2	RRF0.5	RRF5	RRF10	RRF15	$\overline{RRF}$	% RSD	
Dichlorodifluoromethane		1.366	1.434	1.433	1.448			
1,2-Dichlorotetrafluoroethan	1.270	1.332	1.360	1.381	1.362			
Vinyl Chloride	0.366	0.416	0.440	0.458	0.468			
1,3-Butadiene	0.216	0.256	0.285	0.304	0.313			
Bromomethane	0.630	0.683	0.695	0.720	0.711			
Chloroethane		0.262	0.264	0.269	0.270			
Bromoethene	0.737	0.763	0.830	0.850	0.866			
Trichlorofluoromethane	2.554	2.275	2.359	2.403	2.391			
1,1-Dichloroethene	0.600	0.689	0.722	0.728	0.723			
3-Chloropropene	0.510	0.556	0.612	0.624	0.624			
Methylene chloride		0.860	0.701	0.685	0.663			
Methyl tert-Butyl Ether	1.206	1.219	1.403	1.574	1.344			
trans-1,2-Dichloroethene	0.895	0.960	1.031	1.024	1.000			
n-Hexane	1.081	0.819	0.892	0.903	0.893			
1,1-Dichloroethane *	1.060	1.195	1.272	1.282	1.237			*
cis-1,2-Dichloroethene	0.735	0.785	0.849	0.860	0.826			
1,2-Dichloroethene,Total	0.815	0.872	0.940	0.942	0.913			
Chloroform	1.546	1.716	1.792	1.766	1.695			
1,1,1-Trichloroethane	0.383	0.432	0.429	0.465	0.456			
Cyclohexane	0.182	0.209	0.208	0.226	0.218			
Carbon tetrachloride	0.421	0.475	0.483	0.531	0.534			
2,2,4-Trimethylpentane	0.547	0.619	0.618	0.662	0.638			
Benzene	0.509	0.495	0.475	0.506	0.484			
1,2-Dichloroethane	0.207	0.242	0.231	0.253	0.242			
n-Heptane	0.181	0.196	0.200	0.214	0.205			
Trichloroethene	0.245	0.269	0.264	0.282	0.273			
1,2-Dichloropropane	0.128	0.159	0.149	0.162	0.154			
Bromodichloromethane	0.308	0.370	0.399	0.438	0.417			
cis-1,3-Dichloropropene	0.202	0.251	0.256	0.290	0.275			
Toluene	0.370	0.382	0.356	0.375	0.359			
trans-1,3-Dichloropropene	0.201	0.247	0.261	0.304	0.287			
1,1,2-Trichloroethane	0.164	0.204	0.185	0.197	0.189			
Tetrachloroethene	0.383	0.432	0.400	0.409	0.399			
Dibromochloromethane	0.341	0.411	0.465	0.518	0.508			
1,2-Dibromoethane	0.317	0.383	0.390	0.422	0.406			
Ethylbenzene	0.631	0.738	0.729	0.771	0.716			
Xylene (m,p)	0.258	0.299	0.306	0.326	0.305			

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Calibration Time(s): 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF0.2=GEA002V RRF0.5=GEA005V
RRF5 =GEA05V RRF10 =GEA10V RRF15 =GEA15V

COMPOUND	RRF0.2	RRF0.5	RRF5	RRF10	RRF15	$\overline{RRF}$	% RSD
Xylene (o)	0.248	0.292	0.304	0.334	0.314		
Xylenes, Total	0.248	0.292	0.304	0.334	0.314		
Bromoform	0.316	0.414	0.478	0.544	0.527		
1,1,2,2-Tetrachloroethane	0.386	0.449	0.463	0.507	0.466		
4-Ethyltoluene	0.501	0.658	0.804	0.938	0.849		
1,3,5-Trimethylbenzene	0.394	0.528	0.656	0.765	0.693		

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Calibration Time(s): 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF20 =GEA20V RRF40 =GEA40V

COMPOUND	RRF20	RRF40				$\overline{RRF}$	% RSD
Dichlorodifluoromethane	1.390	1.334				1.401	3.2
1,2-Dichlorotetrafluoroethan	1.316	1.258				1.326	3.6
Vinyl Chloride	0.454	0.447				0.436	8.0
1,3-Butadiene	0.305	0.302				0.283	12.5
Bromomethane	0.691	0.687				0.688	4.2
Chloroethane	0.257	0.255				0.263	2.3
Bromoethene	0.838	0.813				0.814	5.8
Trichlorofluoromethane	2.322	2.260				2.366	4.2
1,1-Dichloroethene	0.699	0.684				0.692	6.4
3-Chloropropene	0.599	0.597				0.589	7.1
Methylene chloride	0.638	0.618				0.694	12.5
Methyl tert-Butyl Ether	1.376	1.531				1.379	10.2
trans-1,2-Dichloroethene	0.954	0.904				0.967	5.6
n-Hexane	0.851	0.819				0.894	10.0
1,1-Dichloroethane *	1.188	1.127				1.194	6.7*
cis-1,2-Dichloroethene	0.789	0.738				0.797	6.3
1,2-Dichloroethene,Total	0.871	0.821				0.882	5.9
Chloroform	1.630	1.552				1.671	5.9
1,1,1-Trichloroethane	0.454	0.382				0.429	7.9
Cyclohexane	0.215	0.179				0.205	8.8
Carbon tetrachloride	0.501	0.464				0.487	8.1
2,2,4-Trimethylpentane	0.626	0.542				0.607	7.5
Benzene	0.479	0.430				0.482	5.5
1,2-Dichloroethane	0.241	0.218				0.233	6.9
n-Heptane	0.201	0.174				0.196	7.1
Trichloroethene	0.269	0.226				0.261	7.3
1,2-Dichloropropane	0.152	0.137				0.149	8.1
Bromodichloromethane	0.418	0.373				0.389	11.2
cis-1,3-Dichloropropene	0.276	0.256				0.258	11.0
Toluene	0.360	0.334				0.362	4.3
trans-1,3-Dichloropropene	0.291	0.275				0.266	13.0
1,1,2-Trichloroethane	0.187	0.170				0.185	7.7
Tetrachloroethene	0.394	0.339				0.394	7.3
Dibromochloromethane	0.508	0.464				0.459	14.0
1,2-Dibromoethane	0.408	0.366				0.384	9.1
Ethylbenzene	0.701	0.610				0.699	8.3
Xylene (m,p)	0.298	0.265				0.294	8.2

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 6
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Calibration Time(s): 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

LAB FILE ID: RRF20 =GEA20V RRF40 =GEA40V

COMPOUND	RRF20	RRF40				$\overline{RRF}$	% RSD
Xylene (o)	0.310	0.284				0.298	9.2
Xylenes, Total	0.310	0.284				0.298	9.2
Bromoform	0.514	0.444				0.462	17.2
1,1,2,2-Tetrachloroethane	0.458	0.407				0.448	8.9
4-Ethyltoluene	0.850	0.826				0.775	19.0
1,3,5-Trimethylbenzene	0.685	0.665				0.626	19.9

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date: 02/03/10 Time: 1710

Lab File ID: GEA10IV Init. Calib. Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Init. Calib. Times: 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	1.401	1.200	0.01	14.3	30.0
1,2-Dichlorotetrafluoroethan	1.326	1.099	0.01	17.1	30.0
Vinyl Chloride	0.436	0.389	0.01	10.8	30.0
1,3-Butadiene	0.283	0.255	0.01	9.9	30.0
Bromomethane	0.688	0.600	0.01	12.8	30.0
Chloroethane	0.263	0.234	0.01	11.0	30.0
Bromoethene	0.814	0.680	0.01	16.5	30.0
Trichlorofluoromethane	2.366	1.935	0.01	18.2	30.0
1,1-Dichloroethene	0.692	0.578	0.01	16.5	30.0
3-Chloropropene	0.589	0.524	0.01	11.0	30.0
Methylene chloride	0.694	0.574	0.01	17.3	30.0
Methyl tert-Butyl Ether	1.379	1.275	0.01	7.5	30.0
trans-1,2-Dichloroethene	0.967	0.852	0.01	11.9	30.0
n-Hexane	0.894	0.745	0.01	16.7	30.0
1,1-Dichloroethane	1.194	1.053	0.1	11.8	30.0
cis-1,2-Dichloroethene	0.797	0.684	0.01	14.2	30.0
1,2-Dichloroethene,Total	0.882	0.768	0.01	12.9	30.0
Chloroform	1.671	1.453	0.01	13.0	30.0
1,1,1-Trichloroethane	0.429	0.353	0.01	17.7	30.0
Cyclohexane	0.205	0.172	0.01	16.1	30.0
Carbon tetrachloride	0.487	0.394	0.01	19.1	30.0
2,2,4-Trimethylpentane	0.607	0.528	0.01	13.0	30.0
Benzene	0.482	0.393	0.01	18.5	30.0
1,2-Dichloroethane	0.233	0.198	0.01	15.0	30.0
n-Heptane	0.196	0.174	0.01	11.2	30.0
Trichloroethene	0.261	0.211	0.01	19.2	30.0
1,2-Dichloropropane	0.149	0.128	0.01	14.1	30.0
Bromodichloromethane	0.389	0.337	0.01	13.4	30.0
cis-1,3-Dichloropropene	0.258	0.220	0.01	14.7	30.0
Toluene	0.362	0.284	0.01	21.5	30.0
trans-1,3-Dichloropropene	0.266	0.226	0.01	15.0	30.0
1,1,2-Trichloroethane	0.185	0.154	0.01	16.8	30.0
Tetrachloroethene	0.394	0.302	0.01	23.4	30.0
Dibromochloromethane	0.459	0.388	0.01	15.5	30.0
1,2-Dibromoethane	0.384	0.317	0.01	17.4	30.0
Ethylbenzene	0.699	0.594	0.01	15.0	30.0
Xylene (m,p)	0.294	0.243	0.01	17.3	30.0

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Instrument ID: G Calibration Date: 02/03/10 Time: 1710

Lab File ID: GEA10IV Init. Calib. Date(s): 01/25/10 01/25/10

Heated Purge: (Y/N) N Init. Calib. Times: 1754 2245

GC Column: RTX-624 ID: 0.32 (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Xylene (o)	0.298	0.249	0.01	16.4	30.0
Xylenes, Total	0.298	0.249	0.01	16.4	30.0
Bromoform	0.462	0.379	0.01	18.0	30.0
1,1,2,2-Tetrachloroethane	0.448	0.392	0.01	12.5	30.0
4-Ethyltoluene	0.775	0.694	0.01	10.4	30.0
1,3,5-Trimethylbenzene	0.626	0.568	0.01	9.3	30.0

FORM 8
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON Contract: 29000

Lab Code: STLV Case No.: 29000 SAS No.: SDG No.: NY135606

Lab File ID (Standard): GEA10IV Date Analyzed: 02/03/10

Instrument ID: G Time Analyzed: 1710

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

		IS1(BCM) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CBZ) AREA #	RT #
	12 HOUR STD	617537	9.75	2780570	11.12	2632824	15.20
	UPPER LIMIT	864552	10.08	3892798	11.45	3685954	15.53
	LOWER LIMIT	370522	9.42	1668342	10.79	1579694	14.87
	CLIENT SAMPLE NO.						
01	GA020310LCS	584850	9.74	2382514	11.12	2267247	15.19
02	MBLK020310GA	515744	9.75	2418368	11.12	2198599	15.19
03	SS-12	544146	9.74	2521701	11.12	2099027	15.19
04	SS-11	454632	9.75	2137194	11.12	1949751	15.20
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area
AREA LOWER LIMIT = - 40% of internal standard area
RT UPPER LIMIT = + 0.33 minutes of internal standard RT
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Magna Metals Site

NYSDEC Site No. 360003

CORTLANDT, NEW YORK

Soil Vapor Investigation Report

AKRF Project Number: 40256

Prepared by:

AKRF, Inc.
34 South Broadway, Suite 314
White Plains, NY 10601

APRIL 2011

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Table 1 Subslab Vapor Analytical Results
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FIGURES

Figure 1 Project Site Location Map
Figure 2 Sampling Locations

APPENDICES

Appendix A Polymedco Product Inventory Form
Appendix B Photographic Log
Appendix C Sampling Logs
Appendix D Analytical Data Report

1.0 INTRODUCTION

Investigation at the Magna Metals Site, located in Cortlandt, New York, has been conducted to comply with a New York State Department of Environmental Conservation's (NYSDEC) Consent Order (Site No. 360003). In November 2006, the NYSDEC issued correspondence requesting sampling of the office/warehouse building located east of the former Magna Metals building to confirm that soil vapor intrusion is not occurring. In June 2007, AKRF, Inc. (AKRF) submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In September 2007, the NYSDEC issued correspondence requesting that additional work be performed. In May 2008, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed to satisfy the NYSDEC requirements. In February 2009, the NYSDEC issued correspondence requesting a third sampling event be performed in accordance with the December 2007 Soil Vapor Investigation Work Plan. In June 2009, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed in March 2009 to satisfy the NYSDEC requirements. On July 3, 2009, the NYSDEC issued correspondence requesting that a Soil Vapor Monitoring Work Plan for the Polymedco office facility be submitted to the NYSDEC and the New York Department of Health (NYSDOH) for review and approval. In August 2009, the NYSDEC approved the Work Plan prepared by AKRF to complete soil vapor monitoring for the Polymedco office facility and required annual sampling to take place prior to January 31 of each heating season until the completion of vapor mitigation. In March 2010, AKRF submitted a Soil Vapor Investigation Report to the NYSDEC that summarized the results of sub-slab soil vapor samples and air sampling completed in January 2010 to satisfy the NYSDEC requirements. This report documents the collection and analysis of sub-slab soil vapor and ambient air samples collected during the January 2011 to satisfy the NYSDEC requirements.

2.0 SITE DESCRIPTION

2.1 Site Location

The Magna Metals site is located in the Town of Cortlandt, Westchester County, New York, near the intersection of Furnace Dock Road and Maple Avenue. A site location map is included in Figure 1. Nearby towns include Peekskill and Croton-on-Hudson, and the Hudson River is located 3 miles west of the site.

2.2 Site and Vicinity Characteristics

Locally, the site is part of a larger commercial property owned by Baker Properties, having several operating businesses which currently include Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. The office/warehouse building was reported by the owner to include some manufacturing activities. Baker Properties acquired the property from ISC Properties, Inc. (ISCP) in 1982, and has leased it to various tenants. The identity of these tenants, their use of the property, and their waste disposal practices are unknown. The Croton Egg Farm and an inactive emery mine are located to the west and to the north-northwest of the site, respectively. To the north, south, and east of the project site are residential areas. A wetland area is located between the site and the residential area southwest of the site.

2.3 Site Geology, Hydrogeology and Subsurface Characteristics

Topography is variable throughout the 0.5-mile radius from the site. Elevations range from 300 to 600 feet above mean sea level (MSL). On the former Magna Metals site, topography ranges from

360 feet MSL along the eastern site boundary to 320 feet MSL along the western site boundary. Stormwater drainage flows towards the west, following site topography, and drains into an unnamed tributary to Furnace Brook. The tributary flows south/southwest and discharges into a pond located in a large wetland area.

Stormwater on the former Magna Metals site leaves the site via overland flow and enters into the unnamed tributary. One catch basin was observed by Tetra Tech FW, Inc. (TTI) on the former site property. This basin is located in the central western portion of the site and collects discharge water from a roadway/parking area. The roadway is a mix of gravel and pavement. A search for the catch basin's outfall pipe was conducted along the unnamed tributary. An outfall pipe was not located. The stormwater collection system on Furnace Dock Road discharges into the unnamed tributary near the intersection of Furnace Dock Road and Gilman Lane.

The geologic characteristics of the subsurface conditions at the site consist primarily of a sandy to silty sand overburden unit, approximately 10 to 20 feet thick, overlying bedrock. The bedrock is mapped by the New York State Museum and Science Service as Hornblende Norite, which is a part of the Cortlandt Mafic Complex. Overburden groundwater exists in the form of a very shallow overburden aquifer (i.e., typically less than five feet in thickness). Groundwater flow from the site is in the western direction towards the stream and wetland area.

Results of slug tests completed by TTI indicate a range in hydraulic conductivity values from 5.3 x 10^{-5} cm/sec (or 0.16 ft/day) at MW-1 in the higher portion of the site to 2.2 x 10^{-3} cm/sec (6.2 ft/day) at MW-3 in the lower portion of the former leach pit area. Previous groundwater sampling by TTI indicated that some monitoring wells were observed to be dry during seasonal low groundwater conditions.

2.4 Review of Site History

Metal plating, polishing, and lacquering operations were conducted at the Magna Metals site from 1955 to 1979. During operation, iron, lead, copper, nickel, and zinc chlorides, cyanides, and sulfates were discharged to a series of leaching pits. Spent trichloroethylene (TCE) was drummed and removed. The site building is currently utilized as commercial rental space and includes three tenants: Polymedco, Inc., Motion Labs, Inc., and International Purchasing Systems. Polymedo, Inc. is a marketer and distributer of medical testing instruments and business activities include corporate management, laboratory testing of equipment, and warehouse storage. Motion Labs, Inc. is a development and manufacturing company specializing in electrical power distribution and motor/hoist control systems for rigging, lighting, staging and sound. International Purchasing Systems operates as a wholesale distributer of retail merchandise.

2.5 Previous Studies

Between 1978 and 1984, site investigations were completed by the NYSDOH, the NYSDEC, and William Cosulich Associates to determine if property uses had resulted in contamination. The investigations concluded that soil, groundwater, sediment, and, surface water contamination existed at the site. Between 1998 and 2009, several phases of investigation were completed by Foster Wheeler Environmental Corporation (predecessor to TTI), TTI, and AKRF to delineate the nature and extent of contamination, review the potential remedial options that could be performed, and to complete a vapor intrusion assessment at the site. Copies of reports containing the results for each phase of investigation are available for review at NYSDEC.

3.0 FIELD PROGRAM

The objective of the field-sampling program was to confirm that soil vapor intrusion is not occurring in office/warehouse building located east of the former Magna Metals building. The field procedures and sampling activities were completed in accordance with NYSDOH's Guidance for Evaluating Soil Vapor Instruction in the State of New York, October 2006. The field program is outlined in Section 3.1, and the subsequent sections provide a summary of sampling implementation. The field program was conducted in accordance with the detailed methodologies described in the Soil Vapor Sampling Plan (SVSP), which was approved by the NYSDEC on August 21, 2009.

3.1 Field Program Summary

Site access for the property and study building was agreed upon between ISCP and the property owner/manager through an access agreement. Sub-slab soil-gas samples were collected at two locations and indoor air samples were collected at three locations from the lowest level of the Polymedco, Inc office building area. Figure 2 shows the project site building and the locations for soil gas sampling.

3.2 Pre-Sampling Survey

A pre-sampling survey was previously conducted on March 16, 2007, prior to initiating the March 2007 soil vapor sampling program. The survey was completed to document any factors that may affect indoor air quality and included interviews with building owners and/or building occupants, documentation of the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, building operations, product inventory, and any other known factors that may affect indoor air quality. Copies of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory forms and a summary of the inspection results were included in the June 2007 Soil Vapor Investigation Report. On February 21, 2008, a pre-sampling inspection walkthrough was complete prior to the March 2008 sampling event to document any material changes associated with facility operations, chemical storage, and/or structural/building components that may have occurred since the initial pre-sampling survey conducted in March 2007. Copies of the building inventory forms and a summary of the walk through results were included in the May 2008 Soil Vapor Investigation Report.

On January 19, 2011, AKRF completed a sampling inspection walkthrough of the Polymedco office to document any material changes associated with the facility and to confirm that the sampling locations were accessible. Mr. Steve Grens and Ms. Elizabeth Baird of AKRF were accompanied by Matt Hoskins of Environmental Resource Management (ERM). The building occupants and facility operations were observed to be unchanged from the previous inspection.

A photoionization detector (PID) capable of measuring in parts per billion (ppb) was used during the survey to sample ambient air for the presence of VOCs. Prior to conducting the survey, the PID was calibrated with 100 parts per million (ppm) isobutylene in accordance with the manufacturer's instructions. Compared to the previous pre-sampling inspections in February 2007, March 2008, March 2009, and January 2010, there were no observed changes to the building characteristics, air flow patterns, heating, venting and air conditioning, occupancy, water and sewage utilities, or building operations that would change the sampling parameters. A review of product storage areas indicated that product inventory was consistent with past inspections. A comprehensive product inventory of the Polymedco office is included in Appendix A. Photographs taken during the survey are included in Appendix B. The building layout and tenant locations on the entire property are shown on Figure 2.

Polymedco, Inc.

Polymedco occupied one section of the site building; the western section consisted of a one story office area (see Figure 2). There was no known chemical storage in the office area. The lab coats that were stored in the laboratory were reported as being laundered and not dry cleaned. The laboratory was observed to contain a refrigerated storage unit that stored reagents for control testing of the laboratory machines. The maintenance room contained shelved storage units that stored a variety of containerized chemicals and cleaning products. Items of note included buckets of paint, spray paint, turpentine, citrus degreaser, insect spray, varnish cleaner, greased lightning degreaser, wood polish, tiki-torch oil, metal polish, and spray adhesive. A locked storage cabinet was present in the storage room and contained an unknown amount and type of containerized chemicals. Organic vapors were not detected with the PID the chemical storage areas.

Sample Point/Sample Location Inspection

The two permanent sub-slab sample point locations (SV-11 and SV-12) were observed to be in good condition and were accessible. The three indoor air sampling locations (IA-10 through IA-12) that were confirmed by the NYSDEC in August 2009 were also accessible and cleared for sampling. The sampling locations are shown on Figure 2. The rationale for each sampling location is summarized as follows:

Soil Gas Well I.D.	Sampling Rationale
IA-10	Indoor air sample located in the southeastern corner of the office building
SV-11/IA-11	Soil gas investigation in the central area of the Polymedco office. Sub-slab point (SV-11) through floor in employee office. Indoor air sample (IA-11) on shelf in employee office.
SV-12/IA-12	Soil gas investigation in the south end of the Polymedco office area. Sub-slab point (SV-12) through concrete floor in lab coat closet. Indoor air sample (IA-12) on shelf in closet.

3.3 Sub-Slab Soil Gas Sampling

On January 19, 2011, AKRF conducted the field sampling program in accordance with the SVSP. AKRF personnel were accompanied by Matt Hoskins of ERM. Prior to initiating sample collection, each sub-slab sampling point was sealed, purged, and screened for the helium tracer gas and VOCs as indicated in the SVSP. Following purging, soil gas samples were collected for VOC analysis by connecting the sample tubing to a six-liter Summa canister equipped with a vacuum gauge and flow regulator set by the laboratory to collect a six-liter sample over an 8-hour sampling period. The sampling period was stopped after 8 hours or when the vacuum inside the summa canister was between 4 and 7 inches of mercury (“Hg). Photographs of the sampling process are included in Appendix B. Sampling logs are included in Appendix C. Field screening results and sampling parameters are summarized as follows:

Sample Location	Sample ID	PID Reading (ppm)	Helium Tracer Detection	Sampling Period (hrs)	Starting Vacuum ("Hg)	Ending Vacuum ("Hg)
SV-11	SS-11	8.6	No	7.25	29	5
SV-12	SS-12	72.2	No	8	28	15

3.4 Indoor Air Sampling

Indoor air samples (labeled IA-10 through IA-12 on Figure 2) were collected concurrently with the soil gas sampling. Sample IA-13 was collected as a duplicate of IA-12. All three indoor air sampling locations were placed in the locations confirmed by the NYSDOH in August 2009. The sampling was conducted in accordance with SVSP, and the parameters are summarized in the following table:

Sample ID	PID Reading (ppm)	Sampling Period (hrs)	Starting Vacuum ("Hg)	Ending Vacuum ("Hg)
IA-10	0	8	30	7
IA-11	0	7.25	28	6
IA-12	0	8	28	4
IA-13	0	8	27	16

3.5 Quality Assurance / Quality Control

In addition to the laboratory analysis of the field samples, additional analysis was included for quality control measures. These samples included one duplicate, reported as IA-13, collected at the indoor air location IA-12, and one background ambient (outdoor) air sample, reported as AA-1, which was collected on the southwestern corner of the building.

3.6 Laboratory Methods

The samples were analyzed for VOCs by EPA Method TO-15 with a detection limit of 1 µg/m^3 for all compounds, except for trichloroethylene, which had a detection limit of 0.25 µg/m^3 for indoor air samples. All sample analysis was performed by TestAmerica of South Burlington, Vermont, a NYSDOH Environmental Laboratory Approval Program (ELAP) laboratory certified to perform NYSDEC Analytical Services Protocol (ASP). The laboratory produced Category B deliverables. Samples were shipped to the laboratory with appropriate chain of custody documentation. The laboratory report is included in Appendix D.

4.0 ANALYTICAL RESULTS

4.1 Laboratory Results

Sub-Slab Samples

Sub-slab analytical results are summarized in Table 1. The sampling results from March 2007, March 2008, March 2009, and January 2010 are included in the table for comparison. Concentrations of detected VOCs were compared to the action level guidance values (from Matrix 1 and Matrix 2) of the NYSDOH Soil Vapor Intrusion Guidance and values in NYSDOH Summary of Indoor Levels of Volatile Organic Compounds from Fuel Oil Heated Homes in New York State, 1997-2003, which provides a means of comparison of indoor air to background conditions.

TCE detections of 1,300 µg/m^3 and 65,000 µg/m^3were recorded at locations SV-11 and SV-12, respectively, above the action levels in Matrix 1. PCE was not detected in either of the SV-11 and SV-12 locations. Cis-1,2-dichloroethylene (DCE) was detected at locations SV-11 at concentrations of 9,800 µg/m^3. 1,1,1-trichloroethane (TCA) and carbon tetrachloride were not

detected in any of the collected sub-slab samples. Toluene was detected in both samples with a maximum value of 470 µg/m^3 at location SV-12. The laboratory results were consistent with the March 2007, March 2008, March 2009, and January 2010 sampling events.

Indoor Air Samples

Indoor air analytical results and guidance values included in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance are included in Table 2. TCE was detected in the indoor air samples at concentrations ranging from 2.3 to 5.4 µg/m^3. The concentration of TCE in sample IA-12 (5.1 µg/m^3) and IA-13 (5.4 µg/m^3) exceeded the NYSDOH guidance values of 5 µg/m^3. IA-13 was a duplicate sample of IA-12. The concentration of TCE in sample IA-10 (2.3 µg/m^3) and IA-11 (3.5 µg/m^3) were below the NYSDOH guidance value. PCE was not detected in the four indoor air samples. Cis-1,2-DCE was detected in the indoor air samples at concentrations ranging from 0.17 to 0.34 µg/m^3, which was below the Indoor Air Upper Fence value of 0.41 µg/m^3. Toluene was detected at all locations, with the highest value of 2.3 µg/m^3 in indoor air sample IA-11. Several aromatic VOCs, including benzene, ethylbenzene, and xylenes, were detected in the indoor samples at concentrations ranging from 0.25 to 1.1 µg/m^3. Each of these compounds were not detected in the sub-slab samples and are not considered a result of vapor intrusion. Each of these compounds was also detected in the ambient air (outdoor) sample. Carbon tetrachloride was detected in all three indoor air samples at concentrations ranging from 0.32 to 0.42 µg/m^3. This compound was also detected in the outdoor air sample at a concentration of 0.48 µg/m^3 and is not considered to be a result of vapor intrusion. The remaining detections were at levels consistent with the outdoor air sample results and below the NYSDOH Upper Fence values.

5.0 SUMMARY OF FINDINGS

TCE was detected in indoor air sample IA-12 and IA-13 (duplicate of IA-12) at concentrations of 5.1 and 5.4 µg/m^3, which exceeded the indoor air guidance of 5 µg/m^3 in Table 3.1 of the NYSDOH Soil Vapor Intrusion Guidance. The remaining indoor air samples contained TCE at concentrations of 2.3 and 3.5 µg/m^3, which were below the NYSDOH's guidance for TCE. Elevated concentrations of TCE, and to a lesser extent several other volatile organic compounds, were detected in the sub-slab soil gas in both SV-11 and SV-12.

6.0 REFERENCES

Foster Wheeler Environmental Corporation; *Remedial Investigation/Feasibility Study (RI/FS), Magna Metals Site*, Cortlandt, New York; June 1998.

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New York State Department of Environmental Conservation, Division of Environmental Remediation, *DER-13/Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York*, October 2006.

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TABLES

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-11 (Polymedco Office)				
Sample ID	Soil Vapor	Indoor Air	SV-11(S.S)	SV-11	SS-11	SS-11	SS-11
Lab Sample ID	Guidance Values	Value	JTPG31AD	742889	789544	818507	200-3486-3
Date Sampled	Intrusion	Upper Fence	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2011
Dilution					5	12.8	10
µg/m^3	µg/m^3	µg/m^3					
1,1,1-Trichloroethane	100/1000	2.5	8.7 U	6 U	5.5 U	45	11 U
1,1,2,2-Tetrachloroethane	NS	0.38	11 U	7.6 U	6.9 U	18 U	14 U
1,1,2-Trichloroethane	NS	0.38	8.7 U	6 U	5.5 U	14 U	11 U
1,1-Dichloroethane	NS	0.38	6.5 U	4.5 U	4 U	93	8.1 U
1,1-Dichloroethene	NS	0.4	6.3 U	4.4 U	4 U	10 U	7.9 U
1,2-Dibromoethane (EDB)	NS	0.38	12 U	8.5 U	7.7 U	20 U	15 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	11 U	7.7 U	7 U	18 U	14 U
1,2-Dichloroethane	NS	0.37	6.5 U	4.5 U	4 U	11 U	8.1 U
1,2-Dichloropropane	NS	0.39	7.4 U	5.1 U	4.6 U	12 U	9.2 U
1,3,5-Trimethylbenzene	NS	3.9	7.9 U	5.4 U	4.9 U	13 U	9.8 U
1,3-Butadiene	NS	0.49	7.1 U	6.2 U	5.5 U	14 U	4.4 U
2,2,4-Trimethylpentane	NS	NL	19 U	5.1 U	4.7 U	12 U	9.3 U
3-Chloropropene	NS	NL	5	8.8 U	7.8 U	20 U	16 U
4-Ethyltoluene	NS	NL	16 U	5.4 U	4.9 U	13 U	9.8 U
Benzene	NS	13	5.1 U	3.5 U	3.2 U	8.3 U	6.4 U
Bromodichloromethane	NS	NL	11 U	7.4 U	6.7 U	17 U	13 U
Bromoform	NS	NL	17 U	11 U	10 U	27 U	21 U
Bromomethane	NS	0.48	6.2 U	4.3 U	3.9 U	10 U	7.8 U
Carbon tetrachloride	5/50/250	1.3	5 U	6.9 U	6.3 U	16 U	13 U
Chloroethane	NS	0.39	4.2 U	2.9 U	6.6 U	17 U	13 U
Chloroform	NS	1.2	7.8 U	5.4 U	4.9 U	13 U	9.8 U
cis-1,2-Dichloroethene	NS	0.41	6.3 U	4.4 U	4 U	87	7.9 U
cis-1,3-Dichloropropene	NS	0.38	7.3 U	5 U	4.5 U	12 U	9.1 U
Cyclohexane	NS	6.3	170	4.1	12	13	6.9 U
Dibromochloromethane	NS	NL	14 U	9.4 U	8.5 U	22 U	17 U
Dichlorodifluoromethane	NS	10	7.9 U	14 U	12 U	43	25 U
Ethylbenzene	NS	6.4	6.9 U	4.8 U	4.3 U	11 U	8.7 U
Methyl tert-butyl ether	NS	14	29 U	10 U	9 U	23 U	22 U
Methylene Chloride	NS	16	NA	9.7 U	8.7 U	22 U	7.2 U
m-Xylene & p-Xylene	NS	11	16	4.8 U	11 U	22 U	17 U
n-Heptane	NS	18	16 U	4.5 U	4.1 U	11 U	8.2 U
n-Hexane	NS	14	84	9.9 U	8.8 U	23 U	7.0 U
o-Xylene	NS	7.1	6.9 U	4.8 U	4.3 U	11 U	8.7 U
Tetrachloroethene	100/1000	2.5	11 U	7.5 U	6.8 U	18 U	14 U
Toluene	NS	57	450	45	10	16	14
trans-1,2-Dichloroethene	NS	NL	6.3 U	4.4 U	4 U	10 U	7.9 U
trans-1,3-Dichloropropene	NS	0.4	7.3 U	5 U	4.5 U	12 U	9.1 U
Trichloroethene	5/50/250	0.46	1200	910	750	860	1300
Trichlorofluoromethane	NS	12	9 U	6.2 U	5.6 U	15	11 U
Vinyl bromide	NS	NL	7 U	4.8 U	4.4 U	11 U	NR
Vinyl chloride	NS	0.37	4.1 U	2.8 U	2.6 U	6.6 U	5.1 U

NS - No Standard. NL - Not listed. NR - Not reported.
* - Recovery or RCD exceeds control limits.
^ - Instrument related QC exceeds the control limits.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 1
Magna Metals
New York, NY
Sub-Slab Soil Vapor Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-12 (Polymedco Office)					
Sample ID	Soil Vapor	Indoor Air	SV-12(S.S)	SV-12	SS-12	SS-12	SS-12	SS-16
Lab Sample ID	Guidance Values	Value	JTPHF1AD	742892	789545	818510	200-3486-5	789553
Date Sampled	Intrusion	Upper Fence	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2011	3/17/2009
Dilution					734	401	522	657 (Duplicate of SS-12)
µg/m^3	µg/m^3	µg/m^3						
1,1,1-Trichloroethane	100/1000	2.5	680 U	600 U	820 U	440 U	570 U	710 U
1,1,2,2-Tetrachloroethane	NS	0.38	860 U	760 U	1000 U	550 U	720 U	890 U
1,1,2-Trichloroethane	NS	0.38	680 U	600 U	820 U	440 U	570 U	710 U
1,1-Dichloroethane	NS	0.38	500 U	450 U	610 U	320 U	420 U	530 U
1,1-Dichloroethene	NS	0.4	490 U	440 U	590 U	360	410 U	520 U
1,2-Dibromoethane (EDB)	NS	0.38	960 U	850 U	1200 U	610 U	800 U	1000 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	870 U	770 U	1000 U	560 U	730 U	910 U
1,2-Dichloroethane	NS	0.37	500 U	450 U	610 U	320 U	420 U	530 U
1,2-Dichloropropane	NS	0.39	580 U	510 U	690 U	370 U	480 U	600 U
1,3,5-Trimethylbenzene	NS	3.9	610 U	540 U	740 U	390 U	510 U	640 U
1,3-Butadiene	NS	0.49	550 U	600 U	820 U	440 U	230 U	730 U
2,2,4-Trimethylpentane	NS	NL	1500 U	510 U	700 U	370 U	490 U	610 U
3-Chloropropene	NS	NL	390 U	850 U	1200 U	630 U	820 U	1000 U
4-Ethyltoluene	NS	NL	1200 U	540 U	740 U	390 U	510 U	640 U
Benzene	NS	13	400 U	350 U	480 U	260 U	330 U	420 U
Bromodichloromethane	NS	NL	840 U	740 U	1000 U	540 U	700 U	870 U
Bromoform	NS	NL	1300 U	1100 U	1600 U	830 U	1100 U	1300 U
Bromomethane	NS	0.48	480 U	430 U	580 U	310 U	410 U	500 U
Carbon tetrachloride	5/50/250	1.3	390 U	690 U	940 U	500 U	660 U	820 U
Chloroethane	NS	0.39	330 U	290 U	980 U	530 U	690 U	870 U
Chloroform	NS	1.2	610 U	540 U	730 U	390 U	510 U	630 U
cis-1,2-Dichloroethene	NS	0.41	11000	11000	18000	13000	9800	16000
cis-1,3-Dichloropropene	NS	0.38	570 U	500 U	680 U	360 U	470 U	590 U
Cyclohexane	NS	6.3	1100 U	520	520 U	280 U	360 U	450 U
Dibromochloromethane	NS	NL	1100 U	940 U	1300 U	680 U	890 U	1100 U
Dichlorodifluoromethane	NS	10	620 U	1300 U	1800 U	990 U	1300 U	1600 U
Ethylbenzene	NS	6.4	540 U	480 U	650 U	350 U	450 U	560 U
Methyl tert-butyl ether	NS	14	2200 U	970 U	1300 U	720 U	1100 U	1200 U
Methylene Chloride	NS	16	NA	940 U	1300 U	690 U	380 U	1100 U
m-Xylene & p-Xylene	NS	11	540 U	480 U	1600 U	690 U	910 U	1400 U
n-Heptane	NS	18	1300 U	450 U	610 U	330 U	430 U	530 U
n-Hexane	NS	14	1400	950 U	1300 U	700 U	370 U	1200 U
o-Xylene	NS	7.1	540 U	480 U	650 U	350 U	450 U	560 U
Tetrachloroethene	100/1000	2.5	850 U	750 U	1000 U	540 U	710 U	880 U
Toluene	NS	57	3300	6800	980	1500	470	940
trans-1,2-Dichloroethene	NS	NL	490 U	440 U	590 U	320 U	410 U	520 U
trans-1,3-Dichloropropene	NS	0.4	570 U	500 U	680 U	360 U	470 U	590 U
Trichloroethene	5/50/250	0.46	66000	97000	130000	81000	65000	110000
Trichlorofluoromethane	NS	12	700 U	620 U	840 U	450 U	590 U	730 U
Vinyl bromide	NS	NL	550 U	480 U	660 U	350 U	NR	570 U
Vinyl chloride	NS	0.37	320 U	280 U	380 U	200 U	270 U	330 U

NS - No Standard. NL - Not listed. NR - Not reported.

* - Recovery or RCD exceeds control limits.

^ - Instrument related QC exceeds the control limits.

Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2
New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion i
the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Outdoor Location 1				
Sample ID	Indoor Air	Indoor Air	OUTDOOR 1 (A.A)	AA-1	AA-1	AA-1	AA-1
Lab Sample ID	Guidance	Upper Fence	JTPJM1AD	742886	789540	818508	200-3486-7
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2011
Dilution					4	4	4
µg/m^3	µg/m^3	µg/m^3					
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.22 U	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.4	0.25
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.19 U	0.75	0.46
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.2 U	0.2 U	0.2 U	0.20 U
Benzene	NS	13	0.48	0.48	0.54	1.9	1.1
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.51	0.35	0.56	0.6	0.48
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.2 U	0.2 U	0.20 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.69 U	1.2	0.22	0.3	0.17
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	2.2	2	3.3	3.2	2.9
Ethylbenzene	NS	6.4	0.35 U	0.26	0.17 U	0.52	0.26
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	2.8 U	2.8 J * ^
m-Xylene & p-Xylene	NS	11	0.42	0.96	0.37	1.5	0.71
n-Heptane	NS	18	0.82 U	1.1	0.34	0.57	0.37
n-Hexane	NS	14	0.7 U	0.35	0.53	1.1	0.64
o-Xylene	NS	7.1	0.35 U	0.25	0.17 U	0.52	0.26
Tetrachloroethene	100	2.5	0.54 U	0.28	0.27 U	0.48	0.32
Toluene	NS	57	0.97	0.98	0.75	3.3	1.8
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	0.21 U	0.21 U	0.25	0.21 U	0.21 U
Trichlorofluoromethane	NS	12	1.3	0.84	1.6	1.6	1.3
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	NR
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.20 U *

NS - No standard. NL - Not listed. NR - Not reported.
* - Recovery or RCD exceeds control limits.
^ - Instrument related QC exceeds the control limits.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	Polymedco Southern Lab Room				
Sample ID	Indoor Air	Indoor Air	IA-10	IA-19	IA-10	IA-10	IA-10
Lab Sample ID	Guidance	Upper Fence	742893	742894	789542	818512	200-3486-1
Date Sampled	Value	Value	3/6/2008	3/6/2008	3/17/2009	1/19/2010	1/19/2011
Dilution				(Duplicate of IA-10)	4	4	4
µg/m^3	µg/m^3	µg/m^3					
1,1,1-Trichloroethane	5	2.5	0.22 U	45	0.33	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.27 U	18 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.22 U	14 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.16 U	93	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.16 U	10 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.31 U	20 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.28 U	18 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	11 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	12 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	5.9	13 U	0.42	0.39 U	0.39 U
1,3-Butadiene	NS	0.49	0.27	14 U	0.18 U	0.18 U	0.18 U
2,2,4-Trimethylpentane	NS	NL	1.4	12 U	0.19 U	0.43	0.30
3-Chloropropene	NS	NL	0.25 U	20 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	5.9	13 U	0.2	0.2 U	0.20 U
Benzene	NS	13	1.7	8.3 U	0.48	1.2	0.80
Bromodichloromethane	NS	NL	0.27 U	17 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.41 U	27 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	10 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.62	16 U	0.49	0.53	0.32
Chloroethane	NS	0.39	0.21 U	17 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.2 U	13 U	0.34	0.2 U	0.20 U
cis-1,2-Dichloroethene	NS	0.41	0.36	87	0.21	0.19	0.17
cis-1,3-Dichloropropene	NS	0.38	0.18 U	12 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.41	13	0.83	0.24	0.20
Dibromochloromethane	NS	NL	0.34 U	22 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	3.2	43	3.5	3.6	1.8
Ethylbenzene	NS	6.4	6.5	11 U	0.24	0.43	0.25
Methyl tert-butyl ether	NS	14	0.14 U	23 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	2.8 U	22 U	2.8 U	2.8 U	2.8 J * ^
m-Xylene & p-Xylene	NS	11	27	22 U	0.56	1.2	0.70
n-Heptane	NS	18	1.3	11 U	0.45	0.53	0.31
n-Hexane	NS	14	1.1	23 U	0.35	1.2	0.44
o-Xylene	NS	7.1	12	11 U	0.23	0.39	0.24
Tetrachloroethene	100	2.5	0.58	18 U	0.27 U	0.37	0.27 U
Toluene	NS	57	14	16	1.6	3	1.7
trans-1,2-Dichloroethene	NS	NL	0.3	87	0.16 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.18 U	12 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	4.8	860	2.4	2	2.3
Trichlorofluoromethane	NS	12	1.6	15	1.4	1.6	0.86
Vinyl bromide	NS	NL	0.35 U	11 U	0.35 U	0.35 U	NR
Vinyl chloride	NS	0.37	0.2 U	6.6 U	0.2 U	0.2 U	0.20 U *

NS - No standard. NL - Not listed. NR - Not reported.
* - Recovery or RCD exceeds control limits.
^ - Instrument related QC exceeds the control limits.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-11 (Polymedco Office)				
Sample ID	Indoor Air	Indoor Air	SV-11(A.A)	IA-11	IA-11	IA-11	IA-11
Lab Sample ID	Guidance	Upper Fence	JTPHA1AD	742890	789543	818509	200-3486-2
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2011
Dilution					4	4	4
µg/m^3	µg/m^3	µg/m^3					
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.41	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	1.2	0.45	0.54	0.45	0.39 U
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.31	0.24
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.19 U	0.61	0.41
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.59	0.26	0.29	0.21
Benzene	NS	13	0.55	0.51	0.61	1.6	1.1
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.53	0.31	0.56	0.63	0.42
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.46	0.2	0.20 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.16 U	0.26	0.36	0.24
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.69 U	0.25	0.38	0.34	0.39
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	2.3	2.6	3	3.9	2.8
Ethylbenzene	NS	6.4	0.49	0.19	0.22	0.52	0.36
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	2.8 U	2.8 J * ^
m-Xylene & p-Xylene	NS	11	1.4	0.78	0.56	1.5	0.96
n-Heptane	NS	18	1.7	1.2	0.66	0.94	0.64
n-Hexane	NS	14	0.7 U	0.56	0.42	1.2	0.64
o-Xylene	NS	7.1	0.6	0.23	0.25	0.52	0.35
Tetrachloroethene	100	2.5	0.54 U	0.52	0.27 U	0.52	0.27 U
Toluene	NS	57	3.6	1.5	2	3.8	2.3
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	2.2	1.6	3	4.5	3.5
Trichlorofluoromethane	NS	12	1.3	1	1.3	1.8	1.2
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	NR
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.20 U *

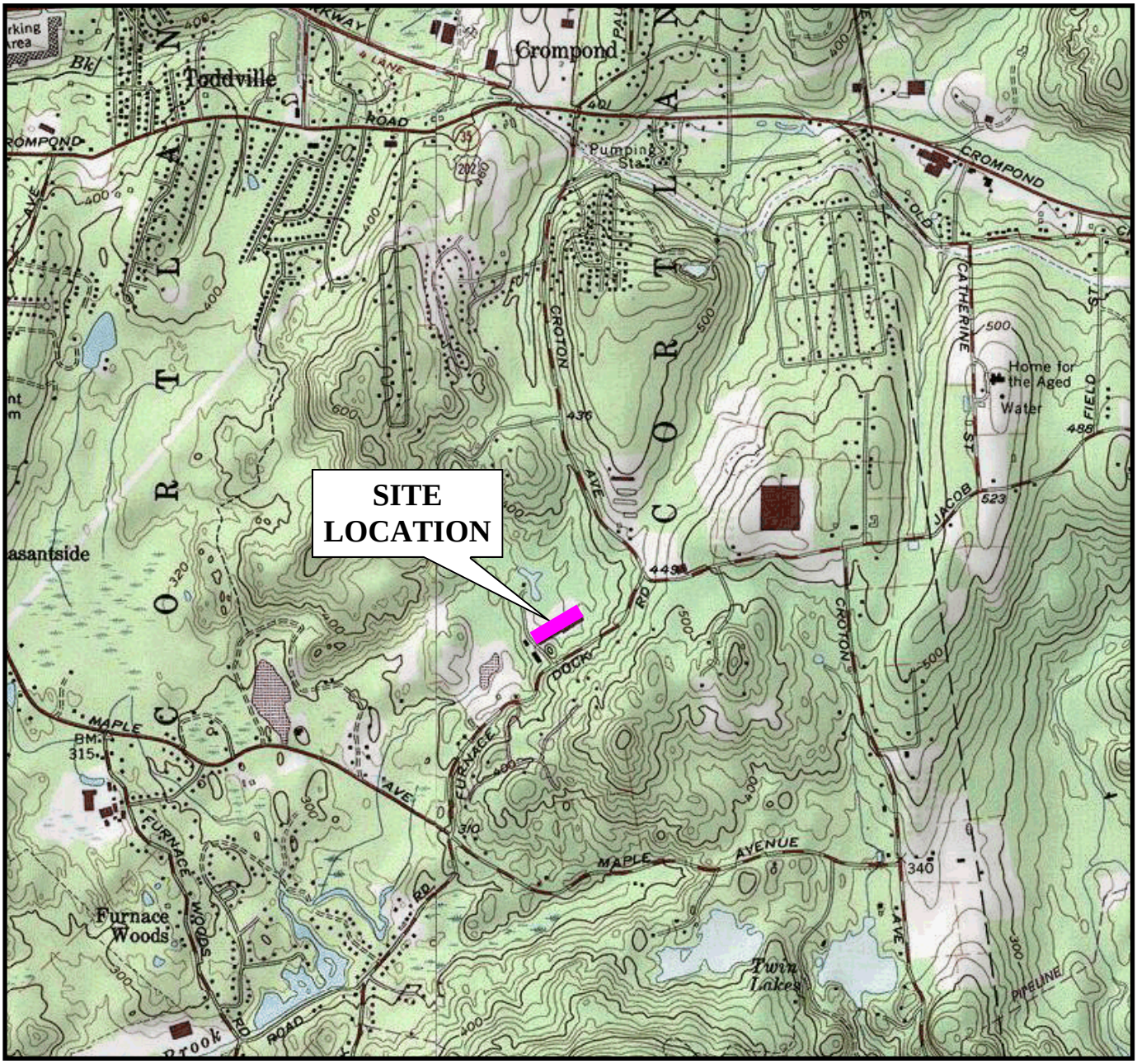
NS - No standard. NL - Not listed. NR - Not reported.
* - Recovery or RCD exceeds control limits.
^ - Instrument related QC exceeds the control limits.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

Table 2
Magna Metals
New York, NY
Outdoor and Indoor Air Analytical Results

Sample Location	NYSDOH	NYSDOH	SV-12 (Polymedco Office)						
Sample ID	Indoor Air	Indoor Air	SV-12(A.A)	IA-12	IA-12	IA-12	IA-12	IA-13	IA-13
Lab Sample ID	Guidance	Upper Fence	JTPHX1AD	742891	789546	818512	200-3486-4	818513	200-3486-6
Date Sampled	Value	Value	4/5/2007	3/6/2008	3/17/2009	1/19/2010	1/19/2011	1/19/2010	1/19/2011
Dilution					4	4	4	4 (Duplicate of IA-12)	3.99 (Duplicate of IA-12)
µg/m³	µg/m³	µg/m³							
1,1,1-Trichloroethane	5	2.5	0.44 U	0.22 U	0.41	0.22 U	0.22 U	0.22 U	0.22 U
1,1,2,2-Tetrachloroethane	NS	0.38	0.55 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1,2-Trichloroethane	NS	0.38	0.44 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,1-Dichloroethane	NS	0.38	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1-Dichloroethene	NS	0.4	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,2-Dibromoethane (EDB)	NS	0.38	0.61 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	NS	0.42	0.56 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
1,2-Dichloroethane	NS	0.37	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
1,2-Dichloropropane	NS	0.39	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,3,5-Trimethylbenzene	NS	3.9	0.78	0.39 U	0.39 U	5.9	0.39 U	5.9	0.39 U
1,3-Butadiene	NS	0.49	0.35 U	0.18 U	0.18 U	0.27	0.18	0.27	0.22
2,2,4-Trimethylpentane	NS	NL	0.93 U	0.19 U	0.28	1.1	0.32	1.4	0.35
3-Chloropropene	NS	NL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Ethyltoluene	NS	NL	0.79 U	0.54	0.2 U	7.4	0.20 U	5.9	0.20 U
Benzene	NS	13	0.71	0.42	0.58	1.5	0.79	1.7	0.86
Bromodichloromethane	NS	NL	0.54 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Bromoform	NS	NL	0.83 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromomethane	NS	0.48	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Carbon tetrachloride	100	1.3	0.51	0.38	0.52	0.54	0.38	0.62	0.38
Chloroethane	NS	0.39	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chloroform	NS	1.2	0.39 U	0.2 U	0.38	0.2 U	0.20 U	0.2 U	0.19 U
cis-1,2-Dichloroethene	NS	0.41	0.32 U	0.23	0.35	0.48	0.34	0.36	0.31
cis-1,3-Dichloropropene	NS	0.38	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Cyclohexane	NS	6.3	0.69 U	0.14 U	0.76	0.34	0.16	0.41	0.17
Dibromochloromethane	NS	NL	0.68 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Dichlorodifluoromethane	NS	10	2.2	2.5	3.4	3	2.4	3.2	2.4
Ethylbenzene	NS	6.4	0.62	0.17 U	0.29	5.2	0.34	6.5	0.35
Methyl tert-butyl ether	NS	14	1.4 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Methylene Chloride	NS	16	NA	2.8 U	2.8 U	2.8 U	2.8 J * ^	2.8 U	2.8 J * ^
m-Xylene & p-Xylene	NS	11	1.9	0.41	0.78	22	0.98	27	0.95
n-Heptane	NS	18	0.82 U	2	1.3	1	0.39	1.3	0.53
n-Hexane	NS	14	0.7 U	0.28 U	1.4	1	0.50	1.1	0.71
o-Xylene	NS	7.1	0.59	0.17 U	0.37	10	0.30	12	0.33
Tetrachloroethene	100	2.5	0.54 U	0.55	0.27 U	0.65	0.27 U	0.58	0.27 U
Toluene	NS	57	4	1.5	2.3	11	1.6	14	1.7
trans-1,2-Dichloroethene	NS	NL	0.32 U	0.16 U	0.16 U	0.2	0.16 U	0.3	0.16 U
trans-1,3-Dichloropropene	NS	0.4	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Trichloroethene	5	0.46	2.9	3.6	4	5.1	5.1	4.8	5.4
Trichlorofluoromethane	NS	12	1.7	1	1.5	1.5	1.0	1.6	1.1
Vinyl bromide	NS	NL	0.35 U	0.35 U	0.35 U	0.35 U	NR	0.35 U	NR
Vinyl chloride	NS	0.37	0.2 U	0.2 U	0.2 U	0.2 U	0.20 U *	0.2 U	0.20 U *

NS - No standard. NL - Not listed. NR - Not reported.
* - Recovery or RCD exceeds control limits.
^ - Instrument related QC exceeds the control limits.
Soil vapor guidance values for monitoring and mitigation presented in Matrices 1 & 2 of New York State Department of Health Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

FIGURES





SCALE IN FEET

0’ 1000’ 2000’ 4000’

SCALE: 1”=2000’

N

SOURCE:

7.5 MINUTE SERIES USGS TOPOGRAPHIC MAP
QUADRANGLE: MOHEGAN LAKE, NY 1981

MAGNA METALS
CORTLANDT, NEW YORK

PROJECT SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE	1.08.06
PROJECT No.	40256
SCALE	AS SHOWN
FIGURE	1

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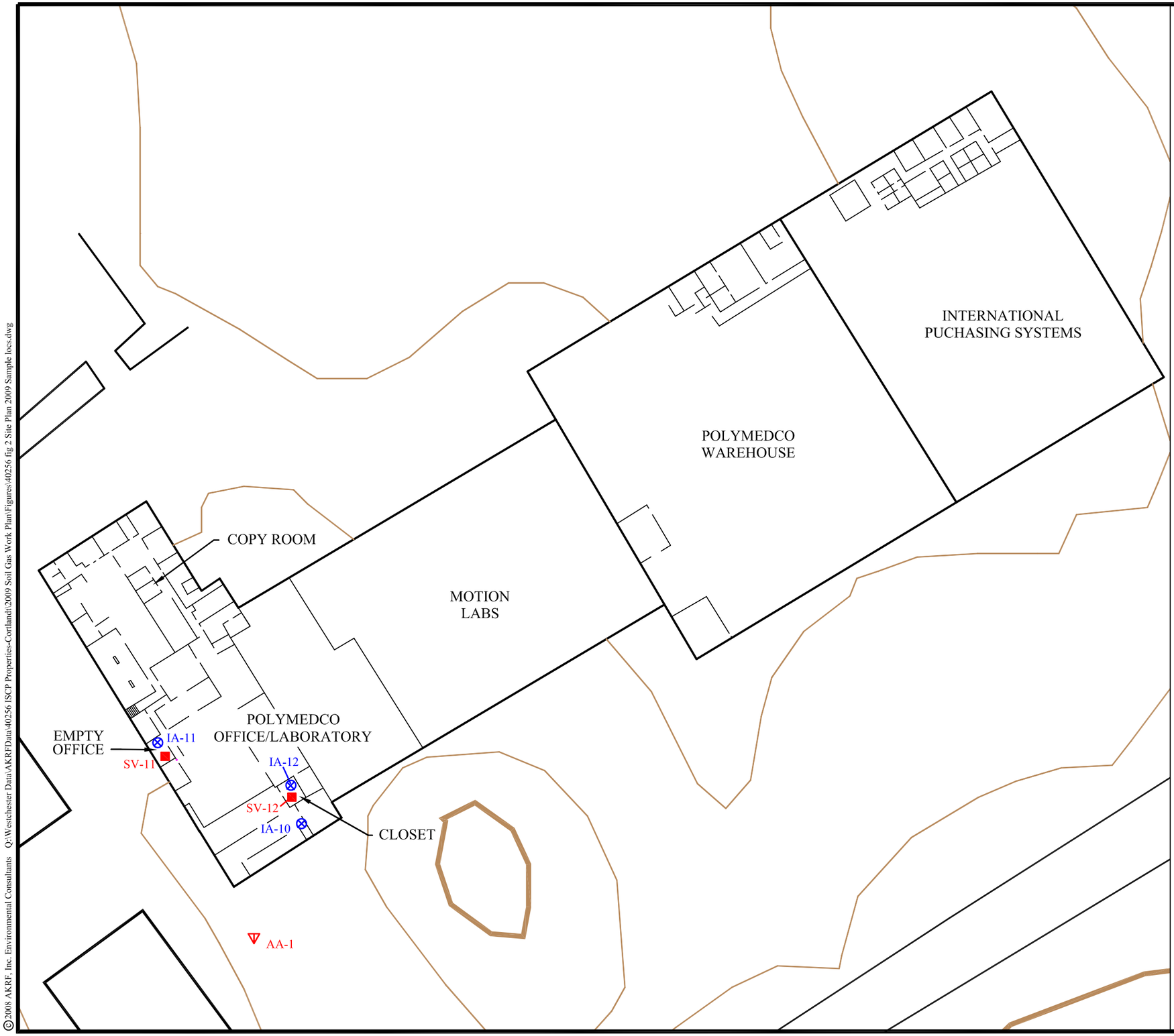


SOURCES:
1. BASE MAP PROVIDED BY TETRA TECH EC, INC. JUNE 2006.

2. CONTOUR LINES BASED ON MOHEGAN LAKE, NY AND PEEKSKILL, NY TOPOGRAPHIC QUADRANGLES, 7.5-MINUTE SERIES, DATED 1956 AND 1957, RESPECTIVELY, AND PHOTOREVISED IN 1981.

3. ADDITIONAL SURFACE FEATURES BASED ON WESTCHESTER COUNTY DEPARTMENT OF PLANNING AERIAL PHOTOGRAPH (SPRING 1990), DECEMBER 18, 1999 AERIAL PHOTOGRAPH, AND SURVEY DATA.

LEGEND:

SV-11	SUBSLAB VAPOR SAMPLING LOCATION
IA-11	INDOOR AIR SAMPLING LOCATIONS
AA-1	OUTDOOR AIR SAMPLING LOCATION
320	CONTOUR LINE (20 FT INTERVAL)

NOTES:
1. LOCATIONS OF FORMER MAGNA METALS BUILDING, 1 STORY CONCRETE BLOCK BUILDING, SHED, GEOPHYSICAL SURVEY AREA, AND MONITORING WELLS ARE BASED ON SURVEY DATA.

0' 30' 60' 120'
SCALE IN FEET

N

AKRF
Environmental Consultants
34 South Broadway, White Plains, N.Y. 10601

MAGNA METALS
CORTLANDT, NEW YORK

SITE PLAN SHOWING SAMPLING LOCATIONS

DATE
7.20.09

PROJECT NO.
40256

SCALE
1"=60'

FIGURE
2

©2008 AKRF, Inc. Environmental Consultants Q:\Westchester Data\AKRFData\40256 ISCP Properties-Cortlandt\2009 Soil Gas Work Plan\Figures\40256 fig 2 Site Plan 2009 Sample locs.dwg

APPENDIX A

POLYMEDCO PRODUCT INVENTORY FORM

13. PRODUCT INVENTORY FORM – Polymedco Office

Make & Model of field instrument used: ppbRAE Model PGM-7240

List of specific products found at the site that have the potential to affect indoor air quality.

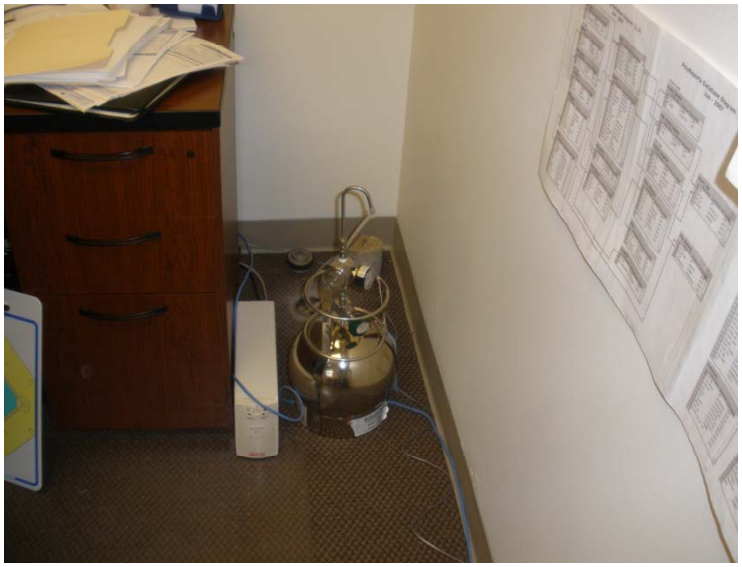
Location	Product Description	Size (units)	Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Maintenance Room	Clorox – Disinfecting Wipes	8	U/UO	NA	0	Y
	Lysol – Disinfectant Spray	6	UO	NA	0	Y
	Crown Janitorial Products	5	UO	Alakine lomine	0	Y
	Pledge – Wood Polish	2	U/UO	NA	0	Y
	Windex – Window Cleaner	3	U/UO	NA	0	Y
	ZEP – Cleaner and Degreaser	2	U/UO	NA	0	Y
	Murphy – Oil Soap	3	U/UO	NA	0	Y
	Amorall Carpet and Upholstery Cleaner	1	U	Isopropyl alcohol	0	Y
	Sheetrock Joint Compound	1	U	Vinyl acetate monomer, acetaldehyde, formaldehyde	0	Y
	RugDoctor – Steam Cleaner	1	U	NA	0	Y
	ZEP – High Traffic Carpet Cleaner	1	UO	NA	0	Y
	Resolve – Spot and Stain Remover	2	UO	NA	0	Y
	WD-40	1	U	Petroleum Distillates	0	Y
	Zep – Toilet Bowl Cleaner	9	U/UO	NA	0	Y
	Glade – Air Freshener	6	U/UO	NA	0	Y
	Sta-Put Plumbers Putty	1	U	NA	0	Y
	Spectro – Wasp and Hornet Killer	4	U/UO	Propane, heptane, chlorpyrifos	0	Y
	Henry Co – Base Adhesive	1	U	NA	0	Y

Maintenance Room	Winter Warrior De-Icer	3	UO	NA	0	Y
	Turtle Wax – Bug, Tar, and Tree Sap Remover	1	U	NA	0	Y
	SoftSoap – Hand Soap	6	U/UO	Trichlosan, methyl glucose	0	Y
	Febreeze – Air Freshener	3	U/UO	NA	0	Y
	Real Kill –Home Insect Control	1	U	Propane, heptane, chlorpyrifos	0	Y
	Ajax – Bleach Cleanser	4	U/UO	Chlorine	0	Y
	Swiffer Wet Jet	6	U/UO	Solvents	0	Y
	Endust	5	U/UO	Naptha, paraffinic, propane, 2-methyl, solvents	0	Y
	Raid – Ant and Roach Killer	1	UO	Propane, heptane, chlorpyrifos	0	Y
	Strait Line – Marking Chalk	2	UO	NA	0	Y
	Minwax – Wood Stain	1	U	Solvents	0	Y
	BEHR Latex Paint	11	U/UO	Ethylene glycol	0	Y
	Benjamin Moore Latex Paint	2	U/UO	Ethylene glycol	0	Y
	Kimcare – Lotion Soap	4	U	NA	0	Y
	Isopropyl alcohol	3	UO	Isopropyl alcohol	0	Y
	Spray Paint	10	U/UO	Propane, butane, toluene, acetone, 2-methyl-1-propanol	0	Y
	Dirtex	1	UO	2-butoxyethanol, ammonia	0	Y
	Guardsmen – Wood Cleaner	1	U	Petroleum distillates	0	Y
	Expo – White Board Cleaner	1	UO	Isopropyl, ethanol	0	Y
	Vacuum Pump Oil 19	3	U/UO	Solvents, paraffin oil	0	Y
	Clorox Bleach	3	UO	Sodium hydrochloride, chlorine	0	Y
	Soft Scrub – Bleach Cleanser	1	UO	NA	0	Y
	Stop & shop – Pure Power Fabric	1	U/UO	Alcohol	0	Y

	Refresher					
	MinWax – Polyurethane	4	U/UO	Aliphatic hydrocarbons	0	Y
	Acrylic Pro-Ceramic Tile Adhesive	1	UO	Petroleum distillates	0	Y
	High Performance Water-Based Epoxy	1	UO	Tetraethylene Pentamine, Ethylenediamine, Propylene glycol monomethyl, glycol ether, 2-butoxyethanol	0	Y
	CLR – Calcium, Rust, and Lyme Remover	1	U	NA	0	Y
	Great Stuff – Insulating Foam Sealant	1	D	Methyl ether, propane, isobutane	0	Y
	Henry Carpet and Sheet Vinyl	1	U	Petroleum distillates	0	Y
	Premixed Tile Grout	1	UO	Ethylene glycol	0	Y
	Non-Acid Disinfectant Bathroom Cleaner	1	U	Ammonium chloride	0	Y
	Jasco – Floor Patch and Level Compound	1	UO	Silica quartz, acrylic styrene polymer, methanol	0	Y
	Turtle Wax – Carpet Cleaner	1	UO	Oxygen containing surfactants	0	Y
Storage Closet	Printer Cartridges and Toners	Several	UO	NA	0	Y

APPENDIX B

PHOTOGRAPHIC LOG



Photograph 1: Soil vapor sampling location SV-11.



Photograph 2: Purging set-up with helium tracer gas at SV-12.



Photograph 3: Indoor air sampling IA-11.



Photograph 4: Ambient air sampling AA-1.



Photograph 5: Maintenance room of Polymedco office.



Photograph 6: Locked storage cabinet in maintenance room of Polymedco office.



Photograph 7:Product inventory in maintenance room of Polymedco office.



Photograph 8: Refrigerator in Polymedco equipment laboratory.

APPENDIX C

SAMPLING LOGS

AKRF

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: IA-10

Summa #: 4811 **Gage #:** — **Flow Control #** 3240

Laboratory Sample (Summa Canister)

Time Started: 0852 **Vacuum:** -30 in Hg

Time Stopped: 1653 **Vacuum:** -7 in Hg

AKRF

Indoor Air Sampling Log

ICP Properties

Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: IA-11

Summa #: 3217 **Gage #:** — **Flow Control #** 2768

Laboratory Sample (Summa Canister)

Time Started: 0927 **Vacuum:** -28 in Hg

Time Stopped: 1544 **Vacuum:** -6 in Hg

Soil Gas Sampling Log

ICP Properties
Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: SS-11

Summa #: 3636 **Gage #:** 548 **Flow Control #** 518

Purging

Time Started: 0817 **Vol. Purged:** 0.5/liters

Time Stopped: 0820 **Flow Rate:** L/min

Laboratory Sample (Summa Canister)

Time Started: 0829 **Vacuum:** -29 in Hg

Time Stopped: 1545 **Vacuum:** -5 in Hg

Field Sample

PID Calibration: 96.7 ppm **PID Reading:** 0 ppm

He Reading: 0 ppm

Time Started: 0810

Time Stopped: 0812

Indoor Air Sampling Log

ICP Properties
Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: IA-12

Summa #: 4458 **Gage #:** — **Flow Control #** 5166

Laboratory Sample (Summa Canister)

Time Started: 0840 **Vacuum:** -28 in Hg

Time Stopped: 1640 **Vacuum:** -4 in Hg

AKRF

Soil Gas Sampling Log

ICP Properties
Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: SS-12

Summa #: 5039 **Gage #:** — **Flow Control #** 5195

Purging

Time Started: 0836 **Vol. Purged:** 0.5 liters

Time Stopped: 0840 **Flow Rate:** L/min

Laboratory Sample (Summa Canister)

Time Started: 0847 **Vacuum:** -30 in Hg

Time Stopped: 1641 **Vacuum:** -15 in Hg

Field Sample

PID Calibration: 96.7 ppm **PID Reading:** 0 ppm

Time Started: 0810 **He Reading:** 0 ppm

Time Stopped: 0812

AKRF

Indoor Air Sampling Log

ICP Properties
Cortlandt, NY

Job #: 40256

Sample by: SG/EB **Date:** 01/19/2011

Sample ID #: IA-13 (Blind Duplicate for Laboratory QA/QC)

Summa #: 3257 **Gage #:** — **Flow Control #** 5177

Laboratory Sample (Summa Canister)

Time Started: 0840 **Vacuum:** -27 in Hg

Time Stopped: 1640 **Vacuum:** -16 in Hg

Outdoor Air Sampling Log

ICP Properties
Cortlandt, NY

Job #: 40256

Sample by: EB/SG **Date:** 01/19/2011

Sample ID #: AA-1

Summa #: 4472 **Gage #:** — **Flow Control #** 2804

Laboratory Sample (Summa Canister)

Time Started: 0857 **Vacuum:** -29 in Hg

Time Stopped: 1632 **Vacuum:** -3 in Hg

APPENDIX D

ANALYTICAL DATA REPORT

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 200-3486-1

SDG Number: 200-3486

Job Description: Magna Metals

For:
AKRF Inc
34 South Broadway, Suite 314
White Plains, NY 10601

Attention: Mr. Bryan Zieroff



Approved for release.
Don C Dawicki
Project Manager II
2/7/2011 3:16 PM

Don C Dawicki
Project Manager II
don.dawicki@testamericainc.com
02/07/2011

The test results in this report relate only to sample(s) as received by the laboratory. These test results were derived under a quality system that adheres to the requirements of NELAC. Pursuant to NELAC, this report may not be produced in full without written approval from the laboratory

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CASE NARRATIVE

Client: AKRF Inc

Project: Magna Metals

Report Number: 200-3486-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 01/24/2011; the samples arrived in good condition.

VOLATILE ORGANIC COMPOUNDS
Samples SS-11 and SS-12 were analyzed for Volatile Organic Compounds in accordance with EPA Method TO-15. The samples were analyzed on 01/28/2011.

Samples SS-11[10X] and SS-12[522X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the VOC analyses.

All quality control parameters were within the acceptance limits.

LOW LEVEL VOLATILE ORGANIC COMPOUNDS
Samples IA-10, IA-11, IA-12, IA-13 and AA-1 were analyzed for Low Level Volatile Organic Compounds in accordance with EPA Method TO-15. The samples were analyzed on 01/27/2011 and 01/28/2011.

Methylene Chloride and Vinyl chloride failed the recovery criteria high for LCS 200-13126/3. Refer to the QC report for details.

No other difficulties were encountered during the Low Level VOC analyses.

All other quality control parameters were within the acceptance limits.

AIR - GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3486-1

SDG No.: 200-3486

Instrument ID: G.i Analysis Batch Number: 9884

Lab Sample ID: IC 200-9884/3 Client Sample ID:

Date Analyzed: 11/18/10 10:16 Lab File ID: gfd003.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Isopentane	4.78	Baseline event	wrd	11/18/10 13:30
n-Pentane	5.31	Baseline event	wrd	11/18/10 13:31
Cyclohexane	9.90	Baseline event	wrd	11/18/10 13:31
1,2-Dichloropropane	11.72	Baseline event	wrd	11/18/10 13:32

AIR - GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3486-1

SDG No.: 200-3486

Instrument ID: E.i Analysis Batch Number: 4567

Lab Sample ID: IC 200-4567/3 Client Sample ID:

Date Analyzed: 07/07/10 15:08 Lab File ID: eeh003.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethene	6.39	Baseline event	wrd	07/08/10 15:10
Cyclohexane	10.38	Baseline event	wrd	07/08/10 15:10

Lab Sample ID: IC 200-4567/4 Client Sample ID:

Date Analyzed: 07/07/10 16:03 Lab File ID: eeh004.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,2-Dichloroethane	11.06	Peak not found by the data system	wrd	07/07/10 20:40
n-Heptane	11.13	Baseline event	wrd	07/08/10 08:22

AIR - GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3486-1

SDG No.: 200-3486

Instrument ID: E.i Analysis Batch Number: 13126

Lab Sample ID: 200-3486-2 Client Sample ID: IA-11

Date Analyzed: 01/27/11 21:43 Lab File ID: eehau009.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
4-Ethyltoluene	17.37	Poor chromatography	klp	01/30/11 15:35

Lab Sample ID: 200-3486-4 Client Sample ID: IA-12

Date Analyzed: 01/27/11 22:39 Lab File ID: eehau010.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
4-Ethyltoluene	17.37	Poor chromatography	klp	01/30/11 15:37

Lab Sample ID: 200-3486-6 Client Sample ID: IA-13

Date Analyzed: 01/27/11 23:36 Lab File ID: eehau011.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
4-Ethyltoluene	17.37	Poor chromatography	klp	01/30/11 15:38

SAMPLE SUMMARY

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
200-3486-1	IA-10	Air	01/19/2011 1653	01/24/2011 1010
200-3486-2	IA-11	Air	01/19/2011 1544	01/24/2011 1010
200-3486-3	SS-11	Air	01/19/2011 1545	01/24/2011 1010
200-3486-4	IA-12	Air	01/19/2011 1640	01/24/2011 1010
200-3486-5	SS-12	Air	01/19/2011 1641	01/24/2011 1010
200-3486-6	IA-13	Air	01/19/2011 1640	01/24/2011 1010
200-3486-7	AA-1	Air	01/19/2011 1632	01/24/2011 1010

EXECUTIVE SUMMARY - Detections

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200-3486-1	**IA-10**				
Dichlorodifluoromethane		0.37	0.040	ppb v/v	TO15 LL
Dichlorodifluoromethane		1.8	0.20	ug/m3	TO15 LL
Trichlorofluoromethane		0.15	0.040	ppb v/v	TO15 LL
Trichlorofluoromethane		0.86	0.22	ug/m3	TO15 LL
n-Hexane		0.12	0.080	ppb v/v	TO15 LL
n-Hexane		0.44	0.28	ug/m3	TO15 LL
cis-1,2-Dichloroethene		0.042	0.040	ppb v/v	TO15 LL
cis-1,2-Dichloroethene		0.17	0.16	ug/m3	TO15 LL
Cyclohexane		0.059	0.040	ppb v/v	TO15 LL
Cyclohexane		0.20	0.14	ug/m3	TO15 LL
Carbon tetrachloride		0.050	0.040	ppb v/v	TO15 LL
Carbon tetrachloride		0.32	0.25	ug/m3	TO15 LL
2,2,4-Trimethylpentane		0.064	0.040	ppb v/v	TO15 LL
2,2,4-Trimethylpentane		0.30	0.19	ug/m3	TO15 LL
Benzene		0.25	0.040	ppb v/v	TO15 LL
Benzene		0.80	0.13	ug/m3	TO15 LL
n-Heptane		0.077	0.040	ppb v/v	TO15 LL
n-Heptane		0.31	0.16	ug/m3	TO15 LL
Trichloroethene		0.43	0.040	ppb v/v	TO15 LL
Trichloroethene		2.3	0.21	ug/m3	TO15 LL
Toluene		0.45	0.040	ppb v/v	TO15 LL
Toluene		1.7	0.15	ug/m3	TO15 LL
Ethylbenzene		0.058	0.040	ppb v/v	TO15 LL
Ethylbenzene		0.25	0.17	ug/m3	TO15 LL
o-Xylene		0.056	0.040	ppb v/v	TO15 LL
o-Xylene		0.24	0.17	ug/m3	TO15 LL
1,2-Dichloroethene, Total		0.042	0.040	ppb v/v	TO15 LL
1,2-Dichloroethene, Total		0.17	0.16	ug/m3	TO15 LL
m-Xylene & p-Xylene		0.16	0.080	ppb v/v	TO15 LL
m-Xylene & p-Xylene		0.70	0.35	ug/m3	TO15 LL
Xylenes, Total		0.22	0.040	ppb v/v	TO15 LL
Xylenes, Total		0.94	0.17	ug/m3	TO15 LL

EXECUTIVE SUMMARY - Detections

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200-3486-2	**IA-11**				
Dichlorodifluoromethane		0.57	0.040	ppb v/v	TO15 LL
Dichlorodifluoromethane		2.8	0.20	ug/m3	TO15 LL
1,3-Butadiene		0.11	0.080	ppb v/v	TO15 LL
1,3-Butadiene		0.24	0.18	ug/m3	TO15 LL
Trichlorofluoromethane		0.21	0.040	ppb v/v	TO15 LL
Trichlorofluoromethane		1.2	0.22	ug/m3	TO15 LL
n-Hexane		0.18	0.080	ppb v/v	TO15 LL
n-Hexane		0.64	0.28	ug/m3	TO15 LL
cis-1,2-Dichloroethene		0.060	0.040	ppb v/v	TO15 LL
cis-1,2-Dichloroethene		0.24	0.16	ug/m3	TO15 LL
Cyclohexane		0.11	0.040	ppb v/v	TO15 LL
Cyclohexane		0.39	0.14	ug/m3	TO15 LL
Carbon tetrachloride		0.067	0.040	ppb v/v	TO15 LL
Carbon tetrachloride		0.42	0.25	ug/m3	TO15 LL
2,2,4-Trimethylpentane		0.089	0.040	ppb v/v	TO15 LL
2,2,4-Trimethylpentane		0.41	0.19	ug/m3	TO15 LL
Benzene		0.33	0.040	ppb v/v	TO15 LL
Benzene		1.1	0.13	ug/m3	TO15 LL
n-Heptane		0.16	0.040	ppb v/v	TO15 LL
n-Heptane		0.64	0.16	ug/m3	TO15 LL
Trichloroethene		0.64	0.040	ppb v/v	TO15 LL
Trichloroethene		3.5	0.21	ug/m3	TO15 LL
Toluene		0.61	0.040	ppb v/v	TO15 LL
Toluene		2.3	0.15	ug/m3	TO15 LL
Ethylbenzene		0.083	0.040	ppb v/v	TO15 LL
Ethylbenzene		0.36	0.17	ug/m3	TO15 LL
o-Xylene		0.080	0.040	ppb v/v	TO15 LL
o-Xylene		0.35	0.17	ug/m3	TO15 LL
4-Ethyltoluene		0.043	0.040	ppb v/v	TO15 LL
4-Ethyltoluene		0.21	0.20	ug/m3	TO15 LL
1,2-Dichloroethene, Total		0.060	0.040	ppb v/v	TO15 LL
1,2-Dichloroethene, Total		0.24	0.16	ug/m3	TO15 LL
m-Xylene & p-Xylene		0.22	0.080	ppb v/v	TO15 LL
m-Xylene & p-Xylene		0.96	0.35	ug/m3	TO15 LL
Xylenes, Total		0.30	0.040	ppb v/v	TO15 LL
Xylenes, Total		1.3	0.17	ug/m3	TO15 LL
200-3486-3	**SS-11**				
Trichloroethene		250	2.0	ppb v/v	TO-15
Trichloroethene		1300	11	ug/m3	TO-15
Toluene		3.7	2.0	ppb v/v	TO-15
Toluene		14	7.5	ug/m3	TO-15
Xylene (total)		2.7	2.0	ppb v/v	TO-15
Xylene (total)		12	8.7	ug/m3	TO-15

EXECUTIVE SUMMARY - Detections

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200-3486-4	**IA-12**				
Dichlorodifluoromethane		0.48	0.040	ppb v/v	TO15 LL
Dichlorodifluoromethane		2.4	0.20	ug/m3	TO15 LL
1,3-Butadiene		0.082	0.080	ppb v/v	TO15 LL
1,3-Butadiene		0.18	0.18	ug/m3	TO15 LL
Trichlorofluoromethane		0.18	0.040	ppb v/v	TO15 LL
Trichlorofluoromethane		1.0	0.22	ug/m3	TO15 LL
n-Hexane		0.14	0.080	ppb v/v	TO15 LL
n-Hexane		0.50	0.28	ug/m3	TO15 LL
cis-1,2-Dichloroethene		0.085	0.040	ppb v/v	TO15 LL
cis-1,2-Dichloroethene		0.34	0.16	ug/m3	TO15 LL
Cyclohexane		0.046	0.040	ppb v/v	TO15 LL
Cyclohexane		0.16	0.14	ug/m3	TO15 LL
Carbon tetrachloride		0.060	0.040	ppb v/v	TO15 LL
Carbon tetrachloride		0.38	0.25	ug/m3	TO15 LL
2,2,4-Trimethylpentane		0.068	0.040	ppb v/v	TO15 LL
2,2,4-Trimethylpentane		0.32	0.19	ug/m3	TO15 LL
Benzene		0.25	0.040	ppb v/v	TO15 LL
Benzene		0.79	0.13	ug/m3	TO15 LL
n-Heptane		0.095	0.040	ppb v/v	TO15 LL
n-Heptane		0.39	0.16	ug/m3	TO15 LL
Trichloroethene		0.95	0.040	ppb v/v	TO15 LL
Trichloroethene		5.1	0.21	ug/m3	TO15 LL
Toluene		0.44	0.040	ppb v/v	TO15 LL
Toluene		1.6	0.15	ug/m3	TO15 LL
Ethylbenzene		0.079	0.040	ppb v/v	TO15 LL
Ethylbenzene		0.34	0.17	ug/m3	TO15 LL
o-Xylene		0.069	0.040	ppb v/v	TO15 LL
o-Xylene		0.30	0.17	ug/m3	TO15 LL
1,2-Dichloroethene, Total		0.085	0.040	ppb v/v	TO15 LL
1,2-Dichloroethene, Total		0.34	0.16	ug/m3	TO15 LL
m-Xylene & p-Xylene		0.23	0.080	ppb v/v	TO15 LL
m-Xylene & p-Xylene		0.98	0.35	ug/m3	TO15 LL
Xylenes, Total		0.30	0.040	ppb v/v	TO15 LL
Xylenes, Total		1.3	0.17	ug/m3	TO15 LL
200-3486-5	**SS-12**				
cis-1,2-Dichloroethene		2500	100	ppb v/v	TO-15
cis-1,2-Dichloroethene		9800	410	ug/m3	TO-15
1,2-Dichloroethene, Total		2500	100	ppb v/v	TO-15
1,2-Dichloroethene, Total		9800	410	ug/m3	TO-15
Trichloroethene		12000	100	ppb v/v	TO-15
Trichloroethene		65000	560	ug/m3	TO-15
Toluene		130	100	ppb v/v	TO-15
Toluene		470	390	ug/m3	TO-15

EXECUTIVE SUMMARY - Detections

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200-3486-6	**IA-13**				
Dichlorodifluoromethane		0.49	0.040	ppb v/v	TO15 LL
Dichlorodifluoromethane		2.4	0.20	ug/m3	TO15 LL
1,3-Butadiene		0.099	0.080	ppb v/v	TO15 LL
1,3-Butadiene		0.22	0.18	ug/m3	TO15 LL
Trichlorofluoromethane		0.20	0.040	ppb v/v	TO15 LL
Trichlorofluoromethane		1.1	0.22	ug/m3	TO15 LL
n-Hexane		0.20	0.080	ppb v/v	TO15 LL
n-Hexane		0.71	0.28	ug/m3	TO15 LL
cis-1,2-Dichloroethene		0.079	0.040	ppb v/v	TO15 LL
cis-1,2-Dichloroethene		0.31	0.16	ug/m3	TO15 LL
Cyclohexane		0.050	0.040	ppb v/v	TO15 LL
Cyclohexane		0.17	0.14	ug/m3	TO15 LL
Carbon tetrachloride		0.060	0.040	ppb v/v	TO15 LL
Carbon tetrachloride		0.38	0.25	ug/m3	TO15 LL
2,2,4-Trimethylpentane		0.076	0.040	ppb v/v	TO15 LL
2,2,4-Trimethylpentane		0.35	0.19	ug/m3	TO15 LL
Benzene		0.27	0.040	ppb v/v	TO15 LL
Benzene		0.86	0.13	ug/m3	TO15 LL
n-Heptane		0.13	0.040	ppb v/v	TO15 LL
n-Heptane		0.53	0.16	ug/m3	TO15 LL
Trichloroethene		1.0	0.040	ppb v/v	TO15 LL
Trichloroethene		5.4	0.21	ug/m3	TO15 LL
Toluene		0.45	0.040	ppb v/v	TO15 LL
Toluene		1.7	0.15	ug/m3	TO15 LL
Ethylbenzene		0.082	0.040	ppb v/v	TO15 LL
Ethylbenzene		0.35	0.17	ug/m3	TO15 LL
o-Xylene		0.075	0.040	ppb v/v	TO15 LL
o-Xylene		0.33	0.17	ug/m3	TO15 LL
1,2-Dichloroethene, Total		0.079	0.040	ppb v/v	TO15 LL
1,2-Dichloroethene, Total		0.31	0.16	ug/m3	TO15 LL
m-Xylene & p-Xylene		0.22	0.080	ppb v/v	TO15 LL
m-Xylene & p-Xylene		0.95	0.35	ug/m3	TO15 LL
Xylenes, Total		0.29	0.040	ppb v/v	TO15 LL
Xylenes, Total		1.3	0.17	ug/m3	TO15 LL

EXECUTIVE SUMMARY - Detections

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
200-3486-7	**AA-1**				
Dichlorodifluoromethane		0.60	0.040	ppb v/v	TO15 LL
Dichlorodifluoromethane		2.9	0.20	ug/m3	TO15 LL
1,3-Butadiene		0.11	0.080	ppb v/v	TO15 LL
1,3-Butadiene		0.25	0.18	ug/m3	TO15 LL
Trichlorofluoromethane		0.23	0.040	ppb v/v	TO15 LL
Trichlorofluoromethane		1.3	0.22	ug/m3	TO15 LL
n-Hexane		0.18	0.080	ppb v/v	TO15 LL
n-Hexane		0.64	0.28	ug/m3	TO15 LL
Cyclohexane		0.048	0.040	ppb v/v	TO15 LL
Cyclohexane		0.17	0.14	ug/m3	TO15 LL
Carbon tetrachloride		0.077	0.040	ppb v/v	TO15 LL
Carbon tetrachloride		0.48	0.25	ug/m3	TO15 LL
2,2,4-Trimethylpentane		0.099	0.040	ppb v/v	TO15 LL
2,2,4-Trimethylpentane		0.46	0.19	ug/m3	TO15 LL
Benzene		0.34	0.040	ppb v/v	TO15 LL
Benzene		1.1	0.13	ug/m3	TO15 LL
n-Heptane		0.090	0.040	ppb v/v	TO15 LL
n-Heptane		0.37	0.16	ug/m3	TO15 LL
Toluene		0.49	0.040	ppb v/v	TO15 LL
Toluene		1.8	0.15	ug/m3	TO15 LL
Tetrachloroethene		0.047	0.040	ppb v/v	TO15 LL
Tetrachloroethene		0.32	0.27	ug/m3	TO15 LL
Ethylbenzene		0.060	0.040	ppb v/v	TO15 LL
Ethylbenzene		0.26	0.17	ug/m3	TO15 LL
o-Xylene		0.060	0.040	ppb v/v	TO15 LL
o-Xylene		0.26	0.17	ug/m3	TO15 LL
m-Xylene & p-Xylene		0.16	0.080	ppb v/v	TO15 LL
m-Xylene & p-Xylene		0.71	0.35	ug/m3	TO15 LL
Xylenes, Total		0.22	0.040	ppb v/v	TO15 LL
Xylenes, Total		0.98	0.17	ug/m3	TO15 LL

METHOD SUMMARY

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Description	Lab Location	Method	Preparation Method
Matrix: Air			
Volatile Organic Compounds in Ambient Air	TAL BUR	EPA TO-15	
Collection via Summa Canister	TAL BUR		Summa Canister
Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)	TAL BUR	EPA TO15 LL	
Collection via Summa Canister	TAL BUR		Summa Canister

Lab References:

TAL BUR = TestAmerica Burlington

Method References:

EPA = US Environmental Protection Agency

METHOD / ANALYST SUMMARY

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Method	Analyst	Analyst ID
EPA TO-15	Valjevac, Sanel	SV
EPA TO15 LL	Desjardins, William R	WRD

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **SS-11**

Lab Sample ID: 200-3486-3
Client Matrix: Air

Date Sampled: 01/19/2011 1545
Date Received: 01/24/2011 1010

TO-15 Volatile Organic Compounds in Ambient Air

Method:	TO-15	Analysis Batch: 200-12866	Instrument ID: G.i
Preparation:	Summa Canister		Lab File ID: gfdai013.d
Dilution:	10		Initial Weight/Volume: 20 mL
Date Analyzed:	01/28/2011 0448		Final Weight/Volume: 200 mL
Date Prepared:	01/28/2011 0448		Injection Volume: 200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	5.0	U	5.0
1,2-Dichlorotetrafluoroethane	2.0	U	2.0
Vinyl chloride	2.0	U	2.0
1,3-Butadiene	2.0	U	2.0
Bromomethane	2.0	U	2.0
Chloroethane	5.0	U	5.0
Bromoethene(Vinyl Bromide)	2.0	U	2.0
Trichlorofluoromethane	2.0	U	2.0
1,1-Dichloroethene	2.0	U	2.0
3-Chloropropene	5.0	U	5.0
Methylene Chloride	5.0	U	5.0
Methyl tert-butyl ether	2.0	U	2.0
trans-1,2-Dichloroethene	2.0	U	2.0
n-Hexane	2.0	U	2.0
1,1-Dichloroethane	2.0	U	2.0
cis-1,2-Dichloroethene	2.0	U	2.0
1,2-Dichloroethene, Total	2.0	U	2.0
Chloroform	2.0	U	2.0
1,1,1-Trichloroethane	2.0	U	2.0
Cyclohexane	2.0	U	2.0
Carbon tetrachloride	2.0	U	2.0
2,2,4-Trimethylpentane	2.0	U	2.0
Benzene	2.0	U	2.0
1,2-Dichloroethane	2.0	U	2.0
n-Heptane	2.0	U	2.0
Trichloroethene	250		2.0
1,2-Dichloropropane	2.0	U	2.0
Bromodichloromethane	2.0	U	2.0
cis-1,3-Dichloropropene	2.0	U	2.0
Toluene	3.7		2.0
trans-1,3-Dichloropropene	2.0	U	2.0
1,1,2-Trichloroethane	2.0	U	2.0
Tetrachloroethene	2.0	U	2.0
Dibromochloromethane	2.0	U	2.0
1,2-Dibromoethane	2.0	U	2.0
Ethylbenzene	2.0	U	2.0
m,p-Xylene	5.0	U	5.0
Xylene, o-	2.0	U	2.0
Xylene (total)	2.7		2.0
Bromoform	2.0	U	2.0
1,1,2,2-Tetrachloroethane	2.0	U	2.0
4-Ethyltoluene	2.0	U	2.0
1,3,5-Trimethylbenzene	2.0	U	2.0

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	25	U	25

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **SS-11**

Lab Sample ID: 200-3486-3
Client Matrix: Air

Date Sampled: 01/19/2011 1545
Date Received: 01/24/2011 1010

TO-15 Volatile Organic Compounds in Ambient Air

Method:	TO-15	Analysis Batch: 200-12866	Instrument ID: G.i
Preparation:	Summa Canister		Lab File ID: gfdai013.d
Dilution:	10		Initial Weight/Volume: 20 mL
Date Analyzed:	01/28/2011 0448		Final Weight/Volume: 200 mL
Date Prepared:	01/28/2011 0448		Injection Volume: 200 mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	14	U	14
Vinyl chloride	5.1	U	5.1
1,3-Butadiene	4.4	U	4.4
Bromomethane	7.8	U	7.8
Chloroethane	13	U	13
Bromoethene(Vinyl Bromide)	8.7	U	8.7
Trichlorofluoromethane	11	U	11
1,1-Dichloroethene	7.9	U	7.9
3-Chloropropene	16	U	16
Methylene Chloride	17	U	17
Methyl tert-butyl ether	7.2	U	7.2
trans-1,2-Dichloroethene	7.9	U	7.9
n-Hexane	7.0	U	7.0
1,1-Dichloroethane	8.1	U	8.1
cis-1,2-Dichloroethene	7.9	U	7.9
1,2-Dichloroethene, Total	7.9	U	7.9
Chloroform	9.8	U	9.8
1,1,1-Trichloroethane	11	U	11
Cyclohexane	6.9	U	6.9
Carbon tetrachloride	13	U	13
2,2,4-Trimethylpentane	9.3	U	9.3
Benzene	6.4	U	6.4
1,2-Dichloroethane	8.1	U	8.1
n-Heptane	8.2	U	8.2
Trichloroethene	1300		11
1,2-Dichloropropane	9.2	U	9.2
Bromodichloromethane	13	U	13
cis-1,3-Dichloropropene	9.1	U	9.1
Toluene	14		7.5
trans-1,3-Dichloropropene	9.1	U	9.1
1,1,2-Trichloroethane	11	U	11
Tetrachloroethene	14	U	14
Dibromochloromethane	17	U	17
1,2-Dibromoethane	15	U	15
Ethylbenzene	8.7	U	8.7
m,p-Xylene	22	U	22
Xylene, o-	8.7	U	8.7
Xylene (total)	12		8.7
Bromoform	21	U	21
1,1,2,2-Tetrachloroethane	14	U	14
4-Ethyltoluene	9.8	U	9.8
1,3,5-Trimethylbenzene	9.8	U	9.8

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **SS-12**

Lab Sample ID: 200-3486-5
Client Matrix: Air

Date Sampled: 01/19/2011 1641
Date Received: 01/24/2011 1010

TO-15 Volatile Organic Compounds in Ambient Air

Method:	TO-15	Analysis Batch: 200-12866	Instrument ID: G.i
Preparation:	Summa Canister		Lab File ID: gfdai014.d
Dilution:	522		Initial Weight/Volume: 20 mL
Date Analyzed:	01/28/2011 0537		Final Weight/Volume: 200 mL
Date Prepared:	01/28/2011 0537		Injection Volume: 200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	260	U	260
1,2-Dichlorotetrafluoroethane	100	U	100
Vinyl chloride	100	U	100
1,3-Butadiene	100	U	100
Bromomethane	100	U	100
Chloroethane	260	U	260
Bromoethene(Vinyl Bromide)	100	U	100
Trichlorofluoromethane	100	U	100
1,1-Dichloroethene	100	U	100
3-Chloropropene	260	U	260
Methylene Chloride	260	U	260
Methyl tert-butyl ether	100	U	100
trans-1,2-Dichloroethene	100	U	100
n-Hexane	100	U	100
1,1-Dichloroethane	100	U	100
cis-1,2-Dichloroethene	2500		100
1,2-Dichloroethene, Total	2500		100
Chloroform	100	U	100
1,1,1-Trichloroethane	100	U	100
Cyclohexane	100	U	100
Carbon tetrachloride	100	U	100
2,2,4-Trimethylpentane	100	U	100
Benzene	100	U	100
1,2-Dichloroethane	100	U	100
n-Heptane	100	U	100
Trichloroethene	12000		100
1,2-Dichloropropane	100	U	100
Bromodichloromethane	100	U	100
cis-1,3-Dichloropropene	100	U	100
Toluene	130		100
trans-1,3-Dichloropropene	100	U	100
1,1,2-Trichloroethane	100	U	100
Tetrachloroethene	100	U	100
Dibromochloromethane	100	U	100
1,2-Dibromoethane	100	U	100
Ethylbenzene	100	U	100
m,p-Xylene	260	U	260
Xylene, o-	100	U	100
Xylene (total)	100	U	100
Bromoform	100	U	100
1,1,2,2-Tetrachloroethane	100	U	100
4-Ethyltoluene	100	U	100
1,3,5-Trimethylbenzene	100	U	100

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	1300	U	1300

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **SS-12**

Lab Sample ID: 200-3486-5
Client Matrix: Air

Date Sampled: 01/19/2011 1641
Date Received: 01/24/2011 1010

TO-15 Volatile Organic Compounds in Ambient Air

Method:	TO-15	Analysis Batch: 200-12866	Instrument ID: G.i
Preparation:	Summa Canister		Lab File ID: gfdai014.d
Dilution:	522		Initial Weight/Volume: 20 mL
Date Analyzed:	01/28/2011 0537		Final Weight/Volume: 200 mL
Date Prepared:	01/28/2011 0537		Injection Volume: 200 mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	730	U	730
Vinyl chloride	270	U	270
1,3-Butadiene	230	U	230
Bromomethane	410	U	410
Chloroethane	690	U	690
Bromoethene(Vinyl Bromide)	460	U	460
Trichlorofluoromethane	590	U	590
1,1-Dichloroethene	410	U	410
3-Chloropropene	820	U	820
Methylene Chloride	910	U	910
Methyl tert-butyl ether	380	U	380
trans-1,2-Dichloroethene	410	U	410
n-Hexane	370	U	370
1,1-Dichloroethane	420	U	420
cis-1,2-Dichloroethene	9800		410
1,2-Dichloroethene, Total	9800		410
Chloroform	510	U	510
1,1,1-Trichloroethane	570	U	570
Cyclohexane	360	U	360
Carbon tetrachloride	660	U	660
2,2,4-Trimethylpentane	490	U	490
Benzene	330	U	330
1,2-Dichloroethane	420	U	420
n-Heptane	430	U	430
Trichloroethene	65000		560
1,2-Dichloropropane	480	U	480
Bromodichloromethane	700	U	700
cis-1,3-Dichloropropene	470	U	470
Toluene	470		390
trans-1,3-Dichloropropene	470	U	470
1,1,2-Trichloroethane	570	U	570
Tetrachloroethene	710	U	710
Dibromochloromethane	890	U	890
1,2-Dibromoethane	800	U	800
Ethylbenzene	450	U	450
m,p-Xylene	1100	U	1100
Xylene, o-	450	U	450
Xylene (total)	450	U	450
Bromoform	1100	U	1100
1,1,2,2-Tetrachloroethane	720	U	720
4-Ethyltoluene	510	U	510
1,3,5-Trimethylbenzene	510	U	510

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-10**

Lab Sample ID: 200-3486-1
Client Matrix: Air

Date Sampled: 01/19/2011 1653
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID: E.i
Preparation:	Summa Canister		Lab File ID: eehau008.d
Dilution:	4.0		Initial Weight/Volume: 125 mL
Date Analyzed:	01/27/2011 2047		Final Weight/Volume: 500 mL
Date Prepared:	01/27/2011 2047		Injection Volume: 500 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	0.37		0.040
1,2-Dichlorotetrafluoroethane	0.040	U	0.040
Vinyl chloride	0.080	U *	0.080
1,3-Butadiene	0.080	U	0.080
Bromomethane	0.080	U	0.080
Chloroethane	0.080	U	0.080
Bromoethene(Vinyl Bromide)	0.080	U	0.080
Trichlorofluoromethane	0.15		0.040
1,1-Dichloroethene	0.040	U	0.040
3-Chloropropene	0.080	U	0.080
Methylene Chloride	0.80	U * ^	0.80
Methyl tert-butyl ether	0.040	U	0.040
trans-1,2-Dichloroethene	0.040	U	0.040
n-Hexane	0.12		0.080
1,1-Dichloroethane	0.040	U	0.040
cis-1,2-Dichloroethene	0.042		0.040
Chloroform	0.040	U	0.040
1,1,1-Trichloroethane	0.040	U	0.040
Cyclohexane	0.059		0.040
Carbon tetrachloride	0.050		0.040
2,2,4-Trimethylpentane	0.064		0.040
Benzene	0.25		0.040
1,2-Dichloroethane	0.080	U	0.080
n-Heptane	0.077		0.040
Trichloroethene	0.43		0.040
1,2-Dichloropropane	0.080	U	0.080
Bromodichloromethane	0.040	U	0.040
cis-1,3-Dichloropropene	0.040	U	0.040
Toluene	0.45		0.040
trans-1,3-Dichloropropene	0.040	U	0.040
1,1,2-Trichloroethane	0.040	U	0.040
Tetrachloroethene	0.040	U	0.040
Dibromochloromethane	0.040	U	0.040
1,2-Dibromoethane	0.040	U	0.040
Ethylbenzene	0.058		0.040
o-Xylene	0.056		0.040
Bromoform	0.040	U	0.040
1,1,2,2-Tetrachloroethane	0.040	U	0.040
4-Ethyltoluene	0.040	U	0.040
1,3,5-Trimethylbenzene	0.080	U	0.080
1,2-Dichloroethene, Total	0.042		0.040
m-Xylene & p-Xylene	0.16		0.080
Xylenes, Total	0.22		0.040

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	1.8		0.20

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-10**

Lab Sample ID: 200-3486-1
Client Matrix: Air

Date Sampled: 01/19/2011 1653
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau008.d	
Dilution:	4.0		Initial Weight/Volume:	125	mL
Date Analyzed:	01/27/2011 2047		Final Weight/Volume:	500	mL
Date Prepared:	01/27/2011 2047		Injection Volume:	500	mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	0.28	U	0.28
Vinyl chloride	0.20	U *	0.20
1,3-Butadiene	0.18	U	0.18
Bromomethane	0.31	U	0.31
Chloroethane	0.21	U	0.21
Bromoethene(Vinyl Bromide)	0.35	U	0.35
Trichlorofluoromethane	0.86		0.22
1,1-Dichloroethene	0.16	U	0.16
3-Chloropropene	0.25	U	0.25
Methylene Chloride	2.8	U * ^	2.8
Methyl tert-butyl ether	0.14	U	0.14
trans-1,2-Dichloroethene	0.16	U	0.16
n-Hexane	0.44		0.28
1,1-Dichloroethane	0.16	U	0.16
cis-1,2-Dichloroethene	0.17		0.16
Chloroform	0.20	U	0.20
1,1,1-Trichloroethane	0.22	U	0.22
Cyclohexane	0.20		0.14
Carbon tetrachloride	0.32		0.25
2,2,4-Trimethylpentane	0.30		0.19
Benzene	0.80		0.13
1,2-Dichloroethane	0.32	U	0.32
n-Heptane	0.31		0.16
Trichloroethene	2.3		0.21
1,2-Dichloropropane	0.37	U	0.37
Bromodichloromethane	0.27	U	0.27
cis-1,3-Dichloropropene	0.18	U	0.18
Toluene	1.7		0.15
trans-1,3-Dichloropropene	0.18	U	0.18
1,1,2-Trichloroethane	0.22	U	0.22
Tetrachloroethene	0.27	U	0.27
Dibromochloromethane	0.34	U	0.34
1,2-Dibromoethane	0.31	U	0.31
Ethylbenzene	0.25		0.17
o-Xylene	0.24		0.17
Bromoform	0.41	U	0.41
1,1,2,2-Tetrachloroethane	0.27	U	0.27
4-Ethyltoluene	0.20	U	0.20
1,3,5-Trimethylbenzene	0.39	U	0.39
1,2-Dichloroethene, Total	0.17		0.16
m-Xylene & p-Xylene	0.70		0.35
Xylenes, Total	0.94		0.17

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-11**

Lab Sample ID: 200-3486-2
Client Matrix: Air

Date Sampled: 01/19/2011 1544
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID: E.i
Preparation:	Summa Canister		Lab File ID: eehau009.d
Dilution:	4.0		Initial Weight/Volume: 125 mL
Date Analyzed:	01/27/2011 2143		Final Weight/Volume: 500 mL
Date Prepared:	01/27/2011 2143		Injection Volume: 500 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	0.57		0.040
1,2-Dichlorotetrafluoroethane	0.040	U	0.040
Vinyl chloride	0.080	U *	0.080
1,3-Butadiene	0.11		0.080
Bromomethane	0.080	U	0.080
Chloroethane	0.080	U	0.080
Bromoethene(Vinyl Bromide)	0.080	U	0.080
Trichlorofluoromethane	0.21		0.040
1,1-Dichloroethene	0.040	U	0.040
3-Chloropropene	0.080	U	0.080
Methylene Chloride	0.80	U * ^	0.80
Methyl tert-butyl ether	0.040	U	0.040
trans-1,2-Dichloroethene	0.040	U	0.040
n-Hexane	0.18		0.080
1,1-Dichloroethane	0.040	U	0.040
cis-1,2-Dichloroethene	0.060		0.040
Chloroform	0.040	U	0.040
1,1,1-Trichloroethane	0.040	U	0.040
Cyclohexane	0.11		0.040
Carbon tetrachloride	0.067		0.040
2,2,4-Trimethylpentane	0.089		0.040
Benzene	0.33		0.040
1,2-Dichloroethane	0.080	U	0.080
n-Heptane	0.16		0.040
Trichloroethene	0.64		0.040
1,2-Dichloropropane	0.080	U	0.080
Bromodichloromethane	0.040	U	0.040
cis-1,3-Dichloropropene	0.040	U	0.040
Toluene	0.61		0.040
trans-1,3-Dichloropropene	0.040	U	0.040
1,1,2-Trichloroethane	0.040	U	0.040
Tetrachloroethene	0.040	U	0.040
Dibromochloromethane	0.040	U	0.040
1,2-Dibromoethane	0.040	U	0.040
Ethylbenzene	0.083		0.040
o-Xylene	0.080		0.040
Bromoform	0.040	U	0.040
1,1,2,2-Tetrachloroethane	0.040	U	0.040
4-Ethyltoluene	0.043		0.040
1,3,5-Trimethylbenzene	0.080	U	0.080
1,2-Dichloroethene, Total	0.060		0.040
m-Xylene & p-Xylene	0.22		0.080
Xylenes, Total	0.30		0.040

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	2.8		0.20

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-11**

Lab Sample ID: 200-3486-2
Client Matrix: Air

Date Sampled: 01/19/2011 1544
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau009.d	
Dilution:	4.0		Initial Weight/Volume:	125	mL
Date Analyzed:	01/27/2011 2143		Final Weight/Volume:	500	mL
Date Prepared:	01/27/2011 2143		Injection Volume:	500	mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	0.28	U	0.28
Vinyl chloride	0.20	U *	0.20
1,3-Butadiene	0.24		0.18
Bromomethane	0.31	U	0.31
Chloroethane	0.21	U	0.21
Bromoethene(Vinyl Bromide)	0.35	U	0.35
Trichlorofluoromethane	1.2		0.22
1,1-Dichloroethene	0.16	U	0.16
3-Chloropropene	0.25	U	0.25
Methylene Chloride	2.8	U * ^	2.8
Methyl tert-butyl ether	0.14	U	0.14
trans-1,2-Dichloroethene	0.16	U	0.16
n-Hexane	0.64		0.28
1,1-Dichloroethane	0.16	U	0.16
cis-1,2-Dichloroethene	0.24		0.16
Chloroform	0.20	U	0.20
1,1,1-Trichloroethane	0.22	U	0.22
Cyclohexane	0.39		0.14
Carbon tetrachloride	0.42		0.25
2,2,4-Trimethylpentane	0.41		0.19
Benzene	1.1		0.13
1,2-Dichloroethane	0.32	U	0.32
n-Heptane	0.64		0.16
Trichloroethene	3.5		0.21
1,2-Dichloropropane	0.37	U	0.37
Bromodichloromethane	0.27	U	0.27
cis-1,3-Dichloropropene	0.18	U	0.18
Toluene	2.3		0.15
trans-1,3-Dichloropropene	0.18	U	0.18
1,1,2-Trichloroethane	0.22	U	0.22
Tetrachloroethene	0.27	U	0.27
Dibromochloromethane	0.34	U	0.34
1,2-Dibromoethane	0.31	U	0.31
Ethylbenzene	0.36		0.17
o-Xylene	0.35		0.17
Bromoform	0.41	U	0.41
1,1,2,2-Tetrachloroethane	0.27	U	0.27
4-Ethyltoluene	0.21		0.20
1,3,5-Trimethylbenzene	0.39	U	0.39
1,2-Dichloroethene, Total	0.24		0.16
m-Xylene & p-Xylene	0.96		0.35
Xylenes, Total	1.3		0.17

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-12**

Lab Sample ID: 200-3486-4
Client Matrix: Air

Date Sampled: 01/19/2011 1640
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID: E.i
Preparation:	Summa Canister		Lab File ID: eehau010.d
Dilution:	4.0		Initial Weight/Volume: 125 mL
Date Analyzed:	01/27/2011 2239		Final Weight/Volume: 500 mL
Date Prepared:	01/27/2011 2239		Injection Volume: 500 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	0.48		0.040
1,2-Dichlorotetrafluoroethane	0.040	U	0.040
Vinyl chloride	0.080	U *	0.080
1,3-Butadiene	0.082		0.080
Bromomethane	0.080	U	0.080
Chloroethane	0.080	U	0.080
Bromoethene(Vinyl Bromide)	0.080	U	0.080
Trichlorofluoromethane	0.18		0.040
1,1-Dichloroethene	0.040	U	0.040
3-Chloropropene	0.080	U	0.080
Methylene Chloride	0.80	U * ^	0.80
Methyl tert-butyl ether	0.040	U	0.040
trans-1,2-Dichloroethene	0.040	U	0.040
n-Hexane	0.14		0.080
1,1-Dichloroethane	0.040	U	0.040
cis-1,2-Dichloroethene	0.085		0.040
Chloroform	0.040	U	0.040
1,1,1-Trichloroethane	0.040	U	0.040
Cyclohexane	0.046		0.040
Carbon tetrachloride	0.060		0.040
2,2,4-Trimethylpentane	0.068		0.040
Benzene	0.25		0.040
1,2-Dichloroethane	0.080	U	0.080
n-Heptane	0.095		0.040
Trichloroethene	0.95		0.040
1,2-Dichloropropane	0.080	U	0.080
Bromodichloromethane	0.040	U	0.040
cis-1,3-Dichloropropene	0.040	U	0.040
Toluene	0.44		0.040
trans-1,3-Dichloropropene	0.040	U	0.040
1,1,2-Trichloroethane	0.040	U	0.040
Tetrachloroethene	0.040	U	0.040
Dibromochloromethane	0.040	U	0.040
1,2-Dibromoethane	0.040	U	0.040
Ethylbenzene	0.079		0.040
o-Xylene	0.069		0.040
Bromoform	0.040	U	0.040
1,1,2,2-Tetrachloroethane	0.040	U	0.040
4-Ethyltoluene	0.040	U	0.040
1,3,5-Trimethylbenzene	0.080	U	0.080
1,2-Dichloroethene, Total	0.085		0.040
m-Xylene & p-Xylene	0.23		0.080
Xylenes, Total	0.30		0.040

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	2.4		0.20

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-12**

Lab Sample ID: 200-3486-4
Client Matrix: Air

Date Sampled: 01/19/2011 1640
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau010.d	
Dilution:	4.0		Initial Weight/Volume:	125	mL
Date Analyzed:	01/27/2011 2239		Final Weight/Volume:	500	mL
Date Prepared:	01/27/2011 2239		Injection Volume:	500	mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	0.28	U	0.28
Vinyl chloride	0.20	U *	0.20
1,3-Butadiene	0.18		0.18
Bromomethane	0.31	U	0.31
Chloroethane	0.21	U	0.21
Bromoethene(Vinyl Bromide)	0.35	U	0.35
Trichlorofluoromethane	1.0		0.22
1,1-Dichloroethene	0.16	U	0.16
3-Chloropropene	0.25	U	0.25
Methylene Chloride	2.8	U * ^	2.8
Methyl tert-butyl ether	0.14	U	0.14
trans-1,2-Dichloroethene	0.16	U	0.16
n-Hexane	0.50		0.28
1,1-Dichloroethane	0.16	U	0.16
cis-1,2-Dichloroethene	0.34		0.16
Chloroform	0.20	U	0.20
1,1,1-Trichloroethane	0.22	U	0.22
Cyclohexane	0.16		0.14
Carbon tetrachloride	0.38		0.25
2,2,4-Trimethylpentane	0.32		0.19
Benzene	0.79		0.13
1,2-Dichloroethane	0.32	U	0.32
n-Heptane	0.39		0.16
Trichloroethene	5.1		0.21
1,2-Dichloropropane	0.37	U	0.37
Bromodichloromethane	0.27	U	0.27
cis-1,3-Dichloropropene	0.18	U	0.18
Toluene	1.6		0.15
trans-1,3-Dichloropropene	0.18	U	0.18
1,1,2-Trichloroethane	0.22	U	0.22
Tetrachloroethene	0.27	U	0.27
Dibromochloromethane	0.34	U	0.34
1,2-Dibromoethane	0.31	U	0.31
Ethylbenzene	0.34		0.17
o-Xylene	0.30		0.17
Bromoform	0.41	U	0.41
1,1,2,2-Tetrachloroethane	0.27	U	0.27
4-Ethyltoluene	0.20	U	0.20
1,3,5-Trimethylbenzene	0.39	U	0.39
1,2-Dichloroethene, Total	0.34		0.16
m-Xylene & p-Xylene	0.98		0.35
Xylenes, Total	1.3		0.17

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-13**

Lab Sample ID: 200-3486-6
Client Matrix: Air

Date Sampled: 01/19/2011 1640
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID: E.i
Preparation:	Summa Canister		Lab File ID: eehau011.d
Dilution:	3.99		Initial Weight/Volume: 288 mL
Date Analyzed:	01/27/2011 2336		Final Weight/Volume: 500 mL
Date Prepared:	01/27/2011 2336		Injection Volume: 500 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	0.49		0.040
1,2-Dichlorotetrafluoroethane	0.040	U	0.040
Vinyl chloride	0.080	U *	0.080
1,3-Butadiene	0.099		0.080
Bromomethane	0.080	U	0.080
Chloroethane	0.080	U	0.080
Bromoethene(Vinyl Bromide)	0.080	U	0.080
Trichlorofluoromethane	0.20		0.040
1,1-Dichloroethene	0.040	U	0.040
3-Chloropropene	0.080	U	0.080
Methylene Chloride	0.80	U * ^	0.80
Methyl tert-butyl ether	0.040	U	0.040
trans-1,2-Dichloroethene	0.040	U	0.040
n-Hexane	0.20		0.080
1,1-Dichloroethane	0.040	U	0.040
cis-1,2-Dichloroethene	0.079		0.040
Chloroform	0.040	U	0.040
1,1,1-Trichloroethane	0.040	U	0.040
Cyclohexane	0.050		0.040
Carbon tetrachloride	0.060		0.040
2,2,4-Trimethylpentane	0.076		0.040
Benzene	0.27		0.040
1,2-Dichloroethane	0.080	U	0.080
n-Heptane	0.13		0.040
Trichloroethene	1.0		0.040
1,2-Dichloropropane	0.080	U	0.080
Bromodichloromethane	0.040	U	0.040
cis-1,3-Dichloropropene	0.040	U	0.040
Toluene	0.45		0.040
trans-1,3-Dichloropropene	0.040	U	0.040
1,1,2-Trichloroethane	0.040	U	0.040
Tetrachloroethene	0.040	U	0.040
Dibromochloromethane	0.040	U	0.040
1,2-Dibromoethane	0.040	U	0.040
Ethylbenzene	0.082		0.040
o-Xylene	0.075		0.040
Bromoform	0.040	U	0.040
1,1,2,2-Tetrachloroethane	0.040	U	0.040
4-Ethyltoluene	0.040	U	0.040
1,3,5-Trimethylbenzene	0.080	U	0.080
1,2-Dichloroethene, Total	0.079		0.040
m-Xylene & p-Xylene	0.22		0.080
Xylenes, Total	0.29		0.040

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	2.4		0.20

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **IA-13**

Lab Sample ID: 200-3486-6
Client Matrix: Air

Date Sampled: 01/19/2011 1640
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau011.d	
Dilution:	3.99		Initial Weight/Volume:	288	mL
Date Analyzed:	01/27/2011 2336		Final Weight/Volume:	500	mL
Date Prepared:	01/27/2011 2336		Injection Volume:	500	mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	0.28	U	0.28
Vinyl chloride	0.20	U *	0.20
1,3-Butadiene	0.22		0.18
Bromomethane	0.31	U	0.31
Chloroethane	0.21	U	0.21
Bromoethene(Vinyl Bromide)	0.35	U	0.35
Trichlorofluoromethane	1.1		0.22
1,1-Dichloroethene	0.16	U	0.16
3-Chloropropene	0.25	U	0.25
Methylene Chloride	2.8	U * ^	2.8
Methyl tert-butyl ether	0.14	U	0.14
trans-1,2-Dichloroethene	0.16	U	0.16
n-Hexane	0.71		0.28
1,1-Dichloroethane	0.16	U	0.16
cis-1,2-Dichloroethene	0.31		0.16
Chloroform	0.19	U	0.19
1,1,1-Trichloroethane	0.22	U	0.22
Cyclohexane	0.17		0.14
Carbon tetrachloride	0.38		0.25
2,2,4-Trimethylpentane	0.35		0.19
Benzene	0.86		0.13
1,2-Dichloroethane	0.32	U	0.32
n-Heptane	0.53		0.16
Trichloroethene	5.4		0.21
1,2-Dichloropropane	0.37	U	0.37
Bromodichloromethane	0.27	U	0.27
cis-1,3-Dichloropropene	0.18	U	0.18
Toluene	1.7		0.15
trans-1,3-Dichloropropene	0.18	U	0.18
1,1,2-Trichloroethane	0.22	U	0.22
Tetrachloroethene	0.27	U	0.27
Dibromochloromethane	0.34	U	0.34
1,2-Dibromoethane	0.31	U	0.31
Ethylbenzene	0.35		0.17
o-Xylene	0.33		0.17
Bromoform	0.41	U	0.41
1,1,2,2-Tetrachloroethane	0.27	U	0.27
4-Ethyltoluene	0.20	U	0.20
1,3,5-Trimethylbenzene	0.39	U	0.39
1,2-Dichloroethene, Total	0.31		0.16
m-Xylene & p-Xylene	0.95		0.35
Xylenes, Total	1.3		0.17

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **AA-1**

Lab Sample ID: 200-3486-7
Client Matrix: Air

Date Sampled: 01/19/2011 1632
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau012.d	
Dilution:	4.0		Initial Weight/Volume:	125	mL
Date Analyzed:	01/28/2011 0033		Final Weight/Volume:	500	mL
Date Prepared:	01/28/2011 0033		Injection Volume:	500	mL

Analyte	Result (ppb v/v)	Qualifier	RL
Dichlorodifluoromethane	0.60		0.040
1,2-Dichlorotetrafluoroethane	0.040	U	0.040
Vinyl chloride	0.080	U *	0.080
1,3-Butadiene	0.11		0.080
Bromomethane	0.080	U	0.080
Chloroethane	0.080	U	0.080
Bromoethene(Vinyl Bromide)	0.080	U	0.080
Trichlorofluoromethane	0.23		0.040
1,1-Dichloroethene	0.040	U	0.040
3-Chloropropene	0.080	U	0.080
Methylene Chloride	0.80	U * ^	0.80
Methyl tert-butyl ether	0.040	U	0.040
trans-1,2-Dichloroethene	0.040	U	0.040
n-Hexane	0.18		0.080
1,1-Dichloroethane	0.040	U	0.040
cis-1,2-Dichloroethene	0.040	U	0.040
Chloroform	0.040	U	0.040
1,1,1-Trichloroethane	0.040	U	0.040
Cyclohexane	0.048		0.040
Carbon tetrachloride	0.077		0.040
2,2,4-Trimethylpentane	0.099		0.040
Benzene	0.34		0.040
1,2-Dichloroethane	0.080	U	0.080
n-Heptane	0.090		0.040
Trichloroethene	0.040	U	0.040
1,2-Dichloropropane	0.080	U	0.080
Bromodichloromethane	0.040	U	0.040
cis-1,3-Dichloropropene	0.040	U	0.040
Toluene	0.49		0.040
trans-1,3-Dichloropropene	0.040	U	0.040
1,1,2-Trichloroethane	0.040	U	0.040
Tetrachloroethene	0.047		0.040
Dibromochloromethane	0.040	U	0.040
1,2-Dibromoethane	0.040	U	0.040
Ethylbenzene	0.060		0.040
o-Xylene	0.060		0.040
Bromoform	0.040	U	0.040
1,1,2,2-Tetrachloroethane	0.040	U	0.040
4-Ethyltoluene	0.040	U	0.040
1,3,5-Trimethylbenzene	0.080	U	0.080
1,2-Dichloroethene, Total	0.040	U	0.040
m-Xylene & p-Xylene	0.16		0.080
Xylenes, Total	0.22		0.040

Analyte	Result (ug/m3)	Qualifier	RL
Dichlorodifluoromethane	2.9		0.20

Client: AKRF Inc

Job Number: 200-3486-1
Sdg Number: 200-3486

Client Sample ID: **AA-1**

Lab Sample ID: 200-3486-7
Client Matrix: Air

Date Sampled: 01/19/2011 1632
Date Received: 01/24/2011 1010

TO15 LL Volatile Organic Compounds in Ambient Air, Low Concentration (GC/MS)

Method:	TO15 LL	Analysis Batch: 200-13126	Instrument ID:	E.i	
Preparation:	Summa Canister		Lab File ID:	eehau012.d	
Dilution:	4.0		Initial Weight/Volume:	125	mL
Date Analyzed:	01/28/2011 0033		Final Weight/Volume:	500	mL
Date Prepared:	01/28/2011 0033		Injection Volume:	500	mL

Analyte	Result (ug/m3)	Qualifier	RL
1,2-Dichlorotetrafluoroethane	0.28	U	0.28
Vinyl chloride	0.20	U *	0.20
1,3-Butadiene	0.25		0.18
Bromomethane	0.31	U	0.31
Chloroethane	0.21	U	0.21
Bromoethene(Vinyl Bromide)	0.35	U	0.35
Trichlorofluoromethane	1.3		0.22
1,1-Dichloroethene	0.16	U	0.16
3-Chloropropene	0.25	U	0.25
Methylene Chloride	2.8	U * ^	2.8
Methyl tert-butyl ether	0.14	U	0.14
trans-1,2-Dichloroethene	0.16	U	0.16
n-Hexane	0.64		0.28
1,1-Dichloroethane	0.16	U	0.16
cis-1,2-Dichloroethene	0.16	U	0.16
Chloroform	0.20	U	0.20
1,1,1-Trichloroethane	0.22	U	0.22
Cyclohexane	0.17		0.14
Carbon tetrachloride	0.48		0.25
2,2,4-Trimethylpentane	0.46		0.19
Benzene	1.1		0.13
1,2-Dichloroethane	0.32	U	0.32
n-Heptane	0.37		0.16
Trichloroethene	0.21	U	0.21
1,2-Dichloropropane	0.37	U	0.37
Bromodichloromethane	0.27	U	0.27
cis-1,3-Dichloropropene	0.18	U	0.18
Toluene	1.8		0.15
trans-1,3-Dichloropropene	0.18	U	0.18
1,1,2-Trichloroethane	0.22	U	0.22
Tetrachloroethene	0.32		0.27
Dibromochloromethane	0.34	U	0.34
1,2-Dibromoethane	0.31	U	0.31
Ethylbenzene	0.26		0.17
o-Xylene	0.26		0.17
Bromoform	0.41	U	0.41
1,1,2,2-Tetrachloroethane	0.27	U	0.27
4-Ethyltoluene	0.20	U	0.20
1,3,5-Trimethylbenzene	0.39	U	0.39
1,2-Dichloroethene, Total	0.16	U	0.16
m-Xylene & p-Xylene	0.71		0.35
Xylenes, Total	0.98		0.17

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Tuccoff	Samples Collected By: SG/EB	1 of 2 COCs
Company: AKRF	Phone: 914.922.2382		
Address: 34 S. Broadway	Email: btuccoff@akrf.com		
City/State/Zip: White Plains, NY 10601			
Phone: 914.922.2382	Site Contact: Elizabeth Baier		
FAX: 914.949.7559	TA Contact: Jill Dunack		
Project Name: Magna Metals	**Analysis Turnaround Time**		
Site: Cortlandt, NY	Standard (Specify) X - 5 days		
PO # 40252	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-10	1.19.11	0852	1653	-30	-7	3240	4811	X											
IA-11	1.19.11	0827	1544	-28	-6	27168	3217	X											
SS-11	1.19.11	0829	1545	-29	-5	5189	3636	X											
IA-12	1.19.11	0840	1640	-28	-4	51168	4458	X											
SS-12	1.19.11	0847	1641	-30	-15	5195	5039	X											
IA-13	1.19.11	0840	1640	-27	-16	5177	3257	X											

Temperature (Fahrenheit)	Interior	Ambient
Start		
Stop		

Pressure (Inches of Hg)	Interior	Ambient
Start		
Stop		

Special Instructions/QC Requirements & Comments:

Samples Shipped by:	Date/Time:	Samples Received by:
Samples Relinquished by: Rob Klusek	Date/Time: 1/20/11 1640	Received by: Albert Granby
Relinquished by: Albert Granby	Date/Time: 1/20/11 1902	Received by: 1-20-11 1902

Lab Use Only Shipper Name: 1-21-11 1100 Opened by: Condition: Received by lab TA 01/24/11 1010

TestAmerica Burlington
30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Bryan Tuttle	**Samples Collected By:** EB/SG	2 of 2 COCs
Company: AKRF	Phone: 914.922.2382		
Address: 34 S. Broadway	Email: btuttle@akrf.com		
City/State/Zip White Plains, NY 10601			
Phone: 914.922.2382	Site Contact: E. Baird - 917.863.5972		
FAX: 914.949.7559	TA Contact: Jill Dunaway		
Project Name: Magna Metals	**Analysis Turnaround Time**		
Site: Cortlandt, NY	Standard (Specify) X - 5 day		
PO # 40256	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
AA-1	1.19.11	0857	1632	-29	-3	2804	4472	X											

Temperature (Fahrenheit)			
	Interior	Ambient	
Start			
Stop			

Pressure (Inches of Hg)			
	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

Samples Shipped by:	Date/Time:	Samples Received by:
Samples Relinquished by: Peter Kleser	Date/Time: 1/20/11 1640	Received by: Albert Gonzalez
Relinquished by: Albert Gonzalez	Date/Time: 1/20/11 1902	Received by: 1-20-11 1902

Lab Use Only Shipper Name: 1-21-11 11:00 Opened by: Condition: Received by lab: TA 01/24/11 1010

Former Magna Metals
Sub-Slab Depressurization System Final Certification

Prepared for:

The New York State Department of Environmental Remediation

&

The New York State Department of Health
Bureau of Environemtal Exposeure Investigation

Prepared By:
Aztech Technologies Inc.
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Mr. Donald E Duthaler, JR, P.E.
Baker Capital L.P.
Director of Property Management
One West Red Oak Lane
Fort Plains, NY 10604

May 14, 2012

Re: Sub-Slab Depressurization System (SSDS) - Post Installation Certification

Dear Mr. Duthaler:

Enclosed with this correspondence letter please find our SSDS Post-Installation Certification prepared in accordance with the requirements set forth by Nathan Walz of the New York State Department of Health's Bureau of Environmental Exposure Investigation.

This certification has been prepared on behalf of Baker Capital, L.P. to certify that the SSDS installed at 510 Furnace Dock Road in Cortlandt Manor, NY is functioning properly and is protective of public health.

If you have any questions concerning this submittal, please contact me at (518) 885-5383.

Thank you for the opportunity to be of service on this important project.

Sincerely,



Joseph Sabanos
Project Manager
Aztech Technologies, Inc.

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1. Introduction

1.1 Report Preface

The following report is intended to present pertinent information and data collected during the pre-design phase and post-installation phase of the sub-slab depressurization system (SSDS) located at the former Magna Metals site (the site) in Cortlandt Manor New York. The purpose of this report is to certify that the SSDS installed at the site is functioning properly and is protective of the occupant's public health. The content below is a combination of data obtained from public records, first hand site inspections and air sampling conducted by Aztech Technologies, Inc. (Aztech).

Aztech has prepared this report on behalf of the current property owner, Baker Capital, L.P. as requested by Nathan Walz of the New York State Department of Health's Bureau of Environmental Exposure Investigation.

1.2 Site Background

Located at 510 Furnace Dock Road, the site operated as a metal plating facility from 1955 through 1979. Currently located on the property are a warehouse building and an attached office/laboratory. Both areas of the structure are currently occupied by privately owned companies.

Due to the metal plating operations and associated contamination that took place at the site, the NYSDEC has classified the site as a Class 2 under the State Superfund Program. A Class 2 site is known to contain hazardous waste or other components such as breakdown products that represent a significant threat to the environment or public health.

Historically the operations that took place on site by Magna Metals included the discharging of iron, lead, copper, nickel, zinc, chlorides, cyanides, and sulfates into a series of leaching pits located on the property. In addition to the metals discharged directly onto the ground surface of the site, Trichloroethene (TCE) was allegedly discharged into the septic system on the property. Other volatile organic compounds (VOCs) were detected in groundwater and soil samples during the Remedial Investigation (RI). These VOCs have the potential to migrate through the groundwater across a site and volatize into voids of the soil creating vapors under a structure or dwelling. The vapors penetrate through the porous concrete slab of the structure and into the ambient air of the occupied space. Over time these vapors can have negative effects on the health of the public living or working in that structure or dwelling.

1.3 Scope of Work

The remedy chosen to assist in mitigating the soil vapor intrusion of TCE into the office building on the site included the design and installation of a sub-slab depressurization system (SSDS) by an experienced remedial contractor. Aztech was contracted by the current property owner, Baker Capital Limited Partnership to perform the design and installation of the SSDS.

The SSDS installed is capable of extracting soil vapors from underneath the slab of the laboratory/office space of the building and discharging those vapors above the roofline into the atmosphere. Design of the system included a calculated theoretical discharge concentration to determine if vapor phase carbon treatment is required by regulatory standards. Discussion of these calculations and final confirmatory testing can be found in the following sections.

2. Pre-Installation

2.1 Preliminary Air Quality Sampling and Analysis

As part of the State Superfund Program, sub-slab soil vapor and indoor ambient air samples were collected every year inside of the building during the heating seasons from 2007 through 2011. Laboratory analysis for VOCs was conducted using Method TO-15 with a detection limit of 1 µg/m³. Analysis of the soil vapor and indoor air confirmed that soil vapors were penetrating the slab of the laboratory/office building on site. The compound TCE was identified each year in every sample collected. Over time the concentrations of TCE generally increased from the previous year. In 2011 concentrations of TCE were identified at 65,000 parts per billion (ppb) and 5.4 ppb in the sub-slab soil vapor and indoor air samples respectively. Due to the increasing concentrations of TCE identified inside of the office building, the decision was made to take action to reduce the infiltration of VOCs in order to protect the health of the building occupants.

2.2 Pre-Design Radius of Influence Communication Testing

Prior to the initiating the design process, Aztech mobilized to the site to conduct sub-slab communication testing. This served as a way to determine the amount of vacuum pressure that can pass through the sub-slab soil over a measured distance. From these tests, the radius of influence an extraction well is capable of mitigating can be determined based on the applied vacuum of the system fan. The sub-slab communication test was conducted by Aztech personnel on October 11, 2011 using a 1.5 HP Rotron blower fan and digital manometer. The test results concluded that the system design would require a fan that would draw a minimum vacuum of five inches of water column at each extraction well to accomplish a flow rate of 10.25 CFM. This would achieve adequate communication over a distance of approximately 30 ft from each of the extraction wells.

2.3 Pre-Installation Communication Test Results

Time	Extraction Point Number: EW1									
	Fan Model: 1.5 HP Rotron Blower									
	Vacuum at Well Head	Vacuum at Point #1	Distance from Well Head to #1	Vacuum at Point #2	Distance from Well Head to #2	Vacuum at Point #3	Distance from Well Head to #3	Vacuum at Point #4	Distance from Well Head to #4	Air Flow (F/M)
2015	60"	n/a	8'	0.125	36'	0.005	48'	0.062	27'	1546
2030	35"	1.646	8'	0.022	36'	0.005	48'	0.038	27'	1037
2045	15"	0.659	8'	0.022	36'	0.000	48'	0.013	27'	624
	5"	0.200	8'	0.012	36'	0.000	48'	0.004	27'	474

Time	Extraction Point Number: EW2													
	Fan Model: 1.5 HP Rotron Blower													
	Vacuum at Well Head	Vacuum at Point #1	Distance from Well Head to #1	Vacuum at Point #2	Distance from Well Head to #2	Vacuum at Point #3	Distance from Well Head to #3	Vacuum at Point #4	Distance from Well Head to #4	Vacuum at Point #5	Distance from Well Head to #5	Vacuum at Point #6	Distance from Well Head to #6	Air Flow (F/M)
2300	60"	0.264	10'	0.027	20'	0.035	30'	0.031	40'	0.000	50'	0.000	20'	1003
2315	35"	0.239	10'	0.017	20'	0.027	30'	0.022	40'	0.000	50'	0.000	20'	728
2330	15"	0.138	10'	0.009	20'	0.015	30'	0.012	40'	0.000	50'	0.000	20'	604
2345	5"	0.049	10'	0.004	20'	0.005	30'	0.004	40'	0.000	50'	0.000	20'	425

2.4 Sub-Slab Depressurization System Design

Communication test data and physical site characteristics were entered into the New York State Department of Environmental Conservation's (NYSDEC) Air Guide 1 effluent formulation software program. The ratio of weight to volume of the contaminant of concern, TCE, determined during initial sub-slab vapor analysis was also inputted into the software program. Other required site characteristics and parameters such as geographic location and site zoning were taken into account and used by the software to generate an estimated annual effluent concentration. That theoretical effluent concentration was compared to the Annual Guideline Concentration (AGC) for TCE dictated by the NYSDEC. Based on the projected annual effluent concentration, the system design, and effluent stack height chosen, the system, as designed, is allowed to discharge into the atmosphere without flowing through a vapor phase carbon treatment system.

Aztech designed a SSDS that consists of three (3) soil vapor extraction fans that provide soil vapor mitigation throughout the office space of the building as well as a portion of the loading dock area shared by the adjacent warehouse. The system utilizes six (6) sub-slab extraction wells installed to a depth of approximately 12 to 18 inches below the bottom of the existing structural slab. Adjacent extraction points are paired together and piped to one of the three (3) high suction Radon-Away™ fans located on the roof of the office building.

3. Post Installation

3.1 SSDS Installation

On November 14th 2011, Aztech mobilized a crew of experienced technicians and materials to the site. All extraction wells and lateral plumbing was installed using three-inch (3") Schedule 40 polyvinyl chloride (PVC) pipe and hung above the drop ceiling in the office areas. Each extraction well penetrated the concrete slab and was set at a depth 12-18 inches below the slab. Extraction wells were backfilled with crushed granular stone to allow for an even flow of soil vapor from all directions. A layer of non-shrink grout was placed on top of the stone to ensure a tight seal around the base of the well level with the top of the existing concrete slab. Pairs of adjacent extraction wells were plumbed together into three (3) separate header pipes. Each header pipe penetrated the outer block wall of the building prior to being plumbed up to the roof and into their respective high suction fans. All lateral plumbing was installed sloping back to the extraction wells to prevent condensation from accumulating in the pipe. All condensation will drain back into the ground below the structural slab.

Each of the three high-suction extraction fans have been securely mounted to a custom fabricated steel channel strut bracing directly fastened to the roof. Each fan is powered from a sub-metered electrical panel with dedicated circuit breakers. All labor and materials associated with electrical work was conducted by a certified electrical contractor licensed in the county of Westchester NY.

Along each of the three main header pipes, a pressure switch and indicator light have been installed to display when a fan is no longer drawing a vacuum over 0.25 inches of water column. Each indicator light is visible for building maintenance staff to monitor.

3.2 Final Installation Photographs



Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: High Suction Fan

Description: High suction fan mounted to custom bracing on roof with 10-foot high discharge. Power supply mounted to roof directly under fan bracing.



Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: Header Pipe/Pressure Switch

Description: Extraction wells tied into header pipe. Pressure switch tied into header pipe.



Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: Roof Conduit

Description: Electrical rigid conduit mounted to roof with junction boxes and liquid tight fittings.

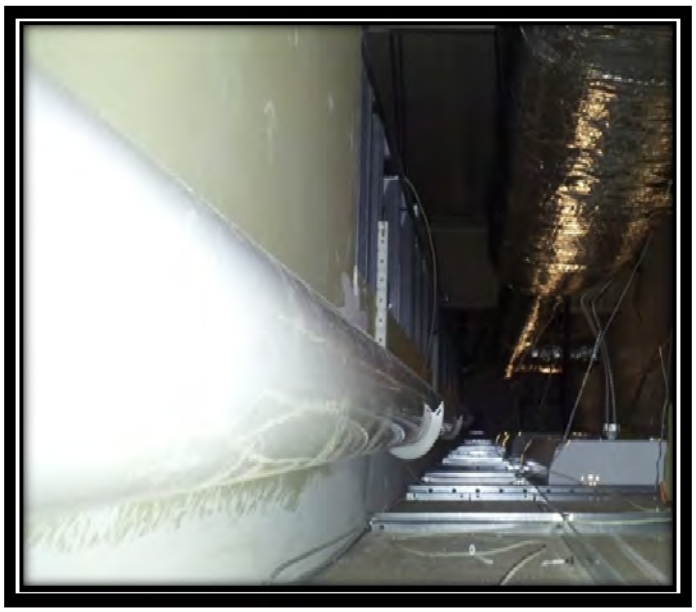


Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: Pressure Switch Indicator Light

Description: Pressure switch indicator light mounted to wall for easy visibility. If the total vacuum from any of the fans falls below 0.25 inches of water column the indicator light will turn on.



Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: Lateral Plumbing

Description: Piping installed above drop ceilings were hung on a slight pitch to allow for condensation to flow back to into the wells.



Site: Former Magna Metals

Location: 315 Furnace Dock Rd.
Cortlandt Manor NY

Subject: Exposed Lateral Pipe

Description: Pipe hung in areas of the building without drop ceilings was hung using threaded rod.

3.3 Post Installation Communication Testing and System Verification

Subsequent to installing the SSDS, Aztech allowed a total of ten (10) weeks for the system to be operable before mobilizing back to the site for a post installation sub-slab communications test. The communication tests conducted consisted of drilling a 3/8th inch hole through the structural slab at specific distances from each extraction well. A digital micro-manometer was inserted into the hole to measure the vacuum draw at each specific point. Results from each test are displayed in the table below. Influence of an area is acceptable when a minimum of 0.004 inches of water column is measured through a communication test hole in the slab.

Extraction Well	Distance From Well (ft)	Micro Manometer Reading (Inches of WC)
E	28	-0.075
E	54	-0.014
D	27	-0.035
A	35	-0.118

3.4 Post Installation Air Quality Sampling and Analysis

Indoor air quality samples were collected throughout the office space to confirm that the SSDS is effective in mitigating the contaminant infiltration from the office and loading dock portion of the building. Air sampling consisted of collecting 24-hour composite indoor ambient air samples from a total of three (3) locations inside the office area. Post installation samples were collected from the same locations and time of year as preceding samples. This provided similar conditions for an accurate comparison of the results. A duplicate sample was collected from one of the indoor sample locations and an outdoor sample was collected for analysis comparison. Samples were collected using stainless steel electropolished passive vessels also known as summa canisters. Samples were sent to Upstate Laboratories, Inc. to be analyzed for VOCs using EPA Method TO-15. The results of that analysis for the contaminant of concern (TCE) are listed below. Historical analysis results collected annually by other parties are also displayed. Analysis from the final sampling event on February 8th 2012 confirmed that the concentrations of TCE were below the detectable limits. Full analysis report can be found in **Appendix B.**

	Sample Location / TCE Concentration (µg/m³)		
Sample Date	**AI #1 / IA-12**	**AI #2 / IA-11**	**AI #3 / IA-10**
2/8/2012	ND	ND	ND
1/19/2011	5.1	3.5	2.3
1/19/2010	5.1	4.5	2
3/17/2009	4	3	2.4

3.5 Data Usability Summary Report (DUSR)

Analytical results were reviewed by Alpha Geoscience (Alpha) on March 28th 2012. A data usability summary report (DUSR) **(Appendix C)** was prepared by Alpha based on the data packages provided by the laboratory. The DUSR validated that the performances of the analyses were acceptable and fulfilled the requirements of the analytical method. Based on DUSR the lab data is considered usable and confirms that the SSDS is working to mitigate the TCE infiltration. This analysis also confirms that the SSDS is working to protect the health of those who occupy the office/laboratory portion of the building.

3.6 System O&M and Troubleshooting

In the event of a system shutdown due to a power outage, the SSDS fans will turn on automatically once power to the building has been restored. In the event of an indicator light displaying a loss in system vacuum please contact Aztech directly for additional support.

3.7 Conclusion

The objective of designing and installing an SSDS in the office/laboratory building at the Former Magna Metals site is to protect the human health of those occupying the structure. Post installation communication testing and laboratory analysis provide confirmation that the objective has been met. As a means to ensure that the SSDS continues to be protective of human health, the vacuum gauge indicator lights should be checked routinely to determine if the system is drawing vapors from below the structural slab. In the event of a loss in vacuum, an indicator light will illuminate. If necessary, Aztech can mobilize to the site to troubleshoot and resolve the issue. At the time of this report, the system is functioning properly and continues to serve its purpose of protecting the human health of the building occupants.

Appendix A – Figures

Figure 1 – Extraction Well Detail

Figure 2 – As-built System Layout

Figure 3 – Sampling Location Map

Figure 4 – Proposed SSDS Design

Figure 5 – Site Map

5 McCrea Hill Road
Ballston Spa
New York 12020

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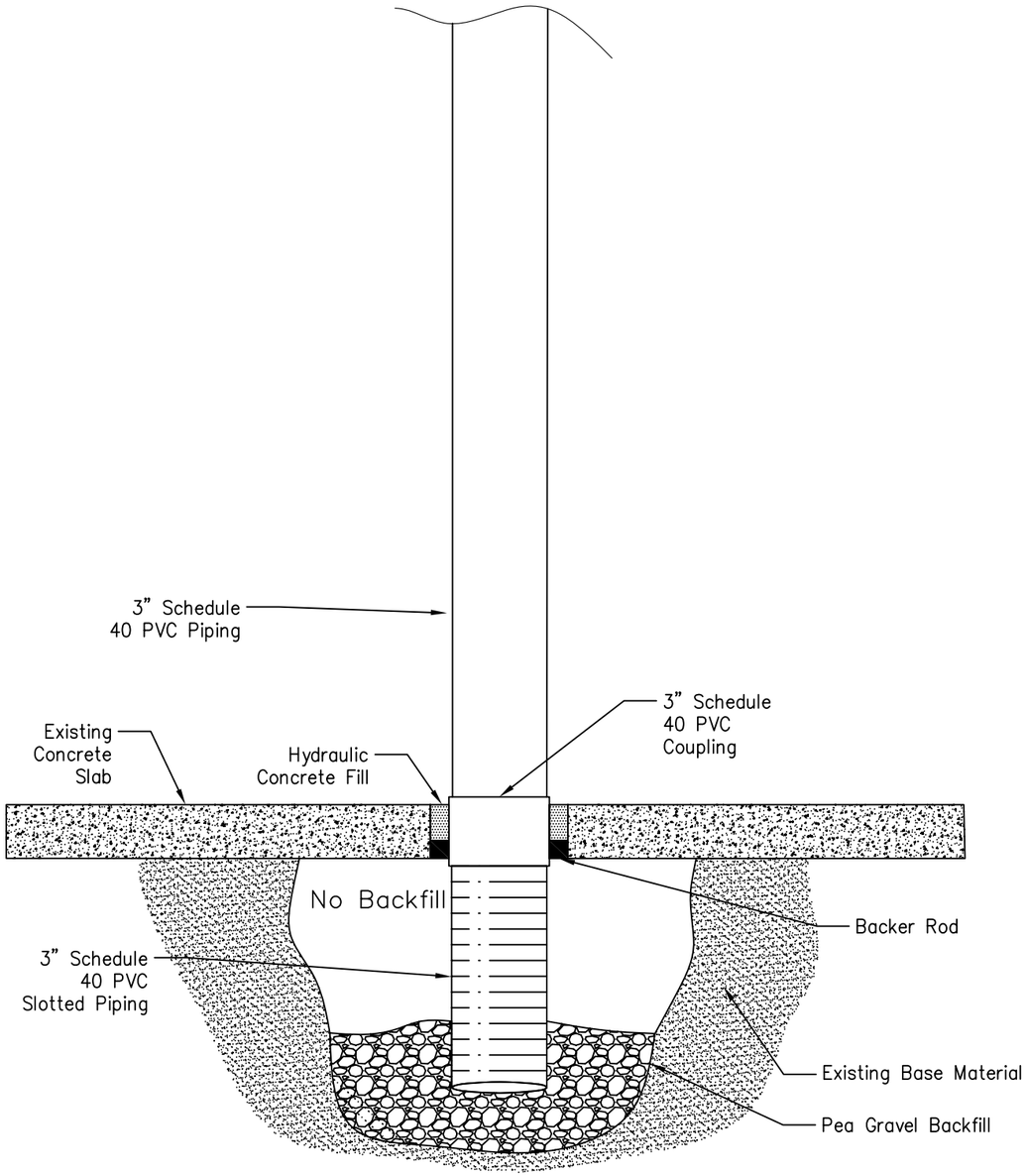
Fax: 518-885-5385
www.aztechtech.com



EXPERTISE YOU CAN COUNT ON

Aztech Technologies, Inc.

5 McCrea Hill Road
Ballston Spa
New York 12020

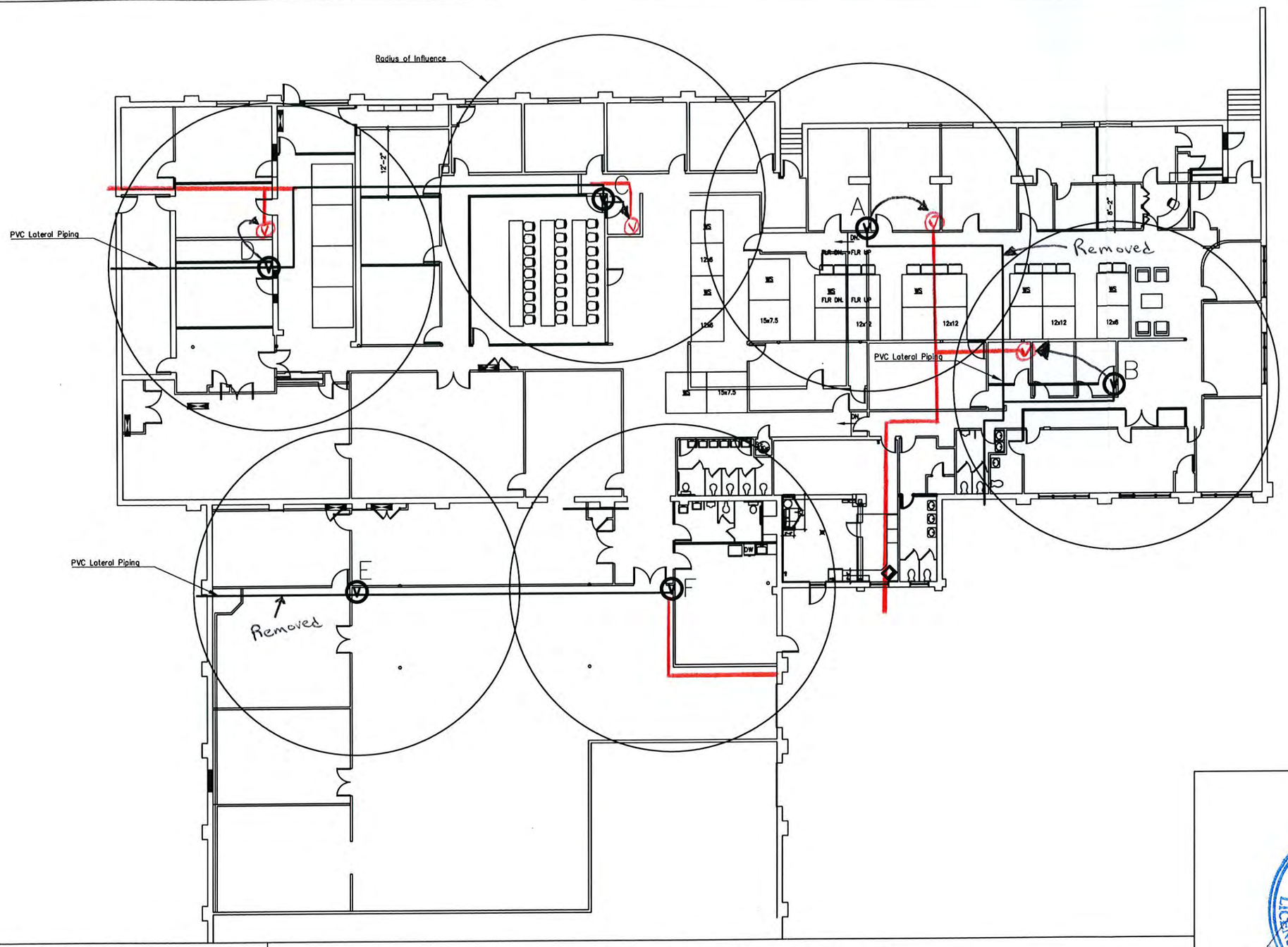
Phone: 518-885-5383
Fax: 518-885-5385
www.aztechtech.com

510 Furnace Dock Rd.
Cortlandt, NY

FIGURE 1 - EXTRACTION WELL DETAIL

DATE: 11-8-2011

SCALE: NTS



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New York 12020

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Fax: 518-885-5385
www.aztechtech.com

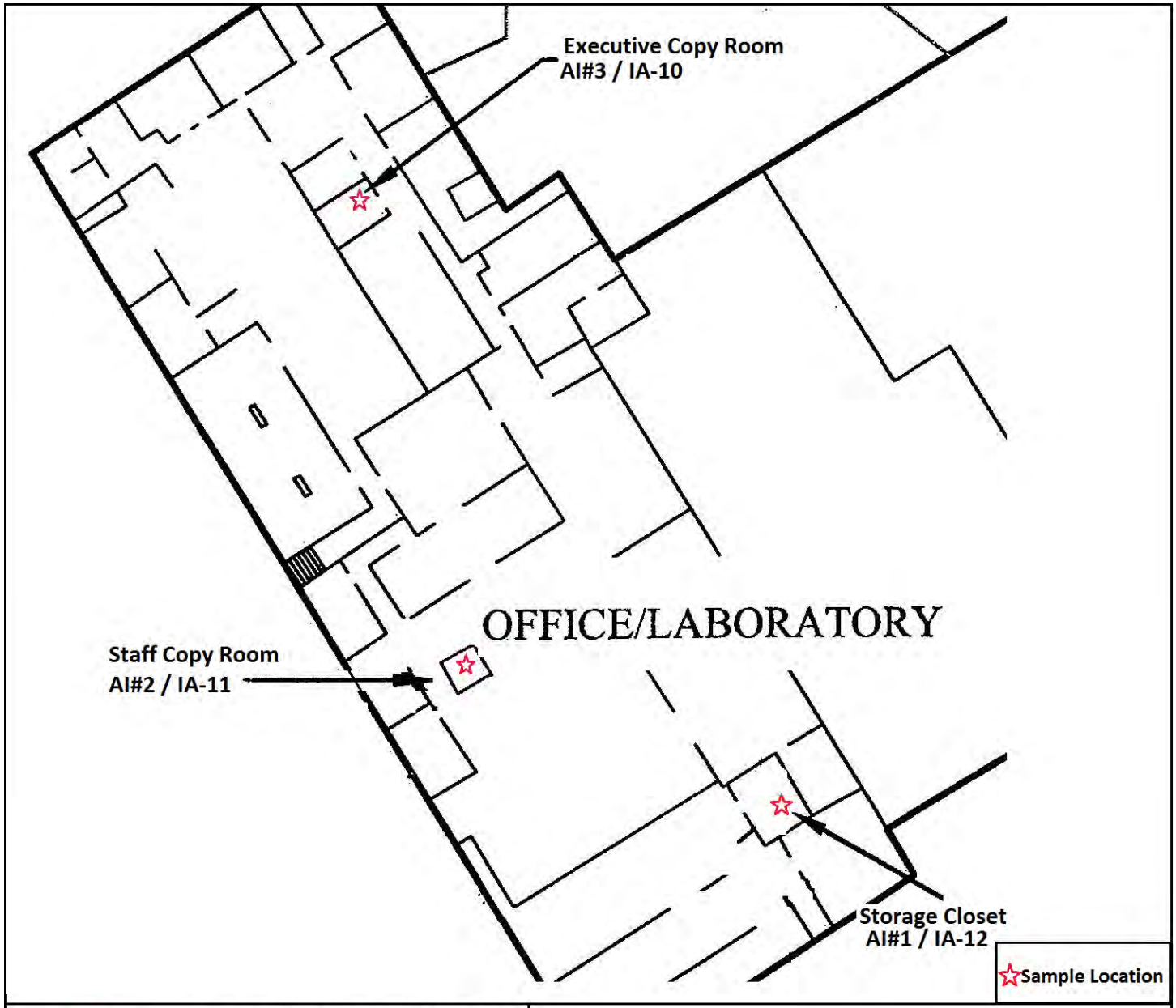
510 Furnace Dock Rd.
Cortlandt, NY

Figure 2: As-Built System Layout

DATE: 11-8-2011

SCALE: NTS

STATE OF NEW YORK
FILL. FINA III
069949
LICENSED PROFESSIONAL ENGINEER



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New York 12020

Phone: 518-885-5383
Fax: 518-885-5385
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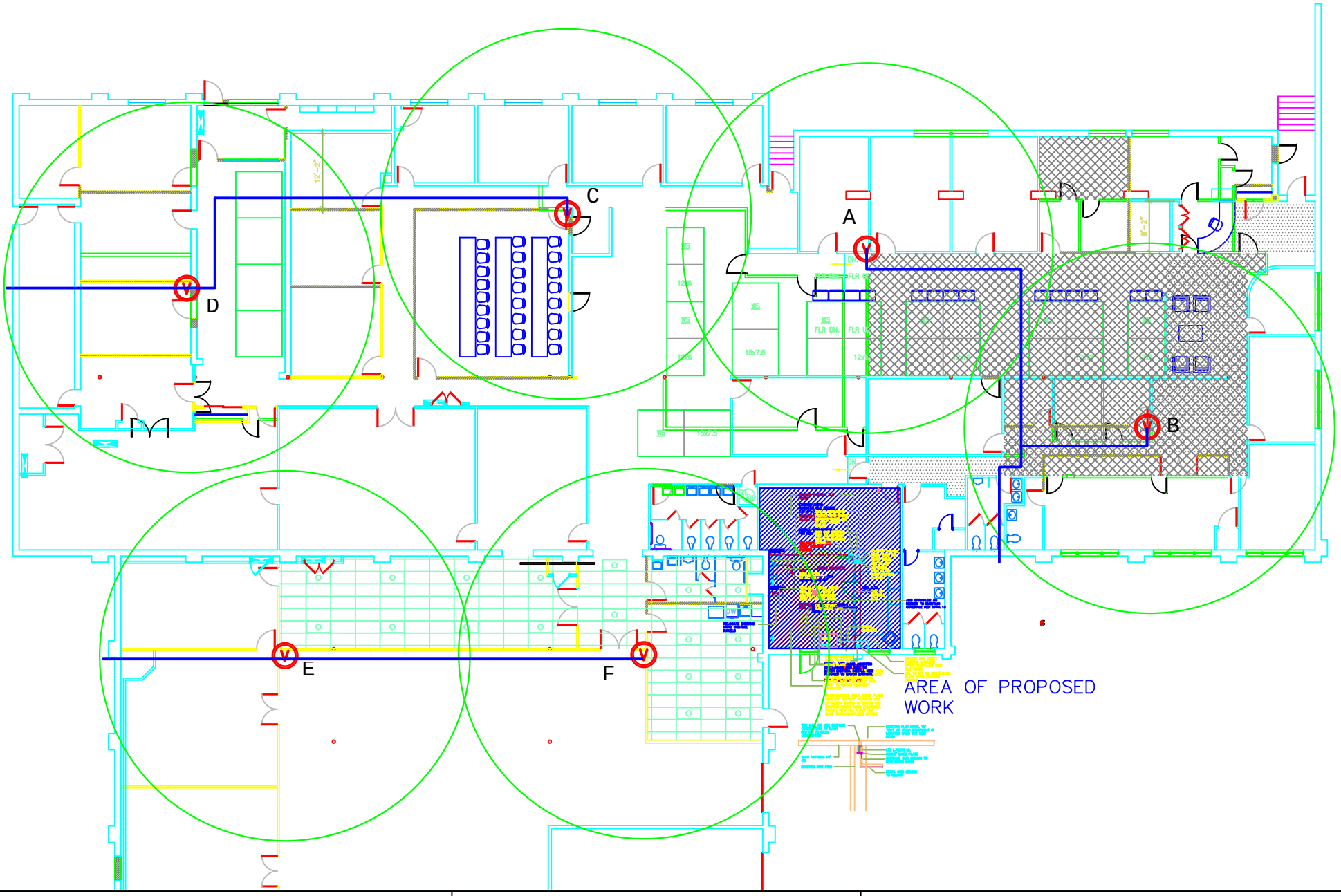
510 Furnace Dock Rd.
Cortlandt, NY

Figure 3: Sample Location Map

DATE: 2/8/2012

SCALE: NTS



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www.aztechtech.com

510 Furnace Dock Rd.
Cortlandt, NY

Figure 4: Proposed SSDS Design

DATE: 10-21-2011 | SCALE: NTS

Ⓥ – Extraction point

TITLE NO.

CERTIFIED TO:

IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS.

CERTIFICATIONS SHALL RUN ONLY TO THOSE GRANTEES AND INSTITUTIONS SHOWN HEREON UNDER THE TITLE POLICY NUMBER SHOWN ABOVE. SAID CERTIFICATIONS ARE NOT TRANSFERABLE.

NOTES

1) THE SANITARY SEWER DISPOSAL AREA AND SEPTIC TANKS SHOWN HEREON WERE DERIVED FROM SEAMED IMAGES OF "AS BUILT" SKETCHES PROVIDED BY THE RAYMOND KEYES ASSOCIATES AND WERE NOT FIELD LOCATED BY SURVEYOR

SIGN TABLE	
SIGN NO.	DESCRIPTION
S.1	STREET ADDRESS NO. 510, ETC.
S.2	NORTHERN WESTCHESTER BUSINESS PARK (1414)
S.3	STOP SIGN
S.4	SLOW SPEED RAMP
S.5	SLOW PEDESTRIANS
S.6	SLOW PEDESTRIANS
S.7	SLOW SPEED RAMP
S.8	VISITOR PARKING
S.9	RESERVED PARKING
S.10	HANDICAPPED PARKING (PORTABLE)
S.11	NO PARKING
S.13	HANDICAP PARKING

LEGEND

- HYDRANT
- CRW CONCRETE RETAINING WALL
- POLE
- LP/G LIGHT POLE
- WV WATER VALVE
- MW MONITORING WELL
- S.1 SIGN (SEE SIGN TABLE FOR DESCRIPTION)
- LIGHT (ON BUILDING)

NORTH

NOW OR FORMERLY THE MINES PRESS INC.

S16°02'50"E 828.11'

S73°57'10"E 651.08'

S16°02'50"E 879.97'

N73°57'10"W 495.45'

N27°56'10"W 699.19'

N27°56'10"W 189.03'

S73°57'10"E 1211.86'

ROAD

DOCK

FURNACE

ROAD

PARKWAY

HOMEOWNERS ASSOC. INC.

NOW OR FORMERLY CORTLANDT RIDGE SECTION 34.18 BLOCK 1 LOT 11

CONTROLLER 10" DIA. 6.6' SOUTH

CONTROLLER 10" DIA. 6.8' SOUTH

CONTROLLER 10" DIA. 6.8' NORTH

CONTROLLER 10" DIA. 6.8' NORTH

S73°57'10"E 156.13'

156.04' (DEED)

N31°37'W

N31°37'W 58.10'

N39°59'W 36.89'

N27°20'W 128.18'

N25°16'W 101.40'

N27°13'W

LOT 29 NOW OR FORMERLY CARA SAX & ARTHUR PIDORIANO SECTION 34.17 BLOCK 3 LOT 3 80 CROSS ROAD CORTLANDT MANOR, NY 10567

LOT 19 NOW OR FORMERLY CHRISTOPHER T. & ALISON MAZZONI SECTION 34.17 BLOCK 3 LOT 4 16 CROSS ROAD CORTLANDT MANOR, NY 10567

LOT 18 NOW OR FORMERLY TILAK K. & GEETA AGERKALA SECTION 34.18 BLOCK 1 LOT 4 15 CROSS ROAD CORTLANDT MANOR, NY 10567

LOT 17 NOW OR FORMERLY JOSEPH H. & MARILYN BRASS SECTION 34.18 BLOCK 1 LOT 3 14 CROSS ROAD CORTLANDT MANOR, NY 10567

LOT 16 NOW OR FORMERLY VICTOR & ALICE BORSELLA SECTION 34.18 BLOCK 1 LOT 8 12 CROSS ROAD CORTLANDT MANOR, NY 10567

LOT 15 FORMERLY NOW OR JOHN W. & MARYANN ITZKAS SECTION 34.18 BLOCK 1 LOT 1 10 CROSS ROAD CORTLANDT MANOR, NY 10567

DRAINAGE EASEMENT

LOT 14 NOW OR FORMERLY SHANKER & UMA KRISHNAMURTHY SECTION 45.08 BLOCK 1 LOT 3 8 CROSS ROAD CORTLANDT MANOR, NY 10567

20' WIDE DRAINAGE EASEMENT

LOT 3 NOW OR FORMERLY JAMES K. & ARLENE APOSTOLOU SECTION 45.08 BLOCK 1 LOT 8 5 ROSLAND COURT CORTLANDT MANOR, NY 10567

LOT 2 NOW OR FORMERLY ANTHONY C. & KATHLEEN PISANO SECTION 45.08 BLOCK 1 LOT 7 7 ROSLAND COURT CORTLANDT MANOR, NY 10567

NOW OR FORMERLY ROBERT & NOAH MURPHY SECTION 34.18 BLOCK 1 LOT 6 111 FURNACE DOCK ROAD CORTLANDT MANOR, NY 10567

NOW OR FORMERLY FRANK & NANCY PAPPO SECTION 34.18 BLOCK 1 LOT 14 111 FURNACE DOCK ROAD CORTLANDT MANOR, NY 10567

NOW OR FORMERLY CITY OF MARY MUSEGIAN SECTION 34.18 BLOCK 1 LOT 13 109 FURNACE DOCK ROAD CORTLANDT MANOR, NY 10567

NOW OR FORMERLY CITY OF COSMAS STEELE SECTION 34.18 BLOCK 1 LOT 12 101 FURNACE DOCK ROAD CORTLANDT MANOR, NY 10567

NOW OR FORMERLY BRUCE SECTION 34.18 BLOCK 1 LOT 11 99 FURNACE DOCK ROAD CORTLANDT MANOR, NY 10567

NOW OR FORMERLY CITY OF UNKNOWN 27 FOOT WIDE RIGHT OF WAY

BUILDING METAL BUILDING CONCRETE BLOCK BUILDING CONCRETE BLOCK BUILDING CONCRETE

SUBDIVISION MAP OF "FURNACE DOCK ACRES" FILED JANUARY 28, 1987 AS MAP NUMBER 22608

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ALL CERTIFICATIONS HEREON ARE VALID FOR THE MAP AND COPIES THEREOF ONLY IF SAID MAP OR COPIES BEAR THE EMBOSSED SEAL OF THE SURVEYOR WHOSE SIGNATURE APPEARS HEREON

SURVEYED & PREPARED BY
BUNNEY ASSOCIATES
LAND SURVEYORS
301 FIELDS LANE, BREWSTER
NEW YORK 10509
TEL (845) 277-3404

Anthony DiRosa
N.Y.S. LIC. NO. 049331

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

THE LOCATION OF UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS, IF ANY EXIST, ARE NOT CERTIFIED

LOT 1
AREA = 28.026 AC.

PREMISES SHOWN HEREON BEING LOT 1 AS SHOWN ON A MAP ENTITLED "SUBDIVISION MAP LANDS BAKER SUBDIVISION" SAID MAP FILED IN THE WESTCHESTER COUNTY CLERK'S OFFICE ON AUGUST 1, 1984 AS MAP NO. 21668

PREPARED FOR BAKER CAPITAL, L.P.

SURVEY OF PROPERTY
SITUATE IN
TOWN OF CORTLANDT
WESTCHESTER COUNTY
NEW YORK

SCALE: 1"=60'

DATE: SEPTEMBER 28, 2001
REVISED: OCTOBER 8, 2001
REVISED: DECEMBER 14, 2001
REVISED: FEBRUARY 21, 2006
BROUGHT TO DATE: MAY 20, 2010

FILE No. T 702-24 P37-2
CORTLANDT/B/BAKER COMPANIES

Appendix B – Full Lab Report

Upstate Laboratories, Inc.

Shipping: 6034 Corporate Dr. * E. Syracuse, NY 13057-1017 * (315) 437-0255 * Fax (315) 437-1209
Mailing: Box 169 * Syracuse, NY 13206
Albany (518) 459-3134 * Binghamton (607) 239-4413 * Buffalo (716) 972-0371
Rochester (866) 437-0255 * New Jersey (908) 581-4285

Mr. Matt Ryan
Aztech Technologies, Inc.
5 McCrea Hill Rd.
Ballston Spa, NY 12020

Friday, March 09, 2012

RE: Analytical Report: Order No.: U1202289
360003 Baker Capital - Magna Metals

Dear Mr. Matt Ryan:

Upstate Laboratories, Inc. received 5 sample(s) on 2/10/2012 for the analyses presented in the following report.

All analytical results relate to the samples as received by the laboratory.

All analytical data conforms with standard approved methodologies and quality control. Our quality control narrative will be included should any anomalies occur.

We have included the Chain of Custody Record as part of your report. You may need to reference this form for a more detailed explanation of your samples. Samples will be disposed of approximately one month from final report date.

Should you have any questions regarding these tests, please feel free to give us a call.

Thank you for your patronage.

Sincerely,

UPSTATE LABORATORIES, INC.
Anthony J. Scala
Anthony J. Scala
President/CEO

CC:
Enclosures: ASP-B/report on disk, hard copy report

Confidentiality Statement: This report is meant for the use of the intended recipient. It may contain confidential information, which is legally privileged or otherwise protected by law. If you have received this report in error, you are strictly prohibited from reviewing, using, disseminating, distributing or copying the information.

NY Lab ID 10170 **NJ Lab ID NY750** **PA Lab ID 68-01096**

Upstate Laboratories, Inc.

Analytical Report

Date: *09-Mar-12*

CLIENT: Aztech Technologies, Inc. **Lab Order:** U1202289

Project: 360003 Baker Capital - Magna Metals

Lab ID: U1202289-001 **Collection Date:** 2/9/2012 8:54:00 AM

Client Sample ID: AI #1 **Matrix:** INDOOR AMBIENT AIR

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA TO-15 AIR METHOD			**TO-15**			Analyst: **Sub**
TO-15	See Attached	0		µg/m³	1	2/17/2012

NOTES:
Subcontracted to NYSDOH ELAP Lab ID#11920

Lab ID: U1202289-002 **Collection Date:** 2/9/2012 8:54:00 AM

Client Sample ID: AI #1 Dup **Matrix:** INDOOR AMBIENT AIR

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA TO-15 AIR METHOD			**TO-15**			Analyst: **Sub**
TO-15	See Attached	0		µg/m³	1	2/17/2012

NOTES:
Subcontracted to NYSDOH ELAP Lab ID#11920

Lab ID: U1202289-003 **Collection Date:** 2/9/2012 9:08:00 AM

Client Sample ID: AI #2 **Matrix:** INDOOR AMBIENT AIR

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA TO-15 AIR METHOD			**TO-15**			Analyst: **Sub**
TO-15	See Attached	0		µg/m³	1	2/17/2012

NOTES:
Subcontracted to NYSDOH ELAP Lab ID#11920

Lab ID: U1202289-004 **Collection Date:** 2/9/2012 9:10:00 AM

Client Sample ID: AI #3 **Matrix:** INDOOR AMBIENT AIR

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA TO-15 AIR METHOD			**TO-15**			Analyst: **Sub**
TO-15	See Attached	0		µg/m³	1	2/17/2012

NOTES:
Subcontracted to NYSDOH ELAP Lab ID#11920

Approved By: PF **Date:** 3-9-12

Qualifiers:

#	Accreditation not offered by NYS DOH for this parameter	*	Low Level
**	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

Upstate Laboratories, Inc.

Analytical Report

Date: *09-Mar-12*

CLIENT: Aztech Technologies, Inc. **Lab Order:** U1202289

Project: 360003 Baker Capital - Magna Metals

Lab ID: U1202289-005 **Collection Date:** 2/9/2012 9:17:00 AM

Client Sample ID: AO #1 **Matrix:** OUTDOOR AMBIENT AIR

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EPA TO-15 AIR METHOD			**TO-15**			Analyst: **Sub**
TO-15	See Attached	0		µg/m³	1	2/17/2012

NOTES:
Subcontracted to NYSDOH ELAP Lab ID#11920

Approved By: PF **Date:** 3-9-12

Qualifiers:

#	Accreditation not offered by NYS DOH for this parameter	*	Low Level
**	Value exceeds Maximum Contaminant Value	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this parameter	S	Spike Recovery outside accepted recovery limits

enalytic
environmental air analysis
6500 Joy Road * E. Syracuse, NY 13057 *Phone (315) 701-0425 * Fax (315) 218-5624

Upstate Laboratories, Inc.
6034 Corporate Drive
East Syracuse, NY 13057
(315)437-0255

Tuesday, February 21, 2012

RE: Analytical Report:
Baker Capital - 360003

Order No.: E1202005

Dear Mr.Scala,

Enalytic,LLC received 5 sample(s) on 2/10/2012 for the analyses presented in the following report.

All analytical results relate to the samples as received by the laboratory.

All analytical data conforms with standard approved methodologies and quality control.

We have included the Chain of Custody Record as part of your report. You may need to reference this form for a more detailed explanation of your samples. Samples will be disposed of approximately two weeks from final report date.

Should you have any questions regarding these tests, please feel free to give us a call.

Thank you for your patronage.

Sincerely,
Kris Perrotti
Kris Perrotti

Confidentiality Statement: This report is meant for the use of the intended recipient. It may contain confidential information, which is legally privileged or otherwise protected by law. If you have received this report in error, you are strictly prohibited from reviewing, using, disseminating, distributing or copying the information.

NY Lab ID 11920

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-001A

Client Sample ID: AI#1
Collection Date: 2/8/2012
Tag # 325/02714
Matrix INDOOR AMBIENT AIR

FIELD

CAS#	Target Compound List	Dilution Factor	Date Analyzed	PQL	Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
	Vaccum upon receipt		08-Feb-12		-4		0	

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
71-55-6	1,1,1-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
79-34-5	1,1,2,2-Tetrachloroethane	1	17-Feb-12	0.20	ND		1.4	ND
79-00-5	1,1,2-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
76-13-1	1,1,2-Trifluoro-1,2,2-Trichloroethane (Freon 11:	1	17-Feb-12	0.20	ND		1.6	ND
75-34-3	1,1-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
75-35-4	1,1-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
120-82-1	1,2,4-Trichlorobenzene	1	17-Feb-12	0.20	ND		1.5	ND
95-63-6	1,2,4-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-93-4	1,2-Dibromoethane	1	17-Feb-12	0.20	ND		1.6	ND
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-1	1	17-Feb-12	0.20	ND		1.4	ND
95-50-1	1,2-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
107-06-2	1,2-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
78-87-5	1,2-Dichloropropane	1	17-Feb-12	0.20	ND		0.94	ND
108-67-8	1,3,5-Trimethylbenzene	1	17-Feb-12	0.20	0.27		1	1.3
106-99-0	1,3-Butadiene	1	17-Feb-12	0.20	ND		0.45	ND
541-73-1	1,3-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
106-46-7	1,4-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
123-91-1	1,4-Dioxane	1	17-Feb-12	0.20	ND		0.73	ND
78-93-3	2-Butanone (MEK)	1	17-Feb-12	0.20	0.45		0.6	1.3
591-78-6	2-Hexanone (*)	1	17-Feb-12	0.20	ND		0.83	ND
622-96-8	4-Ethyltoluene (*)	1	17-Feb-12	0.20	0.22		1	1.1
108-10-1	4-Methyl-2-Pentanone (MIBK)	1	17-Feb-12	0.20	ND		0.83	ND
67-64-1	Acetone	1	17-Feb-12	2.0	4.9		4.8	12
71-43-2	Benzene	1	17-Feb-12	0.20	0.31		0.65	1.0
100-44-7	Benzyl chloride	1	17-Feb-12	0.30	ND		1.6	ND
75-27-4	Bromodichloromethane	1	17-Feb-12	0.20	ND		1.4	ND
75-25-2	Bromoform	1	17-Feb-12	0.20	ND		2.1	ND
74-83-9	Bromomethane	1	17-Feb-12	0.20	ND		0.79	ND
75-15-0	Carbon disulfide	1	17-Feb-12	0.21	ND		0.66	ND
56-23-5	Carbon tetrachloride	1	17-Feb-12	0.040	ND		0.26	ND
108-90-7	Chlorobenzene	1	17-Feb-12	0.20	ND		0.94	ND

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KDP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-001A

Client Sample ID: AI#1
Collection Date: 2/8/2012
Tag # 325/02714
Matrix INDOOR AMBIENT AIR

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
75-00-3	Chloroethane	1	17-Feb-12	0.20	ND		0.54	ND
67-66-3	Chloroform	1	17-Feb-12	0.20	ND		0.99	ND
74-87-3	Chloromethane	1	17-Feb-12	0.20	0.66		0.42	1.7
156-59-2	cis-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-01-5	cis-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
110-82-7	Cyclohexane	1	17-Feb-12	0.20	ND		0.7	ND
124-48-1	Dibromochloromethane	1	17-Feb-12	0.20	ND		1.7	ND
75-71-8	Dichlorodifluoromethane (Freon 12)	1	17-Feb-12	0.20	0.53		1	2.7
100-41-4	Ethyl benzene	1	17-Feb-12	0.20	0.2	J	0.88	0.8
87-68-3	Hexachlorobutadiene	1	17-Feb-12	0.30	ND		3.3	ND
110-54-3	Hexane	1	17-Feb-12	0.20	ND		0.72	ND
67-63-0	Isopropanol	1	17-Feb-12	2.0	9.9		5	25
1330-20-7	m,p-Xylene	1	17-Feb-12	0.40	0.47		1.8	2.1
1634-04-4	Methyl tert-butyl ether (MTBE)	1	17-Feb-12	0.20	ND		0.73	ND
75-09-2	Methylene chloride	1	17-Feb-12	0.20	1.8		0.71	6.3
142-82-5	n-Heptane	1	17-Feb-12	0.24	ND		1	ND
95-47-6	o-Xylene	1	17-Feb-12	0.20	0.2	J	0.88	0.8
100-42-5	Styrene	1	17-Feb-12	0.20	ND		0.87	ND
127-18-4	Tetrachloroethene	1	17-Feb-12	0.20	0.2	J	1.4	1
109-99-9	Tetrahydrofuran (*)	1	17-Feb-12	0.20	ND		0.6	ND
108-88-3	Toluene	1	17-Feb-12	0.20	0.71		0.77	2.7
156-60-5	trans-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-02-6	trans-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
79-01-6	Trichloroethene	1	17-Feb-12	0.040	ND		0.22	ND
75-69-4	Trichlorofluoromethane (Freon 11)	1	17-Feb-12	0.20	0.21		1.1	1.2
108-05-4	Vinyl acetate	1	17-Feb-12	0.20	ND		0.72	ND
75-01-4	Vinyl chloride	1	17-Feb-12	0.040	ND		0.1	ND
	Surr: Bromofluorobenzene	1	17-Feb-12	65-135	98.9		0	0
	TIC: Cyclotetrasiloxane, octamethyl-	1	17-Feb-12	0	34		0	0
	TIC: Unknown	1	17-Feb-12	0	16		0	0

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KHP

Date: 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-002A

Client Sample ID: AI#1 Dupe
Collection Date: 2/8/2012
Tag # 294/07214
Matrix INDOOR AMBIENT AIR

FIELD

CAS#	Target Compound List	Dilution Factor	Date Analyzed	PQL	Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
	Vaccum upon receipt		08-Feb-12		-5		0	

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
71-55-6	1,1,1-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
79-34-5	1,1,2,2-Tetrachloroethane	1	17-Feb-12	0.20	ND		1.4	ND
79-00-5	1,1,2-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
76-13-1	1,1,2-Trifluoro-1,2,2-Trichloroethane (Freon 11:	1	17-Feb-12	0.20	ND		1.6	ND
75-34-3	1,1-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
75-35-4	1,1-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
120-82-1	1,2,4-Trichlorobenzene	1	17-Feb-12	0.20	ND		1.5	ND
95-63-6	1,2,4-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-93-4	1,2-Dibromoethane	1	17-Feb-12	0.20	ND		1.6	ND
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-1	1	17-Feb-12	0.20	ND		1.4	ND
95-50-1	1,2-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
107-06-2	1,2-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
78-87-5	1,2-Dichloropropane	1	17-Feb-12	0.20	ND		0.94	ND
108-67-8	1,3,5-Trimethylbenzene	1	17-Feb-12	0.20	0.27		1	1.3
106-99-0	1,3-Butadiene	1	17-Feb-12	0.20	ND		0.45	ND
541-73-1	1,3-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
106-46-7	1,4-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
123-91-1	1,4-Dioxane	1	17-Feb-12	0.20	ND		0.73	ND
78-93-3	2-Butanone (MEK)	1	17-Feb-12	0.20	0.51		0.6	1.5
591-78-6	2-Hexanone (*)	1	17-Feb-12	0.20	ND		0.83	ND
622-96-8	4-Ethyltoluene (*)	1	17-Feb-12	0.20	ND		1	ND
108-10-1	4-Methyl-2-Pentanone (MIBK)	1	17-Feb-12	0.20	ND		0.83	ND
67-64-1	Acetone	1	17-Feb-12	2.0	4.9		4.8	12
71-43-2	Benzene	1	17-Feb-12	0.20	0.29		0.65	0.94
100-44-7	Benzyl chloride	1	17-Feb-12	0.30	ND		1.6	ND
75-27-4	Bromodichloromethane	1	17-Feb-12	0.20	ND		1.4	ND
75-25-2	Bromoform	1	17-Feb-12	0.20	ND		2.1	ND
74-83-9	Bromomethane	1	17-Feb-12	0.20	ND		0.79	ND
75-15-0	Carbon disulfide	1	17-Feb-12	0.21	ND		0.66	ND
56-23-5	Carbon tetrachloride	1	17-Feb-12	0.040	ND		0.26	ND
108-90-7	Chlorobenzene	1	17-Feb-12	0.20	ND		0.94	ND

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KLP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-002A

Client Sample ID: AI#1 Dupe
Collection Date: 2/8/2012
Tag # 294/07214
Matrix INDOOR AMBIENT AIR

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
75-00-3	Chloroethane	1	17-Feb-12	0.20	ND		0.54	ND
67-66-3	Chloroform	1	17-Feb-12	0.20	ND		0.99	ND
74-87-3	Chloromethane	1	17-Feb-12	0.20	0.82		0.42	1.7
156-59-2	cis-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-01-5	cis-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
110-82-7	Cyclohexane	1	17-Feb-12	0.20	ND		0.7	ND
124-48-1	Dibromochloromethane	1	17-Feb-12	0.20	ND		1.7	ND
75-71-8	Dichlorodifluoromethane (Freon 12)	1	17-Feb-12	0.20	0.53		1	2.7
100-41-4	Ethyl benzene	1	17-Feb-12	0.20	0.2	J	0.88	0.7
87-68-3	Hexachlorobutadiene	1	17-Feb-12	0.30	ND		3.3	ND
110-54-3	Hexane	1	17-Feb-12	0.20	ND		0.72	ND
67-63-0	Isopropanol	1	17-Feb-12	2.0	10		5	25
1330-20-7	m,p-Xylene	1	17-Feb-12	0.40	0.44		1.8	1.9
1634-04-4	Methyl tert-butyl ether (MTBE)	1	17-Feb-12	0.20	ND		0.73	ND
75-09-2	Methylene chloride	1	17-Feb-12	0.20	1.8		0.71	6.3
142-82-5	n-Heptane	1	17-Feb-12	0.24	ND		1	ND
95-47-6	o-Xylene	1	17-Feb-12	0.20	0.2	J	0.88	0.8
100-42-5	Styrene	1	17-Feb-12	0.20	ND		0.87	ND
127-18-4	Tetrachloroethene	1	17-Feb-12	0.20	ND		1.4	ND
109-99-9	Tetrahydrofuran (*)	1	17-Feb-12	0.20	ND		0.6	ND
108-88-3	Toluene	1	17-Feb-12	0.20	0.62		0.77	2.4
156-60-5	trans-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-02-6	trans-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
79-01-6	Trichloroethene	1	17-Feb-12	0.040	ND		0.22	ND
75-69-4	Trichlorofluoromethane (Freon 11)	1	17-Feb-12	0.20	0.20		1.1	1.1
108-05-4	Vinyl acetate	1	17-Feb-12	0.20	ND		0.72	ND
75-01-4	Vinyl chloride	1	17-Feb-12	0.040	ND		0.1	ND
	Surr: Bromofluorobenzene	1	17-Feb-12	65-135	100		0	0
	TIC: Cyclotetrasiloxane, octamethyl-	1	17-Feb-12	0	37		0	0
	TIC: Cyclotrisiloxane, hexamethyl-	1	17-Feb-12	0	9.6		0	0
	TIC: Unknown	1	17-Feb-12	0	18		0	0

Qualifiers:

- (*) Certification not offered by NYS for this compound
- E Value above quantitation range
- J Analyte detected below quantitation limits
- Q Outlying QC recoveries were associated with this analyte
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Approved By KLP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-003A

Client Sample ID: AI#2
Collection Date: 2/8/2012
Tag # 315/02708
Matrix INDOOR AMBIENT AIR

FIELD		Dilution	Date			Data	ug/m3	
CAS#	Target Compound List	Factor	Analyzed	PQL	Result	Qualifiers	PQL	Result
	Vaccum upon receipt		08-Feb-12		-3		0	

TO-15 (VI+TICS)		Dilution	Date	ppbV		Data	ug/m3	
CAS#	Target Compound List	Factor	Analyzed	PQL	Result	Qualifiers	PQL	Result
71-55-6	1,1,1-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
79-34-5	1,1,2,2-Tetrachloroethane	1	17-Feb-12	0.20	ND		1.4	ND
79-00-5	1,1,2-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
76-13-1	1,1,2-Trifluoro-1,2,2-Trichloroethane (Freon 11:	1	17-Feb-12	0.20	ND		1.6	ND
75-34-3	1,1-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
75-35-4	1,1-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
120-82-1	1,2,4-Trichlorobenzene	1	17-Feb-12	0.20	ND		1.5	ND
95-63-6	1,2,4-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-93-4	1,2-Dibromoethane	1	17-Feb-12	0.20	ND		1.6	ND
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-1	1	17-Feb-12	0.20	ND		1.4	ND
95-50-1	1,2-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
107-06-2	1,2-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
78-87-5	1,2-Dichloropropane	1	17-Feb-12	0.20	ND		0.94	ND
108-67-8	1,3,5-Trimethylbenzene	1	17-Feb-12	0.20	0.36		1	1.8
106-99-0	1,3-Butadiene	1	17-Feb-12	0.20	ND		0.45	ND
541-73-1	1,3-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
106-46-7	1,4-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
123-91-1	1,4-Dioxane	1	17-Feb-12	0.20	ND		0.73	ND
78-93-3	2-Butanone (MEK)	1	17-Feb-12	0.20	0.54		0.6	1.6
591-78-6	2-Hexanone (*)	1	17-Feb-12	0.20	ND		0.83	ND
622-96-8	4-Ethyltoluene (*)	1	17-Feb-12	0.20	0.30		1	1.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	1	17-Feb-12	0.20	ND		0.83	ND
67-64-1	Acetone	1	17-Feb-12	2.0	8.3		4.8	20
71-43-2	Benzene	1	17-Feb-12	0.20	0.27		0.65	0.88
100-44-7	Benzyl chloride	1	17-Feb-12	0.30	ND		1.6	ND
75-27-4	Bromodichloromethane	1	17-Feb-12	0.20	ND		1.4	ND
75-25-2	Bromoform	1	17-Feb-12	0.20	ND		2.1	ND
74-83-9	Bromomethane	1	17-Feb-12	0.20	ND		0.79	ND
75-15-0	Carbon disulfide	1	17-Feb-12	0.21	ND		0.66	ND
56-23-5	Carbon tetrachloride	1	17-Feb-12	0.040	ND		0.26	ND
108-90-7	Chlorobenzene	1	17-Feb-12	0.20	ND		0.94	ND

Qualifiers:

- (*) Certification not offered by NYS for this compound
- E Value above quantitation range
- J Analyte detected below quantitation limits
- Q Outlying QC recoveries were associated with this analyte
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Approved By KJP

Date: 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-003A

Client Sample ID: AI#2
Collection Date: 2/8/2012
Tag # 315/02708
Matrix INDOOR AMBIENT AIR

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
75-00-3	Chloroethane	1	17-Feb-12	0.20	ND		0.54	ND
67-66-3	Chloroform	1	17-Feb-12	0.20	ND		0.99	ND
74-87-3	Chloromethane	1	17-Feb-12	0.20	0.76		0.42	1.6
156-59-2	cis-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-01-5	cis-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
110-82-7	Cyclohexane	1	17-Feb-12	0.20	ND		0.7	ND
124-48-1	Dibromochloromethane	1	17-Feb-12	0.20	ND		1.7	ND
75-71-8	Dichlorodifluoromethane (Freon 12)	1	17-Feb-12	0.20	0.54		1	2.7
100-41-4	Ethyl benzene	1	17-Feb-12	0.20	0.2	J	0.88	0.8
87-68-3	Hexachlorobutadiene	1	17-Feb-12	0.30	ND		3.3	ND
110-54-3	Hexane	1	17-Feb-12	0.20	ND		0.72	ND
67-63-0	Isopropanol	1	17-Feb-12	2.0	89		5	220
1330-20-7	m,p-Xylene	1	17-Feb-12	0.40	0.49		1.8	2.2
1634-04-4	Methyl tert-butyl ether (MTBE)	1	17-Feb-12	0.20	ND		0.73	ND
75-09-2	Methylene chloride	1	17-Feb-12	0.20	2.0		0.71	6.9
142-82-5	n-Heptane	1	17-Feb-12	0.24	ND		1	ND
95-47-6	o-Xylene	1	17-Feb-12	0.20	0.22		0.88	0.97
100-42-5	Styrene	1	17-Feb-12	0.20	ND		0.87	ND
127-18-4	Tetrachloroethene	1	17-Feb-12	0.20	ND		1.4	ND
109-99-9	Tetrahydrofuran (*)	1	17-Feb-12	0.20	0.28		0.6	0.84
108-88-3	Toluene	1	17-Feb-12	0.20	0.66		0.77	2.5
156-60-5	trans-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-02-6	trans-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
79-01-6	Trichloroethene	1	17-Feb-12	0.040	ND		0.22	ND
75-69-4	Trichlorofluoromethane (Freon 11)	1	17-Feb-12	0.20	0.20		1.1	1.1
108-05-4	Vinyl acetate	1	17-Feb-12	0.20	ND		0.72	ND
75-01-4	Vinyl chloride	1	17-Feb-12	0.040	ND		0.1	ND
	Surr: Bromofluorobenzene	1	17-Feb-12	65-135	100		0	0
	TIC: Benzoic acid, 2-[(trimethylsilyl)o	1	17-Feb-12	0	39		0	0
	TIC: Cyclotetrasiloxane, octamethyl-	1	17-Feb-12	0	440		0	0
	TIC: Cyclotrisiloxane, hexamethyl-	1	17-Feb-12	0	26		0	0
	TIC: Unknown (4.267)	1	17-Feb-12	0	12		0	0
	TIC: Unknown (4.272)	1	17-Feb-12	0	2.1		0	0

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KDP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-004A

Client Sample ID: AI#3
Collection Date: 2/8/2012
Tag # 337/02660
Matrix INDOOR AMBIENT AIR

FIELD

CAS#	Target Compound List	Dilution Factor	Date Analyzed	PQL	Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
	Vaccum upon receipt		08-Feb-12		-1		0	

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
71-55-6	1,1,1-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
79-34-5	1,1,2,2-Tetrachloroethane	1	17-Feb-12	0.20	ND		1.4	ND
79-00-5	1,1,2-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
76-13-1	1,1,2-Trifluoro-1,2,2-Trichloroethane (Freon 11:	1	17-Feb-12	0.20	ND		1.6	ND
75-34-3	1,1-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
75-35-4	1,1-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
120-82-1	1,2,4-Trichlorobenzene	1	17-Feb-12	0.20	ND		1.5	ND
95-63-6	1,2,4-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-93-4	1,2-Dibromoethane	1	17-Feb-12	0.20	ND		1.6	ND
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-1	1	17-Feb-12	0.20	ND		1.4	ND
95-50-1	1,2-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
107-06-2	1,2-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
78-87-5	1,2-Dichloropropane	1	17-Feb-12	0.20	ND		0.94	ND
108-67-8	1,3,5-Trimethylbenzene	1	17-Feb-12	0.20	0.32		1	1.6
106-99-0	1,3-Butadiene	1	17-Feb-12	0.20	ND		0.45	ND
541-73-1	1,3-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
106-46-7	1,4-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
123-91-1	1,4-Dioxane	1	17-Feb-12	0.20	ND		0.73	ND
78-93-3	2-Butanone (MEK)	1	17-Feb-12	0.20	0.33		0.6	0.99
591-78-6	2-Hexanone (*)	1	17-Feb-12	0.20	ND		0.83	ND
622-96-8	4-Ethyltoluene (*)	1	17-Feb-12	0.20	0.27		1	1.3
108-10-1	4-Methyl-2-Pentanone (MIBK)	1	17-Feb-12	0.20	ND		0.83	ND
67-64-1	Acetone	1	17-Feb-12	2.0	3.6		4.8	8.6
71-43-2	Benzene	1	17-Feb-12	0.20	0.25		0.65	0.81
100-44-7	Benzyl chloride	1	17-Feb-12	0.30	ND		1.6	ND
75-27-4	Bromodichloromethane	1	17-Feb-12	0.20	ND		1.4	ND
75-25-2	Bromoform	1	17-Feb-12	0.20	ND		2.1	ND
74-83-9	Bromomethane	1	17-Feb-12	0.20	ND		0.79	ND
75-15-0	Carbon disulfide	1	17-Feb-12	0.21	ND		0.66	ND
56-23-5	Carbon tetrachloride	1	17-Feb-12	0.040	ND		0.26	ND
108-90-7	Chlorobenzene	1	17-Feb-12	0.20	ND		0.94	ND

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KLP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-004A

Client Sample ID: AI#3
Collection Date: 2/8/2012
Tag # 337/02660
Matrix INDOOR AMBIENT AIR

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
75-00-3	Chloroethane	1	17-Feb-12	0.20	ND		0.54	ND
67-66-3	Chloroform	1	17-Feb-12	0.20	ND		0.99	ND
74-87-3	Chloromethane	1	17-Feb-12	0.20	0.73		0.42	1.5
156-59-2	cis-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-01-5	cis-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
110-82-7	Cyclohexane	1	17-Feb-12	0.20	ND		0.7	ND
124-48-1	Dibromochloromethane	1	17-Feb-12	0.20	ND		1.7	ND
75-71-8	Dichlorodifluoromethane (Freon 12)	1	17-Feb-12	0.20	0.52		1	2.6
100-41-4	Ethyl benzene	1	17-Feb-12	0.20	ND		0.88	ND
87-68-3	Hexachlorobutadiene	1	17-Feb-12	0.30	ND		3.3	ND
110-54-3	Hexane	1	17-Feb-12	0.20	ND		0.72	ND
67-63-0	Isopropanol	1	17-Feb-12	2.0	8.3		5	21
1330-20-7	m,p-Xylene	1	17-Feb-12	0.40	0.4	J	1.8	2
1634-04-4	Methyl tert-butyl ether (MTBE)	1	17-Feb-12	0.20	ND		0.73	ND
75-09-2	Methylene chloride	1	17-Feb-12	0.20	1.7		0.71	5.9
142-82-5	n-Heptane	1	17-Feb-12	0.24	ND		1	ND
95-47-6	o-Xylene	1	17-Feb-12	0.20	0.2	J	0.88	0.8
100-42-5	Styrene	1	17-Feb-12	0.20	ND		0.87	ND
127-18-4	Tetrachloroethene	1	17-Feb-12	0.20	ND		1.4	ND
109-99-9	Tetrahydrofuran (*)	1	17-Feb-12	0.20	ND		0.6	ND
108-88-3	Toluene	1	17-Feb-12	0.20	0.70		0.77	2.7
156-60-5	trans-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-02-6	trans-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
79-01-6	Trichloroethene	1	17-Feb-12	0.040	ND		0.22	ND
75-69-4	Trichlorofluoromethane (Freon 11)	1	17-Feb-12	0.20	0.20		1.1	1.1
108-05-4	Vinyl acetate	1	17-Feb-12	0.20	ND		0.72	ND
75-01-4	Vinyl chloride	1	17-Feb-12	0.040	ND		0.1	ND
	Surr: Bromofluorobenzene	1	17-Feb-12	65-135	100		0	0
	TIC: Unknown	1	17-Feb-12	0	11		0	0

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KLP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-005A

Client Sample ID: AO#1
Collection Date: 2/8/2012
Tag # 279/03952
Matrix OUTDOOR AMBIENT AIR

FIELD		Dilution	Date			Data	ug/m3	
CAS#	Target Compound List	Factor	Analyzed	PQL	Result	Qualifiers	PQL	Result
	Vaccum upon receipt		08-Feb-12		-2		0	

TO-15 (VI+TICS)		Dilution	Date	ppbV		Data	ug/m3	
CAS#	Target Compound List	Factor	Analyzed	PQL	Result	Qualifiers	PQL	Result
71-55-6	1,1,1-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
79-34-5	1,1,2,2-Tetrachloroethane	1	17-Feb-12	0.20	ND		1.4	ND
79-00-5	1,1,2-Trichloroethane	1	17-Feb-12	0.20	ND		1.1	ND
76-13-1	1,1,2-Trifluoro-1,2,2-Trichloroethane (Freon 11:	1	17-Feb-12	0.20	ND		1.6	ND
75-34-3	1,1-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
75-35-4	1,1-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
120-82-1	1,2,4-Trichlorobenzene	1	17-Feb-12	0.20	ND		1.5	ND
95-63-6	1,2,4-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-93-4	1,2-Dibromoethane	1	17-Feb-12	0.20	ND		1.6	ND
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon-1	1	17-Feb-12	0.20	ND		1.4	ND
95-50-1	1,2-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
107-06-2	1,2-Dichloroethane	1	17-Feb-12	0.20	ND		0.82	ND
78-87-5	1,2-Dichloropropane	1	17-Feb-12	0.20	ND		0.94	ND
108-67-8	1,3,5-Trimethylbenzene	1	17-Feb-12	0.20	ND		1	ND
106-99-0	1,3-Butadiene	1	17-Feb-12	0.20	ND		0.45	ND
541-73-1	1,3-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
106-46-7	1,4-Dichlorobenzene	1	17-Feb-12	0.20	ND		1.2	ND
123-91-1	1,4-Dioxane	1	17-Feb-12	0.20	ND		0.73	ND
78-93-3	2-Butanone (MEK)	1	17-Feb-12	0.20	0.34		0.6	1.0
591-78-6	2-Hexanone (*)	1	17-Feb-12	0.20	ND		0.83	ND
622-96-8	4-Ethyltoluene (*)	1	17-Feb-12	0.20	0.2	J	1	0.8
108-10-1	4-Methyl-2-Pentanone (MIBK)	1	17-Feb-12	0.20	ND		0.83	ND
67-64-1	Acetone	1	17-Feb-12	2.0	3.0		4.8	7.3
71-43-2	Benzene	1	17-Feb-12	0.20	0.26		0.65	0.84
100-44-7	Benzyl chloride	1	17-Feb-12	0.30	ND		1.6	ND
75-27-4	Bromodichloromethane	1	17-Feb-12	0.20	ND		1.4	ND
75-25-2	Bromoform	1	17-Feb-12	0.20	ND		2.1	ND
74-83-9	Bromomethane	1	17-Feb-12	0.20	ND		0.79	ND
75-15-0	Carbon disulfide	1	17-Feb-12	0.21	ND		0.66	ND
56-23-5	Carbon tetrachloride	1	17-Feb-12	0.040	ND		0.26	ND
108-90-7	Chlorobenzene	1	17-Feb-12	0.20	ND		0.94	ND

Qualifiers:

- (*) Certification not offered by NYS for this compound
- E Value above quantitation range
- J Analyte detected below quantitation limits
- Q Outlying QC recoveries were associated with this analyte
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Approved By KNP **Date:** 2-21-12

Enalytic,LLC

Analytical Report

Date *21-Feb-12*

CLIENT: Aztech Technologies, Inc.
Locatio U2022289
Project: Baker Capital - 360003
Lab ID E1202005-005A

Client Sample ID: AO#1
Collection Date: 2/8/2012
Tag # 279/03952
Matrix OUTDOOR AMBIENT AIR

TO-15 (VI+TICS)

CAS#	Target Compound List	Dilution Factor	Date Analyzed	ppbV PQL	ppbV Result	Data Qualifiers	ug/m3 PQL	ug/m3 Result
75-00-3	Chloroethane	1	17-Feb-12	0.20	ND		0.54	ND
67-66-3	Chloroform	1	17-Feb-12	0.20	ND		0.99	ND
74-87-3	Chloromethane	1	17-Feb-12	0.20	0.56		0.42	1.2
156-59-2	cis-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-01-5	cis-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
110-82-7	Cyclohexane	1	17-Feb-12	0.20	ND		0.7	ND
124-48-1	Dibromochloromethane	1	17-Feb-12	0.20	ND		1.7	ND
75-71-8	Dichlorodifluoromethane (Freon 12)	1	17-Feb-12	0.20	0.46		1	2.3
100-41-4	Ethyl benzene	1	17-Feb-12	0.20	ND		0.88	ND
87-68-3	Hexachlorobutadiene	1	17-Feb-12	0.30	ND		3.3	ND
110-54-3	Hexane	1	17-Feb-12	0.20	ND		0.72	ND
67-63-0	Isopropanol	1	17-Feb-12	2.0	1	J	5	3
1330-20-7	m,p-Xylene	1	17-Feb-12	0.40	ND		1.8	ND
1634-04-4	Methyl tert-butyl ether (MTBE)	1	17-Feb-12	0.20	ND		0.73	ND
75-09-2	Methylene chloride	1	17-Feb-12	0.20	0.27		0.71	0.95
142-82-5	n-Heptane	1	17-Feb-12	0.24	ND		1	ND
95-47-6	o-Xylene	1	17-Feb-12	0.20	ND		0.88	ND
100-42-5	Styrene	1	17-Feb-12	0.20	ND		0.87	ND
127-18-4	Tetrachloroethene	1	17-Feb-12	0.20	ND		1.4	ND
109-99-9	Tetrahydrofuran (*)	1	17-Feb-12	0.20	0.24		0.6	0.72
108-88-3	Toluene	1	17-Feb-12	0.20	0.39		0.77	1.5
156-60-5	trans-1,2-Dichloroethene	1	17-Feb-12	0.20	ND		0.81	ND
10061-02-6	trans-1,3-Dichloropropene	1	17-Feb-12	0.20	ND		0.92	ND
79-01-6	Trichloroethene	1	17-Feb-12	0.040	ND		0.22	ND
75-69-4	Trichlorofluoromethane (Freon 11)	1	17-Feb-12	0.20	0.20		1.1	1.1
108-05-4	Vinyl acetate	1	17-Feb-12	0.20	ND		0.72	ND
75-01-4	Vinyl chloride	1	17-Feb-12	0.040	ND		0.1	ND
	Surr: Bromofluorobenzene	1	17-Feb-12	65-135	99.6		0	0
	TIC: Cyclotetrasiloxane, octamethyl-	1	17-Feb-12	0	11		0	0
	TIC: Cyclotrisiloxane, hexamethyl-	1	17-Feb-12	0	0.55		0	0
	TIC: Silane, 1,4-phenylenebis[trimethyl-	1	17-Feb-12	0	2.5		0	0

Qualifiers:

(*)	Certification not offered by NYS for this compound	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
Q	Outlying QC recoveries were associated with this analyte	S	Spike Recovery outside accepted recovery limits

Approved By KLP **Date:** 2-21-12

P.O. # 6721

ULI Computer Input Form

Upstate

Laboratories, Inc.
6034 Corporate Drive, E. Syracuse, NY 13057
TEL: 315-437-0255 Fax: 315-437-1209
www.upstatelabs.com

Chain of Custody
Project Information

Project Information: Baker Capital – Magna M
Project Location: Cortlandt Manor NY
Project Number: 360003
PO Number: 06-060-57125

Report Deliverables		Detection Limit		Report Limit	
Fax		5ppbv		Std	
Email	X	1ug/m3		Level II	
EDD	X	1ug/M3+TCE.25	X	Cat A	
Other		TIC's	X	Cat B	X

Client Information:

Client: Aztech Technologies, Inc. Contact: Joseph Sabanos
Address: 5 McCrea Hill Road
Ballston Spa, NY 12020
Phone: 518.885.5383
Fax:
Email: jsabanos@aztechtech.com

Turnaround Time Check One		*Rush TAT Surcharge
10 Business Days	X	Date Due Standard
5 Business Days		25%
4 Business Days		35%
3 Business Days		50%
2 Business Days		75%
1 Business Days		100%
Same Day		200%

1202289

	Sample ID	*Sample Matrix	Date Sampled	Date Finished	Canister #	Reg #	Start Vac	Final Vac	Vac at Lab	Start Time	End Time	Analysis Requested
1	AI #1	Air	2/8/12	2/9/12	325	02714	+30	5.9	-4	1652	859	TO 15
2	AI #1 DUP	Air	2/8/12	2/9/12	294	02714	+30	3.9	-5	1652	859	TO 15
3	AI #2	Air	2/8/12	2/9/12	315	02708	29.2	4.5	-3	1659	908	TO 15
4	AI #3	Air	2/8/12	2/9/12	337	02660	29.1	0.0	-1	1602	910	TO15
5	AO #1	Air	2/8/12	2/9/12	279	03952	+30	3.5	-2	1110	917	TO15

Chain of Custody	Print Name	Signature	Date/Time	Courier
Sampled by:	Joseph Sabanos		2/9/12 1115	
Relinquished by:			2/9/12	1115
Received at lab by:		GARY GEORGE	2/9/12 1410	

*** Rush Samples** - Please call ahead to ensure that Rush TAT is available to schedule with laboratory.

*Sample Matrix/DL
OA - Outdoor Air: 1ug/M3+TCE.25
IA - Indoor Air : 1ug/M3+TCE.25
SS - Sub Slab: 1ug/m3
DL as above unless otherwise requested/stated.

RELINQUISHED BY GARY GEORGE 2/10/12 7:30A
RECEIVED BY R Crump 2/10/12 ~~0730~~ 0750
M. Fal 2/10/12 7:55

P.O. # 6721

ULI Computer Input Form

Upstate

Laboratories, Inc.
6034 Corporate Drive, E. Syracuse, NY 13057
TEL: 315-437-0255 Fax: 315-437-1209
www.upstatelabs.com

Chain of Custody
Project Information

Project Information: Baker Capital – Magna M
Project Location: Cortlandt Manor NY
Project Number: 360003
PO Number: 06-060-57125

Report Deliverables		Detection Limit		Report Limit	
Fax		5ppbv		Std	
Email	X	1ug/m3		Level II	
EDD	X	1ug/M3+TCE.25	X	Cat A	
Other		TIC's	X	Cat B	X

Client Information:

Client:	Aztech Technologies, Inc.	Contact:	Joseph Sabanos
Address:	5 McCrea Hill Road		
	Ballston Spa, NY 12020		
Phone:	518.885.5383		
Fax:			
Email:	jsabanos@aztechtech.com		

Turnaround Time Check One		*Rush TAT Date Due	Surcharge Standard
10 Business Days	X		
5 Business Days			25%
4 Business Days			35%
3 Business Days			50%
2 Business Days			75%
1 Business Days			100%
Same Day			200%

)1202289

	Sample ID	*Sample Matrix	Date Sampled	Date Finished	Canister #	Reg #	Start Vac	Final Vac	Vac at Lab	Start Time	End Time	Analysis Requested
1	AI #1	Air	2/8/12	2/9/12	325	02714	+30	5.9		1052	859	TO 15
2	AI #1 DUP	Air	2/8/12	2/9/12	294	02714	+30	5.9		1052	859	TO 15
3	AI #2	Air	2/8/12	2/9/12	315	02708	29.2	4.5		1059	908	TO 15
4	AI #3	Air	2/8/12	2/9/12	337	02660	29.1	0.0		1102	910	TO 15
5	AO #1	Air	2/8/12	2/9/12	279	03952	+30	3.5		1110	917	TO 15

Chain of Custody	Print Name	Signature	Date/Time	Courier
Sampled by:	Joseph Sabanos	[signature]	2/9/12	[signature]
Relinquished by:	[signature]	[signature]	2/9/12	[signature]
Received at lab by:	[signature]	GARY GEORGE	2/9/12	[signature]

* **Rush Samples** - Please call ahead to ensure that Rush TAT is available to schedule with laboratory.

*Sample Matrix/DL
OA - Outdoor Air: 1ug/M3+TCE.25
IA - Indoor Air : 1ug/M3+TCE.25
SS - Sub Slab: 1ug/m3
DL as above unless otherwise requested/stated.

RELINQUISHED BY [signature] GARY GEORGE 2/10/12 7:30A
RECEIVED BY [signature] 2/10/12 ~~0730~~ 0750

Appendix C – Data Usability Summary Report (DUSR)

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

March 28, 2012

Mr. Joseph Sabanos
Aztech Technologies, Inc.
5 McCrea Hill Road
Ballston Spa, New York 12020

Re: Data Usability Summary Report
Baker Capital Project
February 2012 Air Sampling

Dear Mr. Sabanos:

The data usability summary report (DUSR) and data validation review are attached to this letter for the Baker Capital project, February 2012 air sampling event. The data were acceptable for Upstate Laboratories Inc. subcontractor Enalytic, LLC SDG: AZ001 with some minor issues that are identified and discussed in the validation summaries. The data pack does not contain data that are either unusable (R) or estimated (J).

A list of common data validation acronyms is attached to this letter to assist you interpreting the validation summaries. If you have any questions concerning the work performed, please contact me at (518) 348-6995. Thank you for the opportunity to assist Aztech Technologies, Inc.

Sincerely,
Alpha Geoscience



Donald Anné
Senior Chemist

DCA:dca
attachments

Z:\PROJECTS\2012\12600-12620\12609-BAKER CAPITAL\BAKER CAPITAL-121.LTR.WPD

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

Data Usability Summary Report
for Upstate Laboratories, Inc.
Subcontract to: Enalytic, LLC.
SDG: AZ001

4 Air Samples and 1 Field Duplicate
Collected February 8, 2012

Prepared by: Donald Anné
March 28, 2012

The data packages contain the documentation required by NYSDEC ASP. The proper chain of custody procedures were followed by the samplers. All information appeared legible and complete. The data packs contained the 4 air samples and 1 field duplicate analyzed for TO-15 volatiles.

The overall performances of the analyses are acceptable. Enalytic, LLC. did fulfill the requirements of the analytical method.

The data are mostly acceptable with some issues that are identified in the accompanying data validation reviews. The following data were flagged:

- The positive volatile result for isopropanol was flagged as "not detected" (U) in sample AO#1 because the level reported in sample AO#1 was not significantly greater than (more than 5 times) the associated method blank level.

All data are considered usable, with estimated (J) data associated with a higher level of quantitative uncertainty. Detailed information on data quality is included in the data validation reviews.

Z:\PROJECTS\2012\12600-12620\12609-BAKER CAPITAL\AZ001.DUS.WPD

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

QA/QC Review of TO-15 Volatiles Data
for Upstate Laboratories, Inc.
Subcontract to: Enalytic, LLC.
SDG: AZ001

4 Air Samples and 1 Field Duplicate
Collected February 8, 2012

Prepared by: Donald Anné
March 28, 2012

Holding Times: Samples were analyzed within the EPA recommended holding times.

GC/MS Tuning and Mass Calibration: The BFB tuning criteria were within control limits.

Initial Calibration: The average RRFs for target compounds were above the allowable minimum (0.010) and the %RSDs were below the allowable maximum (30%), as required.

Continuing Calibration: The CCRFs for target compounds were above the allowable minimum (0.010) and the %Ds were below the allowable maximum (30%), as required.

Blanks: The method blank contained traces of acetone (0.3 ppbV) and isopropanol (0.4 ppbV). Positive results for acetone that are less than ten times the method blank level should be reported as not detected (U) in associated samples. Positive results for isopropanol that are less than five times the method blank level should be reported as not detected (U) in associated samples.

Internal Standard Area Summary: The internal standard areas and retention times were within control limits.

Surrogate Recovery: The surrogate recoveries were within control limits for soil vapor samples.

Matrix Spike/Matrix Spike Duplicate: The relative percent differences for target compounds were below the allowable maximum and the percent recoveries were within QC limits for MS/MSD sample AI#3.

Laboratory Duplicates: The relative percent differences for applicable compounds were below the allowable maximum (25%) in duplicate samples AI#2 and AI#1 Dupe, as required.

679 Plank Road ● Clifton Park, New York 12065 ● (518) 348-6995 ● Fax (518) 348-6966
www.alphageoscience.com

Laboratory Control Sample: The percent recoveries for target compounds were within QC limits for the LCS.

Field Duplicates: The relative percent differences for applicable compounds were below the allowable maximum (50%) in field duplicate pair AI#1/AI#1 Dupe (attached table), as required.

Compound ID: Checked compounds were within GC quantitation limits. The mass spectra for detected compounds contained the primary and secondary ions, as outlined in the method.

Appendix D – NYSDEC Mitigation System Installation Record

Mitigation System Installation Record

☒ Structure was sampled previously

System Information

Site No: 360003

System ID: AZ-11-1245

Site Name: Former Magna Metals

Owner Name: Baker Capital L.P. ☐ Owner Occupied

System Address: 510 Furnace Dock Road Telephone: 914-461-9000

City: Cortlandt Manor Zip: 10567 Alt. Telephone:

Contractor Information

Installer Name: Aztech Company: Aztech Technologies Inc.

Telephone: 518-885-5383

Building Conditions Building Type: Office/Professional Building

Slab Integrity: ○ Poor ○ Average ◉ Good ○ Excellent

Slab Penetrations: ☐ Sump ☐ Floor drain ☐ Perimeter drain ☐ Other

Describe:

Sub-floor installed on slab in half of the office space. Condition of that portion of slab is unknown.

Observed Water: ◉ Dry ○ Damp ○ Sump only ○ Standing

Describe:

No water observed during installation

System Installation

Installation Type: Sub-Slab Depressurization (Active) Date Installed:

Slab Thickess (inches): 3 to 5 in.

Subslab Material: Sand Subslab Moisture: Dry

Number of Suction Points: 5 Number of Fans Installed: 3

	☒ Fan #1 Operating	☒ Fan #2 Operating	☒ Fan #3 Operating
Fan Model No(s):	HS5000 P/N 230004	HS5000 P/N 230004	HS5000 P/N 230004
Fan Serial No(s):	NA	NA	NA
Final U-Tube Levels:			

Additional Mitigation Elements (check all that apply):

☐ Drainjer ☐ Membrane ☐ Sealed cracks ☐ New floor ☐ Rain cap ☐ Other

Comments:

A total of six extraction points were installed. One high suction fan extracts vapors from two points. When discussing portion of office where sub-floor was installed, client stated that prior to sub-floor installation, concrete slab was seen and appeared to be in good condition. Post installation

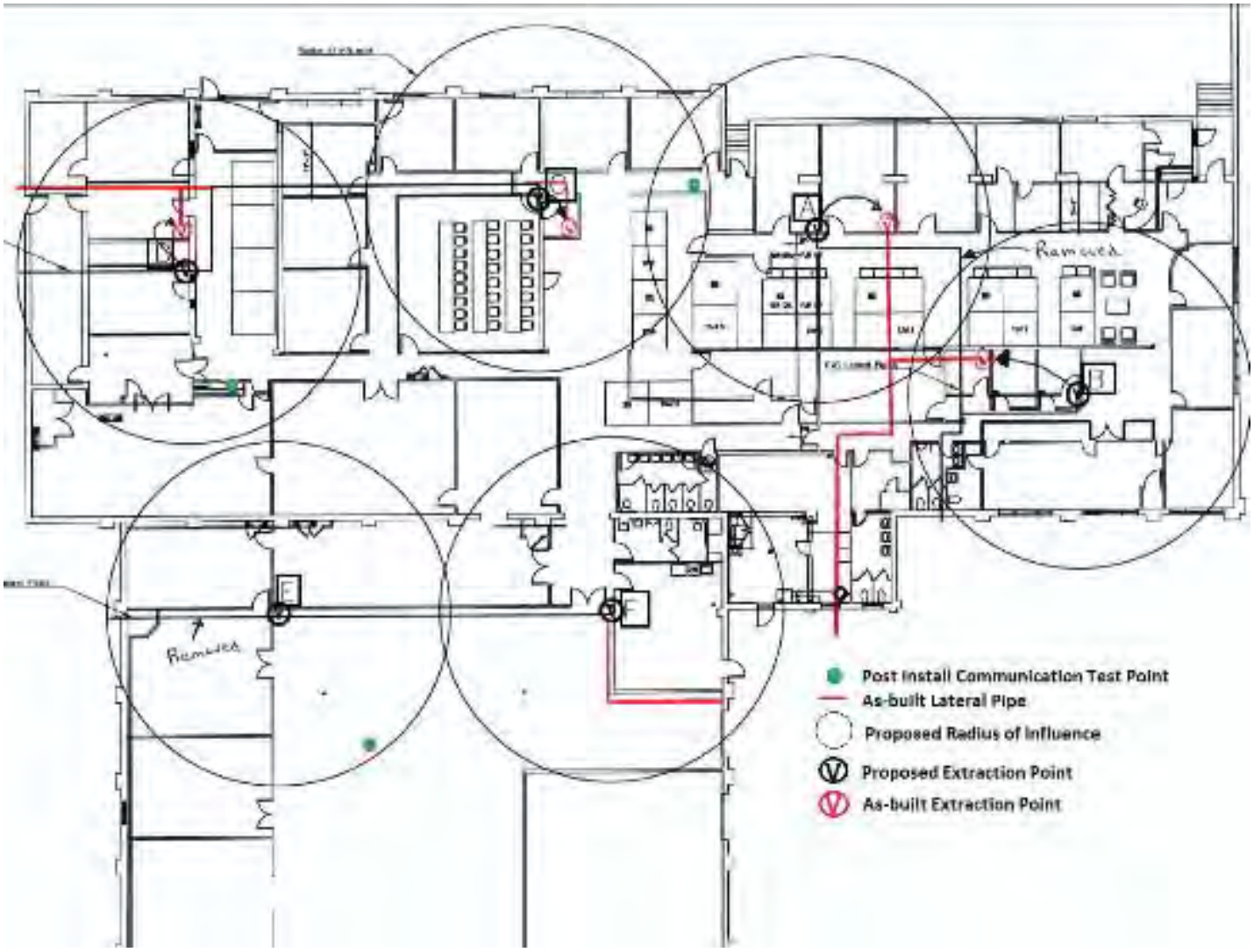
Communication Testing

Test Method: Micromanometer Meter Type/Manufacturer: Dwyer - Series 471 Mark III

Location	Reading/Result	Dist. From Suction Point (ft)	Passed?
E	-0.075	28	☒
D	-0.035	40	☒
A	-0.188	35	☒
			☐
			☐

System Sketch
(indicate notable features, location of extraction points, and communication test holes)

NORTH



Appendix E – Structure Sampling Field Log

Structure Sampling Field Log

Site Number & Name: Baker Capital Magnum Metals

Structure ID:

Samplers & Company: Joseph Sabres Aztech

Sample Date: 2/8/12

Structure Address:

Phone Number:

Owner Name and Address (if different):

Weather & Outdoor Temperature: Cold & Sunny

Slab Condition: ☐ Dirt Floor ☐ Poor (major cracks) ☐ Average (some cracks) ☒ Good (minor cracks)

Floor Penetrations: (select all present) ☐ Sump Pit ☐ Floor Drain ☐ Perimeter Drain ☒ Other

Describe: plugged hole next to AI #1

Standing Water: (select all present) Basement Is Dry ☒ Floor Penetrations are Damp ☐ Standing Water in Floor Penetrations ☐ Standing Water on Basement Floor ☐

Building Questionnaire Completed: ☐ Yes ☐ No Product Inventory Completed: ☐ Yes ☐ No Layout Sketch Completed: ☐ Yes ☐ No

Sample ID:	AI #1/AI #DUP	AI #2	AI #3	AO #1	
Location Description:	South East Closet	Middle West Copy Room	North East Executive Copy Room	off of loading Dock	
Canister ID:	325/294	315	337	279	
Regulator ID:	02714	02708	02660	03952	
Slab Thickness:					
Sub-Slab Material:					
Sub-Slab Moisture: (Dry, Damp, Saturated)					
Seal Type:					
Pre-Sample Leak Detection					
% Helium in Chamber:					
Purge Volume:					
% Helium in Tedlar:					
Purge Air PID Reading:					
Sample Times and Vacuum Readings					
Canister Vol:	☐ 6L Other:	☐ 6L Other:	☐ 6L Other:	☐ 6L Other:	☐ 6L Other:
Sample Start Time:					
Vacuum Gauge Start:					
Sample End Time:					
Vacuum Gauge End:					
Post-Sample Leak Detection					
% Helium in Chamber:					
% Helium in Tedlar:					
Purge Air PID Reading:					
Drill Holes Sealed:	☐	☐	☐	☐	☐

Structure Sampling Field Log

SUB SLAB SOIL GAS PARAMETERS

Sample ID:					
CH_4 - ppm					
O_2 %					
CO_2 ppm					
H_2S ppm					

ADDITIONAL SAMPLES

Sample ID:					
Location Description:					
Canister ID:					
Regulator ID:					
Slab Thickness:					
Sub-Slab Material:					
Sub-Slab Moisture: (Dry, Damp, Saturated)					
Seal Type:					
Pre-Sample Leak Detection					
% Helium in Chamber:					
Purge Volume:					
% Helium in Tedlar:					
Purge Air PID Reading :					
Sample Times and Vacuum Readings					
Caniter Volume:	◻ 6L Other:	◻ 6L Other:	◻ 6L Other:	◻ 6L Other:	◻ 6L Other:
Sample Start Time:					
Vacuum Gauge Start:					
Sample End Time:					
Vacuum Gauge End:					
Post-Sample Leak Detection					
% Helium in Chamber:					
% Helium in Tedlar:					
Purge Air PID Reading :					
Drill Holes Sealed:	☐	☐	☐	☐	☐

General Comments:	

Soil Vapor Intrusion - Initial Structure Sampling Building Questionnaire Structure ID : _____

Site No. : _____ Site Name : Baker Capital / Meyer Metals

Structure Address : _____

Preparer's Name & Company : _____

Residential ? ☐ Yes ☒ No Owner Occupied ? ☐ Yes ☐ No Owner Interviewed ? ☐ Yes ☐ No

Commercial ? ☒ Yes ☐ No Industrial ? ☐ Yes ☒ No Mixed Uses ? ☒ Yes ☐ No

Identify all non-residential use(s): Office Space / Labs

Owner Name : Baker Capital Owner Phone : ( ) _____ - _____

Owner Phone (Secondary) : ( ) _____ - _____

Owner Address (if different) : _____

Occupant Name : _____ Occupant Phone : ( ) _____ - _____

Occupant Phone (Secondary) : ( ) _____ - _____

Additional Owner/ Occupant Informatior (availability, special mailing instructions) : _____

Describe Building (style, number floors, size) : Single floor Structure. Approx 1/2 on wood Sub floors.

ApproximateYear Built : _____ Is the buildinginsulated? ☐ Yes ☐ No

Lowest level : ☒ Slab-on-grade ☐ Basement ☐ Crawlspace

Describe Lowest Level (floor construction, finishing, use) : Carpet on all floors except Storage area

Floor Type: ☒ Concrete Slab ☐ Dirt ☐ Mixed : _____

Floor Condition : ☒ Good (few or no cracks) ☐ Average (some cracks) ☐ Poor (broken concrete or dirt)

Sumps / drains? ☒ Yes ☐ No Describe : Some Sumps located away from Samples #5

Identify other floor penetrations & details : Sampling location plugged next to Sample #1

Wall Construction : ☒ Concrete Block ☐ Poured Concrete ☐ Laid-Up Stone

Identify any wall penetrations : None

Identify water, moisture, or seepage: location & severity (sump, cracks, stains, etc) : None

Heating Fuel : ☐ Oil ☐ Gas ☐ Wood ☐ Electric ☒ Other Propane

Heating System : ☒ Forced Air ☐ Hot Water ☐ Other : _____

Hot Water System : ☐ Combustion ☒ Electric

Clothes Dryer : ☐ Electric ☐ Gas Where is dryer vented to? Vent.

IF combustion occurs describe where air comes from (cold air return, basement, external air, etc.) : _____

Soil Vapor Intrusion - Initial Structure Sampling Building Questionnaire **Structure ID :** _____

Air Conditioning : ☒ Central Air ☐ Window Units ☐ Fans

Fans & Vents (identify where fans/vents pull air from and where they vent/exhaust to) : Roof

Describe factors that may affect indoor air quality (chemical use/storage, unvented heaters, smoking, workshop):

Attached Garage ? ☐ Yes ☒ No — Air fresheners ? ☐ Yes ☐ No

New carpet or furniture ? ☐ Yes ☒ No — What / Where ? _____

Recent **painting** or **staining** ? ☐ Yes ☒ No — Where ? _____

Any **solvent** or **chemical-like** odors ? ☐ Yes ☒ No — Describe : _____

Last time **Dry Cleaned** fabrics brought in ? May be? — What / Where ? _____

Do any building occupants use solvents at work ? ☒ Yes ☐ No — Describe : Recent floor cleaning See list

Any testing for Radon ? ☐ Yes ☒ No — Results : _____

Radon System present ? ☒ Yes ☐ No — Describe : SSDS Installed 11/11

Lowest Building Level Layout Sketch

See Attached Drawings

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify the room use (bedroom, living room, den, kitchen, etc.) on the layout sketch.
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or F	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	xxxxxxx	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	######	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling - Product Inventory

Page _____ of _____.

Homeowner Name & Address: _____ Date: _____

Samplers & Company: _____ Structure ID: _____

Site Number & Name: _____ Phone Number: _____

Make & Model of PID: _____ Date of PID Calibration: _____

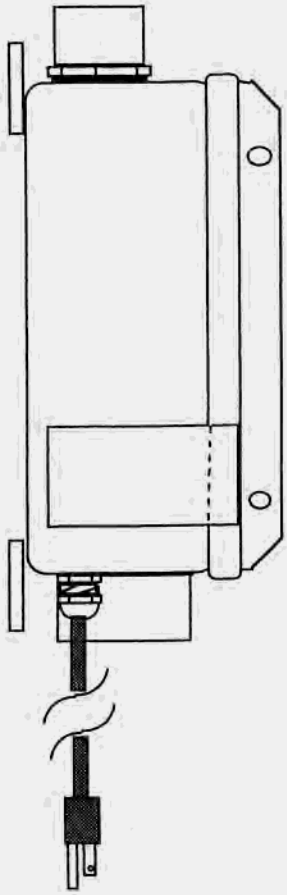
Identify any Changes from Original Building Questionnaire : _____

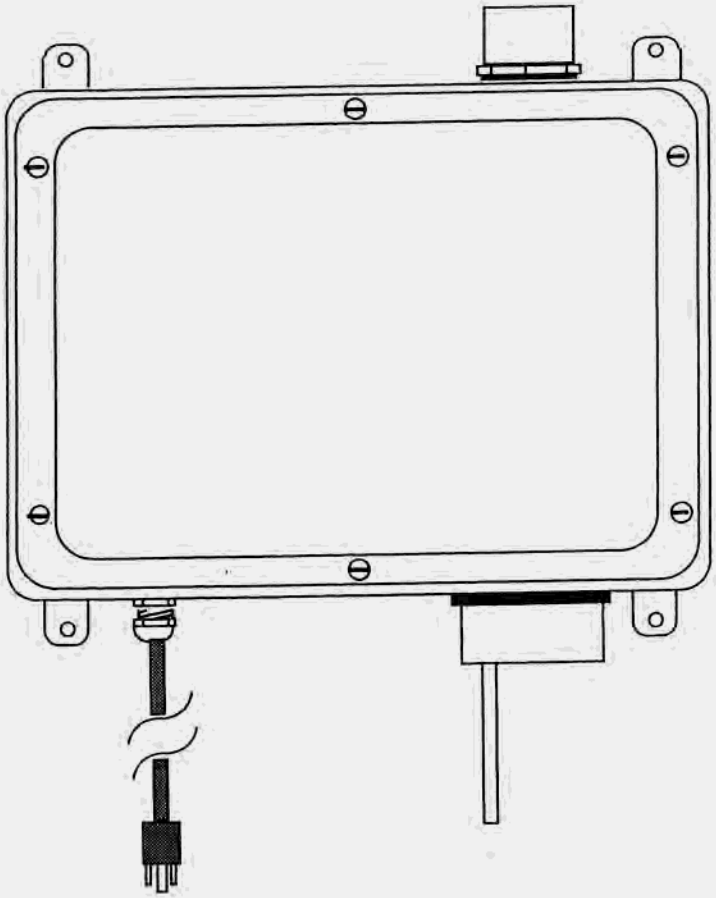
Product Name/Description	Quantity	Chemical Ingredients	PID Reading	Location
Zep commercial Heavy Duty Floor Stripper Benman Industries	5gal	Unlisted		Back room
BlueBuster mop on Reliquifier & Buildup remover	5gal #2 F0 R0 O0	corrosive (8) Sodium Hydroxide		
Simoniz maintain	1gal	Acrylic Polymer Diethylene glycol methyl Ether		
Buff floor finish maintainer	1gal	2 Butoxy Ethanol		
Solution Series NU-View	1gal	Coconut Soap 68783-34-6 Fragrance		
Lemon plus The Bannergroup Allpurpose clener	1gal	Alcohol Ethoxylates 68002-97-1 Sodium Polyacrylate 9003-04-7 Cocomonium chloride 61791-10-4		
Simoniz Premier plus Acrylic polymer Floor finish	5gal	Acrylate copolymer ~~7732-18-5~~ Diethylene Glycol Ethyl Ether Olefin - Acrylate Polymer Tributoxy Ethyl phosphate	63744-68-3 111-90-0 67892-91-5 78-51-3	
Easy Rider Benman Industries	5gal	Acrylic Acid Polymer 25987-660 2-(2 methoxethoxy) Ethanol 111-77-3 Polyethylene Emulsion 67892-91-5 Tributoxy Ethyl phosphate 78-57-3		
Butchers over Drive	1qt	1138-43-8 68131-39-5 111-90-0 64742-48-9		

Appendix F – System Fan Cut Sheet

HS SERIES INSTALLATION INSTRUCTIONS

BY RadonAway™





RadonAway, Inc. Ward Hill, MA.

P/N IN007 Rev F

RadonAway Ward Hill, MA.

HS Series Fan Installation Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.

2. **WARNING!** Do not use fan to pump explosive or corrosive gases.

3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

5. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.

6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician..

7. **WARNING!** In the event that the fan is immersed in water, return unit to factory for service before operating.

8. **WARNING!** Do not twist or torque fan inlet or outlet piping as Leakage may result.

9. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

INSTALLATION INSTRUCTIONS (Rev F)
for DynaVac High Suction Series
HS2000 p/n 23004-1
HS3000 p/n 23004-2
HS5000 p/n 23004-3

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The DynaVac is intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of the DynaVac. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The DynaVac is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the DynaVac should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F. The DynaVac is thermally protected such that it will shut off when the internal temperature is above 104 degrees F. Thus if the DynaVac is idle in an area where the ambient temperature exceeds this shut off, it will not restart until the internal temperature falls below 104 degrees F.

1.3 ACOUSTICS

The DynaVac, when installed properly, operates with little or no noticable noise to the building occupants. There are, however, some considerations to be taken into account in the system design and installation. When installing the DynaVac above sleeping areas, select a location for mounting which is as far away as possible from those areas. Avoid mounting near doors, fold-down stairs or other uninsulated structures which may transmit sound. Insure a solid mounting for the DynaVac to avoid structure-borne vibration or noise.

The velocity of the outgoing air must also be considered in the overall system design. With small diameter piping, the "rushing" sound of the outlet air can be disturbing. The system design should incorporate a means to slow and quiet the outlet air. The use of the RadonAway Exhaust Muffler, p/n 24001, is strongly recommended.

1.4 GROUND WATER

Under no circumstances should water be allowed to be drawn into the inlet of the DynaVac as this may result in damage to the unit. The DynaVac should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the DynaVac with water in installations with occasional high water tables.

In the event that a temporary high water table results in water at or above slab level, water will be drawn into the riser pipes thus blocking air flow to the DynaVac. The lack of cooling air will result in the DynaVac cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the DynaVac be disconnected until the water recedes allowing for return to normal operation.

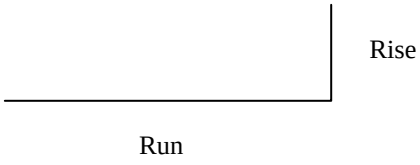
1.5 CONDENSATION & DRAINAGE

(WARNING!: Failure to provide adequate drainage for condensation can result in system failure and damage the DynaVac).

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation.

The use of small diameter piping in a system increases the speed at which the air moves. The speed of the air can pull water uphill and at sufficient velocity it can actually move water vertically up the side walls of the pipe. This has the potential of creating a problem in the negative pressure (inlet) side piping. For DynaVac inlet piping, the following table provides the minimum recommended pipe diameters as well as minimum pitch under several system condition. Use this chart to size piping for a system.

Pipe Diam.	Minimum Rise per Foot of Run*		
	@ 25 CFM	@ 50 CFM	@ 100 CFM
4"	1/32 "	3/32 "	3/8 "
3"	1/8 "	3/8 "	1 1/2 "



*Typical operational flow rates:

HS3000, or HS5000	20 - 40 CFM
HS2000	50 - 90 CFM

All exhaust piping should be 2" PVC.

1.6 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A Magnehelic pressure gauge is recommended for this purpose. The indicator should be mounted at least 5 feet above the slab penetration to minimize the risk of filling the gauge with water in installations with occasional high water tables.

1.7 SLAB COVERAGE

The DynaVac can provide coverage of well over 1000 sq. ft. per slab penetration. This will, of course, depend on the sub-slab aggregate in any particular installation and the diagnostic results. In general, sand and gravel are much looser aggregates than dirt and clay. Additional suction points can be added as required. It is recommended that a small pit (2 to 10 gallons in size) be created below the slab at each suction hole.

1.8 ELECTRICAL WIRING

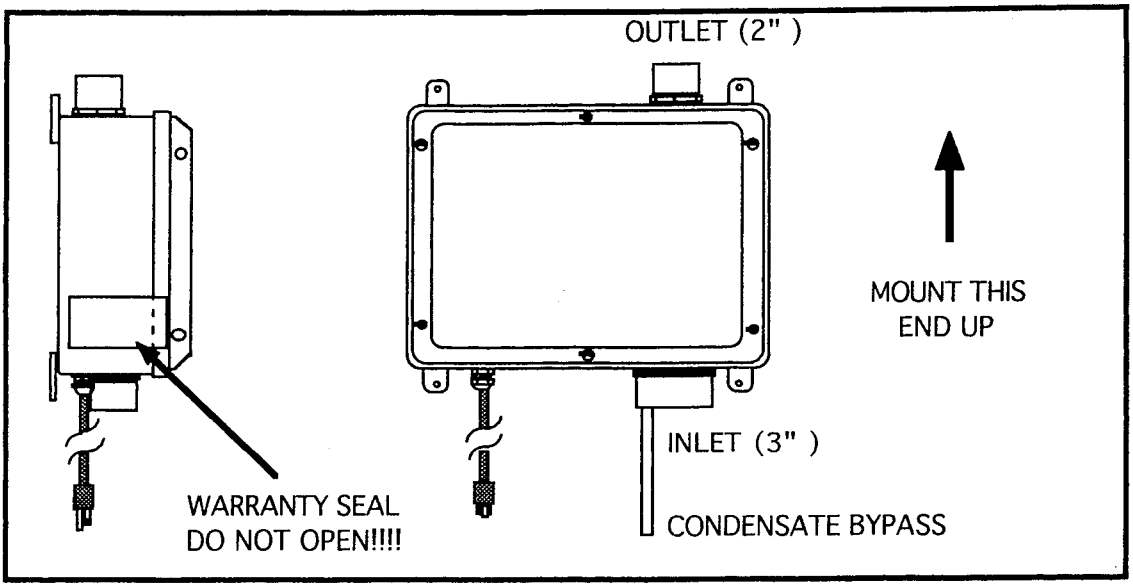
The DynaVac plugs into a standard 120V outlet. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.

1.8a ELECTRICAL BOX (optional)

The optional Electrical Box (p/n 20003) provides a weathertight box with switch for outdoor hardwire connection. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit.

1.9 SPEED CONTROLS

Electronic speed controls can **NOT** be used on HS series units.



2.0 INSTALLATION

2.1 MOUNTING

Mount the DynaVac to the wall studs, or similar structure, in the selected location with (4) 1/4" x 1 1/2" lag screws (not provided). Insure the DynaVac is both plumb and level.

2.2 DUCTING CONNECTIONS

Make final ducting connection to DynaVac with flexible couplings. Insure all connections are tight. Do not twist or torque inlet and outlet piping on DynaVac or leaks may result.

2.3 VENT MUFFLER INSTALLATION

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed above the roofline at the end of the vent pipe.

2.5 OPERATION CHECKS

____ Make final operation checks by verifying all connections are tight and leak-free.

____ Insure the DynaVac and all ducting is secure and vibration-free.

____ Verify system vacuum pressure with Magnehelic. Insure vacuum pressure is less than the maximum recommended as shown below:

DynaVac	HS2000	14" WC
DynaVac	HS3000	21" WC
DynaVac	HS5000	40" WC

(Above are based on sea-level operation, at higher altitudes reduce above by about 4% per 1000 Feet.)
If these are exceeded, increase number of suction points.

____ Verify Radon levels by testing to EPA protocol.

Addendum

PRODUCT SPECIFICATIONS

Model	Maximum Static Suction	Typical CFM vs Static Suction WC (Recommended Operating Range)						Power* Watts @ 115 VAC
		0"	10"	15"	20"	25"	35"	
HS2000	18"	110	72	40	-	-	-	150-270
HS3000	27"	40	33	30	23	18	-	105-195
HS5000	50"	53	47	42	38	34	24	180-320

*Power consumption varies with actual load conditions

Inlet: 3.0" PVC
Outlet: 2.0" PVC
Mounting: Brackets for vertical mount
Weight: Approximately 18 lbs.
Size: Approximately 15"W x 13"H x 8"D
Minimum recommended inlet ducting (greater diameter may always be used):
HS3000, HS5000 --- 2.0" PVC Pipe
HS2000 --- Main feeder line of 3.0" or greater PVC Pipe
Branch lines (if 3 or more) may be 2.0" PVC Pipe
Outlet ducting: 2.0" PVC
Storage temperature range: 32 - 100 degrees F.
Thermally protected
Locked rotor protection
Internal Condensate Bypass

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the HS Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.
There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the HS Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the HS Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of one (1) year from the date of manufacture (the "Warranty Term"). Outside the Continental United States and Canada the Warranty Term is one (1) year from the date of manufacture.

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at owner's cost) to the RadonAway factory. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not include damage in shipment unless the damage is due to the negligence of RadonAway.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE HS SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

Woman Owned Business
Aztech Environmental
TECHNOLOGIES
5 McCrea Hill Road • Ballston Spa, New York 12020

Mr. Donald Duthaler, Jr., P.E., CPM
Vice President of Operations
Baker Capital, L.P.
One West Red Oak Lane
White Plains, NY 10604

June 20, 2016

RE: Sub-Slab Depressurization System (SSDS) – 2016 Annual Inspection

Dear Mr. Duthaler,

Aztech Environmental Technologies, Inc. (Aztech) is pleased to provide a summary of the findings of the annual Sub-Slab Depressurization System (SSDS) inspection. The purpose of this letter is to summarize any notable activity or changes to the three (3) SSDSs as well as provide the findings of the annual SSDS inspection for the year 2016. In addition to any changes or deficiencies identified, recommendations for improvements are provided as necessary.

The three (3) SSDS installed at 510 Furnace Dock Road (the site) located in Cortlandt Manor, New York have been operational since their installation in December of 2011. Each of the three (3) individual systems is comprised of two (2) sub-slab vapor extraction points. The northern system is equipped with Radonaway HS-5000 fan unit, and the central and southern systems are equipped with Radonaway HS-2000 fan units. Each system is equipped with a pressure indicating alarm which illuminates a light in the event that the vacuum inside of the system falls below 0.25 inches of water column. All plumbing was completed using three-inch Schedule 40 PVC pipe and solvent-welded fittings. The three (3) fans were mounted securely to the roof and all piping was installed on a pitch to allow any condensation to flow back into the ground beneath the building's slab.

It is noted that building maintenance staff confirm the system's operation regularly by checking the status of the vacuum indicator alarms which are positioned inside of a centrally located broom closet. In the event of an alarm, Aztech would be contacted and a technician would be deployed to the site to determine the cause. Since the last annual inspection, there have not been any reported alarms.

On May 26th 2016, Aztech personnel conducted a routine inspection of the three (3) SSDSs previously installed at the site. The system inspection consisted of checking various components of the systems. Aztech personnel visually inspected all of the exposed piping connections to

confirm that the solvent-welded joints have not become loose or disconnected. The support for the piping located on the roof was checked to ensure that there were no depressions in the pipes and that the lengths of piping continue to pitch back to the extraction points beneath the building slab. All three (3) system fans located on the roof were inspected to confirm their operational status as well as the rigidity of the mounting brackets. The electrical conduits were also checked and all system failure alarms were tested to confirm operational status.

It was identified that a portion of the rigid conduit which carries power to the exterior electrical outlets was disjointed at a fitting. The cause of the issue is unknown but upon identification, the electrician who conducted the installation was contacted and a repair was completed.

There were no other deficiencies, changes, or issues identified during the inspection of the systems. All systems appear to be operating as intended. There are no recommendations to alter or modify the systems or their maintenance at this time. Attached is the field inspection log.

Please feel free to contact Aztech if you have any questions.

Sincerely,

AZTECH ENVIRONMENTAL TECHNOLOGIES, INC.



Joseph J. Sabanos

Engineering Manager



Seen here is a seperation in the rigid conduit that conveys power to the Northern Fan. This was likely caused due to snow accumulation/melting cycles and frost heaving. The seperation was repaired.



Seen here is the rigid conduit that conveys power to the Northern Fan after repairs were completed.

System Inspection Field Form
Soil Vapor Mitigation Systems

SVE SYSTEMS INSPECTION FORM

Post Commissioning, Routine or Non-Routine Inspections (circle one)

Date of Inspection: 5/26/2016

Date of Previous Inspection: _____

Address: Furnace Dock Road Cortlandt Manor, NY Tracking Number: —

Equipment Documentation

As Found		Manometer Reading (in. H_2O)	
SVE System	Fan Model	Prior	Current
1-Northern	HS-5000	-	11
2-Central	HS-2000	-	12
3-Southern	HS-2000	-	10

As Left		Manometer Reading (in. H_2O)	
SVE System	Fan Model	Prior	Current
1-Northern	HS5000	-	11
2-Central	HS2000	-	12
3-Southern	HS2000	-	10

	As Found		As Left	
	Yes	No	Yes	No
Fan Check				
Are all fans in operation?	X		X	
Is there a differential pressure shown in U-Tube manometer?		X		X
If yes, provide readings above.				
Is each fan mounted securely?	X		X	
Are coupling connections secure?	X		X	
Is excessive noise heard when fan is running?		X		X
Does each fan induce suction when running?	X		X	
Is switch is locked in the ON position?		X		X
Does smoke enter joints?				
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Piping Check				
Is glue evident at joints?		X		X
Are system suction points sealed?	X		X	
Is piping system properly supported?	X		X	
Are valves and manometers installed at proper locations?		X		X
Is excessive noise heard in piping joints?		X		X
Were piping modifications and 10% of old joints smoke tested?				
Does smoke enter joints?				
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Slab Check				
Have new floor cracks appeared since the last inspection?		X		X
Was each identified slab crack, repair, or modification smoke tested?				

Does smoke enter?				
If yes: Was area re-sealed with approved sealant*?				
Does smoke enter re-sealed area?				
Electrical Check				
Are electrical wires and connections secure?		NO		X *
Is each junction box closed?	X		X	
Are conduit properly supported?	X		X	
Are switch boxes locked?		X		X
Does each fan start when the switch is ON position?	X		X	
Does each fan stop when the switch is in OFF position?	X		X	
Are mitigation system labels applied?	X		X	
Are the correct labels applied in the proper locations?	X		X	

Have the following items changed since the last visit?

	No	Yes	If yes, explain...
Building Footprint	X		
Ownership	X		

If any of these items have changed, a redesign may be required.
Contact the maintenance supervisor for field review.

Deviations/Comments

No Smoke test conducted due to the Sensitivity of work performed inside of the building. All exposed joints were visually Inspected. All Supports inspected. Fans Appear to be operational.

* Disjointed conduit identified on roof.

Performed by: LG Date: 5/26/16

Woman Owned Business
Aztech Environmental
TECHNOLOGIES
5 McCrea Hill Road • Ballston Spa, New York 12020

Mr. Donald Duthaler, Jr., P.E., CPM
Vice President of Operations
Baker Capital, L.P.
One West Red Oak Lane
White Plains, NY 10604

March 17, 2017

RE: Sub-Slab Depressurization System (SSDS) – 2017 Annual Inspection

Dear Mr. Duthaler,

Aztech Environmental Technologies, Inc. (Aztech) is pleased to provide a summary of the findings of the annual Sub-Slab Depressurization System (SSDS) inspection. The purpose of this letter is to summarize any notable activity or changes to the three (3) SSDSs as well as provide the findings of the annual SSDS inspection for the year 2017. In addition to any changes or deficiencies identified, recommendations for improvements are provided as necessary.

The three (3) SSDSs installed at 510 Furnace Dock Road (the site) located in Cortlandt Manor, New York have been operational since their installation in December of 2011. Each of the three (3) individual systems is comprised of two (2) sub-slab vapor extraction points. All three (3) systems are equipped with Radonaway HS-2000 fan units. Each system is also equipped with a pressure indicating alarm which illuminates a light in the event that the vacuum inside of the system falls below 0.25 inches of water column. All plumbing was completed using three-inch Schedule 40 PVC pipe and solvent-welded fittings. The three (3) fans were mounted securely to the roof and all piping was installed on a pitch to allow any condensation to flow back into the ground beneath the building's slab.

It is noted that building maintenance staff confirm the system's operation regularly by checking the status of the vacuum indicator alarms which are positioned inside of a centrally located broom closet. In the event of an alarm, Aztech would be contacted and a technician would be deployed to the site to determine the cause.

On January 27th 2017, Aztech personnel mobilized to the site to determine the cause of a vacuum alarm. Upon inspection, it was discovered that the Northern Fan was inoperable and causing the ground fault circuit interrupter (GFCI) to trip. The fan was removed during this visit until a

replacement could be sourced. The stack was temporarily installed directly to the piping in order to allow the system to passively vent safely in the absence of an induced vacuum. On February 15th 2017, Aztech personnel remobilized to the site to replace the Northern Fan with a new HS-2000 unit. Proper operation was proved and the vacuum alarm was no longer in a fault condition.

During the January and February site visits, the system inspection consisted of checking various components of the systems. Aztech personnel visually inspected all of the exposed piping connections to confirm that the solvent-welded joints had not become loose or disconnected. The support for the piping located on the roof was checked to ensure that there were no depressions in the pipes and that the lengths of piping continue to pitch back to the extraction points beneath the building slab. All three (3) system fans located on the roof were inspected to confirm their operational status as well as the rigidity of the mounting brackets. The electrical conduits were also checked and all system failure alarms were tested to confirm operational status.

Following replacement of the Norther Fan, all systems appear to be operating as intended. There are no recommendations to alter or modify the systems or their maintenance at this time. Attached is the field inspection log.

Please feel free to contact Aztech if you have any questions.

Sincerely,

AZTECH ENVIRONMENTAL TECHNOLOGIES, INC.

Andrew Talbot
Project Engineer



Seen here is the Northern Fan with the malfunctioning fan removed. The piping was connected temporarily to allow for venting while a replacment was sourced.



Seen here is the Northern Fan after repairs were completed.



Seen here is the southern leg of the SSDS. The leg was inspected for proper pitch back to the points for condensation to flow back beneath the slab.

SVE SYSTEMS INSPECTION FORM

Post Commissioning, Routine or Non-Routine Inspections (circle one)

Date of Inspection: 1-27-17

Date of Previous Inspection: 5-26-16

Address: Furnace Dock Road Cortlandt Manor, NY Tracking Number: _____

Equipment Documentation

As Found		Manometer Reading (in. H_2O)		As Left		Manometer Reading (in. H_2O)	
SVE System	Fan Model	Prior	Current	SVE System	Fan Model	Prior	Current
1-Northern	HS-~~5000~~ 2000	-	—	1-Northern	—	-	—
2-Central	HS-~~5000~~ 2000	-	-10" H_2O	2-Central	HS2000	-	-10" H_2O
3-Southern	HS-2000	-	-6.6" H_2O	3-Southern	HS2000	-	-6.6 H_2O

range 1/4 or

	As Found		As Left	
Fan Check	Yes	No	Yes	No
Are all fans in operation?		X		X
Is there a differential pressure shown in U-Tube manometer?	—		—	
If yes, provide readings above.				
Is each fan mounted securely?		X	X	
Are coupling connections secure?		X	X	
Is excessive noise heard when fan is running?		X		X
Does each fan induce suction when running?	X		X	
Is switch is locked in the ON position?	NA		NA	
Does smoke enter joints?		X		X
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Piping Check				
Is glue evident at joints?	X		X	
Are system suction points sealed?	NA		NA	
Is piping system properly supported?	X		X	
Are valves and manometers installed at proper locations?	NA		NA	
Is excessive noise heard in piping joints?		X		X
Were piping modifications and 10% of old joints smoke tested?	X		X	
Does smoke enter joints?		X		X
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Slab Check				
Have new floor cracks appeared since the last inspection?		X		X
Was each identified slab crack, repair, or modification smoke tested?				

Does smoke enter?		X		X
If yes: Was area re-sealed with approved sealant*?				
Does smoke enter re-sealed area?				
Electrical Check				
Are electrical wires and connections secure?	X		X	
Is each junction box closed?	X		X	
Are conduit properly supported?	X		X	
Are switch boxes locked?		X		X
Does each fan start when the switch is ON position?	NA		NA	
Does each fan stop when the switch is in OFF position?	NA		NA	
Are mitigation system labels applied?		X		X
Are the correct labels applied in the proper locations?		X		X

Have the following items changed since the last visit?

	No	Yes	If yes, explain...
Building Footprint	X		
Ownership	X		

If any of these items have changed, a redesign may be required.
Contact the maintenance supervisor for field review.

Deviations/Comments

NORTHERN FAN INOPERABLE. DUE TO TRIPPED GFI. REMOVED FAN.

Performed by: GB + JS Date: 1-27-17

SVE SYSTEMS INSPECTION FORM

Post Commissioning, Routine or Non-Routine Inspections (circle one)

Date of Inspection: 2-15-17

Date of Previous Inspection: 1-27-17

Address: Furnace Dock Road Cortlandt Manor, NY Tracking Number: _____

Equipment Documentation

As Found		Manometer Reading (in. H_2O)	
SVE System	Fan Model	Prior	Current
1-Northern	HS-2000	-	—
2-Central	HS-2000	-	
3-Southern	HS-2000	-	

As Left		Manometer Reading (in. H_2O)	
SVE System	Fan Model	Prior	Current
1-Northern	HS2000	-	10" H2O
2-Central		-	
3-Southern		-	

Fan Check	As Found Yes	As Found No	As Left Yes	As Left No
Are all fans in operation?				
Is there a differential pressure shown in U-Tube manometer?				
If yes, provide readings above.				
Is each fan mounted securely?				
Are coupling connections secure?				
Is excessive noise heard when fan is running?				
Does each fan induce suction when running?				
Is switch is locked in the ON position?				
Does smoke enter joints?				
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Piping Check				
Is glue evident at joints?				
Are system suction points sealed?				
Is piping system properly supported?				
Are valves and manometers installed at proper locations?				
Is excessive noise heard in piping joints?				
Were piping modifications and 10% of old joints smoke tested?				
Does smoke enter joints?				
If yes: Was joint re-sealed?				
Does smoke enter re-sealed joint?				
Slab Check				
Have new floor cracks appeared since the last inspection?				
Was each identified slab crack, repair, or modification smoke tested?				

Does smoke enter? ____ ____ ____ ____

If yes: Was area re-sealed with approved sealant*? ____ ____ ____ ____

Does smoke enter re-sealed area? ____ ____ ____ ____

Electrical Check

Are electrical wires and connections secure? ____ ____ ____ ____

Is each junction box closed? ____ ____ ____ ____

Are conduit properly supported? ____ ____ ____ ____

Are switch boxes locked? ____ ____ ____ ____

Does each fan start when the switch is ON position? ____ ____ ____ ____

Does each fan stop when the switch is in OFF position? ____ ____ ____ ____

Are mitigation system labels applied? ____ ____ ____ ____

Are the correct labels applied in the proper locations? ____ ____

Have the following items changed since the last visit?

	No	**Yes**	**If yes, explain…**
Building Footprint	____	____	____
Ownership	____	____	____

If any of these items have changed, a redesign may be required.
Contact the maintenance supervisor for field review.

Deviations/Comments

Fan replaced & tested. No inspection needed.

Performed by: LG Date: 1-27-17

PROJECT NOTE	WESTON SOLUTIONS, INC.
To: Magna Metals HRS Site File	**Date:** April 5, 2018
W.O. No.: 20408.012.004.0564.00 (TDD No. 0004/1802-03)	
From: G. Gilliland, P.G., Weston Solutions, Inc.	
Subject: Surface Water Pathway and Mapped Wetlands	

On April 5, 2018, Weston Solutions Inc. (WESTON®) personnel Gerry Gilliland downloaded the attached maps from New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper (ERM) and U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) databases for reference. The databases are available at the following web addresses:

- NYSDEC ERM: http://www.dec.ny.gov/gis/erm/
- USFWS NWI: https://www.fws.gov/wetlands/data/Mapper.html

The maps show waterbodies and mapped wetland areas along the surface water migration pathway downstream of the site. The approximate site location has been marked on the maps.

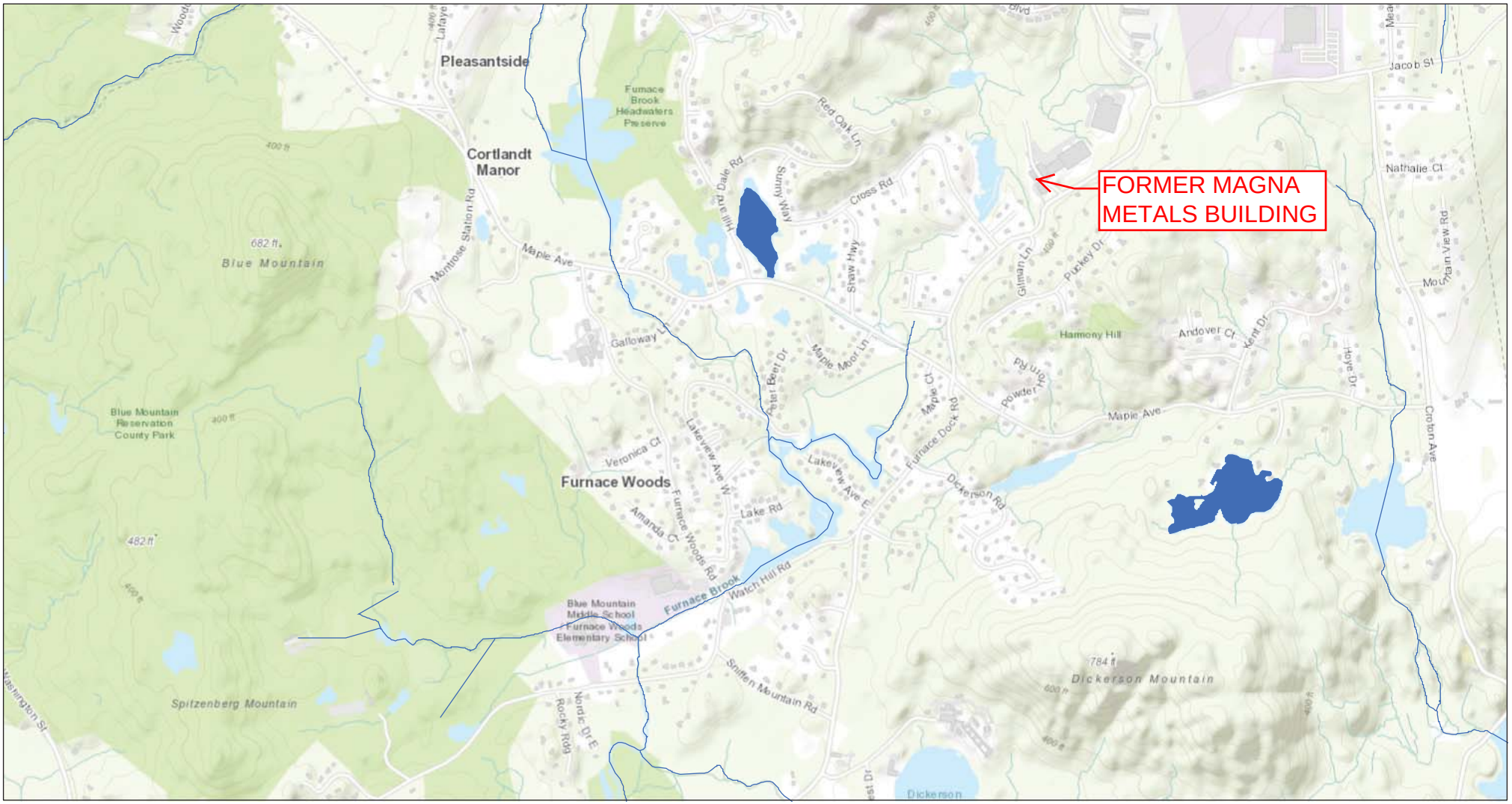
Previous investigations of the site identified the on-site waterbody as Furnace Brook, however, the State maps indicate that the Furnace Brook headwaters are located to the east and the on-site waterbody is a tributary. The waterbodies downstream of the site include the tributary, Furnace Brook, and Hudson River.

Gerald V. Gilliland, P.G.
Principal Project Scientist

Attachments:

Pages 2 and 3 – NYSDEC ERM Waterbodies Maps
Pages 4, 5, and 6 – NYSDEC ERM Freshwater Wetlands Maps
Pages 7 and 8 – USFWS NWI Maps

NYSDEC Map - Waterbodies-1



April 5, 2018

1:18,056

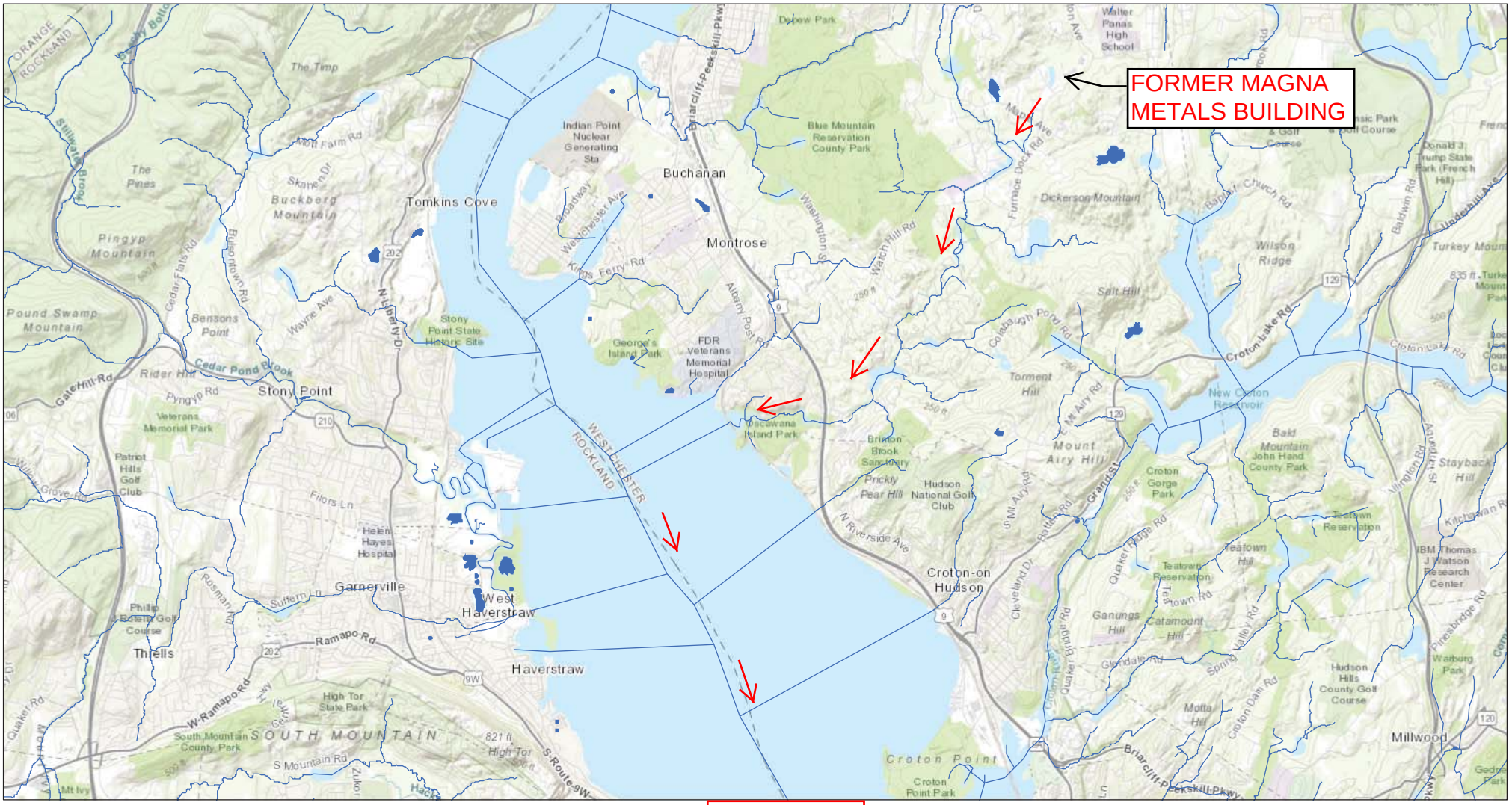
0 0.225 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: NYSDEC Environmental Resource Mapper, http://www.dec.ny.gov/gis/erm/
Not a legal document

NYSDEC Map - Waterbodies-2



April 5, 2018

1:72,224

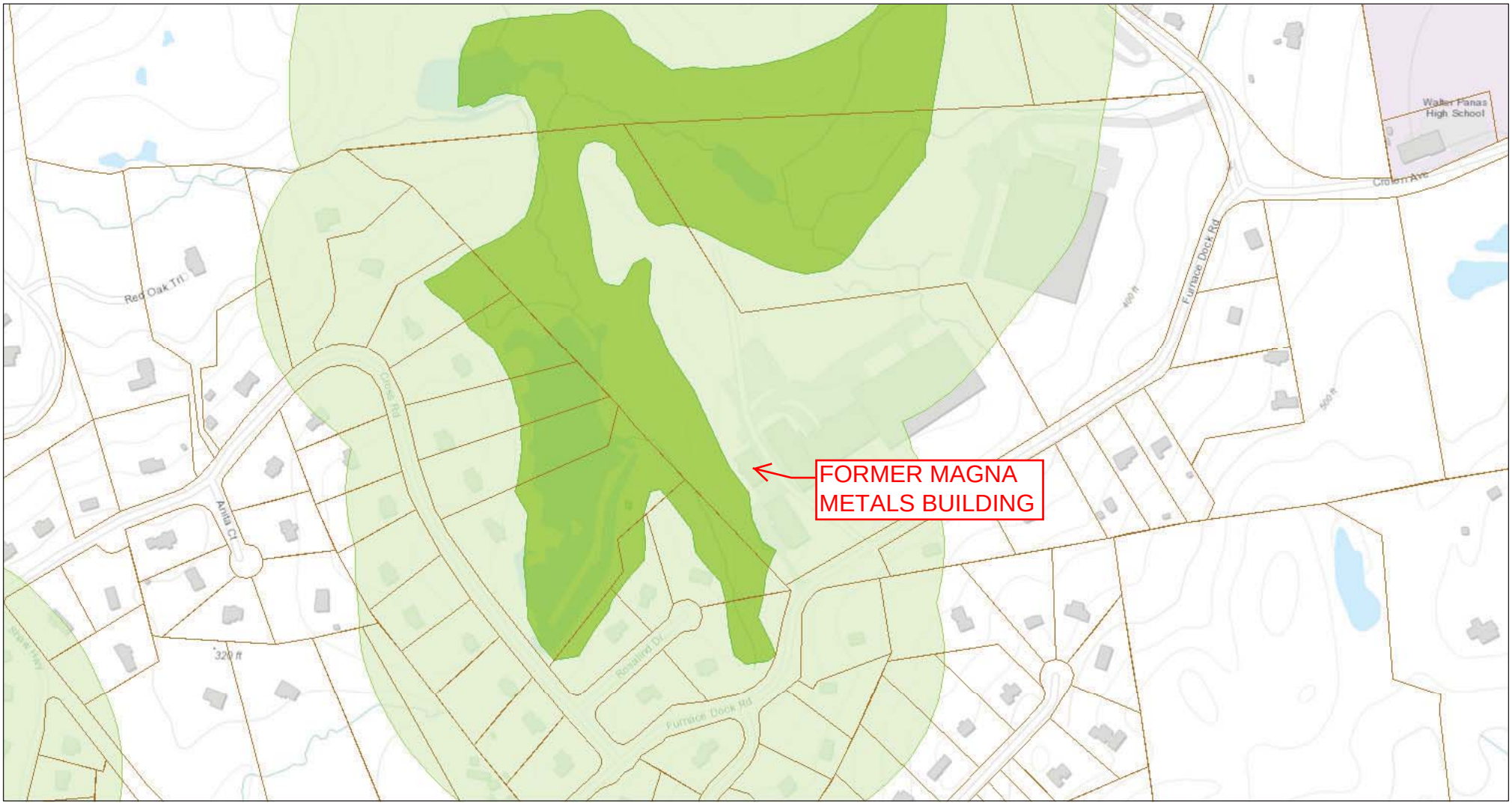
0 0.75 1.5 3 mi

0 1.25 2.5 5 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: NYSDEC Environmental Resource Mapper, http://www.dec.ny.gov/gis/erm/
Not a legal document

NYSDEC Map - State Wetlands - On-Site



April 5, 2018

1:4,514

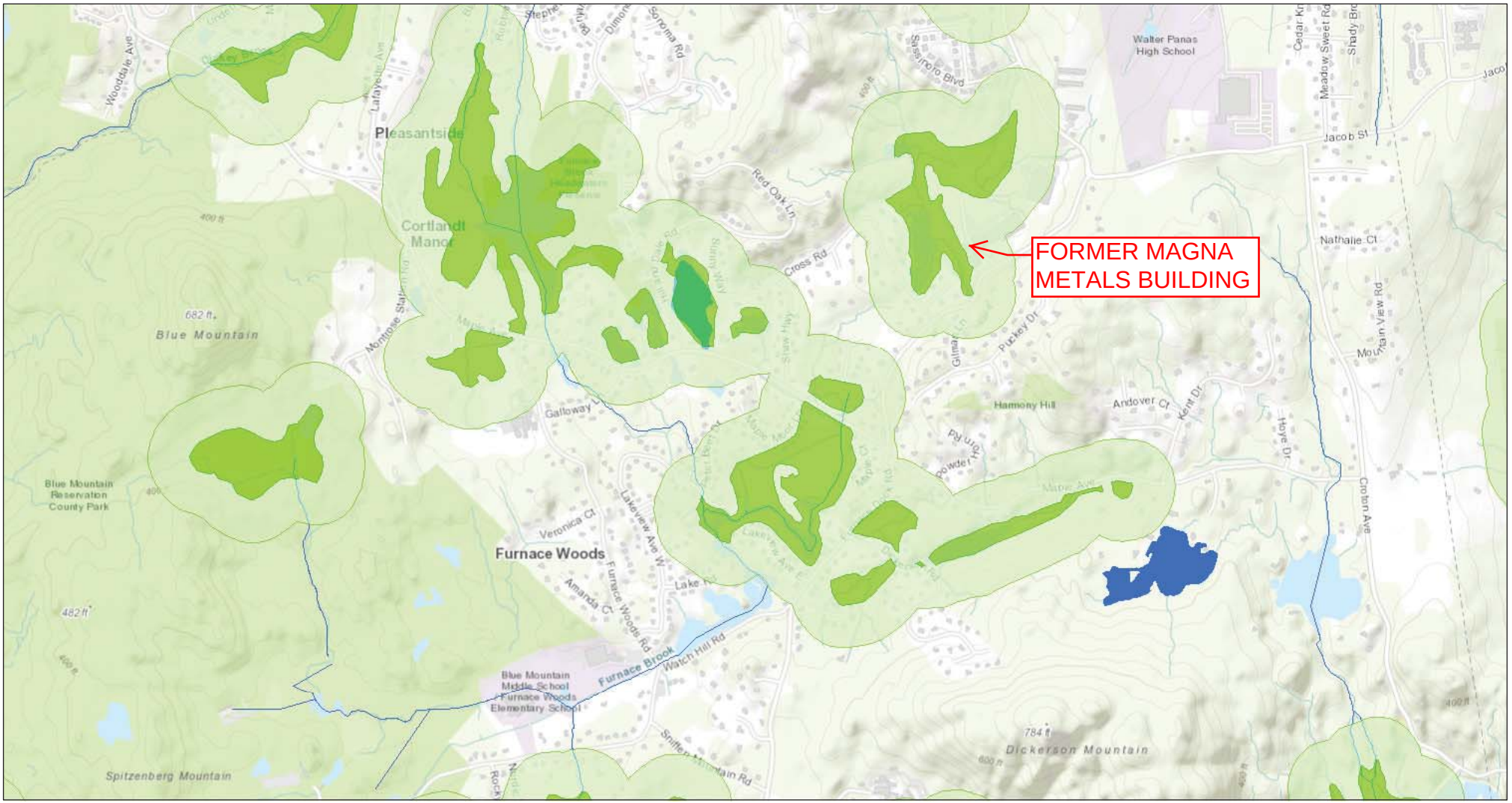
0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: NYSDEC Environmental Resource Mapper, http://www.dec.ny.gov/gis/erm/
Not a legal document

NYSDEC Map - State Wetlands-1



April 5, 2018

1:18,056

0 0.225 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: NYSDEC Environmental Resource Mapper, http://www.dec.ny.gov/gis/erm/
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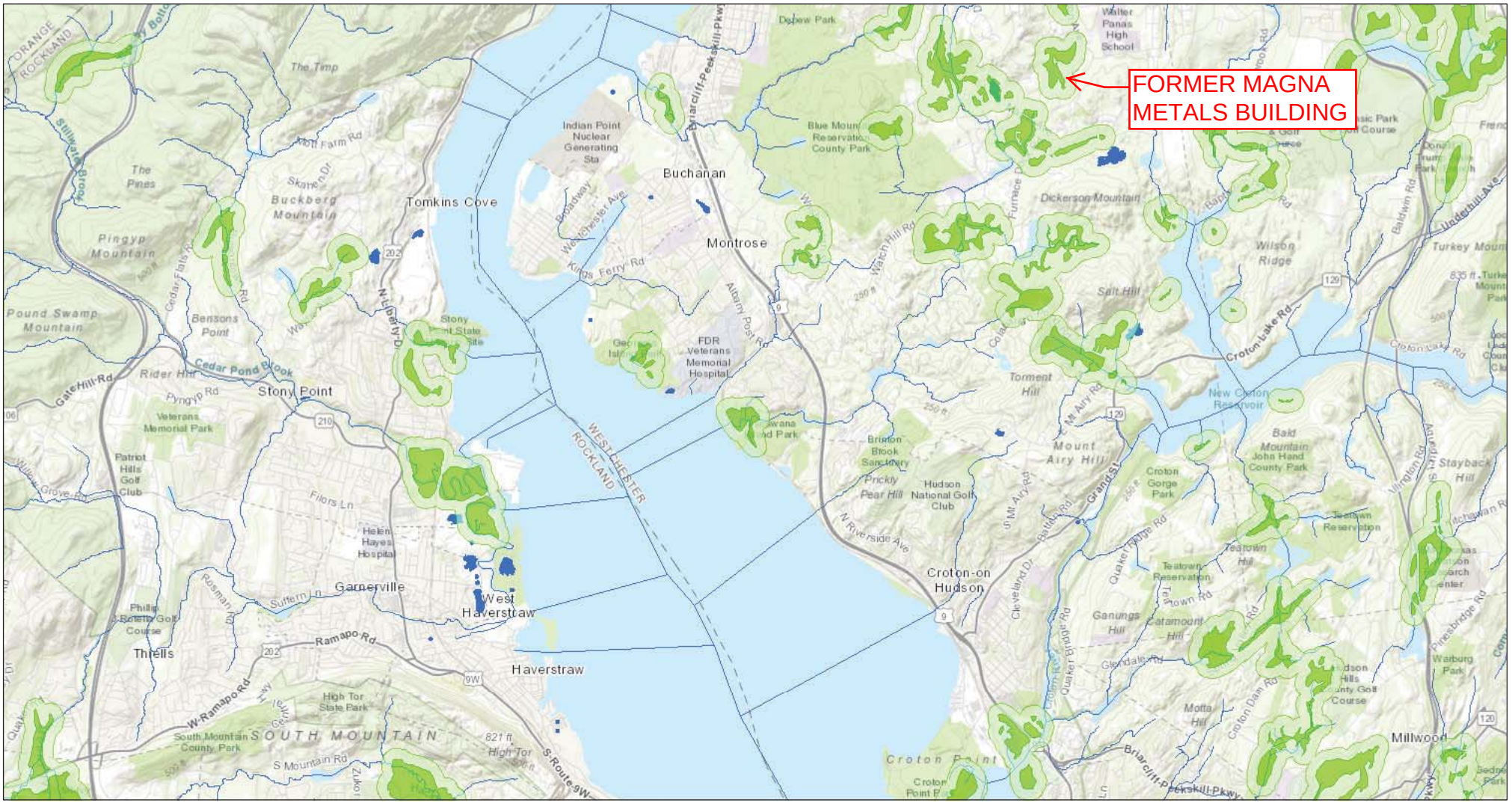
NYSDEC Map - State Wetlands-2



April 5, 2018

1:72,224

0 0.75 1.5 3 mi

0 1.25 2.5 5 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: NYSDEC Environmental Resource Mapper, http://www.dec.ny.gov/gis/erm/
Not a legal document

U.S. Fish and Wildlife Service
National Wetlands Inventory

Magna Metals Wetland - Short Shot



April 5, 2018

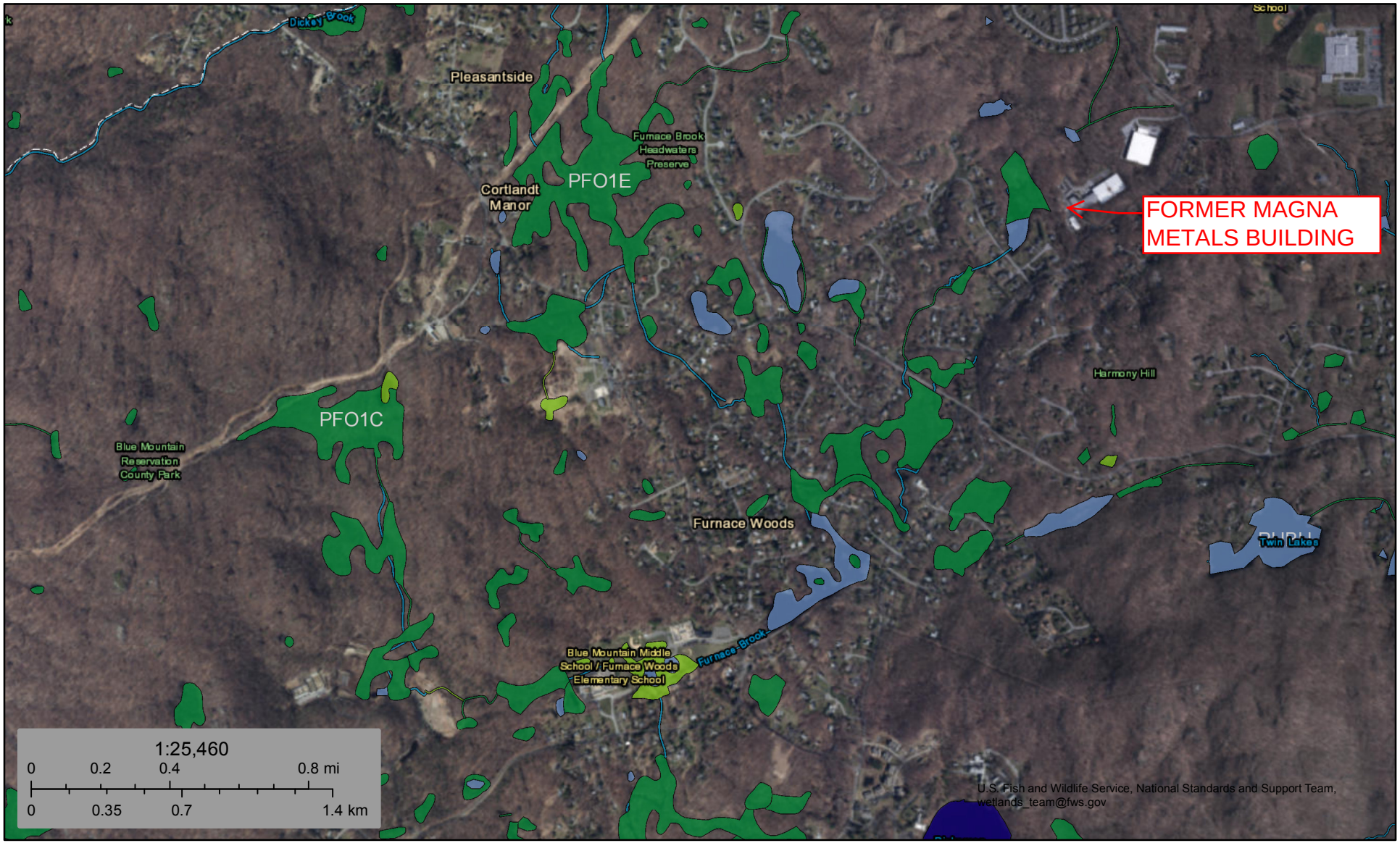
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Magna Metals Wetlands - Full Extent



April 5, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
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- Lake
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- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

PROJECT NOTE	WESTON SOLUTIONS, INC.
To: Magna Metals HRS Site File	**Date:** 2 May 2018
W.O. No.: 20408.012.004.0564.00 (TDD No. 0004/1802-03)	
From: Brian Kirkpatrick, CWB Weston Solutions, Inc.	
Subject: Wetland Categories and Frontage to Furnace Brook Tributary, Town of Cortlandt, Westchester County, New York	

On 18 April 2018, Weston Solutions Inc. (WESTON) personnel Brian Kirkpatrick, a certified wildlife biologist (CWB), and Scott Snyder performed a site reconnaissance to observe wetlands located along an unnamed tributary of Furnace Brook in the Town of Cortlandt, Westchester County, New York (hereinafter "watercourse"). For the purposes of this investigation, "wetlands" are defined at 40 CFR 230.3(iv). WESTON utilized U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) and New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper (ERM) databases to determine the general location and classification of wetlands. Wetlands identified on the NWI and ERM databases are shown in **Figure 1** and **Figure 2**, respectively, and are collectively described as "mapped wetlands" below. The objectives of the field observations were two-fold:

1. Verify that each of the wetlands meets the eligibility requirements for Hazard Ranking System (HRS) scoring as sensitive environments per 40 CFR 230.3; and,
2. Determine the length of frontage to the watercourse of HRS-eligible wetlands.

WESTON documented the wetland category to confirm the HRS-eligibility along the watercourse within the zone of contamination and at upstream, background locations. WESTON also used a Trimble ProXR DGPS global positioning system (GPS), a mapping-grade unit capable of sub-meter accuracy, to document the upstream and downstream extents of wetland frontage along the watercourse. We defined wetland frontage as locations where the waterward wetland boundary was coincident with the top of bank of the watercourse. Particular attention was paid to confirming that the natural and man-made levees/dikes along the banks of the watercourse were not of sufficient size to constitute a thin strip of upland which might separate the wetland from the creek; this was not found to be the case in any of the wetlands assessed.

Positive indicators of hydric soils, wetland hydrology, and wetland vegetation as described in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region (Version 2.0)* were observed at all mapped wetlands. Areas meeting the Clean Water Act's definition of wetlands were generally larger than areas of mapped wetlands.

Along most reaches of the watercourse, a distinct channel was present and wetland frontage was measured along each bank of the channel. Approximately 0.12 mile of the watercourse was impounded upstream of Cross Road, obscuring the original channel. In this location, historical aerial imagery and topographic maps were used to estimate the submerged channel location. A few reaches of the watercourse are contained within culverts. In these locations, the buried channel was assumed to be connected in a direct line between the inlet and outlet of the culvert. **Figure 3** depicts the location of HRS-eligible wetlands along the watercourse.

The following describes how each conclusion was made:

In order to determine the HRS-eligibility of wetlands with frontage to watercourse :

1. WESTON obtained the locations of wetlands from available NWI and ERM data located downstream of the most upstream probable point of entry (PPE) to surface water.
2. A WESTON wetland scientist made observations in the mapped wetlands, in order to document the following features:
    a. The most upstream point where the wetland has frontage to the watercourse;
    b. The presence of wetland vegetation, hydric soils, and wetland hydrology;
    c. The connectivity of wetland frontage to the watercourse downstream of the most upstream point; and,
    d. The most downstream point where the wetland has frontage to the watercourse.
3. Using Highlight A-9 of the *HRS Guidance Manual*, which summarizes the 40CFR 230.3 definition of a wetland, WESTON compared the wetland descriptions to the wetland categories indicated in the NWI data, and confirmed whether the NWI data were consistent with WESTON observations.

For mapped wetlands, WESTON confirmed that the actual wetland categories were consistent with the NWI wetland categories. All wetlands except those along the impounded segment of the watercourse were determined to be palustrine, forested, broad-leaved deciduous, seasonally flooded wetlands (PFO1C) and palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetlands (PFO1E). Common plant species in the forested wetlands include green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), and spicebush (*Lindera benzoin*). The impounded segment of the watercourse is classified as palustrine' unconsolidated bottom, permanently flooded, excavated (PUBHx). The PUBHx wetlands abut PFOlC wetlands. WESTON collected georeferenced ground-based photographs within each reach of the watercourse.

In order to determine HRS-eligible wetland frontage downstream of the site:

1. WESTON documented the most upstream and downstream points of frontage of wetlands on both the east and west banks of the watercourse using a Trimble ProXR DGPS global positioning system (GPS), a mapping-grade unit capable of sub-meter accuracy. WESTON did not utilize the GPS system to record the downstream limits of the zone of contamination and instead relied on physical features that were identifiable at ground level and on aerial imagery.
2. WESTON also made observations along the length of the watercourse to confirm the continuity of their wetland frontage to both the east and west banks, confirming that the entire stream-mile distances between the most upstream and downstream points for mapped wetlands comprise wetland frontage.

3. The most upstream and downstream points of frontage for observed wetlands on both the east and west banks of the watercourse were recovered from the GPS unit and plotted on an aerial photograph basemap using *ArcGIS Desktop 10.6*.

4. Wetland GIS shapefiles were obtained from the NWI and ERM, and were plotted on an aerial photograph basemap using *ArcGIS Desktop 10.6*.

5. Comparison of the two data sources documents that WESTON found portions of wetlands along stream banks where NWI and ERM data did not indicate the presence of wetlands, documenting that the wetland frontage previously measured along the NWI and ERM mapping boundaries omitted frontage to the watercourse and underestimates the actual wetland frontage for the zone of contamination. WESTON determined the landward wetlands boundary using the offsite wetlands delineation methodology described in the 1987 *Corps of Engineers Wetlands Delineation Manual* and plotted their location on an aerial photograph basemap (**Figure 3**).

6. Using the Editor tool in *ArcGIS Desktop 10.6*, WESTON digitized the stream centerline visible on aerial imagery. We combined this information with GPS surveyed sampling locations in the stream to determine the stream centerline where it was not visible on aerial imagery.

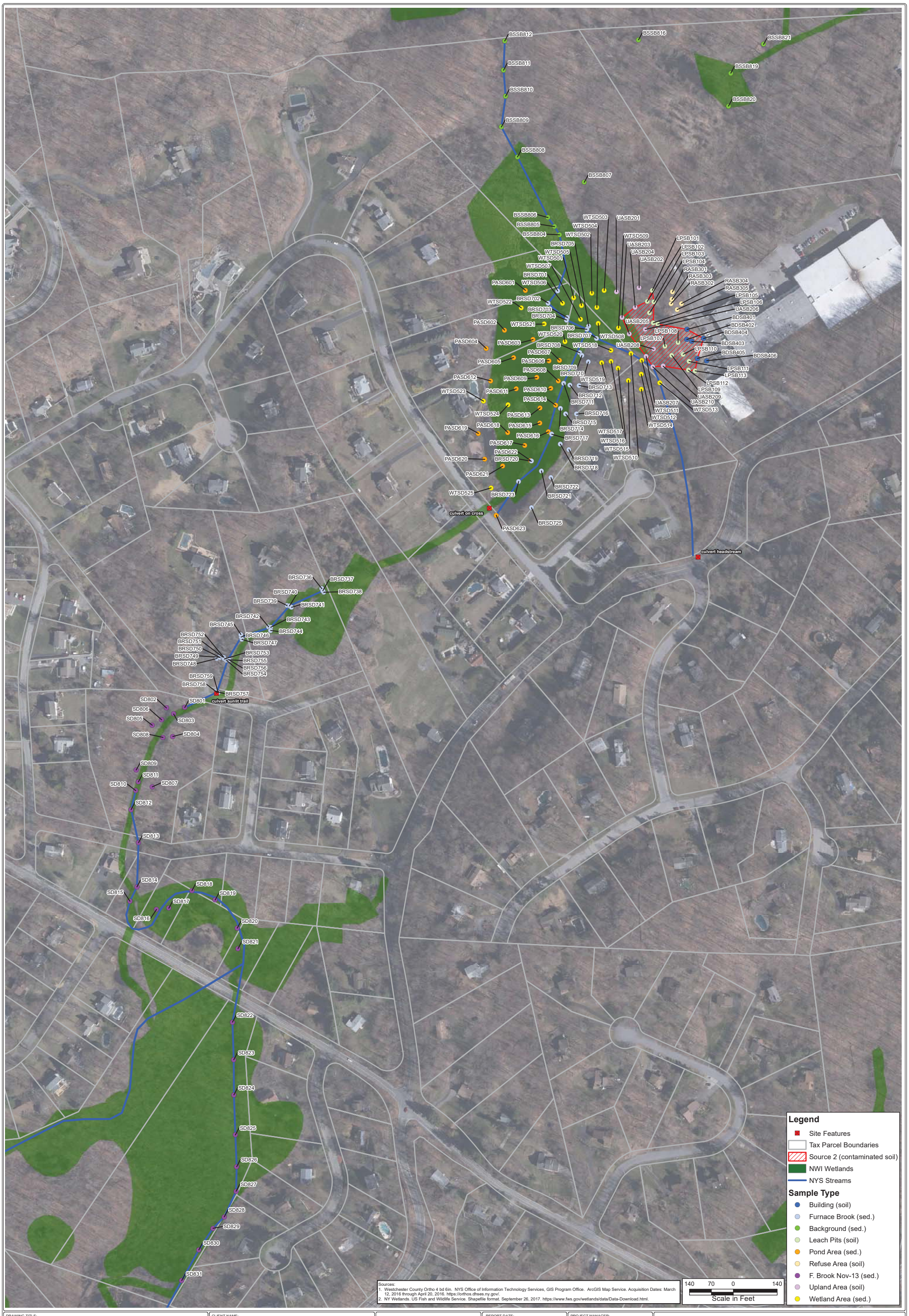
7. The frontage of HRS-eligible wetlands along the digitized stream were traced, starting at the most upstream location for each wetland, working downstream to the most downstream location for each wetland.

8. Using *XTools Pro 17.2 for ArcGIS* desktop, the lengths of the frontage and HRS-eligible wetlands were determined. **Figure 3** depicts the location of wetlands along the watercourse within the zone of contamination. The length of HRS-eligible wetland frontage for the zone of contamination is approximately 1.51 miles. Approximately 1.26 miles of the wetland frontage consists of PFO1C and PFO1E wetlands, and 0.25 mile consists of PUBHx wetlands.

Brian Kirkpatrick
Director, Ecological Services

Attachments:

Figure 1. USFWS NWI Map
Figure 2. NYSDEC ERM Freshwater Wetlands Map
Figure 3. Wetland Frontage along Zone of Contamination
Photographic Record



DRAWING TITLE:

National Wetlands Inventory (NWI) Map
Magna Metals
510 Furnace Dock Rd, Cortlandt, NY

CLIENT NAME: EPA

PROJECT NAME: Magna Metals

N W E S

REPORT DATE: May 2018

PROJECT MANAGER: G. Gilliland

DRAWING: 21924_Magna_Metals_HDR_NWI_Wetlands.mxd
PATH: P:\SAT2\Magna_Metals\MXD\

CHECKED BY: G. Gilliland

REVISION No.: 0

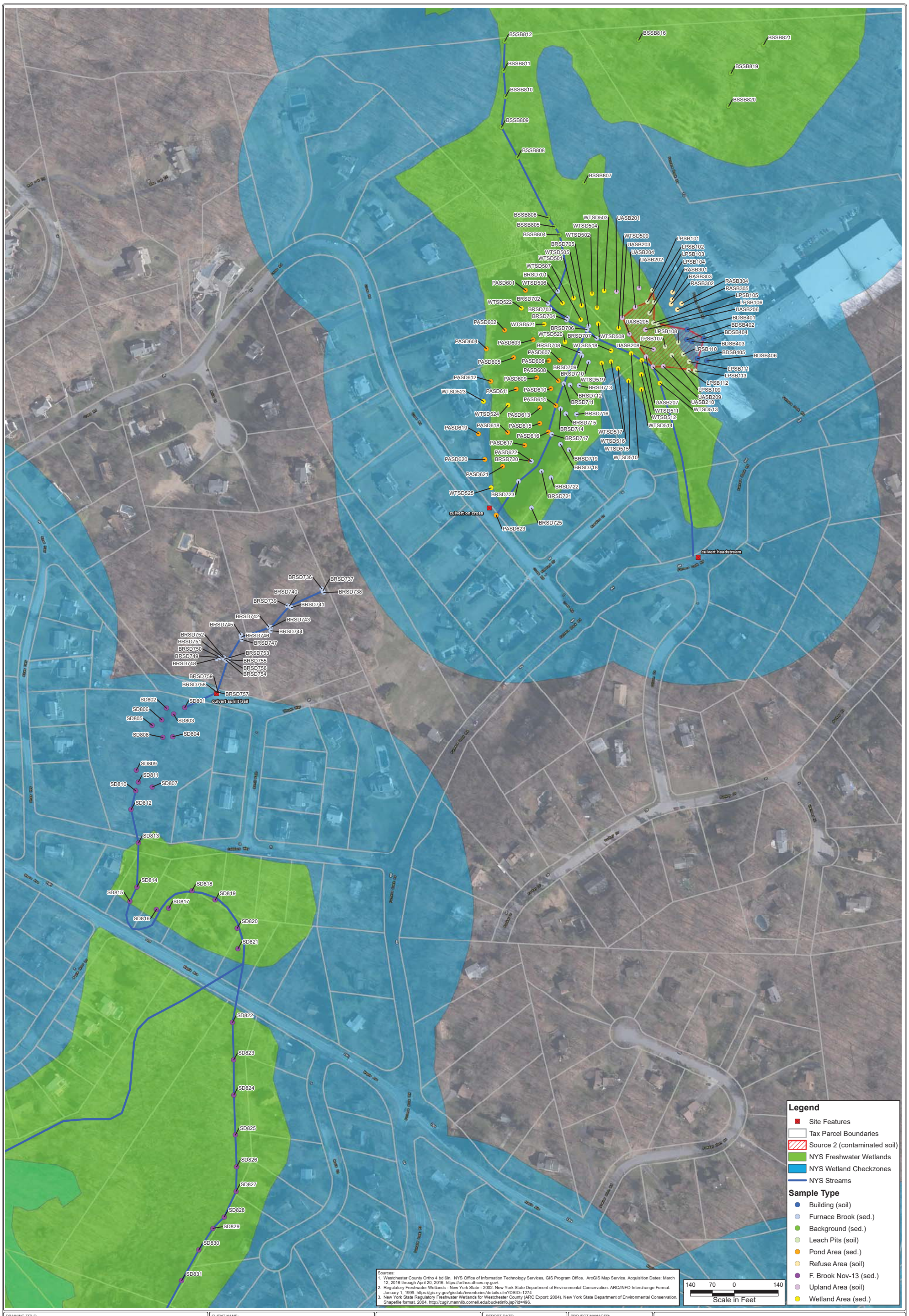
CONTRACT No.
DELIVERY ORDER NO.

WORK ORDER No.: 20408.012.004.0564.00

DRAWN/MODIFIED BY: K. Heulitt
DATE CREATED: 4/13/2018

FIGURE: 1
SCALE: See Above
DATE: May 2018

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com



DRAWING TITLE:
New York State Freshwater Wetlands Map
Magna Metals
510 Furnace Dock Rd, Cortlandt, NY

CLIENT NAME: EPA

PROJECT NAME: Magna Metals

N W E S

REPORT DATE: May 2018

PROJECT MANAGER: G. Gilliland

DRAWING: 21922_Magna_Metals_HDR_State_Freshwater_Wetlands.mxd
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CHECKED BY: G. Gilliland

REVISION No.: 0

CONTRACT No.
DELIVERY ORDER NO.

WORK ORDER No.: 20408.012.004.0564.00

DRAWN/MODIFIED BY: K. Heulitt
DATE CREATED: 4/13/2018

FIGURE: 2
SCALE: See Above
DATE: May 2018

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205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

culvert on cross
culvert headstream
culvert sunlit trail

Sources:
1. Westchester County Ortho 4 bd 6in. NYS Office of Information Technology Services, GIS Program Office. ArcGIS Map Service. Acquisition Dates: March 12, 2016 through April 20, 2016. https://orthos.dhses.ny.gov/.

140 70 0 140
Scale in Feet

Legend

- Site Features
- Tax Parcel Boundaries
- Source 2 (contaminated soil)
- Stream - Piped Reach, No Frontage
- Stream - No Frontage/Outside Zone of Contamination
- Stream - East and West Bank Frontage
- Stream - West Bank Frontage
- Stream - East Bank Frontage
- WESTON Delineated Wetlands

Sample Type

- Building (soil)
- Furnace Brook (sed.)
- Background (sed.)
- Leach Pits (soil)
- Pond Area (sed.)
- Refuse Area (soil)
- F. Brook Nov-13 (sed.)
- Upland Area (soil)
- Wetland Area (sed.)

DRAWING TITLE:
Wetland Frontage along
Zone of Contamination
Magna Metals
510 Furnace Dock Rd, Cortlandt, NY

FIGURE: 3
SCALE: See Above
DATE: May 2018

CLIENT NAME: EPA

PROJECT NAME: Magna Metals

N W E S

REPORT DATE: May 2018
PROJECT MANAGER: G. Gilliland
DRAWING: 21960_Magna_Metals_HDR_Weston_Delineated_Wetlands.mxd
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CHECKED BY: G. Gilliland
REVISION No. 0
CONTRACT No.
DELIVERY ORDER NO.
WORK ORDER No. 20408.012.004.0564.00
DRAWN/MODIFIED BY: K. Heulitt
DATE CREATED: 4/25/2018

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

MAGNA METALS
PHOTOGRAPHIC RECORD
WETLAND ASSESSMENT

CLIENT: EPA	**SITE LOCATION:** 510 Furnace Dock Road Cortlandt, Westchester County, NY
SITE NAME: MAGNA METALS	

DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 1 - Source area Magna Metals



DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 2 - Furnace Brook tributary and adjacent wetlands just downgradient from Magna Metals site.



MAGNA METALS
PHOTOGRAPHIC RECORD
WETLAND ASSESSMENT

CLIENT: EPA	**SITE LOCATION:** 510 Furnace Dock Road Cortlandt, Westchester County, NY
SITE NAME: MAGNA METALS	

DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 3 - Impounded reach of Furnace Brook tributary. View is looking upstream from Cross Road



DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 4 - View looking downstream along Furnace Brook tributary from just south of Thrush Way. Wetlands are present on the west bank and absent on east bank



MAGNA METALS
PHOTOGRAPHIC RECORD
WETLAND ASSESSMENT

CLIENT: EPA	**SITE LOCATION:** 510 Furnace Dock Road Cortlandt, Westchester County, NY
SITE NAME: MAGNA METALS	

DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 5. Typical reach of Furnace Brook tributary where wetlands are absent along both banks



DATE: 4/18/2018

PHOTO DESCRIPTION:

Photo 6 - Furnace Brook tributary from just north of Maple Avenue depicting forested wetlands along both banks



MAGNA METALS
PHOTOGRAPHIC RECORD
WETLAND ASSESSMENT

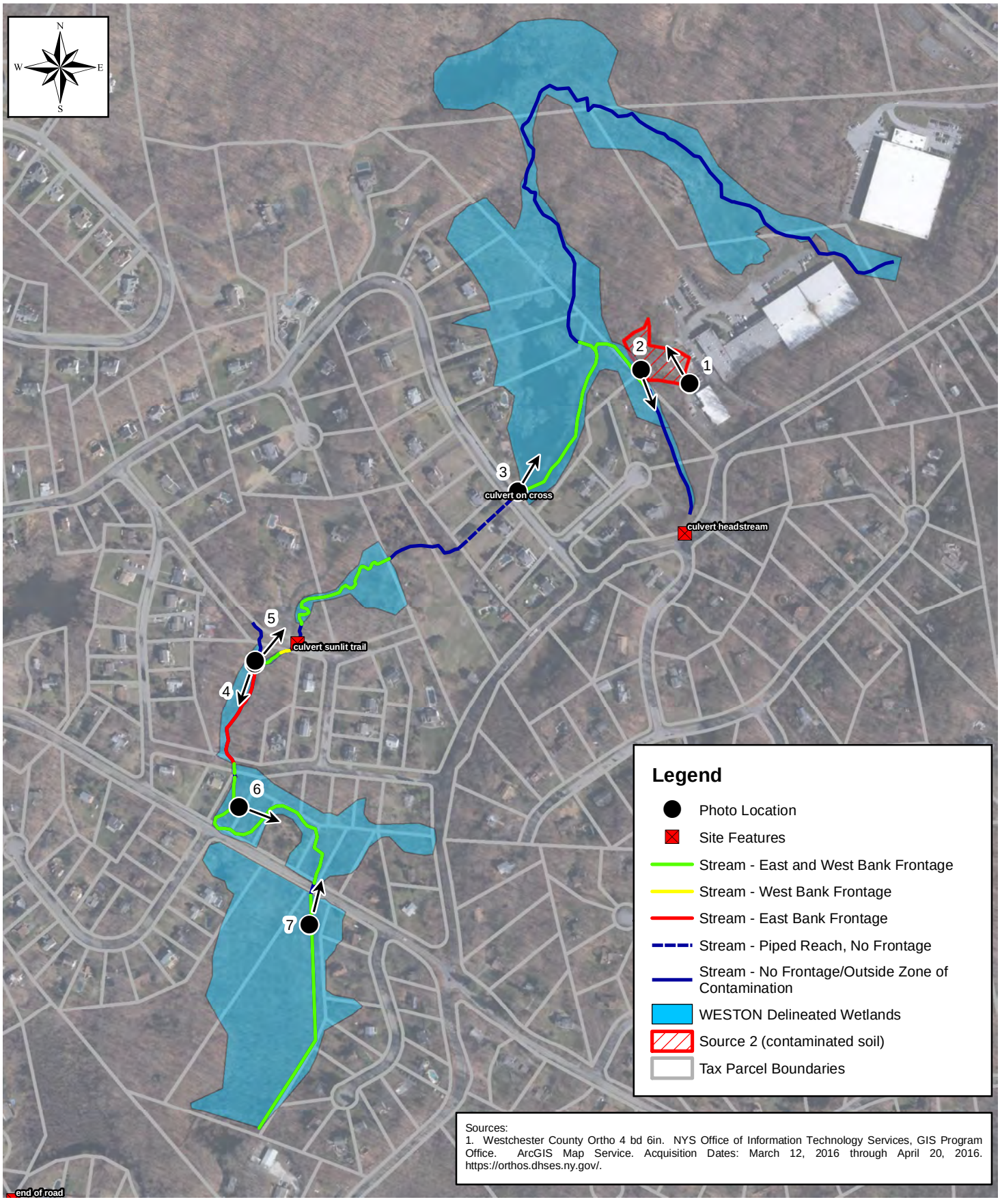
CLIENT: EPA	**SITE LOCATION:** 510 Furnace Dock Road Cortlandt, Westchester County, NY
SITE NAME: MAGNA METALS	

DATE:
4/18/2018

PHOTO DESCRIPTION:

Photo 7 - View looking upstream along Furnace Brook tributary from just downstream of Maple Avenue. Forested wetlands are present along both banks.





SCALE:

520 260 0 520

Scale in Feet

TITLE:

Photograph Location Map
Magna Metals
510 Furnace Dock Rd, Cortlandt, NY

PROJECT: Magna Metals

CLIENT NAME: EPA

DATE: May 2018

FIGURE #: 1

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postscripts

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index

See the complete **Postscripts Table of Contents** by clicking HERE .

Wednesday, May 12, 2010

Of Ponds and Lakes: A Catalog of Water Resources

GAZETTEER

Look at a map of Westchester County, and you'll surely be surprised at the number of ponds and lakes dotting the landscape. Many of these are mute evidence of early industrial technology. Almost from the beginning of settlement, mills sprang up along swift-flowing streams. Gristmills used waterpower to turn their massive grindstones to produce flour. Sawmills cut lumber to meet the housing needs of a population swelled by immigration. Because stream flow could be erratic in dry spells, mill owners built small dams called millponds to assure a constant supply of water. A few ponds were created to supply communities with drinking water or merely for esthetic purposes.

In winter, workers temporarily unemployed in such seasonal industries as brickmaking and farming harvested giant blocks of ice from ponds. Winter-cut ice was stored in giant, well-insulated icehouses for use in the warmer months to come. No longer used as sources of waterpower or ice, these same bodies of water still dot the landscape, offering recreational opportunities for humans and refuges for wildlife, particularly migrating birds. What follows is list of the ponds and lakes, many of which represent links with our past. Where possible, information is given on the derivation of names. Reservoirs are also included. Call it an informal inventory of this area's freshwater resources:

Aschman Pond (Cortlandt), northwest of Mt. Airy Road and southeast of Torment Hill, was named for Charles G. Aschman, owner of the land on which it is located.
Bakwin Pond (New Castle). A tiny pond located north of Croton Dam Road and south of Teatown Lake on land once owned by Morris Bakwin.

Barker Pond (Cortlandt), south of Teatown Road and east of Quaker Ridge Road, is named for Louis Barker, in 1930 the owner of 102 acres of land that included this pond.
Beech Hill Pond (Mt. Pleasant) is north of Route 117 and west of Beech Hill Road; the pond is south of Beech Hill.
Beekman Pond (Mt. Pleasant) was originally dammed by Loyalist Frederick Philipse, who fled to England during the Revolution. Gerard G. Beekman bought the Philipse Manor house from the Commissioners of Forfeiture in 1785. In 1835 his widow had the Philipse estate surveyed and sold off lots to form the nucleus of a community named Beekmantown. The coming of the Hudson River Railroad in 1849 caused Beekmantown to grow. It was known by this name until 1874, when it was incorporated as North Tarrytown. In 1996, North Tarrytown became Sleepy Hollow. The pond is now in Kingsland Point Park.
Broccy Creek Reservoir (Cortlandt) is on the Camp Smith Military reservation. The name comes from an early English word for badger. Broccy Creek runs west from the reservoir to empty into the Hudson.
Brown's Pond (Mt. Pleasant) originally served Bird's Mill on the Saw Mill River. Jackson Brown bought it in 1876. The mill and the pond disappeared in the march of progress with the construction of former Hawthorne traffic circle, which itself has disappeared.
Campfield Reservoir (Peekskill) lies east of Division Street. It was built in 1875 on the site of a Revolutionary War campground.
Campfire Lake (New Castle) takes its name from the Camp Fire Club, which bought the land during the First World War and created the lake.
Cedar Pond and Cedar Swamp. In a 1732 map of Cortlandt Manor, these names were applied to what is now Mohansic Lake. The original name survives in Cedar Point, a promontory jutting into the lake from the south shore.
Cockrene Pond (Yorktown) is located near the southeast corner of the town, south of Crow Hill Road. It takes its slightly altered name from G.A. Cochrane, who built a horseracing track around the pond before 1914.
Colabaugh Pond (Cortlandt) lies east of Colabaugh Pond Road and Mount Airy Road East. The origin of the name is unknown, but it may be Dutch. It appears on maps over the years with a dozen different spellings. Local historian Richard Lederer found the earliest usage (as Callberg) on a 1751 map. Collabaugh [sic] Landing was Croton Landing's name in the early 1800s.
Cortlandt Lake (Cortlandt) is on Sprout Brook on the Westchester-Putnam County line.
Crom Pond (Yorktown) is the name applied to the small lake west of the intersection of Crompond and Baldwin roads.

Mohansic Lake is the name of the larger lake. Originally, they were a single body of water called Crom Pond (Dutch for "crooked lake," because of its shape).

Dickerson Pond (Cortlandt) lies between Furnace Dock Road and Croton Avenue, on land formerly owned by the Valeria Home. It is also called Travis Pond. The origin of the Dickerson name is unknown; a Dickerson Mountain is nearby.

Dickiebusch Lake (Cortlandt), formed by damming Putnam Brook, is in the Camp Smith military reservation. The name is derived from the name of Jacobus DeKey, who purchased land here from the Indians in 1685. In the same year, two other DeKeys, Thouris and Samuel, were among the six purchasers from the Indians of Rycke's patent for the land on which Peekskill stands. The DeKey family name also survives in Dickey Brook, which forms the southern boundary of Peekskill.

Diegel's Pond is the former name of Playhouse Pond. The origin of the name is unknown.

Dixon Lake (Mt. Pleasant), north of Pleasantville Road and west of Hardscrabble Road, was created in 1930.

Dream Lake. There are two Dream Lakes. The one in Cortlandt was originally called Aschman Pond. In 1952, Leo Bodner bought the land from Charles Aschman and changed its name to Dream Lake. Major Edward Bowes, famous for his radio program that afforded opportunities for aspiring amateur entertainers to become professionals, built the other Dream Lake, in Yorktown. It lies south of the Croton Reservoir and west of Illington Road, on land later owned by the Wiltwyck School for Boys, which closed in 1981. Mrs. Bowes, an actress, used the stage name Margaret Illington.

Duck Pond (Croton-on-Hudson) is at the corner of Bungalow Road and South Riverside Avenue (Route 9A). Spring-fed, it is shown on old maps as Spring Lake and was a dependable source of ice. Originally much larger, the pond extended to the north toward the intersection of Radnor Avenue and Ridge Road in the area now occupied by a parking lot, playing field and a children's park. In those days, people came to the spring at the head of Bungalow Road to fill jugs and bottles with the clear water.

Echo Lake (New Castle) was the site of the Lawrence & Vail Rockdale Mills and was formed by damming the Pocantico River. It is located west of the Taconic State Parkway and south of Somerstown Pike (Route 133) and is now part of Echo Lake State Park.

Ferguson's Lake (Mt. Pleasant). A tripartite lake named for George Ferguson, who had four large icehouses on the lake west of the Pocantico Hills Central School.

Fish Pond was an early name for the present Beech Hill Pond. The origin of the name seems obvious.

Fremont Pond (Mt. Pleasant) is named for General John C. Fremont. Explorer, soldier, U.S. Senator, Governor and

unsuccessful Republican presidential candidate, he retired to a 95-acre estate south of the present Phelps Memorial Hospital. He is buried in Rockland Cemetery.

Furnace Brook Pond (Cortlandt) is fed by Furnace Brook (formerly called Jamawissa Creek and the Old Mill Stream), which is fed by water from Dickerson Pond. Furnace Brook continues through Furnace Brook Pond and empties into the Hudson south of Oscawanna Island. The "furnace" of the name was the Cortlandt Furnace, built before 1750. Because of its proximity to the river, ore from mines in what is now Harriman State Park was transported across the Hudson and smelted at the furnace. Costs turned out to be prohibitive, and the furnace went bankrupt by 1764. In its place a gristmill was built to take advantage of the available waterpower. When the New York Central acquired Odell's lands and used the pond to supply water to its locomotives, it was also called Railroad Pond.

Gate of Heaven Pond (Mt. Pleasant) is on the grounds of Gate of Heaven cemetery.

Glendale Lake (Cortlandt) took its name around the end of the nineteenth century from Glendale Lakes Estate, Inc., which owned 55 acres east of Quaker Ridge Road and north of Ganung's Hill.

Great Pond was the name of Mohansic Lake until the mid-1800s.

Gregory Pond (Cortlandt) was formerly called McGregory Pond. This pond and McGregory Brook take their name from Hugh McGregory (or MacGregorie), who was granted a royal patent in 1691. McGregory Brook forms near the Cortlandt-Yorktown line before flowing through Gregory Pond, then into Peekskill and to the Hudson via a culvert at Main Street.

Griffin's Ice Pond (Peekskill), south of the Bear Mountain State Parkway and east of the Rolling Way, takes its name from local farmer Abraham N. Griffin, who bought the land in 1881. It was later owned by the Peekskill Ice Company.

Hardscrabble Lake (Mt. Pleasant) west of Hardscrabble Road was created in 1935.

Heaptauqua Lake (New Castle) was created and named in 1902 by Victor Guinzburg. Despite its Indian-sounding name, it was intended as a joke. The front part of the name, heaptal, came from friends' frequent joshing comments about the project ("heap talk") and the ending, qua, from Chappaqua.

Hemingway's Lake (Mt. Pleasant) was created by a man named Hemingway, a superintendent on the estate of John D. Rockefeller, Jr. It is the southernmost of the five lakes to the southeast of the Pocantico Hills Central School.

Hollow Lake. A former name of Mohegan Lake.

Indian Brook Reservoir, on the New Castle town line north of Route 9A, includes parts of three towns: Ossining, New Castle and Yorktown. Indian Brook forms below Teatown Lake and

flows into the Croton River at Crotonville. The Sing Sing Water Works dammed the brook in 1888.

Journey's End Lake (Cortlandt) lies at the end of Journey's End Road. Broadway and Hollywood actor Holbrook Blinn had a country estate of that name near here. He died June 24, 1928, from an infection caused by a fall from his horse.

Junior Lake (Yorktown), a tiny pond north of Lakeside Street, was created by someone named Halon in 1927.

Kensico Reservoir. When New York City's Board of Water Supply dammed the Bronx River with an earthen dam in 1885 it created the first Kensico Reservoir, a 230-acre affair. In 1917, a new cut-stone higher dam was built near the site of the first dam, creating an even larger reservoir that incorporated the Big and Little Rye lakes.

Kinderogen Lake (Mt. Pleasant) is owned by the Girl Scouts' Camp Edith Macy. The name is reputed to come from the Dutch kinder augen, children's eyes.

Leith Pond. The town of Mt. Pleasant created a park and a pond by dredging a swamp on land formerly owned by Carolyn C. Leith, lying west of Rolling Hills Road and south of Charlotte Place.

Lodge Pool (Briarcliff Manor), a huge outdoor pool, was a feature of the Briarcliff Lodge, which was destroyed in a spectacular fire Sept. 20, 2003. In 1924, Johnny Weismuller trained here for the Olympics held at Paris, France, where he won three gold medals (in the 100- and 400-meter freestyle races and as a member of the victorious 4 x 200-meter relay team.

Lounsbury Pond (Cortlandt) was created when the Lounsbury family dammed Dicky Brook to create an ice pond. The first Lounsbury in the area was a tenant farmer in Van Cortlandt Manor who later bought his farm. The pond is now in the Blue Mountain Reservation.

Macy Pond (Briarcliff Manor) takes its name from owner V. Everitt Macy. From 1914 to 1924 he was Westchester's Commissioner of Public Welfare. He was also president of the County Park Commission. His son, J. Noel Macy, created the Macy newspaper chain.

Meahagh Lake (Cortlandt). The name is from an Indian word meaning "small island," and was used in the deed when the Indians sold what was later called Verplanck Point to Stephanus Van Cortlandt in 1683. In 1872, a swamp along the eastern side of Verplanck Point was dammed to create the lake.

Melvin Pond now lies under Dale Cemetery in Ossining. Thomas Melvin cut ice in this pond before the cemetery association bought it and filled it in.

Miller Pond (New Castle) was not named for an unknown miller but for the owner, J.A. Miller, who owned the land south of Teatown Lake and north of Croton Dam Road.

Mill Pond (Yorktown). A mill once operated here where Hunter

Brook was dammed just north of White Hill Road. Mill Pond Road leads to the pond from Crompond Road. The millstones can be seen now at the Davenport House in Yorktown Heights.
Mirror Lake is a name used on an early land records map for what is now Vernay Lake.
Mitchell Lake (Peekskill) is in Depew Park. Mitchell was Chauncey M. Depew's mother's name and his middle name.
Mohansic Lake (Yorktown) is in Franklin D. Roosevelt State Park, formerly named Mohansic State Park. Once known as Cedar Pond, the pond is shown on a 1732 map as Crom Pond. Mohansic Brook, also known as Hallock's Mill Brook, drains the lake into the Muscoot River.
Mohegan Lake (Cortlandt) takes its name from the Indian tribe that inhabited the area. Although the names are sometimes used interchangeably, the Mohegans should to be confused with the fierce Mohicans of the upper Hudson Valley. Mohegan Lake drains into Peekskill Hollow Brook. Judge Enu Brown employed from 30 to 40 men to cut ice here during the winter.
Munson Pond (Mt. Pleasant). Frank Munson once owned 108 acres north of Bear Ridge Road at the present Munson Road.
Muscoot Reservoir is an arm of the New Croton Reservoir created after 1906 by the construction of the New Croton Dam (to use their official names).
Naumburg Pond (Cortlandt) lies southeast of the intersection of Quaker Ridge and Blinn roads, and is named for George W. Naumburg, an investment banker who owned land here.
New Croton Reservoir. The original Croton Dam was constructed near the Gate House Bridge in 1842 and traces of it can be seen at times of low water in the reservoir. With the enormous population growth of New York City, this dam soon became inadequate. It was replaced by the New Croton Dam, work on which was started in 1892 and completed almost fifteen years later. Until it was officially named, the dam was informally called the Cornell Dam, from Aaron Cornell, who owned the land on which the New York City Board of Water Supply built it.
Odell's Pond (Cortlandt) was an early name for Furnace Brook Pond. Benjamin Odell operated a gristmill here in the nineteenth century.
Oneonme Lake (New Castle). In 1913, when the dam creating a second New Castle Water Company lake came in over budget, Victor Guinzburg admitted that he had goofed by waggishly naming it Oneonme ("one on me") Lake.
Oppermann's Ice Pond (Mt. Pleasant) takes its name from J.H. Oppermann, who cut ice in the pond south of Carrigan and Franklin avenues.
Osceola Lake (Yorktown) lies north of Route 6. In the past it has been variously called Round Lake and Hollow Lake (both names were also applied to Mohegan Lake) and Jefferson Lake. It took its present name in the early 1900s from the Hotel Osceola. The

hamlet to the east was developed in 1923 as Osceola Heights. The name Osceola is not of local origin but memorialized the Seminole Indian chief in Florida who refused to resettle his tribe west of the Mississippi. This touched off the Second Seminole War (1835-1843) that ended with Osceola's capture while negotiating under a flag of truce.

Ossining Reservoir, also called the Pleasantville Road Reservoir, is south of Pleasantville Road between Orchard and Old Briarcliff roads. It is no longer used as a reservoir and has been supplanted by storage tanks. The area around the former reservoir has been improved and made into an inviting park.

Penelope Lake (Peekskill), a dammed portion of McGregory Brook, lies between East Park and Main streets in Tompkins Park. Its name is pronounced "penny-lope" by local residents.

Peterson's Pond (Cortlandt). Created by the New York Central Railroad, it took its name from one L. Peterson, who operated a tree nursery near Washington Street and Montrose Station Road. The railroad constructed a dam to collect water, which was then led through underground pipes to the tracks north of Montrose station. Instead of stopping to take on water, express trains would "jerk water" by scooping it from troughs installed between the rails. Towns where trains seldom stopped but which provided water for locomotive boilers on the fly were referred to as "jerkwater towns."

Phillips Pond was a former name of Furnace Brook Lake.

Playhouse Pond (Mt. Pleasant) is the name given to the pond south of Bedford Road, near the Rockefeller "Play House."

Pocantico Lake (Mt. Pleasant). Like Echo Lake, this is another lake formed by damming the Pocantico River. Pocantico is an Indian word used in the 1681 deed to Frederick Philipse. It means a stream between two hills."

Purdy Pond (Ossining) lies west of Croton Dam Road (Route 134) just south of the New Castle line.

Railroad Pond was another name for Peterson's Pond and Furnace Brook Pond in Cortlandt.

Rockhill Pond (Ossining) is a tiny pond at the base of Rocky Hill, north of Spring Valley Road, immediately south of the New Castle town line.

Round Lake. The name of Mohegan Lake in Yorktown on a 1779 map.

School House Pond (Mt. Pleasant) lies to the east of the Pocantico Hills Central School.

Shadow Lake (Yorktown) is northwest of Croton Dam Road (Route 134) and east of Vernay Lake.

Shrub Oak Pond (Yorktown) is located north of Route 6 between the park and Mill Street. A sawmill off Mill Street cut lumber here for many years.

Silver Lake (Croton-on-Hudson) is the name given to the park and swimming area created by a small dam in the Croton River

below Truesdale Drive.

Sparkle Lake (Yorktown), an elongated pond lying west of Granite Springs Road. Around 1927, Frederick Merk, a nurseryman, dammed a spring-fed brook. It took its name from the lake's clear and sparkling water.

Spring Lake was the original name for the Duck Pond, a spring-fed lake at the intersection of Bungalow Road and South Riverside Avenue (Route 9A) in Croton-on-Hudson.

Spy Pond (Cortlandt) is north of Gallows Hill, where British spy Edmund Palmer, a lieutenant in a loyalist regiment, was hanged Aug. 7, 1777, by order of General Israel Putnam.

Still Lake (New Castle) lies west of the Taconic State Parkway and north of Pines Bridge Road. Not a descriptive name; George W. Still owned land here.

Swan Lake (Mt. Pleasant) lies west of André Lane, just south of the Ossining town line. Mrs. John D. Rockefeller, Jr., had Trout Brook, a tributary of the Pocantico River, dammed here to create a bird sanctuary. The name Swan Lake has also been applied to the large lake to the south of Route 117 in Rockefeller State Park.

Swope Lake (Yorktown) was named for Gerard Swope, former president of General Electric. It is today called Vernay Lake.

Teatown Lake (Yorktown) in the Teatown Lake Reservation lies to the west of Vernay Lake along Spring Valley Road. Gerard Swope built it.

Tercia Pond (New Castle). After creating two lakes with humorous names (see Heaptauqua and Oneome), Victor Guinzburg's New Castle Water Company added still another lake. Called Tercia Pond, the name is a bastardization of tertia, Latin for third.

Travis Pond is another name of Dickerson Pond in Cortlandt. The name came from Frederick Travis, who owned 330 acres here, 60 acres of which are this pond.

Twin Lakes (Cortlandt) are located south of Maple Avenue and west of Croton Avenue.

Vernay Lake (Yorktown) is located south of the intersection of Blinn Road with Spring Valley Road. It had been formerly called Mirror Lake and Swope Lake. Phil E. Gilbert bought the land from Gerard Swope in 1967 and renamed the lake for Arthur Vernay, who built a house there in 1914.

Wallace Pond (Cortlandt) took its name from Thomas Wallace, operator of a wire mill here. The Wallace Pond Ice Company owned the pond in Annsville Creek west of Route 9 in the early 1900s. A square icehouse measuring 150 feet on a side was located below the outlet of the pond. It had double wall, with 4-by-12-inch studs and measured 37 feet from sill to plate. The one-foot void between the walls was filled with sawdust for insulation. Pond ice was cut by hand and moved through the water by workers with iron-tipped pikes to a continuous chain conveyor that would lift it into the icehouse. One of the biggest

users of its ice was Peekskill's Van Cortlandt Dairy. Wallace Pond is now called Westchester Lake.
Whippoorwill Lake (New Castle). Created by the New Castle Water Company's damming of **Whippoorwill Brook,** it lies between King Street and Frog Rock Road. The name of the brook dates from Colonial times.

Labels: Gazetteer, Lakes and Ponds

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Town of Cortlandt
WINTER/SPRING 2018 - Recreation Program Brochure

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6th ANNUAL EGG HUNT AT THE YOUTH CENTER - SATURDAY, MARCH 24th (RAIN DATE – SUNDAY, MARCH 31ST)

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TOWN OF CORTLANDT DEPARTMENT OF RECREATION & CONSERVATION

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The Town of Cortlandt gratefully acknowledges the cooperation extended by the Hendrick Hudson School District, Lakeland Central School District, Bethel Springvale Inn, Village of Buchanan, Village of Croton-on-Hudson, Cortlandt Town Center and to all other groups regarding the use of their facilities and to our business community for supporting our programs and teams.



Dear Cortlandt Residents,

Over the years we completed many recreation projects with more to come in 2018:

1. Softball fields with lights at Sprout Brook Park.
2. An outdoor pavilion at Sprout Brook Park that has a capacity of 200 people.
3. A playground at Sprout Brook Park which is open year round.
4. Expansion of our Muriel H. Morabito Community Center which is off West Brook Drive.
5. A playground at the Community Center which is handicapped accessible.
6. The Christopher Bisordi Memorial Outdoor Basketball Court at the Community Center.
7. Outdoor Bocce Courts and a Horseshoe Facility at the Community Center.
8. Renovation of Charles Cook Pool including a new concrete surface, drainage system, filtration system, bathhouse upgrades, a new playground and "frog slide", landscaping and other amenities. (A 2 million dollar project) and renovation of the swimming lanes was completed in 2006.
9. The Steven Hebert Memorial Skate Park at the Community Center which is off of West Brook Drive.
10. A Roller Hockey Rink adjacent to the New York State Police Headquarters. (Off Route 9A) with lights and a playground.
11. Completion of the Historic Tollhouse for a regional information tourist center. Open on weekends May through October.
12. Community space use (4,000 sq. ft.) at the Cortlandt Town Center is available for rental (Contact our Recreation Department).
13. Steamboat Dock River Park and Overlook in Verplanck are restored and with construction of an outdoor pavilion and a pedestrian trail. We also have plans for the next phases of Broadway Streetscape and new plans for Meahagh Park.
14. The Hudson Highlands Gateway Park (Hill point property) is designed for passive recreation (Trails) off Sprout Brook Road. (352 acres of passive land).
15. Many beautification projects throughout the town. (Flowerbeds, gazebos, plantings and our Veterans Parks)
16. C.U.E. (Cortlandt Upper Teens Entertainment Center) open for all freshman, sophomores, juniors and seniors on Friday and Saturday nights and is supervised by qualified adults.
17. Completed the Oscawana Boat/ Kayak Launch.
18. A playground, tennis courts and basketball court was built off of Croton Avenue.
19. A little league field and a soccer/all-purpose field both at Sprout Brook Park opened in 2008.
20. Construction of a Cortlandt Dog ("Pooch") Park at Sprout Brook Park. Grand Opening took place on November 2, 2008.
21. A Computer Center at the Senior Citizen Center.
22. Renovation of the Town Hall Courtyard and entranceway (New lights, benches, bricks, doors, flowers, new steps etc.)
23. A playground at the Roller Hockey Rink off Memorial Drive in memory of Peter Cutignola.
24. An annual Cortlandt event – "Cortlandt Family Fun Day" (Off Route 9A by the State Police and Roller Hockey Rink).
25. Renovation of the swimming lanes at Cook Pool.
26. Annual Golf Outing to benefit our first responders at the Hollowbrook Golf Course each year.
27. A youth and recreation multi-purpose facility opened in 2009 for ages 11 to 18. It is fully supervised.
28. Cortlandt sponsors the D.A.R.E. programs and the Cortlandt Coalition to educate our youth about substance abuse and awareness prevention.
29. Quadricentennial projects were completed in 2009 to honor Henry Hudson's discovery of the Hudson River including a time capsule at Town Hall.
30. Saved Furnace Dock Lake and the watershed area. It is now owned by the TOC for passive parkland.
31. At the former Martin Property now owned by the Town: a boat launch for the community, an aviation theme playground, benches by the Hudson River.
32. A Veteran's Park at Steamboat Dock dedicated July 20, 2012.
33. Completed a new half-court basketball court in northern Cortlandt June 2012.
34. The public boat launch at Cortlandt Waterfront Park was dedicated in the spring of 2013.
35. Annual 5K Run in October.
36. Held our Town of Cortlandt 225th Anniversary Party at George's Island in 2013.
37. A Purple Heart Memorial dedicated at Cortlandt Town Hall.
38. Support of the Cortlandt Community Rowing Association (Go to website for more information).
39. Started a free outdoor Concert and Movie Series at Cortlandt Waterfront Park in Verplanck.
40. Our Community Garden continues this summer at Meahagh Park.
41. Opened our new water spray park in 2016.
42. Dedicated a new lacrosse field/all-purpose field at Sprout Park in 2016
43. Dedicated new hiking trails at golf course in 2016.
44. Will plan for more fields and walking paths at land purchased from Con Ed in June 2016.
45. Dedicated a Vietnam Memorial at Town Hall in June of 2017.
46. Planning for a new bath house, snack bar and minature golf at the Town Pool.

All have been completed without raising Town taxes (on average for 27 years) many other projects are being considered and planned. If you have any suggestions for recreation projects please write or e-mail my office at:
1 Heady Street, Cortlandt Manor, NY 10567,
lindap@townofcortlandt.com
Thank you,
Linda D. Puglisi
Cortlandt Town Supervisor

Cortlandt Town Board

Linda D. Puglisi, *Town Supervisor*; Richard H. Becker, Debbie A. Costello, James F. Creighton, and Francis X. Farrell

Open Space in Cortlandt Increases

During this administration (1992-2018) open space land has increased and been preserved by 110% approx. (3170 additional acres)

"One of my goals in becoming Town Supervisor was to increase and preserve land for open space. Once the land is gone, its gone forever! We have worked very hard over the years to achieve our goal of acquiring and/or protecting open space as well as to balance this with rational regulated economic growth," states Supervisor Puglisi.

There are other areas throughout our community that we are working on for open space and passive recreation purposes. Putting together partnerships with the Town, State, County, not-for-profit groups and the private sector is a major way of working together with a receptive property owner, to acquire open space. We also have appointed an open space committee to assist us with our goals.

Our largest accomplishment using this practice was the Hillpoint Property in Northern Cortlandt, now called the Hudson Highland Gateway Park-352 acres has been purchased and preserved forever! A committee has worked on passive recreation– a trail and walkway system so we can enjoy the natural beauty and environment of this land.

- Also, an additional 50 acres of open space was added to our open space inventory (Washington Trails Site), and 70 acres at the golf course area are deeded to the Town for open space and 50 acres from Valeria development was recently transferred to the Town.
- Also, an additional 150 from other sites were added to our inventory this year.
- We recently added 52 acres of land and a water body when purchased Furnace Dock Lake after the repair of the dam. The repair of the dam is paid for by Con Edison.
- The purchase of 100 acres along the Hudson River (Formerly owned by Con Edison)

We are very proud of our record and will continue to work on our future open space goals.

Supervisor Linda D. Puglisi
And Town Board

Join us to Volunteer at our Town of Cortlandt Community Garden!



Special Thanks To:
Cortlandt Farm Market, Stuarts Fruit Farm,
Curts Homestead Farm and Floral Design.

- We have a very interested resident of Cortlandt with tremendous knowledge in gardening who has volunteered to coordinate this effort.
- Located Lake Meahagh, Westchester Avenue, Verplanck, NY 10596
- Cortlandt residents and groups (Scouts, Civic organizations, etc.) will take care of their defined areas with the coordinator's guidance.

We are very excited about this project and are looking forward to your participation!



Call 914-734-1050 or
Email TOCREC@townofcortlandt.com

Linda D. Puglisi
Supervisor

CCRA
VERPLANCK, NEW YORK

CORTLANDT COMMUNITY ROWING ASSOCIATION



CREW IN CORTLANDT!

Rowing is a Lifetime Sport — We offer Youth & Adult programs

Cortlandt Community Rowing offers rowing and training opportunities for everyone – students in grades 5th-12th wanting to try a new sport, to adult absolute beginners, through experienced master rowers. Learn to row & get fit!

We row on Lake Meahagh and at Cortlandt Waterfront Park, Verplanck.

LEARN MORE AT
www.CortlandtRowing.com

LIKE US Cortlandt Rowing





6th ANNUAL EGG HUNT

Come meet and take pictures with the Easter Bunny at our Sixth Annual Easter Egg Hunt! Prizes are available for all participants! Age groups: 2-5 years old and 6 years old and over.

Location: Youth Center, 3 Memorial Dr., Croton
3 Memorial Drive, Croton (Off of Albany Post Road, just before the Cortlandt Train Station)
Date: Saturday, March 24; Rain Date: Saturday, March 31
Time: 1:00 PM, Promptly
Fee: Free

CROSS COUNTRY SKIING AND ICE SKATING

at Blue Mt. Reservation

Enjoy Ice Skating or Cross Country Skiing at Blue Mt. Reservation located at Welcher Avenue in Peekskill. An ideal location for scenic outdoor cross country skiing. Whether you prefer challenging trails through wooded areas of open spaces to traverse. You must provide your own equipment. No rentals are available. Conditions permitting cross country skiing is allowed seven days a week during daylight hours.

Blue Mt Reservation is an ideal location for scenic outdoor skating. As with skiing you must bring your own skates. No rentals available. Ice is checked daily at all locations for safety and conditions. Look for sign posting safe conditions, ice skating is permitted seven days a week during daylight hours. For your own safety always check conditions before heading out to the park. For more information call (914) 864-Park for ice conditions. Free admission and free parking.

ICE SKATING CLUB

Any residents interested in joining an Ice Skating Club or looking into Ice Skating activities with a club please go to the following web site www.hessianlakefsc.com or e-mail members@hessianlakefsc.com

HUDSON RIVER EAGLEFEST

Watch in awe as wintering bald eagles fly overhead at Teatown's Hudson River Eaglefest. Don't miss this opportunity to view our national symbol up-close and learn how conservation efforts have brought about the now vibrant bald eagle population in the Hudson Valley. At Steamboat Dock River Park, guests can enjoy eagle viewing staffed by eagle experts with spotting scopes. Just a quick trip away at Croton Point Park, attendees can also enjoy live raptor shows, bus tours, storytelling, children's activities and bird walk.

Call Lesley Popkin at 914-734-1057 or visit www.teatown.org/eaglefest for more information.

Location 1: Headquartered at Croton Point Park .Tickets Required and Pre-sale tickets are discounted and on sale now at www.teatown.org/events/eaglefest/
Location 2: Steamboat Dock River Park for FREE viewing - No tickets required
Date: Saturday, February 10
(snow date Sunday, February 11)
Time: 9:00 AM – 4:00 PM
Fee: Please contact Teatown Lake Reservation for 2018 Rates— (914)762-2912

* Note: Bus tours sell out quickly & reservations are required.



FURNACE DOCK LAKE



The Town of Cortlandt acquired and saved the 100 year old Furnace Dock Lake in 2011. It is now part of the Town's parkland and inventory.

Furnace Dock Lake Rules and Regulations
For a safe and enjoyable park experience please obey the following rules:
- All activities at your own risk
- Park is open dawn to dusk
- Keep pets leashed, clean up after them as well
- All garbage is to be taken out of the park
- Do not remove or destroy plants, wildlife, or artifacts

The following is prohibited :
- Hunting, firearms, alcohol, and camping
- Motorized vehicles and mountain bikes
- Fires, smoking, swimming, and dumping
- Feeding wildlife, metal detectors, and radios
- Fireworks, music, and loud noise



HOLLOW BROOK TRAIL

Hollow Brook Trail was dedicated on October 20, 2016 the trail is part of 70 acres that was given to the Town several years ago. The trail was completed in august and is approximately 3 quarters of a mile long. The entrance to the trail is located at the bottom of Anton Place, in Lake Peekskill, Town of Cortlandt. The trail is adjacent to the Hollow Brook golf course.





HOLLOW BROOK GOLF COURSE



For Cortlandt Residents

Public Access to the Hollow Brook Golf Course (off Oregon Road)

The Hollow Brook Golf Club is a private/public course with Town residents being able to reserve tee-times. The course will open in April 2018 (weather permitting). The Town coordinates those rounds reserved for the exclusive use of Town residents (Agreement on file), Tuesday thru Sunday for public use. On Tuesday and Thursday, 7 of the tee times are discounted at $75 after 2:00 PM, Greens fees will be a total $100 for all other tee times Tuesday, Wednesday and Thursday. On Fridays, Saturdays, Sundays and Holidays greens fees will be $150 with no tee times before noon. Prices include greens fees and a cart. Range balls (only available when playing) for $10. Reservations can be made five days in advance by calling 914- 734-1500.

For the 2018 golf season residents will need to purchase a golf sticker in the recreation department of Town Hall, 1 Heady Street, Cortlandt Manor, N.Y. for a fee of $12 for the 2018 Golf season. This sticker will be placed on the Town of Cortlandt resident I.D. card. If you do not currently have a VALID Town of Cortlandt I.D. Card, one can be purchased for an additional $7 at the days and times listed under "Important Information" in this brochure. For further information regarding ID's or mail in procedure for the golf sticker please call 734-1050 or 734-1054. For further information regarding Hollow Brook please call 734-1058.

To reserve tee times residents will need to call the Hollow Brook Golf Course – 914-734-1500

2018 Golf Sticker Fee: $12 with a valid Town of Cortlandt ID Card (plus an additional $7 if a Town of Cortlandt ID is needed)

Rules for Town of Cortlandt Players

1. Tee Times can be made by phone only.
2. Tee Times can be made five (5) days in advance, after 10:00 a.m. i.e. Friday for Tuesday, Saturday for Wednesday, Sunday for Thursday, Monday for Friday, Wednesday for Saturday and Sunday.
3. Residents must have golf shoes with soft spikes, collared shirts, golf pants or Bermuda shorts – NO JEANS, CUTOFFS, SHORT SHORTS, and CARGO PANTS OR SHORTS.
4. Residents may bring one guest at town fees.
5. Residents can only make reservations for themselves and their guest and not another town resident.
6. Residents must show their Town of Cortlandt resident card with a golf sticker.
7. Residents cannot use the driving range or practice areas unless they are playing golf.
8. Additional fees will be charged for food and beverage.
9. Additional fees will be charged for the driving range - $10.00
10. Residents will not be allowed on the tee before their Tee Time and do not have access to the Club House.

Oscawana Boat Launch

Oscawana boat launch is located on Cortlandt Street in Crugers.
A launching area for kayak's and canoes; hiking trails that lead out to the Hudson River.
It was dedicated on October 4, 2004 by Cortlandt Town Supervisor and the Town Board.





The Toll House is located on Bear Mt. Road, Cortlandt Manor, NY
Toll House was dedicated on September 22, 2002
and is a visitor center with information about the Hudson Valley.
It is opened seasonally from May to November.

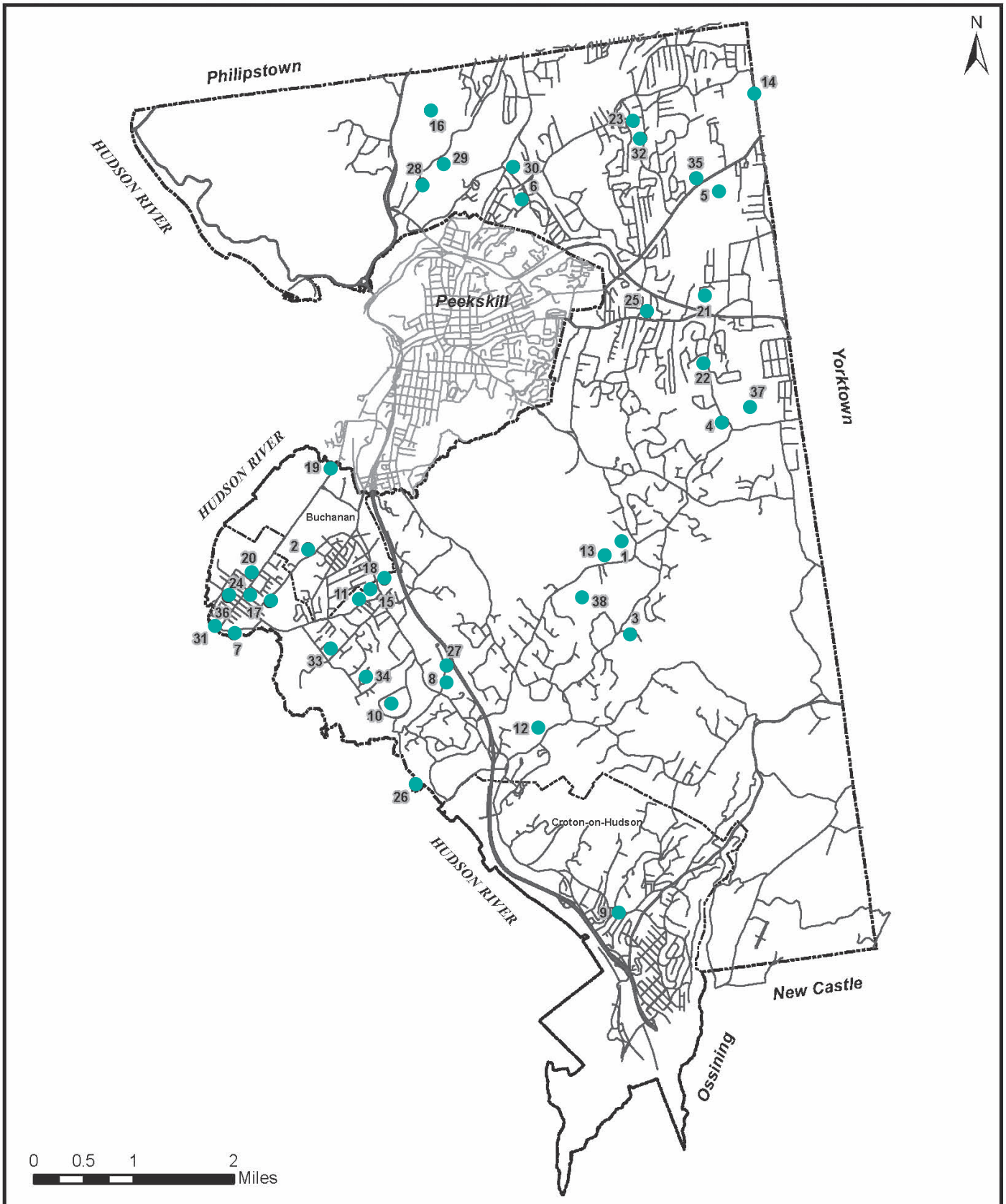




FACILITIES USED BY THE PRC

LOCATION GUIDE

	Ball Fields	Basketball Courts	Boat Launch	Cooking Grills	Dog Park	Horseshoe Pits	Meeting Rooms	Nature Trails	Picnic Area	Playground	Pool - Outdoor Summer	Rest Rooms	Rifle Range	Rock Climbing Wall	Roller Blading	Sr. Citizen Center	Tennis Courts	C.C. Rowing Assoc.
1. BLUE MOUNTAIN MIDDLE SCHOOL	•	•					•					•						
2. BUCHANAN VERPLANCK ELEMENTARY SCHOOL	•	•					•			•		•						
3. CHARLES J. COOK RECREATION CENTER & SPRAY PARK	•	•		•				•	•	•	•						•	
4. CORTLANDT COMMUNITY RECREATION AREA		•								•							•	
5. CORTLANDT TOWN CENTER COMMUNITY ROOM (C.U.E.)							•		•			•						
6. CORTLANDT TOWN HALL	•						•					•						
7. CORTLANDT WATERFRONT PARK			•							•								
8. CORTLANDT YOUTH AND RECREATION CENTER		•					•		•	•		•		•				
9. CROTON MUNICIPAL BUILDING							•						•					
10. F.D.R. VA HOSPITAL																		
11. FRANK G. LINDSEY ELEMENTARY SCHOOL	•	•					•			•		•						
12. FURNACE DOCK LAKE								•										
13. FURNACE WOODS ELEMENTARY SCHOOL	•	•					•			•		•						
14. GEORGE WASHINGTON ELEMENTARY SCHOOL	•	•					•			•		•						
15. HENDRICK HUDSON HIGH SCHOOL	•	•					•					•						
16. HUDSON HIGHLANDS GATEWAY PARK									•									
17. LAKE MEAHAGH PARK																		•
18. LAKE STREET TENNIS COURTS																	•	
19. LENTS COVE PARK	•		•					•	•									
20. LETTERI FIELD	•																	
21. LINCOLN TITUS ELEMENTARY SCHOOL	•	•					•			•		•						
22. LYNWOOD GARDENS FIELD	•																	
23. MURIEL H. MORABITO COMMUNITY CENTER		•				•	•			•		•				•		
24. OLD POND PARK										•								
25. OLD TODDVILLE SCHOOL LITTLE LEAGUE FIELD	•																	
26. OSCAWANA ISLAND NATURE PRESERVE								•										
27. ROLLER HOCKEY RINK										•					•			
28. SPROUT BROOK BALL FIELDS MULTI PURPOSE FIELD	•																	
29. SPROUT BROOK PARK	•			•	•	•			•	•		•						
30. ST. COLUMBANUS LITTLE LEAGUE FIELD	•																	
31. STEAM BOAT PARK									•									
32. STEVEN H. HEBERT MEMORIAL SKATE PARK															•			
33. SUNSET PARK AND PLAYGROUND									•	•								
34. TOMMY THURBER PLAYGROUND									•	•								
35. VAN CORTLANDVILLE ELEMENTARY SCHOOL	•	•					•			•		•						
36. VERPLANCK SCHOOLHOUSE COMMUNITY CENTER							•					•				•		
37. WALTER PANAS HIGH SCHOOL	•	•					•					•					•	
38. WESTCHESTER COUNTY SPORTSMAN CENTER												•	•					



RECREATION SITES
Town of Cortlandt, New York

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

New York State Freshwater Fishing Records

As of July 31, 2017

Current State Record Fish

Species	Weight	Length (inches)	Angler	Lure	Water	Date
American Eel	7 lb. 14 oz.	n/a	Larry Manino	Nightcrawler	Cayuga Lake, Seneca Co.	7/25/84
American Shad	9 lb. 4 oz.	28	Robert Kubica	Shad Dart	Hudson River, Albany Co.	5/9/07
Atlantic Salmon	24 lb. 15 oz.	35	Mike Dandino	Bomber Long A	Lake Ontario, Wayne Co.	4/5/97
Black Bullhead	7 lb. 7 oz.	26	Kevin Kelly	Wonder Bread	Mill Pond, Nassau Co.	8/25/93
Black Crappie	3 lb. 12 oz.	17.75	Kenneth Kierst	Jig	Duck Lake, Cayuga Co.	4/17/98
Bluegill	2 lb. 8 oz.	12	Devin VanZandt	Worm	Kohlbach Pond, Broome Co.	8/3/92
Bowfin	12 lb. 14 oz.	34	Mary Forrest	Live Sucker	Lake Champlain, Essex Co.	7/8/06
Brook Trout	6 lb. 0 oz.	22.6	Richard Beauchamp	Lake Clear Wabbler	Silver Lake Wilderness Area, Hamilton Co.	5/16/13
Brown Bullhead	7 lb. 6 oz.	22.2	Glenn Collacuro	Sawbelly	Lake Mahopac, Putnam Co.	8/1/09
Brown Trout	33 lb. 2 oz.	38	Tony Brown	Smithwick Rogue	Lake Ontario, Oswego Co.	6/10/97
Burbot	16 lb. 12 oz.	34.75	Terrance Colwell	Minnow	Lake Ontario (Black River Bay), Jefferson Co.	2/14/91
Chain Pickerel	8 lb. 1 oz.	n/a	John Bosland		Toronto Reservoir, Sullivan Co.	2/13/65
Channel Catfish	35 lb. 3 oz.	38.25	Eric Scordo	Nightcrawler	Lake Ontario, Jefferson County	4/29/17
Chinook Salmon	47 lb. 13 oz.	48	Kurtis Killian	Orange Fly	Salmon River, Oswego Co.	9/7/91
Cisco (Lake Herring)	5 lb. 7 oz.	n/a	Albert Baratto	Tear Drop & Grub	Lake Lauderdale, Washington Co.	1/25/90
Coho Salmon	33 lb. 7 oz.	41.9	Stephen Sheets Jr.	Cut Bait	Lake Ontario, Oswego Co.	8/13/98
Common Carp	50 lb. 6 oz.	44.5	Charles Primeau Sr.	Nightcrawler	Tomhannock Reservoir, Rensselaer Co.	5/12/95
Fallfish		19		Tube Jig		4/15/09

	3 lb. 9 oz.		Jonathan McNamara		Susquehanna River, Tioga Co.	
Freshwater Drum	36 lb. 0 oz.	42.75	Jason Bair	Rapala Jigging Rap	Oneida Lake, Oneida Co.	6/16/17
Hybrid Striped Bass	15 lb. 5 oz.	26.5	Bryan Colley	Sawbelly	Lake Waccabuc, Westchester Co.	7/30/04
Kokanee Salmon	3 lb. 6 oz.	21.5	Kenneth Shear	Wobbler & Worm	Boy Scouts Clear Pond, Franklin Co.	6/14/02
Lake Trout	41 lb. 8 oz.	42.75	Jesse Wykstra	NK Spoon	Lake Erie, Chautauqua Co.	8/9/03
Lake Whitefish	10 lb. 8 oz.	27.87	Randolph Smith	Worm & Spinner	Lake Pleasant, Hamilton Co.	8/29/95
Largemouth Bass	11 lb. 4 oz.	25.5	John Higbie	Spinnerbait	Buckhorn Lake, Otsego Co.	9/11/87
Longnose Gar	13 lb. 3 oz.	49.5	Kenneth Cassant	Sucker	Lake Champlain, Washington Co.	7/25/99
Muskellunge	69 lb. 15 oz.	64.5	Arthur Lawton		St. Lawrence River, Jefferson Co.	9/22/57
Northern Pike	46 lb. 2 oz.	n/a	Peter Dubuc	Heddon Flaptail	Great Sacandaga Lake, Fulton Co.	9/15/40
Pink Salmon	4 lb. 15 oz.	n/a	Randy Nyberg	Johnson Sprite	Lake Erie, Chautauqua Co.	9/16/85
Pumpkinseed	1 lb. 9 oz.	11.5	R. Kennard Mosher	Nightcrawler	Indian Lake, Hamilton Co.	7/19/94
Rainbow Trout	31 lb. 3 oz.	39	Robert Wilson	Joe's Pirate Crystalina	Lake Ontario, Niagara Co.	8/14/04
Redfin Pickerel	2 lb. 1 oz.	n/a	Duane Gillespie	Do Jigger	Lake Champlain, Essex Co.	3/5/89
Rock Bass	1 lb. 15 oz.	n/a	Eric Avogardo	Live shiner	Ramapo River, Rockland Co.	5/26/84
Sauger	4 lb. 8 oz.	22.19	Darrin Schwenkbeck	Gitzit	Lower Niagara River, Niagara Co.	9/30/90
Shorthead Redhorse	11 lb. 11 oz.	n/a	Joe Williams	Nightcrawler	Salmon River, Oswego Co.	5/26/96
Smallmouth Bass	8 lb. 4 oz.	20.5	Andrew Kartesz Patrick Hildenbrand	Jig & Grub Tail Berkley Powerbait	Lake Erie, Chautauqua Co. St. Lawrence River, Jefferson Co.	6/4/95 8/28/16
Splake	13 lb. 8 oz.	31	Jonathan Simon	Rapala	Limekiln Lake, Herkimer Co.	6/27/04
Striped Bass	60 lb. 0 oz.	53	Eric Lester	Blood Worm	Hudson River, Orange Co.	5/14/14
Tiger Muskellunge	35 lb. 8 oz.	50	Brett Gofgosky	Sucker	Tioughnioga River, Broome Co.	5/25/90
Walleye	16 lb. 9 oz.	34	Thomas Reed	Creek Chub	Mystic Lake, Cattaraugus Co.	1/20/09
White Bass	3 lb. 6 oz.	18.5	Robert Hilton	Rapala	Furnace Brook, Westchester Co.	5/2/92

White Catfish	10 lb. 5 oz.	25.5	Joe Silicato	Jig & Cut Bait	New Croton Reservoir, Westchester Co.	5/17/98
White Crappie	3 lb. 13 oz.	18.5	James Weinberg Richard Otty	Jig Emerald shiner	Sleepy Hollow Lake, Greene Co. Kinderhook Lake, Columbia Co.	6/9/01 1/29/13
White Perch	3 lb. 1 oz.	17.5	Joseph Tansey	Alewife	Lake Oscaletta, Westchester Co.	9/21/91
White Sucker	5 lb. 8 oz.	24	Joshua Wegner	Nightcrawler	Cold Brook, Steuben Co.	4/14/15
Yellow Perch	3 lb. 8 oz.	n/a	George Boice	Minnow	Lake Erie, Erie Co.	4/28/82



Eric Scordo with the 35 lb. 3 oz. channel catfish he caught from Lake Ontario, Jefferson County on April 29, 2017.



Jason Bair with the 36 lb. freshwater drum he caught from Oneida Lake, Oneida County on June 16, 2017.

National Water Information System: Web Interface

Click forNews Bulletins

USGS Surface-Water Annual Statistics for the Nation

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 01372058 HUDSON RIVER BELOW POUGHKEEPSIE NY

Available data for this site: Time-series: Annual statistics | GO

	Output formats
Dutchess County, New York Hydrologic Unit Code 02020008 Latitude 41°39'03", Longitude 73°56'42" NAD27 Drainage area 11,740 square miles	HTML table of all data Tab-separated data Reselect output format

Water Year	72137, Discharge, tidally filtered, cubic feet per second
2004	22,760
2005	18,020
2006	26,230
2010	17,660
2011	27,680
2013	24,210
2014	23,280
2015	21,460
2016	19,120
	Average = 22,269

Water Year	72137, Discharge, tidally filtered, cubic feet per second
** No Incomplete data have been used for statistical calculation	

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U.S. Department of the Interior | U.S. Geological Survey

Title: Surface Water data for USA: USGS Surface-Water Annual Statistics
URL: https://waterdata.usgs.gov/nwis/annual?

Page Contact Information: New York Water Data Support Team
Page Last Modified: 2018-03-01 15:05:07 EST
0.41 0.33 caww01



National Water Information System: Web Interface

Data Category: Current Conditions | Geographic Area: New York | GO

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USGS 01374019 HUDSON RIVER AT SOUTH DOCK AT WEST POINT NY

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site: Time-series: Current/Historical Observations | GO

Click to hide station-specific text

NOTICE (10/01/2015) -- This site was discontinued on October 1, 2015. Although historic data will remain accessible, no new data will be collected unless one or more new funding partners are found. Users who are willing to contribute funding to continue operation of this streamgage should contact Rob Breault or Ward Freeman of the USGS New York Water Science Center at 518-285-5658 or dc_ny@usgs.gov.

This station is operated in cooperation with:
Greeenway Conservancy for the Hudson River Valley

LOCATION.--Lat 41°23'10", long 73°57'20" referenced to North American Datum of 1927, Orange County, NY, Hydrologic Unit 02020008, on right bank at South Dock at West Point. Water-quality sampling site at elevation station.
DRAINAGE AREA.--12,596 mi^2.
PERIOD OF RECORD.--October 1991 to February 2012, June to September 2013. Records for June 1989 to September 1991 are unpublished and available in files of the Geological Survey.
GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929.
REMARKS.--Prior to October 2002 published as maximum, minimum, and mean elevation. Elevations are not corrected for changes in water density. Blanks in tables are the result of only one high or low tide during a day or interruption of record. Satellite and telephone elevation and water-quality telemeter at station.
EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 7.65 ft, Aug. 28, 2011; minimum elevation, -4.26 ft, Mar. 14, 1993.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 29, 2012, reached an elevation of 9.60 ft, from floodmark.
PERIOD OF DAILY RECORD[1].--SPECIFIC CONDUCTANCE: October 1991 to February 2012, June to September 2013. Records for February 1990 to September 1991 are unpublished and available in files of the Geological Survey.

WATER TEMPERATURE: October 1991 to February 2012, June to September 2013. Records for February 1990 to September 1991 are unpublished and available in files of the Geological Survey.
pH: June to September 2013.
DISSOLVED OXYGEN: June to September 2013.
TURBIDITY: June to September 2013.

INSTRUMENTATION[1].--A continuous water-quality monitor with water temperature, specific conductance, pH, dissolved oxygen and turbidity provides 15-minute-interval readings.

EXTREMES FOR PERIOD OF DAILY RECORD[1].--SPECIFIC CONDUCTANCE: Maximum, 12,600 uS/cm, Sept. 23, 1995; minimum, 102 uS/cm, May 30, 1996.
WATER TEMPERATURE: Prior to Oct. 1, 2007--Maximum, 29.0 °C, Aug. 12, 13, 14, 2005; minimum, 0.0 °C on many days during winter periods, except 1998, 2002.
WATER TEMPERATURE: After Oct. 1, 2007--Maximum, 28.2 °C, July 24, 27, 2010; minimum, -0.2 °C on many days during 2009 winter period.

[1] Water-Quality Records

Peak Flow and Stage Information

Link to Hudson River Salt-Front information.

This station managed by the NY Water Science Center Troy.

Available Parameters	Available Period
☐ All 6 Available Parameters for this site	
☑ 00010 Temperature, water	2007-10-01 2014-09-11
☑ 00095 Specific cond at 25C	2007-10-01 2014-09-11
☑ 00300 Dissolved oxygen	2013-06-21 2014-09-11
☑ 00400 pH	2013-06-21 2014-09-11
☑ 62619 Elevation, ocean/est	2007-10-01 2014-09-11
☑ 63680 Turbidity, Form Neph	2013-06-21 2014-09-11

Output format
Graph
Graph w/ stats
Graph w/o stats
Graph w/ (up to 3) parms
Table
Tab-separated

Days (7)

-- or --

Begin date 2018-02-22

End date 2018-03-01

GO

Summary of all available data for this site
Instantaneous-data availability statement

***** There are no data available on the Waterdata system for the time period specified,**
although data may be available in the files of the local USGS office operating the station.

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National Water Information System: Web Interface

USGS Water Resources

Data Category: Site Information | Geographic Area: New York | GO

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Site Map for New York

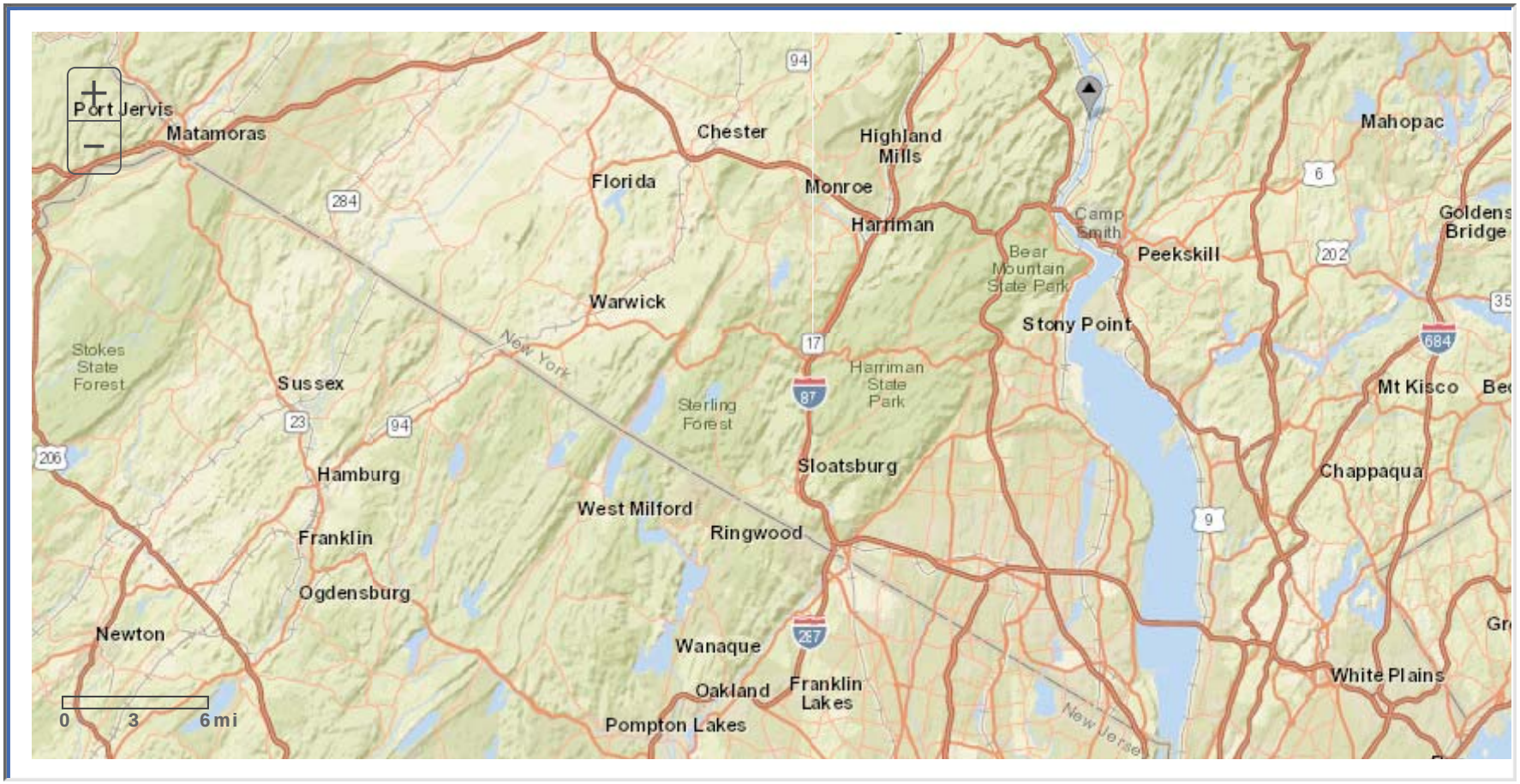
Click to hide state-specific text
ALL DATA ARE EASTERN STANDARD TIME

USGS 01374019 HUDSON RIVER AT SOUTH DOCK AT WEST POINT NY

Available data for this site: Location map | GO

Orange County, New York
Hydrologic Unit Code 02020008
Latitude 41°23'10", Longitude 73°57'20" NAD27
Drainage area 12,596 square miles
Gage datum 6.12 feet above NGVD29

Location of the site in New York



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U.S. Department of the Interior | U.S. Geological Survey

Title: NWIS Site Inventory for New York: Site Map
URL: https://waterdata.usgs.gov/ny/nwis/nwismap?

Page Contact Information: New York Water Data Maintainer
Page Last Modified: 2018-03-01 14:14:59 EST
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Orange County, New York
Hydrologic Unit Code 02020008
Latitude 41°23'10", Longitude 73°57'20" NAD27
Drainage area 12,596 square miles
Gage datum 6.12 feet above NGVD29

Output formats

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00095, Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius,												
Day of month	Mean of daily mean values for each day for 18 - 22 years of record in, uS/cm @25C (Calculation Period 1991-10-01 -> 2014-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	592	593	745	364	233	742	1,240	2,410	3,090	3,210	1,650	758
2	586	538	793	350	226	622	1,220	2,410	3,200	3,090	1,570	668
3	644	653	804	354	217	570	1,300	2,560	3,330	3,060	1,430	644
4	693	785	800	327	207	562	1,340	2,640	3,290	3,090	1,410	541
5	666	777	789	295	204	530	1,380	2,780	3,330	2,710	1,330	532
6	632	751	704	267	211	521	1,290	2,810	3,460	2,660	1,410	529
7	655	796	660	261	245	520	1,290	2,990	3,490	2,640	1,400	539
8	720	810	644	246	305	528	1,330	3,010	3,470	2,590	1,500	563
9	731	719	578	234	415	688	1,370	2,990	3,600	2,630	1,510	575
10	685	683	547	265	511	848	1,410	2,960	3,610	2,550	1,560	543
11	628	696	529	339	648	880	1,420	2,890	3,500	2,490	1,420	542
12	624	693	534	428	751	905	1,570	2,860	3,620	2,570	1,250	500

13	646	775	615	460	670	888	1,670	2,880	3,670	2,540	1,220	451
14	647	902	677	421	616	843	1,750	2,810	3,690	2,530	1,230	520
15	708	928	622	405	560	788	1,850	2,940	3,620	2,530	1,150	504
16	674	1,130	615	346	545	846	1,900	2,840	3,450	2,360	1,030	568
17	736	1,100	611	322	578	874	2,020	2,790	3,310	2,230	1,080	676
18	802	1,130	537	299	641	901	2,200	2,690	3,030	2,130	1,110	728
19	857	989	432	328	697	950	2,290	2,840	3,020	2,160	1,130	801
20	608	921	398	363	770	974	2,250	2,900	2,900	2,060	1,130	814
21	555	921	410	417	827	923	2,220	2,930	2,940	2,050	1,080	718
22	491	946	440	477	791	870	2,250	2,940	3,190	1,840	976	636
23	632	890	430	449	772	876	2,270	3,000	3,170	1,830	879	622
24	726	828	516	374	705	929	2,140	2,910	3,160	1,760	768	666
25	824	837	610	311	657	983	2,100	2,950	3,320	1,730	787	720
26	768	820	651	259	645	1,010	2,260	2,970	3,270	1,620	816	762
27	756	750	594	238	678	1,100	2,380	2,970	3,130	1,490	882	801
28	794	650	507	228	711	1,200	2,410	3,020	3,110	1,320	832	775
29	740	537	395	219	715	1,170	2,430	3,010	3,090	1,330	810	753
30	677		341	227	743	1,190	2,420	2,980	3,110	1,400	818	730
31	596		327		804		2,410	3,120		1,560		590

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Drainage area 12,596 square miles
Gage datum 6.12 feet above NGVD29

Output formats

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00095, Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius,

YEAR	Monthly mean in uS/cm @25C (Calculation Period: 1991-10-01 -> 2014-08-31)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991										2,459	3,147	237.3
1992	750.6	1,944	796.8	223.8	748.9			1,015		1,551	849.8	
1993						1,321	4,050	5,231	4,093	2,155		193.5
1994	390.7	331.9	284.3	191.5	167.0		539.3	786.8	1,122	1,339		
1995	326.6	443.5	246.6	1,028	1,793		4,956	5,602	8,936		194.8	1,077
1996	1,809					427.8	430.4		1,723			191.1
1997	198.9	265.0	212.8				2,907	4,249			1,318	
1998	678.5	607.1	235.0	184.4	205.3	506.2	306.4	2,522	3,784		2,706	1,554
1999	1,117	259.2	1,149	282.8		1,239	2,625	6,744	4,319	635.0	1,370	816.8
2000	289.2	667.1	247.9	221.3	201.4	196.4	326.4	250.0	441.1	1,626	2,968	
2001	809.7	314.0	585.4	217.1	1,558	550.4	2,428	5,188	6,315	5,890	5,272	3,830
2002	3,659	1,374	390.9	230.7		213.4		6,557	8,670	4,071	552.5	542.2
2003	454.7	1,118		275.7	246.3		753.9			279.1	238.4	230.1
2004	213.1	1,101	794.8	258.9	275.3		2,614	418.4	271.4	1,295	994.3	229.8
2005	531.3	651.6	1,046	426.8	1,252	1,072		3,925		1,507	211.6	216.2
2006	231.8	265.0	990.3	653.4	868.4	212.7	186.1	1,603		358.3	168.8	259.5
2007	183.1	2,170	736.7	229.9	211.7	1,338	4,204	5,641	7,195	6,276	747.7	266.4

2008	253.2	377.9	263.2	185.4	275.5	2,043	1,931	689.9	1,959	3,537	747.2	219.9
2009	486.8	591.4	532.0	674.5	234.5	208.9	237.9	247.8	1,899	1,130	573.6	805.3
2010	528.1	1,757	320.2	185.9	766.2	1,893	3,829	3,562	3,741	359.3	404.9	221.9
2011	1,163	582.5	256.7	237.9	169.5	205.6	1,162	2,541	186.9	208.6	216.0	196.2
2012	212.4	284.3										
2013											1,426	401.8
2014	363.0			259.2	251.5		318.2	1,317				
Mean of monthly Specific cond at 25C	698	795	535	332	577	816	1,880	3,060	3,640	2,040	1,270	638

** No Incomplete data have been used for statistical calculation

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Orange County, New York Hydrologic Unit Code 02020008 Latitude 41°23'10", Longitude 73°57'20" NAD27 Drainage area 12,596 square miles Gage datum 6.12 feet above NGVD29	**Output formats** HTML table of all data Tab-separated data Reselect output format

Water Year	00095, Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
2000	469.9
2006	764.8
2007	1,885
2008	1,278
2009	802.3
2010	1,590
2011	628.7

** No Incomplete data have been used for statistical calculation

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Salt-Front Movement in the Hudson River Estuary, New York—Simulations by One-Dimensional Flow and Solute-Transport Models

By M. Peter de Vries and Lawrence A. Weiss

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 99-4024

Prepared in cooperation with the
New York City Department of Environmental Protection
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Hudson Valley Regional Council



Troy, New York
2001

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.59	square kilometer (km^2)
acre	0.40483	hectare (ha)
	Volume	
cubic foot (ft^3)	0.02832	cubic meter (m^3)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
gallon per second (gal/s)	0.0010515	liter per second (L/s)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
million gallons per day (Mgal/d)	3,785	cubic meters per day (m^3/s)
	Density and pressure	
slugs per cubic foot ($slug/ft^3$)	515.4	kilograms per cubic meter (kg/m^3)
pounds per square inch (psi)	70.3089	centimeters of water (at 4˚C)
	Dispersion	
square feet per day (ft^2/d)	0.09290	square meters per day (m^2/d)
	Temperature	
degrees Fahrenheit (˚F)	(˚F-32)/1.8	degrees Celsius (˚C)
	Specific conductance	
micromhos per centimeter at 25˚ Celsius (µmho/cm)	1.00	microsiemens per centimeter at 25˚Celsius (µS/cm)
	Equivalent concentration terms	
microgram per liter (µg/L)	1.000	part per billion (ppb)
milligram per liter (mg/L)	1.000	part per million (ppm)
milligrams per liter (mg/L) X *F1* = milliequivalents per liter (meq/L)		
milligrams per liter (mg/L) X *F2* = millimoles per liter (mmol/L)		
	F1	*F2*
Chloride (Cl^-)	0.02821	0.02821
Sodium (Na^+)	.04350	.04350

Sea Level: In this report, “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Salt-Front Movement in the Hudson River Estuary, New York—

Simulations by One-Dimensional Flow and Solute-Transport Models

By M. Peter de Vries and Lawrence A. Weiss

ABSTRACT

The Hudson River is being considered for use as a supplemental source of water supply for New York City during droughts. One proposal entails withdrawal of Hudson River water from locations near Newburgh, Chelsea, or Kingston, but the extent to which this could cause the salt front to advance upstream to points where it could adversely affect community water supplies is unknown. The U.S. Geological Survey (USGS) one-dimensional Branch-Network Dynamic Flow model (BRANCH) was used in conjunction with the USGS one-dimensional Branched Lagrangian Solute-Transport Model (BLTM) to simulate the effect of five water-withdrawal scenarios on the salt-front location.

The modeled reach contains 132 miles of the lower Hudson River between the Federal Dam at Troy and Hastings-on-Hudson (near New York City). The BRANCH model was calibrated and verified to 19 tidal-cycle discharge measurements made at 11 locations by conventional and acoustic Doppler current-profiler methods. Maximum measured instantaneous tidal flow ranged from 20,000 ft^3/s (cubic feet per second) at Albany to 368,000 ft^3/s at Tellers Point; daily-mean flow at Green Island near Troy ranged from 3,030 ft^3/s to 45,000 ft^3/s during the flow measurements. Successive ebb- and flood-flow volumes were measured and compared with computed volumes; daily-mean bias was -1.6 percent (range from -21.0 to +23.7 percent; 13.5 percent mean absolute error). Daily-mean deviation between simulated and measured stage at eight locations (from Bowline Point to Albany) over the 19 tidal-cycle measurements averaged +0.06 ft (range from -0.31 to +0.40 ft; 0.21 ft root mean square error, RMSE). These results indicate that the model can accurately simulate flow in the Hudson River under a wide range of flow, tide, and meteorological conditions.

The BLTM was used to simulate chloride transport in the 61-mi reach from Turkey Point to Bowline Point under two seasonal conditions in 1990—one representing spring conditions of high inflow and low salinity (April-June), the other representing typical summer conditions of low inflow and high salinity (July-August). Measured chloride concentrations at Bowline Point were used to drive the BLTM simulations, and data collected at West Point were used for calibration. Mean bias in simulated chloride concentration for the April-June 1990 (high flow) data (observed range from 12 to 201 mg/L [milligrams per liter]; 30 mg/L RMSE) was –16 mg/L, and mean bias for the July-August 1990 (low flow) data (observed range from 31 to 2,000 mg/L; 535 mg/L RMSE) was +126 mg/L. The salt front (saltwater/freshwater interface) on the Hudson River was defined as the furthest upstream location where the chloride concentration exceeded 100 mg/L. Data from August 1991 were used to evaluate solute transport between West Point and Poughkeepsie because a chloride concentration of 100 mg/L was not observed at Clinton Point in 1990. The BLTM then was used to simulate chloride concentrations at Chelsea Pump Station and Clinton Point. Regression equations, based on daily mean values of specific conductance measured at West Point, were used to estimate daily mean chloride concentrations at Chelsea Pump Station and Clinton Point for model analysis. Mean biases in BLTM-simulated daily mean chloride concentrations for August 1991 were –38 mg/L at Chelsea Pump Station (range from 189 to 551 mg/L; 103 mg/L RMSE) and –9 mg/L at Clinton Point (range from 53 to 264 mg/L; 62 mg/L RMSE).

Hypothetical withdrawals at (1) Newburgh, (2) Chelsea, (3) Chelsea and Newburgh, (4) Chelsea and Kingston, and (5) Kingston and Newburgh, were simulated to compute the effects of withdrawals on salt-front movement. Withdrawals of 300 Mgal/d from any combination of Chelsea or Newburgh could result in upstream movement of the salt front of as much as 1.0 mi, given an initial salt-front location between West Point and Rogers Point. Scenarios that included withdrawals at Kingston caused the greatest upstream salt-front movement. Simulation of a 90-day April-June high-flow period during which discharges at Green Island averaged 25,200 ft^3/s indicated that withdrawals of 1,939 Mgal/d (million gallons per day) at Chelsea Pump Station would not measureably increase chloride concentrations at Chelsea Pump Station under normal tidal and meteorological conditions, but withdrawals at twice that rate (3,878 Mgal/d) could increase the chloride concentration at Chelsea Pump Station to 250 mg/L.

INTRODUCTION

The Hudson River, which flows more than 300 mi from Wallface Ponds in the Adirondack Mountains of northern New York State to the Battery, the southernmost point of Manhattan Island in New York City (fig. 1), is one of New York State's major water resources. The tidal reach, which extends 153.7 mi from the Battery to the Federal Dam at Troy (figs. 1, 2), contains saline water as far north as **river mile**[1] (**RM**) 85, above the Battery, depending on freshwater flow, **tide stage**, channel geometry, and wind. The river has been used for shipping for more than 3 centuries and serves as a water supply for industries, communities, and private groups; it also provides recreation and is a spawning ground for many fish species, some of which are of interest to the Atlantic Coast commercial fisheries. It is a flyway for many species of migrating birds and provides unique habitats for endangered species of birds, turtles, and fish. As human demands for water supply, waste disposal, and recreation have increased, river management has become vital to minimize contamination of this resource.

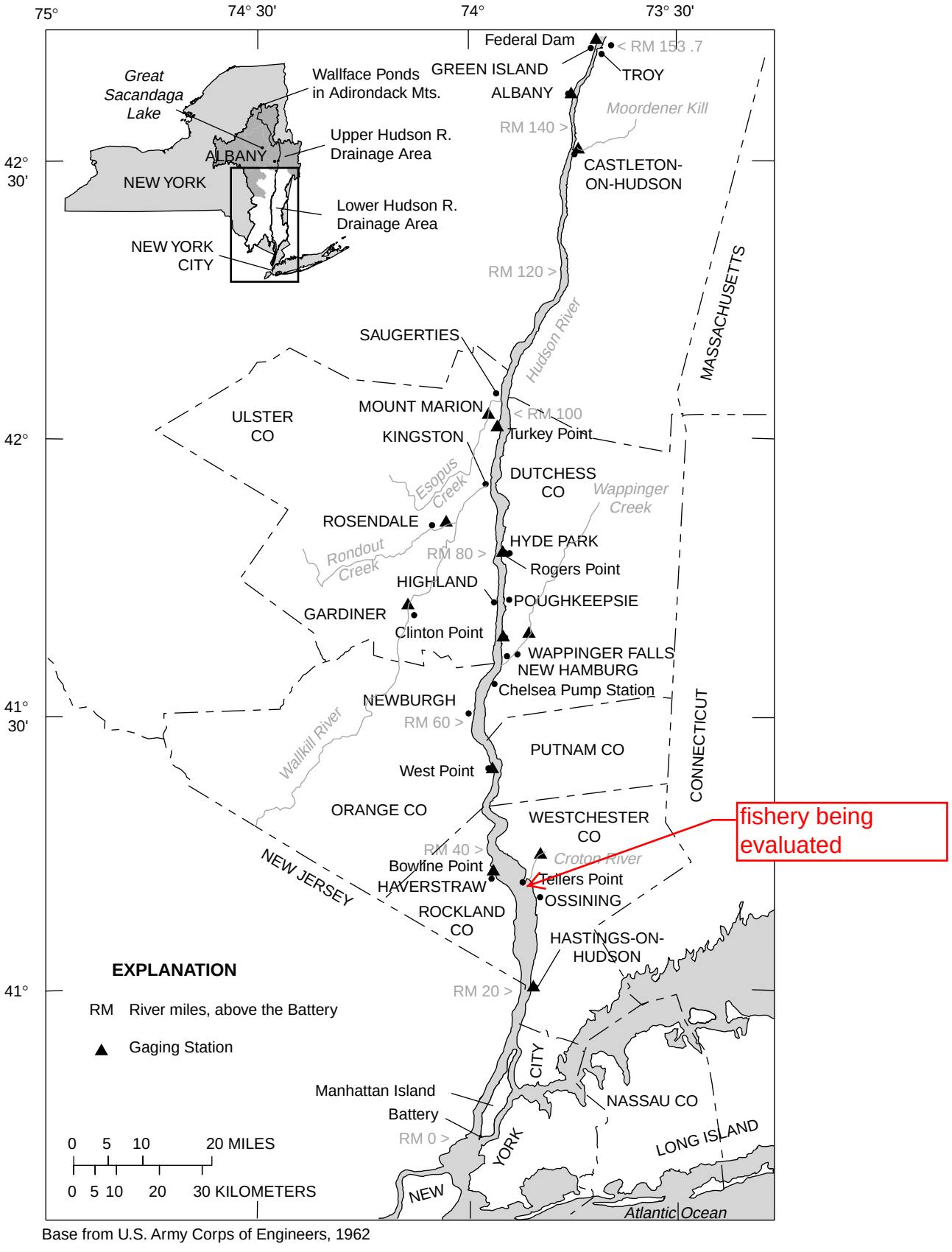
New York City's water-supply system serves more than 9 million people in the City and five nearby counties (fig. 1); several upstate communities can use the system during emergencies. Recent studies indicate that the present water-supply system cannot meet current demands during a drought (New York State, 1989). The Mayor's Intergovernmental Task Force on New York City Water Supply Needs convened in 1985 to review options for decreasing New York City's water demand and increasing water availability (New York City, 1992). Use of the tidal Hudson River is one option being explored as a supplemental source of water supply; but, a major concern is that the withdrawals might cause the **salt front** (saltwater/freshwater interface) to move upstream from its normal late-summer location south of Poughkeepsie and affect the Poughkeepsie water supply at river mile 77.2.

In 1988, the U.S. Geological Survey (USGS), in cooperation with the New York City Department of Environmental Protection, New York State Department of Environmental Conservation, and the Hudson Valley Regional Council (representing the lower Hudson Valley counties of Dutchess, Orange, Putnam, Rockland, Ulster, and Westchester [fig. 1]), began a 5-year study to evaluate the effect of hypothetical water withdrawals on the movement of the salt front. Computerized simulations described in this report are based on chloride concentrations and river-flow rates measured during the spring and summer of 1989, 1990, and 1991. **Specific-conductance** measurements were made during 1988-91 by boat to locate the salt front. Model simulations of flow and solute transport in the 132.2-mi reach between the Federal Dam at Troy and Hastings-on-Hudson (fig. 1) were run to indicate what effect hypothetical withdrawals at Chelsea, Kingston, and Newburgh would have on the position of the salt front. The study entailed:

(1) collection of specific conductance and tide-stage data at 15-minute intervals,
(2) measurement of river **discharge** at selected sites with an acoustic Doppler current profiler,
(3) delineations of salt-front position,
(4) compilation of Hudson River bathymetry data,
(5) calibration and verification of the flow and solute-transport models, and
(6) model simulation of hypothetical withdrawals.

The principal objectives were to implement, calibrate, and verify computerized flow and solute-transport models, then use a pair of **one-dimensional** models to simulate hypothetical public-supply

[1]Boldface terms are explained in glossary.



Base from U.S. Army Corps of Engineers, 1962

Figure 1. *Study area and major geographic features of the Hudson River estuary, N.Y., and locations of gaging stations.*

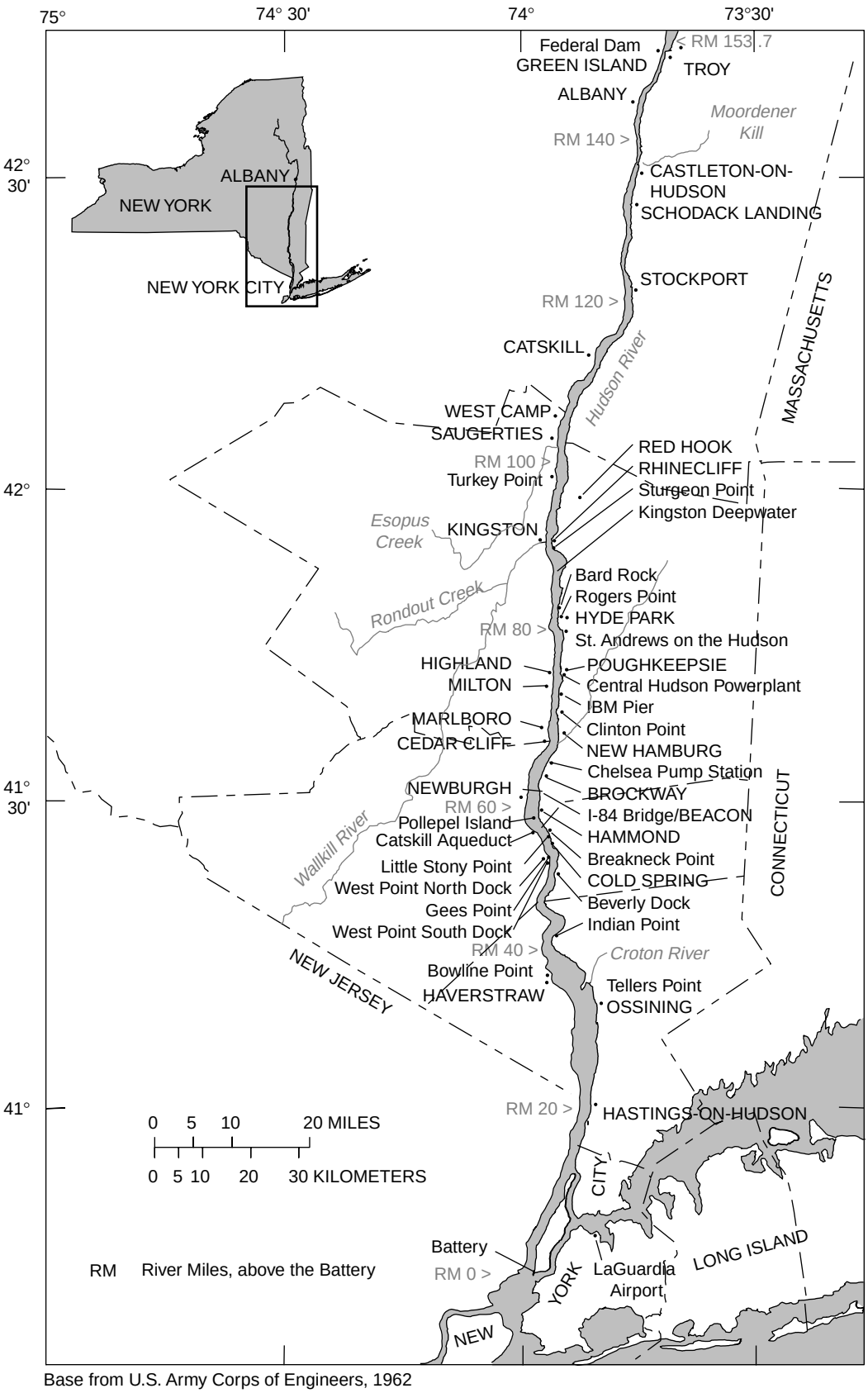


Figure 2. *Locations of additional geographical features of the Hudson River estuary, N.Y.*

withdrawals. This required compilation of bathymetry data for channel representation in the models and collection of tide-stage, specific conductance, and main-stem and tributary flow data for model calibration and verification. Regression analysis was used to relate specific conductance values measured at the tide gages to chloride concentration and salt-front location in ungaged areas.

Purpose and Scope

This report describes the study reach on the Hudson River, N.Y., and the procedures used to calibrate and verify the models. It also (1) describes the data-collection methods and the analytical procedures used to obtain data for model calibration and verification, (2) presents data on riverbed geometry, river flow, wind speed, and the specific conductance values that were used for the simulations, (3) summarizes the model boundary conditions and variables, (4) presents results of simulations of hypothetical supplemental withdrawals and of increased inflow, (5) describes results of a sensitivity analysis to identify which factors have the greatest effect on salt-front movement, and (6) discusses data measurement and model limitations. A tabulation of channel-geometry data and initial-condition input for a series of cross sections are given at the end of the report.

Acknowledgments

Special thanks are extended to the crews who helped during the tidal-cycle data-collection efforts day and night, regardless of weather, and to the following organizations for providing access to the river and use of facilities or land for instrument installation: U.S. Coast Guard at Saugerties, the Hidden Harbor Yacht Club, Roger's Point Boating Association, Mariner's Harbor, IBM Corporation, Lonestar Industries Clinton Point Trap-Rock Facility, White's Hudson River Marina, Newburgh Wastewater Treatment Facility, West Point Harbor Master's office at South Dock, Garrison Yacht Club, Orange and Rockland's Bowline Point Power Generating Facility, Stony Point Marina and Yacht Club, Croton Yacht Club, Croton Point Park, Tarrytown Marina, and Henry Green's Hastings Harbor Warehouses. Thanks also are extended to the employees of the Poughkeepsie Water-Treatment Plant, Castle Point Veterans Administration Hospital, Central Hudson's Danskammer Point Powerplant, New York City's Chelsea Pump Station, and Orange and Rockland Counties' Indian Point Powerplant, for participating in the sampling program and providing laboratory results.

HUDSON RIVER AND STUDY AREA

The Hudson River drains 13,370 mi^2 above its mouth at the Battery in New York City (fig. 1). More than 95 percent of the drainage basin is in New York State; the remainder lies in New Jersey, Vermont, Massachusetts, and Connecticut. The lower (tidal) Hudson River, which begins at the Federal Dam at Troy, is a drowned-rivermouth estuary in which the slope of the riverbed is extremely low (average 0.0002 ft/ft). Water velocities are sufficient, however, to carry suspended sediment seaward so that barrier islands do not form.

Study Area

The study included the entire lower Hudson River from the Federal Dam at Troy to the Battery, but the area of focus was the 77-mi reach from Turkey Point near Saugerties (RM 98.5) to Hastings-on-Hudson (RM 21.5), which normally includes the salt front and **transition zone**. Under normal seasonal tide and inflow conditions, the transition zone extends about 50 mi—from below Hastings-on-Hudson during high-flow periods in spring to New Hamburg (RM 67.7) during late summer low-flow periods (fig. 1). During the 1960's drought, however, saline water was observed as far north as Poughkeepsie, and in the dry summer of 1991, the salt front was detected at river mile 75.3 (1.9 mi below the Poughkeepsie water-treatment-plant intake and 1.2 mi below the Village of Highland water intake). A large inflow (82,500 ft^3/s) at Green Island in November 1990 caused the salt front to move downstream of the gage at Hastings-on-Hudson.

Chloride concentration can range widely within the study reach at any given time. For example, the chloride concentration at Clinton Point near New Hamburg (RM 70.3) is almost always low (less than 25 mg/L), whereas at Hastings-on-Hudson (RM 21.5) it is almost always relatively high (greater than 3,000 mg/L).

The width of the river within the study reach, as estimated from USGS topographic maps, ranges from about 600 ft near Albany to 18,000 ft near Haverstraw. Average bottom elevation of the **thalweg** is 60 ft below sea level; the lowest elevation is 225 ft below sea level near West Point. Channel geometry at six selected locations along the study reach are depicted in figure 3, further on.

Tidal and Nontidal Flow

The Hudson River is tidally affected as far upstream as the Federal Dam near Troy (RM 153.7). Water below this location can flow both upstream (**negative flow**) and downstream (**positive flow**), depending on the tidal conditions. Tide stage within the tidal part of the river, as calculated for the period of record for each of the following five sites, has a mean daily range of about 4.1 ft at Hastings-on-Hudson (RM 21.5), about 3.9 ft at Bowline Point (RM 37.5), about 3.6 ft at West Point (RM 51.6), about 4.3 ft at Turkey Point (RM 98.5), and about 5.5 ft at Albany (RM 146.0)(fig. 1). This variability is primarily due to differences in channel geometry and cross-sectional area. Maximum instantaneous tidal flows range from ±20,000 ft^3/s (12,900 **Mgal/d**) at Albany to about ±400,000 ft^3/s (259,000 Mgal/d) at Tellers Point (RM 33.9), 0.8 mi upstream from Ossining (fig. 1), when freshwater inflow at Green Island is 6,000 ft^3/s (3,870 Mgal/d). Tidal flows as great as 368,000 ft^3/s (238,000 Mgal/d) were measured during August 22-23, 1990 at Tellers Point.

Freshwater inflow, as measured at the USGS gage at Green Island (RM 153.7), comes mostly from the upper Hudson River (the reach above Troy) (fig. 1). Gaged tributaries along the lower Hudson River are the Moordener Kill (RM 138.0), Esopus Creek (RM 102.7), Rondout Creek (RM 91.5), Wallkill River (RM 91.5), Wappinger Creek (RM 67.3), and Croton River (RM 33.5). Inflows from these tributaries were used as an index of freshwater flow for this study and represent 10,179 mi^2 or 77 percent of the 13,265-mi^2 drainage area at Hastings-on-Hudson.

Salt Front

Although a vast amount of information about Hudson River flow has been collected over the years, several aspects pertaining to the lower Hudson River remain poorly understood. One of these is the movement of saline water, which can adversely affect water supplies, wildlife habitat, and fisheries (Busby, 1966; Giese and Barr, 1967; Darmer, 1969; Harleman and others, 1972; Quirk and others, 1973; Abood, 1974; Abood, 1977; Horne, 1977a; Horne, 1977b; Abood, 1978; Apicella and Zimmie, 1978; Dunn and Gravlee, 1978; Horne, 1978; Embree and Wiltshire, 1978. Hudson River Research Council, 1980; Stedfast, 1980; Turk and Troutman, 1981; Stedfast, 1982; Bokuniewicz and Flood, 1986; Malcolm Pirnie, 1986; New York City, 1986; Darmer, 1987; Lee, 1987; New York State, 1987; Rohmann and Lilienthal, 1987; Hahl, 1988; New York State, 1988; de Vries and Freeman, 1991; Abood and others, 1992; Thatcher, 1992; and Weiss and others, 1994).

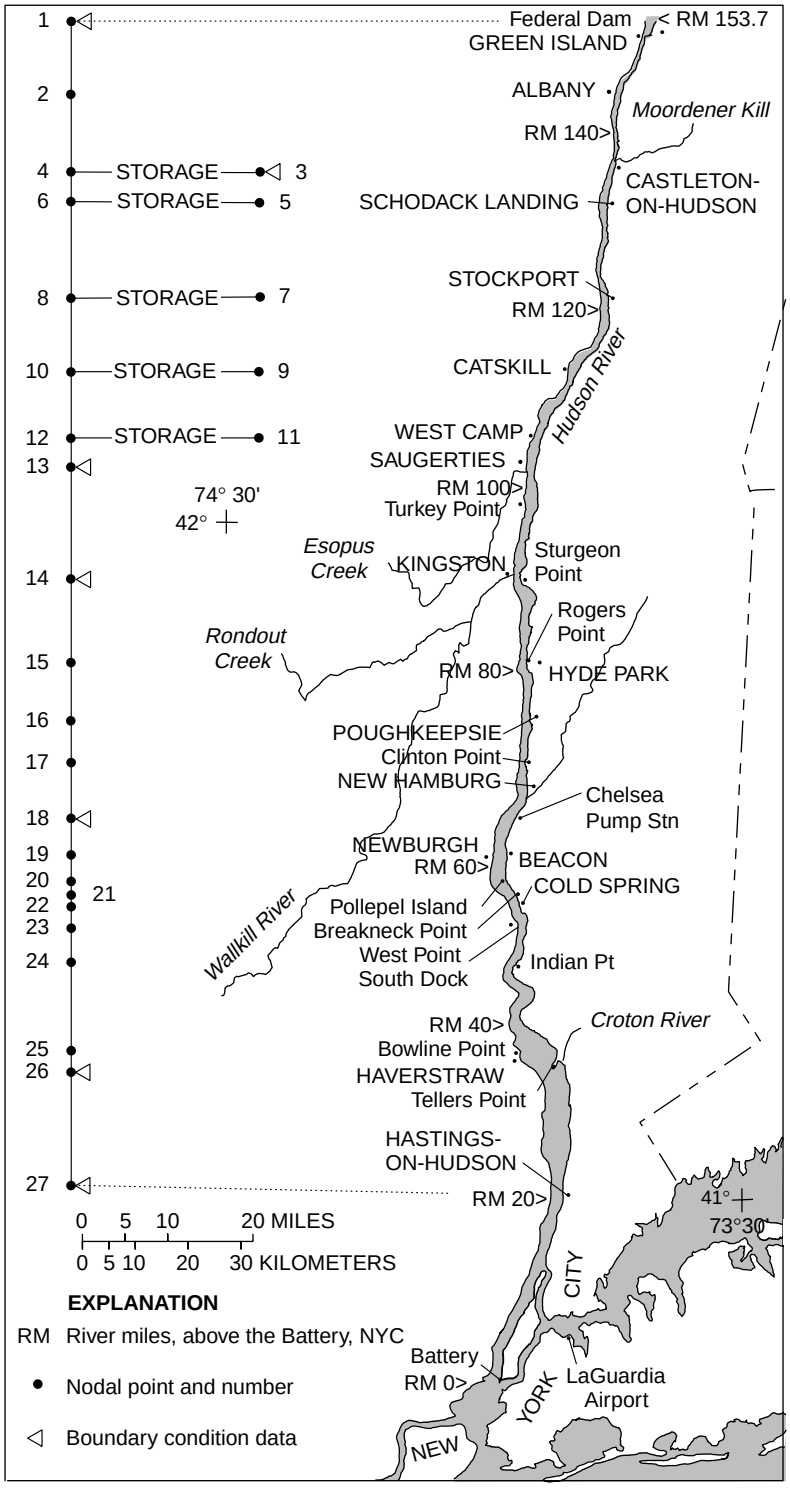
The salt front is defined in this report (unless otherwise noted) as the location at which the chloride concentration equals 100 mg/L, equivalent to a specific conductance of 500 µS/cm. The 250-mg/L New York State drinking-water standard for chloride (New York State, 1991) is a Secondary Standard (U.S. Environmental Protection Agency, 1994), meaning that chloride at this concentration is primarily a taste and odor problem rather than a health issue. Lower concentrations can affect water use, however; industrial users and people on salt-restricted diets may define a concentration as low as 50 mg/L as a quality criterion.

Various factors affect the movement of the salt front; the main ones are freshwater flow (discharge), the twice-daily tide, channel geometry, and wind, especially when parallel to the river. Large changes in barometric pressure and, more significantly, sustained winds along the continental shelf, also can affect the tide stage and, thus, the movement of the salt front (Milton Rutstein, National Ocean Service, 1989, oral commun.).

MODELING APPROACH

The modeling approach entailed (1) selection of models consistent with the Hudson River's hydraulic characteristics and channel conditions, (2) compilation of available flow and stage data and collection of salinity data, (3) developing relations between values of specific conductance (measured continuously) and chloride concentrations in ungaged areas, and (4) model calibration and sensitivity analysis.

A. MODEL SCHEMATIZATION (26 BRANCHES, 27 NODES, INCLUDES 94 CROSS-SECTIONS)



Base from U.S. Army Corps of Engineers, 1962

B. CROSS-SECTIONAL CHANNEL GEOMETRY AT SIX LOCATIONS

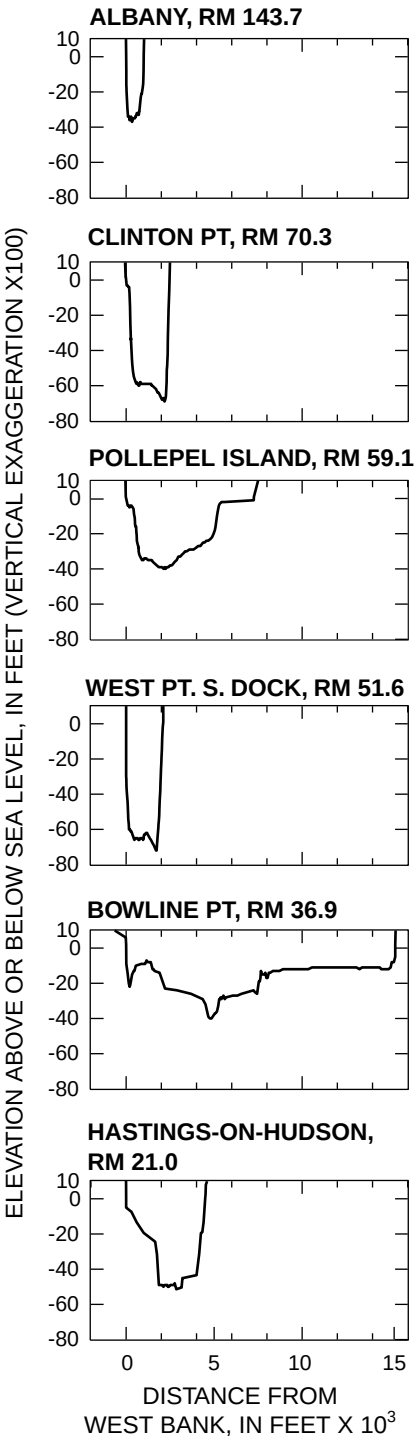


Figure 3. *Schematization of the lower Hudson River, N.Y., for the Branch-Network Dynamic-Flow model. (A) Model schematization showing nodal point numbers, storage areas, and boundary condition data locations. (B) Cross-sectional channel geometry at six selected locations between Green Island and Hastings-on-Hudson. (Additional schematization details are given in tables 10 and 11 and appendix* I *and* II.*)*

Model Selection

Various criteria were considered during model selection, these included the physical and hydraulic characteristics of the Hudson River, the objectives of the study, and the models' availability and ease of use. Several one-dimensional flow and solute-transport models were considered.

Because the lower Hudson River has an extremely low slope as well as daily flow reversals and tidal effects, it requires use of a **fully dynamic flow** model. Most surface-water flow models are based on two equations— the **continuity equation**, which solves for the conservation of mass (Newton's first law), and the **dynamic equation**, which solves for the conservation of momentum (Newton's second law). The dynamic equation is often simplified where **uniform-flow conditions** and(or) **steady-flow conditions** prevail, but because neither condition applies to the lower Hudson River, the number of appropriate models was limited.

Branch-Network Dynamic Flow Model

A modeling study of Hudson River flow was done in the late 1960's by Harleman and others (1972) and Malcolm Pirnie (1986) with the Massachusetts Institute of Technology (MIT) Transient Salinity Intrusion Model (TSIM) (Thatcher and Harleman, 1972a, 1972b, 1978), which solves the continuity, dynamic, and conservation equations through a **finite-difference** solution scheme. The model selected for the present (1989-91) study was the Branch-Network Dynamic Flow model (BRANCH) (Schaffranek and others, 1981; Schaffranek, 1987), which had been used by the USGS to simulate flow in the reach from Albany to Clinton Point (Stedfast, 1982; Stedfast, 1989). The BRANCH flow model meets most of the requirements for the river's physical conditions and is well documented and readily available; it also has a data-management system (Lai and others, 1978; Schaffranek and Baltzer, 1978) and is easily transported among computers. It is similar to the MIT model except that the solute-transport function is provided by a separate solute-transport model. The BRANCH model solves the unsteady-flow equations (continuity and dynamic) through a four-point, nonlinear, implicit finite-difference solution scheme. The unsteady-flow equations account for nonuniform velocity distribution in the cross section, including terms for the Boussinesq coefficient, flow conveyance and storage separation, lateral flows, pressure differentials that result from density variations, and wind effects.

Branched Lagrangian Solute-Transport Model

The model selected for the solute-transport function was the Branched Lagrangian Solute-Transport Model (BLTM) (Schoellhamer, D.H., and Jobson, H.E., 1986a, 1986b; Jobson, 1987; Jobson and Schoellhamer, 1987) because a solution scheme that reduces numerical dispersion inherent in **Eulerian-based models** is used in BLTM. The BLTM solves the convective-dispersion equation through a Lagrangian reference frame that moves the computational nodes with the flow and can simulate the movement and fate of as many as 10 water-quality constituents for the BRANCH-computed **unsteady-flow distribution**. This model is also highly transportable between computers, is well documented, and can use the same data-management system as the BRANCH model.

Once flows had been generated by the flow model at 15-minute intervals, they were transformed into daily values and used as input to the solute-transport model. Calibration of BLTM was done by adjusting the chloride-dispersion values for each reach until the model results closely matched the observed daily mean chloride values. Daily mean values (as opposed to 15-minute or other time-interval values) were chosen because (1) daily mean values reflect primarily low-frequency events such as spring-tide or neap-tide cycles and the river's response to inflows, which are the major factors in movement of the salt front, whereas 15-minute data include mainly the more frequent (semidiurnal) tides and wind effects; (2) regressions that relate predicted to measured salt-front location, as calculated from the West Point index gage, display best fit when based on daily mean values (regressions based on extreme semidiurnal values such as daily maximum or daily minimum display poorer fits); and (3) trends in daily mean chloride values based on a 24-hour time-step are reasonably close to those based on a tidal-day time-step of 24 hours 50 minutes.

The BRANCH flow model and BLTM solute-transport model were calibrated and verified to quantify the forces that control saltwater movement in the lower Hudson River (the reach between Albany and Hastings-on-Hudson) and to predict the locations to which the salt front would move in response to specified stresses (withdrawals and drought conditions). The models were calibrated and verified from data collected before 1980 and from June 1989 through August 1991.

Data

Data needed as input to the flow and transport models include river stage (water-surface elevation), main-stem discharge at Green Island, inflow from tributaries, wind velocity and direction, and salinity. Most simulations represented the range of tide and freshwater-flow conditions measured from May 1989 through October 1990 and in August 1991, but some incorporated data from 1979 to 1980 and from the drought during the 1960's, the most severe drought on record.

Stage, Inflow, and Wind Velocity

Available data for the tidal part of the Hudson River consisted of (1) continuous and partial-record stage data from 11 locations, (2) flow data from 11 sites in addition to Green Island, and (3) inflow data from five tributaries. Locations are described in table 1; discharges on selected dates are listed in table 2. Wind-velocity data were available from Albany and LaGuardia Airports (fig. 2).

Tide Stage and Flow Measurements

Tide-stage data were collected at 15-min intervals from June through October of 1989 and 1990 at the stations listed in table 3; which also indicates the types of recording devices and the reference-point locations and datum corrections. Standard USGS procedures for measuring stage (Carter and Davidian, 1969) and leveling measuring points into a common **datum** (Kennedy, 1988) were followed. Gage-height corrections caused by drift in the pressure transducers used to measure stage are given in table 4.

Flow measurements in the tidal reaches of the Hudson River were made from a boat by a RD Instruments[2] Acoustic Doppler Current Profiler (ADCP) (Gordon, 1989; RD Instruments, 1989; Simpson and Oltmann, 1990). All ADCP measurements were made between June 1989 and October 1990. Measurements were made over a 22-hour period because a 6- to 8-hour model startup time was required before simulation was considered valid. Measurements used for calibration are given in table 2; some of these were collected in previous studies of 1965-67 (Giese and Barr, 1967; Busby and Darmer, 1970) and 1979-80 (Stedfast, 1982) and were measured with current meters from bridges or the moving-boat method (Smoot and Novak, 1969).

Salinity

The term salinity**,** as used in this report, refers to the concentration of chloride (as sodium chloride) derived from the ocean. **Specific conductance**, a measure of a fluid's ability to conduct an electrical current, is an indicator of total dissolved solids and can be directly related by regression analysis to salinity within the concentration ranges found in the Hudson River estuary. (See section, "Relation of Specific Conductance to Chloride Concentration".) Because the reach upstream from the salt front has a relatively low dissolved solids concentration, elevated specific conductance readings are a reliable indication of the salt front's presence.

A total of 30 boat runs, hereafter referred to as salt-front delineations, were made between April and October of 1988-91 between Teller's Point (RM 34) and the Poughkeepsie Water-Treatment Plant (RM 77.2) to locate the salt front. During each salt-front delineation, specific conductance was recorded with a Hydrolab Scout (Hydrolab Corporation, 1988) at three verticals in each cross section and at three depths at each vertical, and samples were collected for analysis at the USGS National Water Quality Laboratory in Denver, Colo. Some typical distribution patterns of specific conductance in relation to depth at Bowline Point, West Point, Clinton Point, and Poughkeepsie are plotted in figure 4.

Salinity data were collected at 15-minute intervals with a USGS Minimonitor (Gordon and Katzenbach, 1983) at Turkey Point near Saugerties (RM 98.5), Rogers Point near Hyde Park (RM 81.0), Clinton Point near New Hamburg (RM 70.3), West Point (RM 51.6), Bowline Point at Haverstraw (RM 37.5), and Hastings-on-Hudson (RM 21.5) (fig. 1) during 1989-90; data were collected only at West Point in 1991 because data collection at the other gages had been discontinued.

Data collected in this study were used to develop regression equations that were in turn used to compute (1) chloride concentration from specific conductance, (2) chloride concentrations at Chelsea Pump Station and Clinton Point from specific-conductance values at West Point, (3) salt-front location from specific conductance at West Point and

[2]Use of trade and brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Table 1. *Locations of sites on the Hudson River, N.Y., from which stage and flow data were measured for BRANCH flow model*

[Locations are shown in figs. 1 and 2. °, degrees; ′, minutes; ", seconds; mi^2, square miles]

Station location and drainage area						Tributary location			
Station location	Station number	Latitude ° ′ ″	Longitude ° ′ ″	Drainage area (mi^2)	River mile[a]	Stream name	River mile[a]	Latitude ° ′ ″	Longitude ° ′ ″
Green Island	01358000[b]	42 45 08	73 41 22	8,090	0.00				
Albany	01359139[c]	42 38 53	73 44 50	8,288	8.53	Moordener Kill[b]	15.93	42 32 36	73 45 13
Catskill	01361450[b]	42 12 36	73 51 12	9,336	41.42				
West Camp	01362187[d]	42 06 46	73 55 34	10,026	49.12	Esopus Creek[b]	51.92	42 04 15	73 55 49
Turkey Point	01364832[d]	42 00 50	73 56 22	10,506	55.92				
Red Hook	01364840[b]	41 59 58	73 56 44	10,509	56.92				
Rhinecliff	01372009[c]	41 55 10	73 57 12	10,528	62.72	Rondout Creek[b] (Combined Rondout/ Wallkill)	62.82	41 55 19	73 58 08
Sturgeon Point	0137200910[b]	41 54 06	73 57 16	11,700	64.22				
Bard Rock	0137203901[d]	41 48 16	73 57 02	11,769	71.32				
Rogers Point	0137204020[d]	41 46 23	73 56 55	11,804	73.52				
Poughkeepsie	01372055[c]	41 42 08	73 56 29	11,732	78.63				
Clinton Point	01372059[d]	41 37 24	73 56 55	11,745	84.23	Wappinger Creek[b]	87.23	41 34 55	73 56 52
Newburgh/Beacon	01372575[b]	41 30 18	73 59 21	12,011	93.23				
West Point	01374019[c]	41 23 10	73 57 20	12,596	102.86				
Beverly Dock	0137402390[b]	41 21 46	73 57 26	12,603	104.34				
Indian Point	01374320[b]	41 16 00	73 58 36	12,730	113.06				
Bowline Point	0137448530[d]	41 12 12	73 57 22	12,792	117.56				
Tellers Point	01374486[b]	41 10 09	73 53 59	12,800	120.66	Croton River[b]	120.76	41 10 25	73 53 05
Hastings-on-Hudson	01376303[d]	40 59 35	73 53 12	13,265	133.00				

[a] River mile downstream from Federal Dam at Green Island. (Green Island is 153.7 river miles upstream from the Battery in New York City.)
[b] Discharge data available.
[c] Discharge and stage data available.
[d] Stage data available.

Table 2. *Hudson River discharge measurements used for calibration of BRANCH flow model*

[Locations are shown in fig. 2. Data for measurements of 1965-80 from Stedfast (1982). ˚F, degrees Fahrenheit; discharges are in cubic feet per second; -, upstream (tidal) flow; +, downstream flow]

Date	Water temperature (˚F)	Average discharge at Green Island	Modeled reach	Measurement locations	Discharge	
					Maximum upriver (northward)	Maximum downriver (southward)
Aug. 11, 1965	77	3,030	Green Island to Clinton Point	Poughkeepsie	-245,000	+237,000
May 24-25, 1966	58	20,000	"	"	-238,000	+281,000
Aug. 30, 1966	74	4,810	"	"	-225,000	+231,000
June 21-22, 1967	71	6,370	"	Rhinecliff Poughkeepsie	-220,000 -318,000	+208,000 +280,000
Aug. 21, 1979	77	6,000	"	Albany Red Hook Poughkeepsie	-19,100 -163,000 -239,000	+19,800 +174,000 +239,000
Mar. 26, 1980	36	39,000	"	Albany	+28,200	+50,000
Apr. 18, 1980	48	26,000	"	Catskill	-117,000	+153,000
June 13-14, 1989	70	19,600	Albany to Haverstraw	Indian Point	-134,000	+205,000
July 18-19, 1989	75	7,500	Green Island to Haverstraw	Beverly Dock	-200,000	+260,000
Aug. 22-23, 1989	76	5,600	"	Newburgh/ Beacon	-200,000	+193,000
Sept. 26-27, 1989	75	11,500	Green Island to Hastings-on-Hudson	"	-210,000	+224,000
May 9-10, 1990	56	17,500	"	Indian Point	-267,000	+295,000
June 13-14, 1990	70	7,400	"	Poughkeepsie	-255,000	+266,000
July 18-19, 1990	75	5,500	"	West Point	-250,000	+285,000
Aug. 22-23, 1990	76	6,000	"	Tellers Point	-340,000	+368,000
Oct. 23, 1990	57	18,000	Green Island to West Point	Sturgeon Point	-190,000	+217,000
Oct. 24, 1990	57	45,000	"	"	-110,000	+237,000

Table 3. *Location, type of stage-recording device, and reference point information for tide-stage recorders in Hudson River, N.Y., 1989-90*

[Locations are shown in fig. 1. psi, pounds per square inch]

Station number	Stage-recording device	Reference Point Information		
		Location	Elevation (feet above sea level)	Datum corrections[1] (feet)
01359139	Fischer-Porter ADR and float in well	Corning Preserve in Albany—Top of I-beam support for outside staff gage	0.82	-10.00
01364832	Campbell CR10 data logger and Druck PDCR 830 pressure transducer, differential 0 to 5 psi	Turkey Point—Lag bolt in piling at southeast corner of dock lighthouse	5.68	-0.55
0137204020	Campbell CR10 data logger and Druck PDCR 830 pressure transducer, differential 0 to 5 psi	Rogers Point—Lag bolt in west face ledge 2 ft west of navigation light	6.05	+0.04
01372059	Campbell CR10 data logger and Scientific Instruments bubble gage with Druck PDCR 830 pressure transducer, differential 0 to 5 psi	Clinton Point—File mark in steel rail of walkway to pump at quarry	15.15	-0.06
01374019	Campbell CR10 data logger and Druck PDCR 830 pressure transducer, differential 0 to 5 psi	South dock at West Point—Lag bolt in piling at northeast corner of South Dock	6.12	-0.12
0137448530	Campbell CR10 data logger and Druck PDCR 830 pressure transducer, differential 0 to 5 psi	Bowline Point—Three file marks in steel decking of pier and 100 ft south of platform	8.42	-0.08
01376303	Campbell CR10 data logger and Druck PDCR 830 pressure transducer, differential 0 to 5 psi	Hastings-on-Hudson—Top of bolt in bracket holding transducer pipe	5.99	0.00

[1]Datum corrections to be applied to stage data stored in the time-dependent data base.

Table 4. *Stage corrections applied to 1989-90 Hudson River, N.Y., tide-stage data used in BRANCH flow model*

[Station locations are shown in fig. 1. All values are in feet. Dash indicates no correction]

Period		Station Number and Location				
From	To	013704020 Rogers Point	01372059 Clinton Point	01374019 West Point	0137448530 Bowline Point	01376303 Hastings-on-Hudson
9-21-89	10-17-89	0.00	-0.15	0.00	-0.14	-0.14
4-11-90	4-30-90	--	--	0.00	-0.14	-0.14
4-31-90	5-18-90	0.00	-0.09	0.00	-0.15	-0.15
5-19-90	6-14-90	0.00	--	0.00	-0.15	-0.15
6-15-90	8-13-90	--	--	0.00	-0.16	-0.19
8-22-90	10-11-90	--	--	0.00	-0.14	-0.30
10-12-90	10-22-90	0.00	--	0.00	-0.14	-0.14
10-23-90	11-15-90	--	-0.09	0.00	--	-0.22

Hastings-on-Hudson, and (4) salt-front location from tide levels at West Point and inflows at Green Island and five tributaries. Results are discussed below.

Relation of Specific Conductance to Chloride Concentration

Specific conductance values and chloride concentrations of more than 1,030 samples collected from the lower Hudson River during 1988-90 were used to develop a regression equation that relates specific conductance to chloride concentration. The equation of best fit (coefficient of determination is 0.9987) is

$$y = -63 + 0.2925x + 4.071\times10^{-8}x^{2.5} - 1.413\times10^{-10}x^{3} + \frac{870\ln(x)}{x} , \quad (1)$$

where

y = chloride concentration, in milligrams per liter; and
x = specific conductance, in microsiemens per centimeter at 25 degrees Celsius.

The correlation between specific conductance and chloride concentration, as determined through regression of data from 1,033 water samples, is illustrated in figure 5.

Relation of Chloride Concentrations at West Point to Those at Chelsea and Clinton Point

The daily-mean specific conductance values computed for Bowline Point and West Point were converted to chloride concentration through equation 1. Because no continuous specific conductance data were collected in the reach above West Point during August 1991 (the only period during the study that the salt front moved north of the bay at Newburgh, RM 56.2-67.7), specific conductance measurements made during salt-front delineations between West Point and the Poughkeepsie Water-Treatment Plant were used to relate daily mean chloride concentration at West Point to daily mean chloride concentrations at Chelsea Pump Station (RM 66.2) and Clinton Point (RM 70.3) through the following regression equations:

Chelsea: $$y = \frac{x^{1.69}}{598} - 150 , \quad (2a)$$

Clinton Point: $$y = \frac{x^{1.829}}{2838} - 150 , \quad (2b)$$

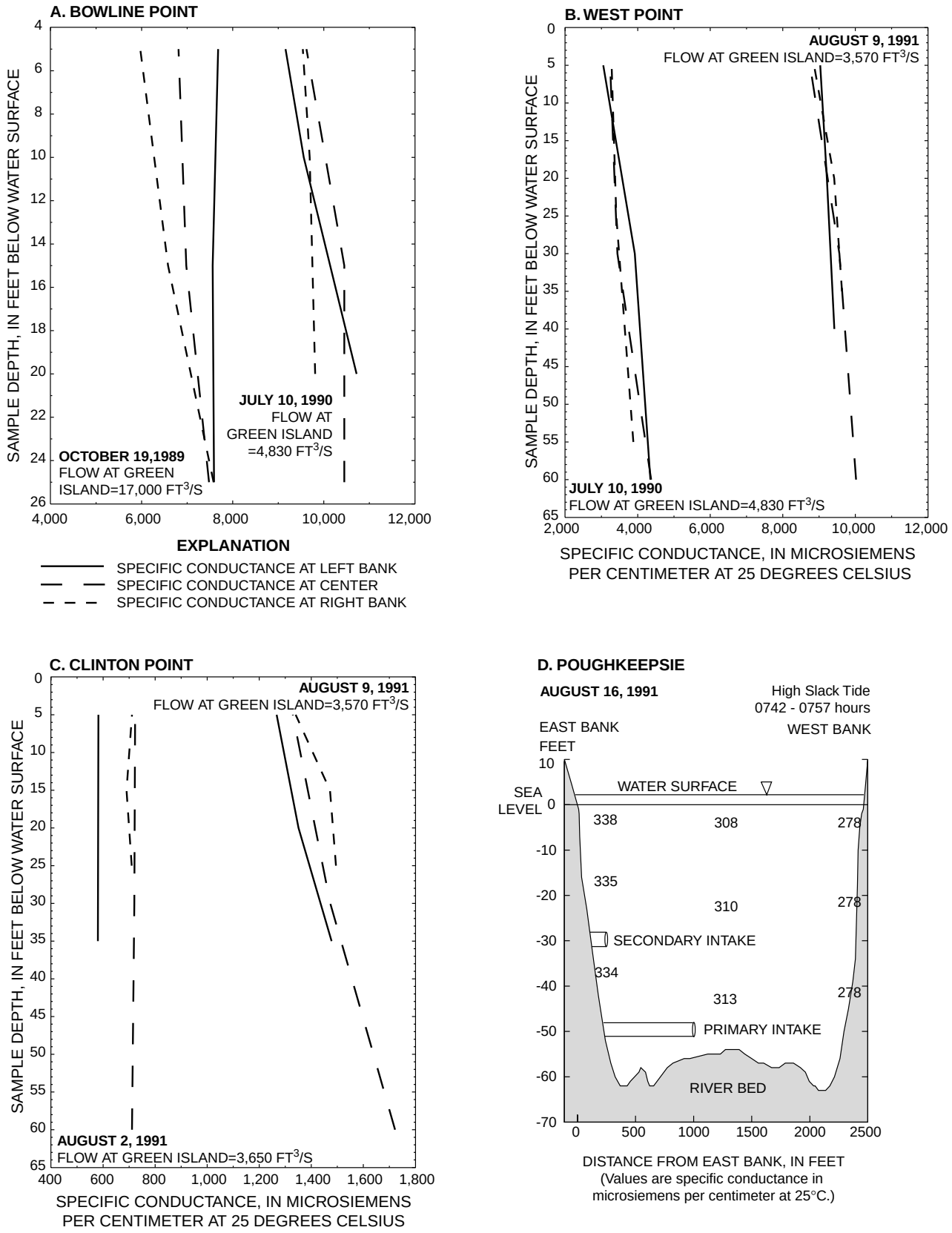


Figure 4. *Relation between sample depth and specific conductance at left bank, center, and right bank of Hudson River, N.Y., on selected dates, 1989-91: A. Bowline Point. B. West Point. C. Clinton Point. D. Poughkeepsie.*

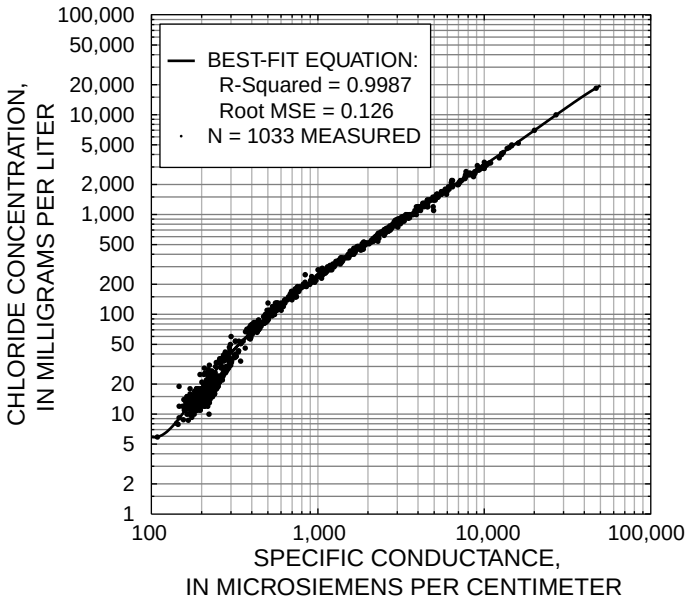


Figure 5. *Relation between specific conductance and chloride concentration in the lower Hudson River, N.Y., based on analyses of 1,033 water samples collected prior to 1991.*

where

y = daily mean chloride concentration at Chelsea Pump Station or Clinton Point, in milligrams per liter; and

x = daily mean chloride concentration at West Point, in milligrams per liter.

The coefficients of determination for Chelsea Pump Station and Clinton Point equations were 0.897 and 0.943, respectively, and the standard errors of estimate were ±9.6 and ±7.7 percent, respectively. Computed daily means for August 9-31, 1991, are shown in table 5.

To verify the predictions of the solute-transport model (described later in the report) at a variety of locations, specific conductance at West Point was related to chloride concentration at West Point (RM 51.6), Catskill Aqueduct at Breakneck Point (RM 56.2), Newburgh (RM 62.3), Chelsea Pump Station (RM 66.2), and Clinton Point (RM 70.3). The regression equations are shown in table 6A; another set of equations (table 6B) was used to recreate the daily chloride concentration at 3 sites near Poughkeepsie—the IBM pier (RM 72.3), the Central Hudson powerplant (RM 74.8), and at the Poughkeepsie Water-Treatment Plant (RM 77.2).

Relation of Specific Conductance at Hastings-on-Hudson and West Point to Salt-front Location

Regression equations were developed that relate daily mean specific conductance at the Hastings-on-Hudson or West Point gages to the salt-front locations observed in the 1988-91 salt-front delineations. The resulting equation for Hastings-on-Hudson is

$$SFRM_{100} = -3911.77 + 193.59\ln(SCHH) + \frac{21635.3}{\ln(SCHH)} - \frac{16820.5}{\sqrt{SCHH}} \quad , (3)$$

where

$SFRM_{100}$ = 100 mg/L salt-front location at high slack tide, in river miles; and

$SCHH$ = Daily mean specific conductance at Hastings-on-Hudson, in micro-siemens per centimeter at 25 degrees Celsius.

The equations for West Point are shown in table 7.

The standard error of estimate was 4.0 mi. The curve flattens at RM 35 (fig. 6a), most likely because lateral mixing in the bay at Haverstraw (RM 33.8-40.7) increases as a result of the extreme width (up to 3.5 mi) and shallow depths (about 20 ft); this mixing decreases the rate of salt-front advancement in relation to its rate in narrower reaches.

The measured specific conductance values at West Point (RM 51.6) were used to delineate the salt front upstream of that gage because the bay at Haverstraw appears to have a strong effect on mixing and, hence, the rate of salt-front movement, and therefore would give more reliable results than the Hastings equation. The resulting lines of fit for the 100-, 250-, and 500-mg/L salt fronts based on West Point data are shown in figure 6B; the equations and standard errors of estimate are given in table 7. The standard error of estimate for the 100-mg/L equation is 4.0 mi if calculated from the Hastings-on-Hudson equation (eq. 3 and fig. 6A) and is 1.45 mi if calculated from the West Point equation (table 7 and fig. 6B).

Table 5. *Observed chloride concentration in Hudson River at West Point, and computed concentrations at Chelsea Pump Station and Clinton Point, N.Y., August 9-31, 1991*

[Locations are shown in fig 1. Concentrations are in milligrams per liter]

Date (August 1991)	Observed concentrations at West Point	Computed concentrations	
		Chelsea Pump Station	Clinton Point
9	2,171	551	264
10	1,998	484	231
11	1,887	421	184
12	1,874	413	178
13	1,844	398	167
14	1,809	445	216
15	1,664	287	121
16	1,730	340	129
17	1,790	369	148
18	1,672	312	112
19	1,509	243	74
20	1,527	250	78
21	1,436	212	61
22	1,488	298	79
23	1,471	228	67
24	1,640	303	104
25	1,663	308	110
26	1,526	254	78
27	1,434	189	53
28	1,462	201	53
29	1,490	236	71
30	1,430	213	60
31	1,332	179	45

Relation of Tide Levels at West Point and Inflows to Salt-front Location

Physical factors that affect chloride transport include stream geometry, freshwater inflows, ocean tides, and wind velocity. Antecedent conditions also must be considered in any attempt to develop longitudinal concentration profiles. A regression equation (eq. 4) developed by Cooper and others (1988) can be used to approximate chloride concentrations from freshwater inflows and maximum tidal effect, given present channel geometry, wind velocities less than 5 mi/h, and initial water density of 1.939 slug/ft^3 (freshwater). Water levels at West Point were used to evaluate tidal effect; the initial water density for the 17 observations of the 100-mg/L chloride-concentration location (based on specific-conductance data) was about 1.939 slug/ft^3 at West Point. The mean elevation of the five previous daily maximum high tides (5-day mean) was used to approximate steady-state conditions, and, similarly, the 5-day mean inflow was computed as the average of the sum of the five previous daily mean flows at Green Island plus those of the five tributaries (Moordener Kill, Esopus Creek, Rondout Creek, Wallkill River, and Wappinger Creek [fig. 1]). The resulting equation for the 100-mg/L chloride-concentration location (*ClL*) upstream from West Point at high slack tide, in river miles, is

$$ClL = \frac{877 tidemax^{0.38}}{flow^{0.34}} , \quad (4)$$

where

ClL = river mile for 100-mg/L chloride concentration,

tidemax = 5-day mean maximum tide, in feet above mean sea level, and

flow = 5-day mean inflow, in cubic feet per second.

The coefficient of determination was 0.76, and the standard errors of estimate were +5.5 and –6.6 percent. This equation has a mean bias of 2.4 mi and a RMSE of 5.9 mi. The observed and calculated salt-front locations are listed in table 8. Wind during major storms affects the river stage and could alter the results of the empirically derived relation between salt-front location and flow. Wind velocity could be incorporated into the equation, but using the 5-day prior average maximum tide would obscure its short-term effect because storm-related wind rarely persists longer than a day. An estimate of stage for the day of the storm could be provided by replacing the 5-day value with the maximum tide for the day of the storm.

Application of Salinity Equations to Recent and Historical Data

Estimates of the location of the 100-mg/L chloride concentrations, based on equation 4, matched the observed location within 1.8 mi for July 1993 and

Table 6. *Equations relating daily mean chloride concentration in Hudson River upstream from West Point to daily mean specific conductance at West Point, N.Y.*

[Locations are shown in fig. 2. r^2, coefficient of determination; Sxy, standard error of estimate; SpC, daily mean specific conductance; µS/cm, microsiemens per centimeter at 25 degrees Celsius; Cl, daily mean chloride concentration, in milligrams per liter (mg/L); RM, river mile above the Battery at New York City; --, not enough data to determine]

Location and river mile	Equation	r^2	Standard error of estimate (percent)		Minimum daily mean specific conductance for given chloride concentration	
			Max	Min	Cl (mg/L)	SpC (µS/cm)
A. Equations based on regression analyses of field data:						
West Point (RM 51.6)	$Cl = -15 + 0.213SpC^{1.09}$	0.978	+15.8	-13.7	100	320
Catskill Aqueduct (RM 56.2), at Breakneck Point	$Cl = -50 + 0.142SpC^{1.09}$	.990	+ 9.6	- 8.8	100	600
Newburgh, I-84 (RM 62.3)	$Cl = -170 + 0.088SpC^{1.09}$	.951	+11.7	-10.5	100	1,580
Chelsea Pump Station (RM 66.2)	$Cl = -192 + 0.051SpC^{1.09}$	.736	+23.3	-18.9	100 250 500	2,800 4,100 6,200
Clinton Point (RM 70.3)	$Cl = -285 + 0.035SpC^{1.09}$	.618	+17.0	-14.6	100	5,100
B. Equations derived from following relation: $Cl = -Constant + bfactor \times SpC^{1.09}$, where: $Constant = -765 + 14.82\ RM$, and $bfactor = 98.237 + 2.2016 \times \ln(RM) - 902.392/\ln(RM) + 877.24/(RM)^{0.5}$						
IBM pier (RM 72.3), below Poughkeesie	$Cl = -306 + 0.032SpC^{1.09}$	--	--	--	100	5,850
Central Hudson Power-plant (RM 74.8), near Poughkeepsie	$Cl = -348 + 0.030SpC^{1.09}$	--	--	--	100	6,750
Poughkeepsie Water-Treatment Plant (RM 77.2)	$Cl = -379 + 0.029SpC^{1.09}$	--	--	--	100 250 500	7,420 9,500 13,000

0.2 mi for August 1993 (both were periods of high chloride concentrations at West Point). On July 21, 1993, when the daily mean specific conductance at West Point was 6,590 µS/cm, the observed and computed locations of the 100-mg/L chloride concentrations were RM 73.5 and RM 75.3, respectively. On August 19, 1993, the daily mean specific conductance at West Point was 6,380 µS/cm, and the observed and computed locations of the 100-mg/L chloride concentrations were RM 74.5 and 74.7, respectively. The 100-mg/L chloride-concentration equation indicates that a daily mean specific conductance of at least 7,350 µS/cm at West Point would be required for the 100-mg/L chloride concentration to reach the Poughkeepsie water-treatment plant (RM 77.2); this concentration would be equivalent to a daily mean chloride concentration of 643 mg/L at Chelsea Pump Station.

Table 7. *Equations relating salt-front location in the Hudson River to daily mean specific conductance at West Point, N.Y.*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius]

EQUATIONS

A. $SFRM_{100} = -4{,}840 + 237.2 \times \ln(SCWP) + 27{,}193/\ln(SCWP) - 21{,}347/(SCWP)^{0.5}$

B. $SFRM_{250} = -9{,}035 + 422.0 \times \ln(SCWP) + 52{,}140/\ln(SCWP) - 43{,}392/(SCWP)^{0.5}$

C. $SFRM_{500} = -19{,}673 + 877.9 \times \ln(SCWP) + 117{,}001/\ln(SCWP) - 104{,}392/(SCWP)^{0.5}$

where: *SFRM* = salt-front location at high slack tide, in river miles, subscripts 100, 250, and 500 refer to chloride concentrations of 100, 250, and 500 milligrams per liter, respectively; and

SCWP = daily mean specific conductance at West Point, in microsiemens per centimeter at 25 degrees Celsius (µS/cm).

Equation	*Coefficient of determination (r^2)*	*Standard error of estimate (Sxy) (miles)*	*Root mean square error (RMSE) (miles)*	*Specific conductance range (µS/cm)*	*Salt-front range (miles)*
A	0.986	1.5	1.5	162 - 10,000	34.6 - 85.0
B	.994	1.0	.9	475 - 10,000	34.6 - 79.0
C	.992	1.1	1.2	1,100 - 10,000	35.5 - 72.0

Observed and predicted salt-front locations during some of the largest and highest tide-producing storms of this century are given in table 9. For example the storm of September 27, 1985, known as Hurricane Gloria, occurred at a river flow of 11,809 ft^3/s, which impeded the upstream movement of the salt front such that the chloride concentration at Chelsea Pump Station (RM 66.2) was less than 40 mg/L, and the computed location for the 100-mg/L salt front was RM 64.5. This computation provided a useful check on the accuracy of the relation, as did the winter storms of February 1985 and December 11, 1992 (table 9). Even though the maximum tide of December 11, 1992, was 3 ft higher than that of February 12, 1985, the flow on December 11 was 3 times that of the February storm. The largest high tide of this century occurred during the Great New England Hurricane of 1938, but freshwater inflow on the Hudson River was so large, estimated to be 200,000 ft^3/s at West Point (Paulsen and others, 1940), that the salt front was probably pushed seaward of the Battery (RM 0).

A chloride concentration of 342 mg/L was measured at the Poughkeepsie Water-Treatment Plant at RM 77.2 on November 20, 1964, during the severe drought of 1960-68. The drought-recurrence interval ranged from 35 to 80 years (Gravlee and others, 1991). Applying the regression equation from table 6 that relates chloride concentration upstream of West Point to specific conductance at West Point indicates that, on that day, the specific conductance at West Point would have been 10,780 µS/cm. Applying this value to the salt-front location equations in table 7 indicates the 100- and 250-mg/L chloride concentrations to be at RM 85.5 and 80.8, respectively. (Note: This use of the equation is for historical reference only and must be interpreted with caution because the specific-conductance value is beyond the range used to develop the equations.) This drought may have been the only time since Great Sacandaga Lake (fig. 1) was built in 1924 that the Natural Heritage Program's Kingston Deepwater site (fig. 2) actually contained the reported "dense saline" waters (New York State, 1990, p. 127-128). Applying the 5-day mean inflow (*flow* term) of 2,920 ft^3/s upstream from West Point and the 5-day tide level (*tidemax* term) of about 3.0 ft above mean sea level at West Point, as approximated from water levels recorded at the Battery by the National Ocean Service of the National Oceanic and Atmospheric Administration (written commun., 1993) to equation 4 yielded a 100-mg/L chloride concentration at RM 88.3, which is 2.8 mi upstream

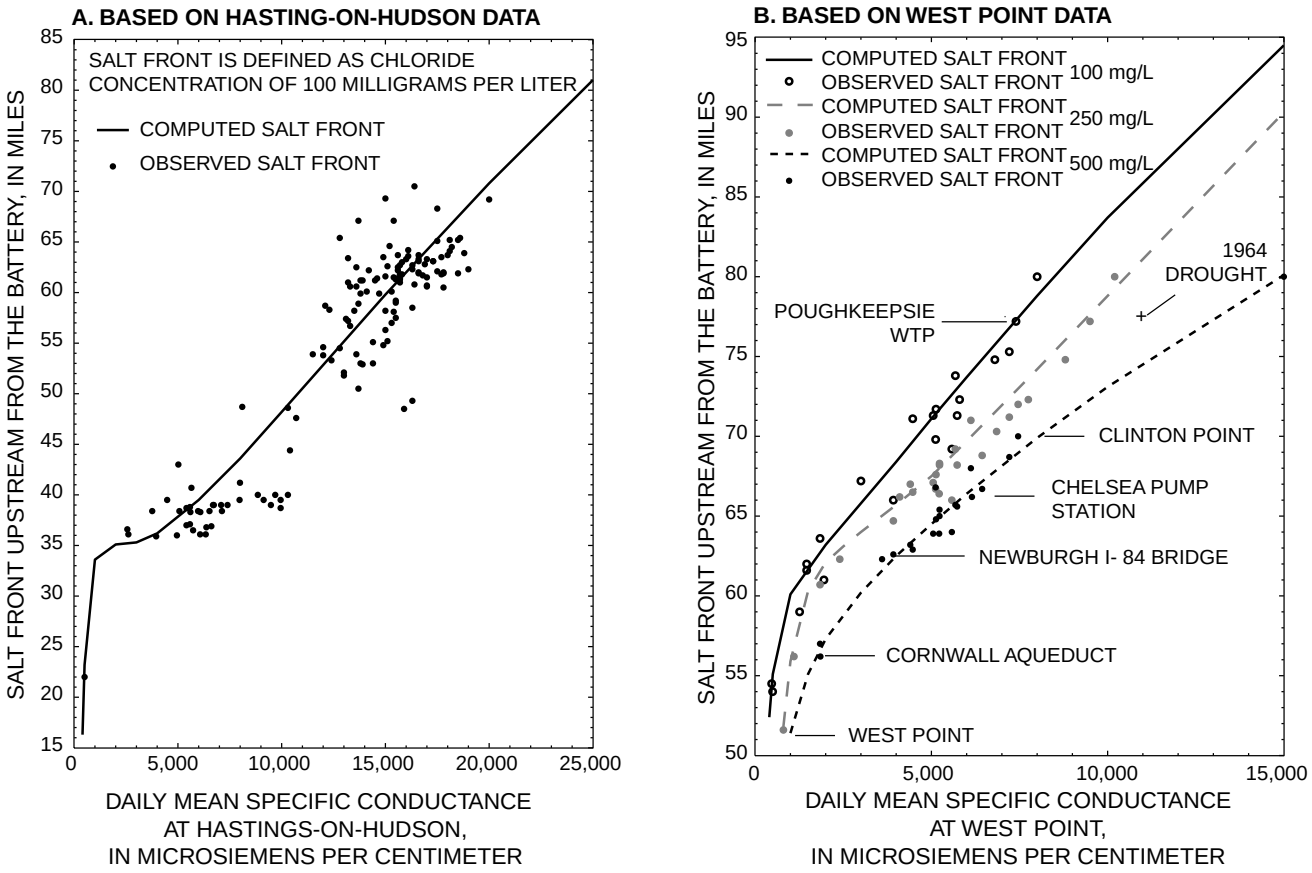


Figure 6. *Computed and observed relation between salt-front location and daily mean specific conductance in Hudson River, N.Y.: (A) 100-milligrams per liter salt-front location based on specific conductance values at Hastings-on-Hudson. (B) 100-, 250-, and 500-milligrams per liter salt-front locations based on specific conductance values at West Point.*

from the location computed from the 100-mg/L West Point specific conductance equation (table 7, eq. A).

Although empirical equations based on specific conductance and physical conditions at West Point are accurate predictors of salt-front locations, they cannot simulate the effect of hypothetical stresses such as low flows or increased withdrawals for water supply on the salt-front location; therefore, deterministic dynamic-wave hydraulic and solute-transport models were used for those purposes in this study.

Flow Simulation by One-dimensional Flow Model (BRANCH)

The USGS one-dimensional Branch-Network Dynamic Flow model (BRANCH) was used to simulate flow in the Hudson River under a wide range of inflow, tidal, and meteorological conditions. The tidal Hudson River is 153.7 mi long, and thalweg depth ranges from 15 ft just north of Albany (RM 152) to more than 225 ft near West Point-North Dock (RM 52.9, fig. 2). River width ranges from 600 ft just north of Albany to 18,000 ft in the bay near Haverstraw (fig. 3). Channel geometry in the estuary was represented in the models as a sequence of subreaches, each of which was divided into branches that are connected at nodal points and each branch was divided into segments, mainly on the basis of channel geometry. Each segment boundary is assigned cross-sectional data in the model. The reach between Green Island and Hastings-on-Hudson contains a total of 26 branches with 27 nodal points (fig. 3). Five additional branches were added to represent side-channel and tributary-storage areas as described by Stedfast (1982). The nodal point locations, distance downstream from Green Island, and number of cross sections in each branch are listed in table 10.

Table 8. *Observed and computed Hudson River salt-front locations, based on (1) combined inflow from Hudson River at Green Island and from five tributaries, and (2) tide elevations at West Point, N.Y.*

[ft^3/s, cubic feet per second]

Tributary Inflow[a] (ft^3/s)	Tide[b] (feet above sea level)	Salt-front Location		
		Observed[c]	Computed[c]	Error[d] (miles)
5,749	2.65	67.2	66.9	-0.3
15,351	2.82	54.0	49.1	-4.9
7,045	2.82	61.6	63.9	+2.3
17,537	2.66	54.5	45.9	-8.6
4,097	3.00	75.3	78.7	+3.4
4,768	2.51	73.8	69.9	-3.9
8,355	2.67	71.3	59.1	-12.2
4,458	2.46	69.8	70.9	+1.1
4,058	2.73	71.7	76.2	+4.5
4,062	2.78	71.1	76.7	+5.6
4,960	2.38	69.2	67.6	-1.6
7,343	2.66	71.3	61.7	-10.6
8,723	2.73	63.6	58.7	-4.9
5,765	2.87	66.0	68.9	+2.9
7,707	2.47	61.0	59.0	-2.0
13,716	3.67	59.0	56.4	-2.6
13,419	2.96	62.0	52.3	-9.7

[a] Mean 5-day prior inflow upstream from West Point.
[b] Mean maximum 5-day prior high tide at West Point.
[c] In river miles upstream from the Battery in New York City.
[d] Difference between observed and computed values.

Calibration and Verification

Model calibration entailed adjusting the coefficients of variables that affect flow in the river until the resulting simulated flow was similar to the measured flow. The final calibration for the entire 133-mi reach represents the values that gave the best overall fit (for weighted daily-mean bias from successive ebb- and flood-flow volumes and tidal-wave timing) in simulating net flow generated from tidal-cycle data collected at 11 discharge-measurement and 8 stage-measurement locations. Instantaneous errors may differ noticeably from observed discharge and stage values and exceed the reported weighted daily-mean bias and absolute error. Model verification entailed comparison of simulated flows with independent data sets (not used during calibration) that had been collected under differing tide and flow conditions.

Channel Geometry

Channel-geometry data were obtained from Stedfast (1980) and the National Ocean Service of the National Oceanic and Atmospheric Administration (the latter in the form of digital files and older hydrographic survey sheets); physical measurements of the river channel also were made. The Channel Geometry Analysis Program (CGAP) (Regan and Schaffranek, 1985) aided in the analysis, interpretation, and quantification of the physical properties of the channel. Segment division criteria were chosen that aid in the accuracy, convergence, and stability of the model (Schaffraneck and others, 1981). Segment divisions were chosen at locations where thalweg depth, averaged over 1 mi, changed by more than 30 ft. Additional segment divisions were chosen where cross-sectional area, averaged over 1 mi,

Table 9. *Salt-front locations in Hudson River, N.Y., during severe storms of the 20th Century*

[Locations shown in fig. 2. RM, river mile above The Battery, New York City; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter]

Date	Discharge† (cubic feet per second)	Maximum tide elevation (feet above mean sea level)	Salt-front location (RM)
9-21-38	200,000‡	8.2 ‡	0.0 ‡
2-12-85	6,500	3.78	73.5 [a] 73.1 [b]
9-27-85	11,809	4.58	64.5 [a]
12-11-92	20,800	6.75	61.7 [a] 60.3 [c]

† 5-day mean inflow for Hudson River at Green Island and 5 tributaries.

‡ Estimated.

[a] Computed from regression equation relating salt-front location to flow and maximum tide (eq.4).

[b] A known chloride concentration of 800 mg/L at RM 64.7 would yield a mean specific conductance of 6,000 µS/cm at West Point; therefore, the estimated location of the 100-mg/L salt front was at RM 73.1.

[c] A mean specific conductance of 1,060 µS/cm measured at West Point would place the 100-mg/L salt front at RM 60.3. The measured chloride concentration at RM 64.7 on December 11, 1992, was 37 mg/L.

Table 10. *Nodal-point and corresponding BRANCH data used in flow model of the Hudson River between Green Island and Hastings-on-Hudson, N.Y.*

[Locations are shown in figs. 2 and 3]

	Station Data			BRANCH Data		
Nodal point	Number[1]	Name	Distance along thalweg downstream from Green Island (ft)[2]	Number[3]	Length (ft)	Number of cross sections[4]
1	01358000	Green Island (Federal Dam)	0	--	--	--
2	01359139	Albany	45,024	1	45,024	6
3	--	Castleton-on-Hudson	88,304	2	43,280	4
4	--	Schodack Landing	130,544	3	42,240	4
5	--	Stockport	173,314	4	42,770	3
6	01361450	Catskill	218,714	5	45,400	4
7	01362187	West Camp	259,374	6	40,660	3
8	--	Saugerties	274,154	7	14,780	2
9	01364832	Turkey Point	295,274	8	21,120	--
10	01364840	Red Hook	300,554	9	5,280	--
11	--	Kingston	314,284	10	13,730	--
12	01372009	Rhinecliff	331,184	11	16,900	5
13	0137200910	Sturgeon Point	352,304	12	21,120	--
14	0137204020	Rogers Point (Hyde Park)	376,594	13	24,290	5
15	01372055	Poughkeepsie	415,144	14	38,550	4
16	01372059	Clinton Point (New Hamburg)	444,714	15	29,570	3
17	--	Chelsea	466,362	16	21,648	4
18	01372575	Beacon (Newburgh)	492,233	17	25,871	3
19	--	Pollepel Island	511,848	18	19,615	3
20	--	Breakneck Point (Catskill aqueduct)	518,712	19	6,864	2
21	--	Cold Spring	530,845	20	12,133	3
22	01374019	West Point	542,988	21	12,143	6
23	0137402390	Beverly Dock	550,932	22	7,944	--
24	01374320	Indian Point	596,844	23	45,912	6
25	0137448530	Bowline Point (Haverstraw)	620,604	24	23,760	4
26	01374486	Tellers Point	636,972	25	16,368	3
27	01376303	Hastings-on-Hudson[5]	701,916	26	64,944	7

[1] Numbers shown wherever data were collected.

[2] Distances from Stedfast (1980, 1982)

[3] Total number of branches was 26, with 27 nodal points. Refer to figure 3 and appendix I and II for details.

[4] Total number of mainstem cross sections was 84; an additional 10 cross sections represent storage.

[5] Hastings-on-Hudson is 21.5 miles upstream from the Batttery in New York City.

changed by more than 800 ft^2. A total of 84 cross sections were used to represent the geometry of the main stem of the tidal Hudson, and another 10 represent side-channel storage areas (Stedfast, 1982).

The channel-geometry characteristics of the study area are depicted in figure 3 as profiles at selected segment divisions; channel cross-sectional area and width at various stages for each segment are given in appendix I. A schematic diagram of the modeled river system is included in figure 3; the one-dimensional representation contains five subreaches—Green Island to Turkey Point, Turkey Point to Clinton Point, Clinton Point to West Point, West Point to Bowline Point, and Bowline Point to Hastings-on-Hudson.

Boundary Conditions

The BRANCH flow model is driven either by upstream and downstream flow, by stage, or by both, and by tributary inflow and wind velocity. In this study, Green Island flow was input as the upstream boundary condition, and stage at either Hastings-on-Hudson or Bowline Point was used as the downstream boundary condition. Stage data also were collected at Albany, Turkey Point, Rogers Point, Clinton Point, and West Point (fig. 1); these measured interim stages and their corresponding flows were used to calibrate and verify the model. The stage data were used to calculate starting water-surface elevations at all 27 nodal points. Inflows of tributaries were measured at Moordener Kill at Castleton-on-Hudson (01359750), Esopus Creek at Mt. Marion (01364500), Rondout Creek at Rosendale (01367500), Wallkill River at Gardiner (01371500), Wappinger Creek at Wappinger Falls (01372500), and Croton River at Croton Dam (01375000) (fig. 1). The drainage areas and flows for these gages were used to estimate flows for ungaged drainage areas between the gages and their respective tributary mouths (table 11). Wind-velocity and direction data were provided at Albany and LaGuardia Airports by NWS. Wind data rarely differed greatly between the two measurement sites, but when the wind was downstream (southward), Albany data were used, and when it was upstream (northward), LaGuardia data were used. An example of boundary input data is given in appendix II.

Table 11. *Nodal-point and corresponding boundary conditions used in Hudson River, N.Y., BRANCH flow model*

[Locations are shown in figs. 1, 2, and 3. mi^2, square miles]

Nodal point	*Station number*	*Boundary condition and location**	*Drainage area above gage site (mi^2)*	*Drainage area above mouth (mi^2)*
1	01358000	Streamflow at Hudson River at Green Island	8,090	8,090
2	--	Wind direction and velocity at Albany	--	--
3	--	Storage near Castleton-on-Hudson	--	--
3	01359750	Streamflow at Moordener Kill at Castleton-on-Hudson	32.6	33
5	--	Storage near Schodack Landing	--	--
7	--	Storage near Stockport	--	--
9	--	Storage near Catskill	--	--
11	--	Storage near West Camp	--	--
13	01364500	Streamflow at Esopus Creek at Mt. Marion	419	425
	01367500	Streamflow at Rondout Creek at Rosendale	383	--
	01371500	Streamflow at Wallkill River at Gardiner	695	--
14	01372000	Streamflow for combined Rondout/Wallkill	1,078	1,172
18	01372500	Streamflow at Wappinger Creek near Wappinger Falls	181	210
26	01375000	Streamflow at Croton River at Croton Dam	378	381
27	01376303	Wind direction and velocity at Hastings-on-Hudson (LaGuardia Airport data)	--	--

* Location of lower boundary-condition stage data used for each model reach is given in tables 15 and 16.

Theta and Chi

Two factors that affect the magnitude and timing of the flow in the BRANCH model are *theta*, the finite-difference weighting factor for the spatial derivatives, and *chi*, a weighting factor for function values in the flow equations; both can range from 0.5 to 1.0. Several combinations were tested and a *theta* value of 1.0 and a *chi* value of 0.5 were selected; these values affected mainly the timing of flow.

Bed Friction and Internal Friction

Another important factor in model calibration is the flow-resistance coefficient, *eta*, which retards flow. Although principally dependent on channel roughness, the flow-resistance coefficient also may account for schematization inaccuracies and departures from assumed conditions (Schaffranek and others, 1981). The flow-resistance coefficients that were used in this study for the reach between Albany and Clinton Point were those previously calculated by Stedfast (1982). When the simulation represented only the reach between Green Island and West Point, the closest match for flow and stage resulted from a flow-resistance coefficient of 0.017 between Clinton Point and West Point. The computed and observed stages at Clinton Point for September 26-27, 1989 are plotted in figure 7. Similarly, measured flow at Tellers Point on August 22-23, 1990, was checked against flow data for the reach from the Bowline Point to Hastings-on-Hudson (fig. 8H); a flow-resistance coefficient of 0.0185 gave the best fit for this reach. Flow-resistance coefficients for model subreaches are listed in appendix II.

The reach from West Point (river width about 2,100 ft) south to Bowline Point (river width about 15,000 ft) is prone to variable-density stratification. These density dynamics cause large internal friction that can affect both the volume and timing of flows. The effect of density differences among reaches was investigated; the relation of water density to reach location when average discharge at Green Island ranged from 5,500 to 11,500 ft^3/s during the summers of 1989 and 1990 are plotted in figure 9. Because BRANCH algorithms assume constant density and one-dimensional flow, the simplification of the actual internal friction processes as incorporated in the model requires adjustments to the flow-resistance coefficient (*eta*) to correctly simulate observed flows. The flow-resistance coefficients for the reach between West Point and Bowline Point, where the river widens considerably, were optimized for those measurements to give the best fit. The flow-resistance factors are plotted in relation to specific conductance at Bowline Point in figure 10; model sensitivity analyses are summarized in table 12. The improvement resulting from the use of varied water-density coefficients between segments is minimal when compared to the constant-freshwater-density results and supports the theory that well-mixed reaches, no matter how varied the longitudinal density differences, will not greatly alter the tidal flow. Increasing the flow-resistance coefficient (*eta*) for the reach from West Point to Bowline Point to account for internal friction losses in conjunction with increased salinity gave an improvement of 17 percent for the August 1989 measurement. The final flow-resistance coefficients used for the reach between West Point and Bowline Point for all measurements made between June 1989 and August 1990 are given in table 13 and ranged from 0.0110 for a specific conductance at or below 1400 µS/cm to 0.040 for a specific conductance of about 9,000 µS/cm at Bowline Point.

The BRANCH model also requires that a momentum coefficient be defined that describes the horizontal and vertical velocity profiles. In this study, a value of 1.000 was used for computational purposes. In natural channels, momentum coefficient can be much greater than 1.000, but any resulting error in the

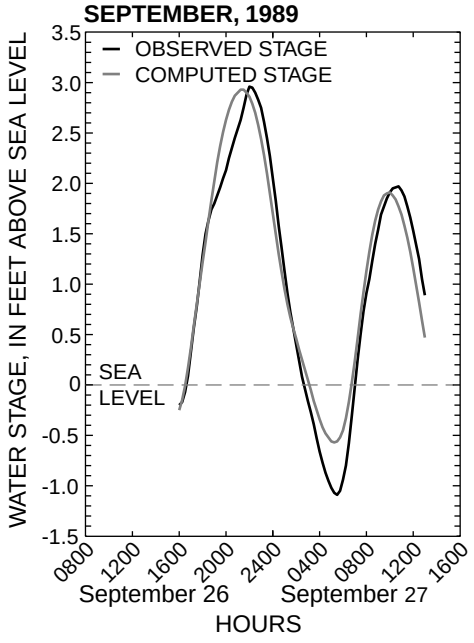


Figure 7. *Observed and computed stage of Hudson River at Clinton Point, N.Y., September 26-27, 1989.*

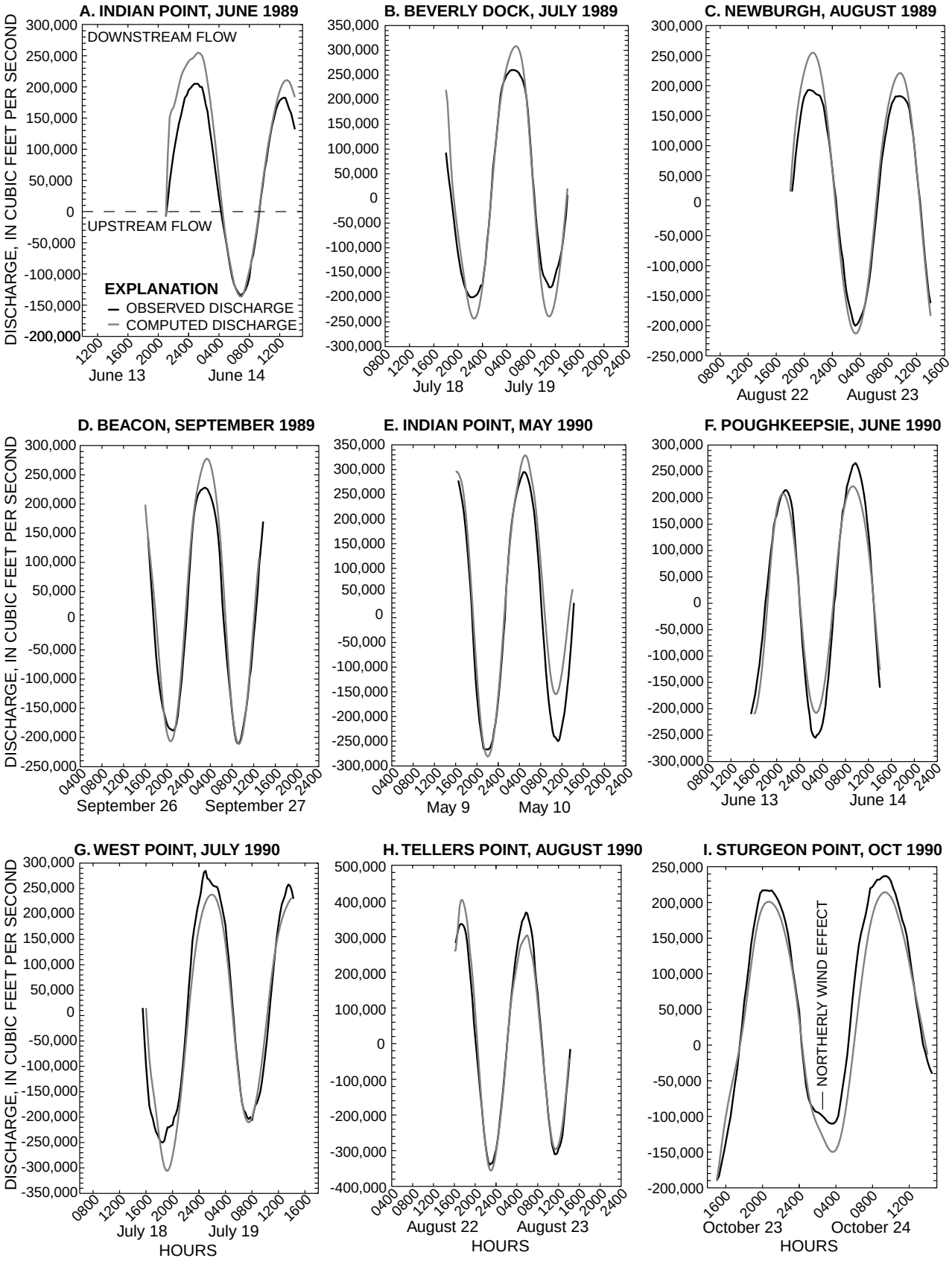


Figure 8. *Observed and computed discharge of Hudson River, N.Y., at nine sites in spring and summer of 1989 and 1990.*

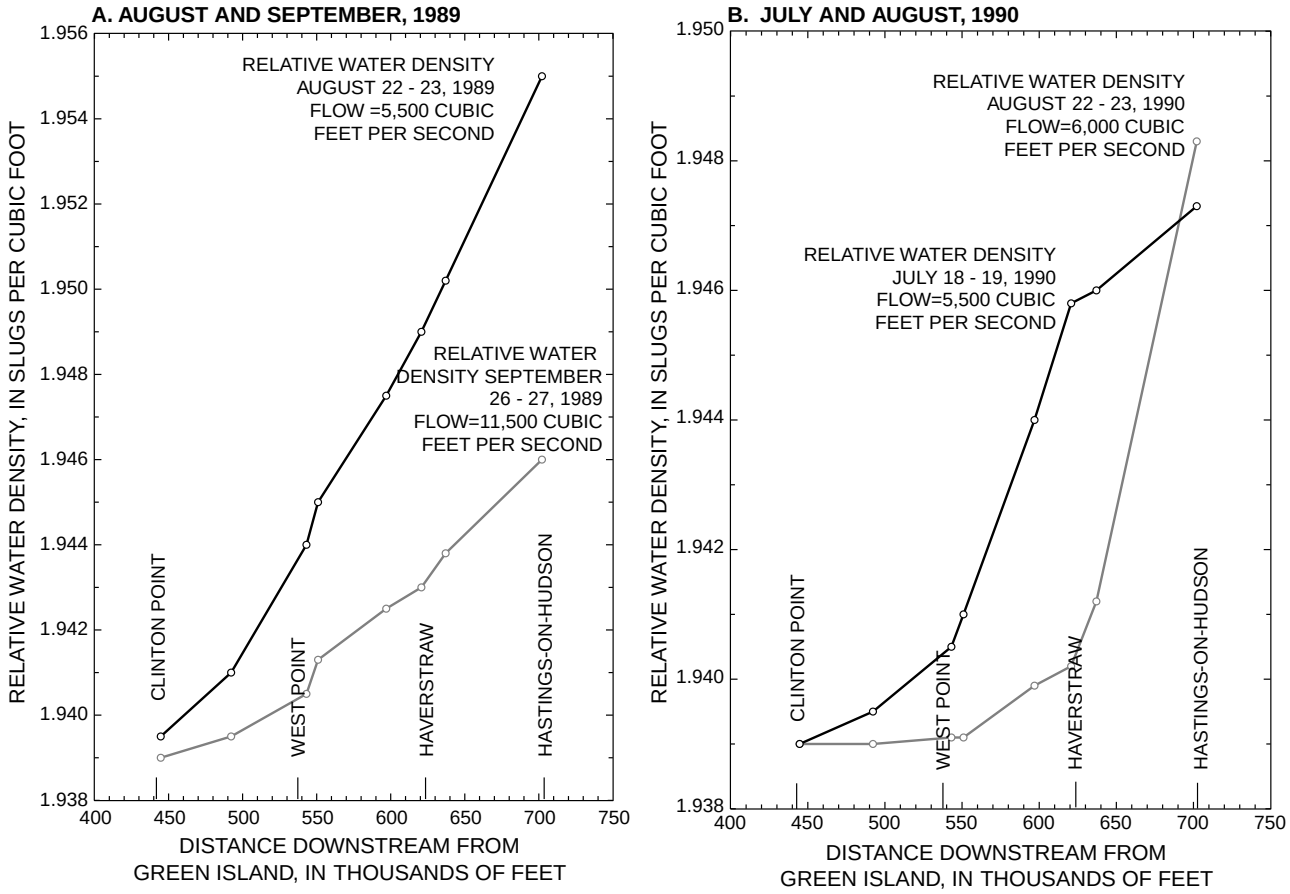


Figure 9. *Water density as a function of location at selected Green Island flows in 6.6-mile reach between Clinton Point and Hastings-on-Hudson, N.Y.: A. August and September 1989. B. July and August 1990.*

computation is assumed to be minimal because the importance lies in the relative difference between cross sections, rather than their actual magnitudes.

Wind Velocity

Wind-velocity data collected at Albany and LaGuardia Airports by the National Weather Service were input on a 3-hour frequency to provide 8 values per day. The average wind speeds at Albany and LaGuardia Airports during calendar year 1990 were 10.5 and 13.8 mi/h, respectively; wind speed during the flow measurements on August 22-23, 1989, was 8.8 mi/h at Albany and 11.2 mi/h at LaGuardia— similar to the annual 1990 values. A sensitivity test of wind effect was made for the August 1989 flow measurement at Newburgh, in which net velocity was increased by 3 mi/h and 6 mi/h. Results (table 14) indicate that increases in the 3- to 6-mi/h range do not cause greater than 10-percent bias in ebb- and flood-flow volume; therefore, wind data from either airport could have been used in the modeling without any significant change in results. A storm on October 24, 1990, at about 1 a.m. in the area of the flow measurement at Sturgeon Point (RM 90.4) was accompanied by wind from the north that impeded upstream flow; the wind velocity was reported to have exceeded 20 mi/h, and river-surface waves were 2 to 3 ft high. These high waves could have decreased the accuracy of flow measurements between 1 a.m. and 8 a.m. that day, and the need for increased flexibility in wind-data requirements for the modeling was noted. Because only one wind-velocity site (Albany) was represented in the model, and because the data represent only 3-hour intervals, the decrease in the upstream flow was difficult to replicate (fig. 8I). Shorter wind-data-collection intervals and use of additional wind-data sites would be useful in future modeling efforts because the study reach is too long to be accurately represented by only one wind-data site. To address this shortcoming, the lower end of the reach was moved 30.1 mi north, from Hastings-on-Hudson to West Point for the October 1990 simulation, to shorten

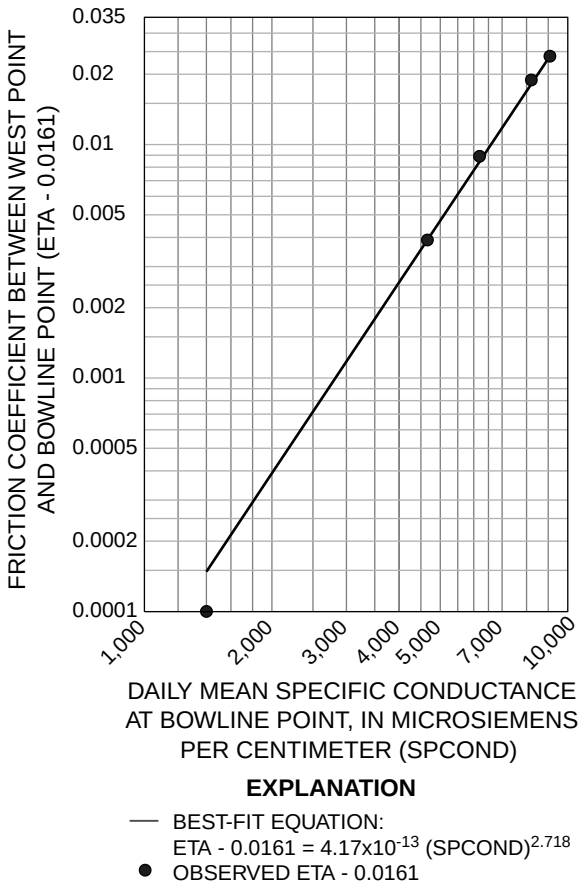


Figure 10. *Friction coefficient in relation to specific-conductance of Hudson River at Bowline Point for 17.8-mile reach from West Point to Bowline Point, N.Y.*

the reach and make the lower boundary-condition stages more representative of any wind-induced conditions at Sturgeon Point. This decreased the daily-mean absolute errors by 0.1 and 3.6 percent for October 23 and 24, 1990, respectively (table 16).

Results

The model for the reach between Green Island and Clinton Point was calibrated from 10 discharge measurements made at five locations (Poughkeepsie, Rhinecliff, Red Hook, Catskill, and Albany) during 1965-67 (Giese and Barr, 1967; Busby and Darmer, 1970) and 1979-80 (Stedfast, 1982). Model coefficients from the USGS modeling study of the Albany-to-Clinton Point reach (Stedfast, 1982) were used as the basis for this calibration. A recalculation done for this study incorporated tributary inflow and wind data and extended the reach 8 mi upstream from Albany to the Federal Dam at Troy so that Green Island flow could be used in place of Albany stage as the upstream boundary condition; flow-resistance coefficients (given in appendix II) were not changed, nor were previous datum corrections. The discharge and stage errors for the sites in this reach are given in table 15. Flow simulations for the 10 measurements of discharge used for model calibration had daily-mean biases that ranged from -21.0 to +4.8 percent; average flow-simulation bias was -6.6 percent (11.5 percent mean absolute error). Stage simulations had daily-mean biases from -0.03 to +0.22 ft (+0.07 mean bias; 0.16 ft RMSE); stage bias in 10 of 14 daily simulations ranged from 0 to +0.08 ft.

The model results for flows between Green Island and Clinton Point were verified with two sets of flow measurements made at Poughkeepsie (RM 76.5) during June 1990 and Sturgeon Point (RM 90.4) during October 1990. The discharge and stage errors for these two sites are given in table 16. Flow simulations for the two tidal-cycle measurements of discharge used for model verification had daily-mean biases that ranged from -13.9 to +15.0 percent; average flow-simulation bias was -1.5 percent (21.4 percent mean absolute error); stage simulations had daily-mean biases from -0.07 to +0.28 ft (+0.1 ft mean bias; 0.2 ft RMSE).

The model reach from Clinton Point to Hastings-on-Hudson was calibrated from three sets of flow and stage data collected at two sites in June and September of 1989 and May of 1990. The calibration for this reach used data from Indian Point and Beacon. The discharge and stage errors for these two sites are given in table 16. Flow simulations for the three measurements of discharge used for model calibration had daily-mean biases that ranged from -7.3 to +11.6 percent (the June 13, 1989, value was not used because of the short period represented, less than 3 hours); average flow-simulation bias was +4.9 percent (16.6 percent mean absolute error). Stage simulations had daily-mean biases from -0.05 to +0.08 ft (0 ft mean bias; 0.1 ft RMSE).

This model reach (Clinton Point to Hastings-on-Hudson) was verified with flow and stage data collected at four sites in July and August 1989 and July and August 1990. The discharge and stage errors for the verification measurements made at these sites—Beverly Dock (RM 50.1), West Point (RM 51.6), Newburgh (RM 61.4), and Tellers Point (RM 33.9)—are included in table 16. Simulations of flow at the times of the four discharge measurements used for

Table 12. *Effect of varying flow-resistance coefficients for Hudson River reach between West Point and Bowline Point, N.Y., on error in flow computations, and effect of varying water density for the reach between Clinton Point and Hastings-on-Hudson*

[Locations are shown in fig. 1]

Flow-resistance coefficient and density combinations	*Daily-mean bias in flow computation (percent)*		*Net bias in flow computation (percent)*
A. AUGUST 22-23, 1989	Aug. 22 (8 hours)	Aug. 23 (13.50 hours)	
Friction coefficient = 0.020 Density = 1.9390 at all cross sections	+33.9	+21.1	+25.8
Average density ranges from 1.939 at Clinton Point to 1.9550 at Hastings-on-Hudson	+28.7	+23.5	+25.4
Friction coefficient = 0.040 Density = 1.9390 at all cross sections	+21.7	+4.2	+10.7
Average density ranges from 1.939 at Clinton Point to 1.9550 at Hastings-on-Hudson	+17.8	+6.6	+10.8
B. SEPTEMBER 26-27, 1989	Sept. 26 (6 hours)	Sept. 27 (13 hours)	
Friction coefficient = 0.020 Density = 1.9390 at all cross sections	-8.5	+13.0	+6.2
Average density ranges from 1.939 at Clinton Point to 1.946 at Hastings-on-Hudson	+3.7	+13.1	+10.1
C. JULY 18-19, 1990	July 18 (8 hours)	July 19 (14 hours)	
Friction coefficient = 0.035 Density = 1.9390 at all cross sections	-13.7	-8.6	-10.5
Average density ranges from 1.939 at Clinton Point to 1.9473 at Hastings-on-Hudson	-11.2	-11.7	-11.5

model verification had daily-mean biases from -11.5 to +23.7 percent; average flow-simulation bias was +1.5 percent (10.7 percent mean absolute error). Stage simulations had daily-mean biases from -0.31 to +0.40 ft (+0.1 ft mean bias; 0.4 ft RMSE).

In summary, the model was calibrated and verified to a total of 19 tidal-cycle discharge measurements made at 11 locations with conventional and acoustic Doppler current-profiler methods. Maximum measured instantaneous tidal flow ranged from 20,000 ft^3/s at Albany to 368,000 ft^3/s at Tellers Point; daily-mean flow at Green Island ranged from 3,030 ft^3/s to 45,000 ft^3/s. Successive ebb- and floodflow volumes were measured and compared with computed volumes; daily-mean bias was -1.6 percent (range from -21.0 to +23.7 percent; 13.5 percent mean absolute error). Daily-mean deviation between simulated and measured stage at 8 locations (from Bowline Point to Albany) over the 19 tidal-cycle measurements averaged +0.06 ft (range from -0.31 to +0.40 ft; 0.21 ft RMSE). These results indicate that the model can accurately simulate flow in the Hudson River under a wide range of inflow, tidal, and meteorological conditions. Examples of the match between observed and computed flow data at nine selected sites in 1989 and 1990 are plotted in figure 8; stage data on September 26-27 at Clinton Point are plotted in figure 7.

Table 13. *Specific conductance of Hudson River at Hastings-on-Hudson and Bowline Point, and flow-resistance coefficient (eta) for West Point to Bowline Point, N.Y. in 1989-90 flow simulations*

[Locations are shown in fig. 2. Dash indicates no data]

Date (1989-90)	Specific conductance, in microsiemens per centimeter at 25°Celsius						Flow-resistance coefficient (eta)
	Hastings-on-Hudson		Bowline Point				
	Daily mean	Mean	Top daily mean	Middle daily mean	Bottom daily mean	Mean	
1989							
June 13	3,820	4,380	536	1,770	1,550	1,530	0.0155
June 14	4,940		777	2,370	2,170		
July 18	13,700	14,700	8,590	9,950	11,940	10,140	.0400
July 19	15,700		9,660	9,520	11,200		
Aug. 22	17,500	17,700	7,590	7,990	8,890	8,030	.0400
Aug. 23	17,900		7,450	7,760	8,480		
Sept. 26	8,400	7,945	4,840	5,510	5,320	4,660	.0200
Sept. 27	7,490		3,770	4,300	4,190		
1990							
May 9	--	--	1,890	2,310	2,660	1,980	.0155
May 10	--		1,540	1,620	1,830		
June 13	--	--	4,320	6,400	7,460	6,190	.0250
June 14	--		4,600	6,720	7,660		
July 18	--	--	7,790	8,020	8,760	8,210	.0350
July 19	--		7,890	8,100	8,700		
Aug. 22	10,700	10,600	1,530	2,180	1,720	1,980	.0155
Aug. 23	10,500		1,700	2,610	2,110		
Oct. 23	8,620	7,650	1,240	1,760	1,810	1,400	.0110
Oct. 24	6,680		759	1,340	1,480		

Table 14. *Bias in simulated successive ebb- and flood-flow volumes of Hudson River at Newburgh, N.Y., August 22-23, 1989, resulting from simulated increase in wind velocity*

[All values are percent error]

		Wind-velocity increase, in miles per hour		
Date	*Time*	*0**	*3*	*6*
Aug. 22	1800 - 2400	+21.8	+26.0	+31.6
Aug. 23	0015 - 0530	-1.1	-5.0	-9.7
	0545 - 1330	+10.7	+12.4	+14.2
	1345 - 1400	-2.3	-4.4	-4.6
Weighted mean error		+10.8	+11.7	+12.9

* See figure 8C

SALT-FRONT MOVEMENT SIMULATION BY THE BRANCH-NETWORK FLOW MODEL

Conservative particle (tagged solutes) movement between Green Island and Hastings-on-Hudson during the 26 days from July 18 through August 13, 1990, was examined before the transport-modeling effort began, and ten particle-entry locations were used to plot the traveltimes of conservative particles. The movement of ten different particles for the 26-day period is plotted in figure 11A. For example, the average flow at Green Island during July 18-29 was 5,970 ft^3/s; from then until August 5 it averaged 4,220 ft^3/s, and during August 6-13 it averaged 12,000 ft^3/s. A particle entering at Bowline Point moved about 6 mi in the first 18 days (0.33 mi/d during July 18-August 4), then, when the average flow increased to 12,000 ft^3/s, the particle moved 11 mi in the next 8 days (1.38 mi/d). Average particle speeds downstream from Green Island are plotted in figure 11B as a function of discharge. These are the maximum rates at which a conservative particle would move; nonconservative (reactive) particles would tend to move more slowly. The net increases in the distance a particle moves downstream for flow increases of 1,000 ft^3/s, 3,000 ft^3/s, and 5,000 ft^3/s at Green Island are plotted in figure 11C.

Simulated Effect of Withdrawals and Flow Increases

Hypothetical withdrawals at selected points were simulated, and the resulting salt-front positions were calculated, in an effort to quantify the upstream movement of the salt front that would result from withdrawals to provide emergency supplies for New York City.

Withdrawals at Kingston, Chelsea, and Newburgh

The Chelsea Pump Station at present is capable of withdrawing 100 Mgal/d from the Hudson River, but withdrawals of as much as 300 Mgal/d have been discussed. Therefore, five scenarios of withdrawals totaling 300 Mgal/d were simulated with the BRANCH model: (1) 300 Mgal/d at Chelsea or Newburgh, (2) 100 Mgal/d at Chelsea and 200 Mgal/d at either Kingston or Newburgh, and (3) 100 Mgal/d at Kingston and 200 Mgal/d at Newburgh; the effect of these withdrawals on upstream movement of a conservative particle started at selected locations is summarized in table 17A. Results for conservative particles injected between Green Island and Tellers Point indicate that, of the five scenarios evaluated for the period of moderate flow (July 18 to August 13, 1990), the scenario that would have the smallest effect on salt-front movement is the one in which the Chelsea Pump Station withdrawal would increase from 100 Mgal/d to 300 Mgal/d. For this simulation, discharge at Green Island averaged 7,100 ft^3/s, and the initial salt-front location was at Clinton Point or below. The withdrawal that would have the smallest effect in the reach from Poughkeepsie upstream to Turkey Point would be withdrawal of 300 Mgal/d at Newburgh. The scenarios that would have the greatest effects on salt-front movement include withdrawals at Kingston, where the greater withdrawal could move a front initially near Poughkeepsie upstream by 1.1 mi.

Increased Rates of Withdrawals at Newburgh

Withdrawals of 1,000 ft^3/s (646 Mgal/d), 3,000 ft^3/s (1,939 Mgal/d), and 5,000 ft^3/s (3,232 Mgal/d) at Newburgh during the 26-day period between July 18 and August 13, 1990 were simulated; the effect of these withdrawals after 26 days on the movement of conservative particles that started at selected locations is shown in table 17B. Flows at Green Island from July 18 through August 5 averaged 5,000 ft^3/s; only during

Table 15. *Calibration error for discharge and stage measured at five locations on Hudson River between Green Island and Clinton Point, N.Y., before 1981*

[Locations are shown in fig. 2. All simulations represent reach from Green Island to Clinton Point unless otherwise noted. Bias, daily-mean bias; RMSE, root mean square error; horseman, hours and minutes; --, dash indicates no record]

		Calibration error					
		Discharge			Stage		
Date of measurement	Location	Bias (percent)	Absolute error (percent)	Error weight (hours:min)	Bias (feet)	RMSE (feet)	Error weight (hours:min)
Aug. 11, 1965	Poughkeepsie	-20.9[1]	20.9[1]	7:30	+0.01	0.26	9:00
May 24, 1966	Poughkeepsie	-6.6	22.8	16:00	+.01	.04	16:00
May 25, 1966	Poughkeepsie	-6.2	6.2	10:45	+.02	.04	11:00
May 24, 1966	Bard Rock (Hyde Park)	--	--	--	-.01	.07	16:00
May 25, 1966	Bard Rock (Hyde Park)	--	--	--	+.04	.08	11:00
Aug. 30, 1966	Poughkeepsie	+4.8	20.1	9:18	+.05	.06	9:15
Aug. 30, 1966	Bard Rock (Hyde Park)	--	--	--	+.08	.11	14:00
Aug. 30, 1966	Albany	--	--	--	-.03	.24	14:00
June 21, 1967	Poughkeepsie	-9.9	9.9	10:24	+.16	.16	16:00
June 22, 1967	Poughkeepsie	-8.1	8.1	8:36	+.12	.12	11:00
June 21, 1967	Rhinecliff	-2.5	2.8	11:23	+.19	.22	16:00
June 22, 1967	Rhinecliff	--	--	--	+.07	.12	11:00
Aug. 21, 1979	Poughkeepsie	-7.2	7.2	11:08	--	--	--
Aug. 21, 1979	Red Hook	-0.2	4.6	9:18	--	--	--
Aug. 21, 1979	Albany	-21.0	21.0	7:50	+.22	.47	13:00
Aug. 21, 1979	West Camp	--	--	--	0	.20	13:00
Mar. 26, 1980	Albany	-6.1	6.1	10:45	--	--	--
Apr. 18, 1980	Catskill	+4.7[2]	4.7[2]	4:45	--	--	--
Weighted mean error		-6.6	11.5		+.07	.16	

[1] Wind velocity used for this measurement was recorded at LaGuardia Airport; wind velocity recorded at Albany Airport for all others.

[2] Green Island to West Camp reach.

the last 7 days of the period (August 7-13) did flows exceed 10,000 ft^3/s. Withdrawals of 1,000 ft^3/s, 3,000 ft^3/s, and 5,000 ft^3/s at Newburgh would shorten the downstream movement of a particle (salt front) started at the Chelsea Pump Station (RM 66.2) (table 17B) by 1.4 mi, 4.6 mi, and 7.4 mi, respectively; flows north of Rogers Point (RM 81.0) would be unaffected. This indicates that these withdrawals would affect at least 21 mi of the river upstream of Newburgh; the 5,000-ft^3/s withdrawal also would affect as much as 27 mi of the river downstream from Newburgh, and the 1,000- and 3,000-ft^3/s withdrawals would affect the river for at least 9 mi downstream from Newburgh.

Increased Flow at Green Island

Flow increases of 1,000 ft^3/s, 3,000 ft^3/s, and 5,000 ft^3/s at Green Island for the period from July 18 through August 13, 1990, were used to simulate the effects of flow augmentations on conservative-particle movement; results are included in table 17B and figure 11C. Generally, all other conditions remaining constant, an increase in discharge at Green Island would increase the rate of downstream movement of a particle. Given an initial average Green Island flow of 7,100 ft^3/s a flow increase of 1,000 ft^3/s could cause a particle started at the Chelsea Pump Station to move 1.4 mi farther downstream than it would otherwise.

Table 16. *Calibration and verification error for discharge and stage measured at seven locations on Hudson River, between Green Island and Hastings-on-Hudson, N.Y., after 1981*

[Locations are shown in fig. 2. All simulations represent reach from Green Island to Hastings-on-Hudson unless otherwise noted. Calib, calibration; Verif, verification; Bias, daily-mean bias; RMSE, root mean square error; hours:min, hours and minutes]

			Calibration or verification error					
			Discharge			Stage at West Point		
Date of measurement	Location	Calib. (C) or verif. (V)	Bias (percent)	Absolute error (percent)	Error weight (hours:min)	Bias (feet)	RMSE (feet)	Error weight (hours:min)
June 13, 1989	Indian Point	C	+53.8[1]	53.8[1]	2:56	+0.05[1]	0.28[1]	3:00
June 14 1989	Indian Point	C	+5.0[1]	9.7[1]	9:44	+.03[1]	.06[1]	14:00
July 18, 1989	Beverly Dock	V	+23.7	23.7	5:07	+.21[2]	.64[2]	8:00
July 19, 1989	Beverly Dock	V	-0.7	3.4	12:33	-.13[2]	.52[2]	14:00
Aug. 22, 1989	Newburgh	V	+21.3	21.3	5:45	+.17	.63	9:00
Aug. 23, 1989	Newburgh	V	+4.7	5.5	13:25	+.06	.28	14:00
Sept. 26, 1989	Beacon	C	-6.1	6.1	7:30	+.06[3]	.13[3]	8:00
Sept. 27, 1989	Beacon	C	+11.6	16.6	12:45	+.08[3]	.08[3]	13:00
May 9, 1990	Indian Point	C	+6.9[3]	6.9[3]	4:54	+.05[3]	.07[3]	7:30
May 10, 1990	Indian Point	C	-7.3[3]	23.4[3]	12:45	-.05[3]	.08[3]	14:00
June 13, 1990	Poughkeepsie	V	+15.0	26.4	8:00	+.28	.34	8:00
June 14, 1990	Poughkeepsie	V	-13.9	13.9	8:00	+.06	.20	14:00
July 18, 1990	West Point	V	-11.5	11.5	8:00	-.31	.37	8:00
July 19, 1990	West Point	V	-8.6	8.6	13:45	+.11	.23	14:00
Aug. 22, 1990	Tellers Point	V	+18.9	18.9	7:45	+.40[4]	.50[4]	8:00
Aug. 23, 1990	Tellers Point	V	-9.9	9.9	11:52	0[4]	.19[4]	14:00
Oct. 23, 1990	Sturgeon Point	V	-12.1[5], -12.2[6]	12.1[5], 12.2[6]	6:29	-.07[3]	.17[3]	9:00
Oct. 24, 1990	Sturgeon Point	V	+1.2[5], +3.7[6]	27.3[5], 30.9[6]	13:44	+.06[3]	.09[3]	14:00
Weighted mean error			+1.9	14.9		+.05	.25	

[1] Albany to Bowline Point reach.

[2] Stage at Clinton Point.

[3] Green Island to Bowline Point reach.

[4] Stage at Bowline Point.

[5] Green Island to West Point reach; high winds noted.

[6] Green Island to Hastings-on-Hudson reach; high winds noted.

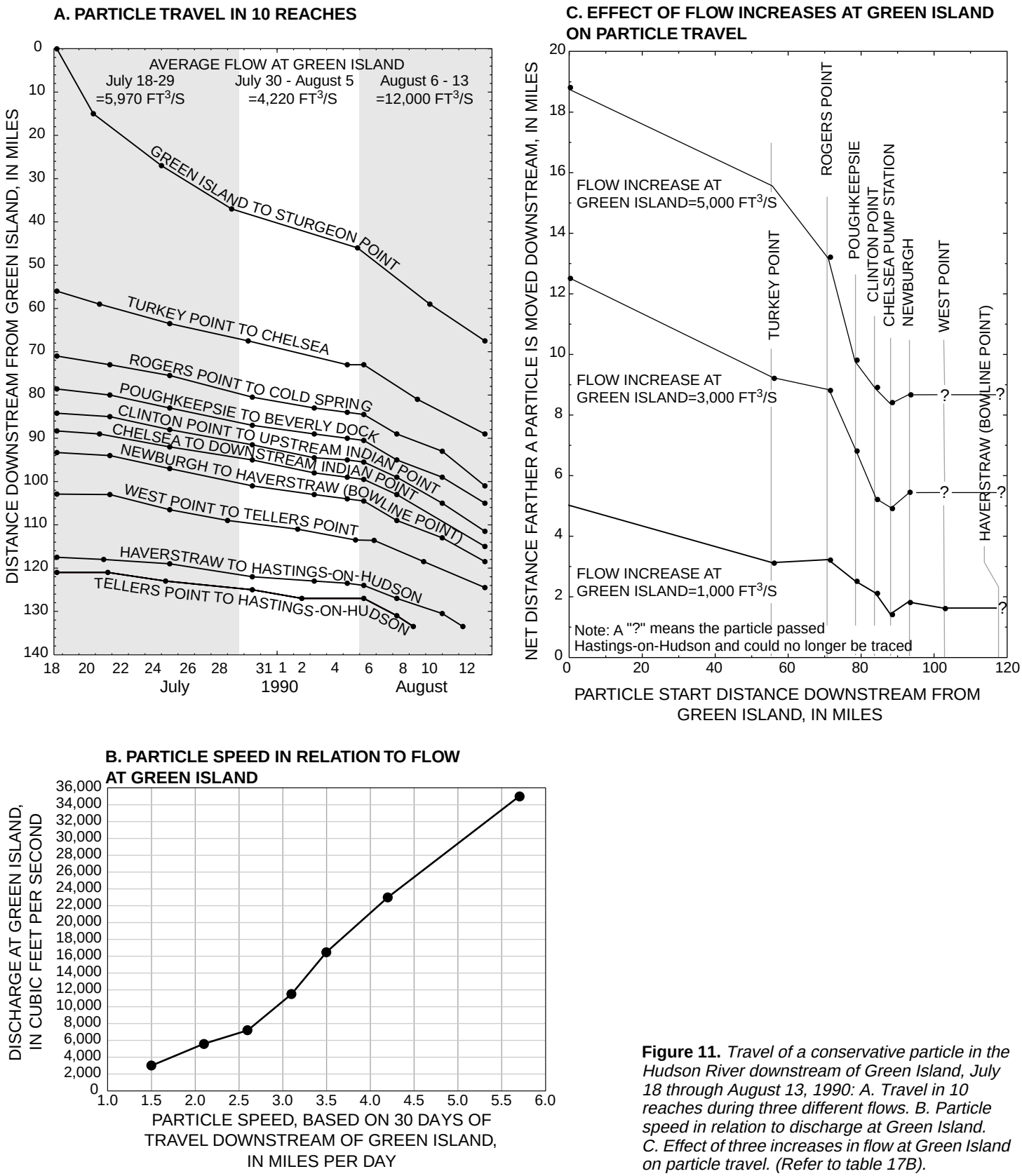


Figure 11. *Travel of a conservative particle in the Hudson River downstream of Green Island, July 18 through August 13, 1990: A. Travel in 10 reaches during three different flows. B. Particle speed in relation to discharge at Green Island. C. Effect of three increases in flow at Green Island on particle travel. (Refer to table 17B).*

Table 17. *Effect of simulated withdrawals from Hudson River, and augmented inflow at Green Island, N.Y., on conservative particle movement 26 days after entry, July 18 through August 13, 1990*

[Locations are shown in fig. 2. Values to right of shaded column indicate change in particle location, in miles, from the corresponding location in shaded column (unstressed-condition location). Negative values represent upstream movement; positive values indicate downstream movement. Values in shaded column are in river miles below Green Island dam.

--, indicates change could not be determined because particle left model reach; ft^3/s, cubic feet per second]

A. With simulated withdrawals, in million gallons per day, at Chelsea, Newburgh, and Kingston for an average discharge of 7,100 ft^3/s at Green Island

Particle-entry point								*Combined withdrawals*		
Station number	*Station location and river miles below Green Island*		*Particle distance below Green Island dam after 26 days, in miles (zero withdrawal)*	*Chelsea withdrawal*		*Newburgh withdrawal*		*Chelsea (100) + Newburgh (200)*	*Chelsea (100) + Kingston (200)*	*Kingston (100) + Newburgh (200)*
				100	*300*	*100*	*300*	*300*	*300*	*300*
01358000	Green Island	0	66.6	0	0	0	**0**	0	-0.2	-0.1
01364832	Turkey Point	55.9	90.6	-.3	-.1	0	**0**	-.2	-1.2	-.6
0137204020	Rogers Point	71.3	102.8	-.4	-1.0	-.1	**-.3**	-.6	**-1.4**	-.9
01372055	Poughkeepsie	78.6	109.5	-.2	-.6	-.1	**-.3**	-.4	**-1.1**	-.7
01372059	Clinton Point	84.2	113.6	-.2	**-.5**	-.2	-.6	-.5	-1.0	-.8
--	Chelsea	88.3	116.6	-.1	**-.4**	-.2	-.6	-.5	-.7	-.7
01372575	Newburgh-Beacon	93.2	119.2	-.1	**-.3**	-.2	-.7	-.6	-.6	-.7
01374019	West Point	102.8	125.1	-.1	**-.4**	-.3	-.8	-.7	-.7	-.8
0137448530	Bowline Point	117.5	133.0[1]	--	--	--	--	--	--	--
01374486	Tellers Point	120.6	133.0[1]	--	--	--	--	--	--	--

B. With increased rates of withdrawal at Newburgh or flow augmentation at Green Island

Particle-entry point			*Particle distance below Green Island dam after 26 days, in miles (zero withdrawal)*	*Withdrawals at Newburgh (million gallons per day)*			*Augmentation at Green Island (cubic feet per second)*		
Station number	*Station location and river miles below Green Island*			*646*	*1,939*	*3,232*	*1,000*	*3,000*	*5,000*
01358000	Green Island	0	66.6	0	0	0	5.0	12.5	18.8
01364832	Turkey Point	55.9	90.6	0	0	0	3.1	9.2	15.6
0137204020	Rogers Point	71.3	102.8	-.7	-1.3	-2.0	3.2	8.8	13.2
01372055	Poughkeepsie	78.6	109.5	-.7	-2.2	-3.7	2.5	6.8	9.8
01372059	Clinton Point	84.2	113.6	-1.2	-3.4	-5.8	2.1	5.2	8.9
--	Chelsea	88.3	116.6	-1.4	-4.6	-7.4	1.4	4.9	8.4
01372575	Newburgh-Beacon	93.2	119.2	-1.4	-4.8	-8.9	1.8	5.4	8.7
01374019	West Point	102.8	125.1	-1.7	-5.5	-8.5	1.6	--	--
0137448530	Bowline Point	117.5	133.0[1]	--	--	-7.0	--	--	--
01374486	Tellers Point	120.6	133.0[1]	--	--	-3.7	--	--	--

[1] The most downstream cross section in the flow model is Hastings-on-Hudson, 133.0 miles downstream from Green Island. A particle cannot be traced once it passes this location.

SALT-FRONT MOVEMENT SIMULATION BY THE BLTM SOLUTE-TRANSPORT MODEL

The Branched Lagrangian Solute-Transport Model (BLTM) was used to simulate the effects of hypothetical withdrawals on chloride concentrations in the reach from Turkey Point to Bowline Point. The BLTM differs from BRANCH particle tracking in that BRANCH accounts only for movement by advection (transport by currents) and does not account for solute movement by the combined effects of turbulent flow and molecular diffusion. The effects of molecular diffusion and turbulence are 1 to 2 orders of magnitude smaller than the effects of advection (Fischer and others, 1979) and are reflected in BLTM through the variable DQQ (the inverse of **dispersion**; thus, the lower the DQQ, the higher the rate of mixing).

Model Calibration

Daily discharge data were collected from May through August 1990 and during August 1991. Flows at each of the 84 cross sections between Green Island and Hastings-on-Hudson were computed at 15-min intervals, then transformed into daily values. Only the 61.0-mi reach from Turkey Point to Bowline Point was used in the model calibration. This reach was treated as a single branch in BLTM for the 1990 and 1991 data. Daily chloride concentrations at Bowline Point were used as the lower boundary condition to simulate daily values for West Point, where several periods of measured daily chloride data were available for calibration.

In 1990, the salt front did not move much farther upstream than Newburgh; therefore, calibration could not be made for locations north of Newburgh. In 1991, the salt front moved much farther upstream, however, and the calibration reach for this period was extended to the Poughkeepsie Water-Treatment Plant. West Point had the only operating chloride-concentration gage in August 1991, so the reach used for the 1991 calibration was Turkey Point to West Point.

The solute-transport model uses a variable DQQ, which was assigned to each cross section to control the rate of mixing in the model. Because upstream tributary inflow can have a large effect on DQQ, periods of high flow (April through June) and periods of low flow (July through August) were evaluated separately.

Turkey Point to Bowline Point

The 61.0-mi reach from Turkey Point to Bowline Point included 36 cross sections.

Boundary Conditions

Boundary conditions for the 1990 simulations were (1) daily chloride concentration at Bowline Point and Turkey Point, (2) daily flow at each cross section, and (3) the area and width of each cross section as computed by the flow model.

Initial Conditions

DQQ values were assigned to each cross section on the basis of cross-sectional width and data on the upstream movement of the salt front from Newburgh in 1990. Starting flows were generated by the flow model. Initial chloride concentrations were derived from measured Bowline Point and West Point data and from relations between chloride concentrations at these sections and those measured at other cross sections during salt-front delineations.

Results

The BLTM was used to simulate chloride transport in the 61-mi reach from Turkey Point (RM 98.5) to Bowline Point (RM 37.5) under two seasonal conditions in 1990—spring conditions of high inflow and low salinity (April-June; daily-mean discharge at Green Island 23,700 ft^3/s) and summer conditions of low inflow and high salinity (July-August; daily-mean discharge at Green Island 7,150 ft^3/s). Measured chloride concentrations at Bowline Point were used to drive the BLTM simulations, and concentrations measured at West Point were used for calibration. Observed and simulated chloride concentrations for the April-June 1990 calibrations and the July-August 1990 calibrations for West Point are plotted in figure 12. Mean bias in simulated chloride concentration for the April-June 1990 data (fig. 12A, observed range 12 to 201 mg/L; 30 mg/L RMSE) was –16 mg/L. Mean bias for the July-August 1990 data (fig. 12B, observed range 31 to 2,000 mg/L; 535 mg/L RMSE) was +126 mg/L. The August 1-29 calibration (fig. 12C) had a mean bias of 11 mg/L. Even though frictional resistance between West Point and Bowline Point varies considerably, depending on tributary-inflow conditions, a single mean value of the flow-resistance coefficient (*eta*) was used by the flow

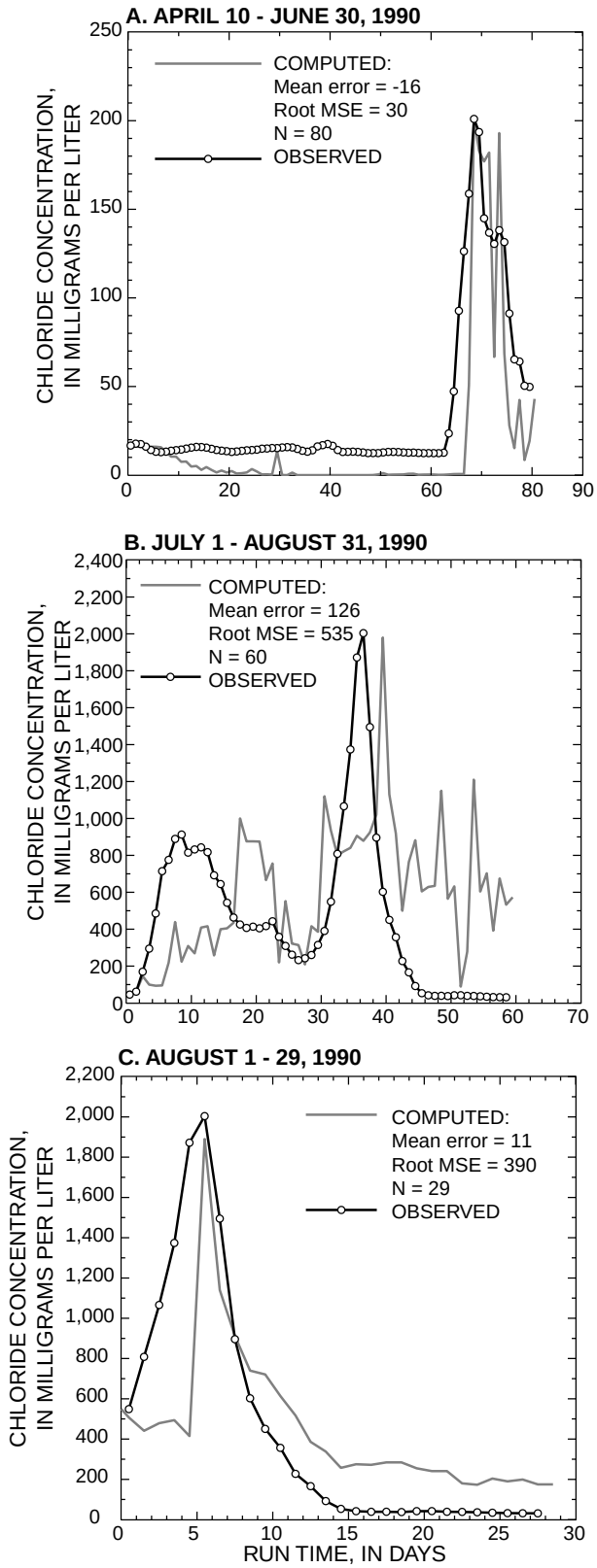


Figure 12. *Observed and simulated chloride concentrations at West Point, N.Y., as a function of time during three solute-transport model calibrations in 1990: A. April 10-June 30. B. July 1-August 31. C. August 1-29.*

model in this reach for the entire simulation period; this could account for the high simulated chloride concentrations after the August peak, when flows at Green Island more than tripled. Relating the flow-resistance coefficient for this reach to specific conductance values at Bowline Point on a continuous basis could improve the accuracy of simulations.

Turkey Point to West Point

The reach between Turkey Point and West Point was calibrated to the August 1991 data to obtain DQQ values for these 26 cross sections. No continuous specific conductance data were collected in the reach above West Point during August 1991 (the only period during the study in which the salt front moved north of the bay at Newburgh); therefore, the accuracy of the solute-transport model at several locations was checked by comparison with salt-front-delineation data that related specific conductance at West Point to chloride concentration at West Point, Catskill Aqueduct (RM 56.2), Newburgh, Chelsea Pump Station, and Clinton Point. The regression equations are shown in table 6; the computed 1991 chloride concentrations at Chelsea Pump Station and Clinton Point used for calibration are given in table 5. These equations also were used to calculate the daily chloride concentration at the IBM pier below Poughkeepsie (RM 72.3), the Central Hudson Powerplant just south of the Mid-Hudson Bridge at Poughkeepsie (RM 74.8), and the Poughkeepsie Water-Treatment Plant (RM 77.2).

Boundary Conditions

The West Point daily chloride concentrations were used to simulate input data for chloride concentration at Chelsea Pump Station and Clinton Point. Other input categories for each cross section were (1) daily flow computed by the BRANCH flow model, (2) cross-section area, and (3) cross-section width.

Initial Conditions

The DQQ values used for the reach downstream of Newburgh for July and August 1990 also were used for the August 1991 calibration. Values of DQQ were adjusted for the reach from Turkey Point downstream to Newburgh; the data are included in table 18. Initial chloride concentrations were obtained in the same manner as the 1990 calibrations.

Table 18. *Observed and simulated chloride concentrations in Hudson River between Turkey Point and West Point, N.Y., August 9-31, 1991*

[Locations are shown in fig. 2. mi, miles. Concentrations are in milligrams per liter]

Station name	Distance below Green Island (mi)	Dispersion coefficient (DQQ) from BLTM model	Chloride concentration	
			Observed maximum instantaneous	Simulated maximum daily
Turkey Point	55.92	0.5	--	--
Rhinecliff	62.72	.5	--	--
Bard Rock	71.32	.5	--	25
Rogers Point	73.52	.5	--	27
St. Andrews on the Hudson	75.63	.5	--	35
Poughkeepsie Water Treatment Plant	77.33	--	48	43
Poughkeepsie railroad bridge	78.13	--	60	71
Poughkeepsie	78.63	1.0	--	75
Central Hudson Powerplant	79.73	--	115	--
Milton	81.23	1.0	--	141
IBM pier	82.23	--	204	194
Clinton Point	84.23	.1	464	264
Marlboro	85.53	7.0	--	363
Cedar Cliff	86.83	.1	--	400
Chelsea Pumping Station	88.33	4.0	990	629
Brockway	90.93	3.8	--	--
Newburgh, I-84 Bridge	92.23	--	1,440	945
Newburgh-Beacon	93.23	3.3	--	1,070
Hammond	95.43	2.5	--	--
Pollepel Island	96.94	.1	--	--
Catskill Aqueduct/Breakneck Point	98.24	.1	2,450	1,630
Little Stony Point	99.44	.1	--	--
--	100.04	6.0	--	--
--	100.84	8.0	--	--
West Point North Dock	101.51	10.0	--	--
Gees Point	101.87	12.0	--	--
--	102.29	20.5	--	--
West Point South Dock	102.86	--	3,150	2,260

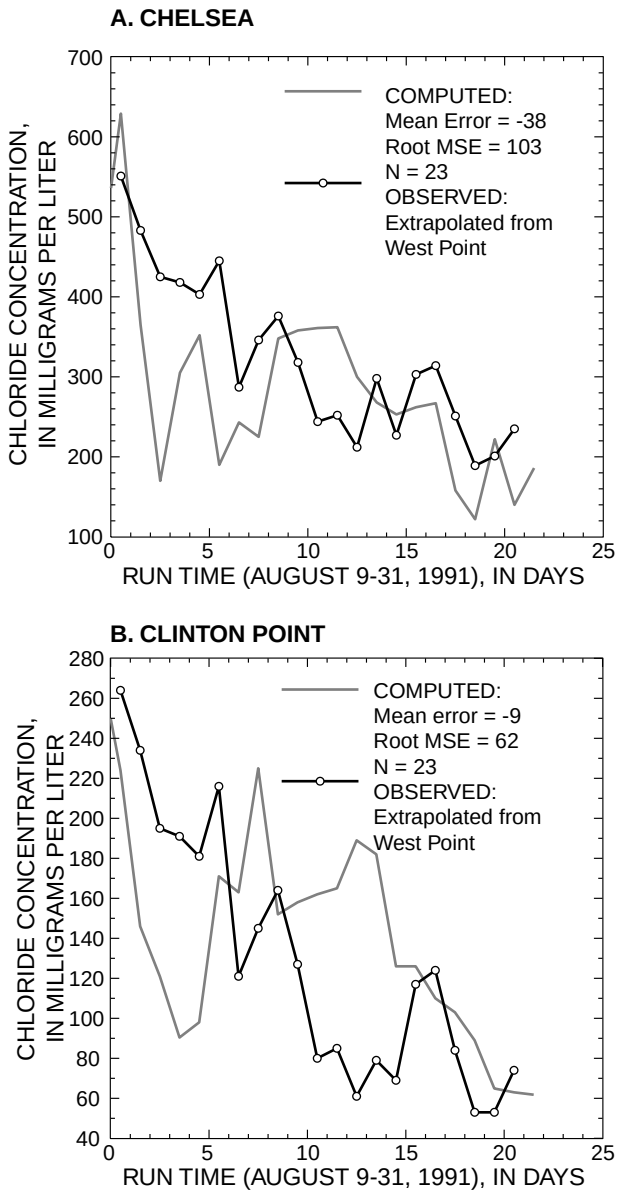


Figure 13. *Observed and simulated chloride concentrations during solute-transport-model calibration, August 9-31, 1991: A. At Chelsea. B. At Clinton Point.*

Results

Simulated chloride concentrations at Chelsea Pump Station and Clinton Point are shown in figure 13A and 13B, respectively. For reference, the measured maximum instantaneous chloride concentrations at many sites are shown in table 18 along with the maximum daily concentrations simulated by the solute-transport model. The main purpose of the August 1991 calibration was to establish reasonable DQQ values for the reach from Newburgh to Poughkeepsie for subsequent withdrawal simulations. Mean biases in BLTM-simulated daily mean chloride concentrations for August 1991 of -38 mg/L at Chelsea Pump Station (range from 189 to 551 mg/L; 103 mg/L RMSE) and -9 mg/L at Clinton Point (range from 53 to 264 mg/L; 62 mg/L RMSE) were similar to those obtained for West Point for July and August 1990 simulations. The combined DQQ values for the reaches above and below West Point, which represent a dispersion ranging from 35 to 250 m^2/d (average 140 m^2/d), were then used in the simulations of (1) withdrawals at Chelsea, Newburgh, Hyde Park, and (2) flow augmentation at Green Island.

Effects of Withdrawals and Flow Augmentations on Salt-front Location

The major objective of this study was to simulate the effects of hypothetical withdrawals and flow augmentation on the salt-front location. Withdrawal simulations for Chelsea or Newburgh were based on April-August 1990 data, and withdrawal simulations for Hyde Park were based on August 1991 data, as were the simulations of increased flow at Green Island. The 1990 data were based on measurements at Bowline Point, whereas the 1991 data were based on measurements at West Point; thus, the simulated salt-front locations are only relative. Effects of simulated withdrawals on the flow field and chloride distribution may propagate out to (and then converge at) the site used as the model boundary, beyond which the upstream effects become limited by the unaffected (constant)-boundary-condition data. The simulated locations would be more accurate if the southern boundary of the reach were pure seawater because chloride concentrations lower than that of seawater at this boundary could result in lesser salt-front movement.

Withdrawals at Chelsea during High Flow

Withdrawals of 3,000 ft^3/s and 6,000 ft^3/s at Chelsea Pump Station were simulated from the April 1-June 30, 1990 data. Flows at Green Island during this period were relatively large, averaging 25,200 ft^3/s, and, therefore, provided ideal conditions for evaluating the effects of high-flow "skimming"—large withdrawals under relatively high freshwater flow conditions. Results (fig. 14A) indicate that a withdrawal of 1,939 Mgal/d (3,000 ft^3/s) would not measurably affect the local chloride concentration,

but that withdrawing at twice that rate (3,878 Mgal/d or 6,000 ft^3/s) could increase it to 250 mg/L. A withdrawal rate of 3,000 ft^3/s could cause the 250-mg/L salt front to move 5 mi upstream from its unstressed-condition location at RM 49.7, and a withdrawal of 6,000 ft^3/s could cause it to move 16 mi upstream to a point close to the Chelsea Pump Station.

Withdrawals at Chelsea or Newburgh

Simulated withdrawals of 5,000 ft^3/s at Chelsea or Newburgh were based on data collected from July 1 through August 31, 1990, when flow at Green Island averaged 7,150 ft^3/s. A simulated withdrawal of 5,000 ft^3/s at Chelsea Pump Station caused the 250-mg/L salt front to move 10 mi upstream from its unstressed-condition location at RM 56.4, and the same rate of withdrawal at Newburgh caused it to move 3.5 mi upstream (fig.14B); the effect of both withdrawals became negligible at the Poughkeepsie Water-Treatment Plant. If withdrawals were increased, or, more likely, if flow at Green Island were to decrease, the salt front could move upstream beyond Poughkeepsie.

The effect of a 100-Mgal/d withdrawal is extrapolated from simulations of larger withdrawals because 100 Mgal/d (155 ft^3/s) represents less than one-half of 1 percent of the measured tidal flow volume (excursion) occurring in the lower Hudson River near Chelsea Pump Station. For example, the floodflow volume at a measured cross section at Newburgh on August 22, 1989, from 1733 to 2335 hours, totaled -2.809×10^9 ft^3 (incoming tide). A constant withdrawal of 155 ft^3/s in this 6-hour period would represent 3.3666×10^6 ft^3 of water, or 0.12 percent of the measured excursion. Note also that the flow model was calibrated to discharge measurements that carry an uncertainty at least of ±5 percent. Running the model with the 100 Mgal/d withdrawal is possible but running the model with a series of larger withdrawals (which are computationally more significant than 100 Mgal/d) and extrapolating to the 100-Mgal/d withdrawal provides greater reliability.

The results of simulated withdrawals shown in figures 14A and 14B were combined as figure 14C to estimate the effects of a 100-Mgal/d withdrawal at the Chelsea Pump Station. The BLTM simulations were carried out for two different flows at Green Island that encompass the range of inflow conditions to which BLTM was calibrated. Overall, the continuous withdrawals based on July 1-August 31, 1990 data had a larger effect — Green Island flows during this period averaged 7,150 ft^3/s, and a simulated continuous withdrawal of 100 Mgal/d at Chelsea Pump Station resulted in an upstream salt-front movement of less than 0.1 mi. The same withdrawals based on April 1-June 30, 1990 data, during which Green Island flows were 3 times greater (averaged 25,200 ft^3/s) also resulted in an upstream movement of the salt front of less than 0.1 mi. The BLTM estimates are similar to the results in table 17A, which lists the effect of a continuous 100-Mgal/d withdrawal on the position of a conservative particle after 26 days (July 18-August 13, 1990), when Green Island flows averaged 7,100 ft^3/s. The 100-Mgal/d withdrawal at Chelsea Pump Station could move the particles about 0.1 mi upstream of the unstressed-condition location, given an initial salt-front location, at or downstream of Chelsea. Withdrawals of 300 Mgal/d from any combination of Chelsea or Newburgh could result in upstream movement of the salt front of as much as 1.0 mi, given an initial salt-front location between West Point and Rogers Point.

Withdrawals at Hyde Park

Simulated withdrawals of 2,500 ft^3/s and 5,000 ft^3/s at Hyde Park were based on the August 1991 chloride concentrations at West Point. The average flow for this period at Green Island was 4,700 ft^3/s; this added to a tributary inflow of 500 ft^3/s from the intervening drainage area, gives a flow of about 5,200 ft^3/s at West Point. Results (fig. 14D) indicate that, for withdrawals of 2,500 ft^3/s or 5,000 ft^3/s, the 250-mg/L salt front would move upstream 2.6 and 3.1 mi, respectively, from an unstressed-condition location at RM 69.7. Because Green Island flows were increasing after August 9, 1991, and tide height was decreasing after the monthly spring tide, earlier flows of less than 4,700 ft^3/s could have resulted in a greater upstream movement of the salt front.

Flow Augmentations at Green Island

Increased river flows at Green Island were simulated to evaluate the effect of flow augmentations on the salt-front location. Simulated low flows at Green Island were increased by 1,000 and 5,000 ft^3/s. The daily mean flow at Green Island during August 9-31, 1991, was 4,400 ft^3/s—about a 90-percent flow duration (flow that is exceeded 90 percent of the time), as indicated by 45 years of continuous

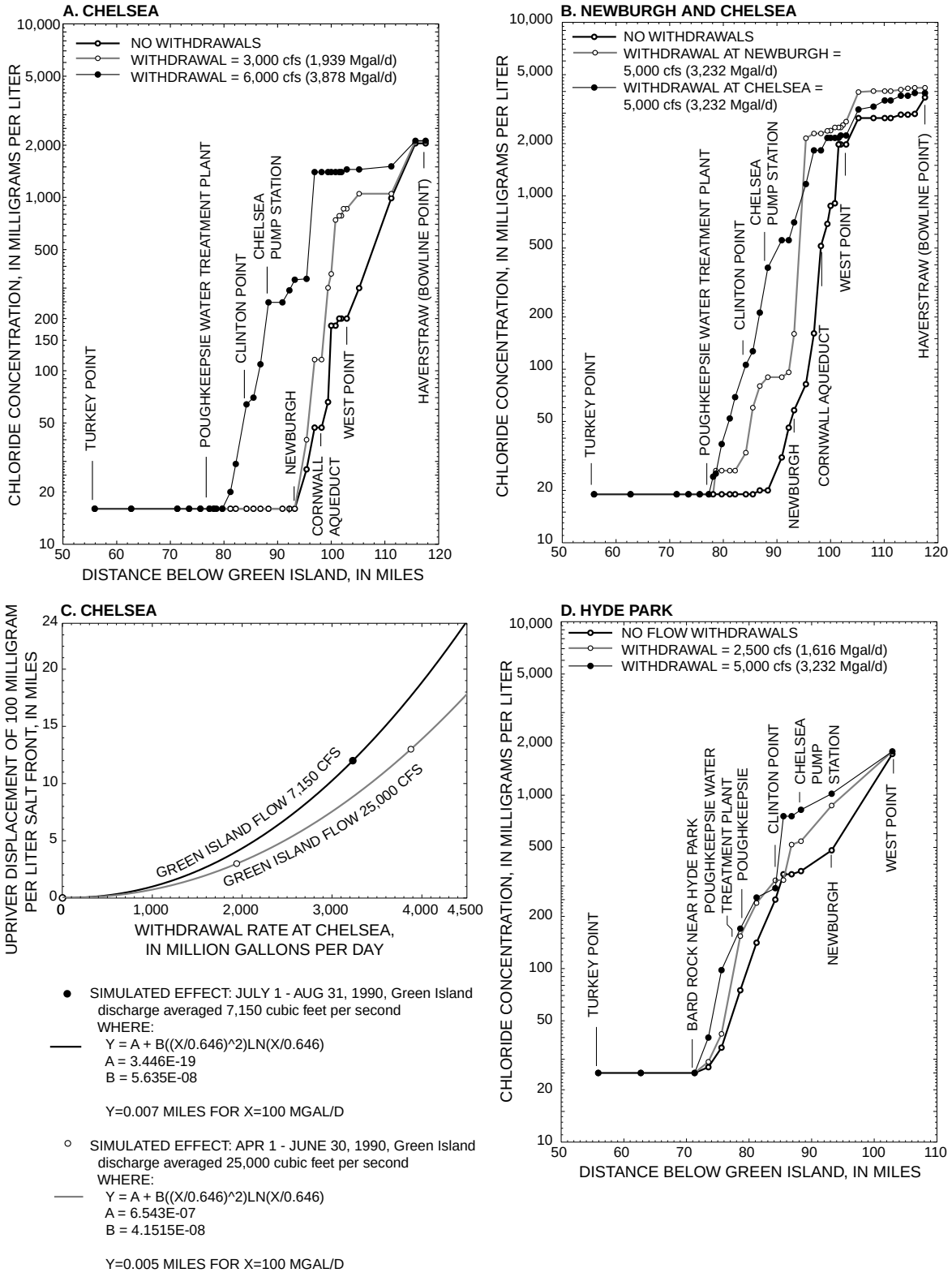


Figure 14. *Simulated chloride concentration of Hudson River, N.Y., at selected sites in reach from Turkey Point to Haverstraw, in relation to hypothetical water-withdrawals at: A. Chelsea, based on high-flow (April 1-June 30, 1990) data. B. Newburgh and Chelsea, based on low-flow (July 1-August 31, 1990) data. C. Combined results from (A) and (B) showing upriver movement of 100-mg/L chloride front as a function of withdrawals at Chelsea during high and low discharges (25,200 and 7,150 cubic feet per second at Green Island). D. Bard Rock near Hyde Park, based on low flow (August 9-31, 1991) discharges.*

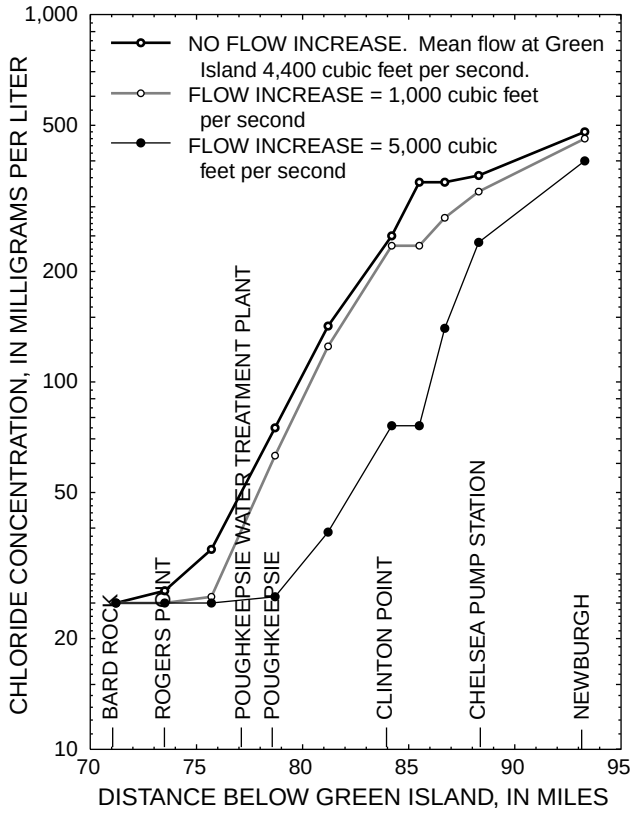


Figure 15. *Simulated chloride concentration of Hudson River, N.Y., at selected sites between Hyde Park and Newburgh, resulting from simulated 10-day flow increases of 1,000 and 5,000 cubic feet per second at Green Island, August 9-31, 1991.*

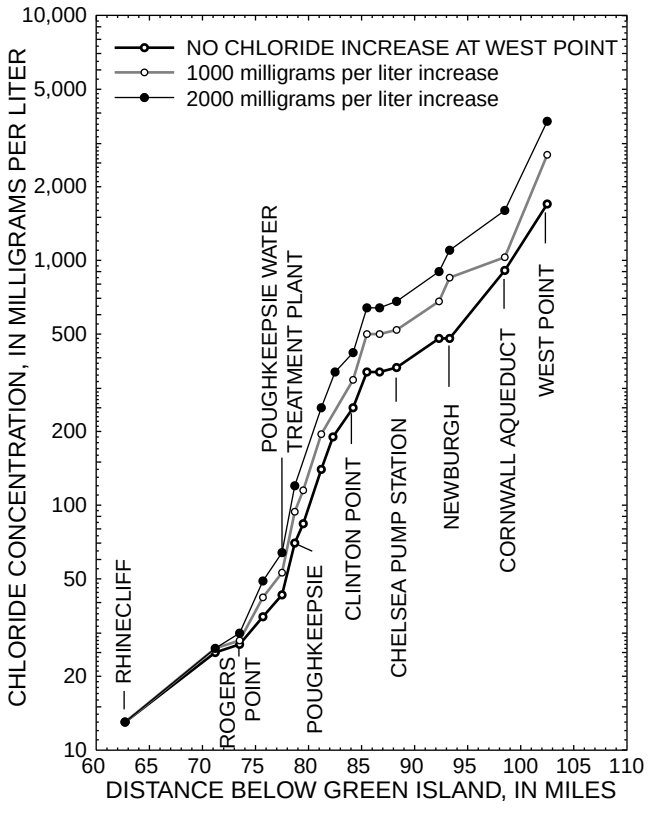


Figure 16. *Chloride concentration in Hudson River, N.Y., at selected sites between Rhinecliff and West Point resulting from simulated chloride increases of 1,000 and 2,000 milligrams per liter at West Point, August 9-31, 1991.*

records collected at Green Island. Results (fig. 15) indicate that an increase of 1,000 ft^3/s could cause the 100-mg/L salt front to move 0.6 mi downstream from its unstressed-condition location at RM 73.9; a 5,000-ft^3/s increase would move it 6.2 mi downstream.

Chloride Increases at West Point

The solute-transport model (BLTM), as previously discussed, is driven in part by the chloride concentration at the lower (southern) boundary. Ideally the chloride concentration at the lower boundary would be fairly constant (equivalent to ocean salinity, typically 18,000 to 20,000 mg/L), and the boundary would be far enough from withdrawal points that its chloride concentration would be unaffected by the withdrawals.

The reach used for simulation of increased chloride concentration during August 9-31, 1991, was the 46.9 mi reach from West Point (lower boundary) north to Turkey Point. Chloride concentrations at West Point were far less than 18,000 mg/L, and concentrations above 3,100 mg/L were rare. The simulated withdrawals at Newburgh caused some of the profiles of chloride concentration in relation to river mile to converge at West Point, indicating that the withdrawal would affect the concentrations at West Point. Because this type of withdrawal simulation cannot alter the lower-boundary data, lower boundary chloride concentrations were artificially increased at West Point to simulate the effect of increased lower-boundary salinity on the salt-front position north of West Point. The test concentrations were 1,000 and 2,000 mg/L greater than the measured chloride concentrations, and the results (fig. 16) indicate that a chloride increase of 1,000 mg/L could cause the 100-mg/L salt front to move 0.9 mi upstream from its unstressed-condition location at RM 73.9, and a 2,000 mg/L increase could move it 1.5 mi upstream. The effects of both increases in concentration becomes negligible just north of Rogers Point (RM 81.0).

SUMMARY AND CONCLUSIONS

New York City's water-supply system may be inadequate to meet the current demand during periods of drought. Use of the tidal part of the Hudson River is being explored as a supplemental source of water supply. One proposal entails withdrawal of Hudson River water from locations near Newburgh, Chelsea, or Kingston, but the extent to which this would cause the salt front to advance to points where it could adversely affect community water supplies is unknown. The U.S. Geological Survey (USGS), in cooperation with the New York City Department of Environmental Protection, New York State Department of Environmental Conservation, and the Hudson Valley Regional Council studied the effects of hypothetical water withdrawals on the movement of the salt front. To simulate effects of proposed withdrawals on salt-front location, the USGS, (1) compiled salt-front-related information from previous studies and public utilities along the lower Hudson River; (2) installed and operated tide-stage, discharge, and water-quality stations at key locations; (3) performed tidal-cycle discharge and salinity measurements under a wide range of hydrologic conditions; (4) used these data to calibrate and verify models to simulate the forces that affect flow and saltwater movement in the estuary; and (5) used the USGS one-dimensional Branch-Network Dynamic Flow model (BRANCH) in conjunction with the USGS one-dimensional Branched Lagrangian Solute-Transport Model (BLTM) to simulate the effect of several hypothetical water-withdrawals on the salt-front location.

Under normal seasonal tide and inflow conditions, the salt front and associated transition zone ranges from below Hastings-on-Hudson (RM 21.5) during high-flow periods in spring to New Hamburg (RM 67.7) during low-flow periods in late-summer, a distance of about 50 mi. Data collected for this study were used to derive regression equations to compute (1) chloride concentrations from measured specific conductance values, (2) chloride concentrations at Chelsea Pump Station and Clinton Point from specific-conductance values measured at West Point, (3) salt-front location from specific conductance values measured at West Point and Hastings-on-Hudson, and (4) salt-front location from tide levels at West Point and inflows at Green Island and five tributaries. Salt-front locations that were predicted from daily mean specific conductance at West Point had standard errors of estimate of 1.5 mi for the 100-mg/L front, 1.0 mi for the 250-mg/L front, and 1.1 mi for the 500-mg/L front. An empirical relation for the 100-mg/L salt-front location was also obtained by regression analysis in which chloride concentration was related to maximum tide stage at West Point and daily mean inflow from Green Island and five tributaries. The average bias was +2.4 mi. For historical reference, both methods were used to simulate the maximum upstream salt movement during (1) the 1964 drought and (2) three storms that produced some of the largest and highest tides of this century; results indicate that the salt front could have moved upstream as far as RM 85 on November 20, 1964, when the chloride concentration at Poughkeepsie was 342 mg/L. Although lunar tides are usually the main factor in salt-front movement on a daily basis, the extremely low 6-month average flow of 3,230 ft^3/s at Green Island during the 1964 drought allowed greater-than-normal upstream salt-front movement.

The Branch-Network Dynamic Flow model (BRANCH) was used to simulate flow in the Hudson River under a wide range of inflow, tidal, and meteorological conditions. A previous model of flow between Albany and Clinton Point near New Hamburg (Stedfast, 1982) was extended 8 mi upstream to Green Island and 49 mi downstream to Hastings-on-Hudson to encompass 133 mi of the lower Hudson River. Green Island flow was used in place of Albany stage as the upstream boundary. Calibration included tributary inflows and wind data in the model.

The reach upstream from Clinton Point has fairly uniform channel geometry and nonsaline water, whereas the reach downstream has nonuniform channel geometry and variable salinity, depending upon tidal movement. A variable flow-resistance coefficient for the 14.1-mi reach between West Point and Bowline Point at Haverstraw was used to adjust model results for the combination of abrupt changes in channel width—from 10,000 ft to 2,000 ft between Bowline Point at Haverstraw and West Point—and the effects of variable water density. These coefficients ranged from 0.0110 for a specific conductance of 1400 µS/cm or less at Bowline Point to 0.040 for a specific conductance of about 9,000 µS/cm.

The BRANCH flow model was calibrated and verified to 19 tidal-cycle discharge measurements made at 11 locations with conventional and acoustic Doppler current-profiler methods. Maximum measured instantaneous tidal flow ranged from 20,000 ft^3/s at

Albany to 368,000 ft^3/s at Tellers Point; Green Island daily-mean flow ranged from 3,030 ft^3/s to 45,000 ft^3/s during these tidal flow measurements. Successive ebb- and flood-flow volumes were measured and compared with computed volumes; daily-mean bias was -1.6 percent (range from -21.0 to +23.7 percent; 13.5 percent mean absolute error). Daily-mean deviation between simulated and measured stage at eight locations (from Bowline Point to Albany) over the 19 tidal-cycle measurements averaged +0.06 ft (range from -0.31 to +0.40 ft; 0.21 ft RMSE). These results indicate that the model can accurately simulate flow in the Hudson River under a wide range of flow, tidal, and meteorological conditions.

The effects of water density and wind velocity on flow were tested through a sensitivity analysis. Although the density term could be varied at each cross section, doing so gave only minimal improvement in flow error. The use of variable densities would have decreased the computational error if the channel geometry of reaches with high water density had been more uniform, but the irregular widening of these reaches allows greater lateral mixing than longitudinal mixing; thus, a **two- or three-dimensional** model would be needed to decrease the density-related error in simulated flow.

The Branched Lagrangian Solute-Transport Model (BLTM) was used to simulate chloride transport in the 61-mi reach from Turkey Point to Bowline Point under two seasonal conditions in 1990—one representing spring conditions of high inflow and low salinity (April-June), and the other representing typical summer conditions of low inflow and high salinity (July-August). Daily chloride oncentrations measured at Bowline Point were used to drive the BLTM simulations; measured daily chloride concentrations collected at West Point were used for calibration. Mean bias in simulated chloride concentration for the April-June 1990 data (observed range of 12 to 201 mg/L; 30 mg/L RMSE) was –16 mg/L. For the July-August 1990 data (observed range of 31 to 2,000 mg/L; 535 mg/L RMSE), the mean bias was +126 mg/L. The salt front or saltwater-freshwater interface on the Hudson River was defined as the furthest upstream location where the chloride concentration exceeded 100 mg/L. The chloride concentration at Clinton Point never exceeded 100 mg/L in 1990; therefore, solute transport between West Point and Poughkeepsie was evaluated from August 1991 data. The BLTM then was used to simulate chloride concentrations at Chelsea Pump Station and Clinton Point. Regression equations, based on daily mean values of specific conductance measured at West Point, were used to obtain daily mean chloride concentrations at Chelsea Pump Station and Clinton Point for model analysis. Mean biases in BLTM-simulated daily mean chloride concentrations for August 1991 were –38 mg/L at Chelsea Pump Station (range of 189 to 551 mg/L; 103 mg/L RMSE) and –9 mg/L at Clinton Point (range of 53 to 264 mg/L; 62 mg/L RMSE). The DQQ values (dispersion coefficient) for the reaches above and below West Point represent a range in dispersion from 35 to 250 m^2/d (average 140 m^2/d).

The BRANCH model was used to simulate various combinations of withdrawals at Kingston, Chelsea, and Newburgh to simulate their effect on the travel of a conservative particle. The Chelsea Pump Station at present is capable of withdrawing 100 Mgal/d from the Hudson River which could result in upstream particle movement of 0.1 mi. Withdrawals of (a) 300 Mgal/d at Chelsea or Newburgh, (b) 100 Mgal/d at Chelsea and 200 Mgal/d at either Kingston or Newburgh, and (c) 100 Mgal/d at Kingston and 200 Mgal/d at Newburgh, were simulated. Of the 300 Mgal/d scenarios evaluated, the one resulting in the smallest movement of the salt front in the reach below Poughkeepsie entailed increasing the Chelsea Pump Station withdrawal from 100 to 300 Mgal/d—resulting in a 0.5 mi upstream movement, and the scenario that would have the smallest effect in the reach from Poughkeepsie upstream to Turkey Point would be the withdrawal of 300 Mgal/d at Newburgh. Scenarios that included withdrawals at Kingston had the greatest effect on salt-front movement; a front starting near Poughkeepsie could move upstream by 1.1 to 1.4 mi.

Withdrawals of 3,000 ft^3/s (1,939 Mgal/d) and 6,000 ft^3/s (3,878 Mgal/d) at Chelsea Pump Station were simulated with the BLTM model and high-flow (April 1-June 30, 1990) data. Flows at Green Island during this period averaged 25,200 ft^3/s and, therefore, provided ideal conditions for evaluation of high-flow "skimming"—large withdrawals under relatively high freshwater flow conditions. A withdrawal of 3,000 ft^3/s could cause the 250-mg/L salt front to move 5 mi upstream from its unstressed (non-pumping) condition location at RM 49.7, and a withdrawal of 6,000 ft^3/s could cause it to move 16 mi upstream to a point close to the Chelsea Pump Station.

A BLTM-simulated withdrawal of 5,000 ft^3/s (3,232 Mgal/d) at Chelsea Pump Station during a low-flow period (July 1-August 31, 1990) when flow at Green Island averaged 7,150 ft^3/s, caused the 250-mg/L salt front to move 10 mi upstream from its unstressed-condition location at RM 56.4. The same withdrawal rate at Newburgh caused it to move 3.5 mi upstream; the effect of both withdrawals became negligible at the Poughkeepsie Water-Treatment Plant. If withdrawals were increased or, more likely, if flow at Green Island were to decrease, the salt front could move upstream beyond Poughkeepsie.

The effect of a 100-Mgal/d withdrawal rate at either Chelsea Pump Station or Newburgh was extrapolated from simulations of larger withdrawals because 100 Mgal/d (155 ft^3/s) represents less than one-half of 1 percent of the measured tidal flow volume occurring in the lower Hudson River near Chelsea Pump Station. For example, a constant withdrawal of 155 ft^3/s at a cross section at Newburgh on August 22, 1989, would represent only 0.12 percent of the measured floodflow volume. The flow model was calibrated to discharge measurements that carry an uncertainty at least of ±5 percent. Running the model with the 100-Mgal/d withdrawal is possible but running the model with a series of larger withdrawals (which are computationally more significant) and extrapolating to the 100-Mgal/d withdrawal provides greater reliability.

The effects of a 100-Mgal/d withdrawal at the Chelsea Pump Station were investigated through simulations for two different Green Island flow regimes that, together, encompass the range of inflow conditions to which BLTM was calibrated. Simulated continuous withdrawals of 100 Mgal/d at Chelsea Pump Station at low flow (July 1-August 31, 1990, when Green Island flows averaged 7,150 ft^3/s), resulted in an upstream movement of the salt front of less than 0.1 mi, as did the same withdrawals at high flow (April 1-June 30, 1990, when Green Island flows averaged 25,200 ft^3/s). The BLTM estimates closely match the conservative-particle-tracking results for the effect of a continuous withdrawal of 100-Mgal/d at Chelsea on the position of a conservative particle after 26 days during low-flow conditions (July 18-August 13, 1990, during which Green Island flows averaged 7,100 ft^3/s). The 100-Mgal/d withdrawal at Chelsea Pump Station could move the particles about 0.1 mi upstream of the unstressed-condition location, given an initial salt-front location at, or downstream from Chelsea. Withdrawals of 300 Mgal/d from any combination of Chelsea or Newburgh could result in upstream movement of the salt front of as much as 1.0 mi, given an initial salt-front location between West Point and Rogers Point.

In summary, the BRANCH model can be used to simulate flow in the Hudson River under a wide range of inflow, tidal, and meteorological conditions. The BLTM model can be used to estimate solute transport when only one representative mean concentration per cross section is required, and when the salt front is within the calibrated reach—in this case between Turkey Point and Bowline Point.

Future use of the models described in this report could be improved by altering the model to accommodate (1) variable water-density conditions through adjustment of the flow-resistance coefficient in all reaches, rather than just the reach between West Point and Bowline Point, (2) input of more than one source of wind-velocity data and at a greater frequency, and (3) selection of DQQ as a function of river flow and initial water density. Simulation of cross-sectional mixing for reaches with irregular widths could be improved by using two- or three-dimensional transport models.

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GLOSSARY

Terms that are set in **bold** within the text are discussed here. Other technical terms common to the field of computational hydraulics are discussed in Schaffranek (1989).

Continuity equation.—The continuity equation is based on Newton's first law (conservation of mass), which states that matter can neither be created or destroyed; this means that, assuming no change in storage, the rate at which a given mass is flowing into a given space (control volume) is equal to the rate at which the equivalent mass is flowing out. The continuity equation, in its simplest form, is written as

$$Q_1 = Q_2$$

or

$$A_1U_1 = A_2U_2$$

where

Q is discharge (flow rate), in units of volume per time;
A is cross-sectional area, in units of length squared;
U is velocity, in units of distance per time; and
subscripts *1* and *2* represent the upstream and downstream ends of the reach, respectively. Further discussion of the continuity equation and conservation of mass are given in Roberson and Crowe, 1980; Chow, 1959; Mahmood and Yevjevich, 1975; and most introductory texts on open-channel flow.

Datum.—A point, line or surface used as a reference, as in surveying, mapping, or geology (American Heritage Dictionary, 1982). Most USGS gages are referenced to a particular datum that is defined in each station description. All stage data in this report have been referenced to sea level (National Geodetic Vertical Datum of 1929 [NGVD of 1929]). See also "Hudson River Datums" and "NGVD of 1929".

Diffusion-wave model.—See "Flow conditions"

Dimensions.—Throughout this report, the three dimensions of the river are described as *longitudinal*, meaning length from upstream to downstream, *horizontal*, meaning width from side to side, and *vertical* meaning depth from surface to bottom. A one-dimensional system, as described herein, refers only to changes in the longitudinal direction. A two-dimensional system can be either vertically averaged and can describe longitudinal and horizontal changes, or it can be horizontally averaged and describe longitudinal and vertical changes.

A three-dimensional system describes longitudinal, vertical, and horizontal changes.

Discharge (Q).— Volume of water that passes through a cross section of channel within a given period of time.

Dispersion and DQQ.— The redistribution of particles by the combined effects of shear (advection of fluid at different velocity and direction at different positions) and transverse diffusion (the scattering of particles by molecular and turbulent [eddy] motion).

Dynamic equation.—The dynamic equation is based on Newton's second law, conservation of momentum (or energy), which states that the summation of all external forces on a system is equal to the rate of change of momentum. External forces can be in the form of gravity, pressure, or friction. Further discussion of the dynamic equation and conservation of momentum can be found in Roberson and Crowe, 1980; Chow, 1959; Mahmood and Yevjevich, 1975; and most introductory texts on open-channel flow. See also "Flow conditions."

Eulerian-based Model.— Model based on a Eulerian approach, which is premised on Eulerian concepts and a fixed-coordinates system. Eulerian equations are a form of equation of motion based on Eulerian concepts, in which a fixed corrdinate system is used, and tangential and normal stresses accompanying deformation are ignored.

Finite Difference.—Finite-difference approximation is the representation of differential forms of equations (continuum) by corresponding finite-difference forms (discrete quantities). Finite-difference equations are derived by substituting difference quotients for derivatives in differential equations. The finite-difference method is an approximation method in which finite-difference expressions are substituted for differential equations to effect a solution.

Flow conditions.—Uniform flow means that the depth, width, and velocity are the same at every section of the channel. This is often stated as the assumption that the channel is prismatic. Steady flow means the velocity does not change with time at a point in the stream. Unsteady flow means that the velocity changes over time at a point in the stream. With fully dynamic flow, neither uniform nor steady assumptions can be made. Uniform flow can be modeled through the use of diffusion-wave simplification of the dynamic equation, which assumes that the effect from convective acceleration (or the increase in rate of flow caused by gravity) is negligible. Steady and uniform flow can be modeled with the kinetic wave simplification of the dynamic equation, which assumes that both convective acceleration and pressure effects (or effects from atmosphere or overlying water) are negligible—because flow is steady, pressure effects essentially cancel out. Fully dynamic flow must use the complete (fully) dynamic equation. Further discussion of these assumptions are given in Roberson and Crowe, 1980; Chow, 1959; Mahmood and Yevjevich, 1975; and most introductory texts on open-channel flow.

Fully dynamic flow.—See "Flow conditions"

Horizontally averaged.—See "Dimensions"

Hudson River Datums.—Several datums are used for hydrographic data in the Hudson River. In this report depths are referenced to National Geodetic Vertical Datum of 1929. Mean Low Water (MLW) refers to datums adopted by the National Ocean Service of the National Oceanic and Aeronautics Administration. Depths referenced to MLW are shown on topographic maps. In the past, Hudson River Datum refered to a datum used on hydrographic survey sheets for points downstream from Ossining (fig. 2). These datums are not static; they change with location in the river and with time and are updated every 19 years. More information on Hudson River datums can be obtained from the National Ocean Service, Tidal Datum Section (Milton Rutstein, National Ocean Service, written commun., 1989)

Kinetic wave model.—See "Flow conditions"

Longitudinal direction.—See "Dimensions"

Mean Low Water datum.—See "Hudson River Datums"

Mean Sea Level.—See "National Geodetic Vertical Datum of 1929"

Mgal/d.—Million gallons per day--A measure of discharge which approximately equals 1.55 ft^3/s (cubic feet per second). (See also conversion table at the beginning of this report.)

National Geodetic Vertical Datum of 1929.—NGVD of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level of 1929." In this report all elevations are referenced to NGVD of 1929. Unless otherwise noted, negative elevations are feet below NGVD of 1929.

Negative flow.—In this report, negative flow is flow in the upstream direction. (See also "Positive flow".)

One-dimensional model.—See "Dimensions"

Percent exceedance.—Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for that day have been greater than the the value shown.

Positive flow.—In this report, positive flow is flow in the downstream direction. (See also "Negative flow".)

River Mile (RM).—River mile is the distance, in miles, above the mouth of a river, determined from a line along the thalweg of the river. River miles in the Hudson River are miles above the Battery in New York City. (See also "Thalweg.")

Salt front.—The salt front is the saltwater/freshwater interface, defined in this study as the furthest upstream location where the chloride concentration exceeds 100 mg/L (milligrams per liter) at some point in the cross section.

Specific conductance.— A measure of the ability of a solution to conduct an electrical current over a 1-centimeter distance and adjusted to 25 degrees Celsius. Specific conductance is equivalent to the reciprocal of the resistance of the solution and is expressed in microsiemens per centimeter. Specific conductance is directly proportional to the chloride concentration and thus the salinity of the Hudson River.

Stage.— See “Water-surface elevation”

Steady-flow conditions.—Flow in which depth (and velocity) of flow in a given cross-section is constant with respect to time. (See also “Flow conditions”.)

Thalweg.—The deepest location in a cross section. River miles are generally measured along the line following the thalweg of a river.

Three dimensional.—See "Dimensions"

Tide.—Periodic variation in the water surface level of oceans, gulfs, bays, inlets, and tidal reaches of rivers, caused by the gravitational attraction of the sun and moon, the lunar effect being the more powerful. Various tidal terms follow: (1) diurnal tide—a tide having a period of 24.84 hours yielding one high water and one low water each lunar day, (2) semi-diurnal tide— a tide having a period of 12.42 hours yielding two nearly equal high waters and low waters in a lunar day, (3) mixed tide—a tide having both semidiurnal and diurnal components producing succeeding high waters that are appreciably different, (4) spring tide—tide of maximum range for a semidiurnal tide, occurring semimonthly usually 1 to 2 days after new and full moon, depending on geographic conditions, (5) neap tide—tide of minimum range for a semidiurnal tide; occurring semimonthly, usually 1 to 2 days after the moon is in quadrature, depending on geographic conditions, (6) slack tide—time interval of tidal flow during which the velocity is zero or nearly zero; in general, it is the transition period between flooding and ebbing or vice versa, (7) tide range—difference in height between consecutive high and low water levels.

Tidal stage.—Stage as it is affected by tide. (See “Tide” and “Water-surface elevation”.)

Transition zone.—The transition zone of an estuary is the area that can vary from water that ranges from salty to fresh throughout a year, depending on the conditions. The transition zone of the Hudson River extends from approximately Hastings-on-Hudson to New Hamburg, N.Y.

Two dimensional.—See "Dimensions"

Uniform flow conditions.—See "Flow conditions"

Unsteady-flow conditions.— Flow in which depth (and velocity) of flow in a given cross section varies with time. Unsteady flow can be alternating (flow direction can change) or unidirectional (flow is always in downstream direction).

Vertically averaged.— See “Dimensions”

Water-surface elevation.— The height (elevation) of the water surface above an established datum plane.

Hudson River Fish Advisory Outreach Project Update 2009-2016

Appendix: Preliminary Results of Hudson River Fish Consumption Surveys

September 2016



NYSDOH Hudson River Fish Advisory Outreach Program Fish Consumption Assessment

This Appendix offers:

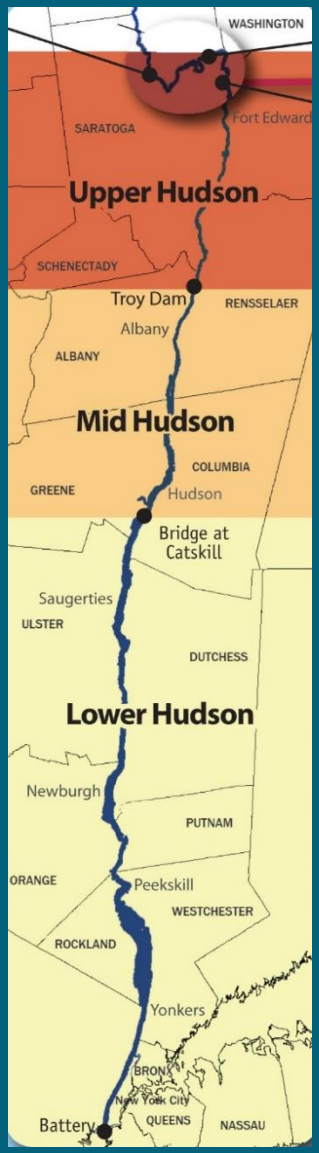
- A brief overview of Hudson River Fish Advisory New York State Department of Health (NYSDOH) advice
- Information from fish consumption surveys done by New York State Department of Health and our minigrant partners
- How this information targets future efforts

Hudson Fish Advisory Outreach Consumption What Is the Advice

- The goal of the Hudson River Fish Advisory Outreach program is that all Hudson fish consumers know, understand and follow the NYSDOH advice on eating Hudson fish
- The advice depends upon who you are, where you fish, and what you catch
- Women under 50 (childbearing years) and children under 15 should not eat any Hudson fish or crabs downstream of Corinth in Saratoga County to the New York Battery

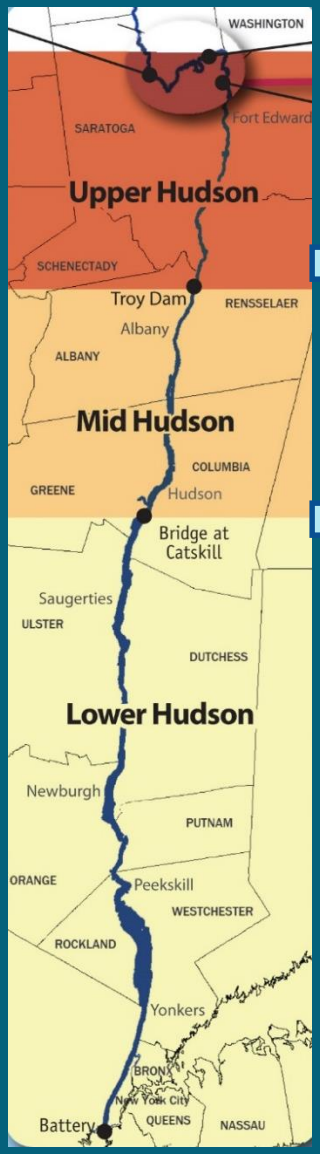


Hudson Fish Consumption
What Is the Advice



- From Hudson Falls to Troy – New York State Department of Environmental Conservation (NYSDEC) regulations are in place - catch and release fishing only, no one can take fish home
- From Troy to Catskill, women above 50 and men can eat four species up to once a month
- From Catskill to New York City, women above 50 and men can eat most species up to once a month and some marine species up to once a week

Hudson River Advice for Men and Women above 50: Hudson Falls to Catskill



Upper Hudson

From the Rt. 9 Bridge to Troy Dam

Do not eat fish from the Route 9 Bridge to the Troy Dam.

From Baker's Falls to the Troy Dam, New York's State Department of Environmental Conservation's "catch and release" regulations apply.

Take No Fish. Eat No Fish.

Mid Hudson

From Troy Dam to Bridge at Catskill

Eat up to one meal a month:



Alewife



Rock bass



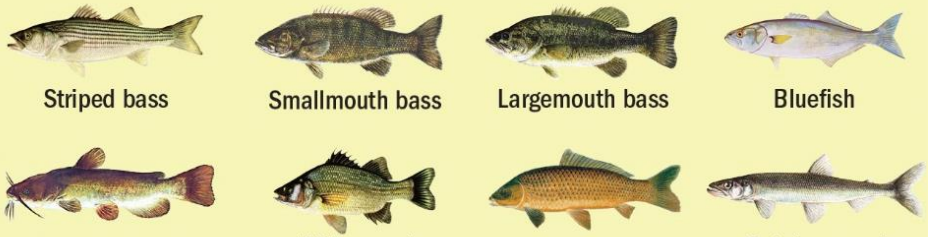
Blueback herring



Yellow perch

Do not eat other fish from the Mid Hudson including striped bass

Hudson River Advice for Men and Women above 50: Catskill to NYC

Lower Hudson From Rip Van Winkle Bridge at Catskill to the NYC Battery	Men over 15 and Women over 50	Women under 50 and Children under 15
 Walleye, White catfish, Channel catfish, American eel*, Gizzard shad **DEC regulations prohibit taking American eel for food from the Hudson River*	DON'T EAT	DON'T EAT
 Striped bass, Smallmouth bass, Largemouth bass, Bluefish, Brown bullhead, White perch, Carp, Rainbow smelt, Goldfish, Atlantic needlefish	Up to 1 meal/month	DON'T EAT
 Blue crab Do not eat the tomalley (green stuff, mustard) or reuse cooking water	Up to 6 crabs/week	DON'T EAT
All other species	Up to 4 meals/month	DON'T EAT

Hudson Fish Consumption

Particularly below Catskill, much of the fish eaten from the Hudson may be consistent with the NYSDOH advice

Hudson fish consumption that is a concern includes:

- Anyone eating fish from Hudson Falls to Troy (NYSDEC "Catch and Release" area)
- Any Hudson fish eaten by women under 50 (childbearing years) and children under 15
- Anyone eating heavily contaminated "do not eat" species: catfish, eel, walleye and gizzard shad

Hudson Fish Consumption

Other Hudson fish consumption that is a concern includes:

- Most of the fish, including striped bass, consumed from Catskill to Troy
  - Advice is that only four species can be eaten up to once a month in this section
- Fish or crabs that are eaten more frequently than advised



NYSDOH and Hudson River Fish Advisory Minigrant Partner Surveys

NYSDOH and Cornell Cooperative Extension (CCE) minigrant partners do a variety of outreach activities, including local and Hudson fish consumption surveys

- CCE Dutchess County (CCE Dutchess) coordinates surveys from five counties on eating locally-caught fish, including the Hudson
- CCE Saratoga County (CCE Saratoga) collects surveys on eating Hudson fish in Saratoga and Washington counties
- NYSDOH collects convenience sample surveys on eating Hudson fish at outreach events staff attend from Saratoga County to NYC

NYSDOH and Hudson River Fish Advisory Minigrant Partner Surveys

NYSDOH and partner surveys meet two outreach goals:

- Education - local fish eaters receive fish advisory materials after survey
- Information collected helps our program target resources

NYSDOH and Hudson River Fish Advisory Minigrant Partner Surveys

Survey limitations:

- All are self-report
- CCE surveys are collected at a variety of community locations, but respondents are not selected to statistically represent Hudson Valley residents
- NYSDOH surveys reflect the people at the events we attend
- Surveys reflect bias of who chooses to participate

NYSDOH and Hudson River Fish Advisory Minigrant Partner Surveys

Survey limitations continued:

- Surveys are very short to encourage participation
  - we do not collect information on how much of each species is consumed or how each type of fish is prepared
- People do not answer every question and in upcoming slides we present results for the number of people who answered the question, may be slightly different from the total responses

CCE Dutchess Partners
Local Fish Consumption Surveys

- Since 2012, CCE Dutchess has coordinated local fish consumption surveys from Dutchess, Columbia, Greene, Orange and Ulster counties
- Surveys are collected at food banks, low income daycare centers, clinics, farmers markets, substance abuse recovery programs and other sites used to recruit nutrition program clients

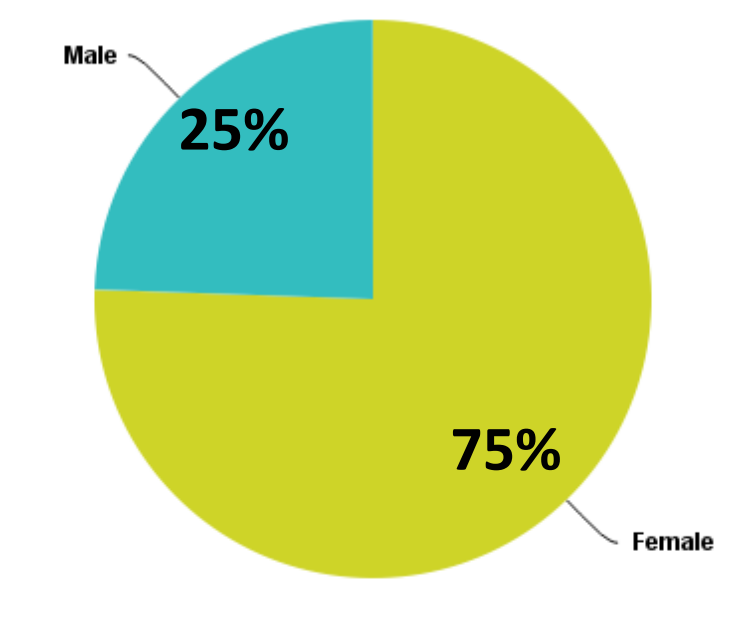
Cornell University
Cooperative Extension
Dutchess County

Cornell University
Cooperative Extension
Columbia & Greene Counties

Cornell University
Cooperative Extension
Orange County

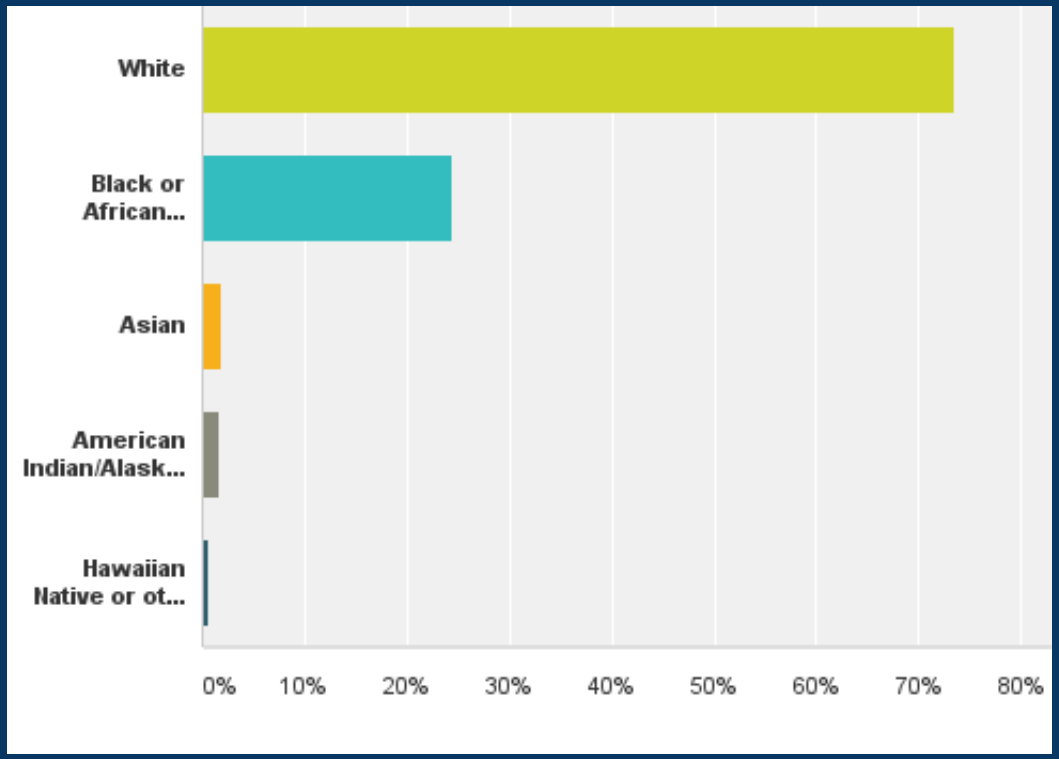
Cornell University
Cooperative Extension
Ulster County

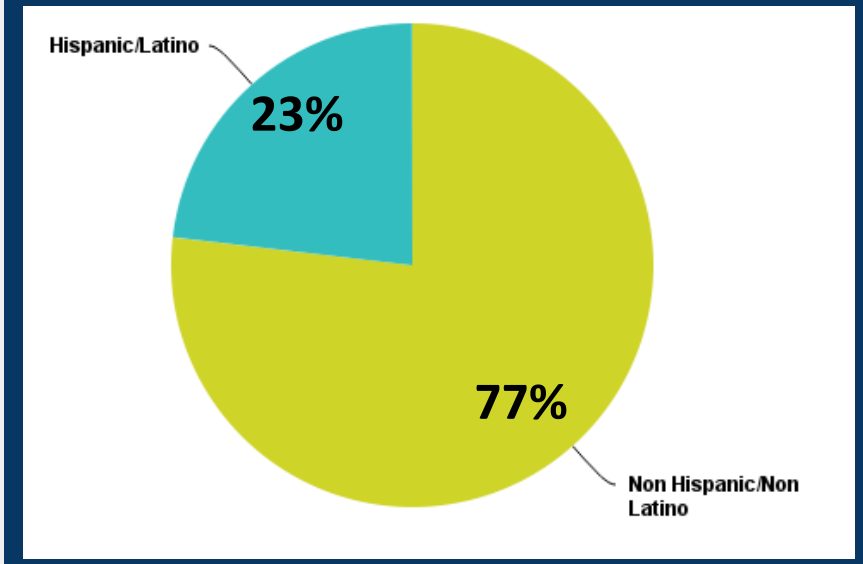
CCE Dutchess Partners
Local Fish Consumption Surveys



- CCE Dutchess partners have access to a major target audience for Hudson fish advisory messages, women of childbearing age, in five Hudson Valley counties
- 72% of respondents are under 55

CCE Dutchess Partners
Local Fish Consumption Surveys Race and Ethnicity

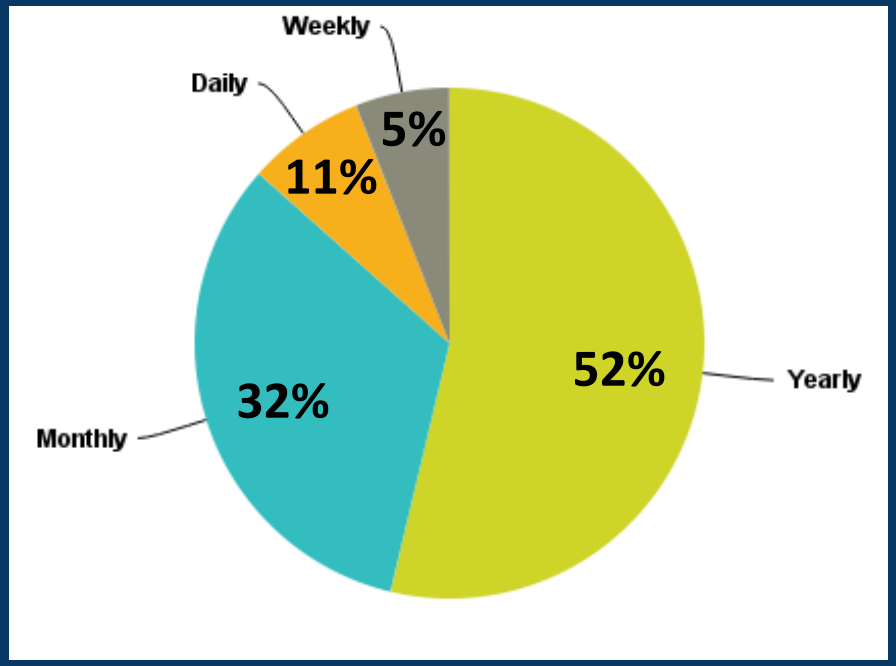




- Able to reach some minority populations

CCE Dutchess Partners
Local Fish Consumers

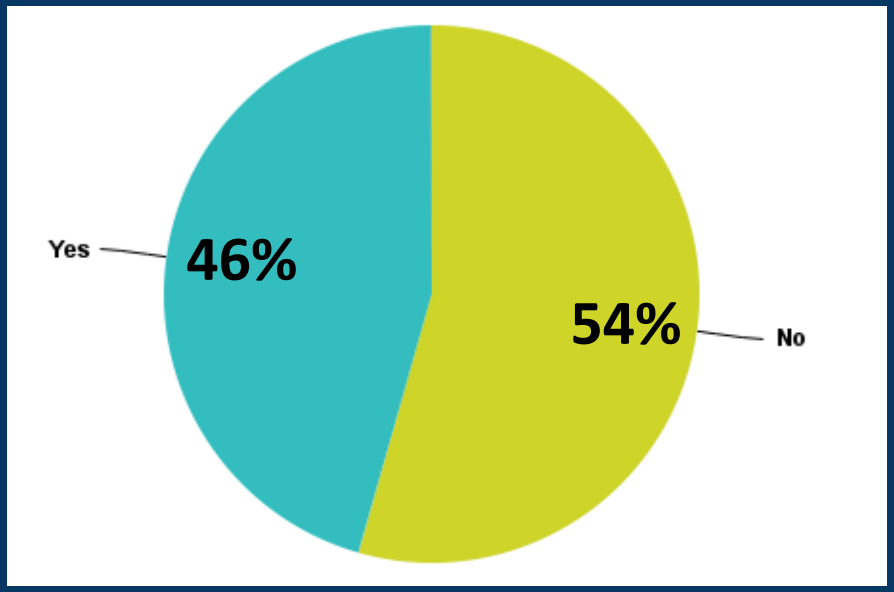
- 1338 surveys
- 17% report they ate fish or crabs they or someone they knew caught from a local water (232)
- Stopped asking species information as many respondents did not know because they do not fish themselves
- More than half report eating local fish (including from the Hudson) annually



How Often Do You Eat Locally Caught Fish?

CCE Dutchess Partners
Hudson Fish Consumers

- 1338 respondents
- Over half of local fish eaters ate fish or crabs from the Hudson – about 10% of all respondents (136)
- 44% of Hudson fish consumers are male



Have you heard health advice about eating fish and/or crabs people catch?

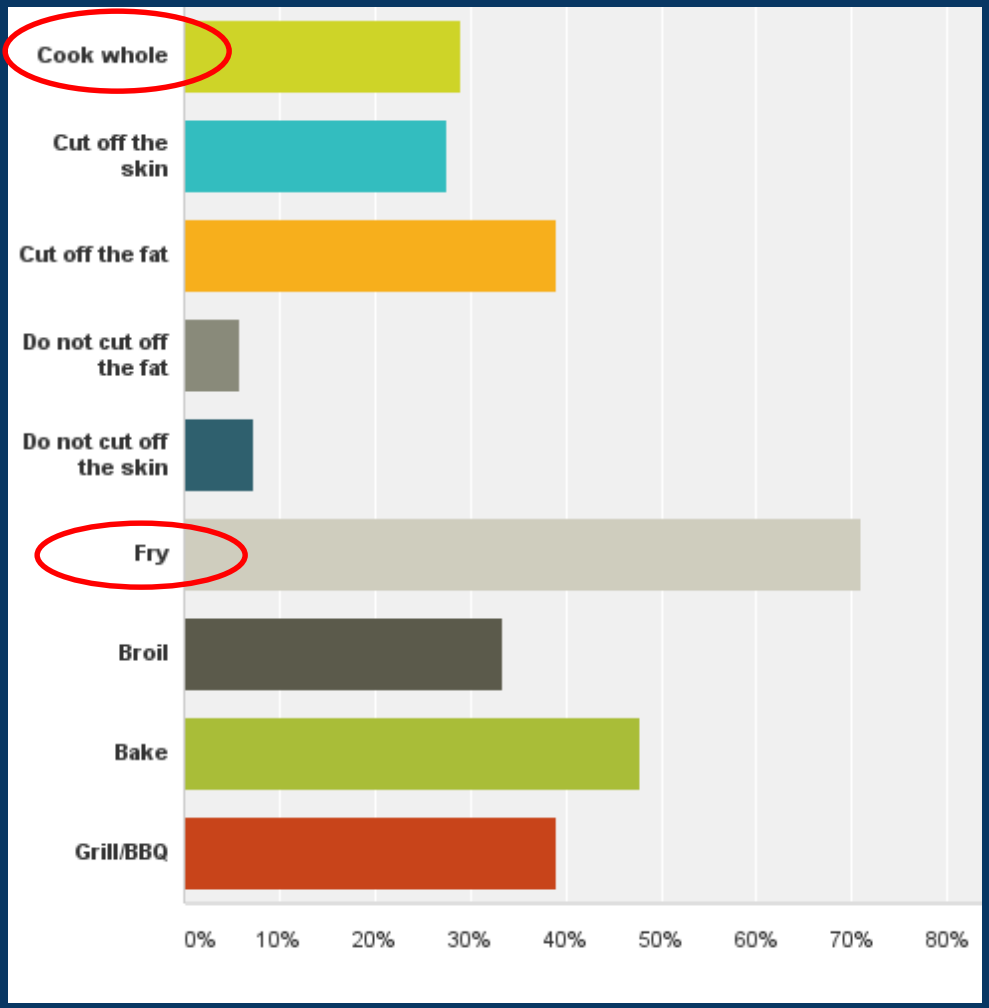
CCE Dutchess Partners
Hudson Fish Consumers

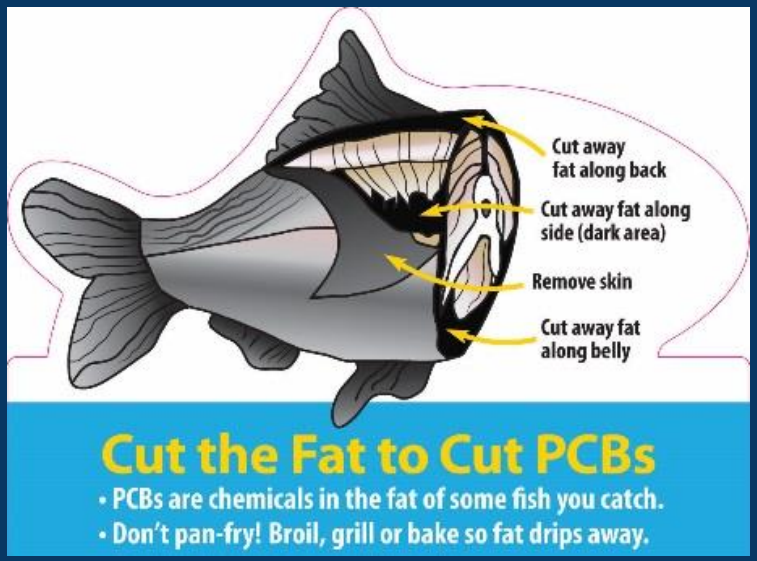
Number	Eating Hudson Fish	Eating Hudson Crabs	Eating Hudson Fish or Crabs
Respondents	72	64	136
Women under 55	29	20	49

1338 surveys

- 29 respondents who ate fish or crabs from the Hudson reported their children under 15 ate fish
- 25% of the people who ate crab ate the tomalley (mustard), which contains a lot of chemicals

CCE Dutchess Partners
Local Fish Consumption Surveys

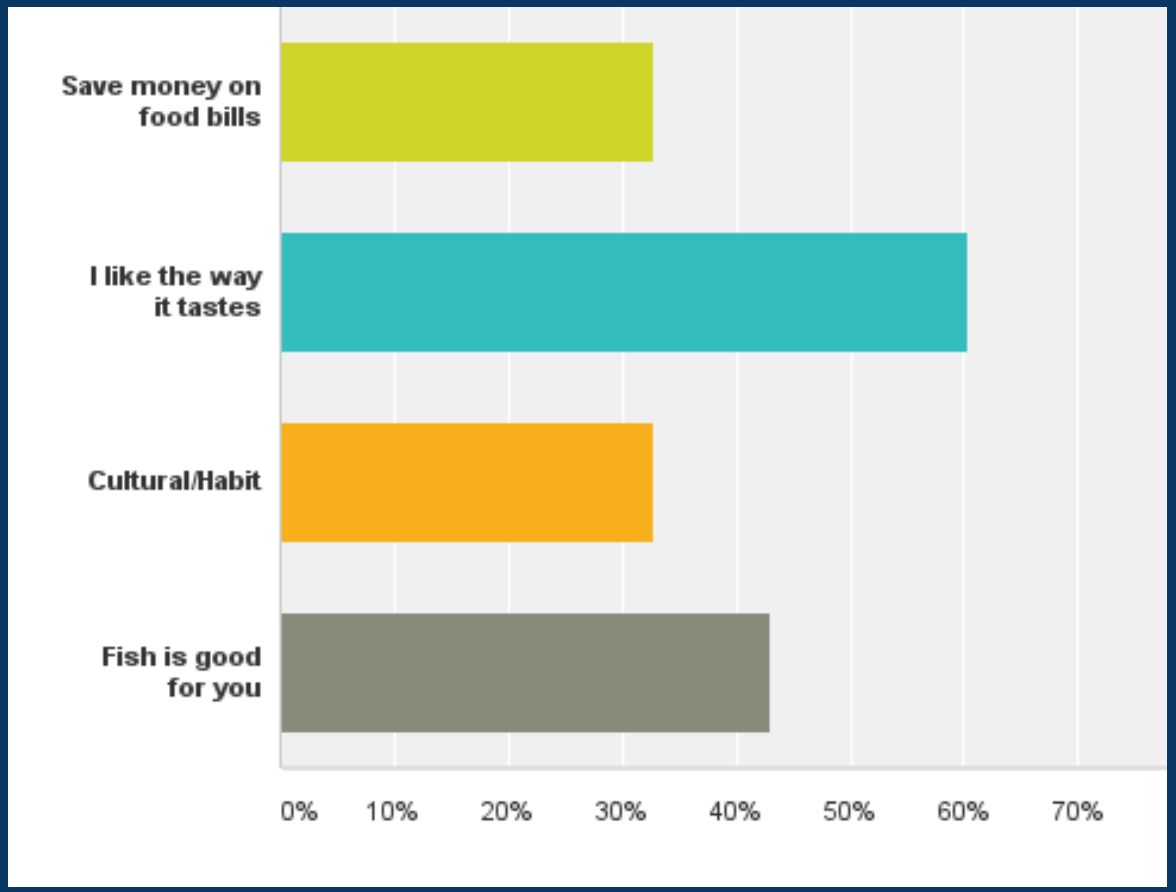




How Do You Prepare Local Fish? (Including Hudson River)

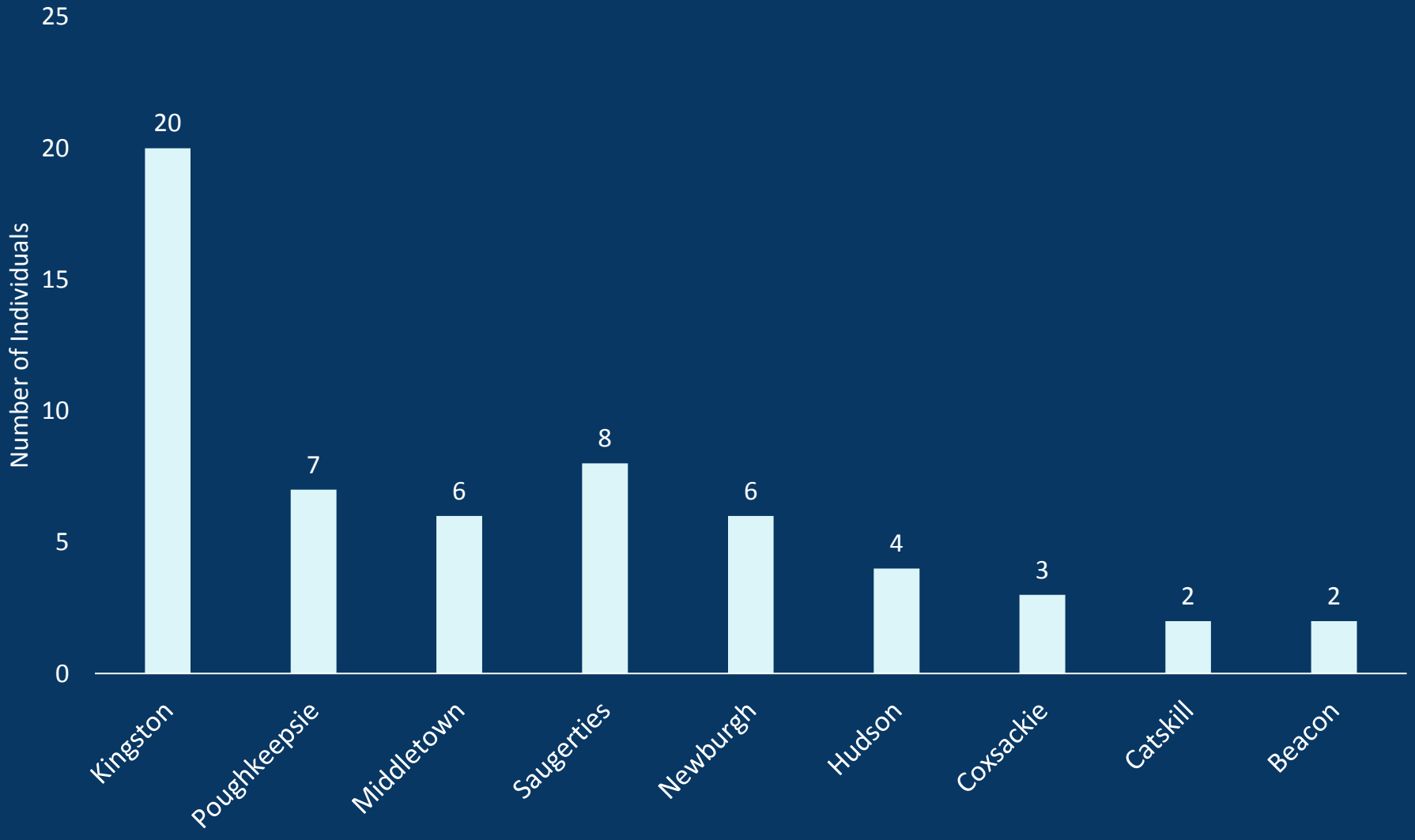
Almost 30% report they cook fish whole and frying is most popular

CCE Dutchess Partners
Hudson Fish Consumers



Responses from people eating Hudson fish to "What are the best reasons for eating fish or crabs that you catch? (check all that apply)"

CCE Dutchess Partners
Primary Locations People Report Eating Hudson Fish



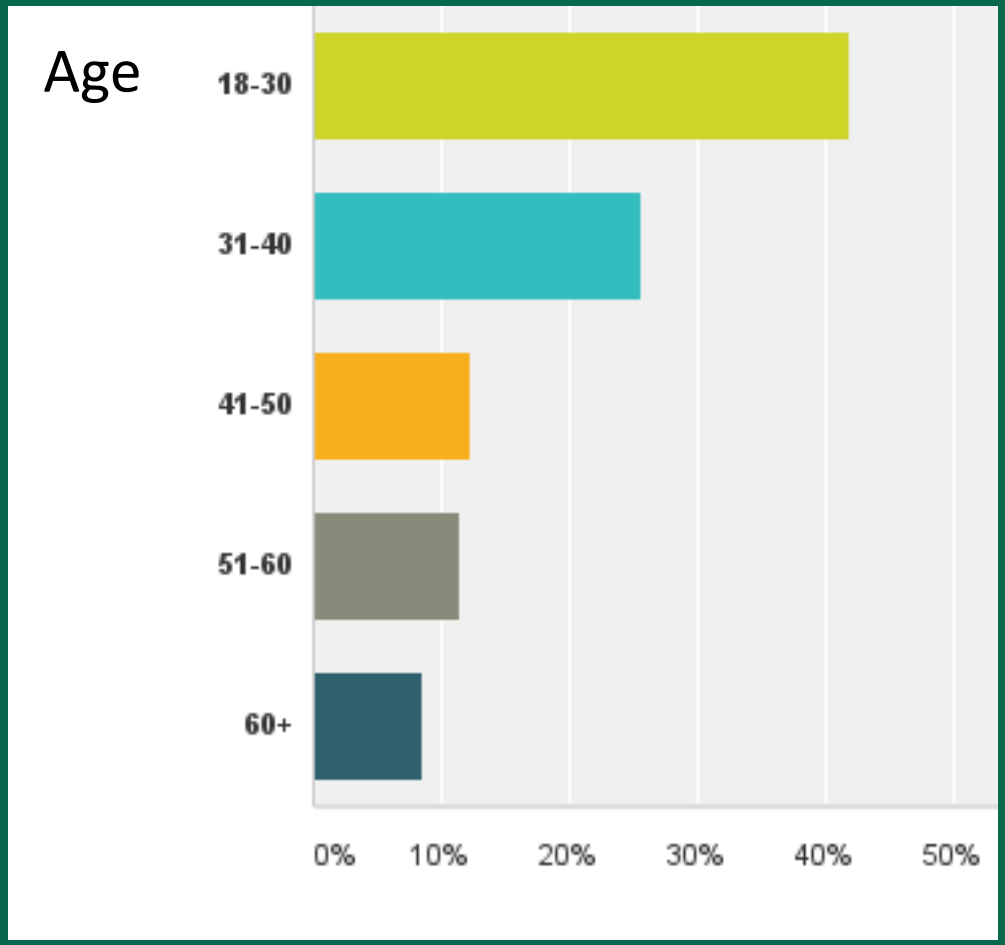
CCE Saratoga Partner
Hudson Fish Consumption Surveys

- Since 2014 CCE nutrition educator surveyed 488 people at Women Infant and Children clinics, fairs and community events in Saratoga and Washington counties
- 212 fished the Hudson
- Will focus on the 107 people who said they most frequently fish the Hudson from Troy to Hudson Falls
- Troy to Hudson Falls has NYSDEC regulations - catch and release fishing only



Cornell University
Cooperative Extension
Saratoga County

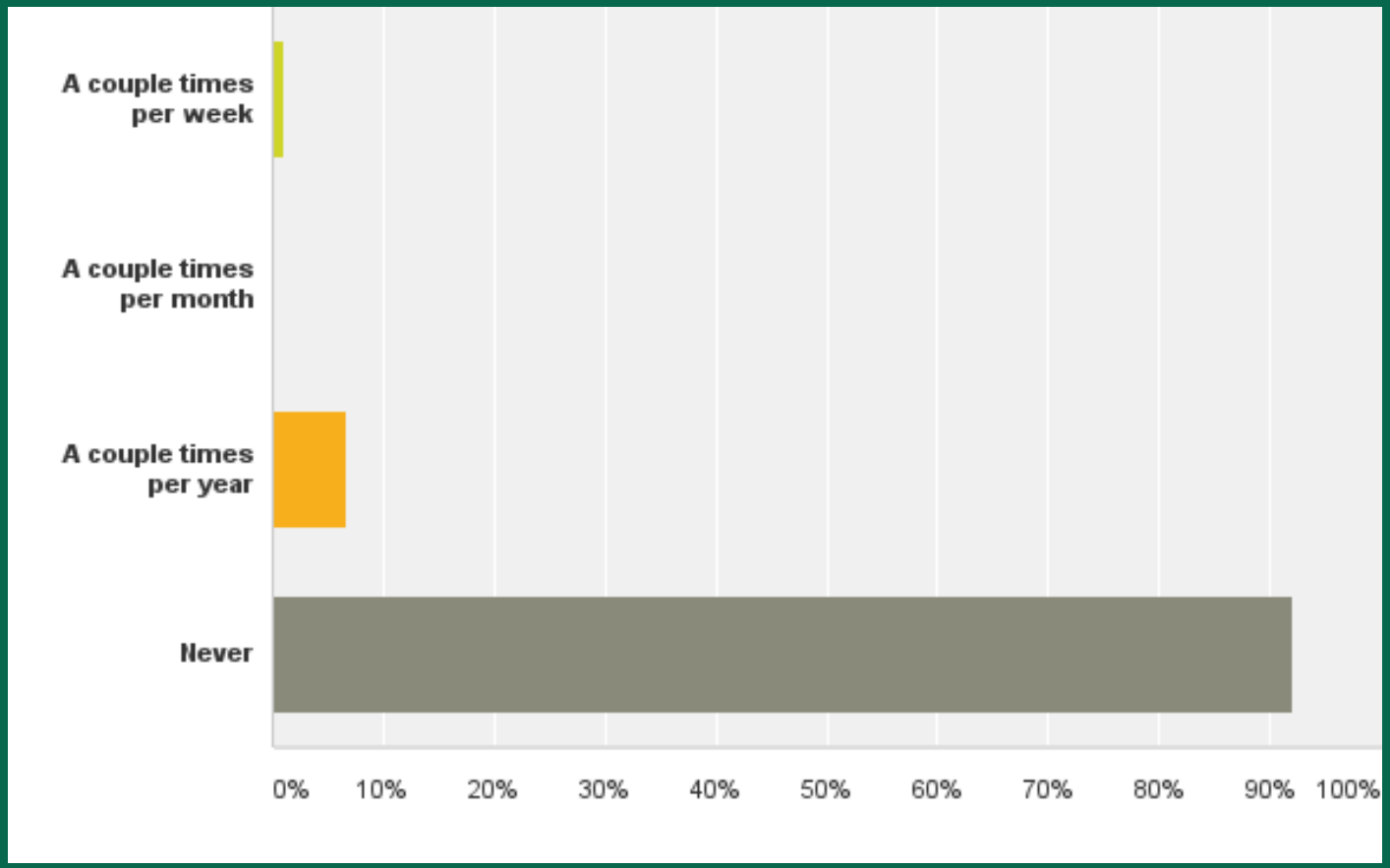
CCE Saratoga Partner
Fish Troy to Hudson Falls Most Often



107 individuals

- 56% male
- 44% female

CCE Saratoga Partner
Hudson Fish Consumption Troy to Hudson Falls



How often do you eat Hudson fish?

CCE Saratoga Partner Fish Reported Eaten

These responses are from people who most frequently fish the Hudson from Troy to Hudson Falls, but they may not be exclusively fishing in that area:

- Catfish (1)
- Walleye (1)
- Smallmouth Bass (1)
- Sunfish/bluegill (1)
- Trout (1)
- Striped Bass (2) – generally south of Troy dam
- Bluefish (1) – marine species
- Don’t know species (1)



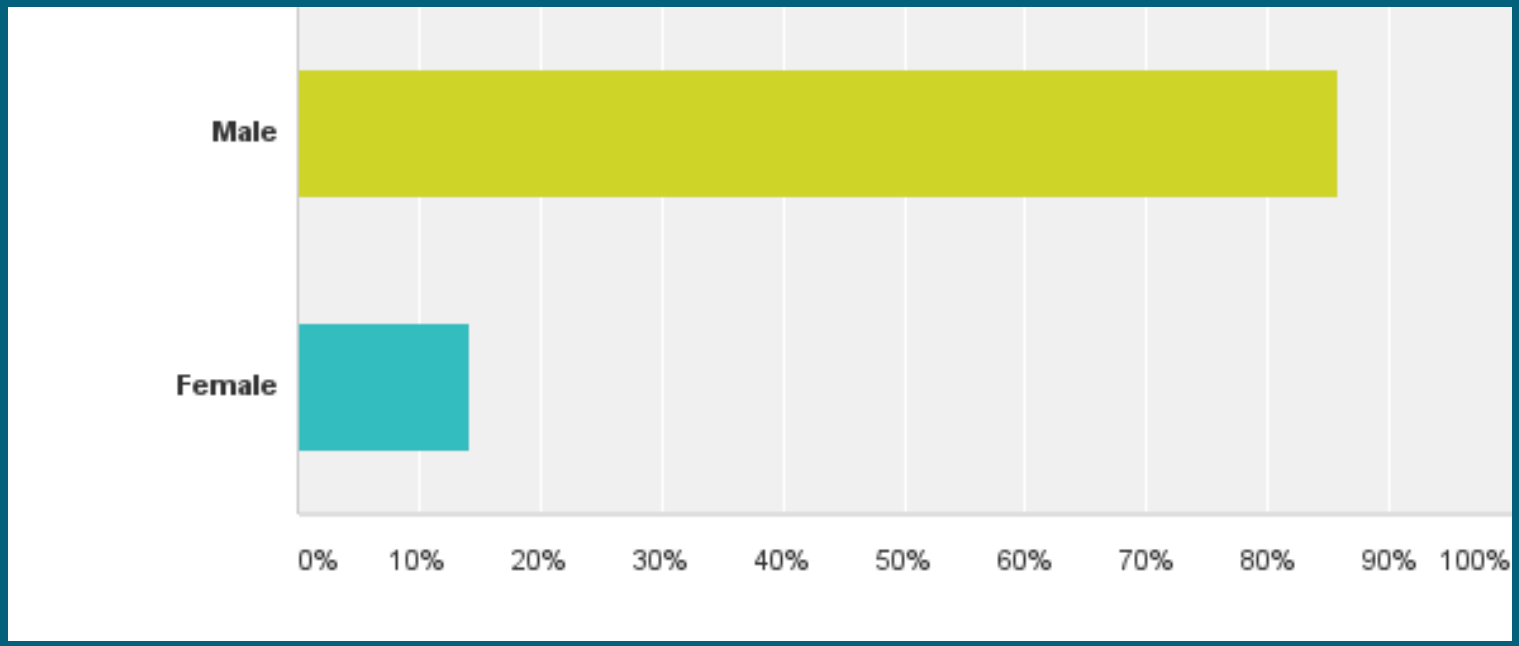
NYSDOH
Hudson Fish Consumption Survey

- 786 “convenience” samples – one page surveys done since 2013 at outreach events NYSDOH staff attend in the Hudson Valley throughout the 200-mile Project Area, from Saratoga to NYC
- All respondents fish on the Hudson River
- Since 2015 we attended a large outdoor show in Rockland County – almost half of our surveys are from this event
- Offer incentive of reusable “striper” bag, bass lures or measuring tape





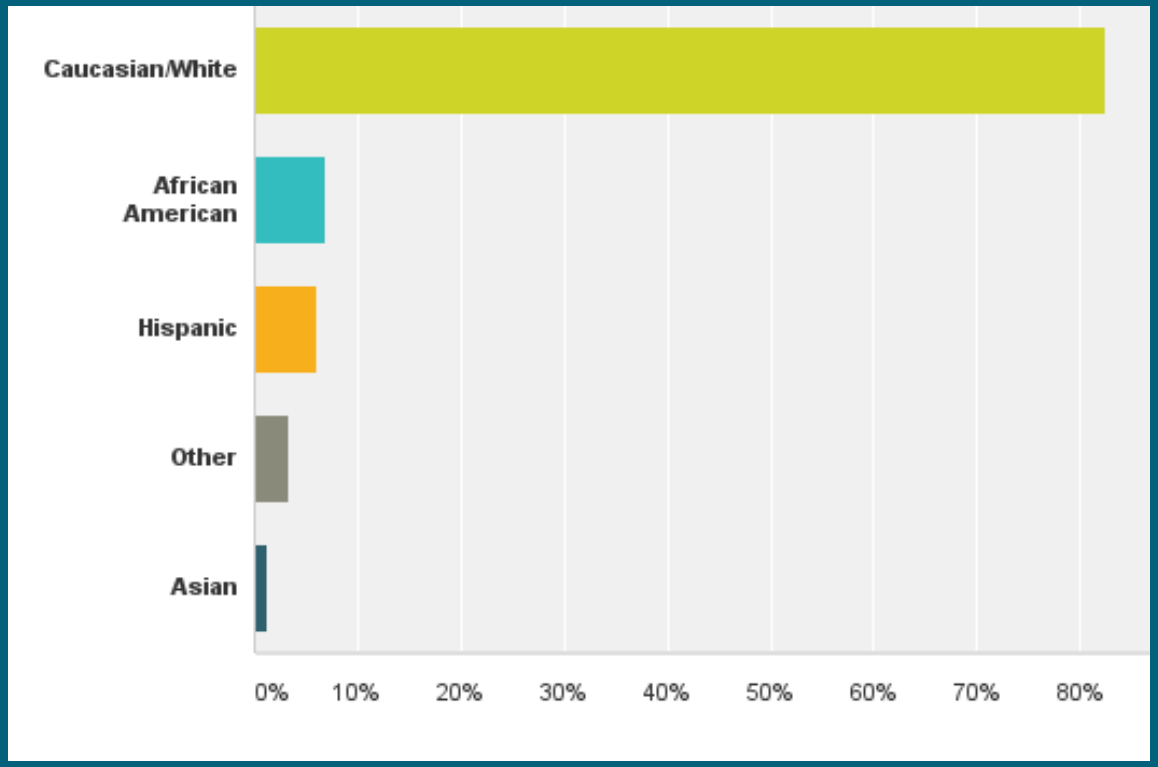
NYSDOH
What Is Your Gender?

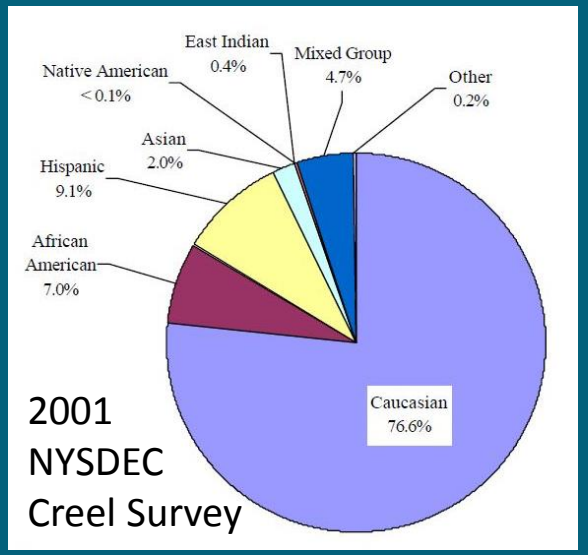


Not representative of Hudson Valley residents, but is similar to a 2001 NYSDEC “creel survey” of 4,800 people fishing the Hudson, with 10.5% female respondents

“Assessment of Hudson River Recreational Fisheries” conducted by Normandeau Associates for the NYSDEC

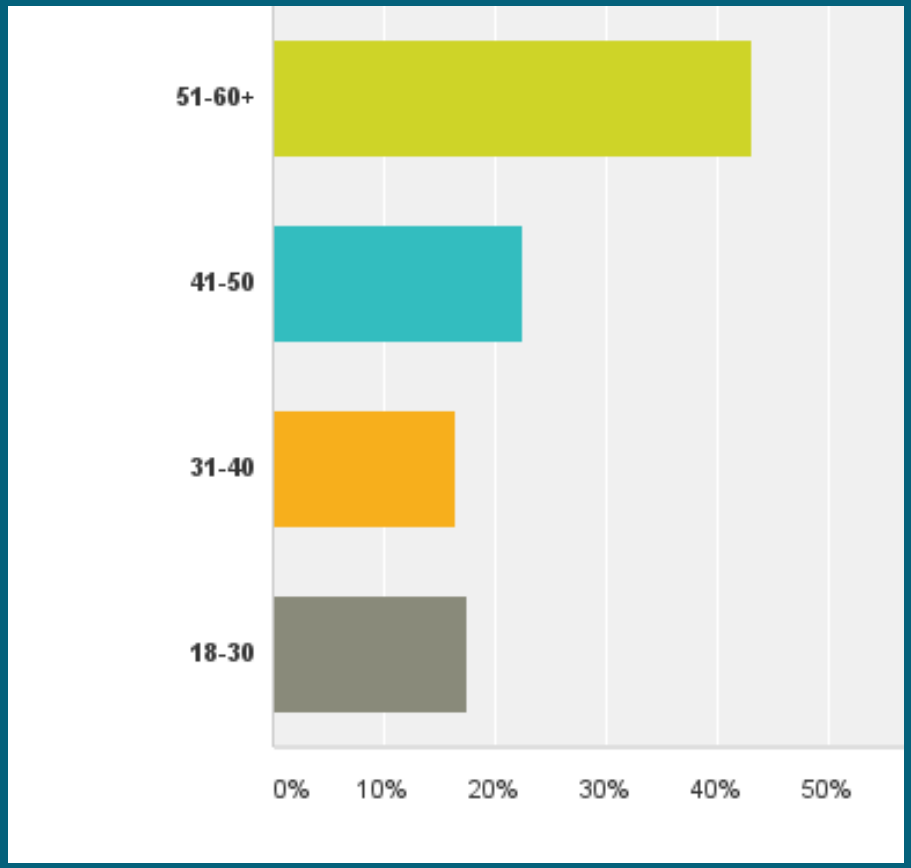
NYSDOH
What Is Your Ethnicity?





Minorities are under-represented compared to Hudson Valley population, but the composition is fairly similar to the 2001 NYSDEC creel survey of people fishing the Hudson

NYSDOH
What Is Your Age?



A 2011 survey of New Yorkers holding fishing licenses found that over half are 55 or older

(2011 National Survey of Fishing Hunting and Wildlife-Associated Recreation)

NYSDOH

Locations: Where in the Hudson River Do You Fish Most Often

North of Troy Dam

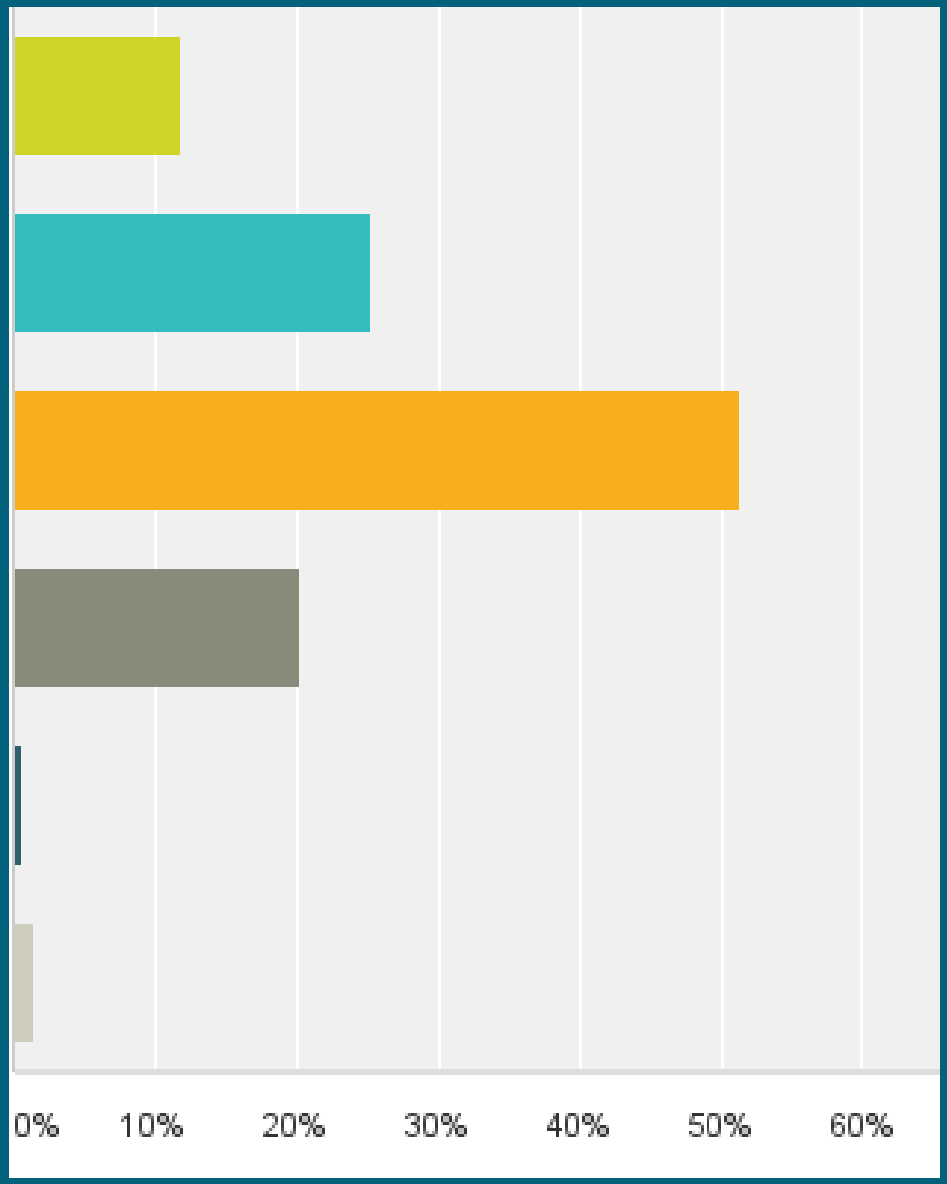
Troy to Catskill

Catskill to Tappan Zee Bridge

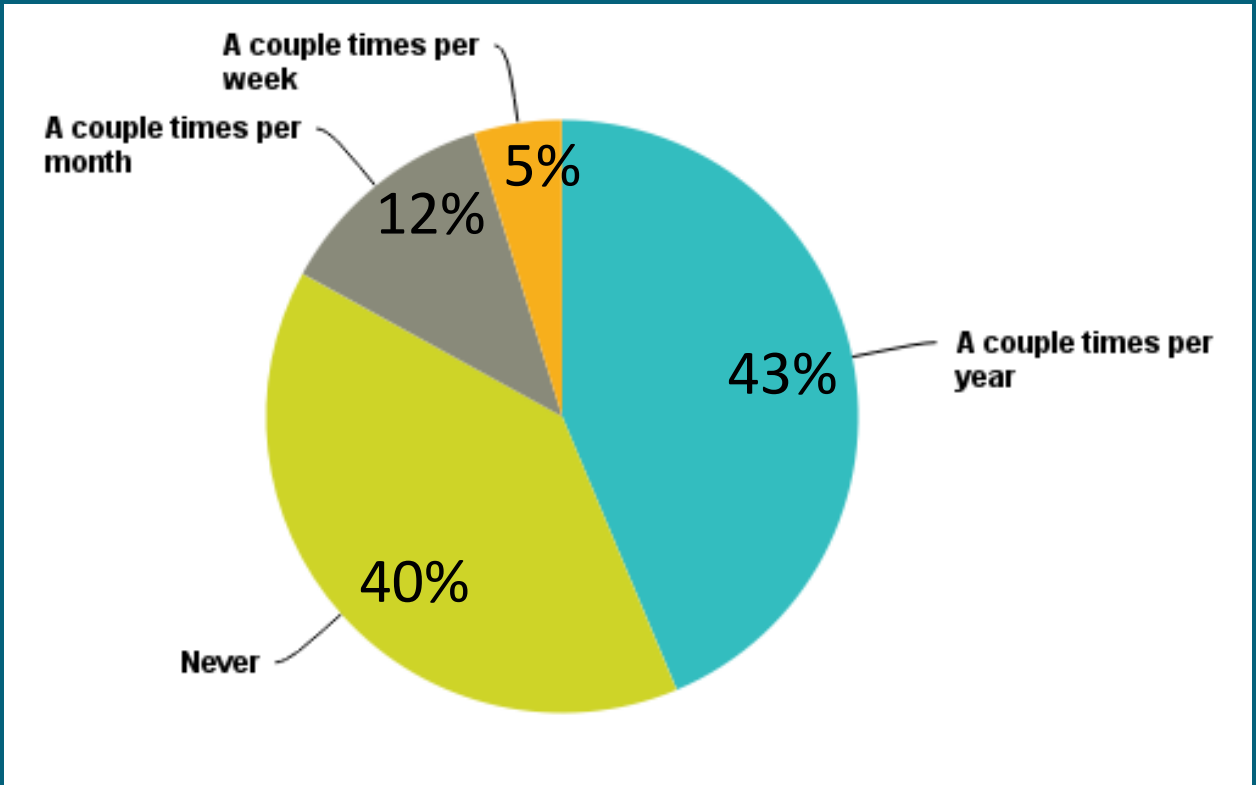
Tappan Zee Bridge to George Washington Bridge

Tappan Zee to George Washington Bridge

George Washington Bridge to Battery

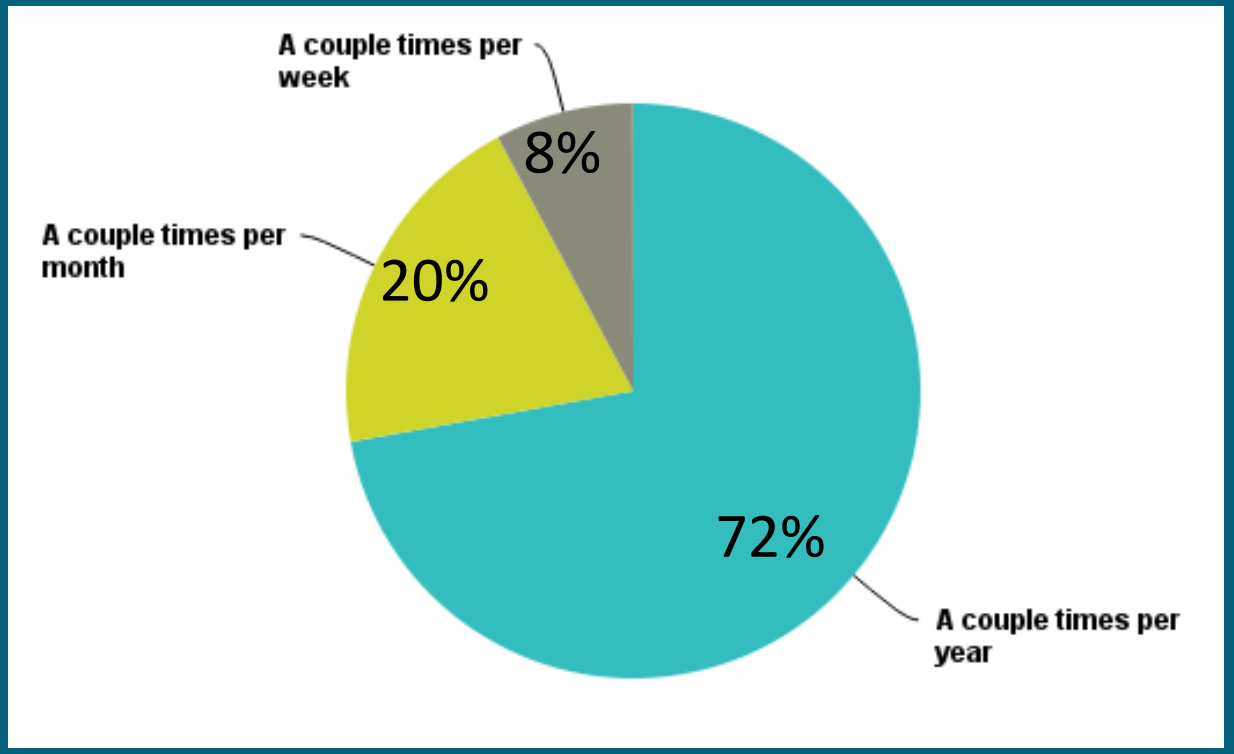


NYSDOH How Often Do You Eat Hudson Fish (All 786 Respondents)



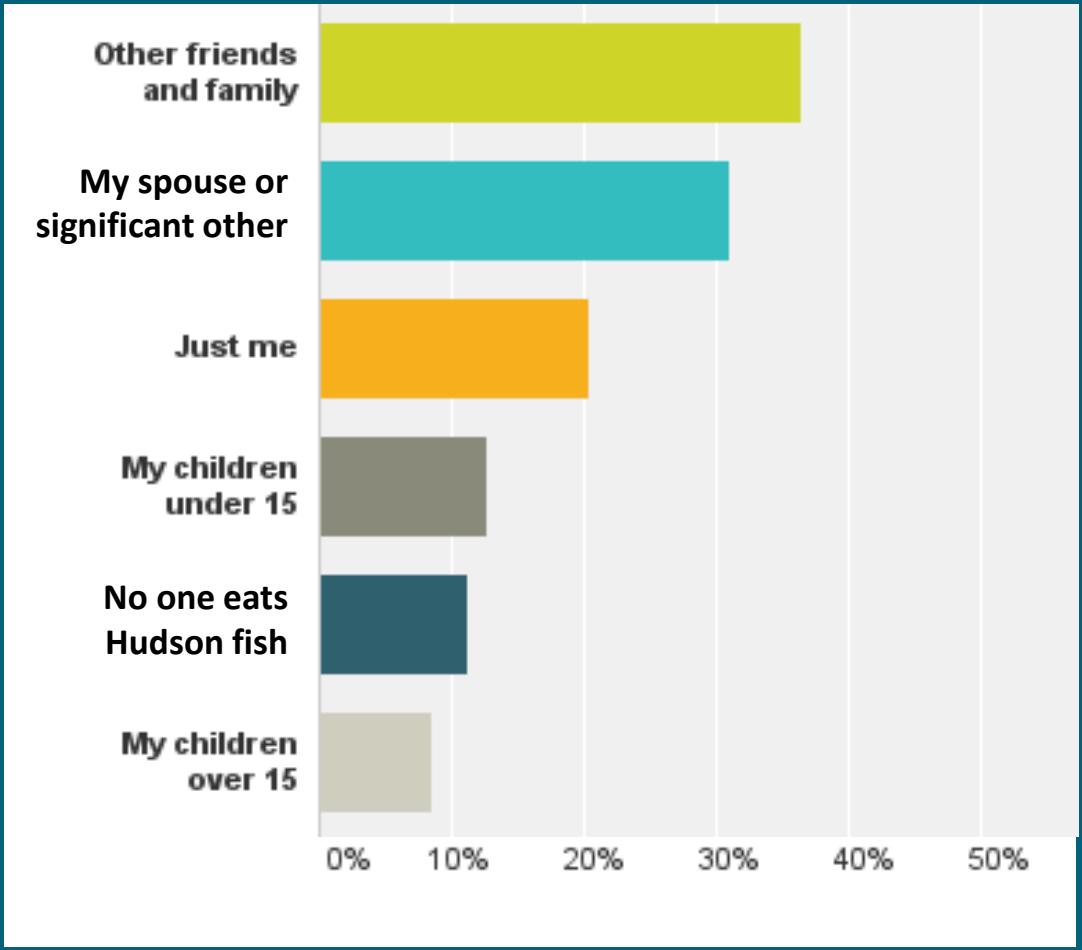
40% of respondents say they practice catch and release

NYSDOH How Often Do You Eat Hudson Fish? (460 Hudson Fish Consumers)



Most Hudson fish consumers report eating Hudson fish a couple times per year, but some eat more often than is advised

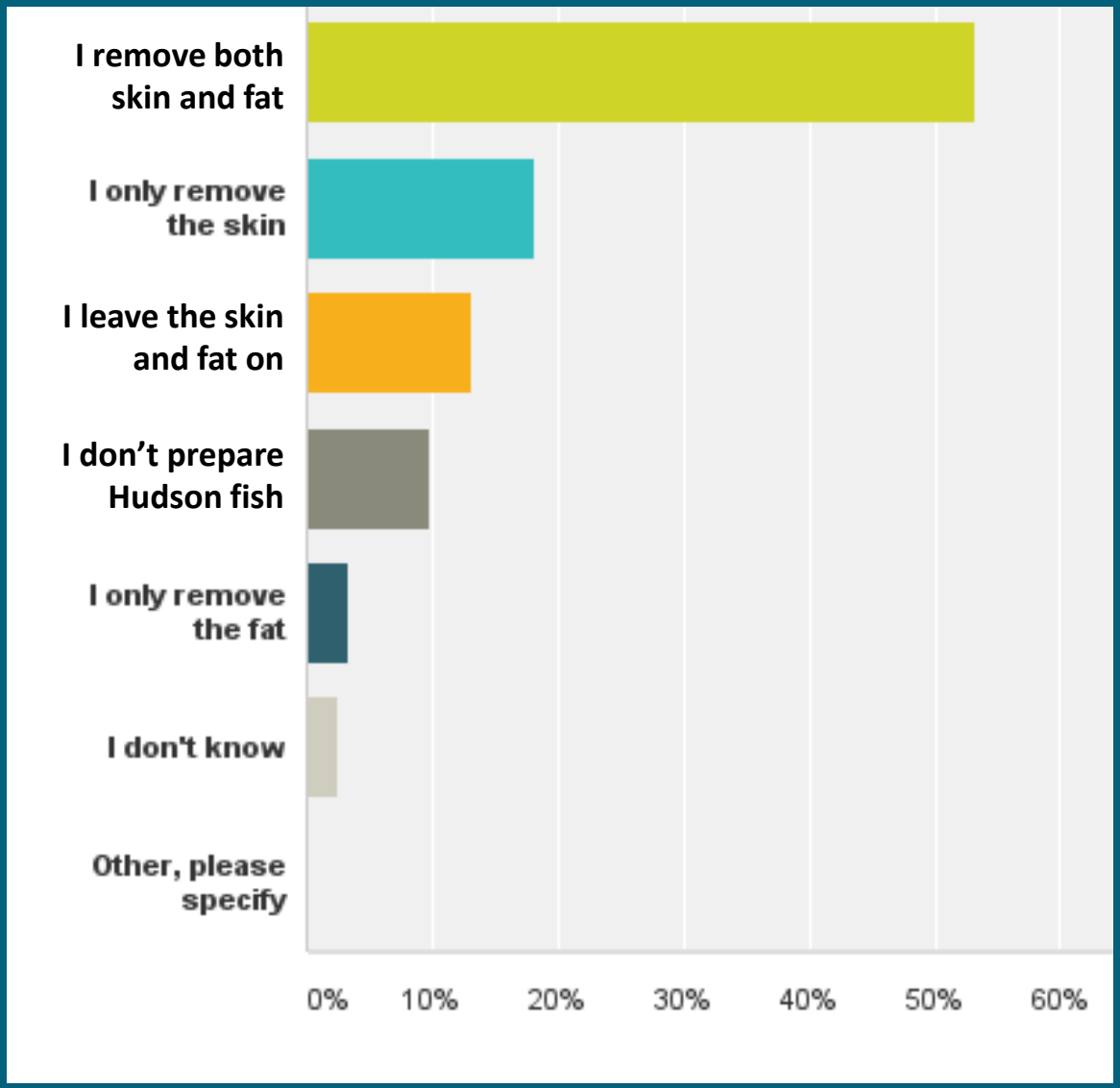
NYSDOH Who Else Eats Hudson Fish? (460 Hudson Fish Consumers)



Sharing is common

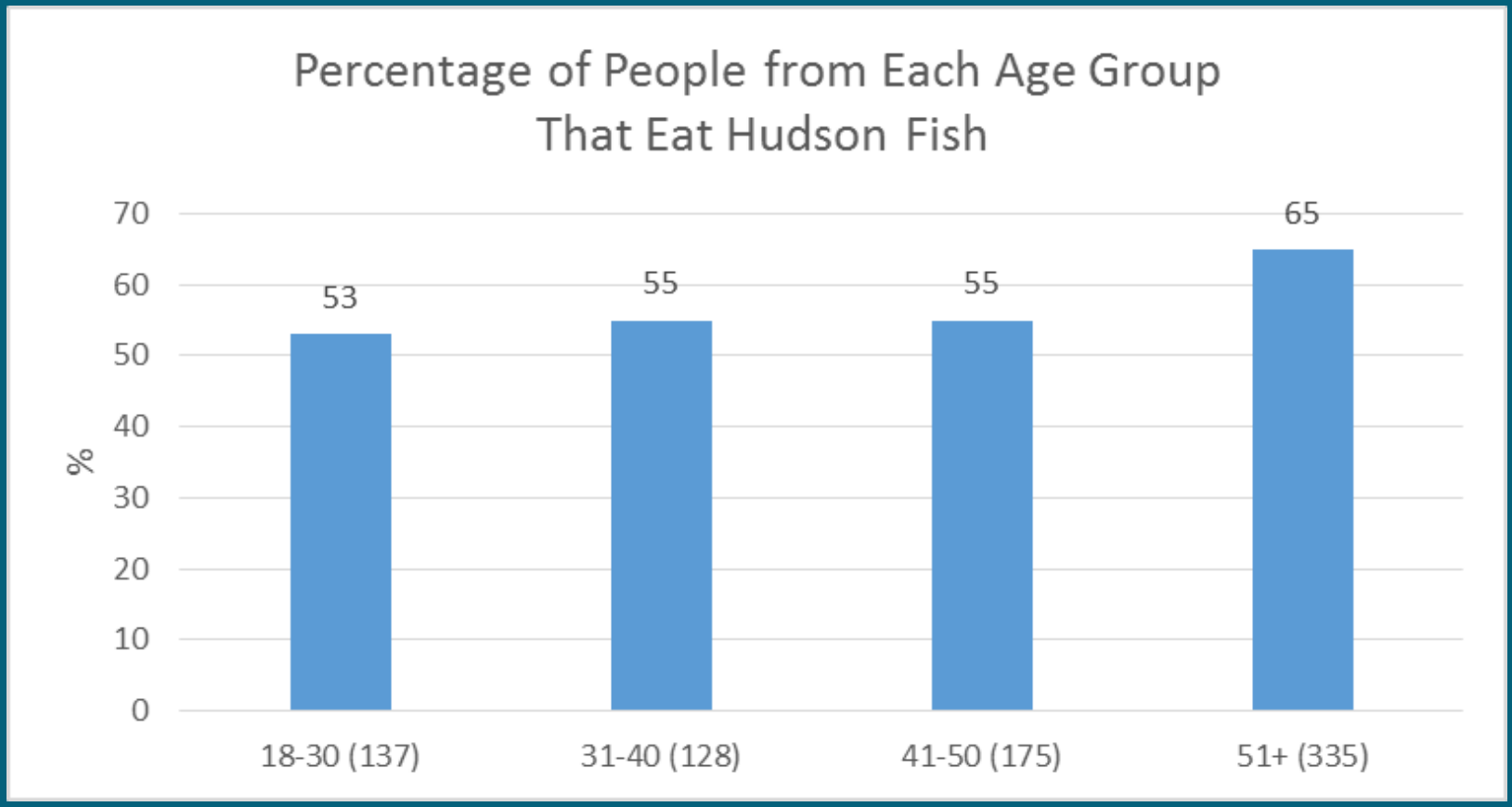
Sharing with children under 15 is a concern (58)

NYSDOH
How Do You Prepare Hudson Fish?



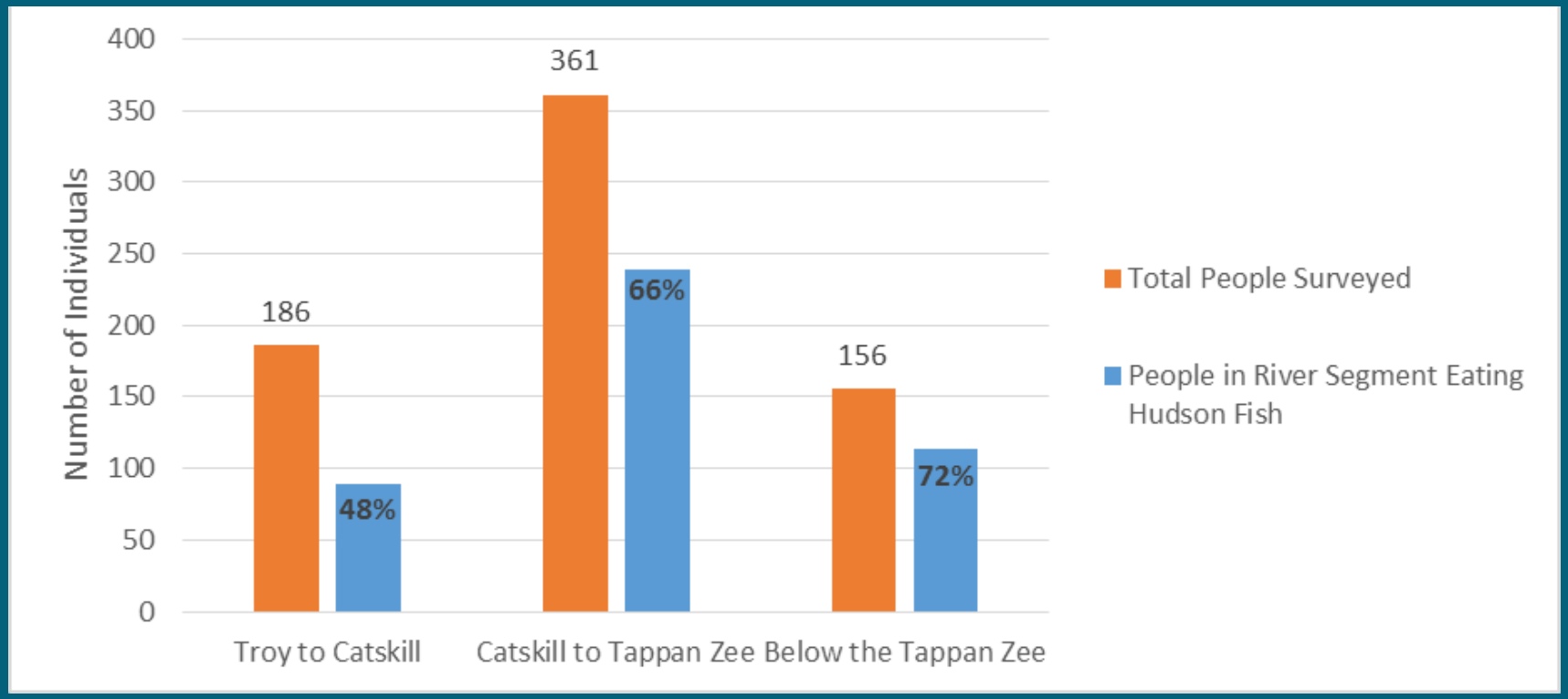
Most Hudson fish consumers remove the skin and/or fat that contain a lot of PCBs

NYSDOH
Hudson Fish Consumption by Age



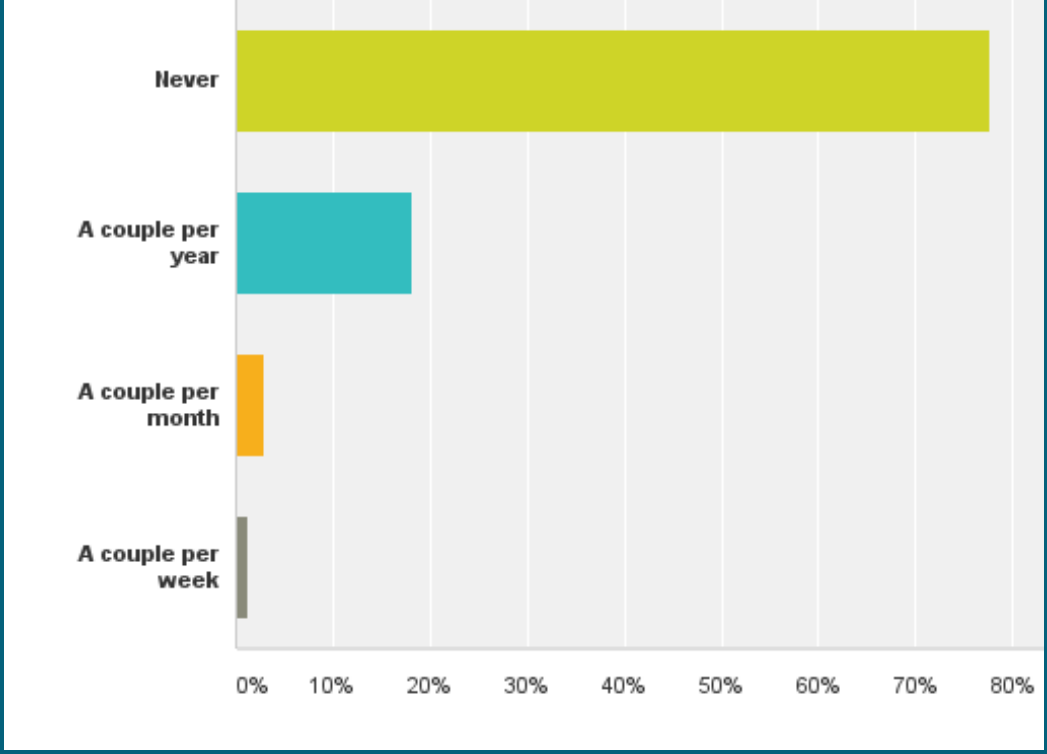
People 51 and older report eating Hudson fish slightly more than other age groups

NYSDOH Percentage of People Eating Hudson Fish Varies Along the River



Fewer people report eating Hudson fish from Troy to Catskill

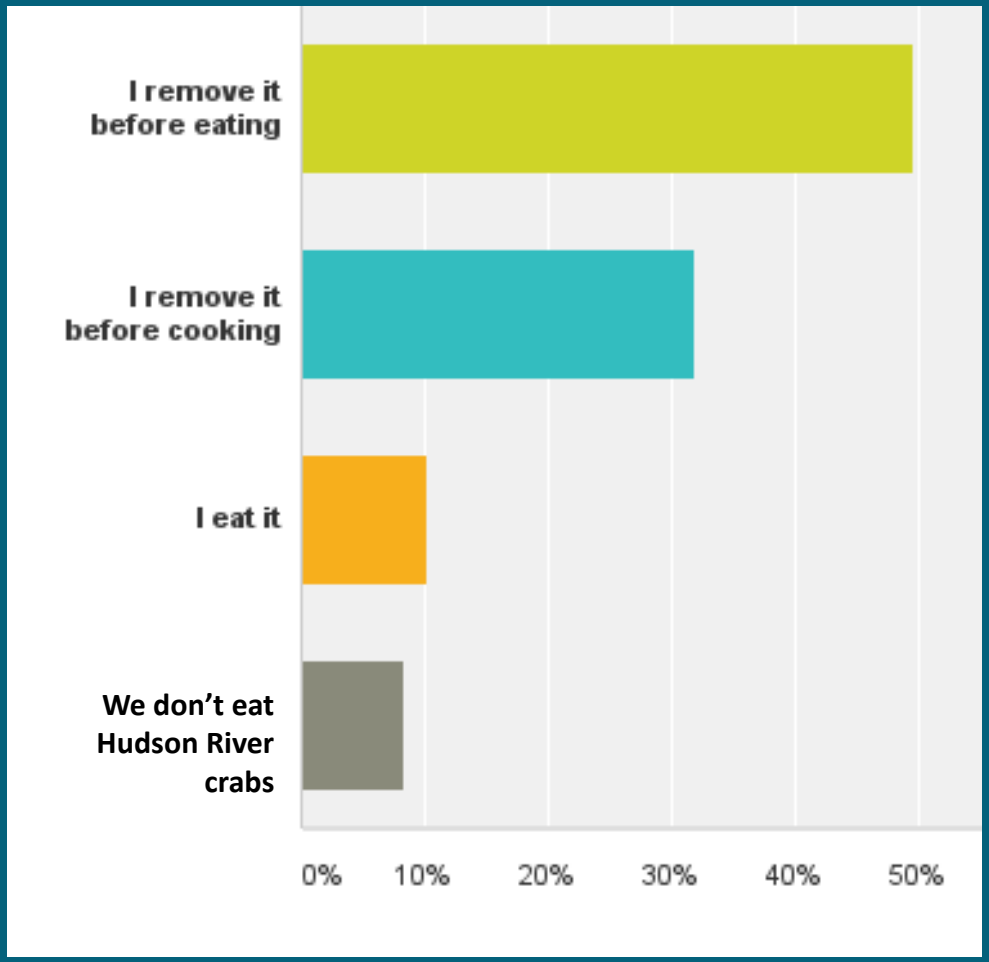
NYSDOH Crab Consumption



How often do you eat Hudson crabs?

- Crabs are much more common in the lower River
- 22% of respondents eat crab (168 of 786 surveys)
- 86% of crab-eaters eat Hudson fish too

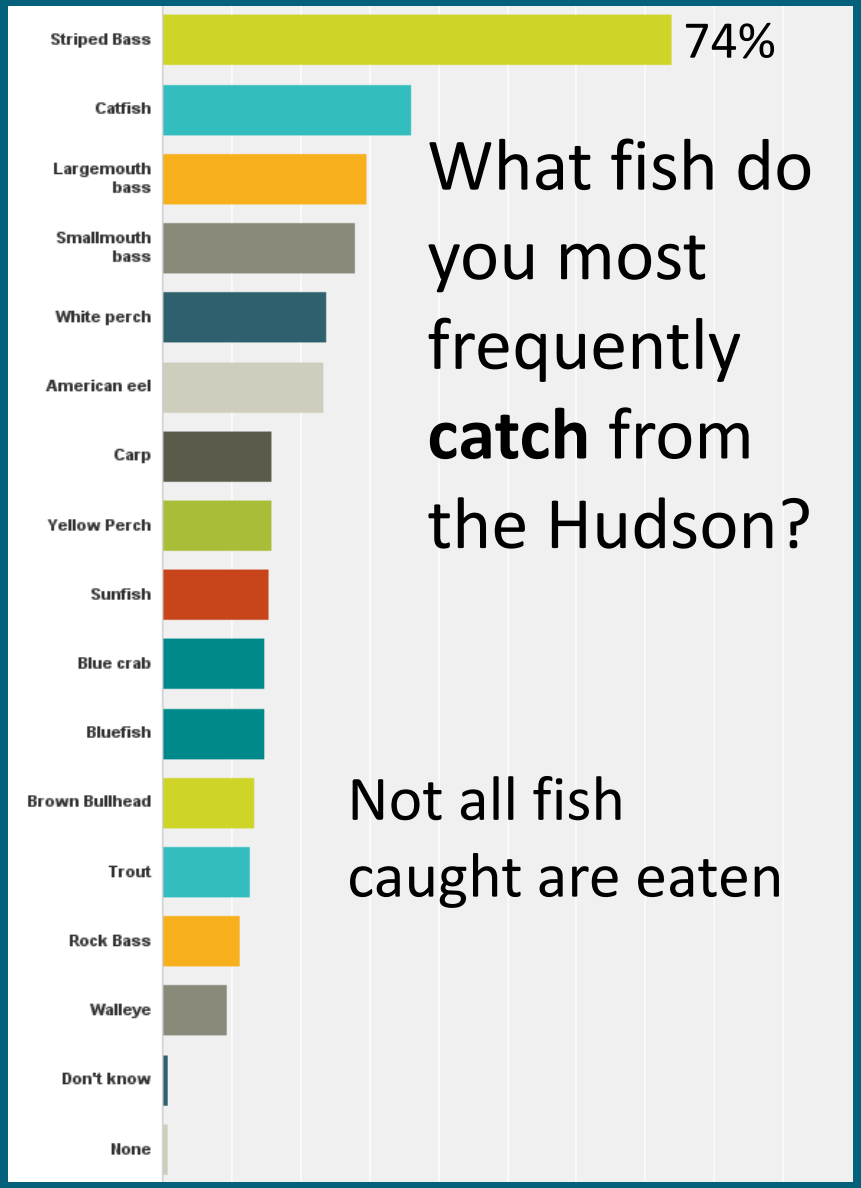
NYSDOH Crab Tomalley Consumption



What do you do with the tomalley (mustard) (168)?

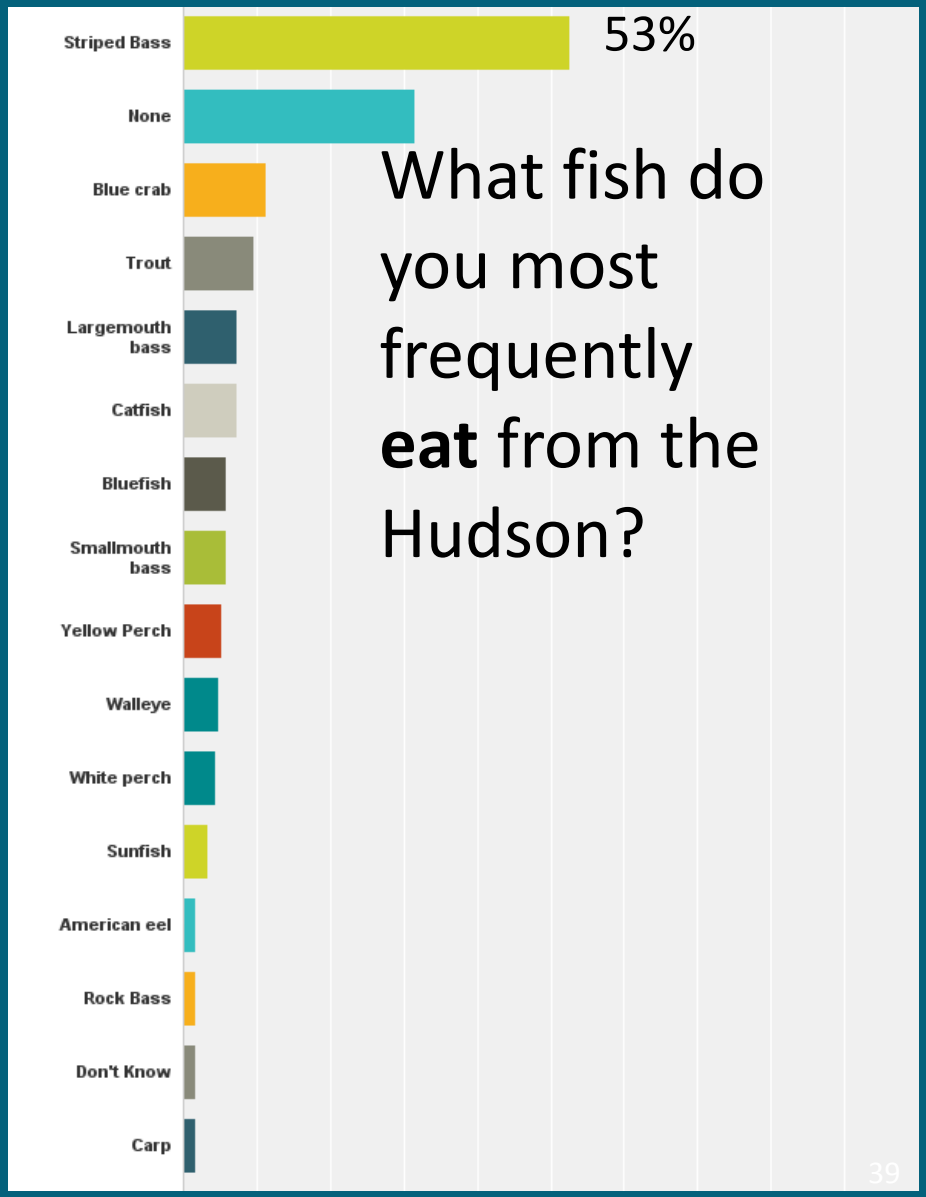
NYSDOH

Hudson Fish Caught and Eaten

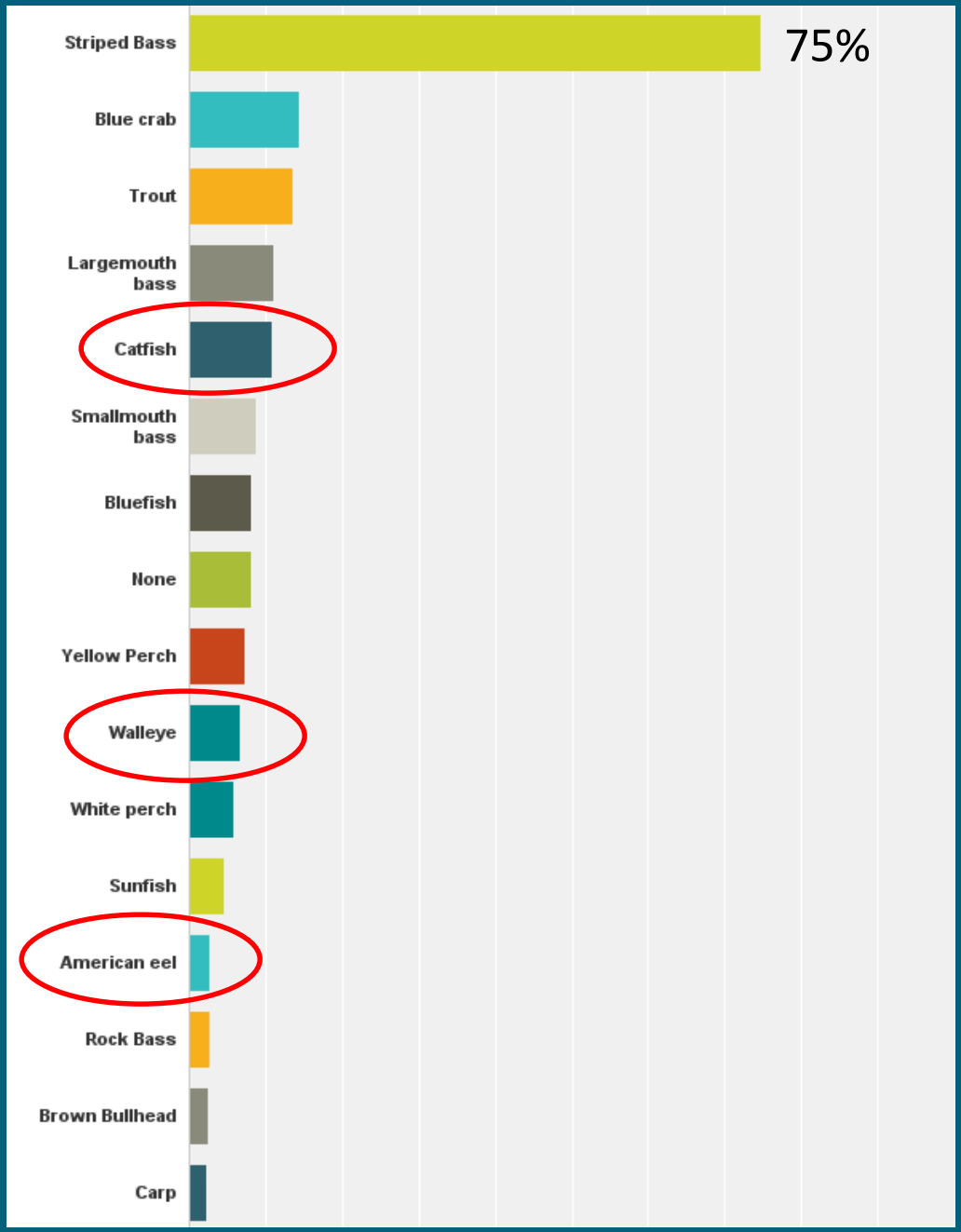


What fish do you most frequently **catch** from the Hudson?

Not all fish caught are eaten



What fish do you most frequently **eat** from the Hudson?



NYSDOH Hudson Fish Consumption (460)

What fish do you most frequently eat from the Hudson? (all that apply)

NYSDOH advises on one should eat Hudson catfish and (as of 2016) walleye

Striped bass are less contaminated south of Catskill, and striped bass from the ocean waters around Long Island and NYC are the healthiest choices
There are no alternative local waters for striped bass, as there is for catfish and walleye

No one should eat eel per both NYSDEC regulations and DOH advice

Fish Consumed
Troy to Catskill (186)



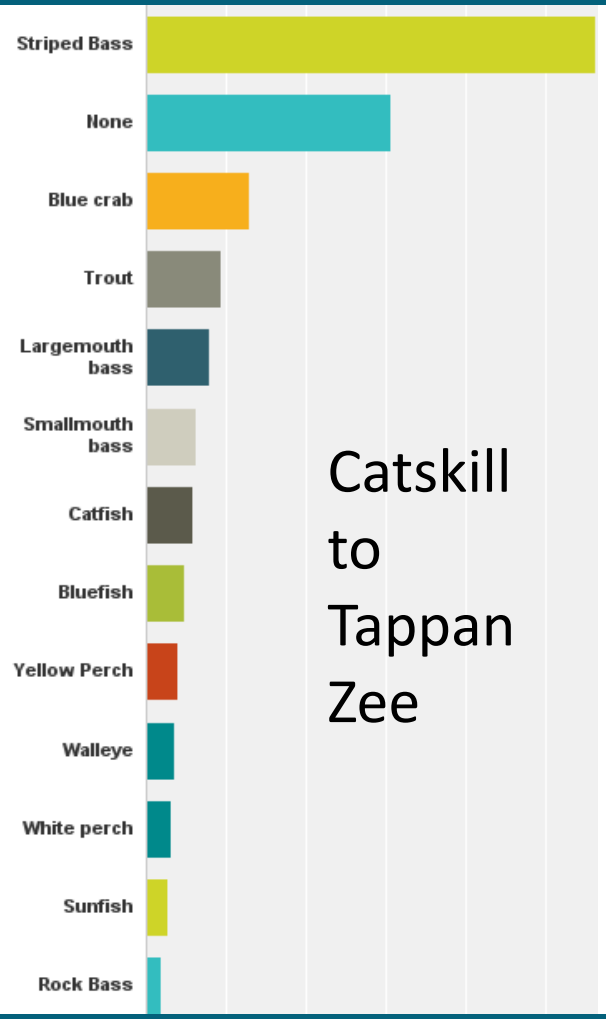
For this area the advice is to eat four species, rock bass, yellow perch, alewife or blueback herring, up to once a month

- Most fish consumption from Troy to Catskill is not consistent with the NYSDOH advice
- Many people feel striped bass are “ocean fish” and do not know, or do not agree, that they should not eat them from Troy to Catskill

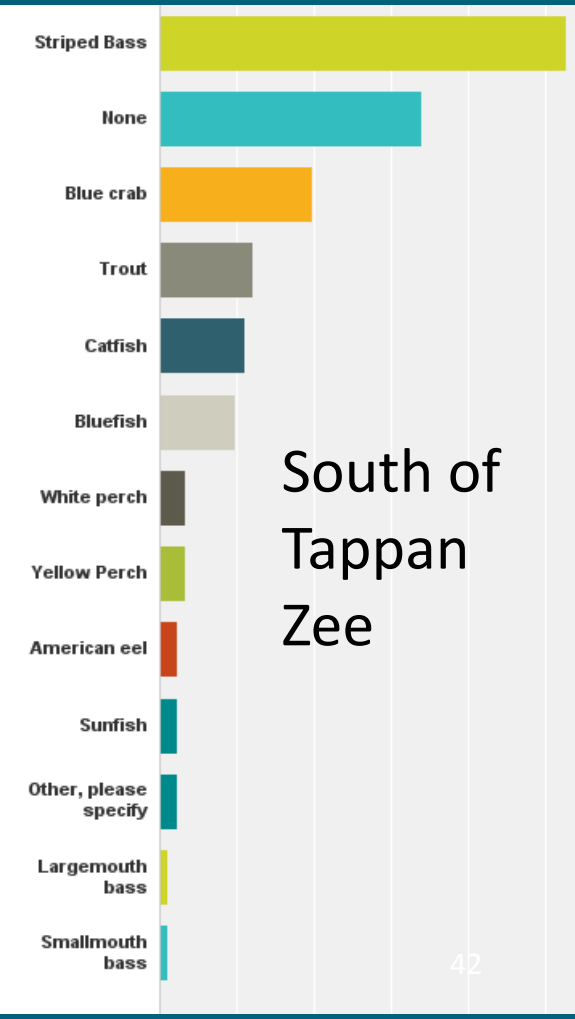
NYSDOH: Most Frequently Eaten Fish Varies by River Section



Troy to Catskill

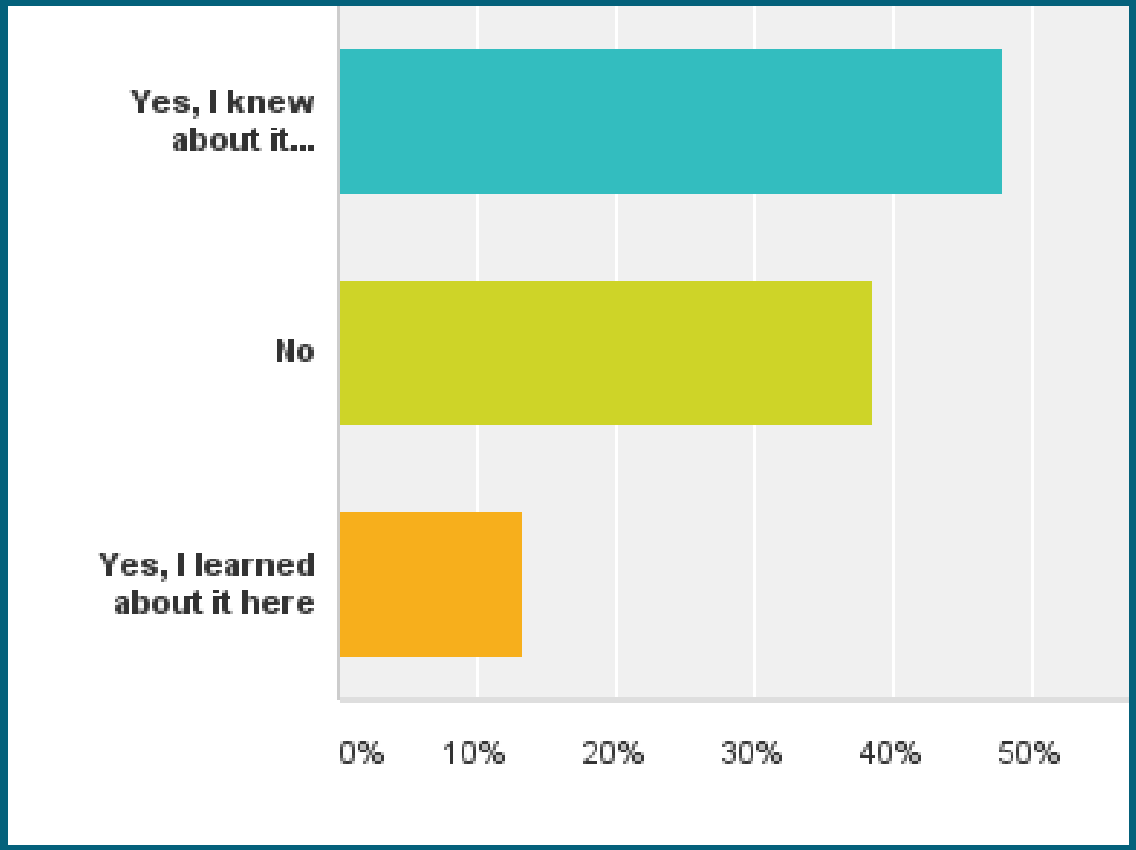


Catskill to Tappan Zee



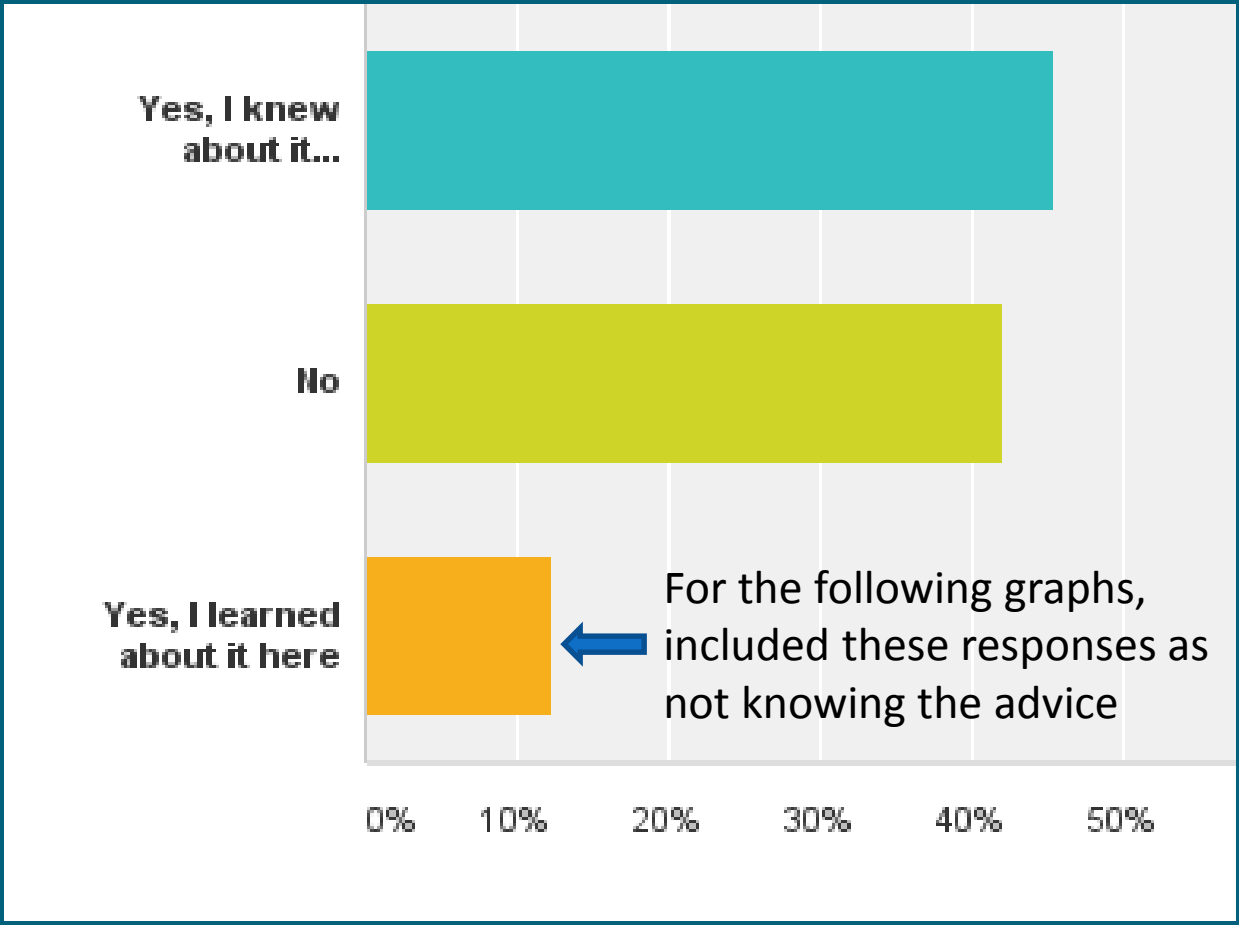
South of Tappan Zee

NYSDOH Awareness of Advice (460 Hudson Fish Consumers)



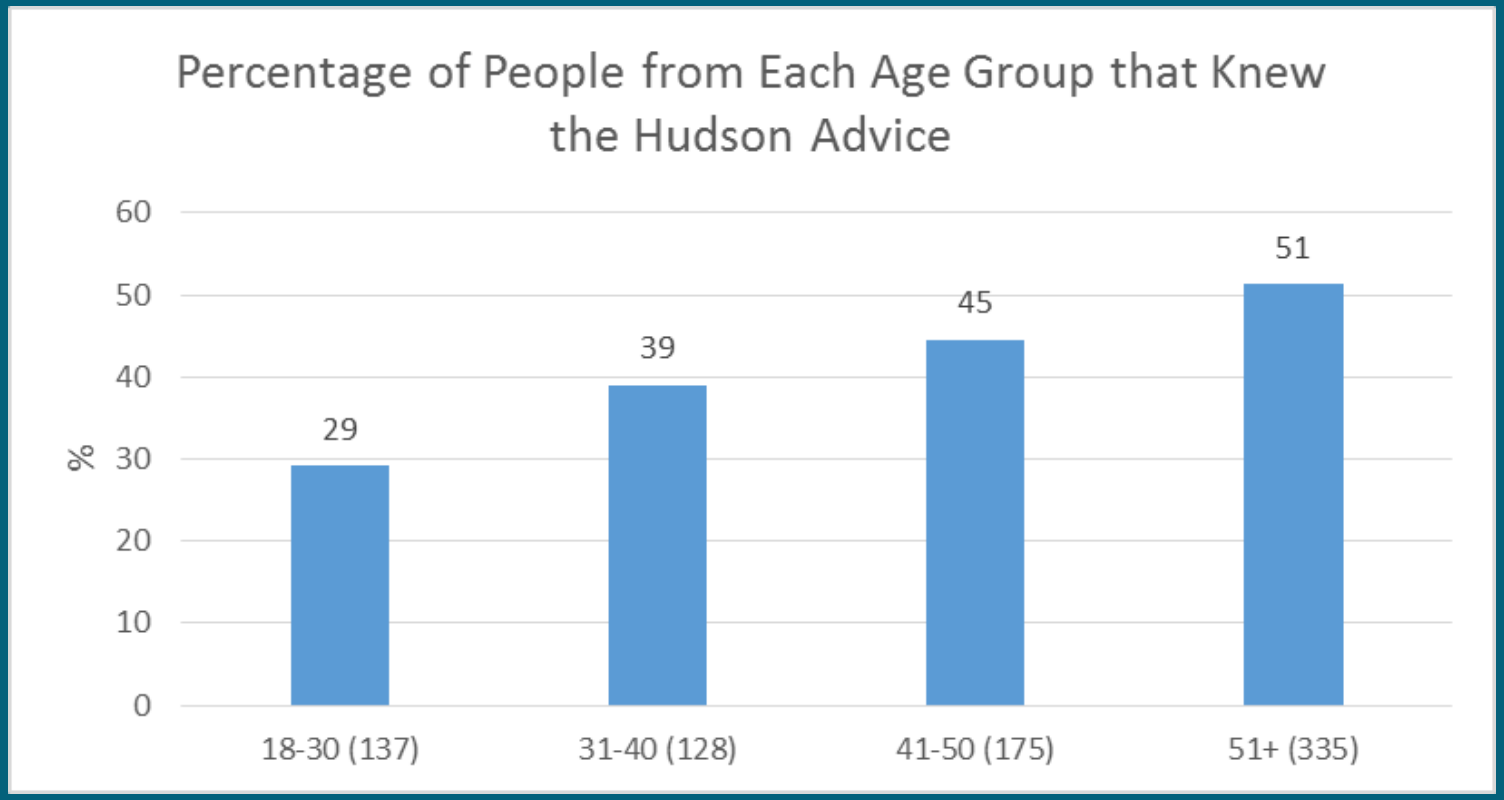
Many Hudson fish consumers report they do not know the advice

NYSDOH Have You Heard Any Advice About Eating Hudson River Fish Or Crabs?



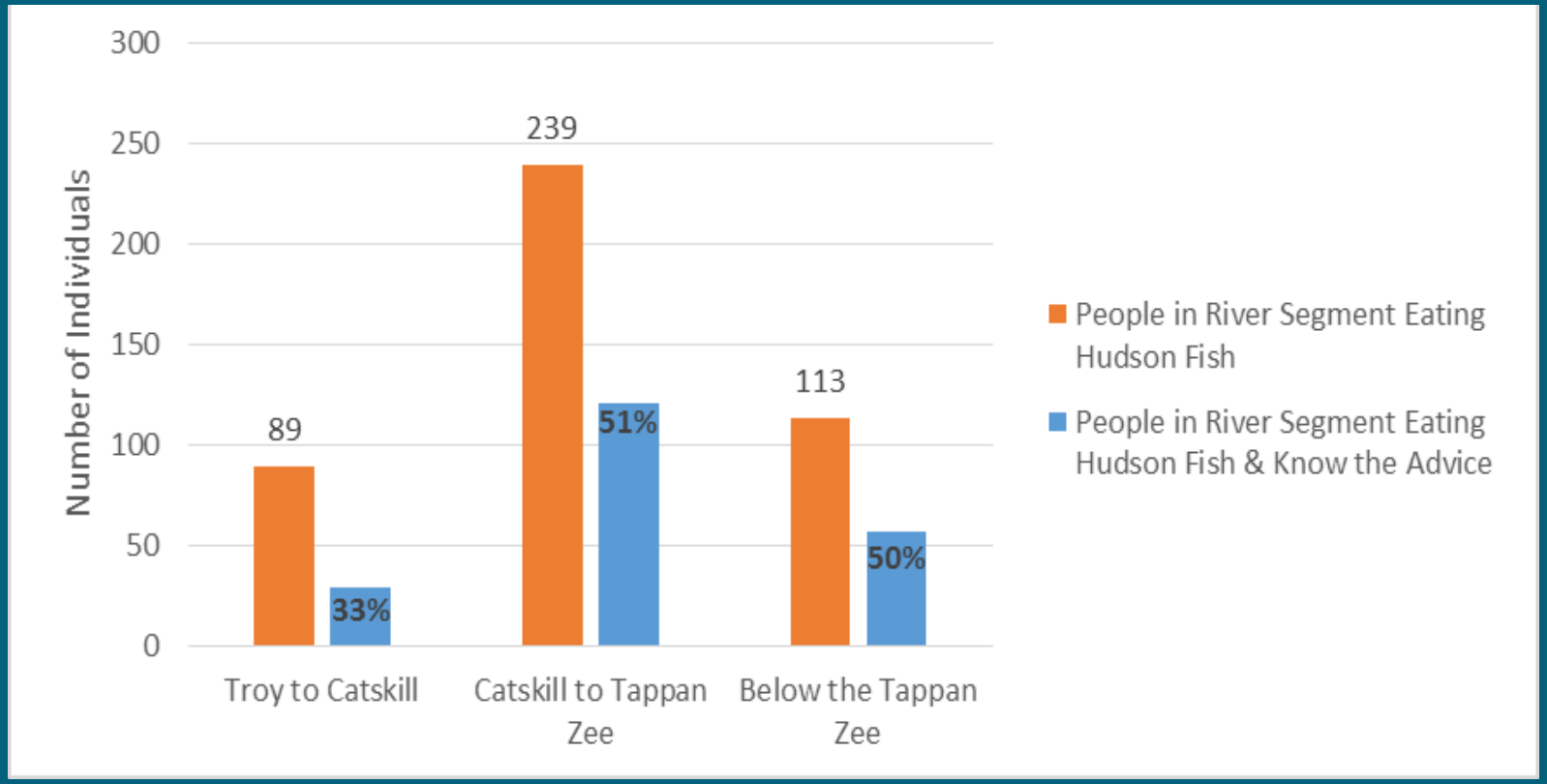
All respondents

NYSDOH All Respondents Awareness of Advice by Age



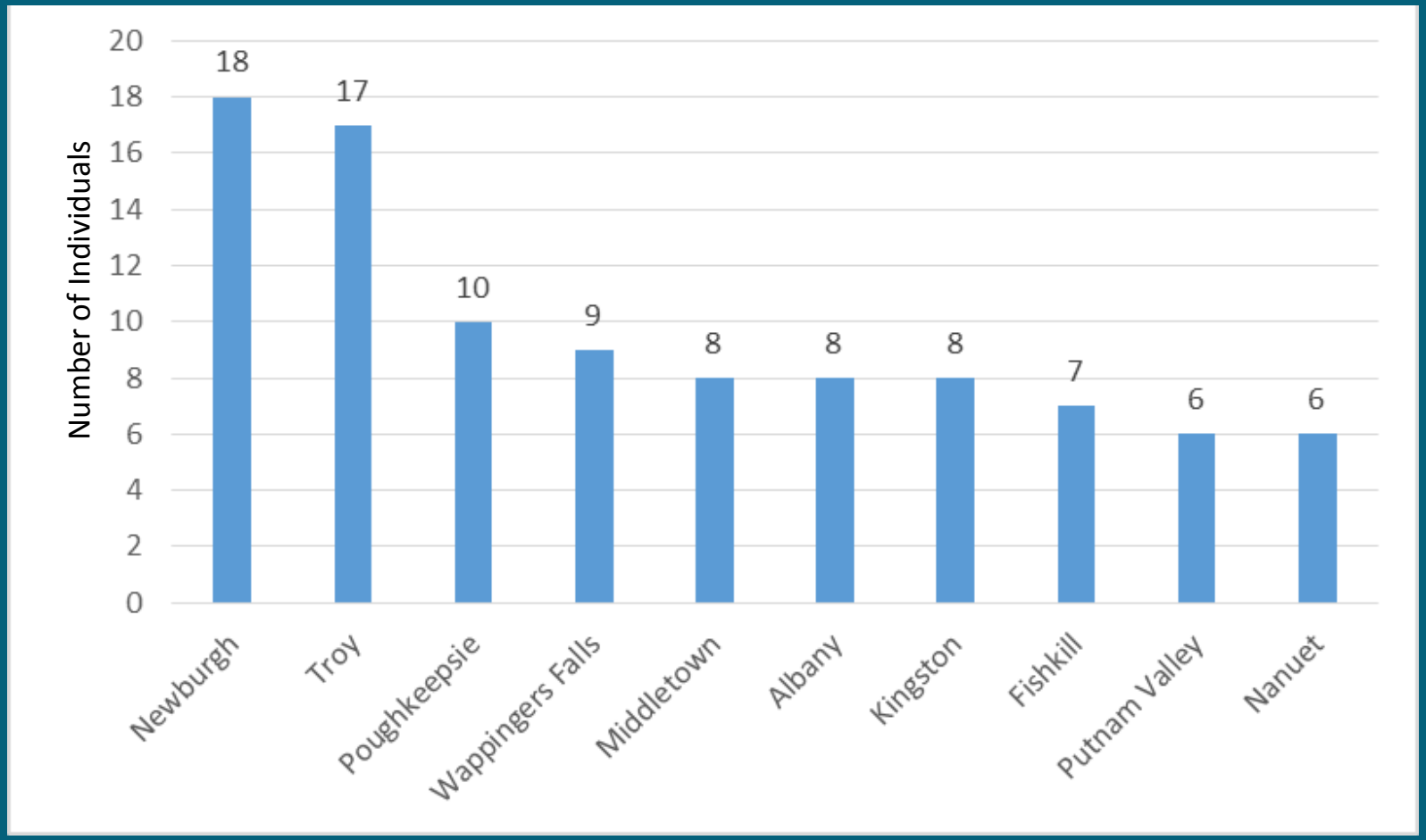
Younger people are less aware of the advice

NYSDOH Hudson Fish Consumers Awareness of the Advice by River Segment

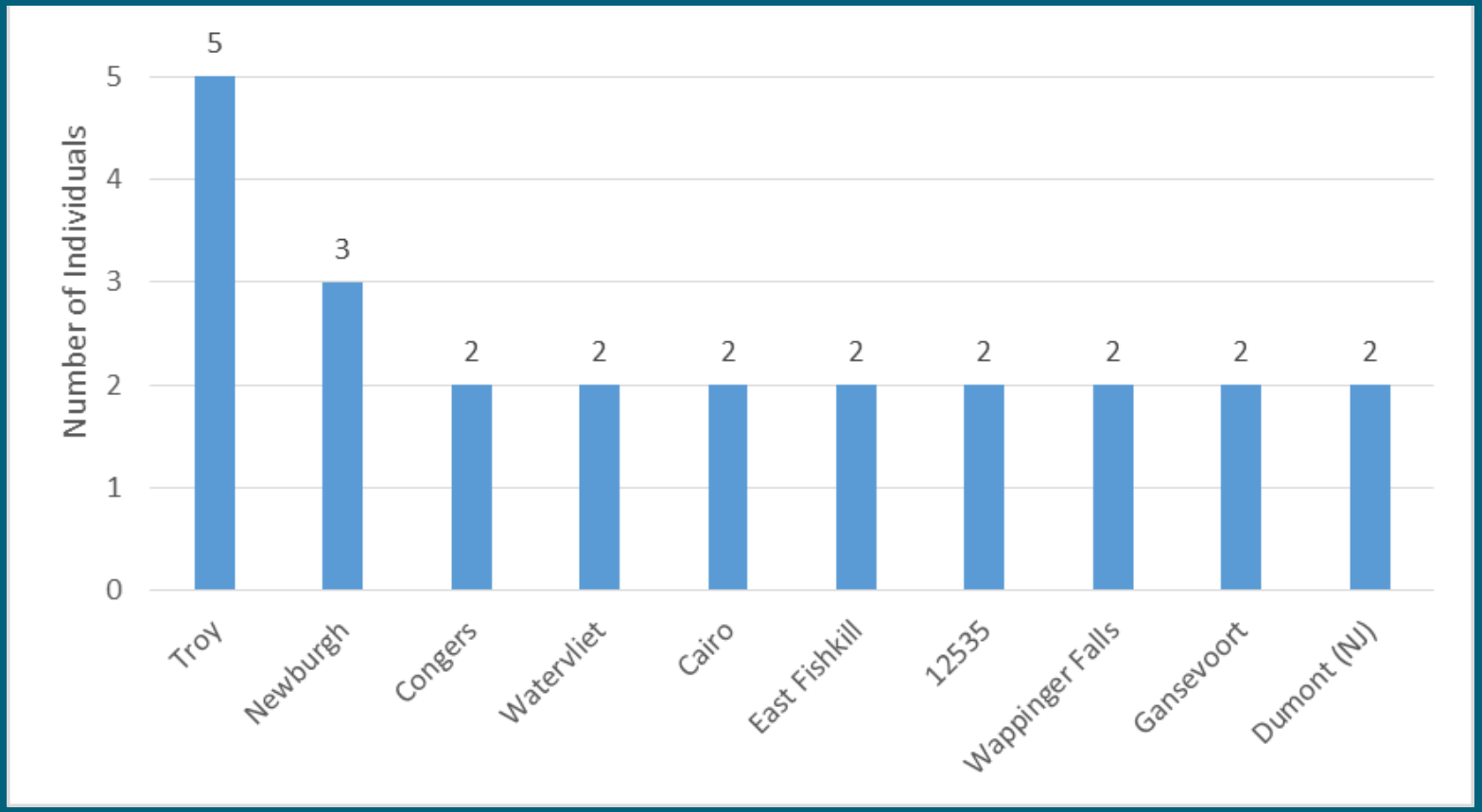


Awareness of advice is lower from Troy to Catskill

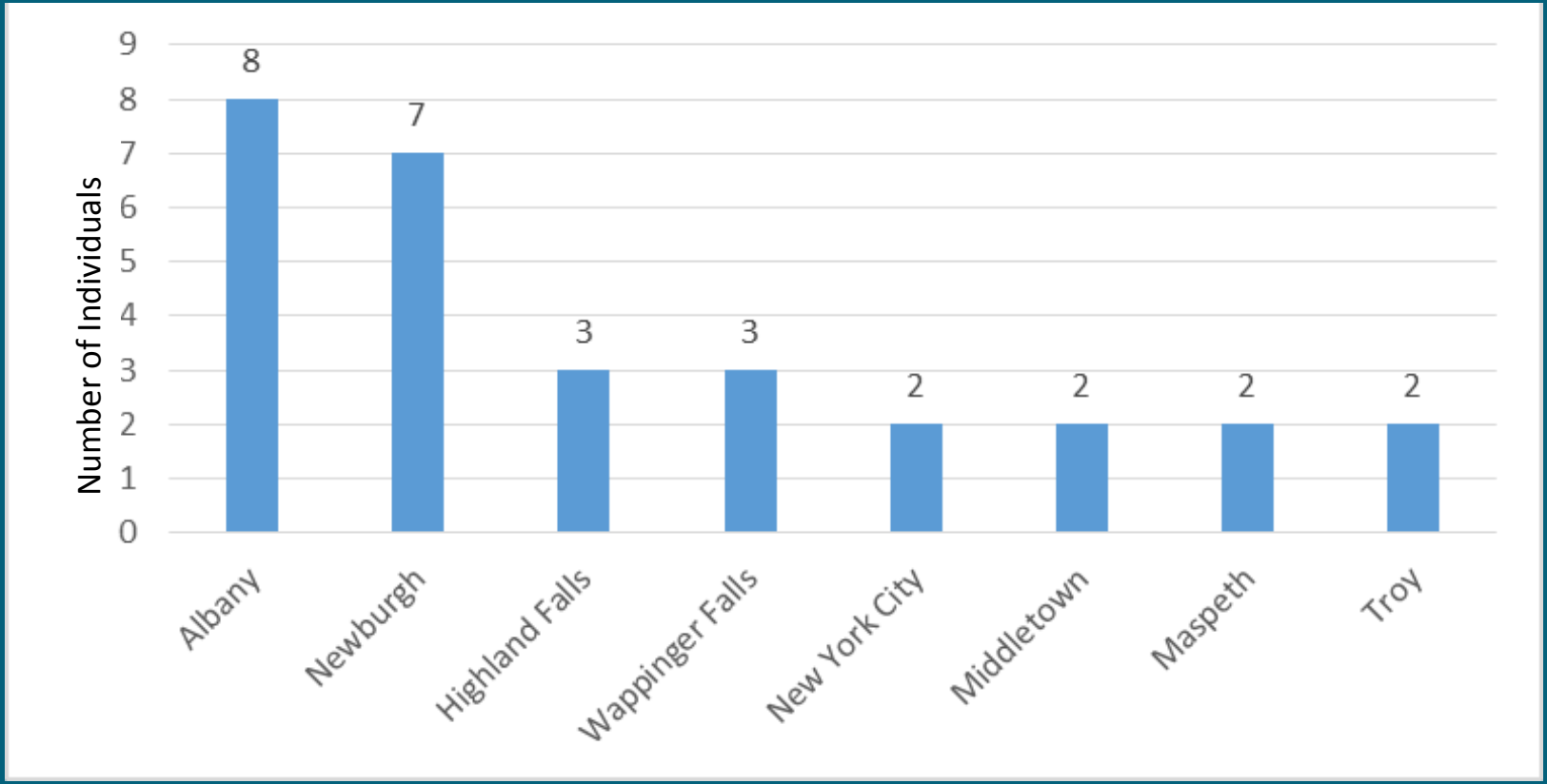
NYSDOH: 10 Locations With Largest Number of People Eating Hudson Fish or Crabs (Residence Zip Code)



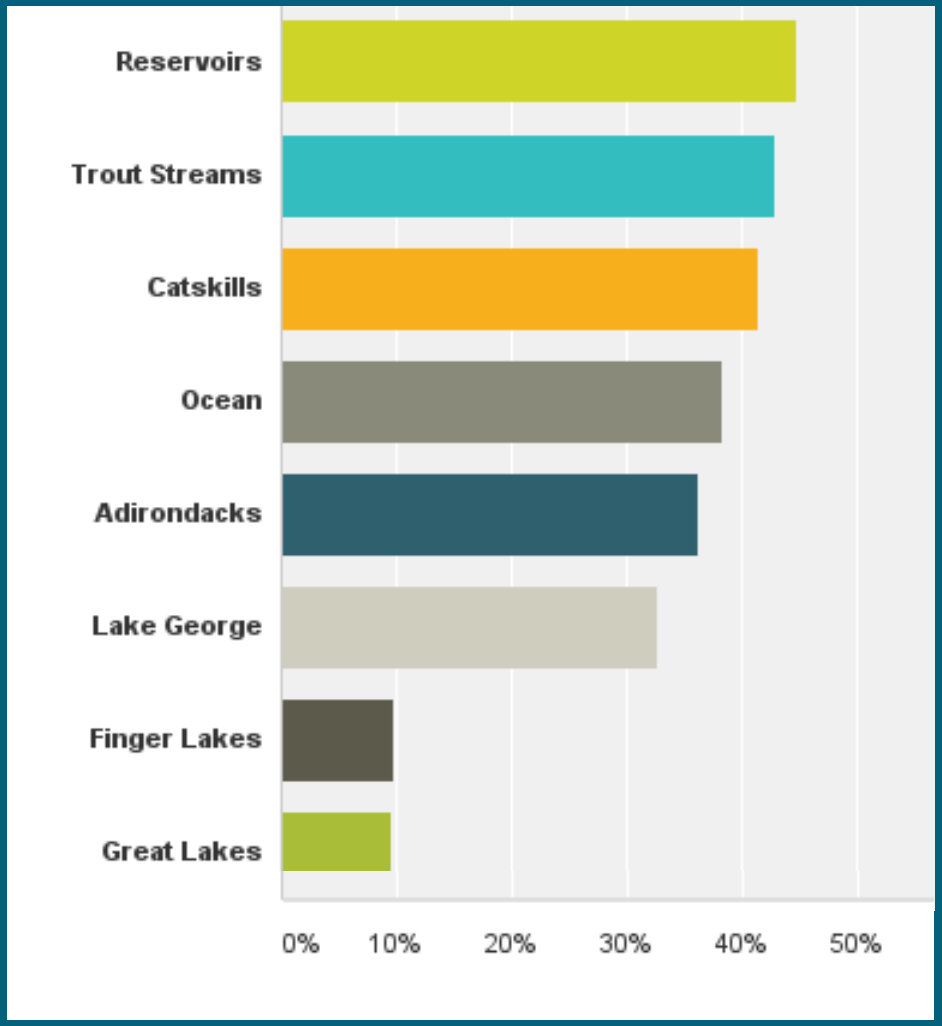
NYSDOH: 10 Locations With Women under 50 Eating Hudson Fish or Crabs (Residence Zip Code) (24)



NYSDOH: 10 Locations With Largest Number of Hispanics and African Americans Eating Hudson Fish or Crabs (Residence Zip Code)



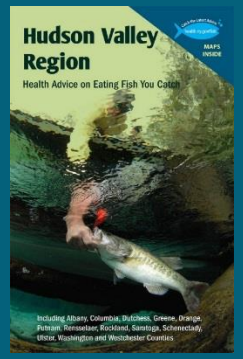
NYSDOH Other Locations Fished



- Besides the Hudson, What Other Places in New York Do You Fish ? (check all that apply)

Many people also fish in other water bodies

2015 brochure lists alternative water bodies in each county where the family can eat fish



NYSDOH Follow-up Survey

- In 2016 we began to request email addresses on surveys to do an electronic follow-up survey
- The follow-up survey asks about what people learn what survey respondents remember from discussion with NYSDOH or materials, if they told any other people, and if they changed their behavior in eating or sharing Hudson fish
- Small number of respondents: 24
- We had a 22% response rate

NYSDOH Follow-up
Reported Changes in Consumption

Response (all that apply)	Percentage (N=24)
No changes in Hudson fish consumption because was not eating Hudson fish	50%
Ate the same amount of fish from the Hudson	8%
Ate less fish from the Hudson	25%
Stopped eating or ate less of a particular species	25%
Gave less Hudson fish to children	12%
Gave less Hudson fish to women under 50	8%
Ate fewer Hudson crabs	4%
Stopped using cooking water from crab in soups and stews	4%
Found out about NYSDOH fish consumption advice for other water bodies	21%

NYSDOH Follow-up
What Do You Remember from Reading Materials or Talking to NYSDOH?

Response (all that apply) – I remember	Percentage (N=24)
PCBs stay in the fat and skin of fish	70%
Striped bass have chemicals like other fish in the Hudson	48%
Making a fillet and baking or grilling fish can cut down PCBs in a fish meal	43%
The NYSDOH advice around Albany and Troy is to not eat most fish	30%
The graph with PCB levels in striped bass	22%
Some fish in the Catskill and Adirondacks have chemicals	22%
The color-coded maps with blue (okay for families) and red (not good for families)	9%
Some supermarket fish have more chemicals than others	4%
I didn't remember anything	0%

NYSDOH Follow-up
Who Did You Share the Information With?

Response (all that apply)	Percentage (N=24)
No one	8%
My family	54%
A friend	21%
More than one friend	54%

NYSDOH Follow-up
Awareness of NYSDOH Advice

Responses	Percentage (N=24)
I knew the advice about eating Hudson fish	21%
I had an idea about the Hudson advice but didn't know the specifics	75%
I did not know there was any advice	4%

Moving Forward

- Discourage sharing fish and crabs with women and children
- Discourage catfish and eel consumption
- Discourage striped bass and other fish consumption in Catskill to Troy, which is more heavily contaminated than lower river
- Discourage crab tomalley consumption
- Increase awareness of the advice among younger Hudson fish consumers

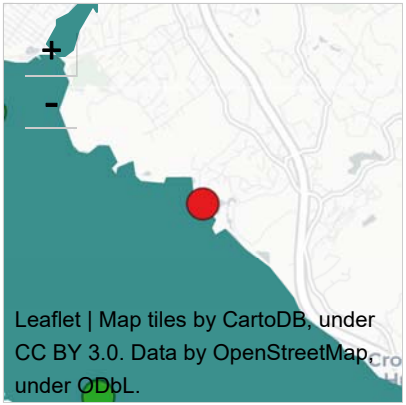
Moving Forward

- Reinforce that contamination levels in fish will take a long time to drop after the dredging
- Continue to create more connections to immigrant communities, whom are likely to be less aware and have been found to eat large amounts of local fish
- Seek more information on minority community consumption
- Try to learn more about Hudson fish consumption in NYC

For more information: hrfa@health.ny.gov or regina.keenan@health.ny.gov or 518-402-7530

Furnace Brook





Furnace Brook

Enterococcus counts

On 10/17/2017: **384**

Prior 4 Days Rain: **0.2"**

Last 6 Measurements

Entero Count:

Rainfall:



Entero/Rainfall Table | **Entero/Rainfall Plot** | **Physical/Chemical Data**

Entero Count (fecal indicator) and Rainfall

72 Samples taken

Sample Date	Enterococcus Count	Quality	Rain, day of (in)	Prior Day	2 Days Prior Rain	3 Days Prior	4 Days Total Rain
Sort	Sort	Sort	Sort	Sort	Sort	Sort	Sort
10/17/2017	384	Beach Advisory	0.0	0.1	0.0	0.0	0.2
09/12/2017	10	Acceptable	0.0	0.0	0.0	0.0	0.0
08/15/2017	1793	Beach Advisory	0.1	0.0	0.0	0.4	0.5
07/11/2017	243	Beach Advisory	0.4	0.1	0.0	0.0	0.5

Water Quality

- Water Quality Program
- Hudson River Estuary Data
  - Albany County & Rensselaer County Sites
  - Greene County & Columbia County Sites
  - Ulster County & Dutchess County Sites
  - Orange County & Putnam County Sites
  - Rockland County & Westchester County Sites
    - Annesville Creek
    - Cedar Pond Brook
    - Croton Point Beach

Sort	Sort	Sort	Sort	Sort	Sort	Sort	Sort
06/13/2017	52	Acceptable	0.0	0.0	0.0	0.0	0.0
05/16/2017	31	Acceptable	0.0	0.0	0.1	1.7	1.8
10/14/2016	31	Acceptable	0.0	0.1	0.0	0.0	0.1

Water Quality*

Acceptable (0–60)
Beach Advisory (61+)

*Single sample thresholds;
Enterococcus count per 100mL

Prior Four Day Rainfall (in inches)

Dry Weather (0–0.25)
Wet Weather (0.25+)

Enterococcus is an EPA-approved fecal contamination indicator.

Samples taken by Riverkeeper, Lamont-Doherty Earth Observatory and CUNY Queens College staff, and processed on the Riverkeeper vessel, according to the 2014 Quality Assurance Project Plan.

Rainfall data comes from wunderground.com. Wet weather is a common trigger of fecal contamination.

What do the Numbers Mean?

Water Quality scoring is based on the 2012 Recreational Water Quality Criteria from the US Environmental Protection Agency (EPA) for safe swimming.
Learn More

About this location:

Cortlandt, NY

The Hudson, off Furnace Brook, has recreational and subsistence fishing, as well as kayaking, and swimming from recreational boats.

AGENCIES RESPONSIBLE:

Westchester County Dept. of Health: 914-813-5000 and NYSDEC Region 3: 914-428-2505

MORE INFORMATION:

What We Are Testing For
Our Partners

Emeline Beach-Haverstraw
Furnace Brook
Haverstraw Bay mid-channel
Irvington Beach
Kingsland Point Park- Pocantico River
Nyack Launch Ramp
Orangetown Sewage Treatment Plant Outfall
Ossining Beach
Peekskill Riverfront Green Park
Piermont Pier
Saw Mill River

Safe Recreation and User Awareness
The Swimmable River Campaign

Stony Point mid-channel

Tappan Zee Bridge mid-channel

Tarrytown Marina

Upper Sparkill Creek

Yonkers mid-channel

Yonkers Sewage Treatment Plant Outfall

New York City, Hudson County & Bergen County Sites

Tributary and Waterfront Data

Water Quality Reports & Research Tools

Drinking Source Water Protection Scorecard

New York Tap Water

Pharmaceuticals

STAY IN TOUCH AND UP TO DATE

Site designed and developed by Social Ink



Hudson River Estuary Public Fishing & Boating Access

Hudson River Estuary

HOW TO USE CD

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MAPS

RESOURCES FOR BOATERS AND ANGLERS

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3. Main Map: Troy to Yonkers **pg.4**
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5. Map B: Albany **pg.6**
6. Map C: Bethlehem **pg.7**
7. Information for Maps A B C **pg.8**
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32. Access to the Hudson River Estuary **pg.33**
33. Boating and Water Safety **pg.34**
34. Fishing Regulations **pg.35**
35. Hudson River Fish Consumption Advisory **pg.36**
36. Hudson River Fish Species **pg.37**
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Home Print

How to Use the CD

Interactive Maps and Pages:

Each page contains interactive buttons to help navigate through the CD. Just click on a button.

You can also click the labeled buttons on the "Title Page" (Home) to jump to a specific section.

The "Table of Contents" is interactive, click on where you want to go and the CD will take you there.

The "Main Map" is linked to the more detailed maps, Map A to Map R. On the "Main Map", click anywhere on the labeled box surrounding the area of interest and you will be taken to the detail map of that area. Once you arrive at a detailed map, click on the number of the fishing and boating access site for more information about the site.

Printing: All detail maps, text pages, and site information sheets are standard 8.5" X 11". Click on the printer icon to print selected pages.

Exiting: To exit the CD, go to the "Title Page" (Home)and click the "Exit" button.

The Hudson River Estuary stretches 153 miles from Troy to New York Harbor, nearly half the river's 315 mile course between Lake Tear of the Clouds, its source in the Adirondacks, and the Battery at the tip of Manhattan. “Estuaries” are bodies of water in which salty ocean water mixes with fresh water from the land.

The Hudson River Estuary feels the ocean's rising and falling tides and shifting tidal currents all the way to Troy. Salty seawater pushes up the estuary, diluted by freshwater runoff as it moves north. Eventually the estuary becomes fresh, even though it is still tidal. In years with average amounts of rainfall, spring runoff holds the leading edge of dilute sea water —the *salt front*—downriver between the Tappan Zee and Yonkers. As runoff slackens in summer, the salt front pushes northward to Newburgh Bay (river mile 55) and further to Poughkeepsie (river mile 75) in droughts. Rarely does brackish water extend north of Poughkeepsie. From Poughkeepsie to Troy it is still fresh water.

Estuaries are among the most productive of earth's ecosystems. Native Americans discovered the Hudson's bounty thousands of years ago; evidence of their repasts remains in heaps of oyster shells on its shores. Henry Hudson and Dutch traders wrote of a river teeming with striped bass, herring and giant sturgeon. More than 200 species of fish are found in the Hudson and its tributaries. The estuary's productivity is ecologically and economically valuable to much of the Atlantic Coast; key commercial and recreational species like shad, striped bass, bluefish and blue crab depend on nursery habitat here. Bald eagles, herons, waterfowl and other birds feed from the river's bounty. Tidal marshes, mudflats and other significant habitats in and along the estuary support a great diversity of life, including endangered species like the shortnose sturgeon.

After over 30 years of environmental initiatives to reverse generations of pollution and neglect, the Hudson River Estuary, with its rich history and abundant natural resources, is again attracting sportsmen and women, naturalists and artists to its shores. Whether it’s to fish, hunt, bird watch, or just to get out on the water, kayakers, canoeists, sail and power boaters are increasingly looking to launch their craft from the banks of the Hudson. The locations of all the public places to access the river along the length of the estuary are contained on this disk.

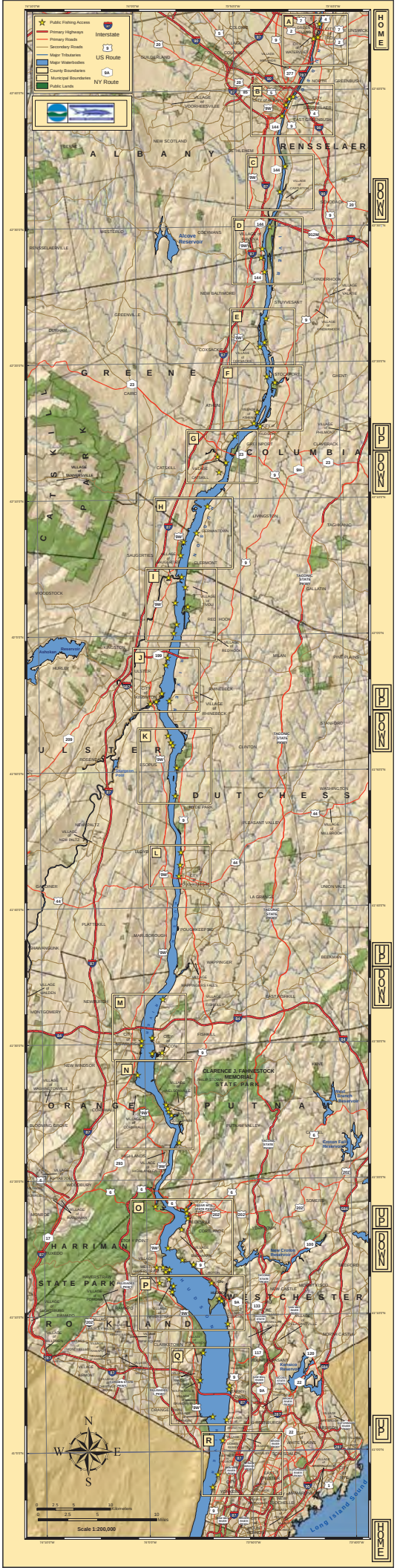
Today the Hudson River is one of the healthiest estuaries on the Atlantic Coast. Its rich history and striking environmental recovery have made it one of the nation's fourteen American Heritage Rivers. NYS DEC's Hudson River Estuary Program partners with citizen groups, local municipalities, and government agencies to restore and protect the estuary's natural resources.

For more information about the Hudson River Estuary, contact:

Hudson River Estuary Program
New York State Department of Environmental Conservation (NYSDEC)
21 S. Putt Corners Road
New Paltz, NY 12561
(845) 256-3016 phone
www.dec.ny.gov/lands/4920.html

For more information about tidal ranges and predictions, contact the *National Oceanic and Atmospheric Administration (NOAA) Center for Operational Oceanographic Products and Services (CO-OPS)* at (301) 713-2813 ext. 123, or: www.tidesandcurrents.noaa.gov/tides07

The *U.S. Geological Survey (USGS)* in New York State operates real-time monitoring stations on the Hudson and its tributaries to track the salt front, tides, and water temperature. Check the following *USGS* website to view these data:
http://ny.water.usgs.gov/projects/dialer_plots/saltfront.html


Public Fishing Access
Primary Highways
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Secondary Roads
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Major Waterbodies
County Boundaries
Municipal Boundaries
Public Lands
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Alcove Reservoir
CLARENCE J. FAHNESTOCK MEMORIAL STATE PARK
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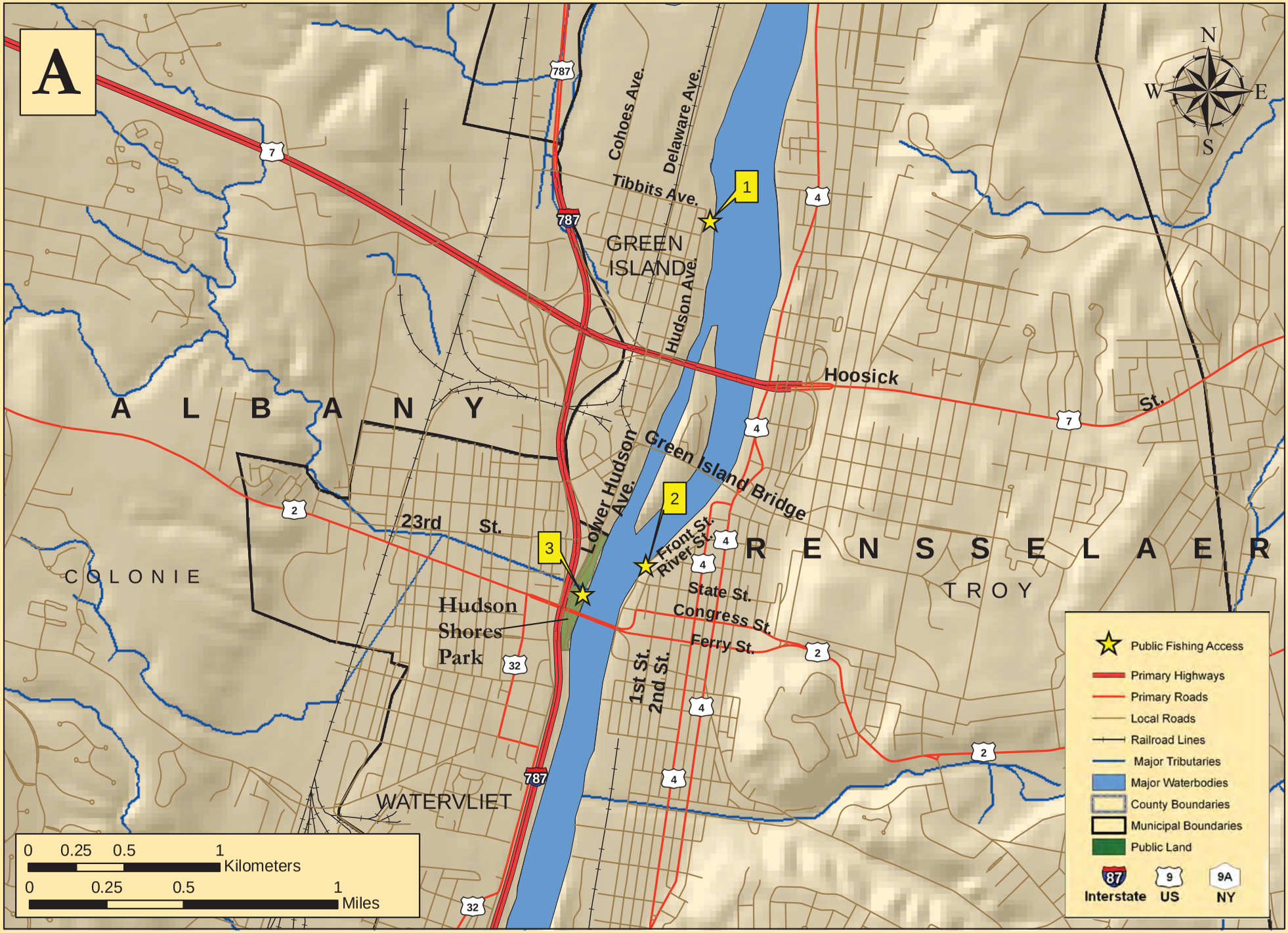
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Tibbits Ave.
1
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GREEN ISLAND
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Hoosick St.
A L B A N Y
Green Island Bridge
Lower Hudson Ave.
2
23rd St.
3
Front St.
River St.
R E N S S E L A E R
TROY
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State St.
Congress St.
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Public Fishing Access
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Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
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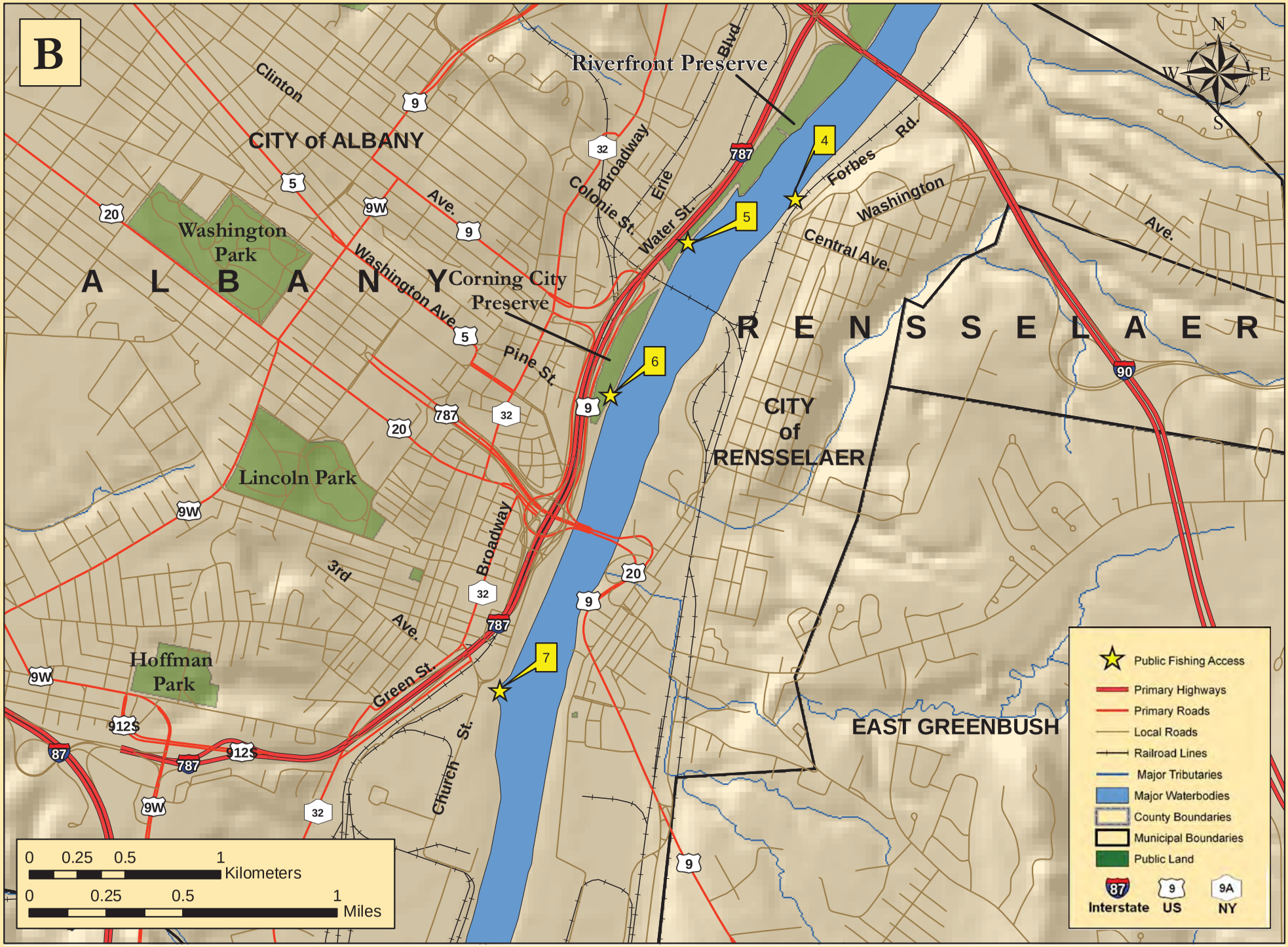
B
Clinton
CITY of ALBANY
Riverfront Preserve
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Broadway
Colonie St.
Erie
Water St.
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Washington
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Central Ave.
Washington Park
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Corning City Preserve
Washington Ave.
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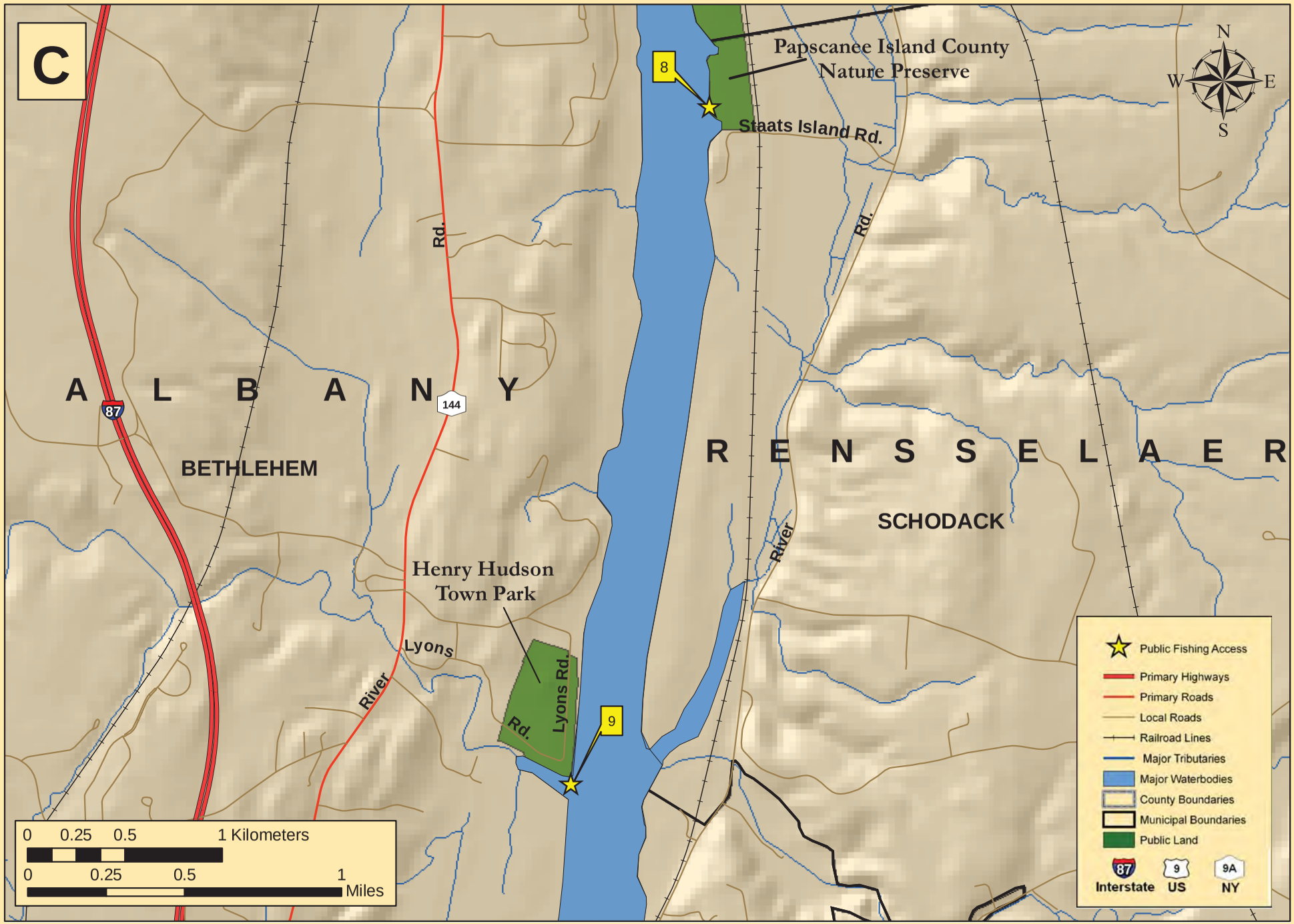
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BETHLEHEM
R E N S S E L A E R
SCHODACK
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Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

Main Map

Information For Maps A B C

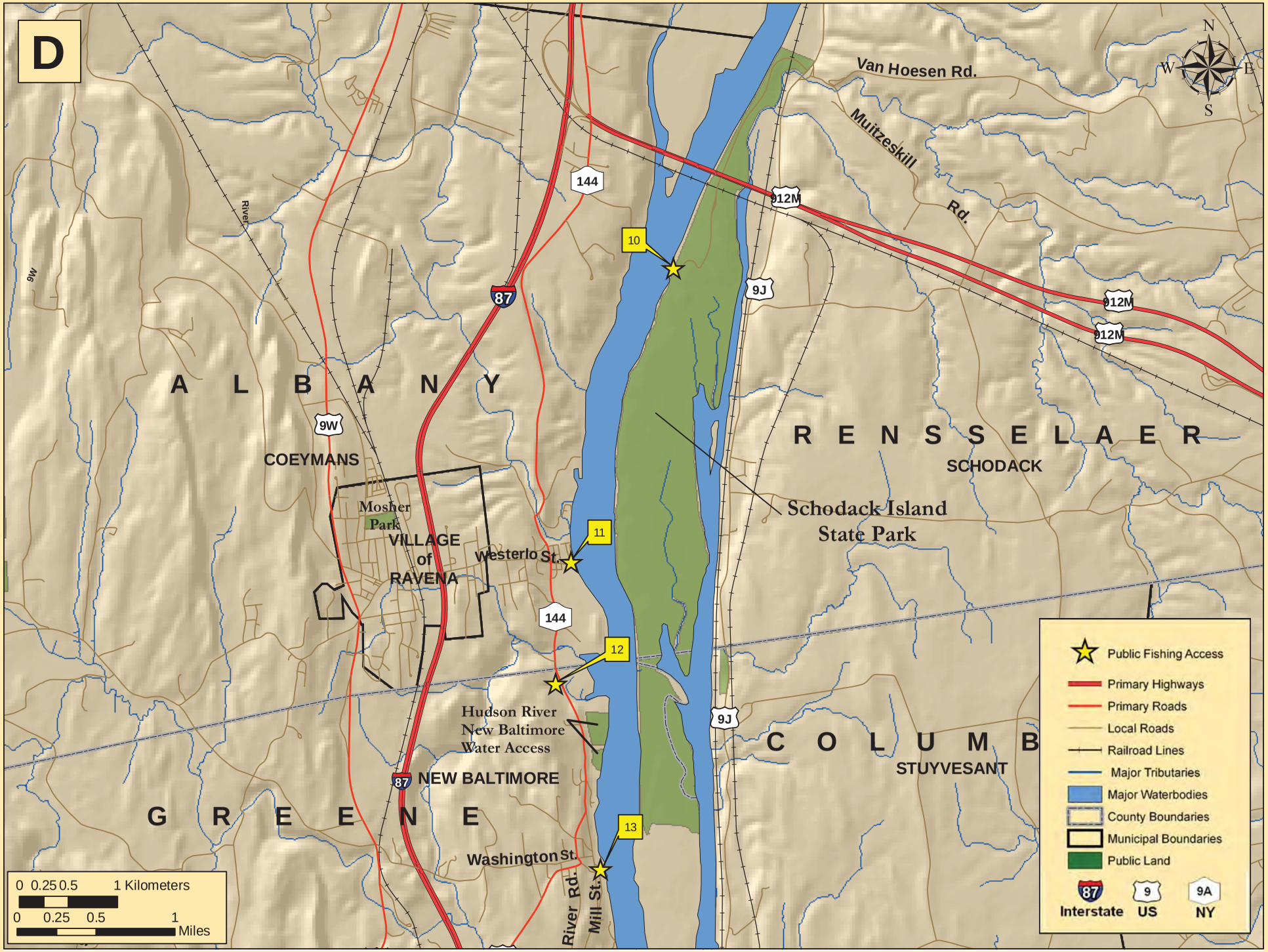
Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
1	Green Island Riverside Park	T. Green Island	M	N	8C	8-10		●			North of RT 7 Br, Hudson Ave to Tibbitts Ave	518-273-0661
2	Troy Riverside Park	C. Troy	M	N	10C	7-11		●			Front St (btw State St & River St), North of Congress St Bridge (Troy-Watervliet/NY2/19th St Bridge)	518-235-7761
3	Hudson Shores Park	C. Watervliet	M	N	20C	8-10	●	●		Seasonal	RT-787, 23rd St/Watervliet exit, North on Lower Hudson Ave, Park located on right.	518-270-3811
4	Rensselaer Boat Launch	C. Rensselaer	M	T2	8C/T 10C			●			Forbes St	
5	Albany Municipal Launch	C. Albany	M	TC	100C		●				RT-787, Exit 4/Clinton Ave, Right on Colonie St.	
6	Corning Preserve	C. Albany	M	H	15C/T			●			RT-787 North, Exit 4/Clinton Ave, Right on Colonie St.	518-458-5637
7	Island Creek Park	C. Albany	M	H	15C	D-11		●			RT-787, Exit 2/Port of Albany, Left on NY-32, Right on Green St, Left on Broadway	518-434-5090
8	Papscanee Island Nature Preserve	T. East Greenbush	M	H	8C	8-8	●			Walk-in	RT-9J in T. East Greenbush, West on Staats Island Rd	
9	Henry Hudson Park	T. Bethlehem	M	T2	35 C/T	9-D	●	●			RT-144, 1/2 north of H. Cedar Hill, East on Lyons Rd	518-439-4131

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee

Map A Map B Map C

Home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COEYMANS
Mosher Park
VILLAGE of RAVENA
Westerlo St.
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Hudson River New Baltimore Water Access
NEW BALTIMORE
G R E E N E
Washington St.
River Rd.
Mill St.
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R E N S S E L A E R
SCHODACK
Schodack Island State Park
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Public Fishing Access
Primary Highways
Primary Roads
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Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
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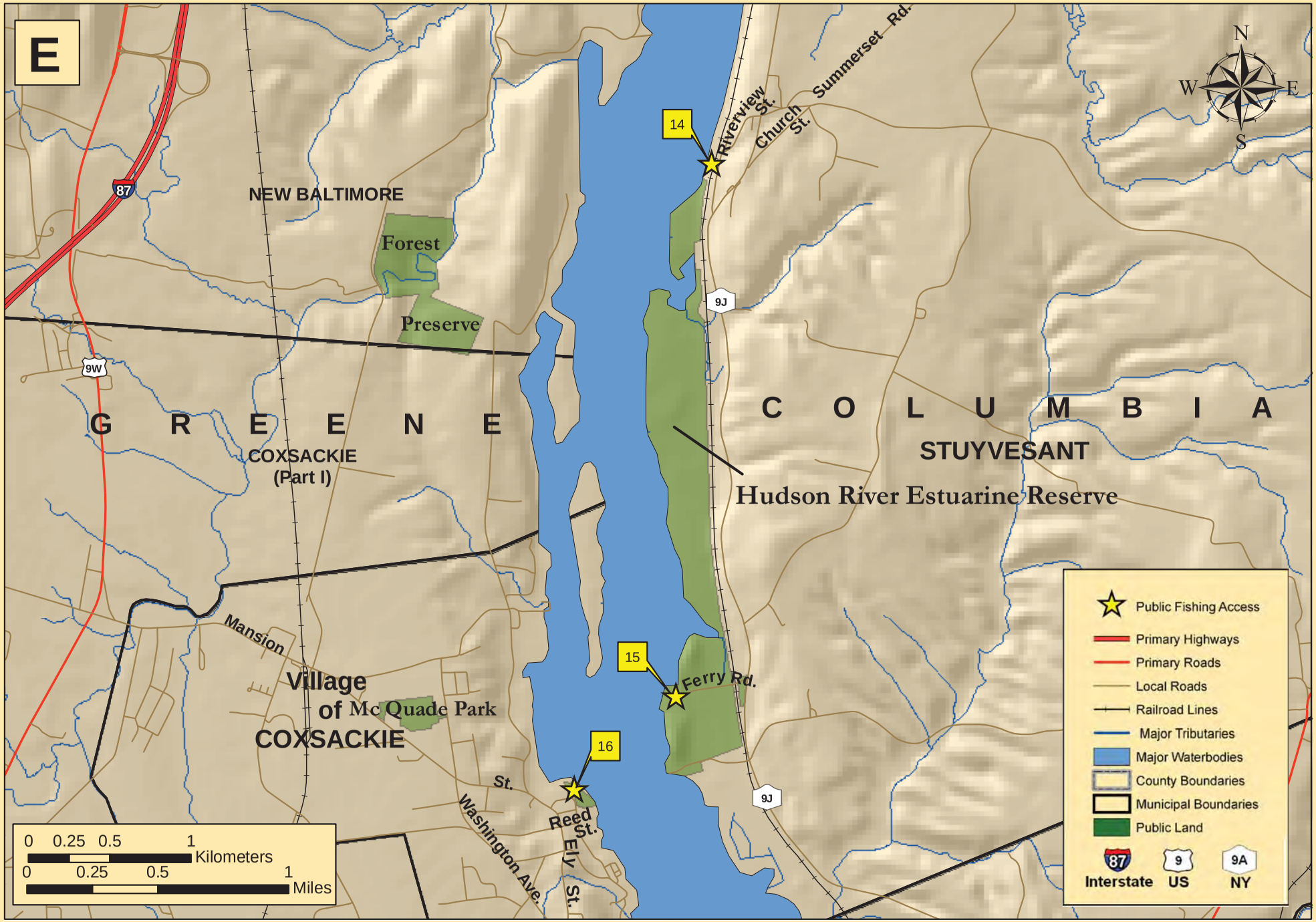
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NEW BALTIMORE
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G R E E N E
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(Part I)
C O L U M B I A
STUYVESANT
Hudson River Estuarine Reserve
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Riverview St.
Church St.
Summerset Rd.
9J
15
Ferry Rd.
16
Mansion
Village
of Mc Quade Park
COXSACKIE
St.
Washington Ave.
Reed St.
Ely St.
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

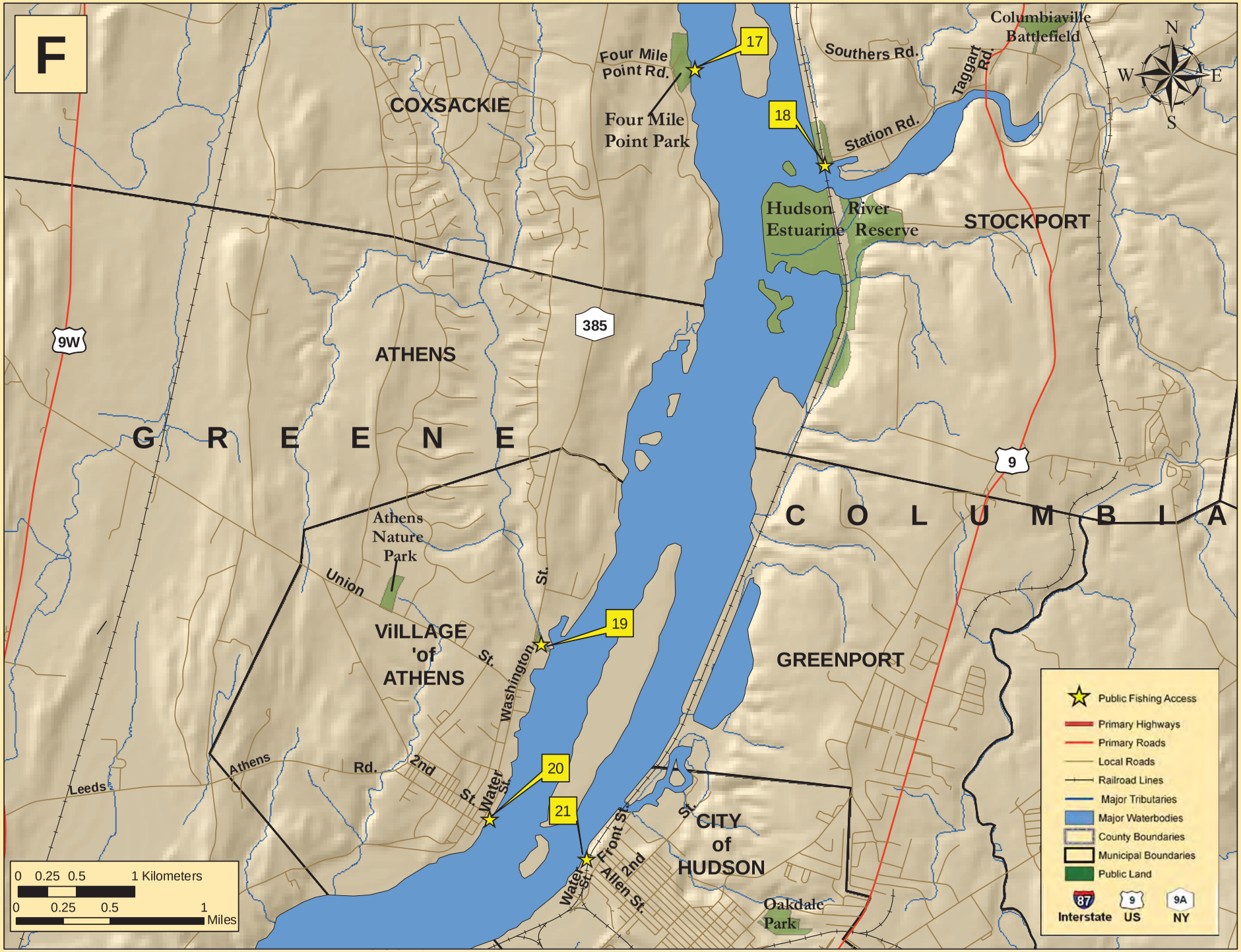
Main Map

Information For Maps D E

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
10	Schodack Island State Park $ ♿	T. Schodack	SP	TC	30C 30C/T	Day	●	●			RT-9J in T. Schodack	518-732-0187
11	Coeyman's Landing ♿	H. Coeymans, T. Coeymans	M	TC	40C/T		●	●	●		RT-144 in H. Coeymans, East on Westerlo St	845-758-6006
12	Hannacroix Creek Preserve	T. New Baltimore	NP	N	10C					Walk-in	RT-144 north of New Baltimore. Preserve on East.	518-756-9193
13	Cornell Park ♿	T. New Baltimore	M	H	8C	Day		●			RT-9W, West on RT-144, South on Main St in T. New Baltimore, East on Mill St	
14	Stuyvesant Riverview Park ♿	T. Stuyvesant	M	N	25C			●			RT-9J in T. Stuyvesant, West on Riverview Rd, West over tracks to park	518-758-6284
15	Nutten Hook Unique Area	T. Stuyvesant	DEC	H	15C			●			RT-9J, West on Ferry Rd	845-758-7010
16	Coxsackie Boat Launch/ Riverside Park ♿	V. Coxsackie	M	TC	36C/T	Day	●	●			RT-9W to RT-385 in T. Coxsackie. South on Mansion St, East on Reed St	518-731-2718

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, ♿ Accessible, Greenway Water Trail Site, $ Fee


F
COXSACKIE
Four Mile Point Rd.
Four Mile Point Park
17
18
Southers Rd.
Taggart Rd.
Columbiaville Battlefield
Station Rd.
Hudson River Estuarine Reserve
STOCKPORT
N
W
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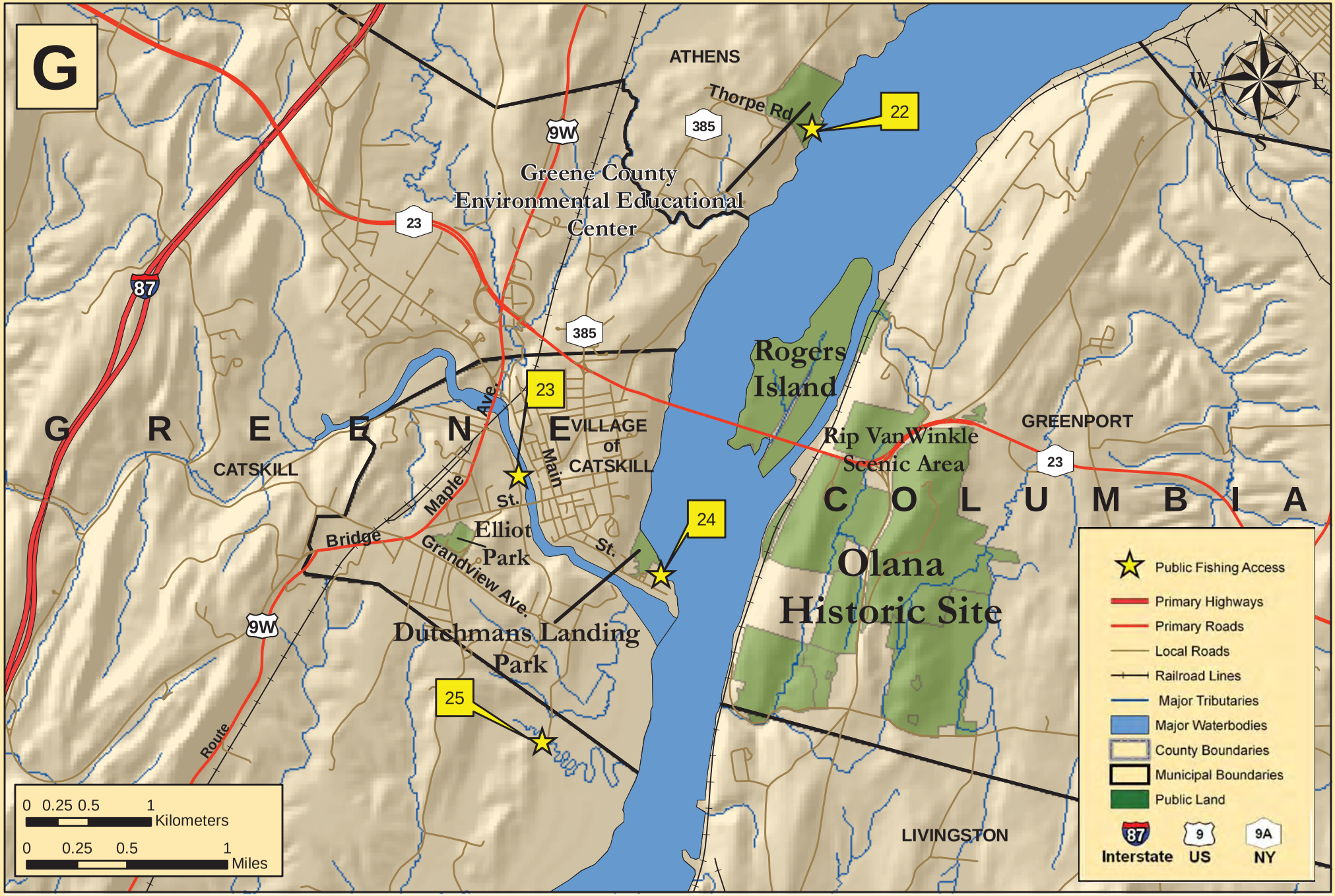
S
9W
385
ATHENS
G R E E N E
9
C O L U M B I A
Athens Nature Park
Union St.
19
ViILLAGE 'of ATHENS
Washington St.
GREENPORT
Athens Rd.
2nd St.
Water St.
20
21
Front St.
Water St.
Allen St.
CITY of HUDSON
Oakdale Park
Leeds
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY


G
ATHENS
Thorpe Rd
22
9W
385
Greene County
Environmental Educational
Center
23
87
385
Rogers
Island
G R E E N E
VILLAGE
of
CATSKILL
CATSKILL
Maple Ave.
23
Main St.
Rip VanWinkle
Scenic Area
GREENPORT
23
C O L U M B I A
Bridge St.
Elliot
Park
Grandview Ave.
24
Olana
Historic Site
9W
Dutchmans Landing
Park
25
Route
LIVINGSTON
N
W
E
S
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles

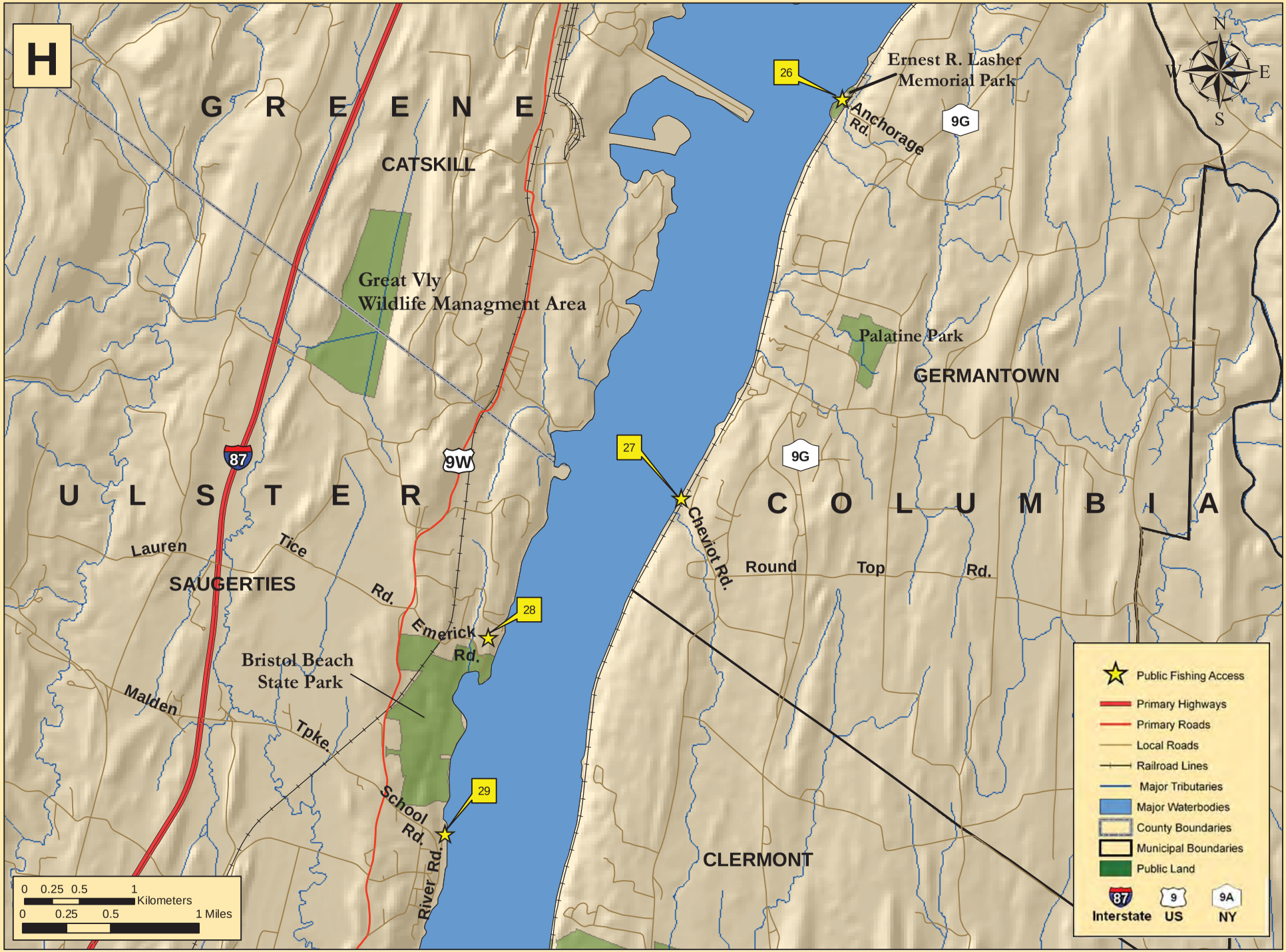
Main Map

Information For Maps F G

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
17	Four-Mile Point Preserve	T. Coxsackie	NP	H	8C	Day		●		Walk-in	RT-385, 8 mi North of Rip Van Winkle Br, East on Four Mile Rd, Parking on left	Scenic Huds. 845- 473-4440 ext 270
18	Stockport Flats	T. Stockport	DEC	TG	20C			●		RR Crossing	RT-9 in T. Stockport, West on Taggart Rd, Continue 1 mi.	607-652-7365
19	Town of Athens State Boat Launch	T. Athens	M	TC	25C			●			RT-385 North of Athens, East to Parking Lot	518-732-0187
20	Athens Riverfront Park	V. Athens	M	H	20C	Day		●			RT-385 in T. Athens, Turn right onto 2nd St, for one block, left on Water St.	518-945-1551
21	Hudson Waterfront Park	C. Hudson	M	TC	46C/T	5-10	●				RT-9G, City of Hudson, West on Allen St, Continue to Ferry St and the foot of Water St	
22	Cohotate Preserve	T. Athens	C	H	30C	Day	●	●		Steep Walk-in	RT-385, 1.6 mi North of V. Catskill	GCSWCD 518-622-3620
23	Kiwanis Park/ Catskill Creek	V. Catskill	M	H	6C						RT-9W, East on Main St, Cross Bridge St, Right on West Main St	518-943-2141
24	Dutchman's Landing	V. Catskill	M	TC	75C		●	●	●		RT-9W in V. Catskill, East on Main St, continue to sign at foot of Main St	518-943-2141
25	Ramshorn-Livingston Sanctuary	T. Catskill	NP	H	8C	Day				Walk-in	RT-9W South of V. Catskill, East on Grandview Ave, Parking on right 0.5 mi	Scenic Huds. 845-473-4440 ext 270

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee


H
G R E E N E
CATSKILL
Great Vly
Wildlife Managment Area
U L S T E R
SAUGERTIES
Lauren
Tice
Rd.
Malden
Tpke.
Bristol Beach
State Park
Emerick
Rd.
School
Rd.
River Rd.
87
9W
26
Ernest R. Lasher
Memorial Park
Anchorage
Rd.
9G
Palatine Park
GERMANTOWN
27
Cheviot Rd.
C O L U M B I A
Round
Top
Rd.
28
29
CLERMONT
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Kilometers
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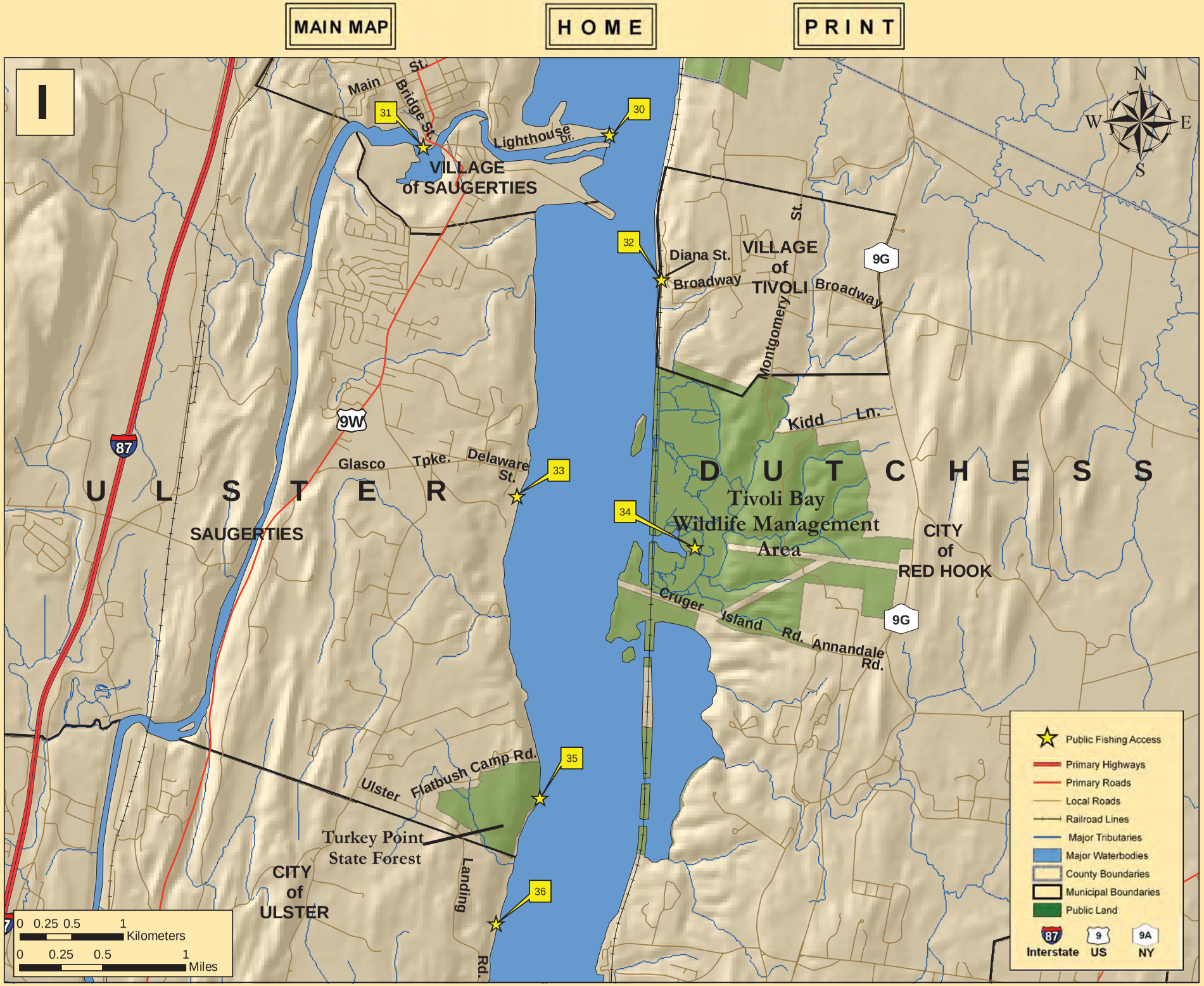
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY


MAIN MAP
HOME
PRINT
I
Main St.
Bridge St.
Lighthouse Dr.
31
30
VILLAGE of SAUGERTIES
32
Diana St.
Broadway
VILLAGE of TIVOLI
Broadway
St.
Montgomery
9G
Kidd Ln.
9W
87
Glasco Tpke.
Delaware St.
33
ULSTER
SAUGERTIES
DUTCHESS
Tivoli Bay Wildlife Management Area
34
CITY of RED HOOK
Cruger Island Rd.
Annandale Rd.
9G
Ulster Flatbush Camp Rd.
35
Turkey Point State Forest
CITY of ULSTER
Landing Rd.
36
N
W
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Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

Main Map

Information For Maps H I

Print

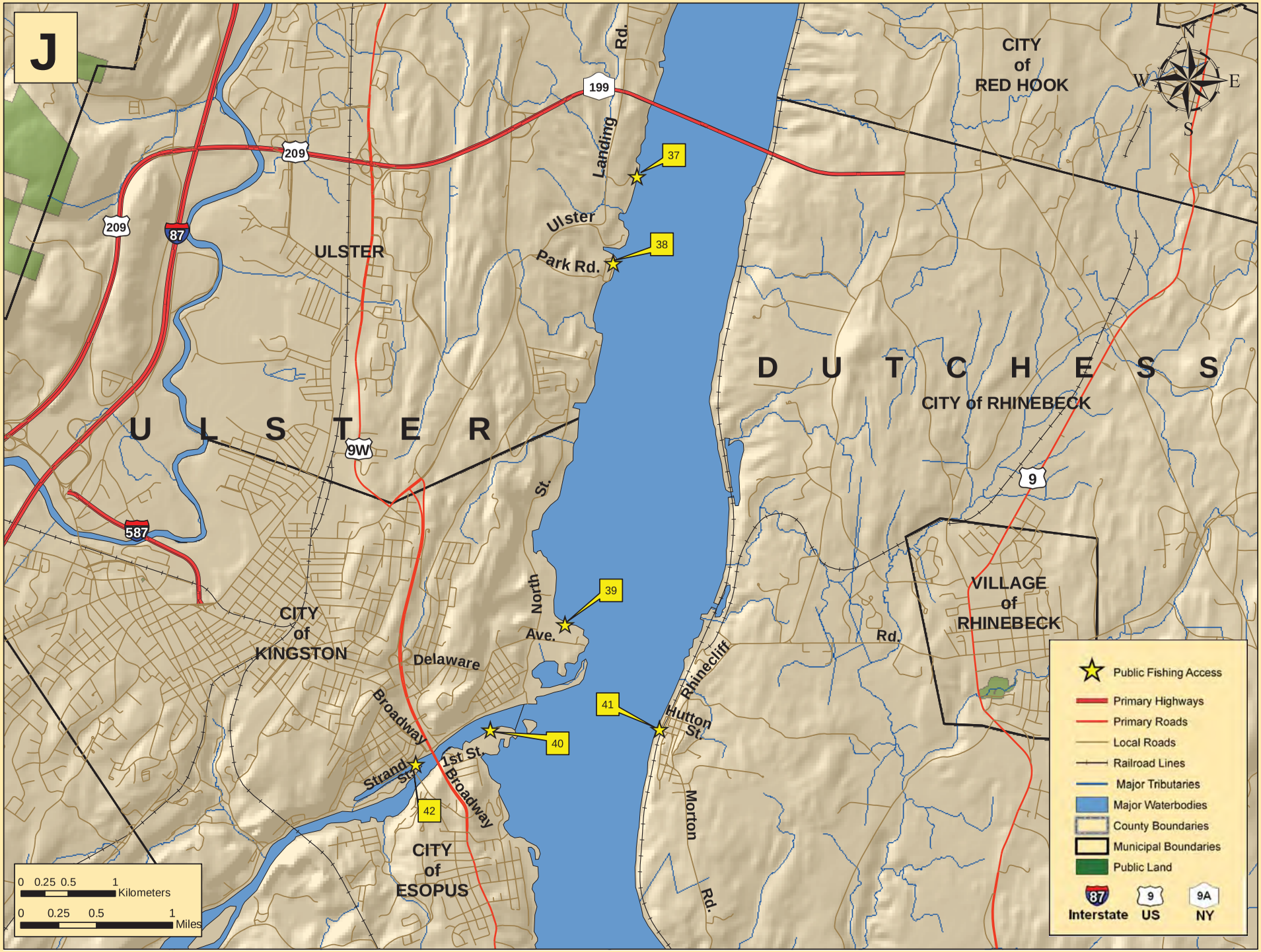
#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
26	Lasher Memorial Park/ Germantown Boat Launch	T. Germantown	M	T2	20C/T			●			RT-9G in H. of North Germantown, West on 35A/Anchorage Rd	
27	Cheviot Boat Ramp	T. Germantown	M	TC	10C/T			●			RT-9G to Roundtop Rd, Cross to Chevoit Rd	
28	Bristol Beach State Park at Eve's Point	T. Saugerties	SP	N	5C	Day				Walk-in	RT-9W at H. Eavesport, East on Emerick Rd/Eavesport Rd	845-786-2701
29	Malden Boat Launch	T. Saugerties.	M	TC	15C			●		Limited Hours	RT-9W in T. Saugerties, East on River Rd, East on Riverside Rd 0.25 mi	845-246-2800
30	Saugerties Lighthouse	V. Saugerties	NP	N	8C					Walk-in	RT-9W in T. Saugerties, East on Lighthouse Rd 2 mi.	845-247-0656
31	Tina Chorvas Memorial Park	V. Saugerties	M	H	40C	Day	●	●			RT-9W in T. Saugerties, East on E. Bridge St, 0.1 mi	845-246-7600
32	Tivoli Boat Launch	V. Tivoli	M	TG	5C						RT-9G, West on 78W (Becomes Broadway), Through V. Tivoli, Left on Diana St over RR	
33	Glasco Mini Park	T. Saugerties	M	TC	20C 10C/T		●	●		Seasonal	State RT-32 to Glasco Tpk (County RT-32), East to Water Treatment Facility	845-246-5890
34	Tivoli North Bay Wildlife Management Area	T. Red Hook	DEC	H	5C	Day				Steep Walk-in	RT-9G, West on Kidd Ln. (3/4 mi south of Village of Tivoli)	845-758-7010
35	Turkey Point State Forest	T. Saugerties	DEC	N	5C					Walk-in	RT-32, East on Ulster Landing Rd (.5mi); Left on Flatbush Camp Rd (.5mi)	845-256-3161
36	Ulster Landing Park	H. Ulster Landing, T. Ulster	M	H	100C		●	●			RT-32, East on Ulster Landing Rd, 3 mi North of Kingston-Rhinecliff Br	845-340-3300

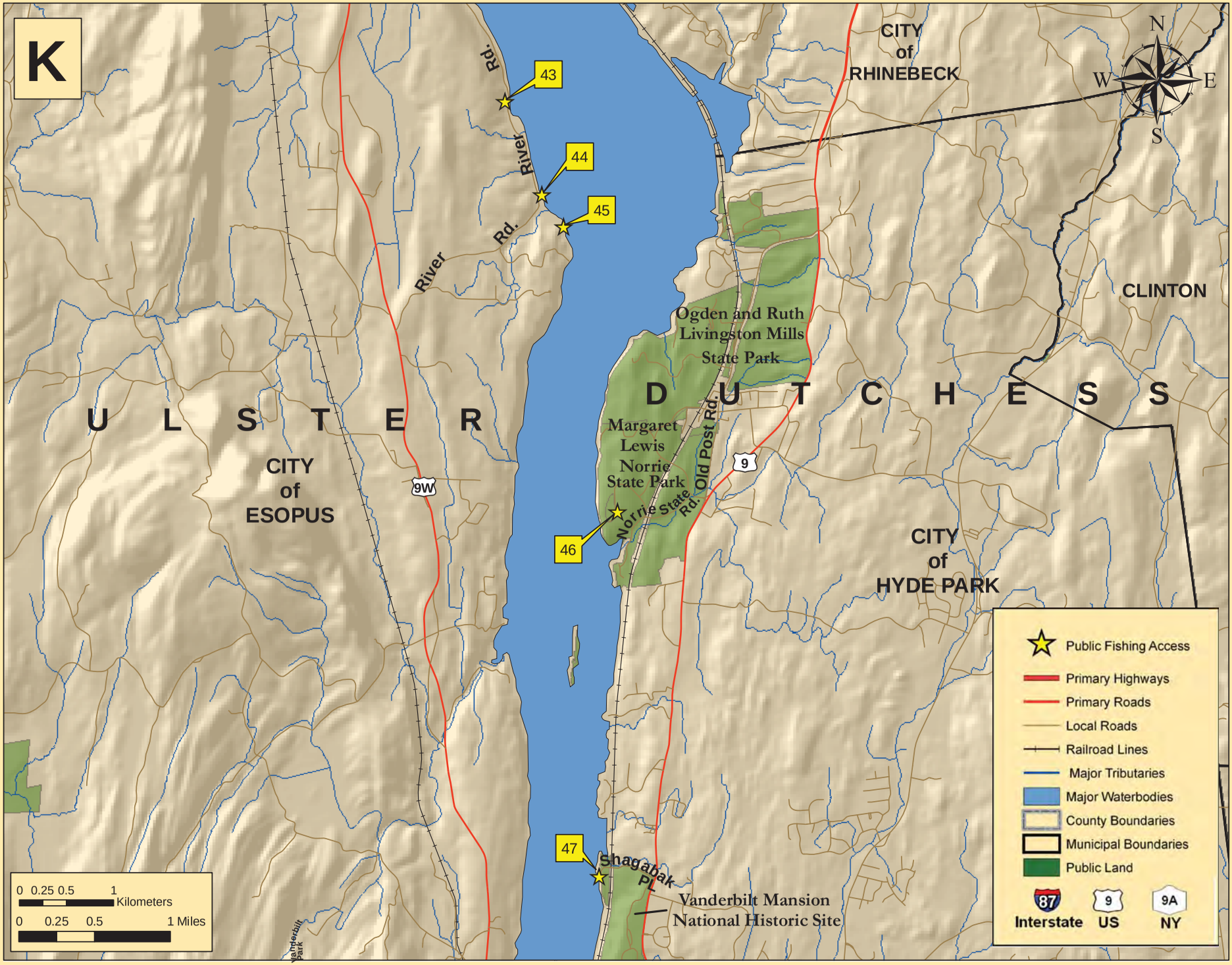
M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee

Map H

Map I

Home


J
CITY of RED HOOK
N
W
E
S
199
209
209
87
ULSTER
Ulster Landing Rd.
37
Ulster Park Rd.
38
D U T C H E S S
CITY of RHINEBECK
U L S T E R
9W
9
587
St.
North Ave.
39
CITY of KINGSTON
Delaware
Broadway
VILLAGE of RHINEBECK
Rd.
Rhinecliff
41
Hutton St.
40
1st St.
Broadway
Strand St.
42
Morton
Rd.
CITY of ESOPUS
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY


K
CITY of RHINEBECK
CLINTON
CITY of ESOPUS
CITY of HYDE PARK
U L S T E R
D U T C H E S S
Ogden and Ruth Livingston Mills State Park
Margaret Lewis Norrie State Park
Norrie State Rd.
Old Post Rd.
River Rd.
Rd.
River
9W
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43
44
45
46
47
Shagabak PL
Vanderbilt Mansion National Historic Site
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Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

Main Map

Information For Maps J K

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
37	Charles Ryder Park	T. Ulster	M	T2	50C/T $		●	●			RT-32, East on Ulster Landing Rd, .6 mi South of Kingston-Rhinecliff Br	845-382-2455
38	Robert E. Post Memorial Park	T. Ulster	M	N	20C			●		2007 Fish Platform	RT-32, East on Ulster Landing Rd, 1.5 mi South of Kingston-Rhinecliff Br	845-336-9736
39	Kingston Point Beach & Park	C. Kingston	M	TG	180C		●	●			RT-9W in C. Kingston, East on Delaware Ave until end	845-331-1682
40	Sleightsburg Park	T. Esopus	M	T2	6C 19C/T		●	●			RT-9W in T. Esopus, East on N. Broadway, Right on First St, Left on Everwood, On Left	845-331-3709
41	Rhinecliff Landing	T. Rhinebeck	M	T2	7C 4C/T	D-10		●		Limited Hours	RT-9W, RT-308 West, 2.2mi to Rhinecliff RR, Right Hutton St	845-876-3409
42	Kingston Rondout Waterfront	C. Kingston	M	H	30C			●	●		Broadway/West Strand	845-331-1682
43	River Road	T. Esopus	M	N	14C						RT-9W, East on River Rd	845-331-3709
44	Esopus Lighthouse Park	T. Esopus	M	N	7C			●			RT-9W, East on River Rd	845-331-3709
45	Esopus Meadows Point Preserve & Environmental Center	T. Esopus	NP	N	10C	Day		●			RT-9W, 10.3 mi North of Mid-Hudson Br, East on River Rd, Entrance on Right 1.3 mi	Scenic Huds. 845-473-4440 ext 270
46	Mills-Norrie State Park $	T. Hyde Park	SP	T2	50C 20C/T	7-9	●			No Pier Fishing	RT-9 in Staatsburg, 9 mi North of Poughkeepsie, West on Norrie Point Rd	845-889-4200
47	Bard Rock	T. Hyde Park	NP	N	25C		●	●			RT-9 North of Poughkeepsie, Left at Vanderbilt Mansion, continue to Bard Rock	

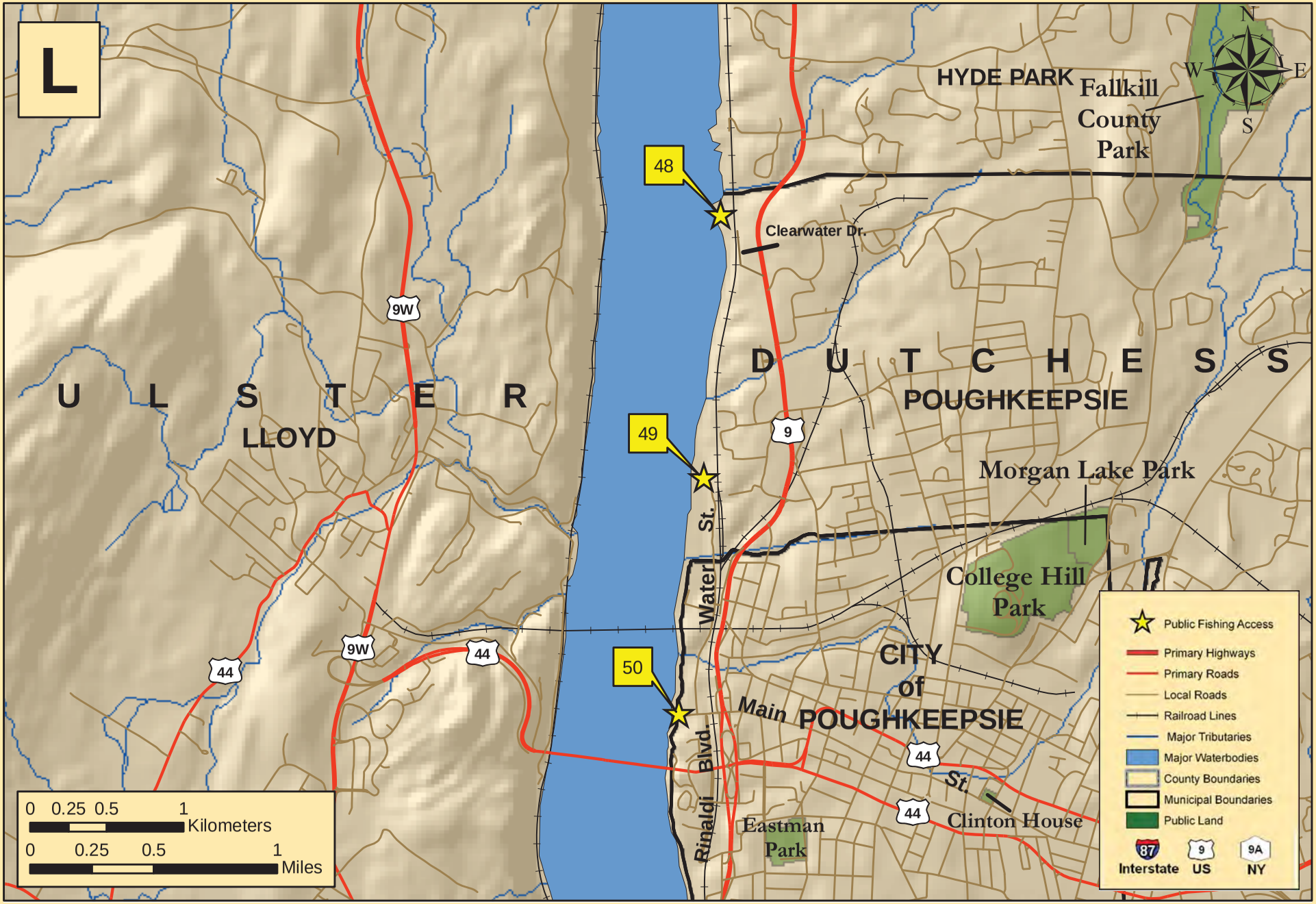
M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee

20

Map J

Map K

Home


L
HYDE PARK
Fallkill
County
Park
N
W
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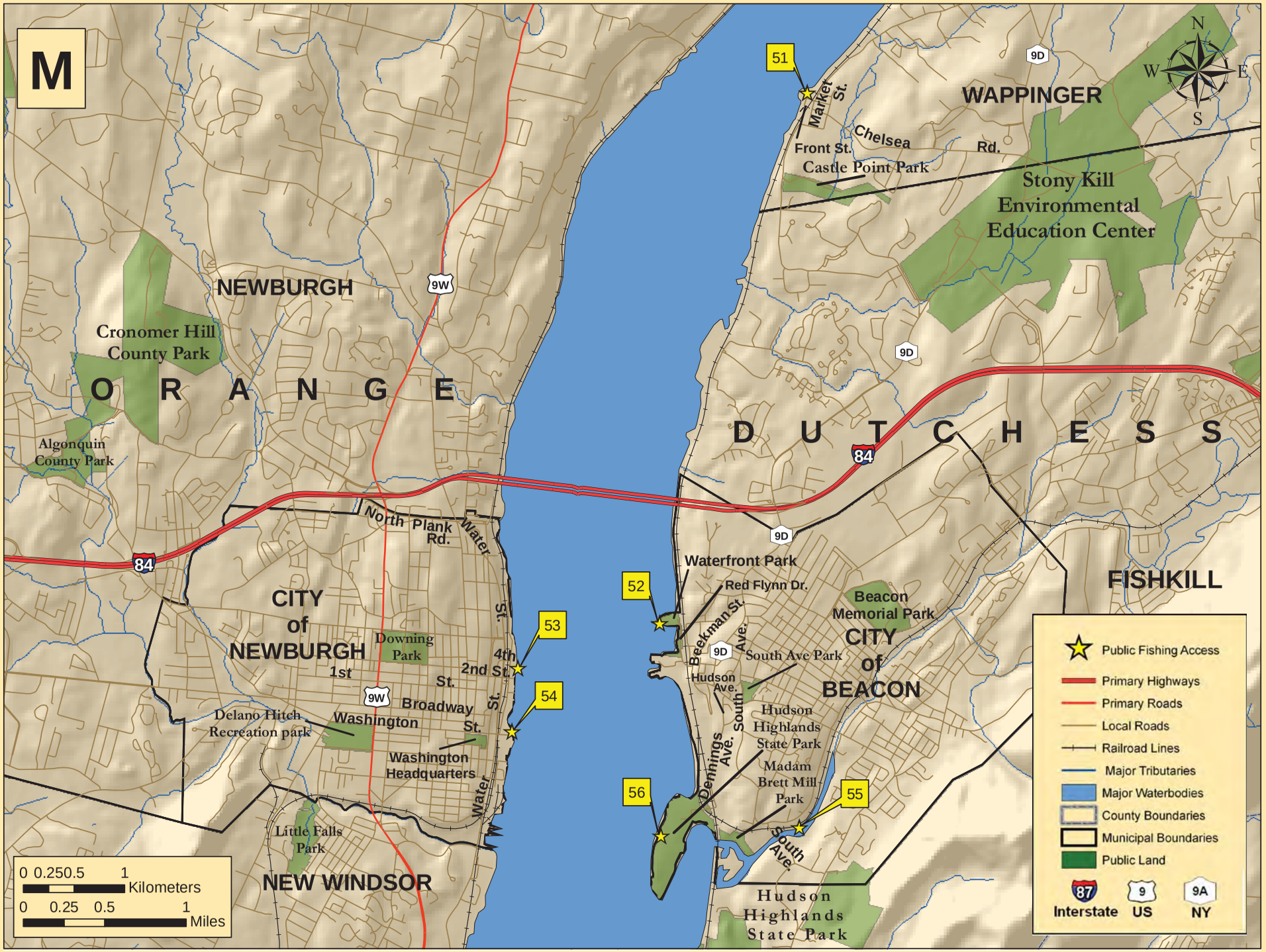
S
48
Clearwater Dr.
9W
U L S T E R
LLOYD
D U T C H E S S
POUGHKEEPSIE
49
9
Morgan Lake Park
St.
Water
College Hill
Park
9W
44
44
50
CITY
of
POUGHKEEPSIE
Main
Rinaldi Blvd.
44
St.
44
Clinton House
Eastman
Park
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY


M
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S
51
Market St.
Front St.
Chelsea
Rd.
Castle Point Park
WAPPINGER
9D
Stony Kill
Environmental
Education Center
NEWBURGH
9W
Cronomer Hill
County Park
O R A N G E
D U T C H E S S
Algonquin
County Park
84
North Plank Rd.
Water St.
CITY
of
NEWBURGH
Downing
Park
1st
2nd St.
4th
St.
53
54
9W
Broadway
St.
Delano Hitch
Recreation park
Washington
St.
Washington
Headquarters
Water St.
Little Falls
Park
NEW WINDSOR
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Kilometers
0 0.25 0.5 1
Miles
52
Waterfront Park
Red Flynn Dr.
Beekman St.
Ave.
Beacon
Memorial Park
CITY
of
BEACON
South Ave Park
Hudson
Ave.
South
Hudson
Highlands
State Park
Madam
Brett Mill
Park
Dennings
Ave.
56
55
South
Ave.
Hudson
Highlands
State Park
FISHKILL
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87
Interstate
9
US
9A
NY

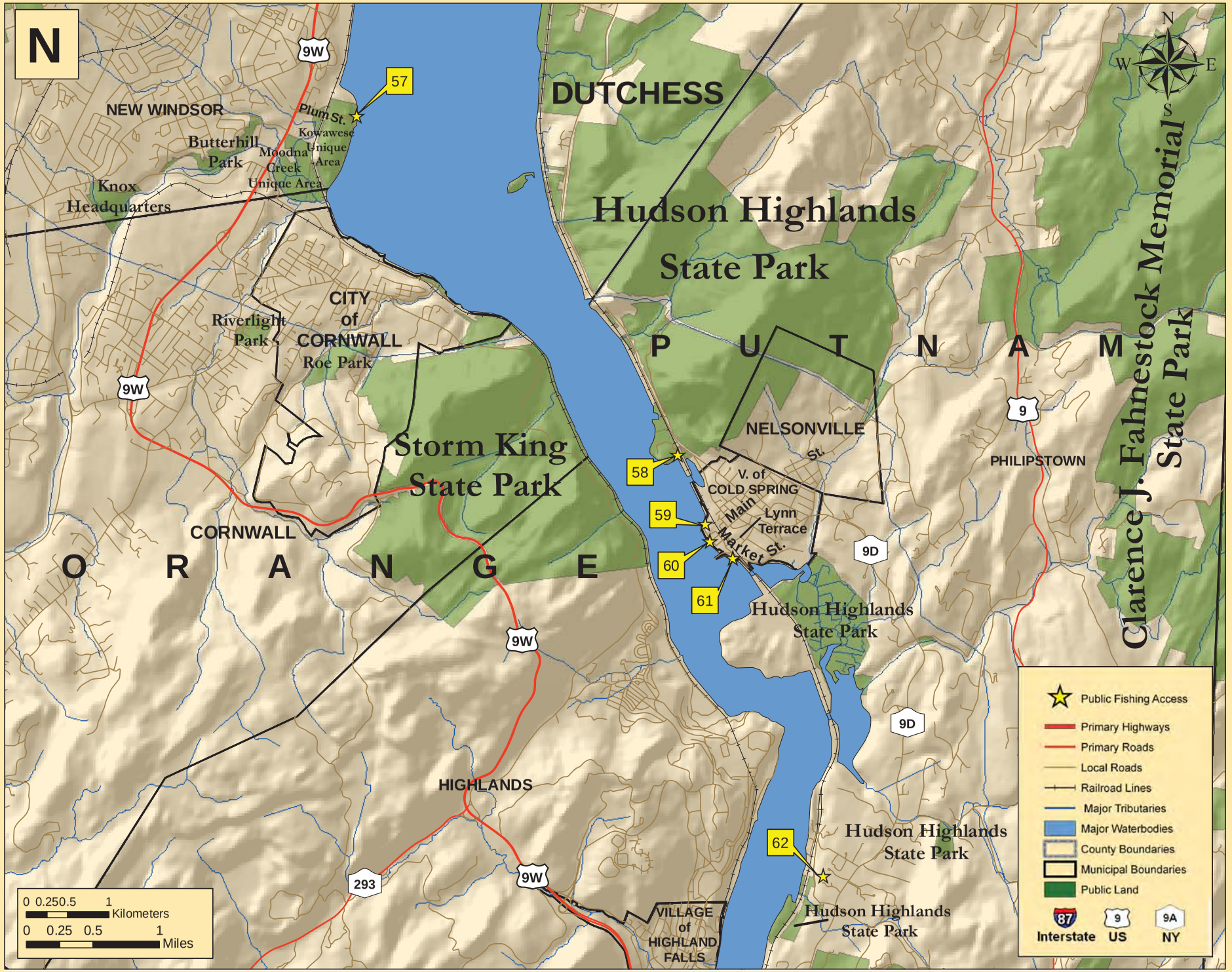
Main Map

Information For Maps L M

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
48	Quiet Cove Riverfront Park	C. Poughkeepsie	C	H	50C	9-8	●	●		Seasonal, Walk-in	RT-9, West on Clearwater Dr	845-298-4600
49	Longview Park	C. Poughkeepsie	M	H	20C					No Motors	RT-9, West to Marist College Main St entrance, Bear Right at fork, through tunnel to water	845-298-4600
50	Waryas Park	C. Poughkeepsie	M	T2	50C 10C/T		●	●			RT-9 in C. Poughkeepsie, West on Main St	845-298-4600
51	Chelsea Boat Ramp/ Wappingers Falls Municipal Launch Ramp	T. Wappinger	M	T2	5C 5C/T						RT-9D in T. Wappinger, West on Chelsea Rd to H. Chelsea, Right on Market St, Left on Front St	914-297-0720
52	Beacon Riverfront Park	C. Beacon	M	N	50C	Day	●	●		H Nearby	RT-9D in C. Beacon, West on Beekman St, Over RR, Right	845-838-5024
53	Newburgh Landing and Waterfront Park	C. Newburgh	M	N	112C		●	●			RT-9W in C. Newburgh, East on North Plank Rd (Becomes Water St), Left on Fourth St	845-565-3297
54	Newburgh Boat Launch	C. Newburgh	M	T2	8C 36C/T			●			RT-17K (Broadway), East on Water St, Left on Washington St	845-565-3230
55	Madam Brett Park	C. Beacon	NP	N	15C	Day				Walk-in	RT-9D in C. Beacon, South on South Ave, Right under overpass, On Left	Scenic Huds. 845-473-4440 ext 270
56	Hudson Highlands State Park, Dennings Point	C. Beacon	SP	N	7C	Day		●		Seasonal, Walk-in	RT-9D in C. Beacon, South on Hudson Ave, West on Dennings Ave	845-225-7207

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee


MAIN MAP
HOME
PRINT
N
DUTCHESS
ORANGE
PUTNAM
NEW WINDSOR
Butterhill Park
Knox Headquarters
Plum St.
Kowawese Unique Area
Moodna Creek Unique Area
CITY of CORNWALL
Riverlight Park
Roe Park
Storm King State Park
CORNWALL
Hudson Highlands State Park
NELSONVILLE
V. of COLD SPRING
Main St.
Lynn Terrace
Market St.
PHILIPSTOWN
Clarence J. Fahnestock Memorial State Park
HIGHLANDS
VILLAGE of HIGHLAND FALLS
57
58
59
60
61
62
9W
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9D
293
0 0.250.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

Information For Map N

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
57	Kowawese State Unique Area at Plum Point	T. New Windsor	C	H	45C	Day	●	●			RT-9W in T.New Windsor (South of Toyota dealership).	845-457-4900
58	Little Stony Point	T. Philipstown	SP	N	9C					Walk-in	RT-9D, 3/4 mi North of V. Cold Spring	845-225-7207
59	Dockside Property	V. Cold Spring	SP	N	20C	Day					RT-9D in V. Cold Spring, West on Main St/Lower Main St, Right on Market St, walk to park	845-225-7207
60	Cold Spring Riverside Park	V. Cold Spring	M	H	20C			●			RT-9D in V. Cold Spring, West on Main St/Lower Main St, Left on Market St to park	
61	Foundry Cove Historic Preserve	V. Cold Spring	NP	H	50C					MetroNorth Parking	RT-9D in V. of Cold Spring, West on Lynn Terrace, Over RR, Left on Market St, Opposite train station.	Scenic Huds. 845-473-4440 ext 270
62	Arden Point	T. Philipstown	SP	H	10C	Day	●	●		Walk-in	Hudson Highlands SP, Garrison NY	845-225-7207

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee


O
Hudson Highlands State Park
Annsville Preserve
Bear Mountain State Park
BEAR MTN. STATE PKWY
N. Water St.
Main St.
CITY of PEEKSKILL
Hudson Ave.
Depew Park
John Walsh Blvd.
PALISADES I. PKWY
Harriman State Park
Blue Mountain Reservation
Broadway
Bleakley Ave.
V. of BUCHANAN
WESTCHESTER
ROCKLAND
STONY POINT
CORTLANDT
Riverview Ave.
Kings Ferry Rd
Montrose State Forest
Sunset Park
Charles Cook Recreation Center Park
Stony Point County Park
George Island County Park
Dutch St.
Oscawana Coutny Park
Furnace Dock Rd.
Veterans Memorial Park
Beach Rd.
Main St.
Lowland Hills Rd.
Grassy Point Rd.
Minisceongo Creek
CROTON-ON-HUDSON
63
64
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Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY

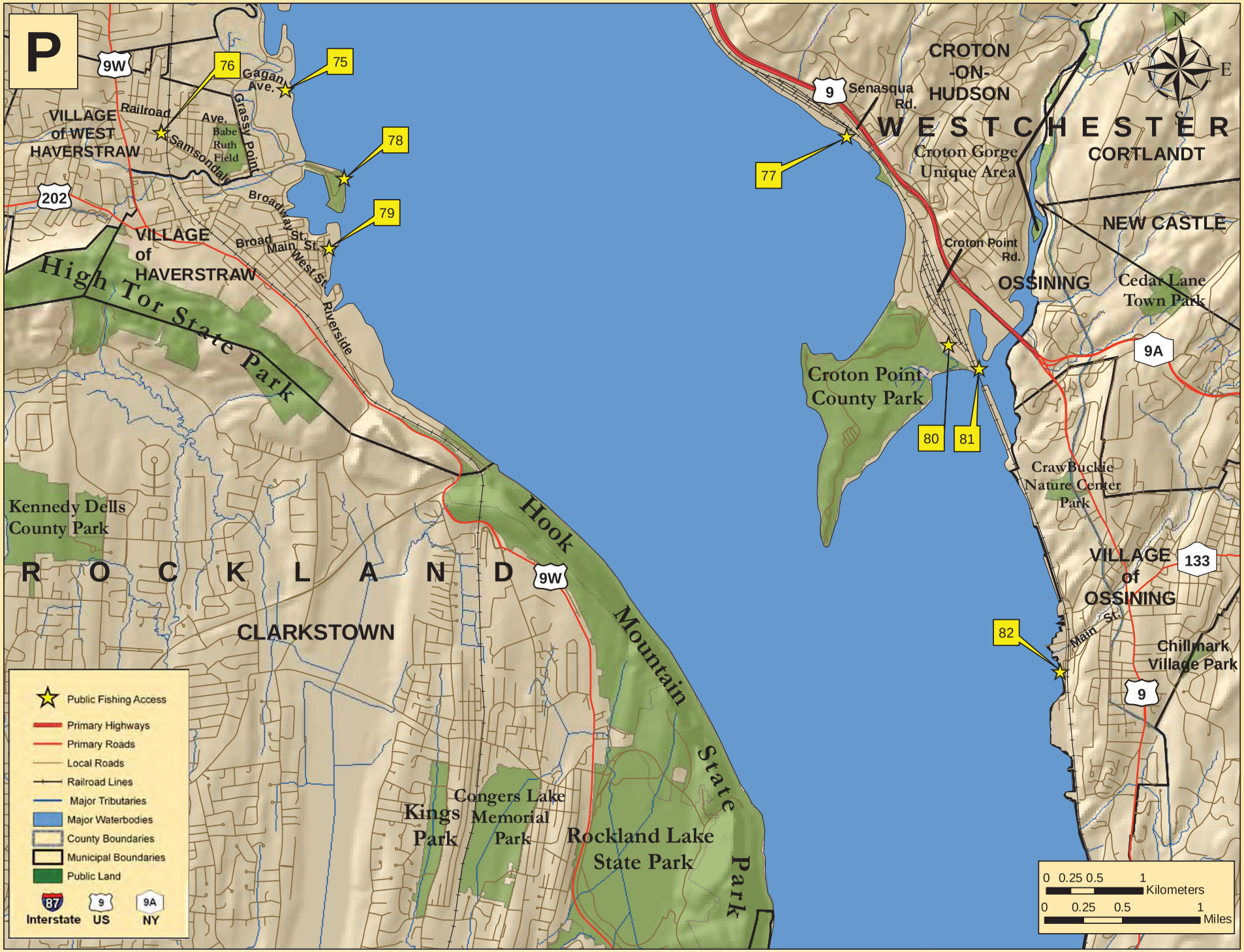
Main Map

Information For Map O

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
63	Bear Mountain State Park Fishing Pier $	T. Stony Point	SP	H	10C		●	●		Walk-in	RT-9W, South of Bear Mountain Circle	845-786-2701
64	Annsville Creek Paddlesport Center	T. Cortlandt	SP	H	30C			●			RT-6D South of Bear Mountain Circle in T. Cortland	845-225-7207
65	Annsville Creek Fishing Pier	C. Peekskill	M	H	20C	Day		●			RT-9, Main St/Peekskill exit, R. Main St, R. North Water St to Annsville Preserve	Peekskill Parks & Rec 914-734-7275
66	Peekskill Municipal Launch	C. Peekskill	M	T2 $	50C/T	Day	●	●			RT-9W in C. Peekskill, West on Hudson Ave, follow train signs to park (just north of station)	914-734-7275
67	Buchanan Boat Launch	V. Buchanan	M	TC $	20C	Day	●	●		Seasonal	RT-9A, West on Bleakley Ave, Right at fork to John Walsh Blvd, Follow Signs for Park.	914-737-1033
68	Steamboat Riverfront Park/ Verplanck Fishing Pier	H. Verplanck, T. Cortlandt	M	H	30C	6-10		●			RT-9A, West on Kings Ferry Rd, West on Riverview Ave	914-734-1050
69	George's Island County Park $	T. Montrose	C	TC $	30C 30C/T	Day	●	●		Seasonal	RT-9A in T. Montrose, West on Dutch St	914-737-7530
70	Oscawana Island Nature Preserve	T. Cortlandt	M	H	6C			●		Walk-in	RT-9A, West on Furnace Dock Rd	914-271-3293
71	Clark Park	T. Stony Point	M	TG $	4C	Day	●	●			RT-9W in H. Stony Point, East on Main St/ Grassy Point Rd, at intersection Beach Rd	Stony Point Rec 845-947-5261
72	Stony Point Park	T. Stony Point	M								RT-9W in H. Stony Point, East on Main St to Grassy Point Rd	845-786-2716
73	Lowland Park	T. Stony Point	M	H	7C	Day	●	●		Tidal Creek	RT-9W in H. Stony Point, East on Lowland Hills Rd	845-947-5261
74	Town of Haverstraw Canoe & Kayak Launch	T. Haverstraw	M	TG	8C	Day				No Motors	RT-9W in H. Stony Point, East on Main St to Grassy Point Rd, just past marina, on right	845-721-8981

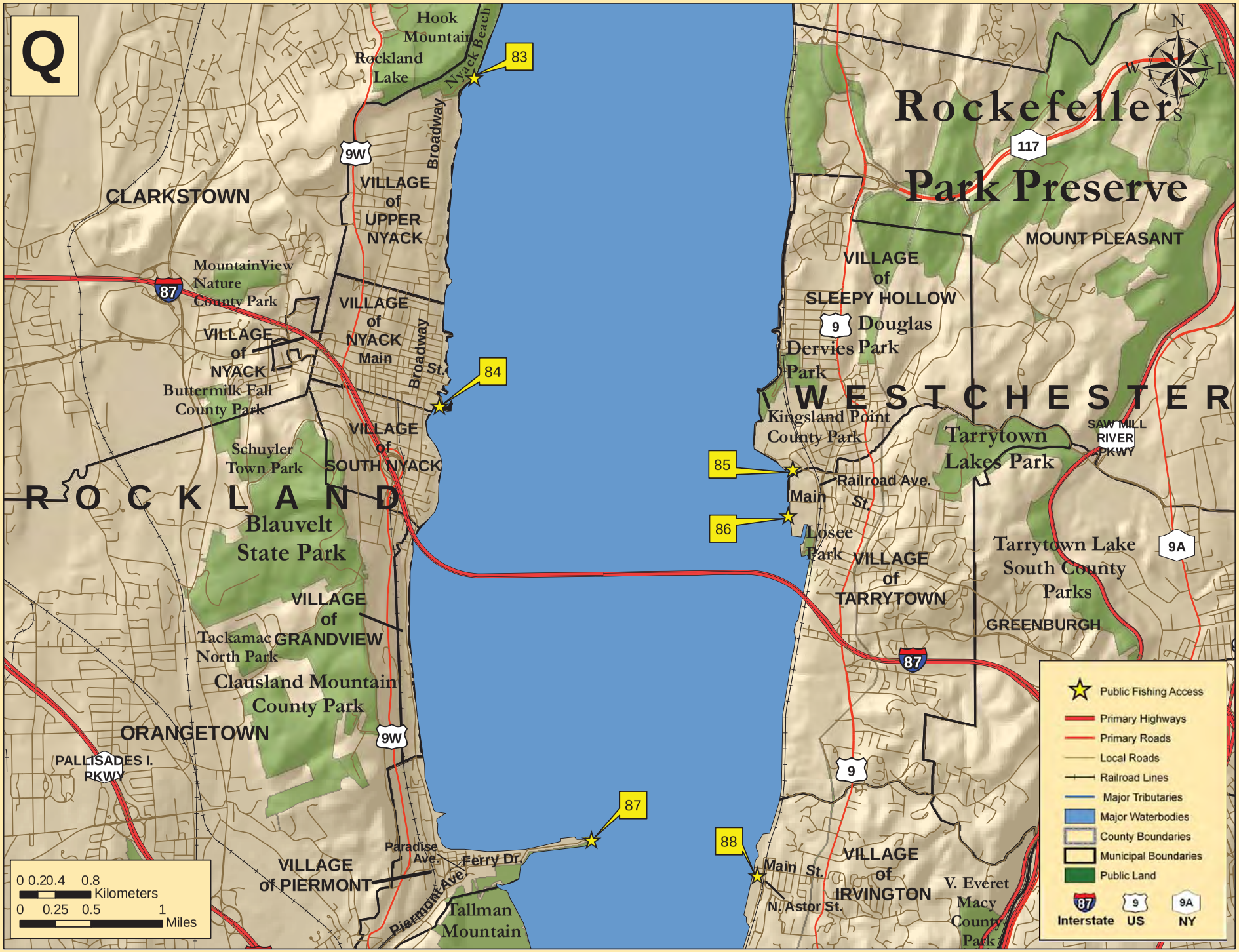
M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee

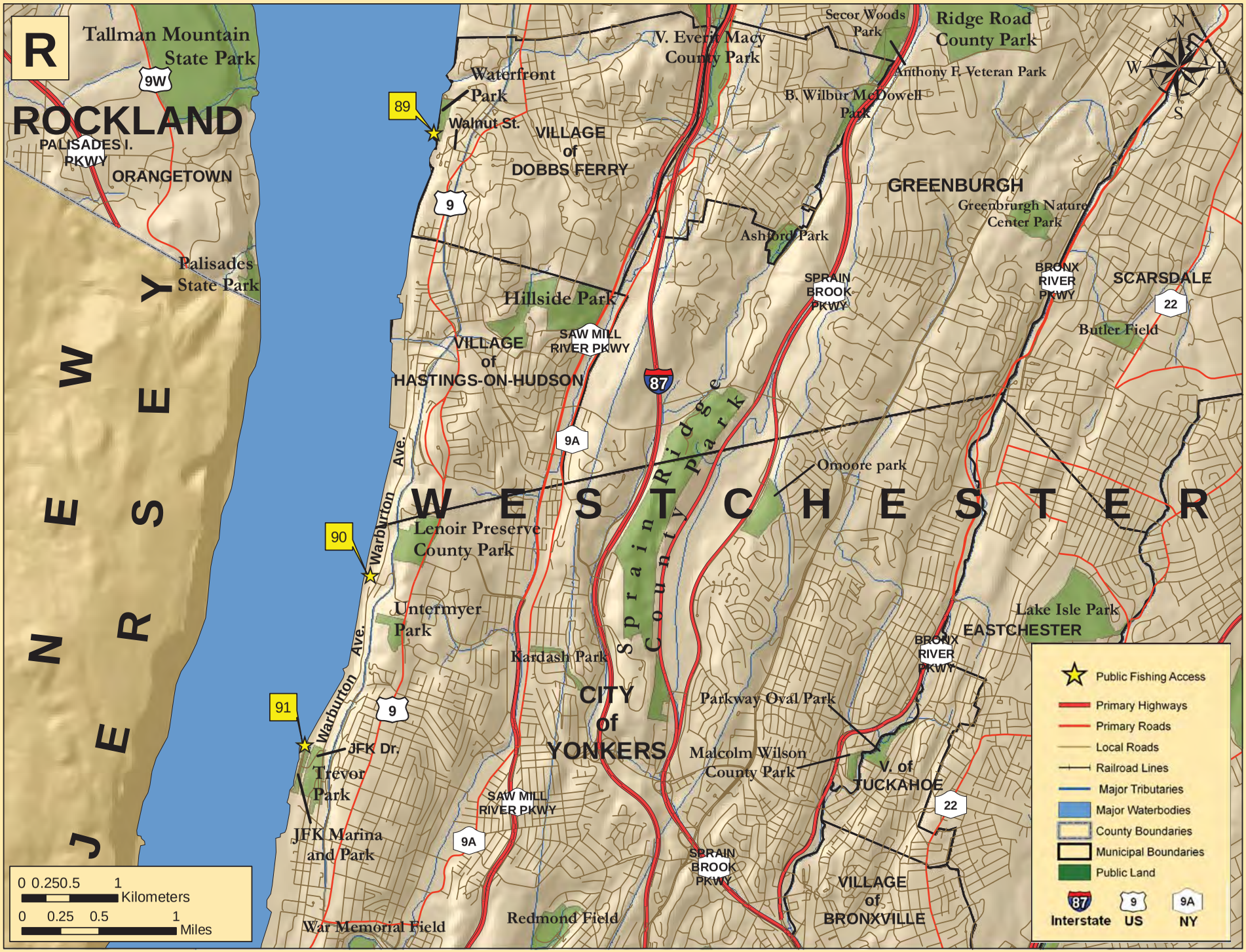

P
9W
76
75
Gagan Ave.
Railroad Ave.
Samsondale
Babe Ruth Field
Grassy Point
VILLAGE of WEST HAVERSTRAW
78
79
202
VILLAGE of HAVERSTRAW
Broadway
Broad St.
Main St.
West St.
Riverside
High Tor State Park
Kennedy Dells County Park
R O C K L A N D
CLARKSTOWN
9W
Hook Mountain State Park
Kings Park
Congers Lake Memorial Park
Rockland Lake State Park
9
Senasqua Rd.
CROTON -ON- HUDSON
W E S T C H E S T E R
CORTLANDT
77
Croton Gorge Unique Area
NEW CASTLE
Croton Point Rd.
OSSINING
Cedar Lane Town Park
9A
Croton Point County Park
80
81
CrawBuckie Nature Center Park
VILLAGE of OSSINING
133
Main St.
82
Chillmark Village Park
9
N
W
E
S
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
87 Interstate
9 US
9A NY
0 0.25 0.5 1 Kilometers
0 0.25 0.5 1 Miles

Information For Map P

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
75	Haverstraw Bay County Park	V. Haverstraw	C	T2 $	200C 50C/T	Day	●	●	●	Fishing Piers	RT-9W, East on Railroad Ave/Grassy Pt Rd, Right on Gagan Rd	845-947-5485
76	Peck's Pond Park	V. West Haverstraw	M	N	25C	Day		●			RT-9W, East on Railroad Ave, Right on Samsondale Ave	845-947-2800
77	Senasqua Boat Basin	V. Croton-on-Hudson	M	H	20C	Day					RT-9, East on Senasqua Rd, On Left	
78	Bowline Point Parks and Recreational Facility	T. Haverstraw	M	N	40C	9-D	●	●			RT-9W, East on Railroad Ave, Right on Samsondale Ave, Left on Bowline Rd, behind plant	
79	Emeline Park	V. Haverstraw	M NP	H	30C	Day	●	●			RT-9W in V. Haverstraw, East on Broadway, Left on Main St	Scenic Huds. 845-473-4440 ext 270
80	Croton Point Park	T. Croton-on-Hudson	C	H	10C	Day	●	●		Seasonal	RT-9W, West on Croton Point Rd, over tracks to park.	914-862-5290
81	Croton River Launch	T. Croton-on-Hudson	M	TG	8C 8C/T					Low Tide Access	RT-9W to Croton Point, West at station, through parking lot to launch	
82	Ossining Municipal Boat Launch	T. Ossining	M	TC $	12C 5C/T	Day	●			26ft Max. Boat Size	RT-9W in T. Ossining, Left on Main St over RR, follow signs to tracks	

M Municipal, **SP** State Park, **NP** Non-Profit, **C** County, **N** None, **H** Hand-launch, **TG** Trailer-launch (Gravel), **TC** Trailer-launch (Concrete), **T2** Trailer-launch (2-lane concrete), **C** Cars, **C/T** Cars & Trailers, **D** Dawn or Dusk, Accessible, Greenway Water Trail Site, $ Fee


Q
Hook Mountain
Rockland Lake
Nyack Beach
83
9W
Broadway
VILLAGE of UPPER NYACK
CLARKSTOWN
MountainView Nature County Park
87
VILLAGE of NYACK
Buttermilk Falls County Park
VILLAGE of NYACK
Main St.
84
Schuyler Town Park
VILLAGE of SOUTH NYACK
ROCKLAND
Blauvelt State Park
VILLAGE of GRANDVIEW
Tackamac North Park
Clausland Mountain County Park
ORANGETOWN
PALISADES I. PKWY
9W
87
Paradise Ave.
Ferry Dr.
VILLAGE of PIERMONT
Piermont Ave.
Tallman Mountain
0 0.20.4 0.8 Kilometers
0 0.25 0.5 1 Miles
Rockefellers
Park Preserve
117
MOUNT PLEASANT
VILLAGE of SLEEPY HOLLOW
9
Douglas Dervies Park
Park
WESTCHESTER
Kingsland Point County Park
SAW MILL RIVER PKWY
Tarrytown Lakes Park
85
Railroad Ave.
Main St.
86
Losee Park
VILLAGE of TARRYTOWN
Tarrytown Lake South County Parks
9A
GREENBURGH
87
9
88
Main St.
N. Astor St.
VILLAGE of IRVINGTON
V. Everet Macy County Park
N
W
E
S
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
Interstate
US
NY


R
Tallman Mountain State Park
9W
ROCKLAND
PALISADES I. PKWY
ORANGETOWN
Palisades State Park
NEW JERSEY
89
Walnut St.
Waterfront Park
VILLAGE of DOBBS FERRY
9
V. Everett Macy County Park
Secor Woods Park
Ridge Road County Park
Anthony F. Veteran Park
B. Wilbur McDowell Park
GREENBURGH
Greenburgh Nature Center Park
Ashford Park
SPRAIN BROOK PKWY
BRONX RIVER PKWY
SCARSDALE
22
Butler Field
Hillside Park
VILLAGE of HASTINGS-ON-HUDSON
SAW MILL RIVER PKWY
87
9A
Sprain Ridge County Park
Omoore park
WESTCHESTER
90
Warburton Ave.
Lenoir Preserve County Park
Untermyer Park
Kardash Park
CITY of YONKERS
Lake Isle Park
EASTCHESTER
Parkway Oval Park
91
JFK Dr.
Trevor Park
JFK Marina and Park
Malcolm Wilson County Park
V. of TUCKAHOE
War Memorial Field
Redmond Field
VILLAGE of BRONXVILLE
0 0.250.5 1 Kilometers
0 0.25 0.5 1 Miles
Public Fishing Access
Primary Highways
Primary Roads
Local Roads
Railroad Lines
Major Tributaries
Major Waterbodies
County Boundaries
Municipal Boundaries
Public Land
Interstate
US
NY
N
W
E
S

Main Map

Information For Maps Q R

Print

#	Site Name	Municipality	Operator	Launch	Parking	Hours	Bathroom	Picnic	Pumpout	Use Limits	Location	Contact
83	Nyack Beach State Park $	V. Upper Nyack	SP	H	30C	Day	●	●			I-87, Exit 10/Nyack, North on Broadway to the end	845-268-3020
84	Nyack Memorial Park	T. Nyack	M	TC $	25C 15C/T	Day	●	●			RT-9W, East on Main St, Right on Broadway, Left on Depew	
85	Horan's Landing	V. North Tarrytown	M	H	10C	Day					RT-9, W. Main St, Railroad Ave over tracks, Right to Park.	
86	Pierson Park	C. Tarrytown	M	N	25C	Day		●			RT-9W, (By train Station)	
87	Piermont Pier	T. Piermont	M	H	20C		●	●		Walk-in	RT-9W, Crescent St/Ash St through downtown to Piermont Ave, West on Paradise Ave to Ferry Rd	
88	Irvington Scenic Hudson Park	V. Irvington	M	H	74C			●		No Pier Fishing	RT-9, West on Main St, Right on North Astor St, Left over RR bridge	914-591-7736
89	Dobbs Ferry Waterfront Park	V. Dobbs Ferry	M	H	20C						RT-9, West on Walnut St, Through Parking Lot	
90	Greystone Station	C. Yonkers	RR	N	20C	Day				MetroNorth Parking	RT-9, West on Warburton Ave	
91	JFK Memorial Park	C. Yonkers	M	T2	50C/T	Day					Warburton Ave in C. Yonkers, West on JFK Dr., Past Museum Middle School	914-377-6425

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Map Q

Map R

Home

Access to the Hudson River Estuary

Access to the Hudson River Estuary can sometimes be difficult. Various manmade and natural obstacles can often complicate efforts to get to the river. Railroads impede access on the eastern shore of the river from Hudson to New York City and on the western shore from Haverstraw to the Town of Esopus. Crossing these railroad tracks where no signal gate or established crossing is present is **extremely** dangerous and illegal. Physical impediments such as steep shoreline slopes and shallow inlets also limit access in many areas. Private land ownership can also complicate access to the river. Accessing the river from private property without the landowner's permission is trespassing and against the law. To address these access difficulties, the Department of Environmental Conservation (DEC) continues to aggressively pursue public access opportunities. DEC has also been active in improving existing access opportunities on the river. Currently, there are approximately 90 developed boat launches and shorefishing locations on the Hudson River that are owned by municipalities, DEC, or other state agencies and not-for-profit groups.

For more information on access to the Hudson River Estuary, contact the *NYSDEC Hudson River Estuary Program* at (845) 256-3016, or visit their access website:
http://www.dec.ny.gov/lands/5088.html
The *NYS Hudson River Valley Greenway Water Trail* at (518) 473-3835, or visit:
http://www.hudsongreenway.state.ny.us/conserv/watertr.htm
Or, the *NYSDEC* list of NYS Boat Launches:
http://www.dec.ny.gov/outdoor/7832.html

Boating and Water Safety

The Hudson is a big river subject to rough weather conditions, strong currents, and heavy commercial and recreational boat use. Barges and other large commercial vessels are common on the river. Wakes from these vessels, including secondary wakes caused by the initial wake bouncing off the shoreline, can be dangerous to small vessels. The Hudson is a tidal river, with water depths changing markedly from high (flood) to low (ebb) tide. This can significantly impact where you can navigate on the river. Boaters on the Hudson must be familiar with the rules and regulations associated with boating on a large navigable waterway such as the Hudson. Boaters should also be sure to carry the appropriate safety equipment for the boat they are operating. One of the most important safety items is a life vest (or personal floatation device (PFD)). Children under the age of 12 must wear a U.S. Coast Guard approved Type 1, 2 or 3 PFD when underway. Every pleasure boat, including kayaks, canoes and rowboats, must have on board at least one wearable U.S. Coast Guard approved PFD for every person on board. The PFD must be in good condition and readily accessible. Vessels 16 ft. in length and larger must also carry a U.S. Coast Guard approved throwable flotation device. In addition to PFDs numerous other safety items must be carried on board a boat. Required equipment varies depending upon the size of your boat. The operator or person in control of the vessel is responsible for compliance with all safety regulations.

For a complete reference of required equipment and the rules and regulations associated with safe boating in New York State, contact the New York State Office of Parks, Recreation and Historic Preservation at (518) 474-0445, or download a copy of the New York State Boaters Guide at: www.nysparks.com/boating/resource.asp

Additional information can also be found at the United States Coast Guard website: www.uscgboating.org

Anglers and boaters planning on using the Erie or Champlain Canals, which allow Hudson boaters to access Lake Champlain and the Great Lakes, should contact the New York State Canal Corporation at (518) 471-5011, or visit their website at: www.nyscanals.gov

Fishing Regulations

A freshwater fishing license is not required when fishing the waters of the Hudson River south of the Troy Barrier Dam. A fishing license **is** required to fish the entire length of all tributaries of the Hudson south of the Troy Dam to the Tappan Zee Bridge **even if the tributary is subject to tidal flow**. Regulations associated with the take of freshwater fish species from the Hudson River can be found in the New York State Freshwater Fishing Regulations Guide available at all DEC regional offices, license sales outlets, or by calling (518) 402-8920. Regulations can also be found on the DEC website at: www.dec.ny.gov/outdoor/7917.html

For marine fishing regulations call (631) 444-0435 or go to the Division of Marine Resources Saltwater Regulations webpage at: www.dec.ny.gov/outdoor/7894.html

Circle Hooks: Scientific research indicates that the use of circle hooks reduces mortality on fish that are caught and released. New regulations on the Hudson are proposed that, if passed, will take effect in 2007. Under these regulations, the use of circle hooks will be required if you are fishing in the Hudson using natural bait (minnows, worms, dough balls, etc.) between April 15 and June 1.

Hudson River Fish Consumption Advisories

The Hudson River Estuary has a very large watershed that includes many urban areas, factory towns, and other sources of pollution. Unfortunately, this has resulted in the addition of chemicals, pathogens and heavy metals to the river that have found their way into the bodies of some Hudson fish species. As a result, fish consumption advisories have been established by the New York State Department of Health (NYSDOH) for many Hudson River fish species. Fish consumption advisories are updated annually and can be found in the New York State Fishing Regulations Guide or by visiting the NYSDOH website at: www.health.state.ny.us/environmental/outdoors/fish/fish.htm

For more information on health effects associated with exposure to chemical contaminants call NYSDOH at 1-800-458-1158 x 27815.

Popular Gamefish More info:

www.dec.ny.gov/animals/269.html



***Striped Bass**, or **Stripers**, easily distinguished by the seven to nine dark horizontal lines found along their sides, vary considerably in size, ranging from 18 to 55 inches in length and three to 70 pounds in weight. On the Hudson River, striped bass fishing is best during the spring spawning run from March to June.*



***American Shad**, the largest of the herring in the Hudson, average 20 to 23 inches in length and five to six pounds in weight. During spawning, April to June, shad arrive in large schools, running up the rivers where they slowly adjust to the change from salt to fresh water.*



***Smallmouth Bass**, members of the sunfish family, are famous for their fighting ability when hooked and have the reputation for being, inch-for-inch, the best sporting fish around. Adult smallmouth bass are usually found near the protection of rocks or near submerged logs. Early morning and evening are their most active feeding times.*



***Largemouth Bass**, also of the sunfish family, have been known to reach weights in excess of ten pounds. They are rather solitary fish, preferring to stay among dense aquatic vegetation or close to submerged cover, such as stumps, logs, or dock pilings.*

Excerpts from articles in *The Conservationist* magazine, authored by Eileen C. Stegemann & Douglas Stang



White Perch, NY's smallest true bass, seldom reach more than 12 inches in length. Like striped bass, white perch can live in both fresh and saltwater. They often occur in large schools in turbid shallow areas. White perch are especially easy to catch in the spring during spawning. Although small in size, they can put up a good fight when hooked.



Yellow Perch, ranging in length from six to 12 inches, prefer shallow, weedy protected sections. Yellow perch spawn in April or May and are most active in the morning and evening. They eat a variety of organisms, including aquatic insects, crayfish, and fish.



Channel Catfish, the largest of New York State's catfish, can reach trophy size of 20-plus pounds. Channel catfish are most active just before sunrise and sunset. Catfish have a very diverse diet, generally eating any object they can get their mouths around.



White Catfish are found throughout the Hudson River. Adults are almost always medium-sized, averaging eight to 14 inches in length. Catfish are nocturnal - feeding most actively at night.



Blue Crab, one of the largest crustaceans, has five pairs of legs. The first pair are claws, and the last pair are adapted into swimming paddles. Adults will eat mollusks and bivalves, using their claws to manipulate them. Other food items include dead or live fish, blue crabs, shrimp, organic debris, and aquatic plants.

Excerpts from articles in *The Conservationist* magazine, authored by Eileen C. Stegemann & Douglas Stang



Carp, first introduced into New York State waters in 1831, can grow quite large, more than 40 pounds! They eat a variety of plant and animal material and are often spotted by the cloud of mud they stir up as they feed. It is not uncommon to see and hear carp sucking in floating insects at the water's surface.

Species of Note



Atlantic Sturgeon, occasionally reaching over 200 pounds in weight and six to eight feet in length, return to the Hudson each spring to spawn. While much is known about their habits in freshwater, little is known about this sturgeon while at sea. *Possession is prohibited.*



Shortnose Sturgeon, rarely exceeding 3.5 feet in length and 14 pounds in weight, have a short, blunt, conical snout with four barbels in front of its large underslung mouth. It is officially listed as *endangered* in all states where it occurs. *It is unlawful to kill or possess this fish.*

Excerpts from articles in *The Conservationist* magazine, authored by Eileen C. Stegemann & Douglas Stang

The estuary usually has two high and two low tides in a twenty-four hour period. With this rising and falling come changes in the direction of flow. Generally speaking, a rising tide is accompanied by a *flood* current flowing north towards Troy, a falling tide by an *ebb* current flowing south towards the sea.

The best time to fish is during the slow current period, just before the change in direction of tidal flow near high and low slack tide. Normally the action builds for about an hour as the current slows. Best fishing often comes during the ½ to ¾ hour of dead slack and tapers off as the current builds again. Slack tides around dawn and dusk are especially hot. Tide current tables will help you plan the best fishing times each day.

Tidal current tables and nautical charts are available from local bait shops, marinas and boating supply dealers. Chart 12347 covers Wappingers Creek to the City of Hudson, and Chart 12348 covers the upper river from the City of Hudson to Troy.

For more information about tides, and current conditions, please refer to the following *NOAA* website: http://tidesandcurrents.noaa.gov/tides06/

For more information about Hudson River Estuary fishing, visit

- The *NYSDEC Fishing* website: www.dec.ny.gov/outdoor/fishing.html
- The *NYS DEC Hudson River Fisheries Unit* website: www.dec.ny.gov/animals/9962.html
- In Albany, Rensselaer, Greene, and Columbia Counties, contact the *NYS DEC Bureau of Fisheries Region 4 Office* at (607) 652-7366
- In Ulster, Dutchess, Orange, Rockland, and Westchester Counties, contact the *Region 3 Office* at (845) 256-3161.

Day-to-day observations of the Hudson's fish, wildlife, birds, sunsets, storms, migrations, and more sent in by anglers, researchers, sailors, bird watchers, schoolchildren, picnickers, and others who delight in the river can be found in the *Hudson River Almanac* at: www.dec.ny.gov/lands/25608.html

Nesting Birds: Many species of birds select nest sites on or close to water. These include ducks, geese, swans, loons, herons, ospreys and eagles. Close approach by boaters and anglers and activities associated with boating and fishing may cause these birds to leave their nests. This makes the eggs or young vulnerable to predators, chilling, overheating and possible abandonment and starvation. Please pay attention and keep a good distance from nesting birds or birds with chicks. Also, be sure to move away from birds that appear to be frightened or defending nesting areas.

Submerged aquatic vegetation (SAV): SAV plays a vital role in the estuarine ecosystem by maintaining water quality and supporting both fish and macroinvertebrate communities. Protecting this sensitive habitat from human disturbance or damage from boat propellers is important to the continued health of the river.

Catch And Release: A fresh fish dinner represents the ideal conclusion to a fishing trip for many people. Fish populations are, however, a limited resource, and anglers can have an impact on the quality of these populations. This is particularly the case for larger gamefish that are relatively rare in a population, and often take an extended period of time to reach these sizes. With the availability of fiberglass mounts that can be painted to exactly duplicate a trophy catch, even the angler who wants a remembrance of the catch of his or her life now has an alternative to killing the fish.

Whether the release of a fish is dictated by fishing regulations or conservation, follow these simple guidelines to ensure that your released fish has the best chance of survival:

- Quickly play and land fish;
- Have necessary tools on hand to remove the hook;
- Unhook fish in the water if possible;
- Handle fish carefully to avoid injury–avoid contact with gills. Do not squeeze fish or remove protective slime. Do not grasp fish by the eye sockets;
- Cut leaders on deeply-hooked fish;
- Consider using barbless or circle hooks;
- Don't "cull" by killing fish considered undesirable, and
- Request the pamphlet "Fish for the Future" from DEC regional offices to learn how to release fish caught from waters greater than 30 feet deep. Such fish often develop distended air bladders due to sudden pressure reduction and require special handling.

Used Fishing Line: Lost or discarded fishing line can last a long time in the environment. Too often birds and other wildlife become entangled leading to severe injury or a slow and painful death. Be sure to properly discard all fishing line by collecting it for proper disposal in trash cans or tackle shop recycling programs. Any additional line that you are able to collect and remove from the areas that you fish will also have a beneficial effect on the environment.

Aquatic Invasive Species: The Hudson River Estuary (HRE) like most other public water bodies in New York State has been affected to some degree by the introduction of aquatic invasive species. Historically the aquatic community was isolated by natural geography until relatively recently when global transportation of goods and services has now provided easy transport of non-native, or exotic, species to new ecosystems. Exotics in the HRE initially may increase community biodiversity with their presence. Without natural enemies, however, they are free to proceed into a boom and bust growth pattern in which high numbers of exotics often out-compete, displace and sometimes extirpate native species. Many nuisance species are now established and have become common household names for boaters and anglers in the lower river basin. Long-term exotics include common carp and the aquatic plants, Eurasian watermilfoil and water chestnut, followed more recently by zebra mussel and European rudd. Other invaders making their way inland from the Great Lakes basin, such as round goby and VHS—viral hemorrhagic septicemia, a deadly fish virus—may pose a future threat to the Hudson.

Anglers and boaters can also spread fish diseases and parasites from waterbody to waterbody. Diseases like whirling disease, VHS and largemouth bass virus can be spread through contaminated live-wells, bait-wells and bilge water, and/or by moving fish from one body of water to another. Anglers and boaters should be certain to drain their live-wells, bait-wells and bilges before leaving a body of water. Anglers should be aware that it is illegal to place fish into a body of water in New York State without a stocking permit. This includes baitfish.

Responsible Angling and Boating

Specific guidelines to prevent the spread of Aquatic Invasive Species are:

- Call your local DEC fisheries office and ask for literature and brochures on exotic species;
- Follow recommended guidelines and NYS regulations while fishing and boating;
- Remove all sediment and aquatic plants from all recreational gear including boots, waders, nets, boats, motors and trailers before departing an access site;
- Drain all water from your boat before leaving the launch or access site, including bilges, live-wells, and bait tanks;
- Dry all fishing gear such as nets and boots before traveling to another water body;
- Do **not** transport fish from one water body to another;
- Do **not** release unused live bait into any water body;
- Do **not** dispose of fish carcasses or by-products in any water body;
- Rinse sediment and debris from waders and other wading gear before reuse;
- Consider disinfecting waders and live wells by using a 10% chlorine/water solution to kill organisms, particularly after entering known infected waters. Rinse gear well after treatment to remove all residual chlorine before next reuse;
- Use responsible live-well and tournament procedures to avoid stressing fish, and
- Stage tournaments during cool weather periods and practice catch and live release.

More information pertaining to Aquatic Invasive Species:



NYSDEC – Freshwater Fishing Regulations Guide, including VHS alert
www.dec.ny.gov/outdoor/7917.html

LMBV, fishing tournaments, and live well procedures
http://sports.espn.go.com/outdoors/bassmaster/conservation/

Stop Aquatic Hitchhikers
www.ProtectYourWaters.net

NYSDEC - Aquatic Invasive Species Eradication Grant Program: including a list of aquatic species in NYS
www.dec.ny.gov/animals/32861.html

Zebra Mussel
(approx. 1/2")



Round Goby



Non-Toxic Sinkers: The loss of sinkers and lures is a routine part of fishing. Unfortunately, lost sinkers, especially split-shot, may be mistaken for food or grit and eaten by water birds such as ducks, geese, swans, gulls or loons. Toxic effects of even a single lead sinker can cause birds to sicken and increase the risk of death through predation, exposure or lead poisoning.

Effective May 7, 2004, the sale of certain lead sinkers (including "split shot") weighing one-half ounce or less is prohibited in New York State. This includes sale from out-of-state vendors, including catalog and internet sales. This prohibition does not include artificial lures, weighted line, weighted flies or jig heads.

As responsible anglers, we should all seek to reduce any unintended effects on the natural environment and leave no trace of our presence. A trip to your favorite tackle shop will reveal a variety of alternatives to lead split shot, sinkers and jig heads. By switching to non-toxic sinkers with your next purchase, you can assure that your fishing tackle choices are helping to reduce the risk of lead poisoning to birds.

Pumpout Stations: While not a major source of pollution, illegal sewage discharge from recreational boats contributes to pollution problems, especially in enclosed shallow bays where boats tend to congregate. Please keep the Hudson clean. *Use Pumpouts!* To follow is a listing of pumpout facilities along the Hudson River Estuary:

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Hudson River Pumpouts

The entire Hudson River Estuary from the Battery in Manhattan to the Troy Dam is a No Discharge Zone!

Call for availability and hours of service.

Facility Name	Municipality	Phone
Albany County		
Offshore Marine (Van Schaick Island Marina)	Cohoes C.	**518-237-2681**
Ravena-Coeymans Yacht Club Inc.	Coeymans T.	**518-756-9932**
Dutch Apple Cruises, Inc.	Albany C.	**518-463-0220**
Coeymans Landing Marina (Stationary & Boat)	Coeymans T.	**518-756-6111**
Rensselaer County		
Castleton Boat Club Inc.	Schodack T.	**518-732-7077**
Troy Motor Boat and Canoe Club	Troy C.	**518-235-9697**
Albany Yacht Club	Rensselaer	**518-445-9587**
City of Troy - Broadway Landing	Troy C.	**518-270-4644**
Greene County		
Shady Harbor Marina Inc.	New Baltimore T.	**518-756-8001**
Coxsackie Yacht Club	Coxsackie V.	**518-731-9819**
Catskill Marina Corp.	Catskill T.	**518-943-4170**
Catskill Yacht Club	Catskill V.	**518-943-6459**
Hop-O-Nose Marina*	Catskill V.	**518-943-4640**
Columbia County		
Hudson Powerboat Association	Hudson C.	**518-821-0151**
Ulster County		
City of Kingston - West Strand Park Public Dock	Kingston C.	**845-331-6940**
Hideaway Marina, Inc.	Kingston	**845-331-4565**
Marlboro Yacht Club	Marlboro	**845-236-3932**
Certified Marine Service, Inc.	Esopus T.	**845-339-3060**
Jeff's Yacht Haven	Esopus T.	**845-331-9248**
Rondout Yacht Basin	Esopus T.	**845-331-7061**
Hidden Harbor Yacht Club	Port Ewen T.	**845-338-0923**
Kingston Powerboat Association	Kingston C.	**845-338-3946**
Dutchess County		
Rogers Point Boating Association	Hyde Park T.	**845-229-2236**
White's Hudson R. Marina Inc. (Stationary & Boat)	Wappinger T.	**845-297-8520**
Orange County		
Cornwall Yacht Club	Cornwall-On-Hudson	**845-534-8835**
Front Street Marina (Stationary & Boat)	Newburgh C.	**845-661-4914**
Rockland County		
Julius Petersen, Inc.	Clarkstown	**845-358-2100**
Panco Oil Co. -Pancor Marine Inc.	Stony Point T.	**845-429-9120**
Tappan Zee Marina	Orangetown T.	**845-359-5522**
Pennybridge Marina	Stony Point T.	**845-786-5100**
Seaweed Yacht Club	Stony Point T.	**845-786-8731**
Haverstraw Marina	Haverstraw T.	**845-429-2001**
Stony Point Bay Marina	Stony Point T.	**845-786-3700**

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Westchester County		
Peekskill Yacht Club	Peekskill C.	**914-737-9515**
Half Moon Bay Marina	Croton-On-Hudson	**914-271-5400**
Cortlandt Yacht Club	Cortlandt T.	**914-739-3011**
Viking Boat Yard*	Cortlandt T.	**914-739-5090**
Westerly Marina, Inc.	Ossining T.	**914-941-2203**
Hudson Valley Marine	Cortlandt T.	**914-736-2932**
Tarrytown Marina Inc. (Stationary & Boat)	Greenburg T.	**914-631-1300**
New York		
NYCDEP - *Dyckman Marine Group, Inc.	Inwood	**212-496-2105**

*Expected Completion 2007

While underway, use an approved Marine Sanitation Device (MSD), and maintain it according to manufacturer recommendations.

For more information contact:
New York Sea Grant: dgw9@cornell.edu 607.255.2832
www.nysgextension.org/pumpouts/pumpouts-search.html

More information about responsible angling and boating:

NYSDEC - Bureau of Fisheries (518) 402-8920
www.dec.ny.gov/about/32834.html

In Albany, Rensselaer, Greene, and Columbia Counties,
NYSDEC - Bureau of Fisheries Region 4 Office (607) 652-7366

In Ulster, Dutchess, Orange, Rockland, and Westchester Counties,
NYSDEC - Bureau of Fisheries Region 3 Office (845) 256-3161

US Coast Guard Boating Safety
www.uscgboating.org

NYSDEC – Hudson River Estuary Program
www.dec.ny.gov/lands/4920.html

NYSDEC - Hudson River Fisheries Unit
www.dec.ny.gov/animals/9962.html

New York-New Jersey Harbor Estuary Program
www.seagrant.sunysb.edu/HEP/library.htm

Boater's Guide To The Hudson River Estuary by Dennis Mildner and Betsy Blair
http://library.marist.edu/diglib/EnvSci/archives/pubacces/mildner/mildner%20-%20blair%20-%20boater's%20guide.html

Contacts

New York State Department of Environmental Conservation (NYSDEC)
www.dec.ny.gov

NYSDEC Hudson River Estuary Program (845) 256-3016
www.dec.ny.gov/lands/4920.html
Access Program: www.dec.ny.gov/lands/5088.html
Hudson River Almanac: www.dec.ny.gov/lands/25608.html

NYSDEC Bureau of Fisheries (518) 402-8920
Freshwater Fishing: www.dec.ny.gov/outdoor/7752.html
Fish Descriptions: www.dec.ny.gov/animals/269.html
List of NYS Boat Launch Sites: www.dec.ny.gov/outdoor/7832.html
Region 3 Office (Ulster, Dutchess, Orange, Rockland, Westchester): (845) 256-3161
Region 4 Office (Albany, Rensselaer, Greene, Columbia): (607) 652-7366

NYSDEC Hudson River Fisheries Unit
www.dec.ny.gov/animals/9962.html

NYSDEC Aquatic Invasive Species Eradication Grant Program
www.dec.ny.gov/animals/32861.html

NYS Office of Parks, Recreation, and Historic Preservation (OPRHP)
Bureau of Marine and Recreational Vehicles (518) 474-0445
www.nysparks.com
Boating Regulations: www.nysparks.com/boating/edu_boat.asp

NYS Hudson River Valley Greenway Water Trail (518) 473-3835
www.hudsongreenway.state.ny.us/conserv/watertr.htm

NYS Canal Corporation (518) 471-5011
www.nyscanals.gov

NYS Department of Health
Health Advisories for Fish Consumption (800) 458-1158 ext.27815
www.health.state.ny.us/nysdoh/environ/fish.htm

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NY Sea Grant *(607) 255-2832*
www.nysgextension.org
Pumpouts: www.nysgextension.org/pumpouts/pumpouts-search.html

New York-New Jersey Harbor Estuary Program
www.seagrant.sunysb.edu/HEP/library.htm

National Oceanic and Atmospheric Administration (NOAA) Center for Operational Oceanographic Products and Services (CO-OPS) (301) 713-2813 ext. 123
Tidal Ranges and Predictions: http://tidesandcurrents.noaa.gov/tides06/

United States Geological Survey (USGS): Salt front, Tides, and Water Temperature
http://ny.water.usgs.gov/projects/dialer_plots/saltfront.html

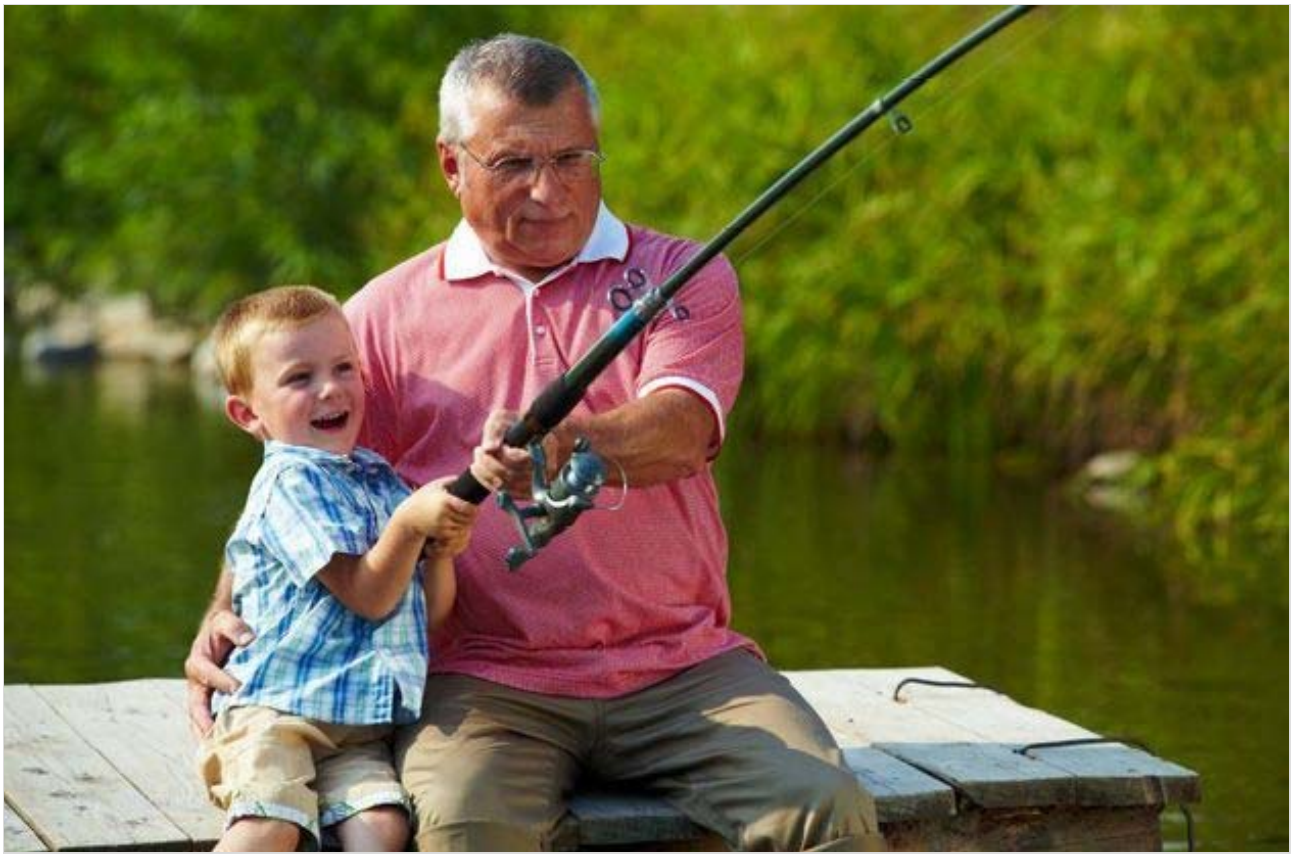
US Coast Guard (USCG): Boating Safety
www.uscgboating.org

B.A.S.S. Conservation: LMBV, fishing tournament, and live well procedures
http://sports.espn.go.com/outdoors/bassmaster/conservation/

Stop Aquatic Hitchhikers
www.ProtectYourWaters.net

Boater's Guide To The Hudson River Estuary by Dennis Mildner and Betsy Blair
http://library.marist.edu/diglib/EnvSci/archives/pubacces/mildner/mildner%20-%20blair%20-%20boater's%20guide.html

Where to: Fish & Boat in Westchester



Activities Tips

By Kristen J. Gough (/newauthor.cfm?authorid=321) (mailto:info@parentsknow.com)
February 4, 2015

Westchester offers everything you need for a day of family fishing. Within the county, you'll find small streams and ponds fit for young anglers, and larger lakes, reservoirs, and coastal fishing for more serious fishers-in-training. While this list doesn't include every fishing area, it will help you to know where to start. A few things to remember before you head out. Anywhere you fish in the county requires a New York State fishing license, available from your local town clerk's office, select sporting goods stores, or from the Westchester County Clerk's Office (914) 995-3086. Licenses cost $19 annually. Visit the New York State Department of Environmental Conservation at www.dec.state.ny.us for more information. County residents should also consider purchasing a Westchester County Park Pass, which costs $40 per individual and allows the holder entrance and discounted parking rates at county facilities. The pass is good for up to three years. Visit www.westchestergov.com for details.

Easy Fishing

Many fishing spots in Westchester are easily accessible and perfect for learning to fish. These are not the spots to find large fish, nor would you want to eat your catch. Instead, enjoy a fishing hole nearby where you can catch and release.

Bronx River Reservation, (914) 723-4058. This 807-acre linear park runs parallel to the Bronx River Parkway fromValhalla to Yonkers. There are several spots to fish, including Bronxville Lake and Crestwood Lake where you'll find free off-street parking.

Tibbetts Brook, (914) 231-2865. Featuring an upper and lower lake and plenty of walking trails, Tibbetts Brook Park, located off Midland Avenue in Yonkers, includes calm waters for fishing. Parking rates are $4 per car with a county pass, or $8 without.

Willson's Woods, (914) 813-6990. As one of the oldest parks in the county, the 23-acre Willson's Woods Park holds definite charm. Located at East Lincoln Avenue in Mount Vernon, the park charges a $4 parking fee with a county pass, and an $8 fee without.

Woodlands Lake, (914) 946-8133. Although this park is right off the Saw Mill Parkway in Irvington, it is worth a visit. The park's exit is only accessible going northbound. There are several paths throughout the area. Free parking.

Twin Lakes, (914) 864-PARK. Off California Road in Eastchester, Twin Lakes contains thick woods, marshlands, fields, and, of course, the two lakes which give it its name. Free off-street parking.

Silver Lake Preserve, (914) 864-PARK. Tucked away on Lake Street in East White Plains, the Silver Lake Preserve is a serene setting. You won't have to pay to park at the 236-acre locale.

Fishing Spots for the More Adventurous Angler

Blue Mountain Reservation, (914) 862-5280. You'll find two large ponds ripe for fishing right off the parking area. Although you're not likely to catch huge fish, you will find over 1,500 acres to explore at the park located off Welcher Avenue in Peekskill. Parking fees apply: $4 with a county pass, $8 without.

Oscawana, (914) 734-1050. Find the perfect fishing spot off the Hudson by taking a 10-minute hike from the parking area to the shoreline. Not many people make the trek so expect some solitude at this beautiful fishing area off Furnace Dock Road in Cortlandt. Free parking.

Wampus Pond, (914) 273-3230. Known as one of the premier freshwater fishing spots in the county, Wampus Pond is located on 102 acres off Route 128 in Armonk. There is no fee for parking, and boat rentals are available on weekends and holidays from 7am to 5pm. Call for details.

Ward Pound Ridge Reservation, (914) 864-7317. As the county's largest park, Ward Pound Ridge Reservation, at Routes 35 and 121 South in Cross River, features sparkling streams, shallow pools — everything you need for a perfect day of fishing. Parking fees apply: $4 with a county pass, $8 without.

Bring the Boat or Rent One

Glen Island Park, (914) 813-6720. Enjoy fishing in Long Island Sound from the shore or from your boat. The launching ramp holds boats up to 21 feet in length at the park located on Pelham Road in New Rochelle. Fees for car-top-carried boats are $4 and trailer-carried boats are $15 (both fees include parking). The ramp operates from 6am to dusk, seven days a week. A county park pass is required.

Playland Park, (914) 813-7010. Another great place to fish Long Island Sound is off the pier at Playland's boardwalk. Car-top-carried boats can be launched at the park. If you want more adventure, kayaks are available for rental, priced according to size; call (914) 921-3437. Prices start at $12 for the first hour and at $38 for the day. Boating is available from noon until dusk during amusement park operating days, Tuesday through Sunday. Parking fees are $5 Tuesday through Friday, $7 Saturday and Sunday, and $10 on holidays. For more information, visit www.ryeplayland.org.

George's Island Park, (914) 737-7530. If you're interested in fishing the Hudson River, visit this park located off Dutch Street in Montrose. There is a boat launch available for boats up to 21 feet in length. The launching fees for car-top-carried boats are $4 with a county park pass, $8 without; for trailer-carried boats, fees are $15 with a county park pass, $25 without (both fees include parking). The ramp is open from 8am to dusk, seven days a week.

Croton Point Park, (914) 862-5291. South of George's Island Park, Croton Point Park offers another fishing and boating site along the Hudson at Croton Point Avenue in Croton-on-Hudson. Canoes and car-top-carried boats can be launched from the beach. The fee is $4 with a county park pass, $8 without (parking included). Launch boats from 8am to dusk, seven days a week.

Franklin D. Roosevelt State Park, (914) 245-4434. Plan on renting a boat or bringing your own if you want to fish here, off Crompound Road in Yorktown Heights. The two lakes within the park, Mohansic Lake and Crom Pond, are known for great bass fishing. Rowboat rentals are available for $5 an hour or $20 for the day; a $25 refundable cash deposit is required. Boats hold a maximum of 4 people and you must be over the age of 18 to rent. Paddleboats are

available for $5 for every half-hour with a 2-hour maximum. The boat launch holds car-top-carried boats and smaller trailer-pulled boats; you need to buy a $15 decal for your boat. No motorized boats are allowed. A $6 parking fee applies to each car entering the park.

Still want to know more about fishing in our area? Check out www.nybass.com and Trout Unlimited's website at www.tu.org.

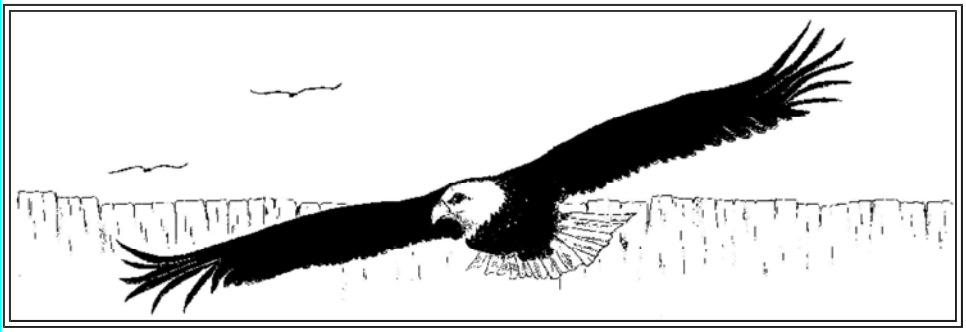
Fishing the Reservoirs

Ask diehard anglers for their favorite place to fish and you're likely to get a reaction akin to asking their ATM access code. While you might wiggle out of them a favorite reservoir, they'll probably give vague replies as to their exact fishing spot. Reservoir fishing tends to be dominated by serious fishing enthusiasts. If you're a beginner, don't let that stop you from fishing Westchester's gorgeous reservoirs — just come prepared.

1) You'll need a watershed permit (also called access permit) to fish in the reservoirs, which are owned by New York City. Find an application at www.nyc.gov/watershedrecreation. Follow the directions for filing your free application. It takes at least 2 weeks, sometimes up to a month to receive your permit, which comes by mail and lasts for 5 years. 2) Parking along the reservoirs is not marked or paved. Park along the shoulder of the road and remember to display your car tag, issued along with your watershed permit, in the car window. 3) Since these areas are meant to be kept as undisturbed as possible, expect to make your own trail down to the shoreline. Also, bring a bag to carry out any trash. 4) Everyone over the age of 16 is required to have a permit to access the area. Children under the age of 18 must be accompanied by an adult. 5) There are strict requirements for boats on the water. For more information, call (800) 575-LAND or refer to the City of New York's Department of Environmental Protection (DEP) website at www.nyc.gov/watershedrecreation. 6) Since 9/11, the DEP has taken great steps in ensuring the safety of these waters. Don't get caught without your permit!

Reservoirs in Westchester County that allow fishing and boating include: Cross River, off Route 35 in Bedford; New Croton, off the Taconic Parkway in Cortlandt; Kensico, off Route 22 in Valhalla; Muscoot, off Interstate 684 in Bedford; Titicus, off Interstate 684 in North Salem; Amawalk, off Route 35 near Somers; and Croton Falls, just barely in Putnam County off Interstate 684 near Somers.

Local Business Directory (/articlecategory.cfm?catname=SPONSORED-CONTENT-NYMP)



Hudson River Audubon Society of Westchester

A New York Chapter of the National Audubon Society
Serving the communities of Ardsley, Dobbs Ferry, Hastings-on-Hudson, Irvington and Yonkers

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Where to Bird in Westchester County

Where to Bird Outside of Westchester

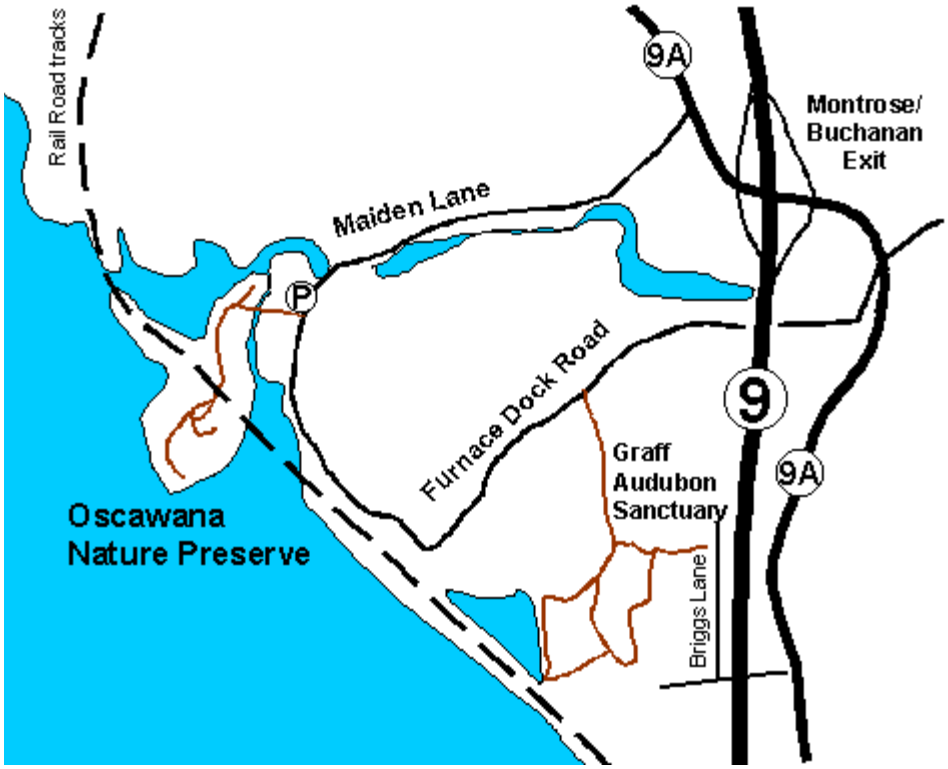
Oscawana Island Nature Preserve, Crugers, Cortlandt

(914) 271-3293

Westchester County purchased the land in 1958 and currently has an intermunicipal agreement with the Town of Cortlandt who uses and operates the property for municipal recreational purposes. Oscawana Island lies along the Hudson River and the river should be scanned for Bald Eagles in winter. The park also has tidal marshlands frequented by Least Bitterm. and a newly grown forest that contains a river flowing through the mid-northern section.

Directions: Take Route 9 to the Montrose/ Bucannan exit. Furnace Dock Road is just south of the exit on Route 9A. Take Furnace Dock Road 1.1 miles to the parking area. Listen for Least bittern near the parking area. A trail leads to the island. The main trail leads over the railroad tracks to the Hudson River.

Oscawana Island Nature Preserve,



For more information on the park check out Westchester County Park's Web Site

Back to Where to bird in Westchester

MAGNA METALS: OU-2
FURNACE BROOK/LOWER POND
Site ID No. 360003
Operable Unit No. 2
Cortlandt (T), Westchester County



January 10, 2018

August 18, 2015

Mr. Matthew Hubicki
Environmental Engineer
Remedial Bureau C
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7012

Re: NYSDEC Standby Engineering Contract D007625
WA #5 Remedial Design — Magna Metals (Site #36003)
Pre-Design Investigation (March & June 2015) Summary Report

Dear Mr. Hubicki

Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) has prepared this fourth letter report to summarize the results of an additional pre-design investigation (PDI) conducted by HDR on NYSDEC's behalf, for the Magna Metals State Superfund Site located in Cortlandt, New York. The first letter was submitted on July 12, 2013 summarizing the PDI conducted in 2013 in the off-site areas concerns (AOCs) including AOC 5 - Freshwater Wetland and Unnamed Tributary area, AOC 6- Off-Site Pond area, and AOC 7- Furnace Brook area. The second letter was submitted on March 14, 2014 summarizing the PDI conducted in 2013 in the on-site AOCs including AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 3 – Refuse Area and AOC 4 – Former Magna Metals Building Area. The third letter is being submitted separately summarizing the 2015 PDI in the on-site AOCs including AOC 1 – Leach Pit Area, AOC 2 – Upland Area, AOC 5 – Freshwater and Unnamed Tributary (Wetland Area), AOC 6 – Off-Site Pond, and AOC 7 – Furnace Brook (Upper Furnace Brook).

This investigation was conducted from March 10 to March 12, and June 2 and June 3, 2015, to determine the extent of potentially impacted sediment further downstream of Furnace Brook (Lower Furnace Brook).

Field Activities

The sediment samples were collected using either a petite ponar grab sampler or a shovel, and the locations were accessed by foot or by utilizing an inflatable work boat. Sediment descriptions for each sample location were recorded and logged following the

Unified Soil Classification System (USCS), including Munsell color descriptions, and are included in Appendix A. An Oxford Instruments handheld X-MET 7500 X-Ray Fluorescence (XRF) was used to scan samples for metal concentrations, and provide supplemental backup data in conjunction with the analytical samples that were sent to the laboratory. For the purposes of this investigation, all discussions will be based on the analytical results.

Samples were collected from the centerline of the stream at a rate of approximately 1 per 100 linear feet, and to a depth of 0.5 feet beneath the sediment surface. The sample locations were named in sequential order starting upstream at BRSD832 and finishing downstream beneath the dam near Furnace Woods Road at BRSD886. Additional samples BRSD887 – BRSD890 were collected at the north eastern corner of the lake between 7 Lakeview Ave and 317 Watch Hill Road. The sample locations are shown on Figures 1 and 2.

Sample's BRSD841 and BRSD-847 to BRSD-850 were unable to be accessed and sampled due to obstructions and hazards on the water that prevented the field crew from safely accessing the locations. However, multiple samples were collected immediately upstream (BRSD846) and downstream (BRSD851) of those locations.

Analytical Sample Results

Sediment samples were sent to Con-Test Analytical Laboratory for analysis. A total of 59 analytical sediment samples (including five duplicate samples) were collected from 54 locations and were analyzed for the target analyte list (TAL) metals, hexavalent chromium, cyanide, and moisture content. The sediment samples were compared to the New York State Lowest Effect Levels (LELs) for metals, as well as the Unrestricted Use Soil Cleanup Objectives (UUSCOs) and the Restricted Use Residential Soil Cleanup Objectives (RURSCOs).

Each sediment sample was collected from 0 to 0.5 feet beneath the sediment surface. The sediment samples were collected to delineate the potential downstream extent of impacted sediment. Figures 1 and 2 illustrate the analytical results for each location.

Metals that exceeded the LEL, UUSCOs, and RURSCOs include antimony, arsenic, barium, beryllium, cadmium, calcium, hexavalent chromium, total chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc, and are presented in Table 1. Total chromium, copper and nickel were the most prevalent constituents detected in exceedance of the criteria. There was at least one constituent exceedance reported in 58

of the 59 sample locations. The maximum concentration of total chromium was reported to be 180 mg/kg at BRSD873. There were 5 detections of hexavalent chromium with a maximum concentration of 2.8 mg/kg at BRSD834; therefore, the majority of the total chromium fraction is comprised of trivalent chromium. Hexavalent chromium was analyzed at all of the locations except for BRSD869, and that was due to insufficient sample recovery in the field. BRSD869 is located in a very rocky location and the field crew was unable to collect a full sample. The maximum concentrations for copper and nickel were found to be 2,800 mg/kg and 450 mg/kg, respectively, both from BRSD851.

The extent of the impacted sediment seems to be largely contained above the dam within the lake. Two samples BRSD885 and BRS886 were collected downstream of the dam. BRSD885, approximately 60 feet downstream of the dam had no exceedences. BRSD886, approximately 160 feet downstream of the dam exceeded the criteria for nickel. The nickel concentration (32 mg/kg) exceeded both the LEL (20 mg/kg) and unrestricted (30 mg/kg) criterion.

If you have any questions or require additional information, please do not hesitate to contact me at (201) 335-9348.

Very truly yours,



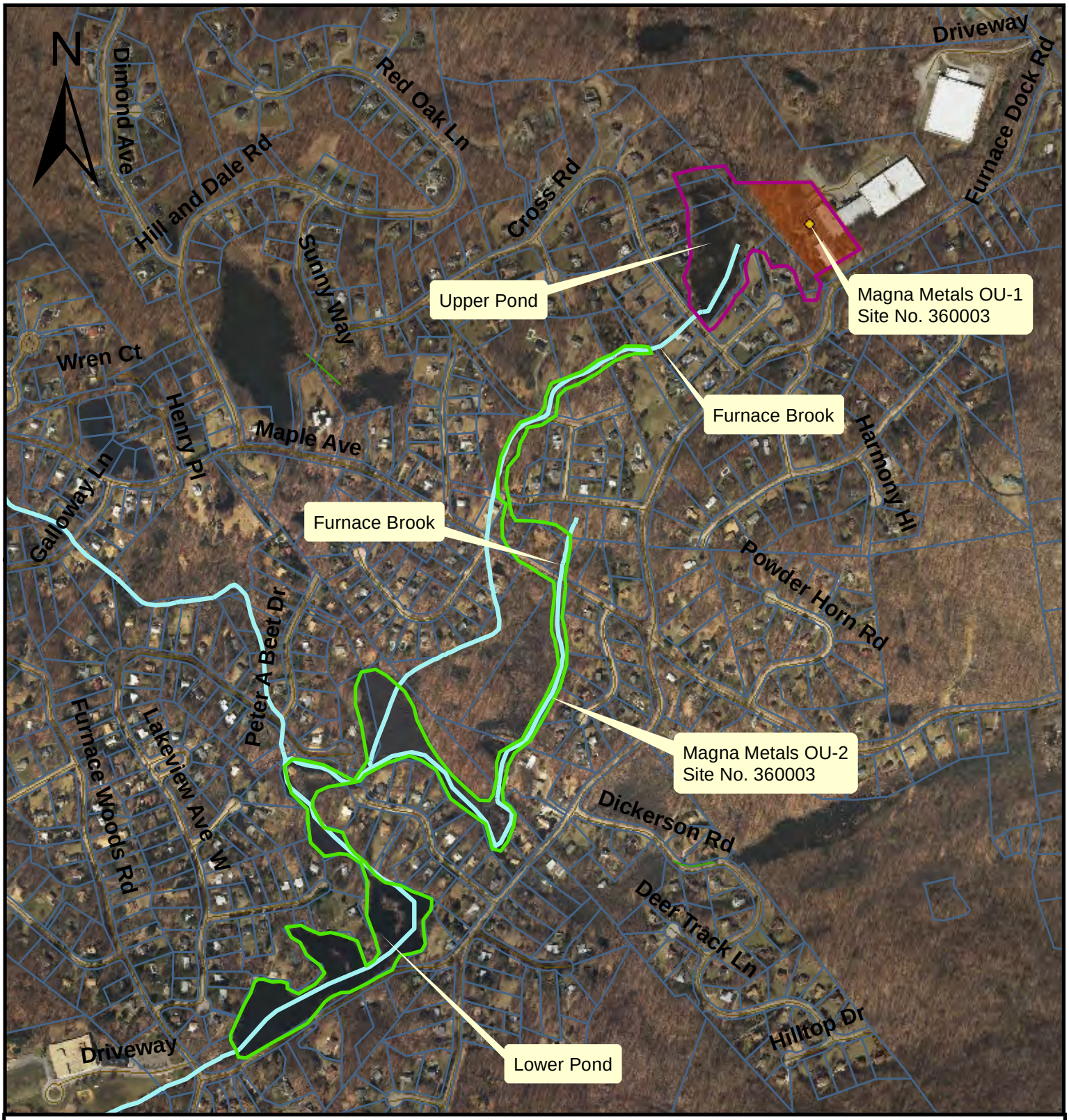
Thomas M. Connors, P.E., MBA

Project Manager

Cc: E. Zimmerman, HDR Contract Manager
HDR File

Att.: Figures 1 - 2
Table 1

FIGURES



Magna Metals
State Superfund
Site No. 360003

Town of Cortlandt, Westchester County, New York

0 265 530 1,060 1,590 2,120 Feet

Date: 11/9/2017

PreDesign Invesitgation Areas
Overview Operable Units



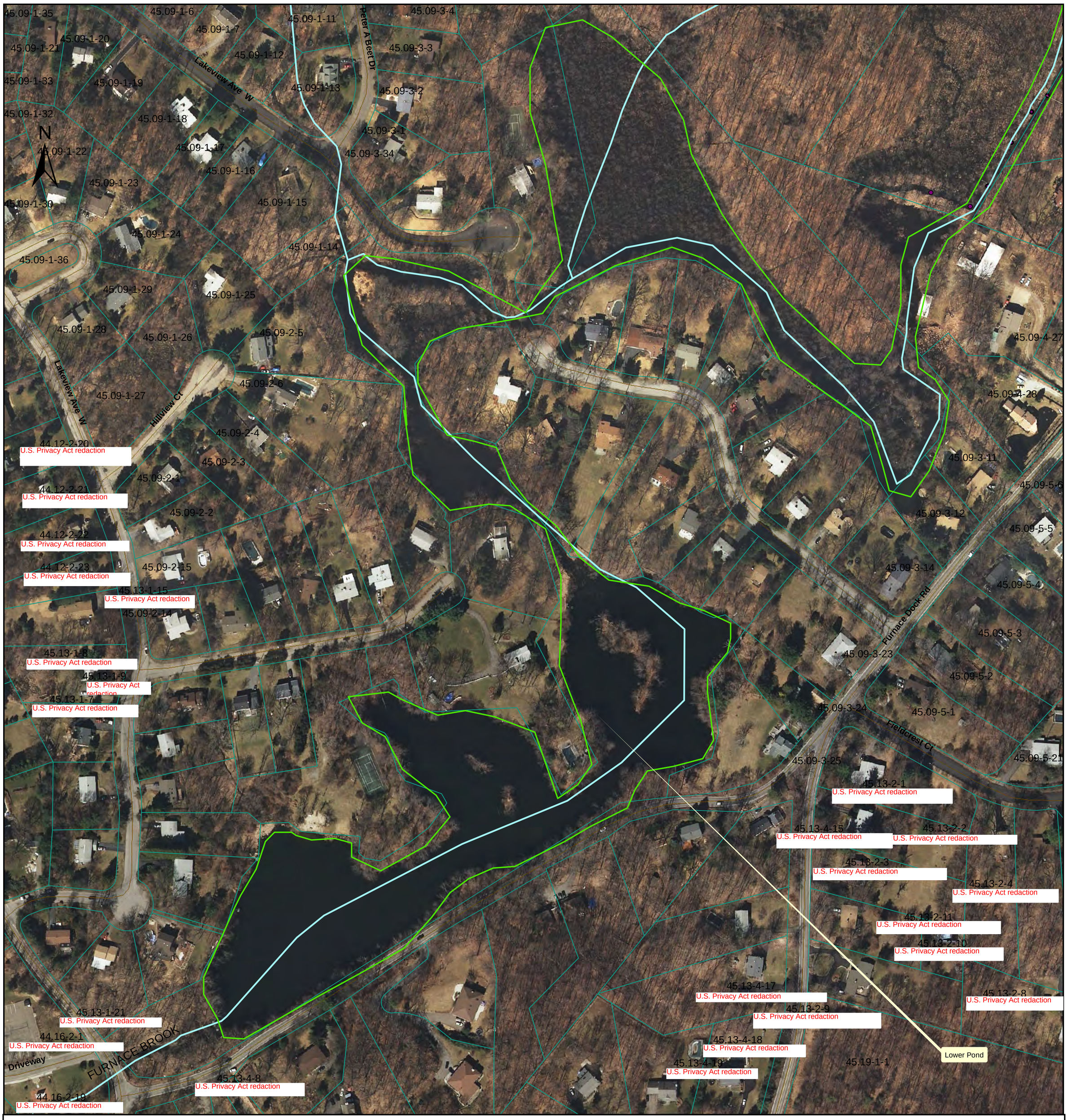
Magna Metals
State Superfund
Site No. 360003

Town of Cortlandt, Westchester County, New York

0 110 220 440 660 880 Feet

Date: 1/8/2018

Summary Metals Sediments
Operable Unit No. 2
Furnace Brook



Magna Metals
State Superfund
Site No. 360003

Town of Cortlandt, Westchester County, New York

0 110 220 440 660 880 Feet

Date: 1/10/2018

Summary Metals Sediments
Operable Unit No. 2
Lower Pond & Lower Furnace Brook

BRSD750	0 - 0.5
Metals	
Antimony	< 3.3
Arsenic	1.8
Cadmium	0.75
Chromium, Total	**95**
Copper	**240**
Iron	24000
Lead	16
Manganese	560
Mercury	0.055
Nickel	**180**
Silver	< 0.73
Zinc	110

BRSD749	0 - 0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	0.43
Chromium, Total	**70**
Copper	**130**
Iron	27000
Lead	4.9
Manganese	280
Mercury	0.011
Nickel	**150**
Silver	< 0.52
Zinc	49

BRSD747	0 - 0.5
Metals	
Antimony	< 4.1
Arsenic	5.5
Cadmium	**1.1**
Chromium, Total	**120**
Copper	**180**
Iron	31000
Lead	35
Manganese	1900
Mercury	0.083
Nickel	**160**
Silver	< 0.89
Zinc	**120**

BRSD746	0 - 0.5
Metals	
Antimony	< 2.2
Arsenic	< 0.99
Cadmium	0.35
Chromium, Total	**50**
Copper	**66**
Iron	16000
Lead	4.2
Manganese	260
Mercury	< 0.0086
Nickel	**94**
Silver	< 0.48
Zinc	35

BRSD745	0 - 0.5
Metals	
Antimony	< 2.7
Arsenic	< 1.2
Cadmium	0.31
Chromium, Total	**57**
Copper	**67**
Iron	14000
Lead	4.8
Manganese	350
Mercury	0.013
Nickel	**77**
Silver	< 0.58
Zinc	40

U.S. Privacy Act redaction

BRSD739	0 - 0.5
Metals	
Antimony	6.1
Arsenic	5.4
Cadmium	< 0.28
Chromium, Total	**170**
Copper	**1300**
Iron	34000
Lead	30
Manganese	370
Mercury	0.12
Nickel	**360**
Silver	< 0.84
Zinc	**180**

BRSD740	0 - 0.5
Metals	
Antimony	< 2.2
Arsenic	< 1
Cadmium	< 0.16
Chromium, Total	**45**
Copper	**51**
Iron	13000
Lead	2.9
Manganese	290
Mercury	< 0.0089
Nickel	**71**
Silver	< 0.49
Zinc	35

BRSD741	0 - 0.5
Metals	
Antimony	< 3.5
Arsenic	1.6
Cadmium	0.7
Chromium, Total	**91**
Copper	**180**
Iron	23000
Lead	15
Manganese	300
Mercury	0.039
Nickel	**140**
Silver	< 0.77
Zinc	94

U.S. Privacy Act redaction

BRSD736	0 - 0.5
Metals	
Antimony	< 3.8
Arsenic	4.1
Cadmium	< 0.28
Chromium, Total	**150**
Copper	**970**
Iron	43000
Lead	35
Manganese	970
Mercury	0.07
Nickel	**290**
Silver	< 0.82
Zinc	**130**

BRSD748	0 - 0.5
Metals	
Antimony	< 4
Arsenic	4.5
Cadmium	0.89
Chromium, Total	**100**
Copper	**190**
Iron	27000
Lead	25
Manganese	1000
Mercury	0.096
Nickel	**160**
Silver	< 0.87
Zinc	**120**

BRSD737	0 - 0.5
Metals	
Antimony	< 2.4
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	**68**
Copper	**63**
Iron	17000
Lead	3.4
Manganese	540
Mercury	< 0.0088
Nickel	**81**
Silver	< 0.53
Zinc	36

BRSD751	0 - 0.5
Metals	
Antimony	< 4.2
Arsenic	3.9
Cadmium	0.97
Chromium, Total	**110**
Copper	**170**
Iron	28000
Lead	28
Manganese	2000
Mercury	0.12
Nickel	**150**
Silver	< 0.91
Zinc	110

BRSD738	0 - 0.5
Metals	
Antimony	< 2.3
Arsenic	< 1
Cadmium	< 0.17
Chromium, Total	**100**
Copper	**270**
Iron	34000
Lead	7.5
Manganese	360
Mercury	0.018
Nickel	**210**
Silver	< 1
Zinc	35

BRSD752	0 - 0.5
Metals	
Antimony	< 3.7
Arsenic	9.4
Cadmium	**1.3**
Chromium, Total	**140**
Copper	**73**
Iron	52000
Lead	23
Manganese	600
Mercury	0.11
Nickel	**130**
Silver	< 0.8
Zinc	62

BRSD743	0 - 0.5
Metals	
Antimony	< 2.3
Arsenic	< 1
Cadmium	0.39
Chromium, Total	**51**
Copper	**90**
Iron	18000
Lead	3.8
Manganese	450
Mercury	< 0.009
Nickel	**100**
Silver	< 0.51
Zinc	33

BRSD753	0 - 0.5
Metals	
Antimony	< 3
Arsenic	3
Cadmium	0.59
Chromium, Total	**75**
Copper	**110**
Iron	21000
Lead	12
Manganese	1100
Mercury	0.046
Nickel	**110**
Silver	< 0.65
Zinc	73

BRSD757	0 - 0.5
Metals	
Antimony	< 4.3
Arsenic	5.1
Cadmium	0.79
Chromium, Total	**85**
Copper	**160**
Iron	27000
Lead	16
Manganese	900
Mercury	0.058
Nickel	**150**
Silver	< 0.94
Zinc	110

BRSD758	0 - 0.5
Metals	
Antimony	< 3
Arsenic	3.1
Cadmium	0.47
Chromium, Total	**64**
Copper	**92**
Iron	20000
Lead	5.4
Manganese	430
Mercury	0.019
Nickel	**110**
Silver	< 0.65
Zinc	52

BRSD759	0 - 0.5
Metals	
Antimony	< 4.7
Arsenic	4.1
Cadmium	0.85
Chromium, Total	**74**
Copper	**110**
Iron	26000
Lead	18
Manganese	3600
Mercury	0.073
Nickel	**130**
Silver	< 1
Zinc	**120**

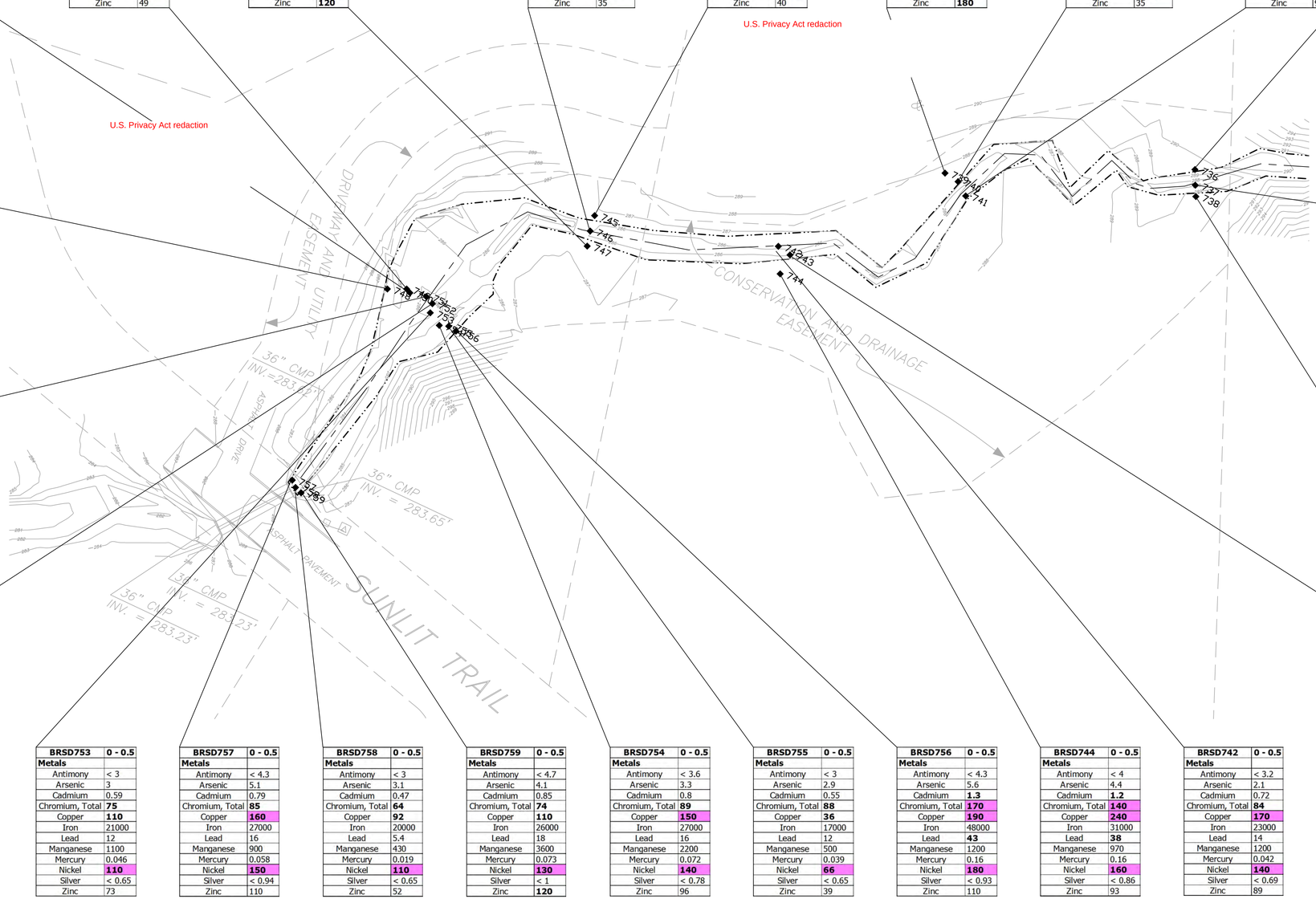
BRSD754	0 - 0.5
Metals	
Antimony	< 3.6
Arsenic	3.3
Cadmium	0.8
Chromium, Total	**89**
Copper	**150**
Iron	27000
Lead	16
Manganese	2200
Mercury	0.072
Nickel	**140**
Silver	< 0.78
Zinc	96

BRSD755	0 - 0.5
Metals	
Antimony	< 3
Arsenic	2.9
Cadmium	0.55
Chromium, Total	**88**
Copper	**36**
Iron	17000
Lead	12
Manganese	500
Mercury	0.039
Nickel	**66**
Silver	< 0.65
Zinc	39

BRSD756	0 - 0.5
Metals	
Antimony	< 4.3
Arsenic	5.6
Cadmium	**1.3**
Chromium, Total	**170**
Copper	**190**
Iron	48000
Lead	**43**
Manganese	1200
Mercury	0.16
Nickel	**180**
Silver	< 0.93
Zinc	110

BRSD744	0 - 0.5
Metals	
Antimony	< 4
Arsenic	4.4
Cadmium	**1.2**
Chromium, Total	**140**
Copper	**240**
Iron	31000
Lead	**38**
Manganese	970
Mercury	0.16
Nickel	**160**
Silver	< 0.86
Zinc	93

BRSD742	0 - 0.5
Metals	
Antimony	< 3.2
Arsenic	2.1
Cadmium	0.72
Chromium, Total	**84**
Copper	**170**
Iron	23000
Lead	14
Manganese	1200
Mercury	0.042
Nickel	**140**
Silver	< 0.69
Zinc	89



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LEGEND:

- CONTOUR
- PROPERTY LINE
- ADJACENT PROPERTY LINE
- WETLAND
- DESIGNATED WETLAND ADJACENT AREA
- BUILDING
- EDGE OF PAVEMENT
- CURB
- MONITORING WELL
- DRAINAGE STRUCTURE
- SD-10 RI SEDIMENT SAMPLE
- 515 RD SEDIMENT SAMPLE
- 114 RD SOIL SAMPLE
- SCOs SOIL CLEANUP OBJECTIVES
- MG/KG MILLIGRAM PER KILOGRAM
- RD REMEDIAL DESIGN

SAMPLE IDENTIFICATION*

BRSD743	0 - 0.5
Metals	
Antimony	< 2.3
Arsenic	< 1
Cadmium	0.39
Chromium, Total	**51**
Copper	**90**
Iron	18000
Lead	3.8
Manganese	450
Mercury	< 0.009
Nickel	**100**
Silver	< 0.51
Zinc	33

- SAMPLE DEPTH OR INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (BOLD INDICATES CLASS B)
- ANALYTICAL RESULT mg/kg (NEITHER PINK NOR BOLD INDICATES CLASS A)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CLASS C)
- ANALYTICAL PARAMETER

FRESHWATER SEDIMENT GUIDANCE VALUES

Compound	Class A	Class B	Class C
	Metals, mg/kg or PPM		
Arsenic	< 10	10 – 33	> 33
Cadmium	< 1	1 – 5	> 5
Chromium	< 43	43 – 110	> 110
Copper	< 32	32 – 150	> 150
Lead	< 36	36 – 130	> 130
Mercury	< 0.2	0.2 – 1	> 1
Nickel	< 23	23 – 49	> 49
Silver	< 1	1 – 2.2	> 2.2
Zinc	< 120	120 – 460	> 460

CLASS A SEDIMENTS ARE CONSIDERED TO BE OF LOW RISK TO AQUATIC LIFE. CLASS B SEDIMENTS ARE SLIGHTLY TO MODERATELY CONTAMINATED AND ADDITIONAL TESTING IS REQUIRED TO EVALUATE THE POTENTIAL RISKS TO AQUATIC LIFE. CLASS C SEDIMENTS ARE CONSIDERED TO BE HIGHLY CONTAMINATED AND LIKELY TO POSE A RISK TO AQUATIC LIFE. ALL VALUES ARE DRY WEIGHT VALUES ROUNDED TO TWO SIGNIFICANT DIGITS.

NOTES:

1. SURVEY INFORMATION IS BASED ON A FIELD SURVEY COMPLETED BY YEC INC. IN JANUARY 2013.
2. RD SEDIMENT SAMPLES WERE COLLECTED BY HDR IN MARCH AND MAY OF 2013.

0 30 60
SCALE IN FEET

DRAFT

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
2	5/5/2014	FINAL SUBMISSION TO NYSDEC
1	7/11/2013	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147-184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

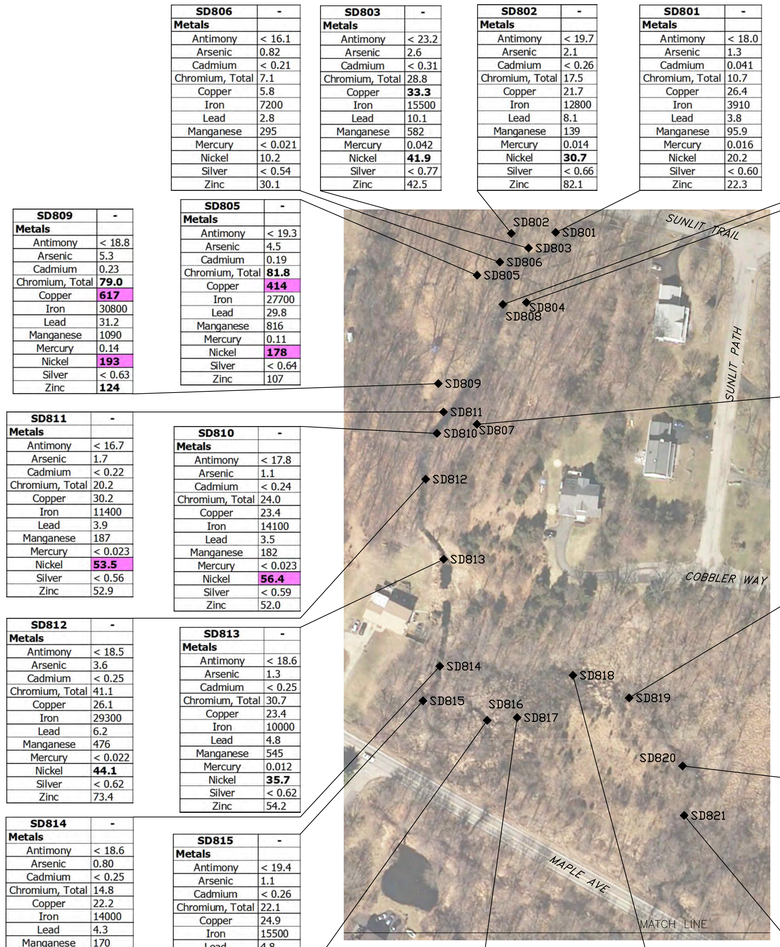
CORTLANDT, WESCHESTER COUNTY, NEW YORK

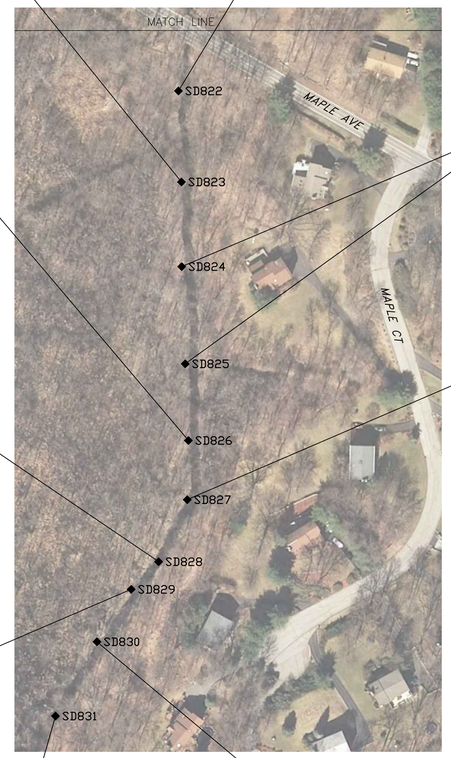
SUMMARY OF SOIL/SEDIMENT SAMPLE ANALYTICAL RESULTS - LOWER FURNACE BROOK

0

FILENAME	
SCALE	1"=30'

SHEET FIGURE 3





SD806	-
Metals	
Antimony	< 16.1
Arsenic	0.82
Cadmium	< 0.21
Chromium, Total	7.1
Copper	5.8
Iron	7200
Lead	2.8
Manganese	295
Mercury	< 0.021
Nickel	10.2
Silver	< 0.54
Zinc	30.1

SD803	-
Metals	
Antimony	< 23.2
Arsenic	2.6
Cadmium	< 0.31
Chromium, Total	28.8
Copper	**33.3**
Iron	15500
Lead	10.1
Manganese	582
Mercury	0.042
Nickel	**41.9**
Silver	< 0.77
Zinc	42.5

SD802	-
Metals	
Antimony	< 19.7
Arsenic	2.1
Cadmium	< 0.26
Chromium, Total	17.5
Copper	21.7
Iron	12800
Lead	8.1
Manganese	139
Mercury	0.014
Nickel	**30.7**
Silver	< 0.66
Zinc	82.1

SD801	-
Metals	
Antimony	< 18.0
Arsenic	1.3
Cadmium	0.041
Chromium, Total	10.7
Copper	26.4
Iron	3910
Lead	3.8
Manganese	95.9
Mercury	0.016
Nickel	20.2
Silver	< 0.60
Zinc	22.3

SD808	-
Metals	
Antimony	< 16.0
Arsenic	9.2
Cadmium	< 0.21
Chromium, Total	33.6
Copper	26.5
Iron	42800
Lead	5.2
Manganese	548
Mercury	< 0.020
Nickel	**60.7**
Silver	< 0.53
Zinc	79.1

SD809	-
Metals	
Antimony	< 18.8
Arsenic	5.3
Cadmium	0.23
Chromium, Total	**79.0**
Copper	**617**
Iron	30800
Lead	31.2
Manganese	1090
Mercury	0.14
Nickel	**193**
Silver	< 0.63
Zinc	**124**

SD805	-
Metals	
Antimony	< 19.3
Arsenic	4.5
Cadmium	0.19
Chromium, Total	**81.8**
Copper	**414**
Iron	27700
Lead	29.8
Manganese	816
Mercury	0.11
Nickel	**178**
Silver	< 0.64
Zinc	107

SD804	-
Metals	
Antimony	< 20.7
Arsenic	4.7
Cadmium	0.095
Chromium, Total	**78.6**
Copper	29.9
Iron	22200
Lead	32.5
Manganese	589
Mercury	0.11
Nickel	**60.0**
Silver	< 0.69
Zinc	58.6

SD811	-
Metals	
Antimony	< 16.7
Arsenic	1.7
Cadmium	< 0.22
Chromium, Total	20.2
Copper	30.2
Iron	11400
Lead	3.9
Manganese	187
Mercury	< 0.023
Nickel	**53.5**
Silver	< 0.56
Zinc	52.9

SD810	-
Metals	
Antimony	< 17.8
Arsenic	1.1
Cadmium	< 0.24
Chromium, Total	24.0
Copper	23.4
Iron	14100
Lead	3.5
Manganese	182
Mercury	< 0.023
Nickel	**56.4**
Silver	< 0.59
Zinc	52.0

SD807	-
Metals	
Antimony	< 24.7
Arsenic	4.4
Cadmium	0.14
Chromium, Total	30.3
Copper	31.6
Iron	18700
Lead	**50.1**
Manganese	255
Mercury	0.18
Nickel	**37.3**
Silver	< 0.82
Zinc	59.5

SD812	-
Metals	
Antimony	< 18.5
Arsenic	3.6
Cadmium	< 0.25
Chromium, Total	41.1
Copper	26.1
Iron	29300
Lead	6.2
Manganese	476
Mercury	< 0.022
Nickel	**44.1**
Silver	< 0.62
Zinc	73.4

SD813	-
Metals	
Antimony	< 18.6
Arsenic	1.3
Cadmium	< 0.25
Chromium, Total	30.7
Copper	23.4
Iron	10000
Lead	4.8
Manganese	545
Mercury	0.012
Nickel	**35.7**
Silver	< 0.62
Zinc	54.2

SD819	-
Metals	
Antimony	< 19.4
Arsenic	1.2
Cadmium	< 0.26
Chromium, Total	37.6
Copper	**65.6**
Iron	14900
Lead	13.4
Manganese	1010
Mercury	0.041
Nickel	**63.8**
Silver	< 0.65
Zinc	91.9

SD814	-
Metals	
Antimony	< 18.6
Arsenic	0.80
Cadmium	< 0.25
Chromium, Total	14.8
Copper	22.2
Iron	14000
Lead	4.3
Manganese	170
Mercury	< 0.024
Nickel	**74.7**
Silver	< 0.62
Zinc	38.1

SD815	-
Metals	
Antimony	< 19.4
Arsenic	1.1
Cadmium	< 0.26
Chromium, Total	22.1
Copper	24.9
Iron	15500
Lead	4.8
Manganese	357
Mercury	< 0.023
Nickel	**63.7**
Silver	< 0.65
Zinc	56.0

SD820	-
Metals	
Antimony	< 17.9
Arsenic	1.4
Cadmium	0.041
Chromium, Total	31.4
Copper	**61.6**
Iron	14100
Lead	10.4
Manganese	1190
Mercury	0.043
Nickel	**54.0**
Silver	< 0.60
Zinc	86.5

SD816	-
Metals	
Antimony	< 19.3
Arsenic	1.3
Cadmium	< 0.26
Chromium, Total	15.8
Copper	13.4
Iron	11800
Lead	8.7
Manganese	190
Mercury	< 0.025
Nickel	**49.9**
Silver	< 0.64
Zinc	49.6

SD817	-
Metals	
Antimony	< 19.8
Arsenic	2.1
Cadmium	< 0.26
Chromium, Total	34.6
Copper	**132**
Iron	16600
Lead	11.8
Manganese	661
Mercury	0.043
Nickel	**76.8**
Silver	< 0.66
Zinc	110

SD818	-
Metals	
Antimony	< 19.6
Arsenic	1.8
Cadmium	0.22
Chromium, Total	29.1
Copper	**58.7**
Iron	10100
Lead	25.7
Manganese	331
Mercury	0.046
Nickel	**40.7**
Silver	< 0.65
Zinc	45.2

SD821	-
Metals	
Antimony	< 19.8
Arsenic	< 2.6
Cadmium	0.14
Chromium, Total	39.8
Copper	**53.7**
Iron	9030
Lead	12.0
Manganese	339
Mercury	0.072
Nickel	**62.2**
Silver	< 0.66
Zinc	50.4

SD823	-
Metals	
Antimony	< 18.3
Arsenic	0.57
Cadmium	0.099
Chromium, Total	30.2
Copper	**61.0**
Iron	11200
Lead	10.9
Manganese	315
Mercury	0.030
Nickel	**45.3**
Silver	< 0.61
Zinc	53.6

SD822	-
Metals	
Antimony	< 17.7
Arsenic	0.70
Cadmium	0.18
Chromium, Total	37.6
Copper	**144**
Iron	12600
Lead	16.1
Manganese	600
Mercury	0.052
Nickel	**77.0**
Silver	< 0.59
Zinc	78.4

SD824	-
Metals	
Antimony	< 17.6
Arsenic	0.56
Cadmium	0.12
Chromium, Total	32.4
Copper	**58.3**
Iron	11500
Lead	10.1
Manganese	630
Mercury	0.036
Nickel	**54.0**
Silver	< 0.59
Zinc	66.4

SD825	-
Metals	
Antimony	< 19.8
Arsenic	3.7
Cadmium	0.32
Chromium, Total	**65.8**
Copper	**267**
Iron	27400
Lead	34.0
Manganese	1820
Mercury	0.12
Nickel	**145**
Silver	< 0.66
Zinc	**153**

SD826	-
Metals	
Antimony	< 17.9
Arsenic	0.63
Cadmium	0.19
Chromium, Total	37.6
Copper	**83.1**
Iron	9690
Lead	12.6
Manganese	154
Mercury	0.053
Nickel	**68.4**
Silver	< 0.60
Zinc	98.1

SD827	-
Metals	
Antimony	< 20.0
Arsenic	< 2.7
Cadmium	0.16
Chromium, Total	**44.5**
Copper	**90.7**
Iron	13500
Lead	14.4
Manganese	362
Mercury	0.050
Nickel	**69.2**
Silver	< 0.67
Zinc	97.2

SD828	-
Metals	
Antimony	< 21.3
Arsenic	0.58
Cadmium	0.18
Chromium, Total	36.1
Copper	**86.1**
Iron	11500
Lead	11.9
Manganese	162
Mercury	0.059
Nickel	**61.4**
Silver	< 0.71
Zinc	94.2

SD829	-
Metals	
Antimony	< 18.3
Arsenic	1.4
Cadmium	0.28
Chromium, Total	28.4
Copper	**88.7**
Iron	11900
Lead	9.2
Manganese	893
Mercury	0.053
Nickel	**54.2**
Silver	< 0.61
Zinc	65.5

SD831	-
Metals	
Antimony	< 17.5
Arsenic	0.57
Cadmium	0.18
Chromium, Total	**43.7**
Copper	**126**
Iron	10400
Lead	17.3
Manganese	281
Mercury	0.068
Nickel	**70.2**
Silver	< 0.58
Zinc	75.8

SD830	-
Metals	
Antimony	< 19.2
Arsenic	0.56
Cadmium	0.27
Chromium, Total	**75.3**
Copper	**426**
Iron	13400
Lead	30.3
Manganese	339
Mercury	0.12
Nickel	**105**
Silver	< 0.64
Zinc	80.6

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LEGEND:

◆	SEDIMENT SAMPLE
SD	SEDIMENT
LEL	LOWEST EFFECTS LEVEL
NS	NO STANDARD
NYSDEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MG/KG	MILLIGRAM PER KILOGRAM

SAMPLE IDENTIFICATION

SD829	-
Metals	
Antimony	< 18.3
Arsenic	1.4 ← ANALYTICAL RESULT mg/kg (NEITHER PINK NOR BOLD INDICATES CLASS A)
Cadmium	0.28
Chromium, Total	28.4
Copper	**88.7** ← ANALYTICAL RESULT mg/kg (BOLD INDICATES CLASS B)
Iron	11900
Lead	9.2
Manganese	893
Mercury	0.053
Nickel	**54.2** ← ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CLASS C)
Silver	< 0.61
Zinc	65.5

ANALYTICAL PARAMETER

FRESHWATER SEDIMENT GUIDANCE VALUES

Compound	Class A	Class B	Class C
	Metals, mg/kg or PPM		
Arsenic	< 10	10 – 33	> 33
Cadmium	< 1	1 – 5	> 5
Chromium	< 43	43 – 110	> 110
Copper	< 32	32 – 150	> 150
Lead	< 36	36 – 130	> 130
Mercury	< 0.2	0.2 – 1	> 1
Nickel	< 23	23 – 49	> 49
Silver	< 1	1 – 2.2	> 2.2
Zinc	< 120	120 – 460	> 460

CLASS A SEDIMENTS ARE CONSIDERED TO BE OF LOW RISK TO AQUATIC LIFE. CLASS B SEDIMENTS ARE SLIGHTLY TO MODERATELY CONTAMINATED AND ADDITIONAL TESTING IS REQUIRED TO EVALUATE THE POTENTIAL RISKS TO AQUATIC LIFE. CLASS C SEDIMENTS ARE CONSIDERED TO BE HIGHLY CONTAMINATED AND LIKELY TO POSE A RISK TO AQUATIC LIFE. ALL VALUES ARE DRY WEIGHT VALUES ROUNDED TO TWO SIGNIFICANT DIGITS.

NOTES:
1. ORTHOIMAGERY IS TAKEN FROM NYS GIS CLEARING HOUSE.
2. SEDIMENT SAMPLES WERE COLLECTED BY NYSDEC IN NOVEMBER 2013 AND LOCATED BY NYSDEC USING A HAND HELD GPS UNIT. ALL SAMPLES WERE COLLECTED FROM 0 TO 6 INCHES.

DRAFT

HDR Engineering, Inc.

ISSUE	DATE	DESCRIPTION
2	6/30/2014	UPDATED TO SHOW LOCATION OF SD818
1	4/3/2014	SUBMITTED

PROJECT MANAGER	T. CONNORS
CAD	
QA/QC	
PROJECT NUMBER	147–184578

MAGNA METALS SUPERFUND SITE
NYSDEC SITE NO. 360003

CORTLANDT, WESCHESTER COUNTY, NEW YORK

SUMMARY OF SEDIMENT SAMPLE ANALYTICAL RESULTS - FURNACE BROOK

0 100' 200'

FILENAME

SCALE 1"= 100'

SHEET 1 OF 1



BRSD859	0 - 0.5
Metals	
Antimony	< 2.5
Arsenic	< 1.1
Cadmium	< 0.18
Chromium, Total	38
Copper	20
Iron	16000
Lead	5.2
Manganese	770
Mercury	< 0.0045
Nickel	**33**
Silver	< 0.54
Zinc	45

BRSD857	0 - 0.5
Metals	
Antimony	< 20
Arsenic	< 8.8
Cadmium	< 1.4
Chromium, Total	**110**
Copper	**1000**
Iron	31000
Lead	**62**
Manganese	320
Mercury	**0.24**
Nickel	**250**
Silver	< 4.3
Zinc	**250**

BRSD854	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 5.5
Cadmium	**1.8**
Chromium, Total	**120**
Copper	**230**
Iron	26000
Lead	**53**
Manganese	490
Mercury	0.19
Nickel	**180**
Silver	< 2.7
Zinc	**160**

BRSD853	0 - 0.5
Metals	
Antimony	< 19
Arsenic	< 8.3
Cadmium	**2**
Chromium, Total	**110**
Copper	**380**
Iron	34000
Lead	**48**
Manganese	440
Mercury	**0.22**
Nickel	**180**
Silver	< 4
Zinc	**270**

BRSD852	0 - 0.5
Metals	
Antimony	< 7
Arsenic	< 3.1
Cadmium	**1**
Chromium, Total	**110**
Copper	**150**
Iron	32000
Lead	21
Manganese	390
Mercury	0.069
Nickel	**160**
Silver	< 1.5
Zinc	100

BRSD851	0 - 0.5	0 - 1
Metals		
Antimony	< 17	< 17
Arsenic	9.1	< 7.4
Cadmium	**2.5**	**2.7**
Chromium, Total	**170**	**170**
Copper	**2800**	**2500**
Iron	49000	52000
Lead	**82**	**85**
Manganese	560	600
Mercury	**0.23**	**0.24**
Nickel	**450**	**440**
Silver	< 3.7	< 3.6
Zinc	**300**	**320**

BRSD836	0 - 0.5
Metals	
Antimony	< 9.9
Arsenic	6.1
Cadmium	**1.5**
Chromium, Total	**110**
Copper	**310**
Iron	44000
Lead	**44**
Manganese	1400
Mercury	0.14
Nickel	**190**
Silver	< 2.2
Zinc	**220**

BRSD835	0 - 0.5
Metals	
Antimony	< 11
Arsenic	8.6
Cadmium	**1.5**
Chromium, Total	**68**
Copper	**120**
Iron	14000
Lead	21
Manganese	600
Mercury	0.18
Nickel	**130**
Silver	< 2.3
Zinc	36

BRSD834	0 - 0.5
Metals	
Antimony	< 9.9
Arsenic	6
Cadmium	**1.6**
Chromium, Total	**89**
Copper	**160**
Iron	11000
Lead	11
Manganese	900
Mercury	0.19
Nickel	**110**
Silver	< 2.2
Zinc	28

BRSD833	0 - 0.5
Metals	
Antimony	< 16
Arsenic	8.9
Cadmium	**1.3**
Chromium, Total	**66**
Copper	**120**
Iron	15000
Lead	7.2
Manganese	1800
Mercury	0.12
Nickel	**120**
Silver	< 3.4
Zinc	13

BRSD832	0 - 0.5
Metals	
Antimony	< 11
Arsenic	7.7
Cadmium	**1.5**
Chromium, Total	**120**
Copper	**170**
Iron	11000
Lead	6.9
Manganese	630
Mercury	0.097
Nickel	**170**
Silver	< 2.5
Zinc	6.8

BRSD858	0 - 0.5
Metals	
Antimony	22
Arsenic	< 8.3
Cadmium	**1.8**
Chromium, Total	**120**
Copper	**350**
Iron	33000
Lead	**52**
Manganese	240
Mercury	**0.26**
Nickel	**190**
Silver	< 4
Zinc	**230**

BRSD860	0 - 0.5	0 - 1
Metals		
Antimony	< 2.5	2.9
Arsenic	< 1.1	< 1
Cadmium	< 0.18	< 0.17
Chromium, Total	**79**	**56**
Copper	20	**37**
Iron	25000	27000
Lead	10	5.1
Manganese	370	240
Mercury	0.0056	< 0.0041
Nickel	**37**	**43**
Silver	< 0.54	< 0.5
Zinc	54	40

BRSD838	0 - 0.5
Metals	
Antimony	< 12
Arsenic	6.8
Cadmium	**1.8**
Chromium, Total	**130**
Copper	**360**
Iron	64000
Lead	**52**
Manganese	1300
Mercury	0.19
Nickel	**210**
Silver	< 2.6
Zinc	**310**

BRSD837	0 - 0.5
Metals	
Antimony	< 10
Arsenic	5.9
Cadmium	**1.5**
Chromium, Total	**100**
Copper	**350**
Iron	32000
Lead	**46**
Manganese	410
Mercury	0.17
Nickel	**190**
Silver	< 2.2
Zinc	**220**

BRSD861	0 - 0.5
Metals	
Antimony	< 6.1
Arsenic	< 2.7
Cadmium	< 0.45
Chromium, Total	**58**
Copper	**40**
Iron	29000
Lead	27
Manganese	350
Mercury	0.093
Nickel	**67**
Silver	< 1.3
Zinc	**140**

BRSD862	0 - 0.5
Metals	
Antimony	< 8.2
Arsenic	< 3.7
Cadmium	< 0.6
Chromium, Total	**87**
Copper	**74**
Iron	30000
Lead	**54**
Manganese	530
Mercury	0.15
Nickel	**98**
Silver	< 1.8
Zinc	**220**

BRSD863	0 - 0.5
Metals	
Antimony	< 5.4
Arsenic	< 2.4
Cadmium	< 0.4
Chromium, Total	**82**
Copper	30
Iron	12000
Lead	4.1
Manganese	270
Mercury	0.04
Nickel	**76**
Silver	< 1.2
Zinc	38

BRSD864	0 - 0.5
Metals	
Antimony	< 4
Arsenic	< 1.8
Cadmium	< 0.3
Chromium, Total	**58**
Copper	26
Iron	12000
Lead	4.5
Manganese	200
Mercury	0.037
Nickel	**74**
Silver	< 0.88
Zinc	33

BRSD865	0 - 0.5
Metals	
Antimony	18
Arsenic	4.9
Cadmium	**1.9**
Chromium, Total	**89**
Copper	**130**
Iron	28000
Lead	**54**
Manganese	770
Mercury	0.18
Nickel	**110**
Silver	0.34
Zinc	**210**

BRSD866	0 - 0.5
Metals	
Antimony	20
Arsenic	5.2
Cadmium	**2**
Chromium, Total	**96**
Copper	**130**
Iron	34000
Lead	**48**
Manganese	730
Mercury	0.17
Nickel	**120**
Silver	0.8
Zinc	**210**

BRSD867	0 - 0.5
Metals	
Antimony	13
Arsenic	3.2
Cadmium	**1.5**
Chromium, Total	**91**
Copper	**73**
Iron	19000
Lead	32
Manganese	290
Mercury	0.12
Nickel	**100**
Silver	0.33
Zinc	**120**

BRSD856	0 - 0.5
Metals	
Antimony	< 3.6
Arsenic	< 1.6
Cadmium	< 0.26
Chromium, Total	**52**
Copper	**55**
Iron	16000
Lead	15
Manganese	290
Mercury	0.037
Nickel	**69**
Silver	< 0.78
Zinc	70

BRSD855	0 - 0.5
Metals	
Antimony	4.8
Arsenic	< 1.2
Cadmium	< 0.19
Chromium, Total	**46**
Copper	**84**
Iron	49000
Lead	8.9
Manganese	580
Mercury	0.0089
Nickel	**130**
Silver	< 0.56
Zinc	85

BRSD846	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 5.5
Cadmium	**2**
Chromium, Total	**120**
Copper	**300**
Iron	58000
Lead	**57**
Manganese	920
Mercury	**0.23**
Nickel	**200**
Silver	< 2.7
Zinc	**320**

BRSD844	0 - 0.5
Metals	
Antimony	< 16
Arsenic	< 6.2
Cadmium	0.67
Chromium, Total	**61**
Copper	**190**
Iron	19000
Lead	28
Manganese	350
Mercury	**0.22**
Nickel	**100**
Silver	< 0.51
Zinc	**190**

BRSD843	0 - 0.5
Metals	
Antimony	< 11
Arsenic	< 4.1
Cadmium	0.51
Chromium, Total	**120**
Copper	**180**
Iron	36000
Lead	**52**
Manganese	720
Mercury	**0.22**
Nickel	**150**
Silver	**1.6**
Zinc	**370**

BRSD842	0 - 0.5
Metals	
Antimony	< 15
Arsenic	< 5.7
Cadmium	0.57
Chromium, Total	**130**
Copper	**140**
Iron	32000
Lead	**40**
Manganese	1400
Mercury	**0.26**
Nickel	**190**
Silver	**1.2**
Zinc	**410**

BRSD840	0 - 0.5	0 - 1
Metals		
Antimony	< 3.5	< 4.2
Arsenic	< 1.6	< 1.9
Cadmium	0.29	0.37
Chromium, Total	32	42
Copper	18	25
Iron	6300	7600
Lead	3.1	4.4
Manganese	120	150
Mercury	0.025	0.032
Nickel	**47**	**57**
Silver	< 0.77	< 0.92
Zinc	17	22

BRSD839	0 - 0.5
Metals	
Antimony	< 2.8
Arsenic	< 1.3
Cadmium	0.37
Chromium, Total	39
Copper	26
Iron	8600
Lead	6.2
Manganese	290
Mercury	0.073
Nickel	**33**
Silver	< 0.61
Zinc	16

BRSD845	0 - 0.5
Metals	
Antimony	< 17
Arsenic	< 6.4
Cadmium	0.7
Chromium, Total	**110**
Copper	**170**
Iron	31000
Lead	**42**
Manganese	920
Mercury	**0.22**
Nickel	**160**
Silver	**1.1**
Zinc	**420**

LEGEND:
- BRSD832 — BROOK SEDIMENT SAMPLE LOCATION (2015 PDI)
- SCOs — SOIL CLEANUP OBJECTIVES
- LEL — LOWEST EFFECTS LEVEL
- mg/kg — MILLIGRAM PER KILOGRAM

SAMPLE IDENTIFICATION

BRSD838	0 - 0.5
Metals	
Antimony	< 12
Arsenic	6.8
Cadmium	**1.8**
Chromium, Total	**130**
Copper	**360**
Iron	64000
Lead	**52**
Manganese	1300
Mercury	0.19
Nickel	**210**
Silver	< 2.6
Zinc	**310**

- SAMPLE INTERVAL (FT)
- ANALYTICAL RESULT mg/kg (NEITHER PINK NOR BOLD INDICATES CLASS A)
- ANALYTICAL RESULT mg/kg (BOLD INDICATES CLASS B)
- ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CLASS C)

ANALYTICAL PARAMETER

FRESHWATER SEDIMENT GUIDANCE VALUES

Compound	Class A	Class B	Class C
	Metals, mg/kg or PPM		
Arsenic	< 10	10 – 33	> 33
Cadmium	< 1	1 – 5	> 5
Chromium	< 43	43 – 110	> 110
Copper	< 32	32 – 150	> 150
Lead	< 36	36 – 130	> 130
Mercury	< 0.2	0.2 – 1	> 1
Nickel	< 23	23 – 49	> 49
Silver	< 1	1 – 2.2	> 2.2
Zinc	< 120	120 – 460	> 460

CLASS A SEDIMENTS ARE CONSIDERED TO BE OF LOW RISK TO AQUATIC LIFE. CLASS B SEDIMENTS ARE SLIGHTLY TO MODERATELY CONTAMINATED AND ADDITIONAL TESTING IS REQUIRED TO EVALUATE THE POTENTIAL RISKS TO AQUATIC LIFE. CLASS C SEDIMENTS ARE CONSIDERED TO BE HIGHLY CONTAMINATED AND LIKELY TO POSE A RISK TO AQUATIC LIFE. ALL VALUES ARE DRY WEIGHT VALUES ROUNDED TO TWO SIGNIFICANT DIGITS.

NOTES:
1. AERIAL TAKEN FROM NYS GIS CLEARINGHOUSE WEBSITE.
2. SAMPLES WERE COLLECTED BY HDR IN MARCH AND JUNE 2015 AND WERE LOCATED USING A HAND HELD GPS UNIT.
3. * LOCATION NOT ACCESSIBLE DUE TO IMPASSABLE OBSTRUCTIONS ON THE WATER.

DRAFT

0 100 200
SCALE IN FEET

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT MANAGER
PROJECT NUMBER

DRAFT

SUPPLEMENTAL PRE-DESIGN INVESTIGATION SAMPLING PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

FURNACE BROOK SUPPLEMENTAL SAMPLE RESULTS

0 100' 200'
FILENAME
SCALE 1" = 100'
SHEET FIGURE 1

BRSD876	0 - 0.5
Metals	
Antimony	18
Arsenic	5.9
Cadmium	**2.2**
Chromium, Total	**120**
Copper	**410**
Iron	33000
Lead	**75**
Manganese	600
Mercury	**0.25**
Nickel	**170**
Silver	**1**
Zinc	**230**

BRSD874	0 - 0.5
Metals	
Antimony	19
Arsenic	< 6.2
Cadmium	**2.2**
Chromium, Total	**97**
Copper	**200**
Iron	29000
Lead	**58**
Manganese	200
Mercury	**0.25**
Nickel	**140**
Silver	**1.3**
Zinc	**270**

BRSD873	0 - 0.5
Metals	
Antimony	24
Arsenic	**10**
Cadmium	**3.1**
Chromium, Total	**180**
Copper	**840**
Iron	34000
Lead	**110**
Manganese	150
Mercury	**0.27**
Nickel	**280**
Silver	0.82
Zinc	**360**

BRSD872	0 - 0.5
Metals	
Antimony	18
Arsenic	5.6
Cadmium	**2**
Chromium, Total	**97**
Copper	**160**
Iron	30000
Lead	**46**
Manganese	480
Mercury	**0.27**
Nickel	**120**
Silver	0.84
Zinc	**230**

BRSD871	0 - 0.5
Metals	
Antimony	20
Arsenic	< 6.3
Cadmium	**2.3**
Chromium, Total	**91**
Copper	**130**
Iron	33000
Lead	**49**
Manganese	890
Mercury	**0.2**
Nickel	**130**
Silver	**1.1**
Zinc	**240**

BRSD868	0 - 0.5
Metals	
Antimony	5.7
Arsenic	1.4
Cadmium	0.38
Chromium, Total	**61**
Copper	**37**
Iron	12000
Lead	3.6
Manganese	160
Mercury	0.021
Nickel	**57**
Silver	< 0.08
Zinc	44

BRSD869	0 - 0.5
Metals	
Antimony	5.1
Arsenic	1.3
Cadmium	0.36
Chromium, Total	**43**
Copper	14
Iron	11000
Lead	3.1
Manganese	180
Mercury	0.015
Nickel	**34**
Silver	0.13
Zinc	33

BRSD870	0 - 0.5
Metals	
Antimony	10
Arsenic	2.6
Cadmium	0.62
Chromium, Total	**150**
Copper	**63**
Iron	26000
Lead	3.8
Manganese	240
Mercury	0.012
Nickel	**130**
Silver	< 0.083
Zinc	45

BRSD887	0 - 0.5
Metals	
Antimony	17
Arsenic	< 4.2
Cadmium	**1.8**
Chromium, Total	**86**
Copper	**190**
Iron	27000
Lead	**48**
Manganese	300
Mercury	**0.22**
Nickel	**120**
Silver	0.4
Zinc	**250**

BRSD888	0 - 0.5
Metals	
Antimony	16
Arsenic	< 4.3
Cadmium	**1.8**
Chromium, Total	**84**
Copper	**160**
Iron	26000
Lead	**48**
Manganese	520
Mercury	**0.21**
Nickel	**110**
Silver	0.55
Zinc	**270**

BRSD877	0 - 0.5
Metals	
Antimony	18
Arsenic	5.6
Cadmium	**2.3**
Chromium, Total	**120**
Copper	**340**
Iron	26000
Lead	**68**
Manganese	150
Mercury	**0.26**
Nickel	**150**
Silver	**1.3**
Zinc	**270**

BRSD878	0 - 0.5
Metals	
Antimony	21
Arsenic	6.8
Cadmium	**2.3**
Chromium, Total	**120**
Copper	**350**
Iron	34000
Lead	**70**
Manganese	340
Mercury	**0.23**
Nickel	**150**
Silver	**1.1**
Zinc	**280**

BRSD881	0 - 0.5
Metals	
Antimony	24
Arsenic	9.9
Cadmium	**2.3**
Chromium, Total	**110**
Copper	**250**
Iron	43000
Lead	**54**
Manganese	730
Mercury	**0.21**
Nickel	**140**
Silver	**1.1**
Zinc	**240**

BRSD882	0 - 0.5
Metals	
Antimony	24
Arsenic	**12**
Cadmium	**2.7**
Chromium, Total	**140**
Copper	**410**
Iron	39000
Lead	**72**
Manganese	600
Mercury	**0.2**
Nickel	**170**
Silver	**1.2**
Zinc	**250**

BRSD885	0 - 0.5
Metals	
Antimony	< 2.7
Arsenic	< 1
Cadmium	< 0.092
Chromium, Total	0.31
Copper	0.29
Iron	< 2.1
Lead	< 0.35
Manganese	< 0.17
Mercury	0.017
Nickel	0.22
Silver	< 0.084
Zinc	< 0.96

BRSD886	0 - 0.5
Metals	
Antimony	< 2.6
Arsenic	< 1.2
Cadmium	0.23
Chromium, Total	25
Copper	16
Iron	8500
Lead	4.5
Manganese	80
Mercury	0.0071
Nickel	**32**
Silver	< 0.56
Zinc	16

BRSD884	0 - 0.5
Metals	
Antimony	19
Arsenic	6.8
Cadmium	**2.1**
Chromium, Total	**99**
Copper	**260**
Iron	31000
Lead	**54**
Manganese	470
Mercury	**0.23**
Nickel	**150**
Silver	**1.1**
Zinc	**210**

BRSD883	0 - 0.5
Metals	
Antimony	20
Arsenic	7.8
Cadmium	**2.4**
Chromium, Total	**130**
Copper	**430**
Iron	39000
Lead	**75**
Manganese	610
Mercury	**0.22**
Nickel	**170**
Silver	**1.1**
Zinc	**250**

BRSD880	0 - 0.5
Metals	
Antimony	24
Arsenic	8.4
Cadmium	**2.6**
Chromium, Total	**130**
Copper	**410**
Iron	39000
Lead	**76**
Manganese	610
Mercury	**0.22**
Nickel	**170**
Silver	**1**
Zinc	**280**

BRSD879	0 - 0.5
Metals	
Antimony	21
Arsenic	6.6
Cadmium	**2.4**
Chromium, Total	**130**
Copper	**440**
Iron	39000
Lead	**74**
Manganese	740
Mercury	**0.24**
Nickel	**170**
Silver	0.81
Zinc	**260**

BRSD889	0 - 0.5
Metals	
Antimony	21
Arsenic	7.2
Cadmium	**2.5**
Chromium, Total	**91**
Copper	**210**
Iron	28000
Lead	**53**
Manganese	280
Mercury	**0.25**
Nickel	**120**
Silver	**1**
Zinc	**250**

BRSD890	0 - 0.5
Metals	
Antimony	< 12
Arsenic	< 4.5
Cadmium	0.95
Chromium, Total	**130**
Copper	**490**
Iron	34000
Lead	**80**
Manganese	510
Mercury	0.18
Nickel	**180**
Silver	**1.6**
Zinc	**300**

BRSD875	0 - 0.5
Metals	
Antimony	21
Arsenic	7.1
Cadmium	**2.4**
Chromium, Total	**120**
Copper	**290**
Iron	38000
Lead	**62**
Manganese	770
Mercury	**0.29**
Nickel	**160**
Silver	0.94
Zinc	**280**



N

LEGEND:

◆ BRSD832 BROOK SEDIMENT SAMPLE LOCATION (2015 PDI)

SCOs SOIL CLEANUP OBJECTIVES

LEL LOWEST EFFECTS LEVEL

mg/kg MILLIGRAM PER KILOGRAM

SAMPLE IDENTIFICATION

BRSD889	0 - 0.5	← SAMPLE INTERVAL (FT)
Metals		
Antimony	21	
Arsenic	7.2	← ANALYTICAL RESULT mg/kg (NEITHER PINK NOR BOLD INDICATES CLASS A)
Cadmium	**2.5**	
Chromium, Total	**91**	
Copper	**210**	
Iron	28000	
Lead	**53**	← ANALYTICAL RESULT mg/kg (BOLD INDICATES CLASS B)
Manganese	280	
Mercury	**0.25**	
Nickel	**120**	← ANALYTICAL RESULT mg/kg (PINK HIGHLIGHT INDICATES CLASS C)
Silver	**1**	
Zinc	**250**	

↑ ANALYTICAL PARAMETER

FRESHWATER SEDIMENT GUIDANCE VALUES

Compound	Class A	Class B	Class C
	Metals, mg/kg or PPM		
Arsenic	< 10	10 – 33	> 33
Cadmium	< 1	1 – 5	> 5
Chromium	< 43	43 – 110	> 110
Copper	< 32	32 – 150	> 150
Lead	< 36	36 – 130	> 130
Mercury	< 0.2	0.2 – 1	> 1
Nickel	< 23	23 – 49	> 49
Silver	< 1	1 – 2.2	> 2.2
Zinc	< 120	120 – 460	> 460

CLASS A SEDIMENTS ARE CONSIDERED TO BE OF LOW RISK TO AQUATIC LIFE. CLASS B SEDIMENTS ARE SLIGHTLY TO MODERATELY CONTAMINATED AND ADDITIONAL TESTING IS REQUIRED TO EVALUATE THE POTENTIAL RISKS TO AQUATIC LIFE. CLASS C SEDIMENTS ARE CONSIDERED TO BE HIGHLY CONTAMINATED AND LIKELY TO POSE A RISK TO AQUATIC LIFE. ALL VALUES ARE DRY WEIGHT VALUES ROUNDED TO TWO SIGNIFICANT DIGITS.

NOTES:

1. AERIAL TAKEN FROM NYS GIS CLEARINGHOUSE WEBSITE.
2. SAMPLES WERE COLLECTED BY HDR IN MARCH AND JUNE 2015 AND WERE LOCATED USING A HAND HELD GPS UNIT.

DRAFT

0 100 200
SCALE IN FEET

PROJECT MANAGER

ISSUE	DATE	DESCRIPTION
1	08/2015	DRAFT SUBMISSION TO NYSDEC

PROJECT NUMBER

DRAFT

SUPPLEMENTAL PRE-DESIGN INVESTIGATION SAMPLING PLAN
MAGNA METALS SUPERFUND SITE
CORTLANDT MANOR, WESCHESTER COUNTY, NEW YORK

FURNACE BROOK SUPPLEMENTAL SAMPLE RESULTS

0 100' 200' FILENAME

SCALE 1" = 100'

SHEET FIGURE 2

TABLE 1

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD832		BRSD833		BRSD834		BRSD835		BRSD836		BRSD837		BRSD838		BRSD839		BRSD840		BRSD840	
				Sample ID	BRSD832-0-0.5		BRSD833-0-0.5		BRSD834-0-0.5		BRSD835-0-0.5		BRSD836-0-0.5		BRSD837-0-0.5		BRSD838-0-0.5		BRSD839-0-0.5		BRSD840-0-0.5		BRSD840-0-0.5-1	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		1	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	9300		7800		12000		13000		11000		13000		15000		8900		5100		6100	
Antimony	7440-36-0	**2**	NA	NA	11	U	16	U	9.9	U	11	U	9.9	U	10	U	12	U	2.8	U	3.5	U	4.2	U
Arsenic	7440-38-2	**6**	13	16	**7.7**	**J**	**8.9**	**J**	**6**	**J**	**8.6**	**J**	**6.1**	**J**	5.9	J	**6.8**	**J**	1.3	U	1.6	U	1.9	U
Barium	7440-39-3	NA	350	350	290		280		440		470		340		290		320		260		120		150	
Beryllium	7440-41-7	NA	7.2	14	1.2	J	1	J	1.2	J	1.5		1.8		1.5		2.2		0.49		0.33	J	0.44	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**1.5**		**1.3**	**J**	**1.6**		**1.5**		**1.5**		**1.5**		**1.8**		0.37		0.29	J	0.37	J
Calcium	7440-70-2	NA	NA	NA	18000		19000		12000		16000		10000		7300		9500		2400		2200		2900	
Chromium, Hexavalent	18540-29-9	NA	1	22	5	U	0.62	U	2.8	JD	0.45	U	0.87	U	2.1	U	1	U	0.16	J	0.73	U	0.35	U
Chromium, Total	7440-47-3	**26**	30	36	**120**		**66**		**89**		**68**		**110**		**100**		**130**		**39**		**32**		**42**	
Cobalt	7440-48-4	NA	NA	NA	8.8	J	14	J	13		14		46		41		52		6.3		15		16	
Copper	7440-50-8	**16**	50	270	**170**		**120**		**160**		**120**		**310**		**350**		**360**		**26**		**18**		**25**	
Cyanide	57-12-5	NA	27	27	7.3		3.1	U	1.9	U	2.2	U	2.1	U	1.8	U	2.4	U	0.32	U	0.61	U	0.68	U
Iron	7439-89-6	**20000**	NA	NA	11000		15000		11000		14000		**44000**	**D**	**32000**	**D**	**64000**	**D**	8600	D	6300		7600	
Lead	7439-92-1	**31**	63	400	6.9		7.2		11		21		**44**		**46**		**52**		6.2		3.1		4.4	
Magnesium	7439-95-4	NA	NA	NA	5400		5400		4300		5600		6900		6900		9100		1600		2000		2400	
Manganese	7439-96-5	**460**	1600	2000	**630**		**1800**		**900**		**600**		**1400**		410		**1300**		290		120		150	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.097	J	0.12	J	**0.19**		**0.18**		0.14		**0.17**		**0.19**		0.073		0.025	J	0.032	J
Nickel	7440-02-0	**20**	30	140	**170**		**120**		**110**		**130**		**190**		**190**		**210**		**33**		**47**		**57**	
Potassium	7440-09-7	NA	NA	NA	380	J	390	J	550		450	J	780		1000		1100		400		290		350	
Selenium	7782-49-2	NA	3.9	36	4.4	U	6	U	3.8	U	4.1	U	3.8	U	3.8	U	4.5	U	1.1	U	1.3	U	1.6	U
Silver	7440-22-4	**1**	2	36	2.5	U	3.4	U	2.2	U	2.3	U	2.2	U	2.2	U	2.6	U	0.61	U	0.77	U	0.92	U
Sodium	7440-23-5	NA	NA	NA	540	J	880		970		420	J	330	J	390	J	1100		160		180		190	J
Thallium	7440-28-0	NA	NA	NA	4.7	U	6.5	U	4.1	U	4.4	U	4.1	U	4.1	U	4.8	U	1.2	U	1.4	U	1.7	U
Vanadium	7440-62-2	NA	NA	NA	49		34		45		51		37		48		49		16		12		16	
Zinc	7440-66-6	**120**	109	2200	6.8		13		28		36		**220**		**220**		**310**		16		17		22	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	17.4		14		20.3		19.3		19.7		20.7		16.3		75.9		59.1		50.6	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD842		BRSD843		BRSD844		BRSD845		BRSD845		BRSD846		BRSD851		BRSD851		BRSD852		BRSD853	
				Sample ID	BRSD842-0-0.5		BRSD843-0-0.5		BRSD844-0-0.5		BRSD845-0-0.5		BRSD845-0-0.5-1		BRSD846-0-0.5		BRSD851-0-0.5		BRSD851-0-0.5-1		BRSD852-0-0.5		BRSD853-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		1		0.5		0.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																								
Aluminum	7429-90-5	NA	NA	NA	12000		14000		7200		12000		9100		16000		17000		19000		8000		15000	
Antimony	7440-36-0	**2**	NA	NA	15	U	11	U	16	U	17	U	17	U	12	U	17	U	17	U	7	U	19	U
Arsenic	7440-38-2	**6**	13	16	5.7	U	4.1	U	6.2	U	6.3	U	6.4	U	5.5	U	**9.1**	**J**	7.4	U	3.1	U	8.3	U
Barium	7440-39-3	NA	350	350	290		270		160		290		250		330		280		300		110		270	
Beryllium	7440-41-7	NA	7.2	14	0.52	J	0.57	J	0.4	U	0.47	J	0.41	U	2.2		2.1	J	2.3		1.2		1.6	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.57	J	0.51	J	**0.67**	**J**	0.57	U	**0.7**	**J**	**2**		**2.5**		**2.7**		**1**		**2**	**J**
Calcium	7440-70-2	NA	NA	NA	8100		9100		5600		8800		7200		8900		5700		5900		3100		7100	
Chromium, Hexavalent	18540-29-9	NA	1	22	3.4	U	2.5	U	3.7	U	3.8	U	1.6	U	0.58	U	0.73	U	0.74	U	0.28	U	1.3	J
Chromium, Total	7440-47-3	**26**	30	36	**130**		**120**		**61**		**110**		**82**		**120**		**170**		**170**		**110**		**110**	
Cobalt	7440-48-4	NA	NA	NA	32		30		19	J	36		34		53		64		72		34		40	
Copper	7440-50-8	**16**	50	270	**140**		**180**		**190**		**170**		**130**		**300**		**2800**		**2500**		**150**		**380**	
Cyanide	57-12-5	NA	27	27	3	U	1.5	U	3.7	U	3.1	U	3.6	U	2.8	U	5.7		3.9	U	1.1	U	2.4	U
Iron	7439-89-6	**20000**	NA	NA	**32000**	**B**	**36000**	**B**	19000	B	**31000**	**B**	**27000**	**B**	**58000**	**D**	**49000**	**D**	**52000**	**D**	**32000**	**D**	**34000**	
Lead	7439-92-1	**31**	63	400	**40**		**52**		28		**42**		**32**		**57**		**82**		**85**		21		**48**	
Magnesium	7439-95-4	NA	NA	NA	6400		8600		4100		7100		5600		8700		7700		8400		19000		8100	
Manganese	7439-96-5	**460**	1600	2000	**1400**	**B**	**720**	**B**	350	B	**870**	**B**	**920**	**B**	**920**		**560**		**600**		390		440	
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.26**		**0.22**		**0.22**		**0.22**		**0.19**	**J**	**0.23**		**0.23**		**0.24**		0.069	J	**0.22**	**J**
Nickel	7440-02-0	**20**	30	140	**190**		**150**		**100**		**160**		**140**		**200**		**450**		**440**		**160**		**180**	
Potassium	7440-09-7	NA	NA	NA	1200		1400		800	J	1300		1100		1200		1500		1700		760		1300	
Selenium	7782-49-2	NA	3.9	36	23	U	17	J	25	U	26	U	26	U	4.7	U	6.5	U	6.3	U	2.7	U	7.1	U
Silver	7440-22-4	**1**	2	36	**1.2**	**J**	**1.6**	**J**	0.51	U	**1.1**	**J**	**1.1**	**J**	2.7	U	3.7	U	3.6	U	1.5	U	4	U
Sodium	7440-23-5	NA	NA	NA	760	J	400	J	470	J	710	J	600	J	300	U	520	J	540	J	170	J	450	U
Thallium	7440-28-0	NA	NA	NA	10	U	7.5	U	11	U	12	U	12	U	5.1	U	7	U	6.8	U	2.9	U	7.6	U
Vanadium	7440-62-2	NA	NA	NA	53		51		29		52		42		53		62		68		32		48	
Zinc	7440-66-6	**120**	109	2200	**410**		**370**		**190**		**420**		**320**		**320**		**300**		**320**		100		**270**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	12.8		17.5		11.7		11.3		11		15.1		12		11.4		31.1		10.7	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD854		BRSD855		BRSD856		BRSD857		BRSD858		BRSD859		BRSD860		BRSD860		BRSD861		BRSD862	
				Sample ID	BRSD854-0-0.5		BRSD855-0-0.5		BRSD856-0-0.5		BRSD857-0-0.5		BRSD858-0-0.5		BRSD859-0-0.5		BRSD860-0-0.5		BRSD860-0-0.5-1		BRSD861-0-0.5		BRSD862-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		1		0.5		0.5	
Analyte	Cas No.	LEL	Unrestricted	Restricted Residential	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.	Result	Qual.
Metals																								
Aluminum	7429-90-5	NA	NA	NA	12000		3900	B	4100	B	14000	B	16000	B	2800	B	2600	B	2700	B	9100	B	17000	B
Antimony	7440-36-0	**2**	NA	NA	12	U	**4.8**		3.6	U	20	U	**22**	**J**	2.5	U	2.5	U	**2.9**		6.1	U	8.2	U
Arsenic	7440-38-2	**6**	13	16	5.5	U	1.2	U	1.6	U	8.8	U	8.3	U	1.1	U	1.1	U	1	U	2.7	U	3.7	U
Barium	7440-39-3	NA	350	350	260		52		81		240		250		55		29		29		150		260	
Beryllium	7440-41-7	NA	7.2	14	1.5	J	0.18	J	0.17	J	0.58	J	0.78	J	0.13	J	0.21	J	0.19	J	0.39	J	0.6	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**1.8**		0.19	U	0.26	U	1.4	U	**1.8**	**J**	0.18	U	0.18	U	0.17	U	0.45	U	0.6	U
Calcium	7440-70-2	NA	NA	NA	6000		4500		1800		5400		6100		7600		18000		3600		5300		7200	
Chromium, Hexavalent	18540-29-9	NA	1	22	0.56	U	0.11	U	0.17	U	0.88	U	0.84	U	0.11	U	0.13	J	0.1	U	0.27	U	2.2	JD
Chromium, Total	7440-47-3	**26**	30	36	**120**		**46**		**52**		**110**		**120**		**38**		**79**		**56**		**58**		**87**	
Cobalt	7440-48-4	NA	NA	NA	44		33		21		56		43		9.1		11		14		19		25	
Copper	7440-50-8	**16**	50	270	**230**		**84**	**B**	**55**	**B**	**1000**	**B**	**350**	**B**	**20**	**B**	**20**	**B**	**37**	**B**	**40**	**B**	**74**	**B**
Cyanide	57-12-5	NA	27	27	2.4	U	0.43	U	0.77	U	2.7	U	4.1	U	0.43	U	0.53	U	0.46	U	1.4	U	2.5	
Iron	7439-89-6	**20000**	NA	NA	**26000**		**49000**	**D**	16000	D	**31000**		**33000**		16000	D	**25000**	**D**	**27000**	**D**	**29000**	**D**	**30000**	**D**
Lead	7439-92-1	**31**	63	400	**53**		8.9		15		**62**		**52**		5.2		10		5.1		27		**54**	
Magnesium	7439-95-4	NA	NA	NA	6100		43000	D	13000	D	8000		8500		8600	D	18000	D	7600	D	4800		6200	
Manganese	7439-96-5	**460**	1600	2000	**490**		**580**		290		320		240		**770**		370		240		350		**530**	
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.19**		0.0089	J	0.037	J	**0.24**	**J**	**0.26**		0.0045	U	0.0056	J	0.0041	U	0.093		**0.15**	
Nickel	7440-02-0	**20**	30	140	**180**		**130**		**69**		**250**		**190**		**33**		**37**		**43**		**67**		**98**	
Potassium	7440-09-7	NA	NA	NA	890		200		330		1200		1000		240		190		170		570		780	
Selenium	7782-49-2	NA	3.9	36	4.7	U	0.99	U	1.4	U	7.5	U	7.1	U	0.94	U	0.94	U	0.87	U	2.3	U	3.2	U
Silver	7440-22-4	**1**	2	36	2.7	U	0.56	U	0.78	U	4.3	U	4	U	0.54	U	0.54	U	0.5	U	1.3	U	1.8	U
Sodium	7440-23-5	NA	NA	NA	480	J	150		260		760	J	490	J	110	J	120	J	85	J	330		550	
Thallium	7440-28-0	NA	NA	NA	5.1	U	1.1	U	1.5	U	8.1	U	7.6	U	1	U	1	U	0.94	U	2.5	U	3.4	U
Vanadium	7440-62-2	NA	NA	NA	48		16		16		55		68		13		20		19		33		53	
Zinc	7440-66-6	**120**	109	2200	**160**		85		70		**250**		**230**		45		54		40		**140**		**220**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	15.5		77		52		10		10.3		79.1		81		83		32.5		23.7	

Notes:
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Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
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B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSD863		BRSD864		BRSD865		BRSD866		BRSD867		BRSD868		BRSD869		BRSD870		BRSD871		BRSD872	
					Sample ID	BRSD863-0-0.5		BRSD864-0-0.5		BRSD865-0-0.5		BRSD866-0-0.5		BRSD867-0-0.5		BRSD868-0-0.5		BRSD869-0-0.5		BRSD870-0-0.5		BRSD871-0-0.5		BRSD872-0-0.5	
					Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
					End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																								
Aluminum	7429-90-5	NA	NA	NA	13000	B	7300	B	14000		16000		12000		3200		3000		3400		15000		15000	
Antimony	7440-36-0	**2**	NA	NA	5.4	U	4	U	**18**		**20**		**13**		**5.7**		**5.1**		**10**		**20**	**J**	**18**	
Arsenic	7440-38-2	**6**	13	16	2.4	U	1.8	U	4.9	J	5.2	J	3.2	J	1.4	J	1.3	U	2.6	J	6.3	U	5.6	J
Barium	7440-39-3	NA	350	350	190		120		280		350		180		46		51		48		310		260	
Beryllium	7440-41-7	NA	7.2	14	0.38	J	0.28	J	0.76	J	0.82	J	0.59	J	0.19	J	0.17	J	0.28	J	0.81	J	0.76	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	0.4	U	0.3	U	**1.9**		**2**		**1.5**		0.38		0.36	J	**0.62**		**2.3**		**2**	
Calcium	7440-70-2	NA	NA	NA	4800		2700		7500		7700		5200		1200		1400		1200		7700		6000	
Chromium, Hexavalent	18540-29-9	NA	1	22	1.2	U	0.95	U	2.5	U	3	U	1.7	U	0.11	U			0.12	U	1.5	U	2.5	U
Chromium, Total	7440-47-3	**26**	30	36	**82**		**58**		**89**		**96**		**91**		**61**		**43**		**150**		**91**		**97**	
Cobalt	7440-48-4	NA	NA	NA	20		22		31		31		31		16		11		25		32		34	
Copper	7440-50-8	**16**	50	270	**30**	**B**	**26**	**B**	**130**		**130**		**73**		**37**		14		**63**		**130**		**160**	
Cyanide	57-12-5	NA	27	27	0.94	U	0.78	U	2.3	U	3.1	U	1.8	U	0.49	U	0.5	U	0.51	U	3.4	U	2.2	U
Iron	7439-89-6	**20000**	NA	NA	12000		12000	D	**28000**		**34000**		19000		12000		11000		**26000**		**33000**		**30000**	
Lead	7439-92-1	**31**	63	400	4.1		4.5		**54**		**48**		**32**		3.6		3.1		3.8		**49**		**46**	
Magnesium	7439-95-4	NA	NA	NA	4000		3300		6100		6400		6300		6300		6300		23000		6800		7400	
Manganese	7439-96-5	**460**	1600	2000	270		200		**770**		**730**		290		160		180		240		**890**		**480**	
Mercury	7439-97-6	**0.15**	0.18	0.81	0.04	J	0.037	J	**0.18**		**0.17**		0.12		0.021	J	0.015	J	0.012	J	**0.2**	**J**	**0.27**	
Nickel	7440-02-0	**20**	30	140	**76**		**74**		**110**		**120**		**100**		**57**		**34**		**130**		**130**		**120**	
Potassium	7440-09-7	NA	NA	NA	290		270		650		790		680		240		350		250		930		890	
Selenium	7782-49-2	NA	3.9	36	2.1	U	1.5	U	16	U	21	U	12	U	3.9	U	5	U	4.1	U	25	U	17	U
Silver	7440-22-4	**1**	2	36	1.2	U	0.88	U	0.34	J	0.8	J	0.33	J	0.08	U	0.13	J	0.083	U	**1.1**	**J**	0.84	J
Sodium	7440-23-5	NA	NA	NA	360		240		590		690	J	350	J	68	J	110	J	100	J	620	J	460	J
Thallium	7440-28-0	NA	NA	NA	2.2	U	1.7	U	7.4	U	9.4	U	5.4	U	1.8	U	2.3	U	1.8	U	11	U	7.6	U
Vanadium	7440-62-2	NA	NA	NA	35		24		47		53		39		12		11		14		54		49	
Zinc	7440-66-6	**120**	109	2200	38		33		**210**		**210**		**120**		44		33		45		**240**		**230**	
Chemistry																								
Solids, Percent	SOLID	NA	NA	NA	35		45.6		17		14.4		25.4		76.9		59.7		73.8		11.9		17.9	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

					Location ID	BRSD873		BRSD873		BRSD874		BRSD875		BRSD876		BRSD877		BRSD878		BRSD879		BRSD880		BRSD881	
					Sample ID	BRSD873-0-0.5		BRSD873-0-0.5-1		BRSD874-0-0.5		BRSD875-0-0.5		BRSD876-0-0.5		BRSD877-0-0.5		BRSD878-0-0.5		BRSD879-0-0.5		BRSD880-0-0.5		BRSD881-0-0.5	
					Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0		0	
					End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**		**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																									
Aluminum	7429-90-5	NA	NA	NA		19000		24000		16000		18000		16000		19000		19000		20000		21000		22000	
Antimony	7440-36-0	**2**	NA	NA		**18**		**24**		**19**	**J**	**21**		**18**		**18**		**21**		**21**		**24**		**24**	
Arsenic	7440-38-2	**6**	13	16		**6.4**	**J**	**10**	**J**	6.2	U	**7.1**	**J**	5.9	J	5.6	J	**6.8**	**J**	**6.6**	**J**	**8.4**	**J**	**9.9**	**J**
Barium	7440-39-3	NA	350	350		250		320		260		300		240		280		270		290		290		300	
Beryllium	7440-41-7	NA	7.2	14		1	J	1.2	J	0.97	J	0.99	J	0.9	J	0.96	J	1	J	1	J	1.1	J	1	J
Cadmium	7440-43-9	**0.6**	2.5	2.5		**2.4**		**3.1**		**2.2**		**2.4**		**2.2**		**2.3**		**2.3**		**2.4**		**2.6**		**2.3**	
Calcium	7440-70-2	NA	NA	NA		6400		8200		8300		6900		6000		6000		7800		6200		8400		7400	
Chromium, Hexavalent	18540-29-9	NA	1	22		2.3	U	0.85	U	1.4	U	1.2	U	0.96	U	2.9	U	1.2	U	0.99	U	1.2	U	1.1	U
Chromium, Total	7440-47-3	**26**	30	36		**140**		**180**		**97**		**120**		**120**		**120**		**120**		**130**		**130**		**110**	
Cobalt	7440-48-4	NA	NA	NA		50		62		34		45		40		38		37		41		39		42	
Copper	7440-50-8	**16**	50	270		**710**		**840**		**200**		**290**		**410**		**340**		**350**		**440**		**410**		**250**	
Cyanide	57-12-5	NA	27	27		2.1	U	2	U	2.5	U	3	U	2.2	U	1.8	U	2.5	U	2.2	U	2.5	U	2.4	U
Iron	7439-89-6	**20000**	NA	NA		**27000**		**34000**		**29000**		**38000**		**33000**		**26000**		**34000**		**39000**		**39000**		**43000**	
Lead	7439-92-1	**31**	63	400		**87**		**110**		**58**		**62**		**75**		**68**		**70**		**74**		**76**		**54**	
Magnesium	7439-95-4	NA	NA	NA		8400		11000		8400		7900		7200		7600		8600		7800		8800		8800	
Manganese	7439-96-5	**460**	1600	2000		120		150		200		**770**		**600**		150		340		**740**		**610**		**730**	
Mercury	7439-97-6	**0.15**	0.18	0.81		**0.27**		**0.25**		**0.25**		**0.29**		**0.25**		**0.26**		**0.23**		**0.24**		**0.22**		**0.21**	
Nickel	7440-02-0	**20**	30	140		**220**		**280**		**140**		**160**		**170**		**150**		**150**		**170**		**170**		**140**	
Potassium	7440-09-7	NA	NA	NA		1200		1500		1100		1200		1000		1300		1300		1300		1400		1500	
Selenium	7782-49-2	NA	3.9	36		16	U	15	U	25	U	21	U	16	U	20	U	20	U	18	U	21	U	18	U
Silver	7440-22-4	**1**	2	36		0.82	J	0.3	U	**1.3**	**J**	0.94	J	**1**	**J**	**1.3**	**J**	**1.1**	**J**	0.81	J	**1**	**J**	**1.1**	**J**
Sodium	7440-23-5	NA	NA	NA		880		1100		980		500	J	520	J	350	J	390	J	640		430	J	750	
Thallium	7440-28-0	NA	NA	NA		7.2	U	6.8	U	11	U	9.6	U	7.4	U	9.1	U	9.1	U	7.9	U	9.3	U	8.3	U
Vanadium	7440-62-2	NA	NA	NA		63		83		63		59		59		60		62		63		67		66	
Zinc	7440-66-6	**120**	109	2200		**280**		**360**		**270**		**280**		**230**		**270**		**280**		**260**		**280**		**240**	
Chemistry																									
Solids, Percent	SOLID	NA	NA	NA		19		20.2		12.1		14.2		18.3		14.9		15		17.1		14.7		16.4	

Notes:
bgs - below ground surface
LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

Table - 1
Magna Metals State Superfund Site
Town of Cortlandt, Westchester County, NY
NYSDEC Site Number: 360003

				Location ID	BRSD882		BRSD883		BRSD884		BRSD885		BRSD886		BRSD887		BRSD888		BRSD889		BRSD890	
				Sample ID	BRSD882-0-0.5		BRSD883-0-0.5		BRSD884-0-0.5		BRSD885-0-0.5		BRSD886-0-0.5		BRSD887-0-0.5		BRSD888-0-0.5		BRSD889-0-0.5		BRSD890-0-0.5	
				Start Depth (feet bgs)	0		0		0		0		0		0		0		0		0	
				End Depth (feet bgs)	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5	
Analyte	**Cas No.**	**LEL**	**Unrestricted**	**Restricted Residential**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**	**Result**	**Qual.**
Metals																						
Aluminum	7429-90-5	NA	NA	NA	22000		21000		17000		2.6	U	2400		14000		14000		14000		18000	
Antimony	7440-36-0	**2**	NA	NA	**24**		**20**		**19**		2.7	U	2.6	U	**17**		**16**		**21**		12	U
Arsenic	7440-38-2	**6**	13	16	**12**	**J**	**7.8**	**J**	**6.8**	**J**	1	U	1.2	U	4.2	U	4.3	U	**7.2**	**J**	4.5	U
Barium	7440-39-3	NA	350	350	290		280		220		0.34	U	36		210		240		290		250	
Beryllium	7440-41-7	NA	7.2	14	1.2	J	1.1	J	0.96	J	0.066	U	0.37		0.77	J	0.79	J	0.95	J	0.66	J
Cadmium	7440-43-9	**0.6**	2.5	2.5	**2.7**		**2.4**		**2.1**		0.092	U	0.23	J	**1.8**		**1.8**		**2.5**		**0.95**	**J**
Calcium	7440-70-2	NA	NA	NA	6000		5900		6300		5.3	U	1200		7100		5400		6600		5400	
Chromium, Hexavalent	18540-29-9	NA	1	22	1	U	1.1	U	2.6	U	0.13	U	0.11	U	2.6	U	1	U	3.4	U	2.6	U
Chromium, Total	7440-47-3	**26**	30	36	**140**		**130**		**99**		0.31	J	25		**86**		**84**		**91**		**130**	
Cobalt	7440-48-4	NA	NA	NA	41		38		37		0.12	U	6.5		31		30		29		41	
Copper	7440-50-8	**16**	50	270	**410**		**430**		**260**		0.29	J	16		**190**		**160**		**210**		**490**	
Cyanide	57-12-5	NA	27	27	2.4	U	2.2	U	2.1	U	0.4	U	0.53	U	2.3	U	3.7		2.9	U	4.8	
Iron	7439-89-6	**20000**	NA	NA	**39000**		**39000**		**31000**		2.1	U	8500	D	**27000**		**26000**		**28000**		**34000**	**B**
Lead	7439-92-1	**31**	63	400	**72**		**75**		**54**		0.35	U	4.5		**48**		**48**		**53**		**80**	
Magnesium	7439-95-4	NA	NA	NA	7700		7800		6200		3.3	U	2700		7700		7500		7400		7100	
Manganese	7439-96-5	**460**	1600	2000	**600**		**610**		**470**		0.17	U	80		300		**520**		280		**510**	**B**
Mercury	7439-97-6	**0.15**	0.18	0.81	**0.2**		**0.22**		**0.23**		0.017	J	0.0071	J	**0.22**		**0.21**		**0.25**		**0.18**	
Nickel	7440-02-0	**20**	30	140	**170**		**170**		**150**		0.22	J	**32**		**120**		**110**		**120**		**180**	
Potassium	7440-09-7	NA	NA	NA	1400		1400		980		880		270		860		860		940		1500	
Selenium	7782-49-2	NA	3.9	36	18	U	18	U	18	U	4.1	U	0.99	U	17	U	17	U	22	U	19	J
Silver	7440-22-4	**1**	2	36	**1.2**	**J**	**1.1**	**J**	**1.1**	**J**	0.084	U	0.56	U	0.4	J	0.55	J	**1**	**J**	**1.6**	**J**
Sodium	7440-23-5	NA	NA	NA	850		730		860		200		160		590		320	J	850		690	
Thallium	7440-28-0	NA	NA	NA	8.1	U	8.3	U	8.2	U	1.9	U	1.1	U	7.7	U	7.8	U	10	U	8.1	U
Vanadium	7440-62-2	NA	NA	NA	70		68		60		0.35	U	12		47		49		51		56	
Zinc	7440-66-6	**120**	109	2200	**250**		**250**		**210**		0.96	U	16		**250**		**270**		**250**		**300**	
Chemistry																						
Solids, Percent	SOLID	NA	NA	NA	16.7		16.3		16.6		67.8		78.8		16.8		17.2		12.8		16.5	

Notes:
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LEL - New York State Lowest Effect Levels for Metals
Unrestricted - Unrestricted Use Soil Cleanup Objectives
Restricted - Restricted Use Residential Soil Cleanup Objectives
Chromium, Total - Compared the unrestricted and restricted residential criteria to the trivalent chromium criteria.
U - Analytical Non-Detect Value
J - Estimated Analytical Value
B - The analyte is detected in the associated blank as well as in the sample.
D - Identified compound in a diluted analysis
mg/kg - milligrams per kilogram
NA - Not Available

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

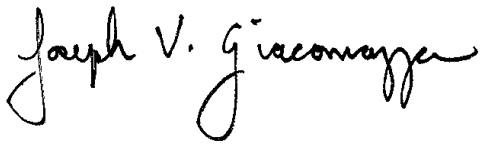
ANALYTICAL REPORT

Job Number: 480-49854-1

Job Description: Magna Metals #360003

For:
New York State D.E.C.
625 Broadway
11th Floor
Albany, NY 12233-3256

Attention: Matthew Hubicki



Approved for release.
Joe V Giacomazza
Project Management Assistant II
1/6/2014 10:39 AM

Designee for
Judy L Stone, Senior Project Manager
10 Hazelwood Drive, Amherst, NY, 14228-2298
(484)685-0868
judy.stone@testamericainc.com
01/06/2014

The test results in this report meet all NELAP requirements for analytes for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the TestAmerica Project Manager who has signed this report. TestAmerica Buffalo NELAC Certifications: CADPH 01169CA, FLDOH E87672, ILEPA 200003, KSDOH E-10187, LADEQ 30708, MDH 036-999-337, NHELAP 2973, NJDEP NY455, NHDOH 10026, ORELAP NY200003, PADEP 68-00281, TXCEQ T-104704412-10-1

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Job Narrative
480-49854-1

Receipt
The samples were received on 11/9/2013 1:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.7º C.

Metals
Method(s) 6010C: The Method Blank for batch 480-151401 contained total calcium and zinc above the method detection limits. These target analyte concentrations were less than the reporting limits (RLs); therefore, re-extraction and/or re-analysis of samples SD806 DUP (480-49854-32), SD816 DUP (480-49854-33), SD821 (480-49854-21), SD822 (480-49854-22), SD823 (480-49854-23), SD824 (480-49854-24), SD825 (480-49854-25), SD825 DUP (480-49854-34), SD826 (480-49854-26), SD827 (480-49854-27), SD828 (480-49854-28), SD829 (480-49854-29), SD830 (480-49854-30), SD831 (480-49854-31) was not performed.

Method(s) 6010C: The recoveries of Post Spike, (480-49854-23 PDS), in batch 480-151401 exhibited results outside the quality control limits for total iron, manganese, selenium, and zinc. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary

Method(s) 6010C: The Matrix Spike/ Matrix Spike Duplicate ((480-49854-23 MS), (480-49854-23 MSD)) recoveries for total aluminum, barium, and copper in batch 480-151401 were outside control limits. The Matrix Spike for total magnesium and the Matrix Spike Duplicate for total calcium were outside the quality control limits. Sample matrix is suspected. The associated Laboratory Control Sample (LCS) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010C: The Method Blank for batch 480-151394 contained total calcium, selenium, and zinc above the method detection limits. These target analyte concentrations were less than the reporting limits (RLs); therefore, re-extraction and/or re-analysis of samples SD801 (480-49854-1), SD802 (480-49854-2), SD803 (480-49854-3), SD804 (480-49854-4), SD805 (480-49854-5), SD806 (480-49854-6), SD807 (480-49854-7), SD808 (480-49854-8), SD809 (480-49854-9), SD810 (480-49854-10), SD811 (480-49854-11), SD812 (480-49854-12), SD813 (480-49854-13), SD814 (480-49854-14), SD815 (480-49854-15), SD816 (480-49854-16), SD817 (480-49854-17), SD818 (480-49854-18), SD819 (480-49854-19), SD820 (480-49854-20) was not performed.

Method(s) 6010C: The Matrix Spike/ Matrix Spike Duplicate ((480-49854-2 MS), (480-49854-2 MSD)) recoveries for total aluminum, calcium, and manganese in batch 480-151394 were outside control limits. Sample matrix is suspected. The associated Laboratory Control Sample (LCS) met acceptance criteria, therefore no corrective action was necessary.

Method(s) 6010C: The Matrix Spike / Matrix Spike Duplicate ((480-49854-2 MS), (480-49854-2 MSD)) precision for batch 480-151394 was outside control limits for total manganese. Non-homogeneity of the sample matrix is suspected. The associated Laboratory Control Sample met acceptance criteria, therefore, no corrective action was necessary.

Method(s) 6010C: The Low Level Continuing Calibration Verification (CCVL 480-152587/40) contained total arsenic above the reporting limit (RL). The reported sample SD806 (480-49854-6) associated with this CCVL was either below the laboratory's standard reporting limit for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of the sample was not performed.

Method(s) 6010C: The Low Level Continuing Calibration Verification (CCVL 480-152587/40) recovered outside control limits for total arsenic, however the CRI standard (at 2X the reporting limit) recovered within control limits. The sample SD808 (480-49854-8) associated with this CCVL was greater than 2X the reporting limit; therefore, re-analysis of the sample was not performed.

Method(s) 6010C: The Low Level Continuing Calibration Verification (CCVL 480-152314/54) recovered outside control limits for total arsenic, however the CRI standard (at 2X the reporting limit) recovered within control limits. The sample SD807 (480-49854-7) associated with this CCVL was greater than 2X the reporting limit; therefore, re-analysis of the sample was not performed.

Method(s) 6010C: The Serial Dilution (480-49854-3 SD) in batch 480-151394, exhibited a result outside the quality control limits for total lead. However, the Post Digestion Spike was compliant so no corrective action was necessary

No other analytical or quality issues were noted.

General Chemistry
Method(s) 7196A: The matrix spike soluble / matrix spike insoluble recoveries for the following sample associated with batch192123 were outside control limits: (460-66526-1 MSI), (460-66526-1 MSS). The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 7196A: The matrix spike soluble/matrix spike insoluble (MSS/MSI) and post spike recoveries for batch192130, which is a re-prep of batch 192123, were outside control limits due to sample matrix. As per procedure he post spike was reanalyzed and this is recovery was also outside the control limits. The associated laboratory control sample (LCSS/LCSI) recoveries met acceptance criteria. Both sets of data have been reported.

No other analytical or quality issues were noted.

SAMPLE SUMMARY

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
480-49854-1	SD801	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-2	SD802	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-3	SD803	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-4	SD804	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-5	SD805	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-6	SD806	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-7	SD807	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-8	SD808	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-9	SD809	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-10	SD810	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-11	SD811	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-12	SD812	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-13	SD813	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-14	SD814	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-15	SD815	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-16	SD816	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-17	SD817	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-18	SD818	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-19	SD819	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-20	SD820	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-21	SD821	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-22	SD822	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-23	SD823	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-24	SD824	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-25	SD825	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-26	SD826	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-27	SD827	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-28	SD828	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-29	SD829	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-30	SD830	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-31	SD831	Solid	11/07/2013 1603	11/09/2013 0130
480-49854-32	SD806 DUP	Solid	11/08/2013 1110	11/09/2013 0130
480-49854-33	SD816 DUP	Solid	11/07/2013 1604	11/09/2013 0130
480-49854-34	SD825 DUP	Solid	11/07/2013 1604	11/09/2013 0130
480-49854-35	SD805 DUP	Solid	11/08/2013 0939	11/09/2013 0130

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-1	**SD801**					
Aluminum		906		12.0	mg/Kg	6010C
Arsenic		1.3	J	2.4	mg/Kg	6010C
Barium		27.2		0.60	mg/Kg	6010C
Beryllium		0.041	J	0.24	mg/Kg	6010C
Cadmium		0.041	J	0.24	mg/Kg	6010C
Calcium		1290	B	60.2	mg/Kg	6010C
Chromium		10.7		0.60	mg/Kg	6010C
Cobalt		5.2		0.60	mg/Kg	6010C
Copper		26.4		1.2	mg/Kg	6010C
Iron		3910		12.0	mg/Kg	6010C
Lead		3.8		1.2	mg/Kg	6010C
Magnesium		907		24.1	mg/Kg	6010C
Manganese		95.9		0.24	mg/Kg	6010C
Nickel		20.2		6.0	mg/Kg	6010C
Potassium		102		36.1	mg/Kg	6010C
Selenium		1.3	J B	4.8	mg/Kg	6010C
Sodium		68.0	J	168	mg/Kg	6010C
Vanadium		6.4		0.60	mg/Kg	6010C
Zinc		22.3	B	2.4	mg/Kg	6010C
Mercury		0.016	J	0.021	mg/Kg	7471B
Percent Moisture		13		0.10	%	Moisture
Percent Solids		87		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-2	**SD802**					
Aluminum		4460		13.1	mg/Kg	6010C
Arsenic		2.1	J	2.6	mg/Kg	6010C
Barium		59.3		0.66	mg/Kg	6010C
Beryllium		0.12	J	0.26	mg/Kg	6010C
Calcium		1930	B	65.6	mg/Kg	6010C
Chromium		17.5		0.66	mg/Kg	6010C
Cobalt		12.1		0.66	mg/Kg	6010C
Copper		21.7		1.3	mg/Kg	6010C
Iron		12800		13.1	mg/Kg	6010C
Lead		8.1		1.3	mg/Kg	6010C
Magnesium		4530		26.3	mg/Kg	6010C
Manganese		139		0.26	mg/Kg	6010C
Nickel		30.7		6.6	mg/Kg	6010C
Potassium		737		39.4	mg/Kg	6010C
Selenium		1.1	J B	5.3	mg/Kg	6010C
Sodium		70.5	J	184	mg/Kg	6010C
Vanadium		17.7		0.66	mg/Kg	6010C
Zinc		82.1	B	2.6	mg/Kg	6010C
Mercury		0.014	J	0.024	mg/Kg	7471B
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture
480-49854-3	**SD803**					
Aluminum		4310		15.4	mg/Kg	6010C
Arsenic		2.6	J	3.1	mg/Kg	6010C
Barium		75.7		0.77	mg/Kg	6010C
Beryllium		0.13	J	0.31	mg/Kg	6010C
Calcium		2060	B	77.2	mg/Kg	6010C
Chromium		28.8		0.77	mg/Kg	6010C
Cobalt		13.9		0.77	mg/Kg	6010C
Copper		33.3		1.5	mg/Kg	6010C
Iron		15500		15.4	mg/Kg	6010C
Lead		10.1		1.5	mg/Kg	6010C
Magnesium		3470		30.9	mg/Kg	6010C
Manganese		582		0.31	mg/Kg	6010C
Nickel		41.9		7.7	mg/Kg	6010C
Potassium		618		46.3	mg/Kg	6010C
Selenium		1.5	J B	6.2	mg/Kg	6010C
Sodium		63.5	J	216	mg/Kg	6010C
Vanadium		21.7		0.77	mg/Kg	6010C
Zinc		42.5	B	3.1	mg/Kg	6010C
Mercury		0.042		0.029	mg/Kg	7471B
Percent Moisture		31		0.10	%	Moisture
Percent Solids		69		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-4	**SD804**					
Aluminum		8590		13.8	mg/Kg	6010C
Arsenic		4.7		2.8	mg/Kg	6010C
Barium		87.4		0.69	mg/Kg	6010C
Beryllium		0.31		0.28	mg/Kg	6010C
Cadmium		0.095	J	0.28	mg/Kg	6010C
Calcium		2150	B	68.8	mg/Kg	6010C
Chromium		78.6		0.69	mg/Kg	6010C
Cobalt		22.1		0.69	mg/Kg	6010C
Copper		29.9		1.4	mg/Kg	6010C
Iron		22200		13.8	mg/Kg	6010C
Lead		32.5		1.4	mg/Kg	6010C
Magnesium		2490		27.5	mg/Kg	6010C
Manganese		589		0.28	mg/Kg	6010C
Nickel		60.0		6.9	mg/Kg	6010C
Potassium		479		41.3	mg/Kg	6010C
Selenium		1.4	J B	5.5	mg/Kg	6010C
Sodium		63.4	J	193	mg/Kg	6010C
Vanadium		31.4		0.69	mg/Kg	6010C
Zinc		58.6	B	2.8	mg/Kg	6010C
Mercury		0.11		0.024	mg/Kg	7471B
Percent Moisture		24		0.10	%	Moisture
Percent Solids		76		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-5	**SD805**					
Aluminum		7090		12.9	mg/Kg	6010C
Arsenic		4.5		2.6	mg/Kg	6010C
Barium		129		0.64	mg/Kg	6010C
Beryllium		0.23	J	0.26	mg/Kg	6010C
Cadmium		0.19	J	0.26	mg/Kg	6010C
Calcium		3990	B	64.4	mg/Kg	6010C
Chromium		81.8		0.64	mg/Kg	6010C
Cobalt		39.6		0.64	mg/Kg	6010C
Copper		414		1.3	mg/Kg	6010C
Iron		27700		12.9	mg/Kg	6010C
Lead		29.8		1.3	mg/Kg	6010C
Magnesium		16500		25.8	mg/Kg	6010C
Manganese		816		0.26	mg/Kg	6010C
Nickel		178		6.4	mg/Kg	6010C
Potassium		585		38.6	mg/Kg	6010C
Selenium		3.1	J B	5.2	mg/Kg	6010C
Sodium		71.8	J	180	mg/Kg	6010C
Vanadium		23.6		0.64	mg/Kg	6010C
Zinc		107	B	2.6	mg/Kg	6010C
Mercury		0.11		0.027	mg/Kg	7471B
Percent Moisture		28		0.10	%	Moisture
Percent Solids		72		0.10	%	Moisture
480-49854-6	**SD806**					
Aluminum		1850		10.7	mg/Kg	6010C
Arsenic		0.82	J ^	2.1	mg/Kg	6010C
Barium		26.4		0.54	mg/Kg	6010C
Beryllium		0.055	J	0.21	mg/Kg	6010C
Calcium		631	B	53.6	mg/Kg	6010C
Chromium		7.1		0.54	mg/Kg	6010C
Cobalt		3.7		0.54	mg/Kg	6010C
Copper		5.8		1.1	mg/Kg	6010C
Iron		7200		10.7	mg/Kg	6010C
Lead		2.8		1.1	mg/Kg	6010C
Magnesium		1110		21.4	mg/Kg	6010C
Manganese		295		0.21	mg/Kg	6010C
Nickel		10.2		5.4	mg/Kg	6010C
Potassium		274		32.2	mg/Kg	6010C
Selenium		0.46	J B	4.3	mg/Kg	6010C
Sodium		34.6	J	150	mg/Kg	6010C
Vanadium		9.0		0.54	mg/Kg	6010C
Zinc		30.1	B	2.1	mg/Kg	6010C
Percent Moisture		11		0.10	%	Moisture
Percent Solids		89		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-7	**SD807**					
Aluminum		12200		16.5	mg/Kg	6010C
Arsenic		4.4	^	3.3	mg/Kg	6010C
Barium		87.0		0.82	mg/Kg	6010C
Beryllium		0.28	J	0.33	mg/Kg	6010C
Cadmium		0.14	J	0.33	mg/Kg	6010C
Calcium		2950	B	82.3	mg/Kg	6010C
Chromium		30.3		0.82	mg/Kg	6010C
Cobalt		10.6		0.82	mg/Kg	6010C
Copper		31.6		1.6	mg/Kg	6010C
Iron		18700		16.5	mg/Kg	6010C
Lead		50.1		1.6	mg/Kg	6010C
Magnesium		3100		32.9	mg/Kg	6010C
Manganese		255		0.33	mg/Kg	6010C
Nickel		37.3		8.2	mg/Kg	6010C
Potassium		534		49.4	mg/Kg	6010C
Selenium		1.7	J B	6.6	mg/Kg	6010C
Sodium		85.3	J	231	mg/Kg	6010C
Vanadium		33.1		0.82	mg/Kg	6010C
Zinc		59.5	B	3.3	mg/Kg	6010C
Mercury		0.18		0.034	mg/Kg	7471B
Percent Moisture		41		0.10	%	Moisture
Percent Solids		59		0.10	%	Moisture
480-49854-8	**SD808**					
Aluminum		3180		10.7	mg/Kg	6010C
Arsenic		9.2	^	2.1	mg/Kg	6010C
Barium		64.9		0.53	mg/Kg	6010C
Beryllium		0.16	J	0.21	mg/Kg	6010C
Calcium		1320	B	53.3	mg/Kg	6010C
Chromium		33.6		0.53	mg/Kg	6010C
Cobalt		16.5		0.53	mg/Kg	6010C
Copper		26.5		1.1	mg/Kg	6010C
Iron		42800		10.7	mg/Kg	6010C
Lead		5.2		1.1	mg/Kg	6010C
Magnesium		10000		21.3	mg/Kg	6010C
Manganese		548		0.21	mg/Kg	6010C
Nickel		60.7		5.3	mg/Kg	6010C
Potassium		249		32.0	mg/Kg	6010C
Sodium		72.5	J	149	mg/Kg	6010C
Vanadium		40.4		0.53	mg/Kg	6010C
Zinc		79.1	B	2.1	mg/Kg	6010C
Percent Moisture		12		0.10	%	Moisture
Percent Solids		88		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-9	**SD809**					
Aluminum		7410		12.5	mg/Kg	6010C
Arsenic		5.3		2.5	mg/Kg	6010C
Barium		145		0.63	mg/Kg	6010C
Beryllium		0.25		0.25	mg/Kg	6010C
Cadmium		0.23	J	0.25	mg/Kg	6010C
Calcium		4310	B	62.6	mg/Kg	6010C
Chromium		79.0		0.63	mg/Kg	6010C
Cobalt		41.0		0.63	mg/Kg	6010C
Copper		617		1.3	mg/Kg	6010C
Iron		30800		12.5	mg/Kg	6010C
Lead		31.2		1.3	mg/Kg	6010C
Magnesium		10400		25.0	mg/Kg	6010C
Manganese		1090		0.25	mg/Kg	6010C
Nickel		193		6.3	mg/Kg	6010C
Potassium		634		37.5	mg/Kg	6010C
Selenium		4.1	J B	5.0	mg/Kg	6010C
Sodium		67.0	J	175	mg/Kg	6010C
Vanadium		25.7		0.63	mg/Kg	6010C
Zinc		124	B	2.5	mg/Kg	6010C
Mercury		0.14		0.023	mg/Kg	7471B
Percent Moisture		18		0.10	%	Moisture
Percent Solids		82		0.10	%	Moisture
480-49854-10	**SD810**					
Aluminum		2880		11.8	mg/Kg	6010C
Arsenic		1.1	J	2.4	mg/Kg	6010C
Barium		43.2		0.59	mg/Kg	6010C
Beryllium		0.067	J	0.24	mg/Kg	6010C
Calcium		1580	B	59.2	mg/Kg	6010C
Chromium		24.0		0.59	mg/Kg	6010C
Cobalt		11.3		0.59	mg/Kg	6010C
Copper		23.4		1.2	mg/Kg	6010C
Iron		14100		11.8	mg/Kg	6010C
Lead		3.5		1.2	mg/Kg	6010C
Magnesium		8390		23.7	mg/Kg	6010C
Manganese		182		0.24	mg/Kg	6010C
Nickel		56.4		5.9	mg/Kg	6010C
Potassium		416		35.5	mg/Kg	6010C
Sodium		87.2	J	166	mg/Kg	6010C
Vanadium		9.9		0.59	mg/Kg	6010C
Zinc		52.0	B	2.4	mg/Kg	6010C
Percent Moisture		11		0.10	%	Moisture
Percent Solids		89		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-11	**SD811**					
Aluminum		2510		11.1	mg/Kg	6010C
Arsenic		1.7	J	2.2	mg/Kg	6010C
Barium		42.7		0.56	mg/Kg	6010C
Beryllium		0.072	J	0.22	mg/Kg	6010C
Calcium		1760	B	55.7	mg/Kg	6010C
Chromium		20.2		0.56	mg/Kg	6010C
Cobalt		12.6		0.56	mg/Kg	6010C
Copper		30.2		1.1	mg/Kg	6010C
Iron		11400		11.1	mg/Kg	6010C
Lead		3.9		1.1	mg/Kg	6010C
Magnesium		6780		22.3	mg/Kg	6010C
Manganese		187		0.22	mg/Kg	6010C
Nickel		53.5		5.6	mg/Kg	6010C
Potassium		383		33.4	mg/Kg	6010C
Selenium		0.58	J B	4.5	mg/Kg	6010C
Sodium		75.6	J	156	mg/Kg	6010C
Vanadium		10.4		0.56	mg/Kg	6010C
Zinc		52.9	B	2.2	mg/Kg	6010C
Percent Moisture		10		0.10	%	Moisture
Percent Solids		90		0.10	%	Moisture
480-49854-12	**SD812**					
Aluminum		5730		12.4	mg/Kg	6010C
Arsenic		3.6		2.5	mg/Kg	6010C
Barium		72.2		0.62	mg/Kg	6010C
Beryllium		0.17	J	0.25	mg/Kg	6010C
Calcium		7930	B	61.8	mg/Kg	6010C
Chromium		41.1		0.62	mg/Kg	6010C
Cobalt		14.6		0.62	mg/Kg	6010C
Copper		26.1		1.2	mg/Kg	6010C
Iron		29300		12.4	mg/Kg	6010C
Lead		6.2		1.2	mg/Kg	6010C
Magnesium		8940		24.7	mg/Kg	6010C
Manganese		476		0.25	mg/Kg	6010C
Nickel		44.1		6.2	mg/Kg	6010C
Potassium		554		37.1	mg/Kg	6010C
Sodium		91.6	J	173	mg/Kg	6010C
Vanadium		25.2		0.62	mg/Kg	6010C
Zinc		73.4	B	2.5	mg/Kg	6010C
Percent Moisture		10		0.10	%	Moisture
Percent Solids		90		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-13	**SD813**					
Aluminum		2440		12.4	mg/Kg	6010C
Arsenic		1.3	J	2.5	mg/Kg	6010C
Barium		68.8		0.62	mg/Kg	6010C
Beryllium		0.071	J	0.25	mg/Kg	6010C
Calcium		1540	B	61.9	mg/Kg	6010C
Chromium		30.7		0.62	mg/Kg	6010C
Cobalt		8.3		0.62	mg/Kg	6010C
Copper		23.4		1.2	mg/Kg	6010C
Iron		10000		12.4	mg/Kg	6010C
Lead		4.8		1.2	mg/Kg	6010C
Magnesium		3630		24.8	mg/Kg	6010C
Manganese		545		0.25	mg/Kg	6010C
Nickel		35.7		6.2	mg/Kg	6010C
Potassium		299		37.2	mg/Kg	6010C
Sodium		83.4	J	173	mg/Kg	6010C
Vanadium		9.8		0.62	mg/Kg	6010C
Zinc		54.2	B	2.5	mg/Kg	6010C
Mercury		0.012	J	0.022	mg/Kg	7471B
Percent Moisture		13		0.10	%	Moisture
Percent Solids		87		0.10	%	Moisture
480-49854-14	**SD814**					
Aluminum		3400		12.4	mg/Kg	6010C
Arsenic		0.80	J	2.5	mg/Kg	6010C
Barium		36.5		0.62	mg/Kg	6010C
Beryllium		0.11	J	0.25	mg/Kg	6010C
Calcium		971	B	62.1	mg/Kg	6010C
Chromium		14.8		0.62	mg/Kg	6010C
Cobalt		8.8		0.62	mg/Kg	6010C
Copper		22.2		1.2	mg/Kg	6010C
Iron		14000		12.4	mg/Kg	6010C
Lead		4.3		1.2	mg/Kg	6010C
Magnesium		7210		24.9	mg/Kg	6010C
Manganese		170	^	0.25	mg/Kg	6010C
Nickel		74.7		6.2	mg/Kg	6010C
Potassium		531		37.3	mg/Kg	6010C
Sodium		57.1	J	174	mg/Kg	6010C
Vanadium		10.4		0.62	mg/Kg	6010C
Zinc		38.1	B	2.5	mg/Kg	6010C
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-15	**SD815**					
Aluminum		3150		12.9	mg/Kg	6010C
Arsenic		1.1	J	2.6	mg/Kg	6010C
Barium		45.4		0.65	mg/Kg	6010C
Beryllium		0.085	J	0.26	mg/Kg	6010C
Calcium		2390	B	64.6	mg/Kg	6010C
Chromium		22.1		0.65	mg/Kg	6010C
Cobalt		12.1		0.65	mg/Kg	6010C
Copper		24.9		1.3	mg/Kg	6010C
Iron		15500		12.9	mg/Kg	6010C
Lead		4.8		1.3	mg/Kg	6010C
Magnesium		8720		25.8	mg/Kg	6010C
Manganese		357		0.26	mg/Kg	6010C
Nickel		63.7		6.5	mg/Kg	6010C
Potassium		376		38.8	mg/Kg	6010C
Sodium		78.4	J	181	mg/Kg	6010C
Vanadium		10.9		0.65	mg/Kg	6010C
Zinc		56.0	B	2.6	mg/Kg	6010C
Percent Moisture		24		0.10	%	Moisture
Percent Solids		76		0.10	%	Moisture
480-49854-16	**SD816**					
Aluminum		3470		12.9	mg/Kg	6010C
Arsenic		1.3	J	2.6	mg/Kg	6010C
Barium		41.3		0.64	mg/Kg	6010C
Beryllium		0.098	J	0.26	mg/Kg	6010C
Calcium		2020	B	64.3	mg/Kg	6010C
Chromium		15.8		0.64	mg/Kg	6010C
Cobalt		9.8		0.64	mg/Kg	6010C
Copper		13.4		1.3	mg/Kg	6010C
Iron		11800		12.9	mg/Kg	6010C
Lead		8.7		1.3	mg/Kg	6010C
Magnesium		6540		25.7	mg/Kg	6010C
Manganese		190		0.26	mg/Kg	6010C
Nickel		49.9		6.4	mg/Kg	6010C
Potassium		364		38.6	mg/Kg	6010C
Selenium		0.52	J B	5.1	mg/Kg	6010C
Sodium		221		180	mg/Kg	6010C
Vanadium		8.6		0.64	mg/Kg	6010C
Zinc		49.6	B	2.6	mg/Kg	6010C
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-17	**SD817**					
Aluminum		4930		13.2	mg/Kg	6010C
Arsenic		2.1	J	2.6	mg/Kg	6010C
Barium		107		0.66	mg/Kg	6010C
Beryllium		0.15	J	0.26	mg/Kg	6010C
Calcium		2410	B	66.0	mg/Kg	6010C
Chromium		34.6		0.66	mg/Kg	6010C
Cobalt		17.4		0.66	mg/Kg	6010C
Copper		132		1.3	mg/Kg	6010C
Iron		16600		13.2	mg/Kg	6010C
Lead		11.8		1.3	mg/Kg	6010C
Magnesium		5240		26.4	mg/Kg	6010C
Manganese		661		0.26	mg/Kg	6010C
Nickel		76.8		6.6	mg/Kg	6010C
Potassium		464		39.6	mg/Kg	6010C
Selenium		2.1	J B	5.3	mg/Kg	6010C
Sodium		120	J	185	mg/Kg	6010C
Vanadium		16.8		0.66	mg/Kg	6010C
Zinc		110	B	2.6	mg/Kg	6010C
Mercury		0.043		0.026	mg/Kg	7471B
Percent Moisture		28		0.10	%	Moisture
Percent Solids		72		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-18	**SD818**					
Aluminum		3850		13.1	mg/Kg	6010C
Arsenic		1.8	J	2.6	mg/Kg	6010C
Barium		65.6		0.65	mg/Kg	6010C
Beryllium		0.13	J	0.26	mg/Kg	6010C
Cadmium		0.22	J	0.26	mg/Kg	6010C
Calcium		4250	B	65.4	mg/Kg	6010C
Chromium		29.1		0.65	mg/Kg	6010C
Cobalt		8.6		0.65	mg/Kg	6010C
Copper		58.7		1.3	mg/Kg	6010C
Iron		10100		13.1	mg/Kg	6010C
Lead		25.7		1.3	mg/Kg	6010C
Magnesium		2990		26.1	mg/Kg	6010C
Manganese		331		0.26	mg/Kg	6010C
Nickel		40.7		6.5	mg/Kg	6010C
Potassium		300		39.2	mg/Kg	6010C
Selenium		2.1	J B	5.2	mg/Kg	6010C
Sodium		153	J	183	mg/Kg	6010C
Vanadium		28.1		0.65	mg/Kg	6010C
Zinc		45.2	B	2.6	mg/Kg	6010C
Mercury		0.046		0.023	mg/Kg	7471B
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-19	**SD819**					
Aluminum		4570		13.0	mg/Kg	6010C
Arsenic		1.2	J	2.6	mg/Kg	6010C
Barium		124		0.65	mg/Kg	6010C
Beryllium		0.15	J	0.26	mg/Kg	6010C
Calcium		2930	B	64.8	mg/Kg	6010C
Chromium		37.6		0.65	mg/Kg	6010C
Cobalt		13.9		0.65	mg/Kg	6010C
Copper		65.6		1.3	mg/Kg	6010C
Iron		14900		13.0	mg/Kg	6010C
Lead		13.4		1.3	mg/Kg	6010C
Magnesium		3080		25.9	mg/Kg	6010C
Manganese		1010		0.26	mg/Kg	6010C
Nickel		63.8		6.5	mg/Kg	6010C
Potassium		410		38.9	mg/Kg	6010C
Selenium		2.2	J B	5.2	mg/Kg	6010C
Sodium		109	J	182	mg/Kg	6010C
Vanadium		15.9		0.65	mg/Kg	6010C
Zinc		91.9	B	2.6	mg/Kg	6010C
Mercury		0.041		0.023	mg/Kg	7471B
Percent Moisture		16		0.10	%	Moisture
Percent Solids		84		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-20	**SD820**					
Aluminum		3730		12.0	mg/Kg	6010C
Arsenic		1.4	J	2.4	mg/Kg	6010C
Barium		125		0.60	mg/Kg	6010C
Beryllium		0.13	J	0.24	mg/Kg	6010C
Cadmium		0.041	J	0.24	mg/Kg	6010C
Calcium		2630	B	59.8	mg/Kg	6010C
Chromium		31.4		0.60	mg/Kg	6010C
Cobalt		12.0		0.60	mg/Kg	6010C
Copper		61.6		1.2	mg/Kg	6010C
Iron		14100		12.0	mg/Kg	6010C
Lead		10.4		1.2	mg/Kg	6010C
Magnesium		2890		23.9	mg/Kg	6010C
Manganese		1190		0.24	mg/Kg	6010C
Nickel		54.0		6.0	mg/Kg	6010C
Potassium		377		35.9	mg/Kg	6010C
Selenium		2.2	J B	4.8	mg/Kg	6010C
Sodium		100	J	167	mg/Kg	6010C
Vanadium		12.6		0.60	mg/Kg	6010C
Zinc		86.5	B	2.4	mg/Kg	6010C
Mercury		0.043		0.024	mg/Kg	7471B
Percent Moisture		21		0.10	%	Moisture
Percent Solids		79		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-21	**SD821**					
Aluminum		3140		13.2	mg/Kg	6010C
Barium		76.5		0.66	mg/Kg	6010C
Beryllium		0.17	J	0.26	mg/Kg	6010C
Cadmium		0.14	J	0.26	mg/Kg	6010C
Calcium		2720	B	66.1	mg/Kg	6010C
Chromium		39.8		0.66	mg/Kg	6010C
Cobalt		13.6		0.66	mg/Kg	6010C
Copper		53.7		1.3	mg/Kg	6010C
Iron		9030		13.2	mg/Kg	6010C
Lead		12.0		1.3	mg/Kg	6010C
Magnesium		2930		26.4	mg/Kg	6010C
Manganese		339		0.26	mg/Kg	6010C
Nickel		62.2		6.6	mg/Kg	6010C
Potassium		276		39.7	mg/Kg	6010C
Selenium		1.8	J	5.3	mg/Kg	6010C
Sodium		121	J	185	mg/Kg	6010C
Vanadium		16.3		0.66	mg/Kg	6010C
Zinc		50.4	B	2.6	mg/Kg	6010C
Mercury		0.072		0.027	mg/Kg	7471B
Percent Moisture		30		0.10	%	Moisture
Percent Solids		70		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-22	**SD822**					
Aluminum		3960		11.8	mg/Kg	6010C
Arsenic		0.70	J	2.4	mg/Kg	6010C
Barium		82.8		0.59	mg/Kg	6010C
Beryllium		0.21	J	0.24	mg/Kg	6010C
Cadmium		0.18	J	0.24	mg/Kg	6010C
Calcium		2970	B	58.9	mg/Kg	6010C
Chromium		37.6		0.59	mg/Kg	6010C
Cobalt		17.3		0.59	mg/Kg	6010C
Copper		144		1.2	mg/Kg	6010C
Iron		12600		11.8	mg/Kg	6010C
Lead		16.1		1.2	mg/Kg	6010C
Magnesium		4490		23.6	mg/Kg	6010C
Manganese		600		0.24	mg/Kg	6010C
Nickel		77.0		5.9	mg/Kg	6010C
Potassium		429		35.4	mg/Kg	6010C
Selenium		1.5	J	4.7	mg/Kg	6010C
Sodium		105	J	165	mg/Kg	6010C
Vanadium		14.7		0.59	mg/Kg	6010C
Zinc		78.4	B	2.4	mg/Kg	6010C
Mercury		0.052		0.023	mg/Kg	7471B
Percent Moisture		18		0.10	%	Moisture
Percent Solids		82		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-23	**SD823**					
Aluminum		3540		12.2	mg/Kg	6010C
Arsenic		0.57	J	2.4	mg/Kg	6010C
Barium		73.4		0.61	mg/Kg	6010C
Beryllium		0.17	J	0.24	mg/Kg	6010C
Cadmium		0.099	J	0.24	mg/Kg	6010C
Calcium		2950	B	61.0	mg/Kg	6010C
Chromium		30.2		0.61	mg/Kg	6010C
Cobalt		10.3		0.61	mg/Kg	6010C
Copper		61.0		1.2	mg/Kg	6010C
Iron		11200		12.2	mg/Kg	6010C
Lead		10.9		1.2	mg/Kg	6010C
Magnesium		3770		24.4	mg/Kg	6010C
Manganese		315		0.24	mg/Kg	6010C
Nickel		45.3		6.1	mg/Kg	6010C
Potassium		325		36.6	mg/Kg	6010C
Selenium		0.82	J	4.9	mg/Kg	6010C
Sodium		164	J	171	mg/Kg	6010C
Vanadium		10.0		0.61	mg/Kg	6010C
Zinc		53.6	B	2.4	mg/Kg	6010C
Mercury		0.030		0.025	mg/Kg	7471B
Percent Moisture		18		0.10	%	Moisture
Percent Solids		82		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-24	**SD824**					
Aluminum		3070		11.8	mg/Kg	6010C
Arsenic		0.56	J	2.4	mg/Kg	6010C
Barium		85.4		0.59	mg/Kg	6010C
Beryllium		0.18	J	0.24	mg/Kg	6010C
Cadmium		0.12	J	0.24	mg/Kg	6010C
Calcium		3260	B	58.8	mg/Kg	6010C
Chromium		32.4		0.59	mg/Kg	6010C
Cobalt		13.4		0.59	mg/Kg	6010C
Copper		58.3		1.2	mg/Kg	6010C
Iron		11500		11.8	mg/Kg	6010C
Lead		10.1		1.2	mg/Kg	6010C
Magnesium		3820		23.5	mg/Kg	6010C
Manganese		630		0.24	mg/Kg	6010C
Nickel		54.0		5.9	mg/Kg	6010C
Potassium		290		35.3	mg/Kg	6010C
Selenium		1.3	J	4.7	mg/Kg	6010C
Sodium		117	J	165	mg/Kg	6010C
Vanadium		10.3		0.59	mg/Kg	6010C
Zinc		66.4	B	2.4	mg/Kg	6010C
Mercury		0.036		0.022	mg/Kg	7471B
Percent Moisture		10		0.10	%	Moisture
Percent Solids		90		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-25	**SD825**					
Aluminum		8650		13.2	mg/Kg	6010C
Arsenic		3.7		2.6	mg/Kg	6010C
Barium		160		0.66	mg/Kg	6010C
Beryllium		0.40		0.26	mg/Kg	6010C
Cadmium		0.32		0.26	mg/Kg	6010C
Calcium		4180	B	66.0	mg/Kg	6010C
Chromium		65.8		0.66	mg/Kg	6010C
Cobalt		33.2		0.66	mg/Kg	6010C
Copper		267		1.3	mg/Kg	6010C
Iron		27400		13.2	mg/Kg	6010C
Lead		34.0		1.3	mg/Kg	6010C
Magnesium		5440		26.4	mg/Kg	6010C
Manganese		1820		0.26	mg/Kg	6010C
Nickel		145		6.6	mg/Kg	6010C
Potassium		487		39.6	mg/Kg	6010C
Selenium		3.6	J	5.3	mg/Kg	6010C
Sodium		213		185	mg/Kg	6010C
Vanadium		29.4		0.66	mg/Kg	6010C
Zinc		153	B	2.6	mg/Kg	6010C
Mercury		0.12		0.024	mg/Kg	7471B
Percent Moisture		16		0.10	%	Moisture
Percent Solids		84		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-26	**SD826**					
Aluminum		3540		11.9	mg/Kg	6010C
Arsenic		0.63	J	2.4	mg/Kg	6010C
Barium		74.6		0.60	mg/Kg	6010C
Beryllium		0.20	J	0.24	mg/Kg	6010C
Cadmium		0.19	J	0.24	mg/Kg	6010C
Calcium		2570	B	59.7	mg/Kg	6010C
Chromium		37.6		0.60	mg/Kg	6010C
Cobalt		16.3		0.60	mg/Kg	6010C
Copper		83.1		1.2	mg/Kg	6010C
Iron		9690		11.9	mg/Kg	6010C
Lead		12.6		1.2	mg/Kg	6010C
Magnesium		3260		23.9	mg/Kg	6010C
Manganese		154		0.24	mg/Kg	6010C
Nickel		68.4		6.0	mg/Kg	6010C
Potassium		265		35.8	mg/Kg	6010C
Selenium		1.3	J	4.8	mg/Kg	6010C
Sodium		200		167	mg/Kg	6010C
Vanadium		13.6		0.60	mg/Kg	6010C
Zinc		98.1	B	2.4	mg/Kg	6010C
Mercury		0.053		0.023	mg/Kg	7471B
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-27	**SD827**					
Aluminum		4630		13.3	mg/Kg	6010C
Barium		88.2		0.67	mg/Kg	6010C
Beryllium		0.23	J	0.27	mg/Kg	6010C
Cadmium		0.16	J	0.27	mg/Kg	6010C
Calcium		2970	B	66.7	mg/Kg	6010C
Chromium		44.5		0.67	mg/Kg	6010C
Cobalt		15.2		0.67	mg/Kg	6010C
Copper		90.7		1.3	mg/Kg	6010C
Iron		13500		13.3	mg/Kg	6010C
Lead		14.4		1.3	mg/Kg	6010C
Magnesium		4840		26.7	mg/Kg	6010C
Manganese		362		0.27	mg/Kg	6010C
Nickel		69.2		6.7	mg/Kg	6010C
Potassium		368		40.0	mg/Kg	6010C
Selenium		1.0	J	5.3	mg/Kg	6010C
Sodium		104	J	187	mg/Kg	6010C
Vanadium		14.3		0.67	mg/Kg	6010C
Zinc		97.2	B	2.7	mg/Kg	6010C
Mercury		0.050		0.025	mg/Kg	7471B
Percent Moisture		19		0.10	%	Moisture
Percent Solids		81		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-28	**SD828**					
Aluminum		3320		14.2	mg/Kg	6010C
Arsenic		0.58	J	2.8	mg/Kg	6010C
Barium		147		0.71	mg/Kg	6010C
Beryllium		0.19	J	0.28	mg/Kg	6010C
Cadmium		0.18	J	0.28	mg/Kg	6010C
Calcium		2830	B	71.0	mg/Kg	6010C
Chromium		36.1		0.71	mg/Kg	6010C
Cobalt		14.6		0.71	mg/Kg	6010C
Copper		86.1		1.4	mg/Kg	6010C
Iron		11500		14.2	mg/Kg	6010C
Lead		11.9		1.4	mg/Kg	6010C
Magnesium		3700		28.4	mg/Kg	6010C
Manganese		162		0.28	mg/Kg	6010C
Nickel		61.4		7.1	mg/Kg	6010C
Potassium		257		42.6	mg/Kg	6010C
Selenium		1.4	J	5.7	mg/Kg	6010C
Sodium		155	J	199	mg/Kg	6010C
Vanadium		12.8		0.71	mg/Kg	6010C
Zinc		94.2	B	2.8	mg/Kg	6010C
Mercury		0.059		0.025	mg/Kg	7471B
Percent Moisture		24		0.10	%	Moisture
Percent Solids		76		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-29	**SD829**					
Aluminum		1930		12.2	mg/Kg	6010C
Arsenic		1.4	J	2.4	mg/Kg	6010C
Barium		134		0.61	mg/Kg	6010C
Beryllium		0.16	J	0.24	mg/Kg	6010C
Cadmium		0.28		0.24	mg/Kg	6010C
Calcium		4700	B	61.2	mg/Kg	6010C
Chromium		28.4		0.61	mg/Kg	6010C
Cobalt		10.3		0.61	mg/Kg	6010C
Copper		88.7		1.2	mg/Kg	6010C
Iron		11900		12.2	mg/Kg	6010C
Lead		9.2		1.2	mg/Kg	6010C
Magnesium		2260		24.5	mg/Kg	6010C
Manganese		893		0.24	mg/Kg	6010C
Nickel		54.2		6.1	mg/Kg	6010C
Potassium		133		36.7	mg/Kg	6010C
Selenium		1.5	J	4.9	mg/Kg	6010C
Sodium		47.5	J	171	mg/Kg	6010C
Vanadium		8.7		0.61	mg/Kg	6010C
Zinc		65.5	B	2.4	mg/Kg	6010C
Mercury		0.053		0.025	mg/Kg	7471B
Percent Moisture		21		0.10	%	Moisture
Percent Solids		79		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-30	**SD830**					
Aluminum		6540		12.8	mg/Kg	6010C
Arsenic		0.56	J	2.6	mg/Kg	6010C
Barium		127		0.64	mg/Kg	6010C
Beryllium		0.32		0.26	mg/Kg	6010C
Cadmium		0.27		0.26	mg/Kg	6010C
Calcium		3740	B	64.1	mg/Kg	6010C
Chromium		75.3		0.64	mg/Kg	6010C
Cobalt		14.5		0.64	mg/Kg	6010C
Copper		426		1.3	mg/Kg	6010C
Iron		13400		12.8	mg/Kg	6010C
Lead		30.3		1.3	mg/Kg	6010C
Magnesium		4140		25.6	mg/Kg	6010C
Manganese		339		0.26	mg/Kg	6010C
Nickel		105		6.4	mg/Kg	6010C
Potassium		358		38.5	mg/Kg	6010C
Selenium		3.3	J	5.1	mg/Kg	6010C
Sodium		144	J	180	mg/Kg	6010C
Vanadium		21.3		0.64	mg/Kg	6010C
Zinc		80.6	B	2.6	mg/Kg	6010C
Mercury		0.12		0.024	mg/Kg	7471B
Percent Moisture		17		0.10	%	Moisture
Percent Solids		83		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-31	**SD831**					
Aluminum		4260		11.7	mg/Kg	6010C
Arsenic		0.57	J	2.3	mg/Kg	6010C
Barium		89.6		0.58	mg/Kg	6010C
Beryllium		0.21	J	0.23	mg/Kg	6010C
Cadmium		0.18	J	0.23	mg/Kg	6010C
Calcium		2680	B	58.5	mg/Kg	6010C
Chromium		43.7		0.58	mg/Kg	6010C
Cobalt		14.7		0.58	mg/Kg	6010C
Copper		126		1.2	mg/Kg	6010C
Iron		10400		11.7	mg/Kg	6010C
Lead		17.3		1.2	mg/Kg	6010C
Magnesium		2610		23.4	mg/Kg	6010C
Manganese		281		0.23	mg/Kg	6010C
Nickel		70.2		5.8	mg/Kg	6010C
Potassium		280		35.1	mg/Kg	6010C
Selenium		2.0	J	4.7	mg/Kg	6010C
Sodium		97.4	J	164	mg/Kg	6010C
Vanadium		14.8		0.58	mg/Kg	6010C
Zinc		75.8	B	2.3	mg/Kg	6010C
Mercury		0.068		0.024	mg/Kg	7471B
Percent Moisture		16		0.10	%	Moisture
Percent Solids		84		0.10	%	Moisture
480-49854-32	**SD806 DUP**					
Aluminum		3130		11.8	mg/Kg	6010C
Arsenic		2.0	J	2.4	mg/Kg	6010C
Barium		50.2		0.59	mg/Kg	6010C
Beryllium		0.15	J	0.24	mg/Kg	6010C
Calcium		1550	B	59.1	mg/Kg	6010C
Chromium		17.3		0.59	mg/Kg	6010C
Cobalt		7.6		0.59	mg/Kg	6010C
Copper		12.9		1.2	mg/Kg	6010C
Iron		13500		11.8	mg/Kg	6010C
Lead		4.1		1.2	mg/Kg	6010C
Magnesium		4230		23.7	mg/Kg	6010C
Manganese		454		0.24	mg/Kg	6010C
Nickel		27.6		5.9	mg/Kg	6010C
Potassium		449		35.5	mg/Kg	6010C
Sodium		54.4	J	166	mg/Kg	6010C
Vanadium		16.4		0.59	mg/Kg	6010C
Zinc		61.1	B	2.4	mg/Kg	6010C
Percent Moisture		14		0.10	%	Moisture
Percent Solids		86		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-33	**SD816 DUP**					
Aluminum		2840		11.2	mg/Kg	6010C
Barium		33.5		0.56	mg/Kg	6010C
Beryllium		0.14	J	0.22	mg/Kg	6010C
Cadmium		0.034	J	0.22	mg/Kg	6010C
Calcium		1110	B	56.1	mg/Kg	6010C
Chromium		14.7		0.56	mg/Kg	6010C
Cobalt		7.0		0.56	mg/Kg	6010C
Copper		14.1		1.1	mg/Kg	6010C
Iron		10000		11.2	mg/Kg	6010C
Lead		3.0		1.1	mg/Kg	6010C
Magnesium		4850		22.4	mg/Kg	6010C
Manganese		113		0.22	mg/Kg	6010C
Nickel		39.2		5.6	mg/Kg	6010C
Potassium		346		33.6	mg/Kg	6010C
Sodium		65.0	J	157	mg/Kg	6010C
Vanadium		7.4		0.56	mg/Kg	6010C
Zinc		39.6	B	2.2	mg/Kg	6010C
Percent Moisture		10		0.10	%	Moisture
Percent Solids		90		0.10	%	Moisture
480-49854-34	**SD825 DUP**					
Aluminum		10700		13.9	mg/Kg	6010C
Arsenic		3.4		2.8	mg/Kg	6010C
Barium		166		0.70	mg/Kg	6010C
Beryllium		0.47		0.28	mg/Kg	6010C
Cadmium		0.43		0.28	mg/Kg	6010C
Calcium		4830	B	69.7	mg/Kg	6010C
Chromium		82.3		0.70	mg/Kg	6010C
Cobalt		37.4		0.70	mg/Kg	6010C
Copper		314		1.4	mg/Kg	6010C
Iron		35100		13.9	mg/Kg	6010C
Lead		39.5		1.4	mg/Kg	6010C
Magnesium		6730		27.9	mg/Kg	6010C
Manganese		947		0.28	mg/Kg	6010C
Nickel		183		7.0	mg/Kg	6010C
Potassium		613		41.8	mg/Kg	6010C
Selenium		3.2	J	5.6	mg/Kg	6010C
Sodium		281		195	mg/Kg	6010C
Vanadium		37.1		0.70	mg/Kg	6010C
Zinc		173	B	2.8	mg/Kg	6010C
Mercury		0.14		0.027	mg/Kg	7471B
Percent Moisture		29		0.10	%	Moisture
Percent Solids		71		0.10	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
480-49854-35	**SD805 DUP**					
Percent Moisture		37		1.0	%	Moisture
Percent Solids		63		1.0	%	Moisture

METHOD SUMMARY

Client: New York State D.E.C. Job Number: 480-49854-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Metals (ICP)	TAL BUF	SW846 6010C	
Preparation, Metals	TAL BUF		SW846 3050B
Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)	TAL BUF	SW846 7471B	
Preparation, Mercury	TAL BUF		SW846 7471B
Percent Moisture	TAL BUF	EPA Moisture	
Chromium, Hexavalent	TAL EDI	SW846 7196A	
Alkaline Digestion (Chromium, Hexavalent)	TAL EDI		SW846 3060A
Percent Moisture	TAL EDI	EPA Moisture	

Lab References:

TAL BUF = TestAmerica Buffalo

TAL EDI = TestAmerica Edison

Method References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: New York State D.E.C. Job Number: 480-49854-1

Method	Analyst	Analyst ID
SW846 6010C	Hanks, Lisa M	LMH
SW846 7471B	Setang, Steven	SS1
SW846 7196A	Kamenetskaya, Raisa	RAK
EPA Moisture	Robinson, Ian	ITR
EPA Moisture	Robison, Zachary J	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD801**

Lab Sample ID: 480-49854-1 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 12.5 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4750 g
Analysis Date:	11/14/2013 1701			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		906		5.3	12.0
Antimony		ND		0.48	18.0
Arsenic		1.3	J	0.48	2.4
Barium		27.2		0.13	0.60
Beryllium		0.041	J	0.034	0.24
Cadmium		0.041	J	0.036	0.24
Calcium		1290	B	4.0	60.2
Chromium		10.7		0.24	0.60
Cobalt		5.2		0.060	0.60
Copper		26.4		0.25	1.2
Iron		3910		1.3	12.0
Magnesium		907		1.1	24.1
Manganese		95.9		0.039	0.24
Nickel		20.2		0.28	6.0
Potassium		102		24.1	36.1
Selenium		1.3	J B	0.48	4.8
Sodium		68.0	J	15.6	168
Thallium		ND		0.36	7.2
Vanadium		6.4		0.13	0.60
Zinc		22.3	B	0.18	2.4

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4750 g
Analysis Date:	11/15/2013 1236			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		3.8		0.29	1.2
Silver		ND		0.24	0.60

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6646 g
Analysis Date:	11/12/2013 1211			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.016	J	0.0084	0.021

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD802**

Lab Sample ID: 480-49854-2 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 17.0 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4587 g
Analysis Date:	11/14/2013 1704			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4460		5.8	13.1
Antimony		ND		0.53	19.7
Arsenic		2.1	J	0.53	2.6
Barium		59.3		0.14	0.66
Beryllium		0.12	J	0.037	0.26
Cadmium		ND		0.039	0.26
Calcium		1930	B	4.3	65.6
Chromium		17.5		0.26	0.66
Cobalt		12.1		0.066	0.66
Copper		21.7		0.28	1.3
Iron		12800		1.4	13.1
Magnesium		4530		1.2	26.3
Manganese		139		0.042	0.26
Nickel		30.7		0.30	6.6
Potassium		737		26.3	39.4
Selenium		1.1	J B	0.53	5.3
Sodium		70.5	J	17.1	184
Thallium		ND		0.39	7.9
Vanadium		17.7		0.14	0.66
Zinc		82.1	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4587 g
Analysis Date:	11/15/2013 1238			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		8.1		0.32	1.3
Silver		ND		0.26	0.66

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5990 g
Analysis Date:	11/12/2013 1213			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.014	J	0.0098	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD803**

Lab Sample ID: 480-49854-3 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 31.4 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4720 g
Analysis Date:	11/14/2013 1715			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4310		6.8	15.4
Antimony		ND		0.62	23.2
Arsenic		2.6	J	0.62	3.1
Barium		75.7		0.17	0.77
Beryllium		0.13	J	0.043	0.31
Cadmium		ND		0.046	0.31
Calcium		2060	B	5.1	77.2
Chromium		28.8		0.31	0.77
Cobalt		13.9		0.077	0.77
Copper		33.3		0.32	1.5
Iron		15500		1.7	15.4
Magnesium		3470		1.4	30.9
Manganese		582		0.049	0.31
Nickel		41.9		0.36	7.7
Potassium		618		30.9	46.3
Selenium		1.5	J B	0.62	6.2
Sodium		63.5	J	20.1	216
Thallium		ND		0.46	9.3
Vanadium		21.7		0.17	0.77
Zinc		42.5	B	0.24	3.1

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4720 g
Analysis Date:	11/15/2013 1245			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		10.1		0.37	1.5
Silver		ND		0.31	0.77

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5941 g
Analysis Date:	11/12/2013 1215			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.042		0.012	0.029

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD804**

Lab Sample ID: 480-49854-4 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 23.7 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4762 g
Analysis Date:	11/14/2013 1718			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8590		6.1	13.8
Antimony		ND		0.55	20.7
Arsenic		4.7		0.55	2.8
Barium		87.4		0.15	0.69
Beryllium		0.31		0.039	0.28
Cadmium		0.095	J	0.041	0.28
Calcium		2150	B	4.5	68.8
Chromium		78.6		0.28	0.69
Cobalt		22.1		0.069	0.69
Copper		29.9		0.29	1.4
Iron		22200		1.5	13.8
Magnesium		2490		1.3	27.5
Manganese		589		0.044	0.28
Nickel		60.0		0.32	6.9
Potassium		479		27.5	41.3
Selenium		1.4	J B	0.55	5.5
Sodium		63.4	J	17.9	193
Thallium		ND		0.41	8.3
Vanadium		31.4		0.15	0.69
Zinc		58.6	B	0.21	2.8

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4762 g
Analysis Date:	11/15/2013 1252			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		32.5		0.33	1.4
Silver		ND		0.28	0.69

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6499 g
Analysis Date:	11/12/2013 1217			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.11		0.0098	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD805**

Lab Sample ID: 480-49854-5 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 28.2 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5409 g
Analysis Date:	11/14/2013 1720			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7090		5.7	12.9
Antimony		ND		0.52	19.3
Arsenic		4.5		0.52	2.6
Barium		129		0.14	0.64
Beryllium		0.23	J	0.036	0.26
Cadmium		0.19	J	0.039	0.26
Calcium		3990	B	4.3	64.4
Chromium		81.8		0.26	0.64
Cobalt		39.6		0.064	0.64
Copper		414		0.27	1.3
Iron		27700		1.4	12.9
Magnesium		16500		1.2	25.8
Manganese		816		0.041	0.26
Nickel		178		0.30	6.4
Potassium		585		25.8	38.6
Selenium		3.1	J B	0.52	5.2
Sodium		71.8	J	16.7	180
Thallium		ND		0.39	7.7
Vanadium		23.6		0.14	0.64
Zinc		107	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5409 g
Analysis Date:	11/15/2013 1255			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		29.8		0.31	1.3
Silver		ND		0.26	0.64

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6280 g
Analysis Date:	11/12/2013 1219			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.11		0.011	0.027

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD806**

Lab Sample ID: 480-49854-6 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 10.9 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5236 g
Analysis Date:	11/14/2013 1804			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		1850		4.7	10.7
Antimony		ND		0.43	16.1
Barium		26.4		0.12	0.54
Beryllium		0.055	J	0.030	0.21
Cadmium		ND		0.032	0.21
Calcium		631	B	3.5	53.6
Chromium		7.1		0.21	0.54
Cobalt		3.7		0.054	0.54
Copper		5.8		0.23	1.1
Lead		2.8		0.26	1.1
Magnesium		1110		0.99	21.4
Nickel		10.2		0.25	5.4
Potassium		274		21.4	32.2
Selenium		0.46	J B	0.43	4.3
Silver		ND		0.21	0.54
Sodium		34.6	J	13.9	150
Thallium		ND		0.32	6.4
Vanadium		9.0		0.12	0.54
Zinc		30.1	B	0.16	2.1

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5236 g
Analysis Date:	11/15/2013 1304			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		0.82	J ^	0.43	2.1
Iron		7200		1.2	10.7
Manganese		295		0.034	0.21

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6306 g
Analysis Date:	11/12/2013 1221			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0087	0.021

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD807**

Lab Sample ID: 480-49854-7 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 41.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5168 g
Analysis Date:	11/14/2013 1806			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		12200		7.2	16.5
Antimony		ND		0.66	24.7
Arsenic		4.4	^	0.66	3.3
Barium		87.0		0.18	0.82
Beryllium		0.28	J	0.046	0.33
Cadmium		0.14	J	0.049	0.33
Calcium		2950	B	5.4	82.3
Chromium		30.3		0.33	0.82
Cobalt		10.6		0.082	0.82
Copper		31.6		0.35	1.6
Lead		50.1		0.40	1.6
Magnesium		3100		1.5	32.9
Nickel		37.3		0.38	8.2
Potassium		534		32.9	49.4
Selenium		1.7	J B	0.66	6.6
Silver		ND		0.33	0.82
Sodium		85.3	J	21.4	231
Thallium		ND		0.49	9.9
Vanadium		33.1		0.18	0.82
Zinc		59.5	B	0.25	3.3

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5168 g
Analysis Date:	11/15/2013 1307			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		18700		1.8	16.5
Manganese		255		0.053	0.33

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5928 g
Analysis Date:	11/12/2013 1222			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.18		0.014	0.034

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD808**

Lab Sample ID: 480-49854-8 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 12.2 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5346 g
Analysis Date:	11/14/2013 1808			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3180		4.7	10.7
Antimony		ND		0.43	16.0
Barium		64.9		0.12	0.53
Beryllium		0.16	J	0.030	0.21
Calcium		1320	B	3.5	53.3
Chromium		33.6		0.21	0.53
Cobalt		16.5		0.053	0.53
Copper		26.5		0.22	1.1
Lead		5.2		0.26	1.1
Magnesium		10000		0.99	21.3
Nickel		60.7		0.25	5.3
Potassium		249		21.3	32.0
Selenium		ND		0.43	4.3
Silver		ND		0.21	0.53
Sodium		72.5	J	13.9	149
Thallium		ND		0.32	6.4
Vanadium		40.4		0.12	0.53
Zinc		79.1	B	0.16	2.1

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5346 g
Analysis Date:	11/15/2013 1309			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		9.2	^	0.43	2.1
Cadmium		ND		0.032	0.21
Iron		42800		1.2	10.7
Manganese		548		0.034	0.21

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6800 g
Analysis Date:	11/12/2013 1228			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0081	0.020

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD809**

Lab Sample ID: 480-49854-9 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 18.1 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4878 g
Analysis Date:	11/14/2013 1730			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		7410		5.5	12.5
Antimony		ND		0.50	18.8
Arsenic		5.3		0.50	2.5
Barium		145		0.14	0.63
Beryllium		0.25		0.035	0.25
Cadmium		0.23	J	0.038	0.25
Calcium		4310	B	4.1	62.6
Chromium		79.0		0.25	0.63
Cobalt		41.0		0.063	0.63
Copper		617		0.26	1.3
Magnesium		10400		1.2	25.0
Nickel		193		0.29	6.3
Potassium		634		25.0	37.5
Selenium		4.1	J B	0.50	5.0
Sodium		67.0	J	16.3	175
Thallium		ND		0.38	7.5
Vanadium		25.7		0.14	0.63
Zinc		124	B	0.19	2.5

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4878 g
Analysis Date:	11/15/2013 1312			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		30800		1.4	12.5
Lead		31.2		0.30	1.3
Manganese		1090		0.040	0.25
Silver		ND		0.25	0.63

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6284 g
Analysis Date:	11/12/2013 1230			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.14		0.0094	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD810**

Lab Sample ID: 480-49854-10 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 11.4 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4767 g
Analysis Date:	11/14/2013 1732			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		2880		5.2	11.8
Antimony		ND		0.47	17.8
Arsenic		1.1	J	0.47	2.4
Barium		43.2		0.13	0.59
Beryllium		0.067	J	0.033	0.24
Cadmium		ND		0.036	0.24
Calcium		1580	B	3.9	59.2
Chromium		24.0		0.24	0.59
Cobalt		11.3		0.059	0.59
Copper		23.4		0.25	1.2
Magnesium		8390		1.1	23.7
Nickel		56.4		0.27	5.9
Potassium		416		23.7	35.5
Selenium		ND		0.47	4.7
Sodium		87.2	J	15.4	166
Thallium		ND		0.36	7.1
Vanadium		9.9		0.13	0.59
Zinc		52.0	B	0.18	2.4

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4767 g
Analysis Date:	11/15/2013 1314			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		14100		1.3	11.8
Lead		3.5		0.28	1.2
Manganese		182		0.038	0.24
Silver		ND		0.24	0.59

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5996 g
Analysis Date:	11/12/2013 1232			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0091	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD811**

Lab Sample ID: 480-49854-11 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 10.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5010 g
Analysis Date:	11/14/2013 1734			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		2510		4.9	11.1
Antimony		ND		0.45	16.7
Arsenic		1.7	J	0.45	2.2
Barium		42.7		0.12	0.56
Beryllium		0.072	J	0.031	0.22
Cadmium		ND		0.033	0.22
Calcium		1760	B	3.7	55.7
Chromium		20.2		0.22	0.56
Cobalt		12.6		0.056	0.56
Copper		30.2		0.23	1.1
Magnesium		6780		1.0	22.3
Nickel		53.5		0.26	5.6
Potassium		383		22.3	33.4
Selenium		0.58	J B	0.45	4.5
Sodium		75.6	J	14.5	156
Thallium		ND		0.33	6.7
Vanadium		10.4		0.12	0.56
Zinc		52.9	B	0.17	2.2

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5010 g
Analysis Date:	11/15/2013 1316			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		11400		1.2	11.1
Lead		3.9		0.27	1.1
Manganese		187		0.036	0.22
Silver		ND		0.22	0.56

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5939 g
Analysis Date:	11/12/2013 1234			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0091	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD812**

Lab Sample ID: 480-49854-12 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 10.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4511 g
Analysis Date:	11/14/2013 1736			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		5730		5.4	12.4
Antimony		ND		0.49	18.5
Arsenic		3.6		0.49	2.5
Barium		72.2		0.14	0.62
Beryllium		0.17	J	0.035	0.25
Calcium		7930	B	4.1	61.8
Chromium		41.1		0.25	0.62
Cobalt		14.6		0.062	0.62
Copper		26.1		0.26	1.2
Magnesium		8940		1.1	24.7
Nickel		44.1		0.28	6.2
Potassium		554		24.7	37.1
Selenium		ND		0.49	4.9
Sodium		91.6	J	16.1	173
Thallium		ND		0.37	7.4
Vanadium		25.2		0.14	0.62
Zinc		73.4	B	0.19	2.5

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4511 g
Analysis Date:	11/15/2013 1319			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		ND		0.037	0.25
Iron		29300		1.4	12.4
Lead		6.2		0.30	1.2
Manganese		476		0.040	0.25
Silver		ND		0.25	0.62

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5949 g
Analysis Date:	11/12/2013 1236			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0091	0.022

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD813**

Lab Sample ID: 480-49854-13 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 13.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4655 g
Analysis Date:	11/14/2013 1739			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		2440		5.4	12.4
Antimony		ND		0.50	18.6
Arsenic		1.3	J	0.50	2.5
Barium		68.8		0.14	0.62
Beryllium		0.071	J	0.035	0.25
Cadmium		ND		0.037	0.25
Calcium		1540	B	4.1	61.9
Chromium		30.7		0.25	0.62
Cobalt		8.3		0.062	0.62
Copper		23.4		0.26	1.2
Magnesium		3630		1.1	24.8
Nickel		35.7		0.28	6.2
Potassium		299		24.8	37.2
Selenium		ND		0.50	5.0
Sodium		83.4	J	16.1	173
Thallium		ND		0.37	7.4
Vanadium		9.8		0.14	0.62
Zinc		54.2	B	0.19	2.5

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4655 g
Analysis Date:	11/15/2013 1321			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		10000		1.4	12.4
Lead		4.8		0.30	1.2
Manganese		545		0.040	0.25
Silver		ND		0.25	0.62

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6165 g
Analysis Date:	11/12/2013 1238			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.012	J	0.0091	0.022

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD814**

Lab Sample ID: 480-49854-14 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 17.2 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4860 g
Analysis Date:	11/14/2013 1741			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3400		5.5	12.4
Antimony		ND		0.50	18.6
Arsenic		0.80	J	0.50	2.5
Barium		36.5		0.14	0.62
Beryllium		0.11	J	0.035	0.25
Cadmium		ND		0.037	0.25
Calcium		971	B	4.1	62.1
Chromium		14.8		0.25	0.62
Cobalt		8.8		0.062	0.62
Copper		22.2		0.26	1.2
Manganese		170	^	0.040	0.25
Nickel		74.7		0.29	6.2
Potassium		531		24.9	37.3
Selenium		ND		0.50	5.0
Sodium		57.1	J	16.2	174
Thallium		ND		0.37	7.5
Vanadium		10.4		0.14	0.62
Zinc		38.1	B	0.19	2.5

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4860 g
Analysis Date:	11/15/2013 1323			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		14000		1.4	12.4
Lead		4.3		0.30	1.2
Magnesium		7210		1.2	24.9
Silver		ND		0.25	0.62

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6155 g
Analysis Date:	11/12/2013 1240			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0095	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD815**

Lab Sample ID: 480-49854-15 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 24.1 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5096 g
Analysis Date:	11/14/2013 1743			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3150		5.7	12.9
Antimony		ND		0.52	19.4
Arsenic		1.1	J	0.52	2.6
Barium		45.4		0.14	0.65
Beryllium		0.085	J	0.036	0.26
Cadmium		ND		0.039	0.26
Calcium		2390	B	4.3	64.6
Chromium		22.1		0.26	0.65
Cobalt		12.1		0.065	0.65
Copper		24.9		0.27	1.3
Magnesium		8720		1.2	25.8
Nickel		63.7		0.30	6.5
Potassium		376		25.8	38.8
Selenium		ND		0.52	5.2
Sodium		78.4	J	16.8	181
Thallium		ND		0.39	7.8
Vanadium		10.9		0.14	0.65
Zinc		56.0	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5096 g
Analysis Date:	11/15/2013 1347			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		15500		1.4	12.9
Lead		4.8		0.31	1.3
Manganese		357		0.041	0.26
Silver		ND		0.26	0.65

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6737 g
Analysis Date:	11/12/2013 1241			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0095	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD816**

Lab Sample ID: 480-49854-16 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 16.7 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4664 g
Analysis Date:	11/14/2013 1745			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3470		5.7	12.9
Antimony		ND		0.51	19.3
Arsenic		1.3	J	0.51	2.6
Barium		41.3		0.14	0.64
Beryllium		0.098	J	0.036	0.26
Cadmium		ND		0.039	0.26
Calcium		2020	B	4.2	64.3
Chromium		15.8		0.26	0.64
Cobalt		9.8		0.064	0.64
Copper		13.4		0.27	1.3
Magnesium		6540		1.2	25.7
Nickel		49.9		0.30	6.4
Potassium		364		25.7	38.6
Selenium		0.52	J B	0.51	5.1
Sodium		221		16.7	180
Thallium		ND		0.39	7.7
Vanadium		8.6		0.14	0.64
Zinc		49.6	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4664 g
Analysis Date:	11/15/2013 1333			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		11800		1.4	12.9
Lead		8.7		0.31	1.3
Manganese		190		0.041	0.26
Silver		ND		0.26	0.64

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5838 g
Analysis Date:	11/12/2013 1243			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.010	0.025

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD817**

Lab Sample ID: 480-49854-17 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 28.5 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5294 g
Analysis Date:	11/14/2013 1748			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4930		5.8	13.2
Antimony		ND		0.53	19.8
Arsenic		2.1	J	0.53	2.6
Barium		107		0.15	0.66
Beryllium		0.15	J	0.037	0.26
Cadmium		ND		0.040	0.26
Calcium		2410	B	4.4	66.0
Chromium		34.6		0.26	0.66
Cobalt		17.4		0.066	0.66
Copper		132		0.28	1.3
Magnesium		5240		1.2	26.4
Nickel		76.8		0.30	6.6
Potassium		464		26.4	39.6
Selenium		2.1	J B	0.53	5.3
Sodium		120	J	17.2	185
Thallium		ND		0.40	7.9
Vanadium		16.8		0.15	0.66
Zinc		110	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5294 g
Analysis Date:	11/15/2013 1335			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Iron		16600		1.5	13.2
Lead		11.8		0.32	1.3
Manganese		661		0.042	0.26
Silver		ND		0.26	0.66

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6383 g
Analysis Date:	11/12/2013 1245			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.043		0.011	0.026

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD818**

Lab Sample ID: 480-49854-18 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 16.7 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4594 g
Analysis Date:	11/14/2013 1757			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3850		5.8	13.1
Antimony		ND		0.52	19.6
Barium		65.6		0.14	0.65
Beryllium		0.13	J	0.037	0.26
Cadmium		0.22	J	0.039	0.26
Calcium		4250	B	4.3	65.4
Chromium		29.1		0.26	0.65
Cobalt		8.6		0.065	0.65
Copper		58.7		0.27	1.3
Lead		25.7		0.31	1.3
Magnesium		2990		1.2	26.1
Nickel		40.7		0.30	6.5
Potassium		300		26.1	39.2
Selenium		2.1	J B	0.52	5.2
Silver		ND		0.26	0.65
Sodium		153	J	17.0	183
Thallium		ND		0.39	7.8
Vanadium		28.1		0.14	0.65
Zinc		45.2	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4594 g
Analysis Date:	11/15/2013 1338			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		1.8	J	0.52	2.6
Iron		10100		1.4	13.1
Manganese		331		0.042	0.26

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6279 g
Analysis Date:	11/12/2013 1251			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.046		0.0093	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD819**

Lab Sample ID: 480-49854-19 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 15.5 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4565 g
Analysis Date:	11/14/2013 1759			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4570		5.7	13.0
Antimony		ND		0.52	19.4
Barium		124		0.14	0.65
Beryllium		0.15	J	0.036	0.26
Cadmium		ND		0.039	0.26
Calcium		2930	B	4.3	64.8
Chromium		37.6		0.26	0.65
Cobalt		13.9		0.065	0.65
Copper		65.6		0.27	1.3
Lead		13.4		0.31	1.3
Magnesium		3080		1.2	25.9
Nickel		63.8		0.30	6.5
Potassium		410		25.9	38.9
Selenium		2.2	J B	0.52	5.2
Silver		ND		0.26	0.65
Sodium		109	J	16.9	182
Thallium		ND		0.39	7.8
Vanadium		15.9		0.14	0.65
Zinc		91.9	B	0.20	2.6

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.4565 g
Analysis Date:	11/15/2013 1340			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		1.2	J	0.52	2.6
Iron		14900		1.4	13.0
Manganese		1010		0.041	0.26

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6252 g
Analysis Date:	11/12/2013 1257			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.041		0.0092	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD820**

Lab Sample ID: 480-49854-20 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 21.0 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5293 g
Analysis Date:	11/14/2013 1802			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3730		5.3	12.0
Antimony		ND		0.48	17.9
Barium		125		0.13	0.60
Beryllium		0.13	J	0.033	0.24
Cadmium		0.041	J	0.036	0.24
Calcium		2630	B	3.9	59.8
Chromium		31.4		0.24	0.60
Cobalt		12.0		0.060	0.60
Copper		61.6		0.25	1.2
Lead		10.4		0.29	1.2
Magnesium		2890		1.1	23.9
Nickel		54.0		0.27	6.0
Potassium		377		23.9	35.9
Selenium		2.2	J B	0.48	4.8
Silver		ND		0.24	0.60
Sodium		100	J	15.5	167
Thallium		ND		0.36	7.2
Vanadium		12.6		0.13	0.60
Zinc		86.5	B	0.18	2.4

Analysis Method:	6010C	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	+0.5293 g
Analysis Date:	11/15/2013 1343			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		1.4	J	0.48	2.4
Iron		14100		1.3	12.0
Manganese		1190		0.038	0.24

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6381 g
Analysis Date:	11/12/2013 1300			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.043		0.0096	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD821**

Lab Sample ID: 480-49854-21 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 29.9 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5392 g
Analysis Date:	11/14/2013 1016			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3140		5.8	13.2
Antimony		ND		0.53	19.8
Arsenic		ND		0.53	2.6
Barium		76.5		0.15	0.66
Beryllium		0.17	J	0.037	0.26
Cadmium		0.14	J	0.040	0.26
Calcium		2720	B	4.4	66.1
Chromium		39.8		0.26	0.66
Cobalt		13.6		0.066	0.66
Copper		53.7		0.28	1.3
Iron		9030		1.5	13.2
Lead		12.0		0.32	1.3
Magnesium		2930		1.2	26.4
Manganese		339		0.042	0.26
Nickel		62.2		0.30	6.6
Potassium		276		26.4	39.7
Selenium		1.8	J	0.53	5.3
Silver		ND		0.26	0.66
Sodium		121	J	17.2	185
Thallium		ND		0.40	7.9
Vanadium		16.3		0.15	0.66
Zinc		50.4	B	0.20	2.6

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6457 g
Analysis Date:	11/12/2013 1302			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.072		0.011	0.027

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD822**

Lab Sample ID: 480-49854-22 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 18.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5196 g
Analysis Date:	11/14/2013 1019			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3960		5.2	11.8
Antimony		ND		0.47	17.7
Arsenic		0.70	J	0.47	2.4
Barium		82.8		0.13	0.59
Beryllium		0.21	J	0.033	0.24
Cadmium		0.18	J	0.035	0.24
Calcium		2970	B	3.9	58.9
Chromium		37.6		0.24	0.59
Cobalt		17.3		0.059	0.59
Copper		144		0.25	1.2
Iron		12600		1.3	11.8
Lead		16.1		0.28	1.2
Magnesium		4490		1.1	23.6
Manganese		600		0.038	0.24
Nickel		77.0		0.27	5.9
Potassium		429		23.6	35.4
Selenium		1.5	J	0.47	4.7
Silver		ND		0.24	0.59
Sodium		105	J	15.3	165
Thallium		ND		0.35	7.1
Vanadium		14.7		0.13	0.59
Zinc		78.4	B	0.18	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6406 g
Analysis Date:	11/12/2013 1303			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.052		0.0093	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD823**

Lab Sample ID: 480-49854-23 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 17.9 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4994 g
Analysis Date:	11/14/2013 1021			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3540		5.4	12.2
Antimony		ND		0.49	18.3
Arsenic		0.57	J	0.49	2.4
Barium		73.4		0.13	0.61
Beryllium		0.17	J	0.034	0.24
Cadmium		0.099	J	0.037	0.24
Calcium		2950	B	4.0	61.0
Chromium		30.2		0.24	0.61
Cobalt		10.3		0.061	0.61
Copper		61.0		0.26	1.2
Iron		11200		1.3	12.2
Lead		10.9		0.29	1.2
Magnesium		3770		1.1	24.4
Manganese		315		0.039	0.24
Nickel		45.3		0.28	6.1
Potassium		325		24.4	36.6
Selenium		0.82	J	0.49	4.9
Silver		ND		0.24	0.61
Sodium		164	J	15.9	171
Thallium		ND		0.37	7.3
Vanadium		10.0		0.13	0.61
Zinc		53.6	B	0.19	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5941 g
Analysis Date:	11/12/2013 1305			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.030		0.010	0.025

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD824**

Lab Sample ID: 480-49854-24 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 10.4 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4748 g
Analysis Date:	11/14/2013 1033			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3070		5.2	11.8
Antimony		ND		0.47	17.6
Arsenic		0.56	J	0.47	2.4
Barium		85.4		0.13	0.59
Beryllium		0.18	J	0.033	0.24
Cadmium		0.12	J	0.035	0.24
Calcium		3260	B	3.9	58.8
Chromium		32.4		0.24	0.59
Cobalt		13.4		0.059	0.59
Copper		58.3		0.25	1.2
Iron		11500		1.3	11.8
Lead		10.1		0.28	1.2
Magnesium		3820		1.1	23.5
Manganese		630		0.038	0.24
Nickel		54.0		0.27	5.9
Potassium		290		23.5	35.3
Selenium		1.3	J	0.47	4.7
Silver		ND		0.24	0.59
Sodium		117	J	15.3	165
Thallium		ND		0.35	7.1
Vanadium		10.3		0.13	0.59
Zinc		66.4	B	0.18	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6145 g
Analysis Date:	11/12/2013 1307			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.036		0.0088	0.022

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD825**

Lab Sample ID: 480-49854-25 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 15.9 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4504 g
Analysis Date:	11/14/2013 1043			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		8650		5.8	13.2
Antimony		ND		0.53	19.8
Arsenic		3.7		0.53	2.6
Barium		160		0.15	0.66
Beryllium		0.40		0.037	0.26
Cadmium		0.32		0.040	0.26
Calcium		4180	B	4.4	66.0
Chromium		65.8		0.26	0.66
Cobalt		33.2		0.066	0.66
Copper		267		0.28	1.3
Iron		27400		1.5	13.2
Lead		34.0		0.32	1.3
Magnesium		5440		1.2	26.4
Manganese		1820		0.042	0.26
Nickel		145		0.30	6.6
Potassium		487		26.4	39.6
Selenium		3.6	J	0.53	5.3
Silver		ND		0.26	0.66
Sodium		213		17.2	185
Thallium		ND		0.40	7.9
Vanadium		29.4		0.15	0.66
Zinc		153	B	0.20	2.6

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5892 g
Analysis Date:	11/12/2013 1308			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.12		0.0098	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD826**

Lab Sample ID: 480-49854-26 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 17.3 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5063 g
Analysis Date:	11/14/2013 1045			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3540		5.3	11.9
Antimony		ND		0.48	17.9
Arsenic		0.63	J	0.48	2.4
Barium		74.6		0.13	0.60
Beryllium		0.20	J	0.033	0.24
Cadmium		0.19	J	0.036	0.24
Calcium		2570	B	3.9	59.7
Chromium		37.6		0.24	0.60
Cobalt		16.3		0.060	0.60
Copper		83.1		0.25	1.2
Iron		9690		1.3	11.9
Lead		12.6		0.29	1.2
Magnesium		3260		1.1	23.9
Manganese		154		0.038	0.24
Nickel		68.4		0.27	6.0
Potassium		265		23.9	35.8
Selenium		1.3	J	0.48	4.8
Silver		ND		0.24	0.60
Sodium		200		15.5	167
Thallium		ND		0.36	7.2
Vanadium		13.6		0.13	0.60
Zinc		98.1	B	0.18	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6432 g
Analysis Date:	11/12/2013 1315			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.053		0.0091	0.023

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD827**

Lab Sample ID: 480-49854-27 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 19.1 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4631 g
Analysis Date:	11/14/2013 1048			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4630		5.9	13.3
Antimony		ND		0.53	20.0
Arsenic		ND		0.53	2.7
Barium		88.2		0.15	0.67
Beryllium		0.23	J	0.037	0.27
Cadmium		0.16	J	0.040	0.27
Calcium		2970	B	4.4	66.7
Chromium		44.5		0.27	0.67
Cobalt		15.2		0.067	0.67
Copper		90.7		0.28	1.3
Iron		13500		1.5	13.3
Lead		14.4		0.32	1.3
Magnesium		4840		1.2	26.7
Manganese		362		0.043	0.27
Nickel		69.2		0.31	6.7
Potassium		368		26.7	40.0
Selenium		1.0	J	0.53	5.3
Silver		ND		0.27	0.67
Sodium		104	J	17.4	187
Thallium		ND		0.40	8.0
Vanadium		14.3		0.15	0.67
Zinc		97.2	B	0.20	2.7

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.5948 g
Analysis Date:	11/12/2013 1317			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.050		0.010	0.025

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD828**

Lab Sample ID: 480-49854-28 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 24.1 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4642 g
Analysis Date:	11/14/2013 1050			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3320		6.2	14.2
Antimony		ND		0.57	21.3
Arsenic		0.58	J	0.57	2.8
Barium		147		0.16	0.71
Beryllium		0.19	J	0.040	0.28
Cadmium		0.18	J	0.043	0.28
Calcium		2830	B	4.7	71.0
Chromium		36.1		0.28	0.71
Cobalt		14.6		0.071	0.71
Copper		86.1		0.30	1.4
Iron		11500		1.6	14.2
Lead		11.9		0.34	1.4
Magnesium		3700		1.3	28.4
Manganese		162		0.045	0.28
Nickel		61.4		0.33	7.1
Potassium		257		28.4	42.6
Selenium		1.4	J	0.57	5.7
Silver		ND		0.28	0.71
Sodium		155	J	18.5	199
Thallium		ND		0.43	8.5
Vanadium		12.8		0.16	0.71
Zinc		94.2	B	0.22	2.8

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6444 g
Analysis Date:	11/12/2013 1319			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.059		0.0099	0.025

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD829**

Lab Sample ID: 480-49854-29 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 20.6 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5150 g
Analysis Date:	11/14/2013 1052			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		1930		5.4	12.2
Antimony		ND		0.49	18.3
Arsenic		1.4	J	0.49	2.4
Barium		134		0.13	0.61
Beryllium		0.16	J	0.034	0.24
Cadmium		0.28		0.037	0.24
Calcium		4700	B	4.0	61.2
Chromium		28.4		0.24	0.61
Cobalt		10.3		0.061	0.61
Copper		88.7		0.26	1.2
Iron		11900		1.3	12.2
Lead		9.2		0.29	1.2
Magnesium		2260		1.1	24.5
Manganese		893		0.039	0.24
Nickel		54.2		0.28	6.1
Potassium		133		24.5	36.7
Selenium		1.5	J	0.49	4.9
Silver		ND		0.24	0.61
Sodium		47.5	J	15.9	171
Thallium		ND		0.37	7.3
Vanadium		8.7		0.13	0.61
Zinc		65.5	B	0.19	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6073 g
Analysis Date:	11/12/2013 1321			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.053		0.010	0.025

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD830**

Lab Sample ID: 480-49854-30 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 16.9 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4694 g
Analysis Date:	11/14/2013 1055			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		6540		5.6	12.8
Antimony		ND		0.51	19.2
Arsenic		0.56	J	0.51	2.6
Barium		127		0.14	0.64
Beryllium		0.32		0.036	0.26
Cadmium		0.27		0.038	0.26
Calcium		3740	B	4.2	64.1
Chromium		75.3		0.26	0.64
Cobalt		14.5		0.064	0.64
Copper		426		0.27	1.3
Iron		13400		1.4	12.8
Lead		30.3		0.31	1.3
Magnesium		4140		1.2	25.6
Manganese		339		0.041	0.26
Nickel		105		0.29	6.4
Potassium		358		25.6	38.5
Selenium		3.3	J	0.51	5.1
Silver		ND		0.26	0.64
Sodium		144	J	16.7	180
Thallium		ND		0.38	7.7
Vanadium		21.3		0.14	0.64
Zinc		80.6	B	0.20	2.6

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6086 g
Analysis Date:	11/12/2013 1322			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.12		0.0096	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD831**

Lab Sample ID: 480-49854-31 Date Sampled: 11/07/2013 1603
Client Matrix: Solid % Moisture: 15.5 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5062 g
Analysis Date:	11/14/2013 1057			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		4260		5.1	11.7
Antimony		ND		0.47	17.5
Arsenic		0.57	J	0.47	2.3
Barium		89.6		0.13	0.58
Beryllium		0.21	J	0.033	0.23
Cadmium		0.18	J	0.035	0.23
Calcium		2680	B	3.9	58.5
Chromium		43.7		0.23	0.58
Cobalt		14.7		0.058	0.58
Copper		126		0.25	1.2
Iron		10400		1.3	11.7
Lead		17.3		0.28	1.2
Magnesium		2610		1.1	23.4
Manganese		281		0.037	0.23
Nickel		70.2		0.27	5.8
Potassium		280		23.4	35.1
Selenium		2.0	J	0.47	4.7
Silver		ND		0.23	0.58
Sodium		97.4	J	15.2	164
Thallium		ND		0.35	7.0
Vanadium		14.8		0.13	0.58
Zinc		75.8	B	0.18	2.3

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6016 g
Analysis Date:	11/12/2013 1324			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.068		0.0096	0.024

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD806 DUP**

Lab Sample ID: 480-49854-32 Date Sampled: 11/08/2013 1110
Client Matrix: Solid % Moisture: 13.6 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4890 g
Analysis Date:	11/14/2013 1059			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		3130		5.2	11.8
Antimony		ND		0.47	17.7
Arsenic		2.0	J	0.47	2.4
Barium		50.2		0.13	0.59
Beryllium		0.15	J	0.033	0.24
Cadmium		ND		0.035	0.24
Calcium		1550	B	3.9	59.1
Chromium		17.3		0.24	0.59
Cobalt		7.6		0.059	0.59
Copper		12.9		0.25	1.2
Iron		13500		1.3	11.8
Lead		4.1		0.28	1.2
Magnesium		4230		1.1	23.7
Manganese		454		0.038	0.24
Nickel		27.6		0.27	5.9
Potassium		449		23.7	35.5
Selenium		ND		0.47	4.7
Silver		ND		0.24	0.59
Sodium		54.4	J	15.4	166
Thallium		ND		0.35	7.1
Vanadium		16.4		0.13	0.59
Zinc		61.1	B	0.18	2.4

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6436 g
Analysis Date:	11/12/2013 1326			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0087	0.022

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD816 DUP**

Lab Sample ID: 480-49854-33 Date Sampled: 11/07/2013 1604
Client Matrix: Solid % Moisture: 10.5 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.4982 g
Analysis Date:	11/14/2013 1102			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		2840		4.9	11.2
Antimony		ND		0.45	16.8
Arsenic		ND		0.45	2.2
Barium		33.5		0.12	0.56
Beryllium		0.14	J	0.031	0.22
Cadmium		0.034	J	0.034	0.22
Calcium		1110	B	3.7	56.1
Chromium		14.7		0.22	0.56
Cobalt		7.0		0.056	0.56
Copper		14.1		0.24	1.1
Iron		10000		1.2	11.2
Lead		3.0		0.27	1.1
Magnesium		4850		1.0	22.4
Manganese		113		0.036	0.22
Nickel		39.2		0.26	5.6
Potassium		346		22.4	33.6
Selenium		ND		0.45	4.5
Silver		ND		0.22	0.56
Sodium		65.0	J	14.6	157
Thallium		ND		0.34	6.7
Vanadium		7.4		0.12	0.56
Zinc		39.6	B	0.17	2.2

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6661 g
Analysis Date:	11/12/2013 1328			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		ND		0.0082	0.020

Client: New York State D.E.C. Job Number: 480-49854-1

Client Sample ID: **SD825 DUP**

Lab Sample ID: 480-49854-34 Date Sampled: 11/07/2013 1604
Client Matrix: Solid % Moisture: 29.0 Date Received: 11/09/2013 0130

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Prep Method:	3050B	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0			Initial Weight/Volume:	+0.5048 g
Analysis Date:	11/14/2013 1111			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Aluminum		10700		6.1	13.9
Antimony		ND		0.56	20.9
Arsenic		3.4		0.56	2.8
Barium		166		0.15	0.70
Beryllium		0.47		0.039	0.28
Cadmium		0.43		0.042	0.28
Calcium		4830	B	4.6	69.7
Chromium		82.3		0.28	0.70
Cobalt		37.4		0.070	0.70
Copper		314		0.29	1.4
Iron		35100		1.5	13.9
Lead		39.5		0.33	1.4
Magnesium		6730		1.3	27.9
Manganese		947		0.045	0.28
Nickel		183		0.32	7.0
Potassium		613		27.9	41.8
Selenium		3.2	J	0.56	5.6
Silver		ND		0.28	0.70
Sodium		281		18.1	195
Thallium		ND		0.42	8.4
Vanadium		37.1		0.15	0.70
Zinc		173	B	0.21	2.8

7471B Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Analysis Method:	7471B	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Prep Method:	7471B	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0			Initial Weight/Volume:	+0.6145 g
Analysis Date:	11/12/2013 1330			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.14		0.011	0.027

General Chemistry

Client Sample ID: **SD801**

Lab Sample ID: 480-49854-1 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	13		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	87		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD802**

Lab Sample ID: 480-49854-2 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD803**

Lab Sample ID: 480-49854-3 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	31		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	69		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD804**

Lab Sample ID: 480-49854-4 Date Sampled: 11/08/2013 1110

Client Matrix: Solid % Moisture: 23.7 Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Cr (VI)	ND		mg/Kg	0.64	2.5	1.0	7196A
Analysis Batch: 460-192123	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-191936	Prep Date: 11/13/2013 1349						
Cr (VI)	ND		mg/Kg	0.63	2.5	1.0	7196A
Analysis Batch: 460-192130	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-192112	Prep Date: 11/13/2013 1130						

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	24		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	76		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD805**

Lab Sample ID: 480-49854-5 Date Sampled: 11/08/2013 1110

Client Matrix: Solid % Moisture: 28.2 Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Cr (VI)	ND		mg/Kg	0.70	2.8	1.0	7196A
Analysis Batch: 460-192123	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-191936	Prep Date: 11/13/2013 1349						
Cr (VI)	ND		mg/Kg	0.67	2.7	1.0	7196A
Analysis Batch: 460-192130	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-192112	Prep Date: 11/13/2013 1130						

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	28		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	72		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD806**

Lab Sample ID: 480-49854-6 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	11		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	89		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD807**

Lab Sample ID: 480-49854-7 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	41		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	59		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD808**

Lab Sample ID: 480-49854-8 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	88		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD809**

Lab Sample ID: 480-49854-9 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	82		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD810**

Lab Sample ID: 480-49854-10 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	11		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	89		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD811**

Lab Sample ID: 480-49854-11 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	90		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD812**

Lab Sample ID: 480-49854-12 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	90		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD813**

Lab Sample ID: 480-49854-13 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	13		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	87		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD814**

Lab Sample ID: 480-49854-14 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD815**

Lab Sample ID: 480-49854-15 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	24		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	76		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD816**

Lab Sample ID: 480-49854-16 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD817**

Lab Sample ID: 480-49854-17 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	28		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	72		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD818**

Lab Sample ID: 480-49854-18 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD819**

Lab Sample ID: 480-49854-19 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	84		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD820**

Lab Sample ID: 480-49854-20 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	21		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	79		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD821**

Lab Sample ID: 480-49854-21 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	30		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	70		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD822**

Lab Sample ID: 480-49854-22 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	82		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD823**

Lab Sample ID: 480-49854-23 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	82		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD824**

Lab Sample ID: 480-49854-24 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	90		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD825**

Lab Sample ID: 480-49854-25 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	84		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD826**

Lab Sample ID: 480-49854-26 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD827**

Lab Sample ID: 480-49854-27 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	19		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	81		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD828**

Lab Sample ID: 480-49854-28 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	24		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	76		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD829**

Lab Sample ID: 480-49854-29 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	21		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	79		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD830**

Lab Sample ID: 480-49854-30 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	17		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	83		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD831**

Lab Sample ID: 480-49854-31 Date Sampled: 11/07/2013 1603

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	84		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD806 DUP**

Lab Sample ID: 480-49854-32 Date Sampled: 11/08/2013 1110

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	14		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	86		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD816 DUP**

Lab Sample ID: 480-49854-33 Date Sampled: 11/07/2013 1604

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	90		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD825 DUP**

Lab Sample ID: 480-49854-34 Date Sampled: 11/07/2013 1604

Client Matrix: Solid Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	29		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N
Percent Solids	71		%	0.10	0.10	1.0	Moisture
Analysis Batch: 480-151293	Analysis Date: 11/11/2013 1606						DryWt Corrected: N

General Chemistry

Client Sample ID: **SD805 DUP**

Lab Sample ID: 480-49854-35 Date Sampled: 11/08/2013 0939

Client Matrix: Solid % Moisture: 37.0 Date Received: 11/09/2013 0130

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Cr (VI)	ND		mg/Kg	0.78	3.1	1.0	7196A
Analysis Batch: 460-192123	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-191936	Prep Date: 11/13/2013 1349						
Cr (VI)	ND		mg/Kg	0.78	3.1	1.0	7196A
Analysis Batch: 460-192130	Analysis Date: 11/13/2013 1645						DryWt Corrected: Y
Prep Batch: 460-192112	Prep Date: 11/13/2013 1130						

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	37		%	1.0	1.0	1.0	Moisture
Analysis Batch: 460-191803	Analysis Date: 11/12/2013 2011						DryWt Corrected: N
Percent Solids	63		%	1.0	1.0	1.0	Moisture
Analysis Batch: 460-191803	Analysis Date: 11/12/2013 2011						DryWt Corrected: N

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	MB 480-151394/1-A	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4601 g
Analysis Date:	11/14/2013 1650	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	ND		4.8	10.9
Antimony	ND		0.43	16.3
Arsenic	ND		0.43	2.2
Barium	ND		0.12	0.54
Beryllium	ND		0.030	0.22
Cadmium	ND		0.033	0.22
Calcium	4.41	J	3.6	54.3
Chromium	ND		0.22	0.54
Cobalt	ND		0.054	0.54
Copper	ND		0.23	1.1
Iron	ND		1.2	10.9
Lead	ND		0.26	1.1
Magnesium	ND		1.0	21.7
Manganese	ND		0.035	0.22
Nickel	ND		0.25	5.4
Potassium	ND		21.7	32.6
Selenium	0.462	J	0.43	4.3
Silver	ND		0.22	0.54
Sodium	ND		14.1	152
Thallium	ND		0.33	6.5
Vanadium	ND		0.12	0.54
Zinc	0.321	J	0.17	2.2

Client: New York State D.E.C. Job Number: 480-49854-1

LCS-Certified Reference Material - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	LCSSRM 480-151394/2-A	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5008 g
Analysis Date:	11/14/2013 1653	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	8830	7162	81.1	42.0 - 158.4	
Antimony	88.1	89.07	101.1	26.3 - 289.1	
Arsenic	99.4	100.3	100.9	69.3 - 130.5	
Barium	310	315.6	102.0	74.2 - 126.1	
Beryllium	72.2	71.51	99.1	73.9 - 126.1	
Cadmium	182	181.5	99.9	73.6 - 126.4	
Calcium	6780	6616	97.6	74.2 - 125.8	
Chromium	136	130.1	95.8	70.4 - 130.1	
Cobalt	128	131.8	103.1	74.1 - 125.0	
Copper	102	103.1	101.2	74.3 - 126.5	
Iron	12600	10630	84.5	31.0 - 168.3	
Lead	115	113.8	99.1	72.1 - 128.7	
Magnesium	3010	2641	87.9	66.1 - 133.9	
Manganese	322	307.5	95.4	74.9 - 125.1	
Nickel	153	155.4	101.8	73.2 - 126.1	
Potassium	2840	2779	98.0	62.0 - 138.0	
Selenium	150	151.9	101.4	67.3 - 132.7	
Silver	40.3	38.00	94.2	65.8 - 133.7	
Sodium	2760	2767	100.4	65.9 - 134.1	
Thallium	174	174.8	100.6	69.0 - 131.6	
Vanadium	97.4	93.30	95.8	65.2 - 135.2	
Zinc	161	149.2	92.8	68.3 - 131.7	

Client: New York State D.E.C. Job Number: 480-49854-1

Post Digestion Spike - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-2	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4587 g
Analysis Date:	11/14/2013 1708	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	4460		2630	6984	96	75 - 125	
Antimony	ND		52.5	56.84	108	75 - 125	
Arsenic	2.1	J	52.5	59.38	109	75 - 125	
Barium	59.3		52.5	113.0	102	75 - 125	
Beryllium	0.12	J	52.5	56.83	108	75 - 125	
Cadmium	ND		52.5	56.96	109	75 - 125	
Calcium	1930		2630	4671	105	75 - 125	
Chromium	17.5		52.5	73.14	106	75 - 125	
Cobalt	12.1		52.5	70.09	110	75 - 125	
Copper	21.7		52.5	78.23	108	75 - 125	
Iron	12800		2630	15250	93	75 - 125	
Magnesium	4530		2630	7129	99	75 - 125	
Manganese	139		52.5	190.1	97	75 - 125	
Nickel	30.7		52.5	85.97	105	75 - 125	
Potassium	737		2630	3411	102	75 - 125	
Selenium	1.1	J	52.5	58.81	110	75 - 125	
Sodium	70.5	J	2630	2653	98	75 - 125	
Thallium	ND		52.5	55.91	106	75 - 125	
Vanadium	17.7		52.5	74.13	107	75 - 125	
Zinc	82.1		52.5	132.3	96	75 - 125	

Post Digestion Spike - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-3	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4720 g
Analysis Date:	11/15/2013 1250	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Lead	10.1	61.8	102.6	150	75 - 125	W
Silver	ND	15.4	13.60	88	75 - 125	

Client: New York State D.E.C. Job Number: 480-49854-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151394

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-2	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4967 g
Analysis Date:	11/14/2013 1710			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

MSD Lab Sample ID:	480-49854-2	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5031 g
Analysis Date:	11/14/2013 1713			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Aluminum	170	170	75 - 125	0	20	F	F
Antimony	84	80	75 - 125	6	20		
Arsenic	96	96	75 - 125	1	20		
Barium	111	116	75 - 125	2	20		
Beryllium	96	96	75 - 125	1	20		
Cadmium	97	96	75 - 125	2	20		
Calcium	144	149	75 - 125	1	20	F	F
Chromium	108	109	75 - 125	1	20		
Cobalt	98	99	75 - 125	0	20		
Copper	102	102	75 - 125	1	20		
Iron	98	143	75 - 125	7	20	4	4
Magnesium	121	118	75 - 125	1	20		
Manganese	59	142	75 - 125	21	20	F	F
Nickel	101	101	75 - 125	1	20		
Potassium	108	108	75 - 125	1	20		
Selenium	97	95	75 - 125	4	20		
Sodium	103	104	75 - 125	0	20		
Thallium	95	95	75 - 125	1	20		
Vanadium	109	110	75 - 125	0	20		
Zinc	103	108	75 - 125	1	20		

Client: New York State D.E.C. Job Number: 480-49854-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151394

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-2	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4967 g
Analysis Date:	11/15/2013 1240			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

MSD Lab Sample ID:	480-49854-2	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5031 g
Analysis Date:	11/15/2013 1243			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Lead	100	99	75 - 125	2	20		
Silver	98	98	75 - 125	1	20		

Client: New York State D.E.C. Job Number: 480-49854-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151394

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-2	Units:	mg/Kg	MSD Lab Sample ID:	480-49854-2
Client Matrix:	Solid			Client Matrix:	Solid
Dilution:	1.0			Dilution:	1.0
Analysis Date:	11/14/2013 1710			Analysis Date:	11/14/2013 1713
Prep Date:	11/12/2013 1030			Prep Date:	11/12/2013 1030
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
Aluminum	4460		2420	2390	8582	F	8544	F
Antimony	ND		48.5	47.9	40.81		38.44	
Arsenic	2.1	J	48.5	47.9	48.52		48.11	
Barium	59.3		48.5	47.9	113.2		115.0	
Beryllium	0.12	J	48.5	47.9	46.58		46.06	
Cadmium	ND		48.5	47.9	46.80		46.03	
Calcium	1930		2420	2390	5410	F	5483	F
Chromium	17.5		48.5	47.9	69.89		69.48	
Cobalt	12.1		48.5	47.9	59.44		59.68	
Copper	21.7		48.5	47.9	71.24		70.46	
Iron	12800		2420	2390	15180	4	16240	4
Magnesium	4530		2420	2390	7458		7353	
Manganese	139		48.5	47.9	167.8	F	207.4	F
Nickel	30.7		48.5	47.9	79.61		79.12	
Potassium	737		2430	2390	3359		3330	
Selenium	1.1	J	48.5	47.9	48.29		46.45	
Sodium	70.5	J	2430	2400	2574		2567	
Thallium	ND		48.5	47.9	45.86		45.33	
Vanadium	17.7		48.5	47.9	70.63		70.36	
Zinc	82.1		48.5	47.9	131.9		133.7	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151394

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-2	Units:	mg/Kg	MSD Lab Sample ID:	480-49854-2
Client Matrix:	Solid			Client Matrix:	Solid
Dilution:	1.0			Dilution:	1.0
Analysis Date:	11/15/2013 1240			Analysis Date:	11/15/2013 1243
Prep Date:	11/12/2013 1030			Prep Date:	11/12/2013 1030
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Lead	8.1	48.5	47.9	56.60	55.67
Silver	ND	12.1	12.0	11.83	11.70

Client: New York State D.E.C. Job Number: 480-49854-1

Serial Dilution - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-2	Analysis Batch:	480-152314	Instrument ID:	ICAP2
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	I2111413A-11.asc
Dilution:	5.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4587 g
Analysis Date:	11/14/2013 1706	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	%Diff	Limit	Qual
Aluminum	4460		4587	2.7	10	
Antimony	ND		ND	NC	10	
Arsenic	2.1	J	ND	NC	10	
Barium	59.3		61.29	3.4	10	
Beryllium	0.12	J	ND	NC	10	
Cadmium	ND		ND	NC	10	
Calcium	1930		2030	5.4	10	
Chromium	17.5		17.69	1.2	10	
Cobalt	12.1		11.99	0.99	10	
Copper	21.7		22.75	4.9	10	
Iron	12800		13620	6.3	10	
Magnesium	4530		4786	5.6	10	
Manganese	139		147.5	5.9	10	
Nickel	30.7		30.73	0.03	10	J
Potassium	737		750.4	1.8	10	
Selenium	1.1	J	4.44	NC	10	J
Sodium	70.5	J	86.62	NC	10	J
Thallium	ND		ND	NC	10	
Vanadium	17.7		18.30	3.2	10	
Zinc	82.1		85.99	4.7	10	

Serial Dilution - Batch: 480-151394

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-3	Analysis Batch:	480-152587	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151394	Lab File ID:	N/A
Dilution:	5.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4720 g
Analysis Date:	11/15/2013 1247	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	%Diff	Limit	Qual
Lead	10.1	11.51	13	10	V
Silver	ND	ND	NC	10	

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 480-151401

Method: 6010C
Preparation: 3050B

Lab Sample ID:	MB 480-151401/1-A	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4806 g
Analysis Date:	11/14/2013 1004	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Aluminum	ND		4.6	10.4
Antimony	ND		0.42	15.6
Arsenic	ND		0.42	2.1
Barium	ND		0.11	0.52
Beryllium	ND		0.029	0.21
Cadmium	ND		0.031	0.21
Calcium	4.28	J	3.4	52.0
Chromium	ND		0.21	0.52
Cobalt	ND		0.052	0.52
Copper	ND		0.22	1.0
Iron	ND		1.1	10.4
Lead	ND		0.25	1.0
Magnesium	ND		0.96	20.8
Manganese	ND		0.033	0.21
Nickel	ND		0.24	5.2
Potassium	ND		20.8	31.2
Selenium	ND		0.42	4.2
Silver	ND		0.21	0.52
Sodium	ND		13.5	146
Thallium	ND		0.31	6.2
Vanadium	ND		0.11	0.52
Zinc	0.379	J	0.16	2.1

Client: New York State D.E.C. Job Number: 480-49854-1

LCS-Certified Reference Material - Batch: 480-151401

Method: 6010C
Preparation: 3050B

Lab Sample ID:	LCSSRM 480-151401/2-A	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5000 g
Analysis Date:	11/14/2013 1014	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	8840	7099	80.3	42.0 - 158.4	
Antimony	88.2	63.62	72.1	26.3 - 289.1	
Arsenic	99.6	93.21	93.6	69.3 - 130.5	
Barium	310	285.2	92.0	74.2 - 126.1	
Beryllium	72.3	68.99	95.4	73.9 - 126.1	
Cadmium	182	168.2	92.4	73.6 - 126.4	
Calcium	6790	6135	90.4	74.2 - 125.8	
Chromium	136	125.7	92.5	70.4 - 130.1	
Cobalt	128	125.7	98.2	74.1 - 125.0	
Copper	102	98.30	96.4	74.3 - 126.5	
Iron	12600	9496	75.4	31.0 - 168.3	
Lead	115	113.0	98.3	72.1 - 128.7	
Magnesium	3010	2516	83.6	66.1 - 133.9	
Manganese	323	288.7	89.4	74.9 - 125.1	
Nickel	153	152.7	99.8	73.2 - 126.1	
Potassium	2840	2533	89.2	62.0 - 138.0	
Selenium	150	141.8	94.6	67.3 - 132.7	
Silver	40.4	36.40	90.1	65.8 - 133.7	
Sodium	2760	2642	95.7	65.9 - 134.1	
Thallium	174	168.7	96.9	69.0 - 131.6	
Vanadium	97.6	87.74	89.9	65.2 - 135.2	
Zinc	161	142.9	88.7	68.3 - 131.7	

Client: New York State D.E.C. Job Number: 480-49854-1

Post Digestion Spike - Batch: 480-151401

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-23	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4994 g
Analysis Date:	11/14/2013 1026	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	3540		2440	5634	86	75 - 125	
Antimony	ND		48.8	36.96	76	75 - 125	
Arsenic	0.57	J	48.8	37.67	76	75 - 125	
Barium	73.4		48.8	113.6	82	75 - 125	
Beryllium	0.17	J	48.8	46.24	94	75 - 125	
Cadmium	0.099	J	48.8	37.02	76	75 - 125	
Calcium	2950		2440	4984	84	75 - 125	
Chromium	30.2		48.8	71.72	85	75 - 125	
Cobalt	10.3		48.8	49.25	80	75 - 125	
Copper	61.0		48.8	100.2	80	75 - 125	
Iron	11200		2440	12700	62	75 - 125	W
Lead	10.9		48.8	48.27	77	75 - 125	
Magnesium	3770		2440	5700	79	75 - 125	
Manganese	315		48.8	340.3	52	75 - 125	W
Nickel	45.3		48.8	82.27	76	75 - 125	
Potassium	325		2440	2325	82	75 - 125	
Selenium	0.82	J	48.8	36.64	73	75 - 125	W
Silver	ND		12.2	9.69	79	75 - 125	
Sodium	164	J	2440	2213	84	75 - 125	
Thallium	ND		48.8	36.42	75	75 - 125	
Vanadium	10.0		48.8	52.73	88	75 - 125	
Zinc	53.6		48.8	89.82	74	75 - 125	W

Client: New York State D.E.C. Job Number: 480-49854-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151401

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-23	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5145 g
Analysis Date:	11/14/2013 1028			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

MSD Lab Sample ID:	480-49854-23	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.5377 g
Analysis Date:	11/14/2013 1031			Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Aluminum	139	138	75 - 125	3	20	F	F
Antimony	85	84	75 - 125	5	20		
Arsenic	97	96	75 - 125	5	20		
Barium	167	144	75 - 125	9	20	F	F
Beryllium	99	99	75 - 125	4	20		
Cadmium	95	95	75 - 125	5	20		
Calcium	116	128	75 - 125	3	20		F
Chromium	117	120	75 - 125	1	20		
Cobalt	100	99	75 - 125	4	20		
Copper	149	140	75 - 125	6	20	F	F
Iron	136	99	75 - 125	7	20	4	4
Lead	101	100	75 - 125	4	20		
Magnesium	73	91	75 - 125	6	20	F	
Manganese	296	322	75 - 125	1	20	4	4
Nickel	121	109	75 - 125	8	20		
Potassium	102	104	75 - 125	2	20		
Selenium	95	93	75 - 125	7	20		
Silver	95	97	75 - 125	3	20		
Sodium	100	102	75 - 125	3	20		
Thallium	94	96	75 - 125	3	20		
Vanadium	106	106	75 - 125	3	20		
Zinc	107	88	75 - 125	11	20		

Client: New York State D.E.C. Job Number: 480-49854-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 480-151401

Method: 6010C
Preparation: 3050B

MS Lab Sample ID:	480-49854-23	Units:	mg/Kg	MSD Lab Sample ID:	480-49854-23
Client Matrix:	Solid			Client Matrix:	Solid
Dilution:	1.0			Dilution:	1.0
Analysis Date:	11/14/2013 1028			Analysis Date:	11/14/2013 1031
Prep Date:	11/12/2013 1030			Prep Date:	11/12/2013 1030
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
Aluminum	3540		2370	2270	6835	F	6664	F
Antimony	ND		47.4	45.3	40.10		38.08	
Arsenic	0.57	J	47.4	45.3	46.62		44.16	
Barium	73.4		47.4	45.3	152.6	F	138.7	F
Beryllium	0.17	J	47.4	45.3	46.95		44.95	
Cadmium	0.099	J	47.4	45.3	45.10		43.00	
Calcium	2950		2370	2270	5688		5843	F
Chromium	30.2		47.4	45.3	85.60		84.61	
Cobalt	10.3		47.4	45.3	57.52		55.36	
Copper	61.0		47.4	45.3	131.5	F	124.3	F
Iron	11200		2370	2270	14400	4	13410	4
Lead	10.9		47.4	45.3	58.94		56.43	
Magnesium	3770		2370	2270	5490	F	5818	
Manganese	315		47.4	45.3	455.4	4	460.8	4
Nickel	45.3		47.4	45.3	102.4		94.78	
Potassium	325		2370	2270	2740		2672	
Selenium	0.82	J	47.4	45.3	45.85		42.89	
Silver	ND		11.8	11.3	11.26		10.94	
Sodium	164	J	2370	2270	2540		2476	
Thallium	ND		47.4	45.3	44.56		43.30	
Vanadium	10.0		47.4	45.3	60.31		58.27	
Zinc	53.6		47.4	45.3	104.1		93.52	

Client: New York State D.E.C. Job Number: 480-49854-1

Serial Dilution - Batch: 480-151401

Method: 6010C
Preparation: 3050B

Lab Sample ID:	480-49854-23	Analysis Batch:	480-152283	Instrument ID:	ICAP1
Client Matrix:	Solid	Prep Batch:	480-151401	Lab File ID:	I1111413A-1.asc
Dilution:	5.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4994 g
Analysis Date:	11/14/2013 1024	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 1030				
Leach Date:	N/A				

Analyte	Sample Result/Qual		Result	%Diff	Limit	Qual
Aluminum	3540		3545	0.23	10	
Antimony	ND		ND	NC	10	
Arsenic	0.57	J	ND	NC	10	
Barium	73.4		77.38	5.4	10	
Beryllium	0.17	J	0.207	NC	10	J
Cadmium	0.099	J	ND	NC	10	
Calcium	2950		3002	1.9	10	
Chromium	30.2		30.84	2.0	10	
Cobalt	10.3		10.20	1.0	10	
Copper	61.0		61.65	1.1	10	
Iron	11200		11240	0.58	10	
Lead	10.9		11.42	4.8	10	
Magnesium	3770		3916	4.0	10	
Manganese	315		330.5	4.9	10	
Nickel	45.3		45.51	0.48	10	
Potassium	325		302.2	NC	10	
Selenium	0.82	J	ND	NC	10	
Silver	ND		ND	NC	10	
Sodium	164	J	154.9	NC	10	J
Thallium	ND		ND	NC	10	
Vanadium	10.0		10.11	0.97	10	
Zinc	53.6		55.61	3.8	10	

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 480-151269

Method: 7471B
Preparation: 7471B

Lab Sample ID:	MB 480-151269/1-A	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Client Matrix:	Solid	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.6311 g
Analysis Date:	11/12/2013 1152	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	ND		0.0077	0.019

LCS-Certified Reference Material/
LCSD - Certified Reference Material Recovery Report - Batch: 480-151269

Method: 7471B
Preparation: 7471B

LCS Lab Sample ID:	LCSSRM 480-151269/2-A	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Client Matrix:	Solid	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.0532 g
Analysis Date:	11/12/2013 1154	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCDSRM 480-151269/3-A	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Client Matrix:	Solid	Prep Batch:	480-151269	Lab File ID:	J11123S1.PRN
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.0531 g
Analysis Date:	11/12/2013 1156	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Mercury	103.7	118.9	50.9 - 149.1	14	20		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 480-151269

Method: 7471B
Preparation: 7471B

LCS Lab Sample ID:	LCSSRM 480-151269/2-A	Units:	mg/Kg
Client Matrix:	Solid		
Dilution:	1.0		
Analysis Date:	11/12/2013 1154		
Prep Date:	11/12/2013 0715		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCDSRM 480-151269/3-A
Client Matrix:	Solid
Dilution:	1.0
Analysis Date:	11/12/2013 1156
Prep Date:	11/12/2013 0715
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Mercury	3.77	3.77	3.91	4.48

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 480-151288

Method: 7471B
Preparation: 7471B

Lab Sample ID:	MB 480-151288/1-A	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Client Matrix:	Solid	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.6540 g
Analysis Date:	11/12/2013 1253	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Mercury	ND		0.0074	0.018

LCS-Certified Reference Material - Batch: 480-151288

Method: 7471B
Preparation: 7471B

Lab Sample ID:	LCSSRM 480-151288/2-A	Analysis Batch:	480-151516	Instrument ID:	LEEMAN3
Client Matrix:	Solid	Prep Batch:	480-151288	Lab File ID:	J11123S1.PRN
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.0532 g
Analysis Date:	11/12/2013 1255	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	11/12/2013 0715				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	3.77	4.03	106.9	50.9 - 149.1	

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 460-191936

Method: 7196A
Preparation: 3060A

Lab Sample ID:	MB 460-191936/1-A	Analysis Batch:	460-192123	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-191936	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1455	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1349				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Cr (VI)	ND		0.50	2.0

Lab Control Sample Insoluble - Batch: 460-191936

Method: 7196A
Preparation: 3060A

Lab Sample ID:	LCSI 460-191936/3-A	Analysis Batch:	460-192123	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-191936	Lab File ID:	N/A
Dilution:	50	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1455	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1349				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cr (VI)	708	704.9	100	80 - 120	

LCS-Certified Reference Material - Batch: 460-191936

Method: 7196A
Preparation: 3060A

Lab Sample ID:	LCSSRM 460-191936/2-A	Analysis Batch:	460-192123	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-191936	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1455	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1349				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cr (VI)	15.2	15.21	100	58 - 107	

Client: New York State D.E.C. Job Number: 480-49854-1

Method Blank - Batch: 460-192112

Method: 7196A
Preparation: 3060A

Lab Sample ID:	MB 460-192112/1-A	Analysis Batch:	460-192130	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-192112	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1645	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1130				
Leach Date:	N/A				

Analyte	Result	Qual	MDL	RL
Cr (VI)	ND		0.50	2.0

Lab Control Sample Insoluble - Batch: 460-192112

Method: 7196A
Preparation: 3060A

Lab Sample ID:	LCSI 460-192112/3-A	Analysis Batch:	460-192130	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-192112	Lab File ID:	N/A
Dilution:	50	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1645	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1130				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cr (VI)	708	704.9	100	80 - 120	

LCS-Certified Reference Material - Batch: 460-192112

Method: 7196A
Preparation: 3060A

Lab Sample ID:	LCSSRM 460-192112/2-A	Analysis Batch:	460-192130	Instrument ID:	WetHexSpec
Client Matrix:	Solid	Prep Batch:	460-192112	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	2.50 g
Analysis Date:	11/13/2013 1645	Units:	mg/Kg	Final Weight/Volume:	100 mL
Prep Date:	11/13/2013 1130				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cr (VI)	15.2	15.21	100	58 - 107	

Client: New York State D.E.C. Job Number: 480-49854-1

Duplicate - Batch: 460-191803

Method: Moisture
Preparation: N/A

Lab Sample ID:	480-49854-35	Analysis Batch:	460-191803	Instrument ID:	No Equipment Assigned
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	11/12/2013 2011	Units:	%	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	37	36	2	20	
Percent Solids	63	64	1	20	

DATA REPORTING QUALIFIERS

Client: New York State D.E.C. Job Number: 480-49854-1

Lab Section	Qualifier	Description
Metals		
	B	Compound was found in the blank and sample.
	^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.
	4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
	F	MS/MSD Recovery and/or RPD exceeds the control limits
	W	PS: Post-digestion spike was outside control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	V	Serial Dilution exceeds the control limits

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 480-151269					
LCSSRM 480-151269/2-A	LCS-Certified Reference Material	T	Solid	7471B	
LCDSRM 480-151269/3-A	LCSD - Certified Reference Material	T	Solid	7471B	
MB 480-151269/1-A	Method Blank	T	Solid	7471B	
480-49854-1	SD801	T	Solid	7471B	
480-49854-2	SD802	T	Solid	7471B	
480-49854-3	SD803	T	Solid	7471B	
480-49854-4	SD804	T	Solid	7471B	
480-49854-5	SD805	T	Solid	7471B	
480-49854-6	SD806	T	Solid	7471B	
480-49854-7	SD807	T	Solid	7471B	
480-49854-8	SD808	T	Solid	7471B	
480-49854-9	SD809	T	Solid	7471B	
480-49854-10	SD810	T	Solid	7471B	
480-49854-11	SD811	T	Solid	7471B	
480-49854-12	SD812	T	Solid	7471B	
480-49854-13	SD813	T	Solid	7471B	
480-49854-14	SD814	T	Solid	7471B	
480-49854-15	SD815	T	Solid	7471B	
480-49854-16	SD816	T	Solid	7471B	
480-49854-17	SD817	T	Solid	7471B	
480-49854-18	SD818	T	Solid	7471B	
Prep Batch: 480-151288					
LCSSRM 480-151288/2-A	LCS-Certified Reference Material	T	Solid	7471B	
MB 480-151288/1-A	Method Blank	T	Solid	7471B	
480-49854-19	SD819	T	Solid	7471B	
480-49854-20	SD820	T	Solid	7471B	
480-49854-21	SD821	T	Solid	7471B	
480-49854-22	SD822	T	Solid	7471B	
480-49854-23	SD823	T	Solid	7471B	
480-49854-24	SD824	T	Solid	7471B	
480-49854-25	SD825	T	Solid	7471B	
480-49854-26	SD826	T	Solid	7471B	
480-49854-27	SD827	T	Solid	7471B	
480-49854-28	SD828	T	Solid	7471B	
480-49854-29	SD829	T	Solid	7471B	
480-49854-30	SD830	T	Solid	7471B	
480-49854-31	SD831	T	Solid	7471B	
480-49854-32	SD806 DUP	T	Solid	7471B	
480-49854-33	SD816 DUP	T	Solid	7471B	
480-49854-34	SD825 DUP	T	Solid	7471B	

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 480-151394					
LCSSRM 480-151394/2-A	LCS-Certified Reference Material	T	Solid	3050B	
MB 480-151394/1-A	Method Blank	T	Solid	3050B	
480-49854-1	SD801	T	Solid	3050B	
480-49854-2	SD802	T	Solid	3050B	
480-49854-2MS	Matrix Spike	T	Solid	3050B	
480-49854-2MSD	Matrix Spike Duplicate	T	Solid	3050B	
480-49854-3	SD803	T	Solid	3050B	
480-49854-4	SD804	T	Solid	3050B	
480-49854-5	SD805	T	Solid	3050B	
480-49854-6	SD806	T	Solid	3050B	
480-49854-7	SD807	T	Solid	3050B	
480-49854-8	SD808	T	Solid	3050B	
480-49854-9	SD809	T	Solid	3050B	
480-49854-10	SD810	T	Solid	3050B	
480-49854-11	SD811	T	Solid	3050B	
480-49854-12	SD812	T	Solid	3050B	
480-49854-13	SD813	T	Solid	3050B	
480-49854-14	SD814	T	Solid	3050B	
480-49854-15	SD815	T	Solid	3050B	
480-49854-16	SD816	T	Solid	3050B	
480-49854-17	SD817	T	Solid	3050B	
480-49854-18	SD818	T	Solid	3050B	
480-49854-19	SD819	T	Solid	3050B	
480-49854-20	SD820	T	Solid	3050B	
Prep Batch: 480-151401					
LCSSRM 480-151401/2-A	LCS-Certified Reference Material	T	Solid	3050B	
MB 480-151401/1-A	Method Blank	T	Solid	3050B	
480-49854-21	SD821	T	Solid	3050B	
480-49854-22	SD822	T	Solid	3050B	
480-49854-23	SD823	T	Solid	3050B	
480-49854-23MS	Matrix Spike	T	Solid	3050B	
480-49854-23MSD	Matrix Spike Duplicate	T	Solid	3050B	
480-49854-24	SD824	T	Solid	3050B	
480-49854-25	SD825	T	Solid	3050B	
480-49854-26	SD826	T	Solid	3050B	
480-49854-27	SD827	T	Solid	3050B	
480-49854-28	SD828	T	Solid	3050B	
480-49854-29	SD829	T	Solid	3050B	
480-49854-30	SD830	T	Solid	3050B	
480-49854-31	SD831	T	Solid	3050B	
480-49854-32	SD806 DUP	T	Solid	3050B	
480-49854-33	SD816 DUP	T	Solid	3050B	
480-49854-34	SD825 DUP	T	Solid	3050B	

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:480-151516					
LCSSRM 480-151269/2-A	LCS-Certified Reference Material	T	Solid	7471B	480-151269
LCDSRM 480-151269/3-A	LCSD - Certified Reference Material	T	Solid	7471B	480-151269
MB 480-151269/1-A	Method Blank	T	Solid	7471B	480-151269
LCSSRM 480-151288/2-A	LCS-Certified Reference Material	T	Solid	7471B	480-151288
MB 480-151288/1-A	Method Blank	T	Solid	7471B	480-151288
480-49854-1	SD801	T	Solid	7471B	480-151269
480-49854-2	SD802	T	Solid	7471B	480-151269
480-49854-3	SD803	T	Solid	7471B	480-151269
480-49854-4	SD804	T	Solid	7471B	480-151269
480-49854-5	SD805	T	Solid	7471B	480-151269
480-49854-6	SD806	T	Solid	7471B	480-151269
480-49854-7	SD807	T	Solid	7471B	480-151269
480-49854-8	SD808	T	Solid	7471B	480-151269
480-49854-9	SD809	T	Solid	7471B	480-151269
480-49854-10	SD810	T	Solid	7471B	480-151269
480-49854-11	SD811	T	Solid	7471B	480-151269
480-49854-12	SD812	T	Solid	7471B	480-151269
480-49854-13	SD813	T	Solid	7471B	480-151269
480-49854-14	SD814	T	Solid	7471B	480-151269
480-49854-15	SD815	T	Solid	7471B	480-151269
480-49854-16	SD816	T	Solid	7471B	480-151269
480-49854-17	SD817	T	Solid	7471B	480-151269
480-49854-18	SD818	T	Solid	7471B	480-151269
480-49854-19	SD819	T	Solid	7471B	480-151288
480-49854-20	SD820	T	Solid	7471B	480-151288
480-49854-21	SD821	T	Solid	7471B	480-151288
480-49854-22	SD822	T	Solid	7471B	480-151288
480-49854-23	SD823	T	Solid	7471B	480-151288
480-49854-24	SD824	T	Solid	7471B	480-151288
480-49854-25	SD825	T	Solid	7471B	480-151288
480-49854-26	SD826	T	Solid	7471B	480-151288
480-49854-27	SD827	T	Solid	7471B	480-151288
480-49854-28	SD828	T	Solid	7471B	480-151288
480-49854-29	SD829	T	Solid	7471B	480-151288
480-49854-30	SD830	T	Solid	7471B	480-151288
480-49854-31	SD831	T	Solid	7471B	480-151288
480-49854-32	SD806 DUP	T	Solid	7471B	480-151288
480-49854-33	SD816 DUP	T	Solid	7471B	480-151288
480-49854-34	SD825 DUP	T	Solid	7471B	480-151288

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:480-152283					
LCSSRM 480-151401/2-A	LCS-Certified Reference Material	T	Solid	6010C	480-151401
MB 480-151401/1-A	Method Blank	T	Solid	6010C	480-151401
480-49854-21	SD821	T	Solid	6010C	480-151401
480-49854-22	SD822	T	Solid	6010C	480-151401
480-49854-23	SD823	T	Solid	6010C	480-151401
480-49854-23MS	Matrix Spike	T	Solid	6010C	480-151401
480-49854-23MSD	Matrix Spike Duplicate	T	Solid	6010C	480-151401
480-49854-24	SD824	T	Solid	6010C	480-151401
480-49854-25	SD825	T	Solid	6010C	480-151401
480-49854-26	SD826	T	Solid	6010C	480-151401
480-49854-27	SD827	T	Solid	6010C	480-151401
480-49854-28	SD828	T	Solid	6010C	480-151401
480-49854-29	SD829	T	Solid	6010C	480-151401
480-49854-30	SD830	T	Solid	6010C	480-151401
480-49854-31	SD831	T	Solid	6010C	480-151401
480-49854-32	SD806 DUP	T	Solid	6010C	480-151401
480-49854-33	SD816 DUP	T	Solid	6010C	480-151401
480-49854-34	SD825 DUP	T	Solid	6010C	480-151401
Analysis Batch:480-152314					
LCSSRM 480-151394/2-A	LCS-Certified Reference Material	T	Solid	6010C	480-151394
MB 480-151394/1-A	Method Blank	T	Solid	6010C	480-151394
480-49854-1	SD801	T	Solid	6010C	480-151394
480-49854-2	SD802	T	Solid	6010C	480-151394
480-49854-2MS	Matrix Spike	T	Solid	6010C	480-151394
480-49854-2MSD	Matrix Spike Duplicate	T	Solid	6010C	480-151394
480-49854-3	SD803	T	Solid	6010C	480-151394
480-49854-4	SD804	T	Solid	6010C	480-151394
480-49854-5	SD805	T	Solid	6010C	480-151394
480-49854-6	SD806	T	Solid	6010C	480-151394
480-49854-7	SD807	T	Solid	6010C	480-151394
480-49854-8	SD808	T	Solid	6010C	480-151394
480-49854-9	SD809	T	Solid	6010C	480-151394
480-49854-10	SD810	T	Solid	6010C	480-151394
480-49854-11	SD811	T	Solid	6010C	480-151394
480-49854-12	SD812	T	Solid	6010C	480-151394
480-49854-13	SD813	T	Solid	6010C	480-151394
480-49854-14	SD814	T	Solid	6010C	480-151394
480-49854-15	SD815	T	Solid	6010C	480-151394
480-49854-16	SD816	T	Solid	6010C	480-151394
480-49854-17	SD817	T	Solid	6010C	480-151394
480-49854-18	SD818	T	Solid	6010C	480-151394
480-49854-19	SD819	T	Solid	6010C	480-151394
480-49854-20	SD820	T	Solid	6010C	480-151394

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:480-152587					
480-49854-1	SD801	T	Solid	6010C	480-151394
480-49854-2	SD802	T	Solid	6010C	480-151394
480-49854-2MS	Matrix Spike	T	Solid	6010C	480-151394
480-49854-2MSD	Matrix Spike Duplicate	T	Solid	6010C	480-151394
480-49854-3	SD803	T	Solid	6010C	480-151394
480-49854-4	SD804	T	Solid	6010C	480-151394
480-49854-5	SD805	T	Solid	6010C	480-151394
480-49854-6	SD806	T	Solid	6010C	480-151394
480-49854-7	SD807	T	Solid	6010C	480-151394
480-49854-8	SD808	T	Solid	6010C	480-151394
480-49854-9	SD809	T	Solid	6010C	480-151394
480-49854-10	SD810	T	Solid	6010C	480-151394
480-49854-11	SD811	T	Solid	6010C	480-151394
480-49854-12	SD812	T	Solid	6010C	480-151394
480-49854-13	SD813	T	Solid	6010C	480-151394
480-49854-14	SD814	T	Solid	6010C	480-151394
480-49854-15	SD815	T	Solid	6010C	480-151394
480-49854-16	SD816	T	Solid	6010C	480-151394
480-49854-17	SD817	T	Solid	6010C	480-151394
480-49854-18	SD818	T	Solid	6010C	480-151394
480-49854-19	SD819	T	Solid	6010C	480-151394
480-49854-20	SD820	T	Solid	6010C	480-151394

Report Basis

T = Total

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:480-151293					
480-49854-1	SD801	T	Solid	Moisture	
480-49854-2	SD802	T	Solid	Moisture	
480-49854-3	SD803	T	Solid	Moisture	
480-49854-4	SD804	T	Solid	Moisture	
480-49854-5	SD805	T	Solid	Moisture	
480-49854-6	SD806	T	Solid	Moisture	
480-49854-7	SD807	T	Solid	Moisture	
480-49854-8	SD808	T	Solid	Moisture	
480-49854-9	SD809	T	Solid	Moisture	
480-49854-10	SD810	T	Solid	Moisture	
480-49854-11	SD811	T	Solid	Moisture	
480-49854-12	SD812	T	Solid	Moisture	
480-49854-13	SD813	T	Solid	Moisture	
480-49854-14	SD814	T	Solid	Moisture	
480-49854-15	SD815	T	Solid	Moisture	
480-49854-16	SD816	T	Solid	Moisture	
480-49854-17	SD817	T	Solid	Moisture	
480-49854-18	SD818	T	Solid	Moisture	
480-49854-19	SD819	T	Solid	Moisture	
480-49854-20	SD820	T	Solid	Moisture	
480-49854-21	SD821	T	Solid	Moisture	
480-49854-22	SD822	T	Solid	Moisture	
480-49854-23	SD823	T	Solid	Moisture	
480-49854-24	SD824	T	Solid	Moisture	
480-49854-25	SD825	T	Solid	Moisture	
480-49854-26	SD826	T	Solid	Moisture	
480-49854-27	SD827	T	Solid	Moisture	
480-49854-28	SD828	T	Solid	Moisture	
480-49854-29	SD829	T	Solid	Moisture	
480-49854-30	SD830	T	Solid	Moisture	
480-49854-31	SD831	T	Solid	Moisture	
480-49854-32	SD806 DUP	T	Solid	Moisture	
480-49854-33	SD816 DUP	T	Solid	Moisture	
480-49854-34	SD825 DUP	T	Solid	Moisture	
Analysis Batch:460-191803					
480-49854-35	SD805 DUP	T	Solid	Moisture	
480-49854-35DU	Duplicate	T	Solid	Moisture	

Client: New York State D.E.C. Job Number: 480-49854-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 460-191936					
LCSI 460-191936/3-A	Lab Control Sample Insoluble	T	Solid	3060A	
LCSSRM 460-191936/2-A	LCS-Certified Reference Material	T	Solid	3060A	
MB 460-191936/1-A	Method Blank	T	Solid	3060A	
480-49854-4	SD804	T	Solid	3060A	
480-49854-5	SD805	T	Solid	3060A	
480-49854-35	SD805 DUP	T	Solid	3060A	
Prep Batch: 460-192112					
LCSI 460-192112/3-A	Lab Control Sample Insoluble	T	Solid	3060A	
LCSSRM 460-192112/2-A	LCS-Certified Reference Material	T	Solid	3060A	
MB 460-192112/1-A	Method Blank	T	Solid	3060A	
480-49854-4	SD804	T	Solid	3060A	
480-49854-5	SD805	T	Solid	3060A	
480-49854-35	SD805 DUP	T	Solid	3060A	
Analysis Batch:460-192123					
LCSI 460-191936/3-A	Lab Control Sample Insoluble	T	Solid	7196A	460-191936
LCSSRM 460-191936/2-A	LCS-Certified Reference Material	T	Solid	7196A	460-191936
MB 460-191936/1-A	Method Blank	T	Solid	7196A	460-191936
480-49854-4	SD804	T	Solid	7196A	460-191936
480-49854-5	SD805	T	Solid	7196A	460-191936
480-49854-35	SD805 DUP	T	Solid	7196A	460-191936
Analysis Batch:460-192130					
LCSI 460-192112/3-A	Lab Control Sample Insoluble	T	Solid	7196A	460-192112
LCSSRM 460-192112/2-A	LCS-Certified Reference Material	T	Solid	7196A	460-192112
MB 460-192112/1-A	Method Blank	T	Solid	7196A	460-192112
480-49854-4	SD804	T	Solid	7196A	460-192112
480-49854-5	SD805	T	Solid	7196A	460-192112
480-49854-35	SD805 DUP	T	Solid	7196A	460-192112

Report Basis
T = Total

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-1 **Client ID:** SD801

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-1-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-1-B		480-152314	480-151394	11/14/2013 17:01	1	TAL BUF	LMH
P:3050B	480-49854-A-1-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-1-B		480-152587	480-151394	11/15/2013 12:36	1	TAL BUF	LMH
P:7471B	480-49854-A-1-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-1-A		480-151516	480-151269	11/12/2013 12:11	1	TAL BUF	SS1
A:Moisture	480-49854-A-1		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-2 **Client ID:** SD802

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-2-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-B		480-152314	480-151394	11/14/2013 17:04	1	TAL BUF	LMH
P:3050B	480-49854-A-2-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-B		480-152587	480-151394	11/15/2013 12:38	1	TAL BUF	LMH
P:7471B	480-49854-A-2-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-2-A		480-151516	480-151269	11/12/2013 12:13	1	TAL BUF	SS1
A:Moisture	480-49854-A-2		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-2 MS **Client ID:** SD802

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-2-C MS		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-C MS		480-152314	480-151394	11/14/2013 17:10	1	TAL BUF	LMH
P:3050B	480-49854-A-2-C MS		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-C MS		480-152587	480-151394	11/15/2013 12:40	1	TAL BUF	LMH

Lab ID: 480-49854-2 MSD **Client ID:** SD802

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-2-D MSD		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-D MSD		480-152314	480-151394	11/14/2013 17:13	1	TAL BUF	LMH
P:3050B	480-49854-A-2-D MSD		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-D MSD		480-152587	480-151394	11/15/2013 12:43	1	TAL BUF	LMH

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-2 SD **Client ID:** SD802

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-2-B SD ^5		480-152314	480-151394	11/12/2013 10:30	5	TAL BUF	NMD2
A:6010C	480-49854-A-2-B SD ^5		480-152314	480-151394	11/14/2013 17:06	5	TAL BUF	LMH
P:3050B	480-49854-A-2-B PDS		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-2-B PDS		480-152314	480-151394	11/14/2013 17:08	1	TAL BUF	LMH

Lab ID: 480-49854-3 **Client ID:** SD803

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-3-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-3-B		480-152314	480-151394	11/14/2013 17:15	1	TAL BUF	LMH
P:3050B	480-49854-A-3-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-3-B		480-152587	480-151394	11/15/2013 12:45	1	TAL BUF	LMH
P:7471B	480-49854-A-3-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-3-A		480-151516	480-151269	11/12/2013 12:15	1	TAL BUF	SS1
A:Moisture	480-49854-A-3		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-3 SD **Client ID:** SD803

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-3-B SD ^5		480-152587	480-151394	11/12/2013 10:30	5	TAL BUF	NMD2
A:6010C	480-49854-A-3-B SD ^5		480-152587	480-151394	11/15/2013 12:47	5	TAL BUF	LMH
P:3050B	480-49854-A-3-B PDS		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-3-B PDS		480-152587	480-151394	11/15/2013 12:50	1	TAL BUF	LMH

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-4 **Client ID:** SD804

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-4-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-4-B		480-152314	480-151394	11/14/2013 17:18	1	TAL BUF	LMH
P:3050B	480-49854-A-4-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-4-B		480-152587	480-151394	11/15/2013 12:52	1	TAL BUF	LMH
P:7471B	480-49854-A-4-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-4-A		480-151516	480-151269	11/12/2013 12:17	1	TAL BUF	SS1
P:3060A	480-49854-C-4-B		460-192130	460-192112	11/13/2013 11:30	1	TAL EDI	RAK
P:3060A	480-49854-C-4-A		460-192123	460-191936	11/13/2013 13:49	1	TAL EDI	RAK
A:7196A	480-49854-C-4-A		460-192123	460-191936	11/13/2013 16:45	1	TAL EDI	RAK
A:7196A	480-49854-C-4-B		460-192130	460-192112	11/13/2013 16:45	1	TAL EDI	RAK
A:Moisture	480-49854-A-4		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-5 **Client ID:** SD805

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-5-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-5-B		480-152314	480-151394	11/14/2013 17:20	1	TAL BUF	LMH
P:3050B	480-49854-A-5-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-5-B		480-152587	480-151394	11/15/2013 12:55	1	TAL BUF	LMH
P:7471B	480-49854-A-5-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-5-A		480-151516	480-151269	11/12/2013 12:19	1	TAL BUF	SS1
P:3060A	480-49854-C-5-B		460-192130	460-192112	11/13/2013 11:30	1	TAL EDI	RAK
P:3060A	480-49854-C-5-A		460-192123	460-191936	11/13/2013 13:49	1	TAL EDI	RAK
A:7196A	480-49854-C-5-A		460-192123	460-191936	11/13/2013 16:45	1	TAL EDI	RAK
A:7196A	480-49854-C-5-B		460-192130	460-192112	11/13/2013 16:45	1	TAL EDI	RAK
A:Moisture	480-49854-A-5		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-6 **Client ID:** SD806

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-6-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-6-B		480-152314	480-151394	11/14/2013 18:04	1	TAL BUF	LMH
P:3050B	480-49854-A-6-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-6-B		480-152587	480-151394	11/15/2013 13:04	1	TAL BUF	LMH
P:7471B	480-49854-A-6-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-6-A		480-151516	480-151269	11/12/2013 12:21	1	TAL BUF	SS1
A:Moisture	480-49854-A-6		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-7 **Client ID:** SD807

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-7-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-7-B		480-152314	480-151394	11/14/2013 18:06	1	TAL BUF	LMH
P:3050B	480-49854-A-7-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-7-B		480-152587	480-151394	11/15/2013 13:07	1	TAL BUF	LMH
P:7471B	480-49854-A-7-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-7-A		480-151516	480-151269	11/12/2013 12:22	1	TAL BUF	SS1
A:Moisture	480-49854-A-7		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-8 **Client ID:** SD808

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-8-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-8-B		480-152314	480-151394	11/14/2013 18:08	1	TAL BUF	LMH
P:3050B	480-49854-A-8-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-8-B		480-152587	480-151394	11/15/2013 13:09	1	TAL BUF	LMH
P:7471B	480-49854-A-8-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-8-A		480-151516	480-151269	11/12/2013 12:28	1	TAL BUF	SS1
A:Moisture	480-49854-A-8		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-9 **Client ID:** SD809

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-9-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-9-B		480-152314	480-151394	11/14/2013 17:30	1	TAL BUF	LMH
P:3050B	480-49854-A-9-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-9-B		480-152587	480-151394	11/15/2013 13:12	1	TAL BUF	LMH
P:7471B	480-49854-A-9-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-9-A		480-151516	480-151269	11/12/2013 12:30	1	TAL BUF	SS1
A:Moisture	480-49854-A-9		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-10 **Client ID:** SD810

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-10-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-10-B		480-152314	480-151394	11/14/2013 17:32	1	TAL BUF	LMH
P:3050B	480-49854-A-10-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-10-B		480-152587	480-151394	11/15/2013 13:14	1	TAL BUF	LMH
P:7471B	480-49854-A-10-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-10-A		480-151516	480-151269	11/12/2013 12:32	1	TAL BUF	SS1
A:Moisture	480-49854-A-10		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-11 **Client ID:** SD811

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-11-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-11-B		480-152314	480-151394	11/14/2013 17:34	1	TAL BUF	LMH
P:3050B	480-49854-A-11-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-11-B		480-152587	480-151394	11/15/2013 13:16	1	TAL BUF	LMH
P:7471B	480-49854-A-11-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-11-A		480-151516	480-151269	11/12/2013 12:34	1	TAL BUF	SS1
A:Moisture	480-49854-A-11		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-12 **Client ID:** SD812

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-12-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-12-B		480-152314	480-151394	11/14/2013 17:36	1	TAL BUF	LMH
P:3050B	480-49854-A-12-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-12-B		480-152587	480-151394	11/15/2013 13:19	1	TAL BUF	LMH
P:7471B	480-49854-A-12-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-12-A		480-151516	480-151269	11/12/2013 12:36	1	TAL BUF	SS1
A:Moisture	480-49854-A-12		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-13 **Client ID:** SD813

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-13-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-13-B		480-152314	480-151394	11/14/2013 17:39	1	TAL BUF	LMH
P:3050B	480-49854-A-13-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-13-B		480-152587	480-151394	11/15/2013 13:21	1	TAL BUF	LMH
P:7471B	480-49854-A-13-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-13-A		480-151516	480-151269	11/12/2013 12:38	1	TAL BUF	SS1
A:Moisture	480-49854-A-13		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-14 **Client ID:** SD814

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-14-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-14-B		480-152314	480-151394	11/14/2013 17:41	1	TAL BUF	LMH
P:3050B	480-49854-A-14-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-14-B		480-152587	480-151394	11/15/2013 13:23	1	TAL BUF	LMH
P:7471B	480-49854-A-14-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-14-A		480-151516	480-151269	11/12/2013 12:40	1	TAL BUF	SS1
A:Moisture	480-49854-A-14		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-15 **Client ID:** SD815

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-15-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-15-B		480-152314	480-151394	11/14/2013 17:43	1	TAL BUF	LMH
P:3050B	480-49854-A-15-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-15-B		480-152587	480-151394	11/15/2013 13:47	1	TAL BUF	LMH
P:7471B	480-49854-A-15-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-15-A		480-151516	480-151269	11/12/2013 12:41	1	TAL BUF	SS1
A:Moisture	480-49854-A-15		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-16 **Client ID:** SD816

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-16-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-16-B		480-152314	480-151394	11/14/2013 17:45	1	TAL BUF	LMH
P:3050B	480-49854-A-16-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-16-B		480-152587	480-151394	11/15/2013 13:33	1	TAL BUF	LMH
P:7471B	480-49854-A-16-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-16-A		480-151516	480-151269	11/12/2013 12:43	1	TAL BUF	SS1
A:Moisture	480-49854-A-16		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-17 **Client ID:** SD817

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-17-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-17-B		480-152314	480-151394	11/14/2013 17:48	1	TAL BUF	LMH
P:3050B	480-49854-A-17-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-17-B		480-152587	480-151394	11/15/2013 13:35	1	TAL BUF	LMH
P:7471B	480-49854-A-17-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-17-A		480-151516	480-151269	11/12/2013 12:45	1	TAL BUF	SS1
A:Moisture	480-49854-A-17		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-18 **Client ID:** SD818

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-18-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-18-B		480-152314	480-151394	11/14/2013 17:57	1	TAL BUF	LMH
P:3050B	480-49854-A-18-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-18-B		480-152587	480-151394	11/15/2013 13:38	1	TAL BUF	LMH
P:7471B	480-49854-A-18-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-18-A		480-151516	480-151269	11/12/2013 12:51	1	TAL BUF	SS1
A:Moisture	480-49854-A-18		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

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Lab ID: 480-49854-19 **Client ID:** SD819

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-19-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-19-B		480-152314	480-151394	11/14/2013 17:59	1	TAL BUF	LMH
P:3050B	480-49854-A-19-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-19-B		480-152587	480-151394	11/15/2013 13:40	1	TAL BUF	LMH
P:7471B	480-49854-A-19-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-19-A		480-151516	480-151288	11/12/2013 12:57	1	TAL BUF	SS1
A:Moisture	480-49854-A-19		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-20 **Client ID:** SD820

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-20-B		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-20-B		480-152314	480-151394	11/14/2013 18:02	1	TAL BUF	LMH
P:3050B	480-49854-A-20-B		480-152587	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-20-B		480-152587	480-151394	11/15/2013 13:43	1	TAL BUF	LMH
P:7471B	480-49854-A-20-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-20-A		480-151516	480-151288	11/12/2013 13:00	1	TAL BUF	SS1
A:Moisture	480-49854-A-20		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-21 **Client ID:** SD821

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-21-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-21-B		480-152283	480-151401	11/14/2013 10:16	1	TAL BUF	LMH
P:7471B	480-49854-A-21-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-21-A		480-151516	480-151288	11/12/2013 13:02	1	TAL BUF	SS1
A:Moisture	480-49854-A-21		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-22 **Client ID:** SD822

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-22-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-22-B		480-152283	480-151401	11/14/2013 10:19	1	TAL BUF	LMH
P:7471B	480-49854-A-22-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-22-A		480-151516	480-151288	11/12/2013 13:03	1	TAL BUF	SS1
A:Moisture	480-49854-A-22		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

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Lab ID: 480-49854-23 **Client ID:** SD823

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-23-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-23-B		480-152283	480-151401	11/14/2013 10:21	1	TAL BUF	LMH
P:7471B	480-49854-A-23-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-23-A		480-151516	480-151288	11/12/2013 13:05	1	TAL BUF	SS1
A:Moisture	480-49854-A-23		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-23 MS **Client ID:** SD823

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-23-C MS		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-23-C MS		480-152283	480-151401	11/14/2013 10:28	1	TAL BUF	LMH

Lab ID: 480-49854-23 MSD **Client ID:** SD823

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-23-D MSD		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-23-D MSD		480-152283	480-151401	11/14/2013 10:31	1	TAL BUF	LMH

Lab ID: 480-49854-23 SD **Client ID:** SD823

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-23-B SD ^5		480-152283	480-151401	11/12/2013 10:30	5	TAL BUF	NMD2
A:6010C	480-49854-A-23-B SD ^5		480-152283	480-151401	11/14/2013 10:24	5	TAL BUF	LMH
P:3050B	480-49854-A-23-B PDS		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-23-B PDS		480-152283	480-151401	11/14/2013 10:26	1	TAL BUF	LMH

Client: New York State D.E.C. Job Number: 480-49854-1

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Lab ID: 480-49854-24 **Client ID:** SD824

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-24-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-24-B		480-152283	480-151401	11/14/2013 10:33	1	TAL BUF	LMH
P:7471B	480-49854-A-24-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-24-A		480-151516	480-151288	11/12/2013 13:07	1	TAL BUF	SS1
A:Moisture	480-49854-A-24		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-25 **Client ID:** SD825

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-25-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-25-B		480-152283	480-151401	11/14/2013 10:43	1	TAL BUF	LMH
P:7471B	480-49854-A-25-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-25-A		480-151516	480-151288	11/12/2013 13:08	1	TAL BUF	SS1
A:Moisture	480-49854-A-25		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-26 **Client ID:** SD826

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-26-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-26-B		480-152283	480-151401	11/14/2013 10:45	1	TAL BUF	LMH
P:7471B	480-49854-A-26-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-26-A		480-151516	480-151288	11/12/2013 13:15	1	TAL BUF	SS1
A:Moisture	480-49854-A-26		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-27 **Client ID:** SD827

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-27-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-27-B		480-152283	480-151401	11/14/2013 10:48	1	TAL BUF	LMH
P:7471B	480-49854-A-27-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-27-A		480-151516	480-151288	11/12/2013 13:17	1	TAL BUF	SS1
A:Moisture	480-49854-A-27		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-28 **Client ID:** SD828

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-28-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-28-B		480-152283	480-151401	11/14/2013 10:50	1	TAL BUF	LMH
P:7471B	480-49854-A-28-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-28-A		480-151516	480-151288	11/12/2013 13:19	1	TAL BUF	SS1
A:Moisture	480-49854-A-28		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-29 **Client ID:** SD829

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-29-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-29-B		480-152283	480-151401	11/14/2013 10:52	1	TAL BUF	LMH
P:7471B	480-49854-A-29-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-29-A		480-151516	480-151288	11/12/2013 13:21	1	TAL BUF	SS1
A:Moisture	480-49854-A-29		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-30 **Client ID:** SD830

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-30-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-30-B		480-152283	480-151401	11/14/2013 10:55	1	TAL BUF	LMH
P:7471B	480-49854-A-30-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-30-A		480-151516	480-151288	11/12/2013 13:22	1	TAL BUF	SS1
A:Moisture	480-49854-A-30		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-31 **Client ID:** SD831

Sample Date/Time: 11/07/2013 16:03 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-31-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-31-B		480-152283	480-151401	11/14/2013 10:57	1	TAL BUF	LMH
P:7471B	480-49854-A-31-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-31-A		480-151516	480-151288	11/12/2013 13:24	1	TAL BUF	SS1
A:Moisture	480-49854-A-31		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-32 **Client ID:** SD806 DUP

Sample Date/Time: 11/08/2013 11:10 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-32-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-32-B		480-152283	480-151401	11/14/2013 10:59	1	TAL BUF	LMH
P:7471B	480-49854-A-32-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-32-A		480-151516	480-151288	11/12/2013 13:26	1	TAL BUF	SS1
A:Moisture	480-49854-A-32		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-33 **Client ID:** SD816 DUP

Sample Date/Time: 11/07/2013 16:04 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-33-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-33-B		480-152283	480-151401	11/14/2013 11:02	1	TAL BUF	LMH
P:7471B	480-49854-A-33-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-33-A		480-151516	480-151288	11/12/2013 13:28	1	TAL BUF	SS1
A:Moisture	480-49854-A-33		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-34 **Client ID:** SD825 DUP

Sample Date/Time: 11/07/2013 16:04 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	480-49854-A-34-B		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	480-49854-A-34-B		480-152283	480-151401	11/14/2013 11:11	1	TAL BUF	LMH
P:7471B	480-49854-A-34-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	480-49854-A-34-A		480-151516	480-151288	11/12/2013 13:30	1	TAL BUF	SS1
A:Moisture	480-49854-A-34		480-151293		11/11/2013 16:06	1	TAL BUF	ZJR

Lab ID: 480-49854-35 **Client ID:** SD805 DUP

Sample Date/Time: 11/08/2013 09:39 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3060A	480-49854-A-35-B		460-192130	460-192112	11/13/2013 11:30	1	TAL EDI	RAK
P:3060A	480-49854-A-35-A		460-192123	460-191936	11/13/2013 13:49	1	TAL EDI	RAK
A:7196A	480-49854-A-35-A		460-192123	460-191936	11/13/2013 16:45	1	TAL EDI	RAK
A:7196A	480-49854-A-35-B		460-192130	460-192112	11/13/2013 16:45	1	TAL EDI	RAK
A:Moisture	480-49854-A-35		460-191803		11/12/2013 20:11	1	TAL EDI	ITR

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: 480-49854-35 DU **Client ID:** SD805 DUP

Sample Date/Time: 11/08/2013 09:39 Received Date/Time: 11/09/2013 01:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:Moisture	480-49854-A-35 DU		460-191803		11/12/2013 20:11	1	TAL EDI	ITR

Lab ID: MB **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	MB 480-151401/1-A		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	MB 480-151401/1-A		480-152283	480-151401	11/14/2013 10:04	1	TAL BUF	LMH
P:3050B	MB 480-151394/1-A		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	MB 480-151394/1-A		480-152314	480-151394	11/14/2013 16:50	1	TAL BUF	LMH
P:7471B	MB 480-151269/1-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	MB 480-151269/1-A		480-151516	480-151269	11/12/2013 11:52	1	TAL BUF	SS1
P:7471B	MB 480-151288/1-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	MB 480-151288/1-A		480-151516	480-151288	11/12/2013 12:53	1	TAL BUF	SS1
P:3060A	MB 460-191936/1-A		460-192123	460-191936	11/13/2013 13:49	1	TAL EDI	RAK
A:7196A	MB 460-191936/1-A		460-192123	460-191936	11/13/2013 14:55	1	TAL EDI	RAK
P:3060A	MB 460-192112/1-A		460-192130	460-192112	11/13/2013 11:30	1	TAL EDI	RAK
A:7196A	MB 460-192112/1-A		460-192130	460-192112	11/13/2013 16:45	1	TAL EDI	RAK

Client: New York State D.E.C. Job Number: 480-49854-1

Laboratory Chronicle

Lab ID: LCSSRM **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3050B	LCSSRM 480-151401/2-A		480-152283	480-151401	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	LCSSRM 480-151401/2-A		480-152283	480-151401	11/14/2013 10:14	1	TAL BUF	LMH
P:3050B	LCSSRM 480-151394/2-A		480-152314	480-151394	11/12/2013 10:30	1	TAL BUF	NMD2
A:6010C	LCSSRM 480-151394/2-A		480-152314	480-151394	11/14/2013 16:53	1	TAL BUF	LMH
P:7471B	LCSSRM 480-151269/2-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	LCSSRM 480-151269/2-A		480-151516	480-151269	11/12/2013 11:54	1	TAL BUF	SS1
P:7471B	LCSSRM 480-151288/2-A		480-151516	480-151288	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	LCSSRM 480-151288/2-A		480-151516	480-151288	11/12/2013 12:55	1	TAL BUF	SS1
P:3060A	LCSSRM 460-191936/2-A		460-192123	460-191936	11/13/2013 13:49	1	TAL EDI	RAK
A:7196A	LCSSRM 460-191936/2-A		460-192123	460-191936	11/13/2013 14:55	1	TAL EDI	RAK
P:3060A	LCSSRM 460-192112/2-A		460-192130	460-192112	11/13/2013 11:30	1	TAL EDI	RAK
A:7196A	LCSSRM 460-192112/2-A		460-192130	460-192112	11/13/2013 16:45	1	TAL EDI	RAK

Lab ID: LCDSRM **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:7471B	LCDSRM 480-151269/3-A		480-151516	480-151269	11/12/2013 07:15	1	TAL BUF	JRK
A:7471B	LCDSRM 480-151269/3-A		480-151516	480-151269	11/12/2013 11:56	1	TAL BUF	SS1

Lab ID: LCSI **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3060A	LCSI 460-191936/3-A		460-192123	460-191936	11/13/2013 13:49	50	TAL EDI	RAK
A:7196A	LCSI 460-191936/3-A		460-192123	460-191936	11/13/2013 14:55	50	TAL EDI	RAK
P:3060A	LCSI 460-192112/3-A		460-192130	460-192112	11/13/2013 11:30	50	TAL EDI	RAK
A:7196A	LCSI 460-192112/3-A		460-192130	460-192112	11/13/2013 16:45	50	TAL EDI	RAK

Lab References:

TAL BUF = TestAmerica Buffalo

TAL EDI = TestAmerica Edison

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
MED_01_Si_00039	05/07/14	11/07/13	1% HNO3, Lot 0000050770	200 mL	MEA_Si_STK_00009	40 mL	Si	2000 ug/mL
.MEA_Si_STK_00009	01/31/16	Ultra Scientific, Lot M00333			(Purchased Reagent)		Si	10000 ug/mL
MED_01_W1_00016	10/31/16	Ultra Scientific, Lot R01031			(Purchased Reagent)		Antimony	40 ug/mL
							Arsenic	40 ug/mL
							Beryllium	40 ug/mL
							Cadmium	40 ug/mL
							Calcium	2000 ug/mL
							Chromium	40 ug/mL
							Cobalt	40 ug/mL
							Copper	40 ug/mL
							Iron	2000 ug/mL
							Lead	40 ug/mL
							Magnesium	2000 ug/mL
							Manganese	40 ug/mL
							Mo	40 ug/mL
							Nickel	40 ug/mL
							Selenium	40 ug/mL
							Thallium	40 ug/mL
							Ti	40 ug/mL
							Vanadium	40 ug/mL
							Zinc	40 ug/mL
MED_02_W2_00013	05/31/14	Ultra Scientific, Lot R00355			(Purchased Reagent)		Aluminum	2000 ug/mL
							Barium	40 ug/mL
							Potassium	2004 ug/mL
							Sodium	2001 ug/mL
MED_02_W2_00015	10/31/14	Ultra Scientific, Lot R01025			(Purchased Reagent)		Aluminum	2000 ug/mL
							B	40 ug/mL
							Barium	40 ug/mL
							Li	40 ug/mL
							Potassium	2001 ug/mL
							Sodium	2002 ug/mL
							Sr	40 ug/mL
MED_03_Ag_00042	04/18/14	10/18/13	1% HNO3, Lot 0000050770	200 mL	MEA_Ag_STK_00004	2 mL	Silver	10 ug/mL
.MEA_Ag_STK_00004	05/31/16	Ultra Scientific, Lot K00335			(Purchased Reagent)		Silver	1000 ug/mL
MED_03_Ag_00043	05/04/14	11/04/13	1% HNO3, Lot 0000050770	200 mL	MEA_Ag_STK_00004	2 mL	Silver	10 ug/mL
.MEA_Ag_STK_00004	05/31/16	Ultra Scientific, Lot K00335			(Purchased Reagent)		Silver	1000 ug/mL
MED_04_Sn_00036	05/04/14	11/04/13	1% HNO3, Lot 0000050770	200 mL	MEI_CCV_Sn_00003	8 mL	Sn	40 ug/mL
.MEI_CCV_Sn_00003	08/06/14	High-Purity, Lot 1210803			(Purchased Reagent)		Sn	1000 ug/mL
MED_05_S_00004	05/04/14	11/04/13	1% HNO3, Lot 0000050770	200 mL	MEA_S_STK_00007	40 mL	Sulfur	2000 ug/mL
.MEA_S_STK_00007	09/29/14	Ultra Scientific, Lot M00068			(Purchased Reagent)		Sulfur	10000 ug/mL
MED_SRM_D080_00001	07/31/15	ERA, Lot D074-540			(Purchased Reagent)		Aluminum	8840 mg/Kg
							Antimony	88.2 mg/Kg
							Arsenic	99.6 mg/Kg
							B	144 mg/Kg
							Barium	310 mg/Kg

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Beryllium	72.3 mg/Kg
							Cadmium	182 mg/Kg
							Calcium	6790 mg/Kg
							Chromium	136 mg/Kg
							Cobalt	128 mg/Kg
							Copper	102 mg/Kg
							Iron	12600 mg/Kg
							Lead	115 mg/Kg
							Magnesium	3010 mg/Kg
							Manganese	323 mg/Kg
							Mercury	19.9 mg/Kg
							Mo	133 mg/Kg
							Nickel	153 mg/Kg
							Potassium	2840 mg/Kg
							Selenium	150 mg/Kg
							Silver	40.4 mg/Kg
							Sn	102 mg/Kg
							Sodium	2760 mg/Kg
							Sr	102 mg/Kg
							Thallium	174 mg/Kg
							Ti	262 mg/Kg
							Vanadium	97.6 mg/Kg
							Zinc	161 mg/Kg
MEH_HG2_WKG_00495	11/13/13	11/12/13	1% HNO3, Lot 1566274	50 mL	MEH_HG2_INT_00016	0.5 mL	Mercury	100 ng/mL
.MEH_HG2_INT_00016	01/12/14	08/12/13	1% HNO3, Lot 1504776	50 mL	MEH_HG3_STK_00003	5 mL	Mercury	10000 ng/mL
..MEH_HG3_STK_00003	05/30/14	Aqua Solutions, Lot 3052463			(Purchased Reagent)		Mercury	100 mg/L
MEH_SRM_D071_00003	04/10/14	ERA, Lot D071-540			(Purchased Reagent)		Aluminum	8980 mg/Kg
							Antimony	122 mg/Kg
							Arsenic	92.6 mg/Kg
							B	106 mg/Kg
							Barium	169 mg/Kg
							Beryllium	62.4 mg/Kg
							Cadmium	61.8 mg/Kg
							Calcium	6150 mg/Kg
							Chromium	71.3 mg/Kg
							Cobalt	103 mg/Kg
							Copper	81.2 mg/Kg
							Iron	12800 mg/Kg
							Lead	91.4 mg/Kg
							Magnesium	2650 mg/Kg
							Manganese	286 mg/Kg
							Mercury	3.77 mg/Kg
							Mo	42.6 mg/Kg
							Nickel	59.1 mg/Kg
							Potassium	2540 mg/Kg
							Selenium	89.5 mg/Kg
							Silver	34.4 mg/Kg

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sn	107 mg/Kg
							Sodium	221 mg/Kg
							Sr	72.4 mg/Kg
							Thallium	123 mg/Kg
							Ti	202 mg/Kg
							Vanadium	59.2 mg/Kg
							Zinc	141 mg/Kg
MEI_04_ICV_00221	12/19/13	11/05/13	1% HNO3, Lot 179397	100 mL	MEI_09_CCV_00134	75 mL	Aluminum	18.75 mg/L
							Arsenic	0.375 mg/L
							Barium	0.375 mg/L
							Beryllium	0.375 mg/L
							Cadmium	0.375 mg/L
							Calcium	18.75 mg/L
							Chromium	0.375 mg/L
							Cobalt	0.375 mg/L
							Copper	0.375 mg/L
							Iron	18.75 mg/L
							Lead	0.375 mg/L
							Magnesium	18.75 mg/L
							Manganese	0.375 mg/L
							Nickel	0.375 mg/L
							Potassium	18.75 mg/L
							Selenium	0.375 mg/L
							Sodium	18.75 mg/L
							Thallium	0.375 mg/L
							Vanadium	0.375 mg/L
							Zinc	0.375 mg/L
							Silver	0.375 mg/L
							Antimony	0.375 mg/L
.MEI_09_CCV_00134	12/19/13	11/01/13	1% HNO3, Lot 1719397	2000 mL	MEI_CCV_A_STK_00005	10 mL	Aluminum	25 ug/mL
							Arsenic	0.5 ug/mL
							Barium	0.5 ug/mL
							Beryllium	0.5 ug/mL
							Cadmium	0.5 ug/mL
							Calcium	25 ug/mL
							Chromium	0.5 ug/mL
							Cobalt	0.5 ug/mL
							Copper	0.5 ug/mL
							Iron	25 ug/mL
							Lead	0.5 ug/mL
							Magnesium	25 ug/mL
							Manganese	0.5 ug/mL
							Nickel	0.5 ug/mL
							Potassium	25 ug/mL
							Selenium	0.5 ug/mL
							Sodium	25 ug/mL
							Thallium	0.5 ug/mL

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vanadium	0.5 ug/mL
							Zinc	0.5 ug/mL
					MEI_CCV_Ag_00003	1 mL	Silver	0.5 ug/mL
					MEI_CCV_B_STK_00007	10 mL	Antimony	0.5 ug/mL
..MEI_CCV_A_STK_00005	12/19/13		High-Purity, Lot 1234767		(Purchased Reagent)		Aluminum	5000 ug/mL
							Arsenic	100 ug/mL
							Barium	100 ug/mL
							Beryllium	100 ug/mL
							Cadmium	100 ug/mL
							Calcium	5000 ug/mL
							Chromium	100 ug/mL
							Cobalt	100 ug/mL
							Copper	100 ug/mL
							Iron	5000 ug/mL
							Lead	100 ug/mL
							Magnesium	5000 ug/mL
							Manganese	100 ug/mL
							Nickel	100 ug/mL
							Potassium	5000 ug/mL
							Selenium	100 ug/mL
							Sodium	5000 ug/mL
							Thallium	100 ug/mL
							Vanadium	100 ug/mL
							Zinc	100 ug/mL
..MEI_CCV_Ag_00003	08/06/14		High-Purity, Lot 1231727		(Purchased Reagent)		Silver	1000 ug/mL
..MEI_CCV_B_STK_00007	12/19/13		High-Purity, Lot 1234738		(Purchased Reagent)		Antimony	100 ug/mL
MEI_04_ICV_00223	12/19/13	11/11/13	1% HNO3, Lot IC-1734412	100 mL	MEI_09_CCV_00135	75 mL	Aluminum	18.75 mg/L
							Arsenic	0.375 mg/L
							Barium	0.375 mg/L
							Beryllium	0.375 mg/L
							Cadmium	0.375 mg/L
							Calcium	18.75 mg/L
							Chromium	0.375 mg/L
							Cobalt	0.375 mg/L
							Copper	0.375 mg/L
							Iron	18.75 mg/L
							Lead	0.375 mg/L
							Magnesium	18.75 mg/L
							Manganese	0.375 mg/L
							Nickel	0.375 mg/L
							Potassium	18.75 mg/L
							Selenium	0.375 mg/L
							Sodium	18.75 mg/L
							Thallium	0.375 mg/L
							Vanadium	0.375 mg/L
							Zinc	0.375 mg/L
							Silver	0.375 mg/L

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Antimony	0.375 mg/L
.MEI_09_CCV_00135	12/19/13	11/08/13	1% HNO3, Lot IC-1734412	2000 mL	MEI_CCV_A_STK_00005	10 mL	Aluminum	25 ug/mL
							Arsenic	0.5 ug/mL
							Barium	0.5 ug/mL
							Beryllium	0.5 ug/mL
							Cadmium	0.5 ug/mL
							Calcium	25 ug/mL
							Chromium	0.5 ug/mL
							Cobalt	0.5 ug/mL
							Copper	0.5 ug/mL
							Iron	25 ug/mL
							Lead	0.5 ug/mL
							Magnesium	25 ug/mL
							Manganese	0.5 ug/mL
							Nickel	0.5 ug/mL
							Potassium	25 ug/mL
							Selenium	0.5 ug/mL
							Sodium	25 ug/mL
							Thallium	0.5 ug/mL
							Vanadium	0.5 ug/mL
							Zinc	0.5 ug/mL
					MEI_CCV_Ag_00003	1 mL	Silver	0.5 ug/mL
					MEI_CCV_B_STK_00007	10 mL	Antimony	0.5 ug/mL
..MEI_CCV_A_STK_00005	12/19/13		High-Purity, Lot 1234767		(Purchased Reagent)		Aluminum	5000 ug/mL
							Arsenic	100 ug/mL
							Barium	100 ug/mL
							Beryllium	100 ug/mL
							Cadmium	100 ug/mL
							Calcium	5000 ug/mL
							Chromium	100 ug/mL
							Cobalt	100 ug/mL
							Copper	100 ug/mL
							Iron	5000 ug/mL
							Lead	100 ug/mL
							Magnesium	5000 ug/mL
							Manganese	100 ug/mL
							Nickel	100 ug/mL
							Potassium	5000 ug/mL
							Selenium	100 ug/mL
							Sodium	5000 ug/mL
							Thallium	100 ug/mL
							Vanadium	100 ug/mL
							Zinc	100 ug/mL
..MEI_CCV_Ag_00003	08/06/14		High-Purity, Lot 1231727		(Purchased Reagent)		Silver	1000 ug/mL
..MEI_CCV_B_STK_00007	12/19/13		High-Purity, Lot 1234738		(Purchased Reagent)		Antimony	100 ug/mL
MEI_06_CRI_00084	12/14/13	11/26/13	1% HNO3, Lot 1719397	2000 mL	MEI_CRI STOCK_00005	20 mL	Silver	0.003 mg/L
							Aluminum	0.2 mg/L

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Arsenic	0.01 mg/L
							Barium	0.002 mg/L
							Beryllium	0.002 mg/L
							Calcium	0.5 mg/L
							Cadmium	0.001 mg/L
							Cobalt	0.004 mg/L
							Chromium	0.004 mg/L
							Copper	0.01 mg/L
							Iron	0.05 mg/L
							Potassium	0.5 mg/L
							Magnesium	0.2 mg/L
							Manganese	0.003 mg/L
							Sodium	1 mg/L
							Nickel	0.01 mg/L
							Lead	0.005 mg/L
							Antimony	0.02 mg/L
							Selenium	0.015 mg/L
							Thallium	0.02 mg/L
							Vanadium	0.005 mg/L
							Zinc	0.01 mg/L
.MEI_CRI STOCK_00005	12/14/13	10/24/13	6%HNO3 5%HCL, Lot 1687455	1000 mL	MEA_Ag_STK_00003	0.3 mL	Silver	0.3 ug/mL
					MEA_Al_STK_00003	2 mL	Aluminum	20 ug/mL
					MEA_As_STK_00002	0.1 mL	Arsenic	1 ug/mL
					MEA_Ba_STK_00003	0.02 mL	Barium	0.2 ug/mL
					MEA_Be_STK_00003	0.02 mL	Beryllium	0.2 ug/mL
					MEA_Ca_STK_00004	5 mL	Calcium	50 ug/mL
					MEA_Cd_STK_00004	0.01 mL	Cadmium	0.1 ug/mL
					MEA_Co_STK_00003	0.04 mL	Cobalt	0.4 ug/mL
					MEA_Cr_STK_00002	0.04 mL	Chromium	0.4 ug/mL
					MEA_Cu_STK_00002	0.1 mL	Copper	1 ug/mL
					MEA_Fe_STK_00003	0.5 mL	Iron	5 ug/mL
					MEA_K_STK_00002	5 mL	Potassium	50 ug/mL
					MEA_MG_STK_00003	2 mL	Magnesium	20 ug/mL
					MEA_Mn_STK_00004	0.03 mL	Manganese	0.3 ug/mL
					MEA_Na_STK_00006	10 mL	Sodium	100 ug/mL
					MEA_Ni_STK_00002	0.1 mL	Nickel	1 ug/mL
					MEA_PB_STK_00005	0.05 mL	Lead	0.5 ug/mL
					MEA_Sb_STK_00002	0.2 mL	Antimony	2 ug/mL
					MEA_Se_STK_00003	0.15 mL	Selenium	1.5 ug/mL
					MEA_Tl_STK_00002	0.2 mL	Thallium	2 ug/mL
					MEA_V_STK_00004	0.5 mL	Vanadium	0.5 ug/mL
					MEA_Zn_STK_00002	0.1 mL	Zinc	1 ug/mL
..MEA_Ag_STK_00003	05/31/16		Ultra Scientific, Lot K00335		(Purchased Reagent)		Silver	1000 ug/mL
..MEA_Al_STK_00003	08/09/14		Ultra Scientific, Lot M00266A		(Purchased Reagent)		Aluminum	10000 ug/mL
..MEA_As_STK_00002	08/31/18		Ultra Scientific, Lot M00736		(Purchased Reagent)		Arsenic	10000 ug/mL
..MEA_Ba_STK_00003	08/19/14		Ultra Scientific, Lot L01142		(Purchased Reagent)		Barium	10000 ug/mL
..MEA_Be_STK_00003	08/19/14		Ultra Scientific, Lot M00347		(Purchased Reagent)		Beryllium	10000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..MEA_Ca_STK_00004	08/09/14		Ultra Scientific, Lot M01149		(Purchased Reagent)		Calcium	10000 ug/mL
..MEA_Cd_STK_00004	08/19/14		Ultra Scientific, Lot L00406		(Purchased Reagent)		Cadmium	10000 ug/mL
..MEA_Co_STK_00003	09/29/14		Ultra Scientific, Lot M00539		(Purchased Reagent)		Cobalt	10000 ug/mL
..MEA_Cr_STK_00002	06/30/16		Ultra Scientific, Lot K00358		(Purchased Reagent)		Chromium	10000 ug/mL
..MEA_Cu_STK_00002	11/30/17		Ultra Scientific, Lot L01250		(Purchased Reagent)		Copper	10000 ug/mL
..MEA_Fe_STK_00003	08/09/14		Ultra Scientific, Lot M00133		(Purchased Reagent)		Iron	10000 ug/mL
..MEA_K_STK_00002	02/28/17		Ultra Scientific, Lot L00056		(Purchased Reagent)		Potassium	10000 ug/mL
..MEA_MG_STK_00003	08/09/14		Ultra Scientific, Lot M00166		(Purchased Reagent)		Magnesium	10000 ug/mL
..MEA_Mn_STK_00004	10/21/14		Ultra Scientific, Lot K00953		(Purchased Reagent)		Manganese	10000 ug/mL
..MEA_Na_STK_00006	10/08/16		Ultra Scientific, Lot M00484		(Purchased Reagent)		Sodium	10000 ug/mL
..MEA_Ni_STK_00002	09/30/16		Ultra Scientific, Lot K00825		(Purchased Reagent)		Nickel	10000 ug/mL
..MEA_PB_STK_00005	07/12/14		Ultra Scientific, Lot L00395		(Purchased Reagent)		Lead	10000 ug/mL
..MEA_Sb_STK_00002	12/14/13		Ultra Scientific, Lot K00854		(Purchased Reagent)		Antimony	10000 ug/mL
..MEA_Se_STK_00003	11/01/15		Ultra Scientific, Lot P01005		(Purchased Reagent)		Selenium	10000 ug/mL
..MEA_Tl_STK_00002	12/14/13		Ultra Scientific, Lot L00055		(Purchased Reagent)		Thallium	10000 ug/mL
..MEA_V_STK_00004	01/03/14		CPI International, Lot V8601		(Purchased Reagent)		Vanadium	1000 ug/mL
..MEA_Zn_STK_00002	12/14/13		Ultra Scientific, Lot K01082		(Purchased Reagent)		Zinc	10000 ug/mL
MEI_06_CRI_00085	12/14/13	11/07/13	1% HNO3, Lot 1719397	500 mL	MEI_CRI STOCK_00005	10 mL	Silver	0.006 mg/L
							Aluminum	0.4 mg/L
							Arsenic	0.02 mg/L
							Barium	0.004 mg/L
							Beryllium	0.004 mg/L
							Calcium	1 mg/L
							Cadmium	0.002 mg/L
							Cobalt	0.008 mg/L
							Chromium	0.008 mg/L
							Copper	0.02 mg/L
							Iron	0.1 mg/L
							Potassium	1 mg/L
							Magnesium	0.4 mg/L
							Manganese	0.006 mg/L
							Sodium	2 mg/L
							Nickel	0.02 mg/L
							Lead	0.01 mg/L
							Antimony	0.04 mg/L
							Selenium	0.03 mg/L
							Thallium	0.04 mg/L
							Vanadium	0.01 mg/L
							Zinc	0.02 mg/L
.MEI_CRI STOCK_00005	12/14/13	10/24/13	6%HNO3 5%HCL, Lot 1687455	1000 mL	MEA_Ag_STK_00003	0.3 mL	Silver	0.3 ug/mL
					MEA_Al_STK_00003	2 mL	Aluminum	20 ug/mL
					MEA_As_STK_00002	0.1 mL	Arsenic	1 ug/mL
					MEA_Ba_STK_00003	0.02 mL	Barium	0.2 ug/mL
					MEA_Be_STK_00003	0.02 mL	Beryllium	0.2 ug/mL
					MEA_Ca_STK_00004	5 mL	Calcium	50 ug/mL
					MEA_Cd_STK_00004	0.01 mL	Cadmium	0.1 ug/mL
					MEA_Co_STK_00003	0.04 mL	Cobalt	0.4 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					MEA_Cr_STK_00002	0.04 mL	Chromium	0.4 ug/mL
					MEA_Cu_STK_00002	0.1 mL	Copper	1 ug/mL
					MEA_Fe_STK_00003	0.5 mL	Iron	5 ug/mL
					MEA_K_STK_00002	5 mL	Potassium	50 ug/mL
					MEA_MG_STK_00003	2 mL	Magnesium	20 ug/mL
					MEA_Mn_STK_00004	0.03 mL	Manganese	0.3 ug/mL
					MEA_Na_STK_00006	10 mL	Sodium	100 ug/mL
					MEA_Ni_STK_00002	0.1 mL	Nickel	1 ug/mL
					MEA_PB_STK_00005	0.05 mL	Lead	0.5 ug/mL
					MEA_Sb_STK_00002	0.2 mL	Antimony	2 ug/mL
					MEA_Se_STK_00003	0.15 mL	Selenium	1.5 ug/mL
					MEA_Tl_STK_00002	0.2 mL	Thallium	2 ug/mL
					MEA_V_STK_00004	0.5 mL	Vanadium	0.5 ug/mL
					MEA_Zn_STK_00002	0.1 mL	Zinc	1 ug/mL
..MEA_Ag_STK_00003	05/31/16		Ultra Scientific, Lot K00335		(Purchased Reagent)		Silver	1000 ug/mL
..MEA_Al_STK_00003	08/09/14		Ultra Scientific, Lot M00266A		(Purchased Reagent)		Aluminum	10000 ug/mL
..MEA_As_STK_00002	08/31/18		Ultra Scientific, Lot M00736		(Purchased Reagent)		Arsenic	10000 ug/mL
..MEA_Ba_STK_00003	08/19/14		Ultra Scientific, Lot L01142		(Purchased Reagent)		Barium	10000 ug/mL
..MEA_Be_STK_00003	08/19/14		Ultra Scientific, Lot M00347		(Purchased Reagent)		Beryllium	10000 ug/mL
..MEA_Ca_STK_00004	08/09/14		Ultra Scientific, Lot M01149		(Purchased Reagent)		Calcium	10000 ug/mL
..MEA_Cd_STK_00004	08/19/14		Ultra Scientific, Lot L00406		(Purchased Reagent)		Cadmium	10000 ug/mL
..MEA_Co_STK_00003	09/29/14		Ultra Scientific, Lot M00539		(Purchased Reagent)		Cobalt	10000 ug/mL
..MEA_Cr_STK_00002	06/30/16		Ultra Scientific, Lot K00358		(Purchased Reagent)		Chromium	10000 ug/mL
..MEA_Cu_STK_00002	11/30/17		Ultra Scientific, Lot L01250		(Purchased Reagent)		Copper	10000 ug/mL
..MEA_Fe_STK_00003	08/09/14		Ultra Scientific, Lot M00133		(Purchased Reagent)		Iron	10000 ug/mL
..MEA_K_STK_00002	02/28/17		Ultra Scientific, Lot L00056		(Purchased Reagent)		Potassium	10000 ug/mL
..MEA_MG_STK_00003	08/09/14		Ultra Scientific, Lot M00166		(Purchased Reagent)		Magnesium	10000 ug/mL
..MEA_Mn_STK_00004	10/21/14		Ultra Scientific, Lot K00953		(Purchased Reagent)		Manganese	10000 ug/mL
..MEA_Na_STK_00006	10/08/16		Ultra Scientific, Lot M00484		(Purchased Reagent)		Sodium	10000 ug/mL
..MEA_Ni_STK_00002	09/30/16		Ultra Scientific, Lot K00825		(Purchased Reagent)		Nickel	10000 ug/mL
..MEA_PB_STK_00005	07/12/14		Ultra Scientific, Lot L00395		(Purchased Reagent)		Lead	10000 ug/mL
..MEA_Sb_STK_00002	12/14/13		Ultra Scientific, Lot K00854		(Purchased Reagent)		Antimony	10000 ug/mL
..MEA_Se_STK_00003	11/01/15		Ultra Scientific, Lot P01005		(Purchased Reagent)		Selenium	10000 ug/mL
..MEA_Tl_STK_00002	12/14/13		Ultra Scientific, Lot L00055		(Purchased Reagent)		Thallium	10000 ug/mL
..MEA_V_STK_00004	01/03/14		CPI International, Lot V8601		(Purchased Reagent)		Vanadium	1000 ug/mL
..MEA_Zn_STK_00002	12/14/13		Ultra Scientific, Lot K01082		(Purchased Reagent)		Zinc	10000 ug/mL
MEI_07_ICSA_00055	04/30/14	10/30/13	1% HNO3, Lot 1702248	500 mL	MEI_ICSA_STK_00007	50 mL	Aluminum	500.6 ug/mL
							Calcium	500.4 ug/mL
							Iron	200.3 ug/mL
							Magnesium	500.3 ug/mL
.MEI_ICSA_STK_00007	04/24/15		Ultra Scientific, Lot M00570		(Purchased Reagent)		Aluminum	5006 ug/mL
							Calcium	5004 ug/mL
							Iron	2003 ug/mL
							Magnesium	5003 ug/mL
MEI_08_ICSAB_00074	03/26/14	11/01/13	1% HNO3, Lot 1719397	500 mL	MEA_Ag_STK_00003	0.1 mL	Silver	0.2 ug/mL
					MEI_ICSAB_STK_00016	50 mL	Aluminum	500.6 ug/mL
							Antimony	0.6 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Arsenic	0.1 ug/mL
							Barium	0.5 ug/mL
							Beryllium	0.5 ug/mL
							Cadmium	1 ug/mL
							Calcium	500.5 ug/mL
							Chromium	0.5 ug/mL
							Cobalt	0.5 ug/mL
							Copper	0.5 ug/mL
							Iron	100 ug/mL
							Lead	0.05 ug/mL
							Li	0.5 ug/mL
							Magnesium	500.6 ug/mL
							Manganese	0.5 ug/mL
							Nickel	1 ug/mL
							Selenium	0.05 ug/mL
							Sr	0.5 ug/mL
							Thallium	0.1 ug/mL
							Vanadium	0.5 ug/mL
							Zinc	1 ug/mL
.MEA_Ag_STK_00003	05/31/16		Ultra Scientific, Lot K00335		(Purchased Reagent)		Silver	1000 ug/mL
.MEI_ICSAB_STK_00016	05/31/14		Ultra Scientific, Lot R00395		(Purchased Reagent)		Aluminum	5006 ug/mL
							Antimony	6 ug/mL
							Arsenic	1 ug/mL
							Barium	5 ug/mL
							Beryllium	5 ug/mL
							Cadmium	10 ug/mL
							Calcium	5005 ug/mL
							Chromium	5 ug/mL
							Cobalt	5 ug/mL
							Copper	5 ug/mL
							Iron	1000 ug/mL
							Lead	0.5 ug/mL
							Li	5 ug/mL
							Magnesium	5006 ug/mL
							Manganese	5 ug/mL
							Nickel	10 ug/mL
							Selenium	0.5 ug/mL
							Sr	5 ug/mL
							Thallium	1 ug/mL
							Vanadium	5 ug/mL
							Zinc	10 ug/mL
MEI_09_CCV_00134	12/19/13	11/01/13	1% HNO3, Lot 1719397	2000 mL	MEI_CCV_A_STK_00005	10 mL	Arsenic	0.5 ug/mL
							Cadmium	0.5 ug/mL
							Iron	25 ug/mL
							Lead	0.5 ug/mL
							Manganese	0.5 ug/mL
					MEI_CCV_Ag_00003	1 mL	Silver	0.5 ug/mL

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.MEI_CCV_A_STK_00005	12/19/13		High-Purity, Lot 1234767		(Purchased Reagent)		Arsenic	100 ug/mL
							Cadmium	100 ug/mL
							Iron	5000 ug/mL
							Lead	100 ug/mL
							Manganese	100 ug/mL
.MEI_CCV_Ag_00003	08/06/14		High-Purity, Lot 1231727		(Purchased Reagent)		Silver	1000 ug/mL
MEI_09_CCV_00136	12/19/13	11/14/13	1% HNO3, Lot IC-1734412	2000 mL	MEI_CCV_A_STK_00005	10 mL	Aluminum	25 ug/mL
							Arsenic	0.5 ug/mL
							Barium	0.5 ug/mL
							Beryllium	0.5 ug/mL
							Cadmium	0.5 ug/mL
							Calcium	25 ug/mL
							Chromium	0.5 ug/mL
							Cobalt	0.5 ug/mL
							Copper	0.5 ug/mL
							Iron	25 ug/mL
							Lead	0.5 ug/mL
							Magnesium	25 ug/mL
							Manganese	0.5 ug/mL
							Nickel	0.5 ug/mL
							Potassium	25 ug/mL
							Selenium	0.5 ug/mL
							Sodium	25 ug/mL
							Thallium	0.5 ug/mL
							Vanadium	0.5 ug/mL
							Zinc	0.5 ug/mL
					MEI_CCV_Ag_00003	1 mL	Silver	0.5 ug/mL
					MEI_CCV_B_STK_00007	10 mL	Antimony	0.5 ug/mL
.MEI_CCV_A_STK_00005	12/19/13		High-Purity, Lot 1234767		(Purchased Reagent)		Aluminum	5000 ug/mL
							Arsenic	100 ug/mL
							Barium	100 ug/mL
							Beryllium	100 ug/mL
							Cadmium	100 ug/mL
							Calcium	5000 ug/mL
							Chromium	100 ug/mL
							Cobalt	100 ug/mL
							Copper	100 ug/mL
							Iron	5000 ug/mL
							Lead	100 ug/mL
							Magnesium	5000 ug/mL
							Manganese	100 ug/mL
							Nickel	100 ug/mL
							Potassium	5000 ug/mL
							Selenium	100 ug/mL
							Sodium	5000 ug/mL
							Thallium	100 ug/mL
							Vanadium	100 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Zinc	100 ug/mL
.MEI_CCV_Ag_00003	08/06/14		High-Purity, Lot 1231727		(Purchased Reagent)		Silver	1000 ug/mL
.MEI_CCV_B_STK_00007	12/19/13		High-Purity, Lot 1234738		(Purchased Reagent)		Antimony	100 ug/mL
MEI_10_CCVL_00001	12/14/13	11/07/13	1% HNO3, Lot 1719397	2000 mL	MEI_CRI STOCK_00005	20 mL	Silver	0.003 mg/L
							Aluminum	0.2 mg/L
							Arsenic	0.01 mg/L
							Barium	0.002 mg/L
							Beryllium	0.002 mg/L
							Calcium	0.5 mg/L
							Cadmium	0.001 mg/L
							Cobalt	0.004 mg/L
							Chromium	0.004 mg/L
							Copper	0.01 mg/L
							Iron	0.05 mg/L
							Potassium	0.5 mg/L
							Magnesium	0.2 mg/L
							Manganese	0.003 mg/L
							Sodium	1 mg/L
							Nickel	0.01 mg/L
							Lead	0.005 mg/L
							Antimony	0.02 mg/L
							Selenium	0.015 mg/L
							Thallium	0.02 mg/L
							Vanadium	0.005 mg/L
							Zinc	0.01 mg/L
.MEI_CRI STOCK_00005	12/14/13	10/24/13	6%HNO3 5%HCL, Lot 1687455	1000 mL	MEA_Ag_STK_00003	0.3 mL	Silver	0.3 ug/mL
					MEA_Al_STK_00003	2 mL	Aluminum	20 ug/mL
					MEA_As_STK_00002	0.1 mL	Arsenic	1 ug/mL
					MEA_Ba_STK_00003	0.02 mL	Barium	0.2 ug/mL
					MEA_Be_STK_00003	0.02 mL	Beryllium	0.2 ug/mL
					MEA_Ca_STK_00004	5 mL	Calcium	50 ug/mL
					MEA_Cd_STK_00004	0.01 mL	Cadmium	0.1 ug/mL
					MEA_Co_STK_00003	0.04 mL	Cobalt	0.4 ug/mL
					MEA_Cr_STK_00002	0.04 mL	Chromium	0.4 ug/mL
					MEA_Cu_STK_00002	0.1 mL	Copper	1 ug/mL
					MEA_Fe_STK_00003	0.5 mL	Iron	5 ug/mL
					MEA_K_STK_00002	5 mL	Potassium	50 ug/mL
					MEA_MG_STK_00003	2 mL	Magnesium	20 ug/mL
					MEA_Mn_STK_00004	0.03 mL	Manganese	0.3 ug/mL
					MEA_Na_STK_00006	10 mL	Sodium	100 ug/mL
					MEA_Ni_STK_00002	0.1 mL	Nickel	1 ug/mL
					MEA_PB_STK_00005	0.05 mL	Lead	0.5 ug/mL
					MEA_Sb_STK_00002	0.2 mL	Antimony	2 ug/mL
					MEA_Se_STK_00003	0.15 mL	Selenium	1.5 ug/mL
					MEA_Tl_STK_00002	0.2 mL	Thallium	2 ug/mL
					MEA_V_STK_00004	0.5 mL	Vanadium	0.5 ug/mL
					MEA_Zn_STK_00002	0.1 mL	Zinc	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..MEA_Ag_STK_00003	05/31/16		Ultra Scientific, Lot K00335		(Purchased Reagent)		Silver	1000 ug/mL
..MEA_Al_STK_00003	08/09/14		Ultra Scientific, Lot M00266A		(Purchased Reagent)		Aluminum	10000 ug/mL
..MEA_As_STK_00002	08/31/18		Ultra Scientific, Lot M00736		(Purchased Reagent)		Arsenic	10000 ug/mL
..MEA_Ba_STK_00003	08/19/14		Ultra Scientific, Lot L01142		(Purchased Reagent)		Barium	10000 ug/mL
..MEA_Be_STK_00003	08/19/14		Ultra Scientific, Lot M00347		(Purchased Reagent)		Beryllium	10000 ug/mL
..MEA_Ca_STK_00004	08/09/14		Ultra Scientific, Lot M01149		(Purchased Reagent)		Calcium	10000 ug/mL
..MEA_Cd_STK_00004	08/19/14		Ultra Scientific, Lot L00406		(Purchased Reagent)		Cadmium	10000 ug/mL
..MEA_Co_STK_00003	09/29/14		Ultra Scientific, Lot M00539		(Purchased Reagent)		Cobalt	10000 ug/mL
..MEA_Cr_STK_00002	06/30/16		Ultra Scientific, Lot K00358		(Purchased Reagent)		Chromium	10000 ug/mL
..MEA_Cu_STK_00002	11/30/17		Ultra Scientific, Lot L01250		(Purchased Reagent)		Copper	10000 ug/mL
..MEA_Fe_STK_00003	08/09/14		Ultra Scientific, Lot M00133		(Purchased Reagent)		Iron	10000 ug/mL
..MEA_K_STK_00002	02/28/17		Ultra Scientific, Lot L00056		(Purchased Reagent)		Potassium	10000 ug/mL
..MEA_MG_STK_00003	08/09/14		Ultra Scientific, Lot M00166		(Purchased Reagent)		Magnesium	10000 ug/mL
..MEA_Mn_STK_00004	10/21/14		Ultra Scientific, Lot K00953		(Purchased Reagent)		Manganese	10000 ug/mL
..MEA_Na_STK_00006	10/08/16		Ultra Scientific, Lot M00484		(Purchased Reagent)		Sodium	10000 ug/mL
..MEA_Ni_STK_00002	09/30/16		Ultra Scientific, Lot K00825		(Purchased Reagent)		Nickel	10000 ug/mL
..MEA_PB_STK_00005	07/12/14		Ultra Scientific, Lot L00395		(Purchased Reagent)		Lead	10000 ug/mL
..MEA_Sb_STK_00002	12/14/13		Ultra Scientific, Lot K00854		(Purchased Reagent)		Antimony	10000 ug/mL
..MEA_Se_STK_00003	11/01/15		Ultra Scientific, Lot P01005		(Purchased Reagent)		Selenium	10000 ug/mL
..MEA_Tl_STK_00002	12/14/13		Ultra Scientific, Lot L00055		(Purchased Reagent)		Thallium	10000 ug/mL
..MEA_V_STK_00004	01/03/14		CPI International, Lot V8601		(Purchased Reagent)		Vanadium	1000 ug/mL
..MEA_Zn_STK_00002	12/14/13		Ultra Scientific, Lot K01082		(Purchased Reagent)		Zinc	10000 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
WThcrIM_00045	05/01/14	11/01/13	Deionized H2O, Lot DI water	100 mL	WThcrSP1_00017	10 mL	Cr (VI)	100 mg/L
.WThcrSP1_00017	05/01/14	Aldrich, Lot MKBG9644V			(Purchased Reagent)		Cr (VI)	1000 mg/L
WThcrIM3_00027	05/01/14	11/01/13	Deionized H2O, Lot DI water	100 mL	WThcrSP2_00015	10 mL	Cr (VI)	100 mg/L
.WThcrSP2_00015	05/01/14	Baker, Lot 0000014184			(Purchased Reagent)		Cr (VI)	1000 mg/L
WThcrPbCr_00004	09/14/15	Sigma, Lot BCBC2419			(Purchased Reagent)		Cr (VI)	0.1609 g/g
WThcrsLCS_00073	04/21/14	ERA, Lot P208-984			(Purchased Reagent)		Cr (VI)	7.62 mg/L

TALS ID: 707203
Rec: 4/25/12

ULTRA SCIENTIFIC
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Certificate of Analysis

ULTRAgrade™ Solution
Silver ICP Standard
1000 µg/mL

Catalog Number: ICP-047
Lot Number: K00335
Job Number: J00009641
Lot Issue Date: 04/08/2009
Expiration Date: 05/31/2016

Starting Material:	Silver Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01040
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ag:	107.88

* light sensitive

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3151

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware and clean bottles in the manufacture of ULTRAgrade standards. Balances used in the manufacture of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	s	Ag			n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.013 g/mL

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Cert. No. 06-1004

William J. Leary
Quality Assurance Manager

250 Smith Street, North Kingstown, RI 02852 USA
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01/06/2014

875293

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Certificate of Analysis

ULTRAgrade™ Solution
Aluminum ICP Standard
10000 µg/mL

Catalog Number: ICP-113
Lot Number: M00266A
Job Number: J00012564
Lot Issue Date: 03/15/2011
Expiration Date: 04/30/2016

Starting Material:	Aluminum Nitrate Nonahydrate
Starting Material Purity:	99.998%
Starting Material Lot No.:	BH01794
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Al:	26.98

Certified Value: 10011 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3101a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

s	Al			*	Ga	<0.010	D	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.030	D	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.010	D	n	Lu			n	Sm			*	V	<0.010	D		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.010	D	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D						
*.	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 20.8°C ± 0.5°C): 1.070 g/mL

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01/06/2014

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Received : 5/29/12
TALS ID: 765404

Certificate of Analysis

ULTRAgrade™ Solution
Arsenic ICP Standard
10000 µg/mL

Catalog Number: ICP-133
Lot Number: M00736
Job Number: J00013158
Lot Issue Date: 07/12/2011
Expiration Date: 08/31/2018

Starting Material:	Arsenic (III) Oxide
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01150
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight As:	74.91

Certified Value: 10008 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3103a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.010	D	*	Ga	<0.005	ND	n	Nb			n	S	
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta	
s	As			n	Au			*	Pd	<0.005	ND	n	Te	
*	Ba	<0.010	D	n	Hf			*	P	<0.005	ND	n	Tb	
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005 ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th	
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm	
*	Cd	<0.005	ND	*	Fe	<0.010	D	n	Re			*	Sn	<0.010 D
*	Ca	<0.020	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.010 D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W	
n	Cs			*	Li	<0.010	D	n	Ru			n	U	
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005 ND
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb	
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y	
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005 ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.010	D	n	Zr	
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND			
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND			

* - element checked for
ND - not detected

I - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.021 g/mL

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William J. Leary
Quality Assurance Manager

875292

Certificate of Analysis

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ULTRAgrade™ Solution
Calcium ICP Standard
10000 µg/mL

Catalog Number: ICP-120
Lot Number: M01149
Job Number: J00013782
Lot Issue Date: 11/02/2011
Expiration Date: 12/31/2018

Starting Material:	Calcium Carbonate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01822
Matrix:	5% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ca:	40.08

Certified Value: 10004 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3109a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.030	D	n	Re			*	Sn	<0.005	ND		
s	Ca			*	La	<0.005	ND	n	Rh			*	Ti	<0.010	D		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.030	D						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.020	D						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5): 1.014 g/mL

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Received : 5/28/12
TALS ID: 765401

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Certificate of Analysis

ULTRAgrade™ Solution
Chromium ICP Standard
10000 µg/mL

Catalog Number: ICP-124
Lot Number: K00358
Job Number: J00009728
Lot Issue Date: 04/20/2009
Expiration Date: 06/30/2016

Starting Material:	Chromium (III) Nitrate Nonahydrate
Starting Material Purity:	99.998%
Starting Material Lot No.:	BH01232
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Cr:	52.01

Certified Value: 10009 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3112a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.010	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.150	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
s	Cr			n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.2°C ± 0.5°C): 1.044 g/mL

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William J. Leary
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01/06/2014

Received: 5/29/12
TALS ID: ~~76504~~ mdm 5/29/12
765406

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ULTRAgrade™ Solution
Copper ICP Standard
10000 µg/mL

Catalog Number: ICP-129
Lot Number: L01250
Job Number: J00011813
Lot Issue Date: 10/27/2010
Expiration Date: 11/30/2017

Starting Material:	Copper (II) Nitrate Hydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01664
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Cu:	63.54

Certified Value: 10016 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3114

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.030	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
s	Cu			*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.046 g/mL

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01/06/2014

8754;

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ULTRAgrade™ Solution
Iron ICP Standard
10000 µg/mL

Catalog Number: ICP-126
Lot Number: M00133
Job Number: J00012569
Lot Issue Date: 02/15/2011
Expiration Date: 03/31/2018

Starting Material:	Iron (III) Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01557
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Fe:	55.85

Certified Value: 10014 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3126a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	s	Fe			n	Re			*	Sn	<0.005	ND		
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.020	D	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.020	D		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 21.5°C ± 0.5°C): 1.049 g/mL

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01/06/2014

Certificate of Analysis

ULTRAgrade™ Solution
Potassium ICP Standard
10000 µg/mL

Catalog Number: ICP-119
Lot Number: L00056
Job Number: J00010831
Lot Issue Date: 01/18/2010
Expiration Date: 02/28/2017

Starting Material:	Potassium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01316
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight K:	39.10

Certified Value: 10017 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3141a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	s	K			n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.010	D	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.0℃ ± 0.5℃): 1.039 g/mL

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William J. Leary
Quality Assurance Manager
01/06/2014

875300

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ULTRAgrade™ Solution
Magnesium ICP Standard
10000 µg/mL

Catalog Number: ICP-112
Lot Number: M00166
Job Number: J00012563
Lot Issue Date: 02/21/2011
Expiration Date: 03/31/2018

Starting Material:	Magnesium Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01553, BH01565, BH01769
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Mg:	24.31

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3131a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Ti	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.070	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	s	Mg			n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 20.0°C ± 0.5°C): 1.054 g/mL

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01/06/2014

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ID: MEA_Mn_STK_00002
Exp 10/2013 Prpd LH Open 10/21/11
Manganese stock, 10,000 u

R. 10/21/11
E. 10/21/2014 mll 10/21/11
432689

ULTRAgrade™ Solution
Manganese ICP Standard
10000 µg/mL

Catalog Number: ICP-125
Lot Number: K00953
Job Number: J00010209
Lot Issue Date: 09/14/2009
Expiration Date: 10/31/2016

Starting Material:	Manganese (II) Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01079
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Mn:	54.94

Certified Value: 10008 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3132

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.030	D	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.050	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.030	D	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.100	D	n	Sc			n	Yb				
*	Cu	<0.005	ND	s	Mn			*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5°C ± 0.5°C): 1.035 g/mL

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William J. Leary
Quality Assurance Manager
01/06/2014

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R 10/8/13 AMH
E 10/8/16

1700283
ID: MEA_Na_STK_00006
Exp:10/08/16 Prpd:AMH Opn:10/24/13
Sodium stock, 10,000 ug/m

ULTRAgrade™ Solution
Sodium ICP Standard
10000 µg/mL

Catalog Number: ICP-111
Lot Number: M00484
Job Number: J00012872
Lot Issue Date: 05/10/2011
Expiration Date: 06/30/2018

Starting Material:	Sodium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01568, BH01851
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Na:	22.99

Certified Value: 10009 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3152a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.020	D	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			s	Na								
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.0°C ± 0.5°C): 1.034 g/mL

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01/06/2014

Received: 5/28/12
TALS ID: 765403

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ULTRAgrade™ Solution
Nickel ICP Standard
10000 µg/mL

Catalog Number: ICP-128
Lot Number: K00825
Job Number: J00010210
Lot Issue Date: 08/12/2009
Expiration Date: 09/30/2016

Starting Material:	Nickel (II) Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01230
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ni:	58.71

Certified Value: 10012 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3136

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.010	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	s	Ni			*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.0°C ± 0.5°C): 1.036 g/mL

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William J. Leary
Quality Assurance Manager

01/06/2014

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Certificate of Analysis

R 9/29/11 AMH
E 9/29/13
387212

ULTRAgrade™ Solution
Sulfur ICP Standard
10000 µg/mL

Catalog Number: ICP-116
Lot Number: M00068
Job Number: J00012566
Lot Issue Date: 01/24/2011
Expiration Date: 02/28/2018

Starting Material:	Ammonium Sulfate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01662
Matrix:	low TOC water (< 50 ppb)
Atomic Weight S:	32.06

Certified Value: 10012 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3154

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			s	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 20.0°C ± 0.5°C): 1.028 g/mL

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William J. Leahy
Quality Assurance Manager

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01/06/2014

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10/9117
Received: 11/1/12

ULTRAgrade™ Solution
Selenium ICP Standard
10000 µg/mL

Catalog Number: ICP-134
Lot Number: P01005
Job Number: J00015288
Lot Issue Date: 10/01/2012
Expiration Date: 11/30/2019

Starting Material:	Selenium (IV) Oxide
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01611
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Se:	78.96

Certified Value: 10020 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3149

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.010	D	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.020	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.010	D		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	s	Se			n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

I - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 20.00°C ± 0.05°C): 1.0201 g/mL

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William J. Leary
Quality Assurance Manager

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11677734
Rec 1/31/13
Exp 1/31/16

ULTRAgrade™ Solution
Silicon ICP Standard
10000 µg/mL

Catalog Number: ICP-114
Lot Number: M00333
Job Number: J00012565
Lot Issue Date: 03/31/2011
Expiration Date: 04/30/2018

Starting Material:	Ammonium Hexafluorosilicate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01795
Matrix:	2% nitric acid, trace hydrofluoric acid in low TOC water (< 50 ppb)
Atomic Weight Si:	28.09

Certified Value: 10013 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3150

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.050	D	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.010	D	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.010	D		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.030	D	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	s	Si			*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.030	D						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 21.5°C ± 0.5°C): 1.048 g/mL

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EXPIRY: JAN 0 3 2014

R 8/17/12 AMH
EXP 1/3/14

886691

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CPI INTERNATIONAL

Europe
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The Netherlands
P: +31 20 638 05 97
F: +31 20 420 28 36

CERTIFICATE OF ANALYSIS

100mL P/N: S4400-1000651
250mL P/N: 4400-1000651

Element: Vanadium (V)
Concentration: 1000 µg/mL ± 0.3%
Matrix: 2% HNO_3
Lot Number: 12F116
Specific Gravity: ~1.007 @ 21 °C

Source: NH_4VO_3
Source Purity: 99.999%
Source Lot: V8601
Traceable to NIST SRM: 3165
Expiry from ship date: 18 months

Preparation: This standard solution was prepared gravimetrically using high purity material source, sub-boiled distilled acid(s) and 18-megaohm deionized water. The material source was weighed to five significant figures and diluted in Class A volumetric glassware.
Uncertainty: The certified value is at the 95% confidence level. It can be expressed at $X = x \pm U$ where X = certified concentration and U = the expanded uncertainty. $U = ku_c$ where k=2 is the coverage factor at the 95% confidence level. $U_c = \sqrt{\Sigma u_i^2}$ where u_i = the sum of the individual element standard uncertainty components associated with the gravimetric preparation and method bias.
Traceability: The raw materials were weighed on a 0.1mg balance routinely calibrated by NIST traceable weights. All Class A glassware was used and calibrated routinely by NIST recommended procedures. The standard concentration was tested by ICP, ICP-MS and or gravimetrically directly against NIST traceable standards. If NIST standard was not available, 3rd party CRM was used.

Li	0.3	P	ND	V	X	Zn	6.7	Y	ND	Ag	ND	Ba	0.4	Gd	ND	Lu	ND	Pt	0.1
Be	ND	Th	ND	Cr	0.4	Ga	ND	Zr	ND	Cd	ND	La	0.4	Tb	ND	Hf	ND	Au	ND
B	0.7	U	0.2	Mn	0.3	Ge	ND	Nb	ND	In	ND	Ce	0.1	Dy	ND	Ta	ND	Hg	6.1
Na	40	K	113	Fe	ND	As	0.5	Mo	0.1	Sn	0.2	Pr	ND	Ho	ND	W	ND	Tl	0.1
Mg	4.6	Ca	38	Co	0.1	Se	0.2	Ru	ND	Sb	1.3	Nd	ND	Er	ND	Re	ND	Pb	0.2
Al	4.7	Sc	0.1	Ni	ND	Rb	0.3	Rh	ND	Te	ND	Sm	ND	Tm	ND	Os	ND	Bi	ND
Si	ND	Ti	ND	Cu	3.9	Sr	0.1	Pd	ND	Cs	0.3	Eu	ND	Yb	ND	Ir	ND		

Concentrations are in ppb. INT=Interference from X, Solution Element ND=None Detected X=Solution

The solution should be kept tightly capped and stored under normal laboratory conditions. Do not sample directly from bottle. Perform serial dilutions to achieve best results. See attached MSDS for proper handling information. MSDS collection is also available at www.cpiinternational.com.

Certifying Officer

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Certification Number: AC-1455

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Certificate of Analysis

1653961
ID: MED_01_W1_00016
Exp: 10/05/16 Prpd: SS1
ICP W1 Spike & PS, ICUS-1

Inorganic Custom Standard

Catalog Number: ICUS-1370
Lot Number: R01031
Job Number: J00017018
Lot Issue Date: 09/26/2013
Expiration Date: 10/31/2014

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentration(s) were prepared and verified by an ISO Guide 34 / ISO 17025 accredited laboratory. The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Analyte	True Value				Analytical Method
antimony	40.00	±	0.20	µg/mL	gravimetric
arsenic	40.00	±	0.20	µg/mL	gravimetric
beryllium	40.00	±	0.20	µg/mL	gravimetric
cadmium	40.00	±	0.20	µg/mL	gravimetric
chromium	40.00	±	0.20	µg/mL	gravimetric
cobalt	40.00	±	0.20	µg/mL	gravimetric
copper	40.00	±	0.20	µg/mL	gravimetric
lead	40.00	±	0.20	µg/mL	gravimetric
manganese	40.00	±	0.20	µg/mL	gravimetric
molybdenum	40.00	±	0.20	µg/mL	gravimetric
nickel	40.00	±	0.20	µg/mL	gravimetric
selenium	40.00	±	0.20	µg/mL	gravimetric
thallium	40.00	±	0.20	µg/mL	gravimetric
* vanadium	40.00	±	0.20	µg/mL	gravimetric
zinc	40.00	±	0.20	µg/mL	gravimetric
titanium	40.00	±	0.20	µg/mL	gravimetric
calcium	2000	±	10	µg/mL	gravimetric
iron	2000	±	10	µg/mL	gravimetric
magnesium	2000	±	10	µg/mL	gravimetric

Matrix: 5% nitric acid, trace tartaric acid in low TOC water (< 50 ppb)

** light sensitive*

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

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Certificate of Analysis

W2
Recd: 4/19/13

1311054
ID: MED_02_W2_00013
Exp: 05/31/14 Prpd: JM
ICP W2 Spike & PS, ICUS-3

Inorganic Custom Standard

Catalog Number: ICUS-3097
Lot Number: R00355
Job Number: J00016195
Lot Issue Date: 04/12/2013
Expiration Date: 05/31/2014

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Analyte	True Value				Analytical Method
barium	40.00	±	0.20	µg/mL	gravimetric
boron	40.00	±	0.20	µg/mL	gravimetric
aluminum	2000	±	10	µg/mL	gravimetric
potassium	2004	±	10	µg/mL	gravimetric
sodium	2001	±	10	µg/mL	gravimetric
lithium	40.00	±	0.20	µg/mL	gravimetric
strontium	40.00	±	0.20	µg/mL	gravimetric

Matrix: 5% nitric acid, trace hydrofluoric acid in low TOC water (< 50 ppb)

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

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William J. Leahy
Quality Assurance Manager

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01/06/2014

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Certificate of Analysis

1653962
ID: MED_02_W2_00015
Exp: 10/31/14 Prpd: SS1
ICP W2 Spike & PS, ICUS-3

Inorganic Custom Standard

Catalog Number: ICUS-3097
Lot Number: R01025
Job Number: J00017019
Lot Issue Date: 09/25/2013
Expiration Date: 10/31/2014

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentration(s) were prepared and verified by an ISO Guide 34 / ISO 17025 accredited laboratory. The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Analyte	True Value				Analytical Method
barium	40.00	±	0.20	µg/mL	gravimetric
boron	40.00	±	0.20	µg/mL	gravimetric
aluminum	2000	±	10	µg/mL	gravimetric
potassium	2001	±	10	µg/mL	gravimetric
sodium	2002	±	10	µg/mL	gravimetric
lithium	40.00	±	0.20	µg/mL	gravimetric
strontium	40.00	±	0.20	µg/mL	gravimetric

Matrix: 5% nitric acid, trace hydrofluoric acid in low TOC water (< 50 ppb)

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

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Quality Assurance Manager

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Reference Materials

▪ Certificate of Analysis ▪

Product: Metals in Soil
Catalog Number: 540
Lot No. D080-540
Certificate Issue Date: April 12, 2013
Expiration Date: July 31, 2016
Revision Number: Original

Rec: 9/12/13

1599934
ID: MED_SRM_D080_00001
Exp: 07/31/15 Prpd: NMD2
DIG Metals in Soil

CERTIFICATION

Parameter	Total Concentration	Certified Value[1]	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/kg	mg/kg	%	mg/kg	mg/kg
Aluminum	68100	8840	6.12	4780 - 12900	3710 - 14000
Antimony	232	88.2	23.0	D.L. - 204	23.2 - 255
Arsenic	114	99.6	11.0	80.5 - 119	69.0 - 130
Barium	742	310	8.83	258 - 362	230 - 391
Beryllium	79.5	72.3	15.5	59.4 - 85.1	53.4 - 91.2
Boron	173	144	4.76	106 - 182	86.3 - 201
Cadmium	207	182	13.3	149 - 215	134 - 230
Calcium	25400	6790	6.30	5610 - 7980	5040 - 8540
Chromium	376	136	15.4	109 - 164	95.7 - 177
Cobalt	150	128	4.37	106 - 149	94.9 - 160
Copper	124	102	9.10	82.7 - 121	75.8 - 129
Iron	42900	12600	17.6	5180 - 19900	3900 - 21200
Lead	121	115	20.9	94.1 - 137	82.9 - 148
Magnesium	9180	3010	10.6	2320 - 3700	1990 - 4030
Manganese	906	323	6.68	266 - 379	242 - 404
Mercury	21.5	19.9	33.9	13.8 - 25.9	10.2 - 29.5
Molybdenum	167	133	7.22	102 - 164	93.8 - 182
Nickel	195	153	16.5	126 - 180	112 - 193
Potassium	19800	2840	8.11	2020 - 3670	1760 - 3920
Selenium	171	150	18.7	116 - 184	101 - 199
Silver	44.7	40.4	29.8	30.3 - 50.4	26.6 - 54.0
Sodium	19800	2760	10.8	1960 - 3560	1820 - 3700
Strontium	222	102	11.8	82.5 - 122	71.8 - 132
Thallium	200	174	8.21	137 - 212	120 - 229

ACCREDITED
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Parameter	Total Concentration	Certified Value[1]	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/kg	mg/kg	%	mg/kg	mg/kg
Tin	118	102	3.61	77.6 - 126	57.9 - 145
Titanium	3310	262	14.1	70.1 - 453	13.3 - 510
Vanadium	184	97.6	12.3	75.2 - 120	63.6 - 132
Zinc	177	161	17.9	130 - 192	110 - 212

ANALYTICAL VERIFICATION

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/kg	mg/kg	%			%
Aluminum	8840	8840	100	175	-	-
Antimony	88.2	88.2	100	186	-	-
Arsenic	99.6	99.6	100	219	-	-
Barium	310	310	100	194	-	-
Beryllium	72.3	72.3	100	190	-	-
Boron	144	144	100	135	-	-
Cadmium	182	182	100	220	-	-
Calcium	6790	6790	100	162	-	-
Chromium	136	136	100	217	-	-
Cobalt	128	128	100	172	-	-
Copper	102	102	100	215	-	-
Iron	12600	12600	100	178	-	-
Lead	115	115	100	233	-	-
Magnesium	3010	3010	100	167	-	-
Manganese	323	323	100	183	-	-
Mercury	19.9	19.9	100	151	-	-
Molybdenum	133	133	100	184	-	-
Nickel	153	153	100	214	-	-
Potassium	2840	2840	100	168	-	-
Selenium	150	150	100	209	-	-
Silver	40.4	40.4	100	196	-	-

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Ph: 281-479-2569
Fax: 281-479-2790
P.O. Box 70
Deer Park,TX 77536
Website: www.aquasolutions.org

B70530

Aqua Solutions, Inc.
6913 Highway 225
Deer Park, TX, 77536
281/479-2569
Certificate of Analysis / QC Results

Customer: VWR010 / VWR SCIENTIFIC*

Sales Order # : 324835 Customer PO # : 4501798641 Shipped Qty : 1

Packaged Product: 5690-100ML
MERCURY STANDARD SOLUTION 1ML=0.1MG (100ML)

Lot # 3052463

Chemical Product: 5690
MERCURY STANDARD SOLUTION 1ML=0.1MG

Test		Target/UOM	Range	Result
PREPARED TO FORMULATION ON FILE		YES		YES
	Tested 05/28/13			
	Tester MTED			
	Recorded 05/28/13			
APPEARANCE AND COLOR		CLEAR WATER WHITE LIQUID APPEARANCE		PASS
	Tested 05/28/13			
	Tester MTED			
	Recorded 05/28/13			
INSTRUMENTS USED DURING PREPARATION		INSTRUMENT		P-86,VF500-X1
	Tested 05/28/13			
	Tester MTED			
	Recorded 05/28/13			

Made 01/01/00

This is to certify that the product listed above has been prepared according to the agreed-upon formulation. The solutions producer has a Quality Management System which governs each step of the manufacturing process to insure the production of a consistent product. Traceability from the producer's lot numbers to the original manufacturer's lot number is maintained. Certificates of Analysis for the raw materials used to prepare this product are available upon request.

The weights and/or volumes used to prepare this product are N.I.S.T. Traceable. All balances used in the preparation of product are calibrated daily against N.I.S.T. Traceable weights. The balances are maintained and serviced on a regular basis by an outside certified company. All volumetric glassware used is N.I.S.T. Traceable and certified as meeting Class A specifications.

Unless otherwise agreed upon, all chemicals used in preparation of the product are Reagent ACS grade.

Richard Kemm
Quality Manager

1075424

ERA
A Waters Company

1075422
ID: MEH_SRM_D071_00003
Hg Metals in Soil

Exp: 4/14
Rec'd 2/10/11
JRK

Certificate of Analysis

Lot No. D071-540

Metals in Soil

Catalog No. 540
Issue Date: October 3, 2010
Revision Date: Original

Certification

Parameter	Total Concentration [1] (mg/kg)	Certified Value [2] (mg/kg)	Uncertainty [3]	QC PALs™ [4] (mg/kg)	PT PALs™ [5] (mg/kg)
aluminum	46500*	8980	0.5%	4130 - 13800	3800 - 14200
antimony	245	122	7.5%	DL - 269	24.4 - 308
arsenic	111	92.6	2.0%	76.8 - 108	64.0 - 121
barium	630	169	1.7%	140 - 198	123 - 215
beryllium	67.1	62.4	4.5%	52.3 - 72.4	45.8 - 79.0
boron	127	106	1.9%	75.5 - 137	62.4 - 150
cadmium	68.2	61.8	1.7%	51.5 - 72.0	45.2 - 78.4
calcium	11400*	6150	0.5%	5110 - 7190	4540 - 7760
chromium	135	71.3	2.3%	58.3 - 84.3	48.8 - 93.8
cobalt	107	103	2.1%	87.7 - 119	76.9 - 130
copper	100	81.2	7.5%	68.1 - 94.3	59.9 - 102
iron	29800*	12800	0.3%	6490 - 19200	4080 - 21600
lead	109	92.4	6.8%	77.0 - 108	65.0 - 120
magnesium	4650	2650	3.2%	1940 - 3360	1700 - 3600
manganese	537	286	2.2%	236 - 336	213 - 360
mercury	3.78	3.77	8.1%	2.70 - 4.84	1.92 - 5.62
molybdenum	52.3	42.6	6.9%	34.0 - 51.2	27.8 - 60.3
nickel	72.3	59.1	3.0%	49.5 - 68.7	41.5 - 76.8
potassium	18800*	2540	2.0%	1720 - 3360	1550 - 3530
selenium	99.4	89.5	1.7%	70.7 - 108	57.5 - 121
silver	37.3	34.4	6.5%	22.8 - 46.0	22.6 - 46.2
sodium	9500*	221	3.8%	146 - 296	61.1 - 380
strontium	209	72.4	3.4%	58.7 - 86.1	50.4 - 93.7
thallium	136	123	1.7%	99.5 - 146	83.1 - 162
tin	119	107	1.7%	82.9 - 131	61.3 - 152
titanium	2340*	202	1.1%	51.2 - 352	0.00 - 427
vanadium	95.2	59.2	3.8%	43.5 - 74.8	32.4 - 85.9
zinc	158	141	3.0%	114 - 168	94.9 - 186

Please see footnotes on back

DL = Detection Limit

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P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

Certificate of Analysis

1135950
ID: MEI_CCV_A_STK_00005
Exp: 12/19/13 Prpd: AH
ICP CCV Solution A

AMH 1/4/13

Product Description:

Part Number:	**SM-606-115**
	Solution A
Lot Number:	**1234737**
Matrix:	5% HNO_3
Purity:	99.98% - 99.9999%

Certified Values:

Element	(µg/mL)	SRM ID	SRM Lot#	Element	(µg/mL)	SRM ID	SRM Lot#
Al	5000 ± 25	3101a	060502	Li	100 ± 1	3129a	100714
As	100 ± 1	3103a	100818	Mg	5000 ± 25	3131a	050302
Ba	100 ± 1	3104a	070222	Mn	100 ± 1	3132	050429
Be	100 ± 1	3105a	090514	Ni	100 ± 1	3136	000612
B	100 ± 1	3107	070514	K	5000 ± 25	3141a	051220
Cd	100 ± 1	3108	060531	Se	100 ± 1	3149	100901
Ca	5000 ± 25	3109a	050825	Na	5000 ± 25	3152a	010728
Cr	100 ± 1	3112a	030730	Sr	100 ± 1	3153a	990906
Co	100 ± 1	3113	000630	Tl	100 ± 1	3158	993012
Cu	100 ± 1	3114	011017	V	100 ± 1	3165	992706
Fe	5000 ± 25	3126a	051031	Zn	100 ± 1	3168a	080123
Pb	100 ± 1	3128	101026				

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2
* Refer to Traceability Information, Section d

Preparation Information:

The standard is generally prepared from single element standard solutions that are ISO Guide 34 certified reference materials. Highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards**
The Calibration Standards are traceable to SRM 3100 Series Spectrometric Standard Solutions or second sources.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**December 12, 2012**
Shipped Date:	DEC 19 2012
Expiration Date:	DEC 19 2013
Certificate Issue Date:	**December 13, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

Vanny T. Yib,
Inorganic Laboratory Manager

Angel Sellers
Quality Manager

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1183083 rec 2/12/14 ex 8/6/14

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Certificate of Analysis

Product Description:

Name:	Silver	Source Material:	Silver Metal
Part Number:	**100051-1**	Material Purity:	99.999%
Lot Number:	**1231727**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 3 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3151 (lot number 992212) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.008 g/mL ± 0.002 g/mL @ 22.5°C

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag		M	Cu	<	2	Li	<	0.02	Rb	<	0.02	Th	<	0.02
Al	<	0.1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.1
As	<	0.05	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.1
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	1	Fe	<	1	Mo	<	0.02	Sb	<	1	U	<	0.1
Ba	<	0.02	Ga	<	0.02	Na	<	2.5	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	2	Ge	<	0.02	Nd	<	0.02	Si	<	5	Y	<	0.02
Ca	<	1	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.1	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	1
Ce	<	0.1	In	<	0.02	Pb	<	0.05	Sr	<	0.1	Zr	<	0.02
Co	<	0.05	Ir	<	0.02	Pd	<	2	Ta	<	0.02			
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs	<	0.02	La	<	0.02	Pt	<	0.02	Te	<	0.02			

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of silver, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**November 12, 2012**
Shipped Date:	**February 6, 2013**
Expiration Date:	**August 6, 2014**
Certificate Issue Date:	**December 5, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

Vanny T. Yib,
Inorganic Laboratory Manager

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Angel Sellers
Quality Manager

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High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

~~1183083 rec. 2/13/14 ex. 8/6/14~~

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Certificate of Analysis

1183084
rec 2/12/14
exp 8/6/14

Product Description:

Name:	Tin	Source Material:	Tin Metal
Part Number:	**100061-3**	Material Purity:	99.999%
Lot Number:	**1210803**	Matrix:	2% (v/v) HNO_3 + 0.5% HF

Certified Value: 1000 µg/mL ± 4 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3161a (lot number 070330) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.011 g/mL ± 0.002 g/mL @ 24.0°C

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag	<	0.02	Cu	<	0.1	Li	<	0.02	Rb	<	0.02	Th	<	1
Al	<	0.1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	1
As	<	0.3	Er	<	0.02	Mg	<	1	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.5	Ru	<	0.02	Tm	<	0.02
B	<	30	Fe	<	1	Mo	<	0.02	Sb	<	5	U	<	0.1
Ba	<	0.02	Ga	<	0.02	Na		20	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	1	Se	<	0.1	W	<	1
Bi	<	0.02	Ge	<	2	Nd	<	0.02	Si	<	100	Y	<	0.02
Ca	<	5	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn		M	Zn	<	2
Ce	<	0.02	In	<	0.02	Pb	<	10	Sr	<	0.02	Zr	<	1
Co	<	0.05	Ir	<	0.02	Pd	<	0.02	Ta	<	0.1			
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs	<	0.1	La	<	0.02	Pt	<	0.02	Te	<	0.02			

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of tin, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**April 17, 2012**
Shipped Date:	**February 6, 2013**
Expiration Date:	**August 6, 2014**
Certificate Issue Date:	**April 23, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

Vanny T. Yib,
Inorganic Laboratory Manager

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Angel Sellers
Quality Manager

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High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

1322135
ID: MEI_ICSA_STK_00007
Exp: 04/24/15 Prpd: MM
ICP ICSA Stock ICM-441

Rec: 4/24/13

CLP ICP Interference Check Standard #1

Catalog Number: ICM-441
Lot Number: M00570
Job Number: J00013209
Lot Issue Date: 06/02/2011
Expiration Date: 07/31/2015

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 5.0%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Analyte	True Value				Analytical Method	NIST SRM
aluminum	5006	±	25	µg/mL	ICP / ICP-MS	3101a
calcium	5004	±	25	µg/mL	ICP / ICP-MS	3109a
iron	2003	±	10	µg/mL	ICP / ICP-MS	3126a
magnesium	5003	±	25	µg/mL	ICP / ICP-MS	3131a

Matrix: 5% nitric acid in low TOC water (< 50 ppb)

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

ACCREDITED

ISO 17025:2005
Accredited
A2LA
Cert. No. 0851.01

ISO 9001:2000
Registered
TUV USA, Inc.
Cert. No. 06-1004

William J. Leary
Quality Assurance Manager

250 Smith Street, North Kingstown, RI 02852 USA
Ph: 401-294-9400 * Fax: 401-295-2330
www.ultrasci.com

01/06/2014

Certification Summary

Client: New York State D.E.C.
Project/Site: Magna Metals #360003

TestAmerica Job ID: 480-49854-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Buffalo	Arkansas DEQ	State Program	6	88-0686
TestAmerica Buffalo	California	NELAP	9	1169CA
TestAmerica Buffalo	Connecticut	State Program	1	PH-0568
TestAmerica Buffalo	Florida	NELAP	4	E87672
TestAmerica Buffalo	Georgia	State Program	4	956
TestAmerica Buffalo	Georgia	State Program	4	N/A
TestAmerica Buffalo	Illinois	NELAP	5	200003
TestAmerica Buffalo	Iowa	State Program	7	374
TestAmerica Buffalo	Kansas	NELAP	7	E-10187
TestAmerica Buffalo	Kentucky	State Program	4	90029
TestAmerica Buffalo	Kentucky (UST)	State Program	4	30
TestAmerica Buffalo	Louisiana	NELAP	6	02031
TestAmerica Buffalo	Maine	State Program	1	NY00044
TestAmerica Buffalo	Maryland	State Program	3	294
TestAmerica Buffalo	Massachusetts	State Program	1	M-NY044
TestAmerica Buffalo	Michigan	State Program	5	9937
TestAmerica Buffalo	Minnesota	NELAP	5	036-999-337
TestAmerica Buffalo	New Hampshire	NELAP	1	2337
TestAmerica Buffalo	New Hampshire	NELAP	1	2973
TestAmerica Buffalo	New Jersey	NELAP	2	NY455
TestAmerica Buffalo	New York	NELAP	2	10026
TestAmerica Buffalo	North Dakota	State Program	8	R-176
TestAmerica Buffalo	Oklahoma	State Program	6	9421
TestAmerica Buffalo	Oregon	NELAP	10	NY200003
TestAmerica Buffalo	Pennsylvania	NELAP	3	68-00281
TestAmerica Buffalo	Rhode Island	State Program	1	LAO00328
TestAmerica Buffalo	Tennessee	State Program	4	TN02970
TestAmerica Buffalo	Texas	NELAP	6	T104704412-11-2
TestAmerica Buffalo	USDA	Federal		P330-11-00386
TestAmerica Buffalo	Virginia	NELAP	3	460185
TestAmerica Buffalo	Washington	State Program	10	C784
TestAmerica Buffalo	West Virginia DEP	State Program	3	252
TestAmerica Buffalo	Wisconsin	State Program	5	998310390
TestAmerica Edison	Connecticut	State Program	1	PH-0200
TestAmerica Edison	DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A
TestAmerica Edison	New Jersey	NELAP	2	12028
TestAmerica Edison	New York	NELAP	2	11452
TestAmerica Edison	Pennsylvania	NELAP	3	68-00522
TestAmerica Edison	Rhode Island	State Program	1	LAO00132
TestAmerica Edison	USDA	Federal		NJCA-003-08

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

METALS

COVER PAGE
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG No.:

Project: Magna Metals #360003

Client Sample ID	Lab Sample ID
SD801	480-49854-1
SD802	480-49854-2
SD803	480-49854-3
SD804	480-49854-4
SD805	480-49854-5
SD806	480-49854-6
SD807	480-49854-7
SD808	480-49854-8
SD809	480-49854-9
SD810	480-49854-10
SD811	480-49854-11
SD812	480-49854-12
SD813	480-49854-13
SD814	480-49854-14
SD815	480-49854-15
SD816	480-49854-16
SD817	480-49854-17
SD818	480-49854-18
SD819	480-49854-19
SD820	480-49854-20
SD821	480-49854-21
SD822	480-49854-22
SD823	480-49854-23
SD824	480-49854-24
SD825	480-49854-25
SD826	480-49854-26
SD827	480-49854-27
SD828	480-49854-28
SD829	480-49854-29
SD830	480-49854-30
SD831	480-49854-31
SD806 DUP	480-49854-32
SD816 DUP	480-49854-33
SD825 DUP	480-49854-34

Comments:

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD801 | Lab Sample ID: 480-49854-1

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 87.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	906	12.0	5.3	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.0	0.48	mg/Kg			1	6010C
7440-38-2	Arsenic	1.3	2.4	0.48	mg/Kg	J		1	6010C
7440-39-3	Barium	27.2	0.60	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.041	0.24	0.034	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.041	0.24	0.036	mg/Kg	J		1	6010C
7440-70-2	Calcium	1290	60.2	4.0	mg/Kg		B	1	6010C
7440-47-3	Chromium	10.7	0.60	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	5.2	0.60	0.060	mg/Kg			1	6010C
7440-50-8	Copper	26.4	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	3910	12.0	1.3	mg/Kg			1	6010C
7439-92-1	Lead	3.8	1.2	0.29	mg/Kg			1	6010C
7439-95-4	Magnesium	907	24.1	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	95.9	0.24	0.039	mg/Kg			1	6010C
7440-02-0	Nickel	20.2	6.0	0.28	mg/Kg			1	6010C
7440-09-7	Potassium	102	36.1	24.1	mg/Kg			1	6010C
7782-49-2	Selenium	1.3	4.8	0.48	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.60	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	68.0	168	15.6	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.2	0.36	mg/Kg			1	6010C
7440-62-2	Vanadium	6.4	0.60	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	22.3	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.016	0.021	0.0084	mg/Kg	J		1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD802 | Lab Sample ID: 480-49854-2

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 83.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4460	13.1	5.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.7	0.53	mg/Kg			1	6010C
7440-38-2	Arsenic	2.1	2.6	0.53	mg/Kg	J		1	6010C
7440-39-3	Barium	59.3	0.66	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.12	0.26	0.037	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.26	0.039	mg/Kg			1	6010C
7440-70-2	Calcium	1930	65.6	4.3	mg/Kg		B	1	6010C
7440-47-3	Chromium	17.5	0.66	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	12.1	0.66	0.066	mg/Kg			1	6010C
7440-50-8	Copper	21.7	1.3	0.28	mg/Kg			1	6010C
7439-89-6	Iron	12800	13.1	1.4	mg/Kg			1	6010C
7439-92-1	Lead	8.1	1.3	0.32	mg/Kg			1	6010C
7439-95-4	Magnesium	4530	26.3	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	139	0.26	0.042	mg/Kg			1	6010C
7440-02-0	Nickel	30.7	6.6	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	737	39.4	26.3	mg/Kg			1	6010C
7782-49-2	Selenium	1.1	5.3	0.53	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.66	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	70.5	184	17.1	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.9	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	17.7	0.66	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	82.1	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.014	0.024	0.0098	mg/Kg	J		1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD803 | Lab Sample ID: 480-49854-3

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 68.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4310	15.4	6.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	23.2	0.62	mg/Kg			1	6010C
7440-38-2	Arsenic	2.6	3.1	0.62	mg/Kg	J		1	6010C
7440-39-3	Barium	75.7	0.77	0.17	mg/Kg			1	6010C
7440-41-7	Beryllium	0.13	0.31	0.043	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.31	0.046	mg/Kg			1	6010C
7440-70-2	Calcium	2060	77.2	5.1	mg/Kg		B	1	6010C
7440-47-3	Chromium	28.8	0.77	0.31	mg/Kg			1	6010C
7440-48-4	Cobalt	13.9	0.77	0.077	mg/Kg			1	6010C
7440-50-8	Copper	33.3	1.5	0.32	mg/Kg			1	6010C
7439-89-6	Iron	15500	15.4	1.7	mg/Kg			1	6010C
7439-92-1	Lead	10.1	1.5	0.37	mg/Kg			1	6010C
7439-95-4	Magnesium	3470	30.9	1.4	mg/Kg			1	6010C
7439-96-5	Manganese	582	0.31	0.049	mg/Kg			1	6010C
7440-02-0	Nickel	41.9	7.7	0.36	mg/Kg			1	6010C
7440-09-7	Potassium	618	46.3	30.9	mg/Kg			1	6010C
7782-49-2	Selenium	1.5	6.2	0.62	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.77	0.31	mg/Kg			1	6010C
7440-23-5	Sodium	63.5	216	20.1	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	9.3	0.46	mg/Kg			1	6010C
7440-62-2	Vanadium	21.7	0.77	0.17	mg/Kg			1	6010C
7440-66-6	Zinc	42.5	3.1	0.24	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.042	0.029	0.012	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD804 | Lab Sample ID: 480-49854-4

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 76.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	8590	13.8	6.1	mg/Kg			1	6010C
7440-36-0	Antimony	ND	20.7	0.55	mg/Kg			1	6010C
7440-38-2	Arsenic	4.7	2.8	0.55	mg/Kg			1	6010C
7440-39-3	Barium	87.4	0.69	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.31	0.28	0.039	mg/Kg			1	6010C
7440-43-9	Cadmium	0.095	0.28	0.041	mg/Kg	J		1	6010C
7440-70-2	Calcium	2150	68.8	4.5	mg/Kg		B	1	6010C
7440-47-3	Chromium	78.6	0.69	0.28	mg/Kg			1	6010C
7440-48-4	Cobalt	22.1	0.69	0.069	mg/Kg			1	6010C
7440-50-8	Copper	29.9	1.4	0.29	mg/Kg			1	6010C
7439-89-6	Iron	22200	13.8	1.5	mg/Kg			1	6010C
7439-92-1	Lead	32.5	1.4	0.33	mg/Kg			1	6010C
7439-95-4	Magnesium	2490	27.5	1.3	mg/Kg			1	6010C
7439-96-5	Manganese	589	0.28	0.044	mg/Kg			1	6010C
7440-02-0	Nickel	60.0	6.9	0.32	mg/Kg			1	6010C
7440-09-7	Potassium	479	41.3	27.5	mg/Kg			1	6010C
7782-49-2	Selenium	1.4	5.5	0.55	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.69	0.28	mg/Kg			1	6010C
7440-23-5	Sodium	63.4	193	17.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	8.3	0.41	mg/Kg			1	6010C
7440-62-2	Vanadium	31.4	0.69	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	58.6	2.8	0.21	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.11	0.024	0.0098	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD805 | Lab Sample ID: 480-49854-5

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 71.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	7090	12.9	5.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.3	0.52	mg/Kg			1	6010C
7440-38-2	Arsenic	4.5	2.6	0.52	mg/Kg			1	6010C
7440-39-3	Barium	129	0.64	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.23	0.26	0.036	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.19	0.26	0.039	mg/Kg	J		1	6010C
7440-70-2	Calcium	3990	64.4	4.3	mg/Kg		B	1	6010C
7440-47-3	Chromium	81.8	0.64	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	39.6	0.64	0.064	mg/Kg			1	6010C
7440-50-8	Copper	414	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	27700	12.9	1.4	mg/Kg			1	6010C
7439-92-1	Lead	29.8	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	16500	25.8	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	816	0.26	0.041	mg/Kg			1	6010C
7440-02-0	Nickel	178	6.4	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	585	38.6	25.8	mg/Kg			1	6010C
7782-49-2	Selenium	3.1	5.2	0.52	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.64	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	71.8	180	16.7	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.7	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	23.6	0.64	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	107	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.11	0.027	0.011	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD806 Lab Sample ID: 480-49854-6

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG ID.:

Matrix: Solid Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY Date Received: 11/09/2013 01:30

% Solids: 89.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	1850	10.7	4.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	16.1	0.43	mg/Kg			1	6010C
7440-38-2	Arsenic	0.82	2.1	0.43	mg/Kg	J	^	1	6010C
7440-39-3	Barium	26.4	0.54	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.055	0.21	0.030	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.21	0.032	mg/Kg			1	6010C
7440-70-2	Calcium	631	53.6	3.5	mg/Kg		B	1	6010C
7440-47-3	Chromium	7.1	0.54	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	3.7	0.54	0.054	mg/Kg			1	6010C
7440-50-8	Copper	5.8	1.1	0.23	mg/Kg			1	6010C
7439-89-6	Iron	7200	10.7	1.2	mg/Kg			1	6010C
7439-92-1	Lead	2.8	1.1	0.26	mg/Kg			1	6010C
7439-95-4	Magnesium	1110	21.4	0.99	mg/Kg			1	6010C
7439-96-5	Manganese	295	0.21	0.034	mg/Kg			1	6010C
7440-02-0	Nickel	10.2	5.4	0.25	mg/Kg			1	6010C
7440-09-7	Potassium	274	32.2	21.4	mg/Kg			1	6010C
7782-49-2	Selenium	0.46	4.3	0.43	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.54	0.21	mg/Kg			1	6010C
7440-23-5	Sodium	34.6	150	13.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	6.4	0.32	mg/Kg			1	6010C
7440-62-2	Vanadium	9.0	0.54	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	30.1	2.1	0.16	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.021	0.0087	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD807 Lab Sample ID: 480-49854-7

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG ID.:

Matrix: Solid Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY Date Received: 11/09/2013 01:30

% Solids: 58.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	12200	16.5	7.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	24.7	0.66	mg/Kg			1	6010C
7440-38-2	Arsenic	4.4	3.3	0.66	mg/Kg		^	1	6010C
7440-39-3	Barium	87.0	0.82	0.18	mg/Kg			1	6010C
7440-41-7	Beryllium	0.28	0.33	0.046	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.14	0.33	0.049	mg/Kg	J		1	6010C
7440-70-2	Calcium	2950	82.3	5.4	mg/Kg		B	1	6010C
7440-47-3	Chromium	30.3	0.82	0.33	mg/Kg			1	6010C
7440-48-4	Cobalt	10.6	0.82	0.082	mg/Kg			1	6010C
7440-50-8	Copper	31.6	1.6	0.35	mg/Kg			1	6010C
7439-89-6	Iron	18700	16.5	1.8	mg/Kg			1	6010C
7439-92-1	Lead	50.1	1.6	0.40	mg/Kg			1	6010C
7439-95-4	Magnesium	3100	32.9	1.5	mg/Kg			1	6010C
7439-96-5	Manganese	255	0.33	0.053	mg/Kg			1	6010C
7440-02-0	Nickel	37.3	8.2	0.38	mg/Kg			1	6010C
7440-09-7	Potassium	534	49.4	32.9	mg/Kg			1	6010C
7782-49-2	Selenium	1.7	6.6	0.66	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.82	0.33	mg/Kg			1	6010C
7440-23-5	Sodium	85.3	231	21.4	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	9.9	0.49	mg/Kg			1	6010C
7440-62-2	Vanadium	33.1	0.82	0.18	mg/Kg			1	6010C
7440-66-6	Zinc	59.5	3.3	0.25	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.18	0.034	0.014	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD808 | Lab Sample ID: 480-49854-8

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 87.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3180	10.7	4.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	16.0	0.43	mg/Kg			1	6010C
7440-38-2	Arsenic	9.2	2.1	0.43	mg/Kg		^	1	6010C
7440-39-3	Barium	64.9	0.53	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.16	0.21	0.030	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.21	0.032	mg/Kg			1	6010C
7440-70-2	Calcium	1320	53.3	3.5	mg/Kg		B	1	6010C
7440-47-3	Chromium	33.6	0.53	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	16.5	0.53	0.053	mg/Kg			1	6010C
7440-50-8	Copper	26.5	1.1	0.22	mg/Kg			1	6010C
7439-89-6	Iron	42800	10.7	1.2	mg/Kg			1	6010C
7439-92-1	Lead	5.2	1.1	0.26	mg/Kg			1	6010C
7439-95-4	Magnesium	10000	21.3	0.99	mg/Kg			1	6010C
7439-96-5	Manganese	548	0.21	0.034	mg/Kg			1	6010C
7440-02-0	Nickel	60.7	5.3	0.25	mg/Kg			1	6010C
7440-09-7	Potassium	249	32.0	21.3	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.3	0.43	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.53	0.21	mg/Kg			1	6010C
7440-23-5	Sodium	72.5	149	13.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	6.4	0.32	mg/Kg			1	6010C
7440-62-2	Vanadium	40.4	0.53	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	79.1	2.1	0.16	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.020	0.0081	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD809 | Lab Sample ID: 480-49854-9

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 81.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	7410	12.5	5.5	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.8	0.50	mg/Kg			1	6010C
7440-38-2	Arsenic	5.3	2.5	0.50	mg/Kg			1	6010C
7440-39-3	Barium	145	0.63	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.25	0.25	0.035	mg/Kg			1	6010C
7440-43-9	Cadmium	0.23	0.25	0.038	mg/Kg	J		1	6010C
7440-70-2	Calcium	4310	62.6	4.1	mg/Kg		B	1	6010C
7440-47-3	Chromium	79.0	0.63	0.25	mg/Kg			1	6010C
7440-48-4	Cobalt	41.0	0.63	0.063	mg/Kg			1	6010C
7440-50-8	Copper	617	1.3	0.26	mg/Kg			1	6010C
7439-89-6	Iron	30800	12.5	1.4	mg/Kg			1	6010C
7439-92-1	Lead	31.2	1.3	0.30	mg/Kg			1	6010C
7439-95-4	Magnesium	10400	25.0	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	1090	0.25	0.040	mg/Kg			1	6010C
7440-02-0	Nickel	193	6.3	0.29	mg/Kg			1	6010C
7440-09-7	Potassium	634	37.5	25.0	mg/Kg			1	6010C
7782-49-2	Selenium	4.1	5.0	0.50	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.63	0.25	mg/Kg			1	6010C
7440-23-5	Sodium	67.0	175	16.3	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.5	0.38	mg/Kg			1	6010C
7440-62-2	Vanadium	25.7	0.63	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	124	2.5	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.14	0.023	0.0094	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD810 | Lab Sample ID: 480-49854-10

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 88.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	2880	11.8	5.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.8	0.47	mg/Kg			1	6010C
7440-38-2	Arsenic	1.1	2.4	0.47	mg/Kg	J		1	6010C
7440-39-3	Barium	43.2	0.59	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.067	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.24	0.036	mg/Kg			1	6010C
7440-70-2	Calcium	1580	59.2	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	24.0	0.59	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	11.3	0.59	0.059	mg/Kg			1	6010C
7440-50-8	Copper	23.4	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	14100	11.8	1.3	mg/Kg			1	6010C
7439-92-1	Lead	3.5	1.2	0.28	mg/Kg			1	6010C
7439-95-4	Magnesium	8390	23.7	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	182	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	56.4	5.9	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	416	35.5	23.7	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.7	0.47	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.59	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	87.2	166	15.4	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.1	0.36	mg/Kg			1	6010C
7440-62-2	Vanadium	9.9	0.59	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	52.0	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.023	0.0091	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD811 | Lab Sample ID: 480-49854-11

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 89.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	2510	11.1	4.9	mg/Kg			1	6010C
7440-36-0	Antimony	ND	16.7	0.45	mg/Kg			1	6010C
7440-38-2	Arsenic	1.7	2.2	0.45	mg/Kg	J		1	6010C
7440-39-3	Barium	42.7	0.56	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.072	0.22	0.031	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.22	0.033	mg/Kg			1	6010C
7440-70-2	Calcium	1760	55.7	3.7	mg/Kg		B	1	6010C
7440-47-3	Chromium	20.2	0.56	0.22	mg/Kg			1	6010C
7440-48-4	Cobalt	12.6	0.56	0.056	mg/Kg			1	6010C
7440-50-8	Copper	30.2	1.1	0.23	mg/Kg			1	6010C
7439-89-6	Iron	11400	11.1	1.2	mg/Kg			1	6010C
7439-92-1	Lead	3.9	1.1	0.27	mg/Kg			1	6010C
7439-95-4	Magnesium	6780	22.3	1.0	mg/Kg			1	6010C
7439-96-5	Manganese	187	0.22	0.036	mg/Kg			1	6010C
7440-02-0	Nickel	53.5	5.6	0.26	mg/Kg			1	6010C
7440-09-7	Potassium	383	33.4	22.3	mg/Kg			1	6010C
7782-49-2	Selenium	0.58	4.5	0.45	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.56	0.22	mg/Kg			1	6010C
7440-23-5	Sodium	75.6	156	14.5	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	6.7	0.33	mg/Kg			1	6010C
7440-62-2	Vanadium	10.4	0.56	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	52.9	2.2	0.17	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.023	0.0091	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD812 | Lab Sample ID: 480-49854-12

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 89.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	5730	12.4	5.4	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.5	0.49	mg/Kg			1	6010C
7440-38-2	Arsenic	3.6	2.5	0.49	mg/Kg			1	6010C
7440-39-3	Barium	72.2	0.62	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.17	0.25	0.035	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.25	0.037	mg/Kg			1	6010C
7440-70-2	Calcium	7930	61.8	4.1	mg/Kg		B	1	6010C
7440-47-3	Chromium	41.1	0.62	0.25	mg/Kg			1	6010C
7440-48-4	Cobalt	14.6	0.62	0.062	mg/Kg			1	6010C
7440-50-8	Copper	26.1	1.2	0.26	mg/Kg			1	6010C
7439-89-6	Iron	29300	12.4	1.4	mg/Kg			1	6010C
7439-92-1	Lead	6.2	1.2	0.30	mg/Kg			1	6010C
7439-95-4	Magnesium	8940	24.7	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	476	0.25	0.040	mg/Kg			1	6010C
7440-02-0	Nickel	44.1	6.2	0.28	mg/Kg			1	6010C
7440-09-7	Potassium	554	37.1	24.7	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.9	0.49	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.62	0.25	mg/Kg			1	6010C
7440-23-5	Sodium	91.6	173	16.1	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.4	0.37	mg/Kg			1	6010C
7440-62-2	Vanadium	25.2	0.62	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	73.4	2.5	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.022	0.0091	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD813 | Lab Sample ID: 480-49854-13

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 86.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	2440	12.4	5.4	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.6	0.50	mg/Kg			1	6010C
7440-38-2	Arsenic	1.3	2.5	0.50	mg/Kg	J		1	6010C
7440-39-3	Barium	68.8	0.62	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.071	0.25	0.035	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.25	0.037	mg/Kg			1	6010C
7440-70-2	Calcium	1540	61.9	4.1	mg/Kg		B	1	6010C
7440-47-3	Chromium	30.7	0.62	0.25	mg/Kg			1	6010C
7440-48-4	Cobalt	8.3	0.62	0.062	mg/Kg			1	6010C
7440-50-8	Copper	23.4	1.2	0.26	mg/Kg			1	6010C
7439-89-6	Iron	10000	12.4	1.4	mg/Kg			1	6010C
7439-92-1	Lead	4.8	1.2	0.30	mg/Kg			1	6010C
7439-95-4	Magnesium	3630	24.8	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	545	0.25	0.040	mg/Kg			1	6010C
7440-02-0	Nickel	35.7	6.2	0.28	mg/Kg			1	6010C
7440-09-7	Potassium	299	37.2	24.8	mg/Kg			1	6010C
7782-49-2	Selenium	ND	5.0	0.50	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.62	0.25	mg/Kg			1	6010C
7440-23-5	Sodium	83.4	173	16.1	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.4	0.37	mg/Kg			1	6010C
7440-62-2	Vanadium	9.8	0.62	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	54.2	2.5	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.012	0.022	0.0091	mg/Kg	J		1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD814 | Lab Sample ID: 480-49854-14

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 82.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3400	12.4	5.5	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.6	0.50	mg/Kg			1	6010C
7440-38-2	Arsenic	0.80	2.5	0.50	mg/Kg	J		1	6010C
7440-39-3	Barium	36.5	0.62	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.11	0.25	0.035	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.25	0.037	mg/Kg			1	6010C
7440-70-2	Calcium	971	62.1	4.1	mg/Kg		B	1	6010C
7440-47-3	Chromium	14.8	0.62	0.25	mg/Kg			1	6010C
7440-48-4	Cobalt	8.8	0.62	0.062	mg/Kg			1	6010C
7440-50-8	Copper	22.2	1.2	0.26	mg/Kg			1	6010C
7439-89-6	Iron	14000	12.4	1.4	mg/Kg			1	6010C
7439-92-1	Lead	4.3	1.2	0.30	mg/Kg			1	6010C
7439-95-4	Magnesium	7210	24.9	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	170	0.25	0.040	mg/Kg		^	1	6010C
7440-02-0	Nickel	74.7	6.2	0.29	mg/Kg			1	6010C
7440-09-7	Potassium	531	37.3	24.9	mg/Kg			1	6010C
7782-49-2	Selenium	ND	5.0	0.50	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.62	0.25	mg/Kg			1	6010C
7440-23-5	Sodium	57.1	174	16.2	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.5	0.37	mg/Kg			1	6010C
7440-62-2	Vanadium	10.4	0.62	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	38.1	2.5	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.024	0.0095	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD815 | Lab Sample ID: 480-49854-15

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 75.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3150	12.9	5.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.4	0.52	mg/Kg			1	6010C
7440-38-2	Arsenic	1.1	2.6	0.52	mg/Kg	J		1	6010C
7440-39-3	Barium	45.4	0.65	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.085	0.26	0.036	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.26	0.039	mg/Kg			1	6010C
7440-70-2	Calcium	2390	64.6	4.3	mg/Kg		B	1	6010C
7440-47-3	Chromium	22.1	0.65	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	12.1	0.65	0.065	mg/Kg			1	6010C
7440-50-8	Copper	24.9	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	15500	12.9	1.4	mg/Kg			1	6010C
7439-92-1	Lead	4.8	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	8720	25.8	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	357	0.26	0.041	mg/Kg			1	6010C
7440-02-0	Nickel	63.7	6.5	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	376	38.8	25.8	mg/Kg			1	6010C
7782-49-2	Selenium	ND	5.2	0.52	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.65	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	78.4	181	16.8	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.8	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	10.9	0.65	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	56.0	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.023	0.0095	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD816 | Lab Sample ID: 480-49854-16

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 83.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3470	12.9	5.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.3	0.51	mg/Kg			1	6010C
7440-38-2	Arsenic	1.3	2.6	0.51	mg/Kg	J		1	6010C
7440-39-3	Barium	41.3	0.64	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.098	0.26	0.036	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.26	0.039	mg/Kg			1	6010C
7440-70-2	Calcium	2020	64.3	4.2	mg/Kg		B	1	6010C
7440-47-3	Chromium	15.8	0.64	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	9.8	0.64	0.064	mg/Kg			1	6010C
7440-50-8	Copper	13.4	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	11800	12.9	1.4	mg/Kg			1	6010C
7439-92-1	Lead	8.7	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	6540	25.7	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	190	0.26	0.041	mg/Kg			1	6010C
7440-02-0	Nickel	49.9	6.4	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	364	38.6	25.7	mg/Kg			1	6010C
7782-49-2	Selenium	0.52	5.1	0.51	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.64	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	221	180	16.7	mg/Kg			1	6010C
7440-28-0	Thallium	ND	7.7	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	8.6	0.64	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	49.6	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.025	0.010	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD817 | Lab Sample ID: 480-49854-17

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 71.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4930	13.2	5.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.8	0.53	mg/Kg			1	6010C
7440-38-2	Arsenic	2.1	2.6	0.53	mg/Kg	J		1	6010C
7440-39-3	Barium	107	0.66	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.15	0.26	0.037	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.26	0.040	mg/Kg			1	6010C
7440-70-2	Calcium	2410	66.0	4.4	mg/Kg		B	1	6010C
7440-47-3	Chromium	34.6	0.66	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	17.4	0.66	0.066	mg/Kg			1	6010C
7440-50-8	Copper	132	1.3	0.28	mg/Kg			1	6010C
7439-89-6	Iron	16600	13.2	1.5	mg/Kg			1	6010C
7439-92-1	Lead	11.8	1.3	0.32	mg/Kg			1	6010C
7439-95-4	Magnesium	5240	26.4	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	661	0.26	0.042	mg/Kg			1	6010C
7440-02-0	Nickel	76.8	6.6	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	464	39.6	26.4	mg/Kg			1	6010C
7782-49-2	Selenium	2.1	5.3	0.53	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.66	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	120	185	17.2	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.9	0.40	mg/Kg			1	6010C
7440-62-2	Vanadium	16.8	0.66	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	110	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.043	0.026	0.011	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD818 | Lab Sample ID: 480-49854-18

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 83.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3850	13.1	5.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.6	0.52	mg/Kg			1	6010C
7440-38-2	Arsenic	1.8	2.6	0.52	mg/Kg	J		1	6010C
7440-39-3	Barium	65.6	0.65	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.13	0.26	0.037	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.22	0.26	0.039	mg/Kg	J		1	6010C
7440-70-2	Calcium	4250	65.4	4.3	mg/Kg		B	1	6010C
7440-47-3	Chromium	29.1	0.65	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	8.6	0.65	0.065	mg/Kg			1	6010C
7440-50-8	Copper	58.7	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	10100	13.1	1.4	mg/Kg			1	6010C
7439-92-1	Lead	25.7	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	2990	26.1	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	331	0.26	0.042	mg/Kg			1	6010C
7440-02-0	Nickel	40.7	6.5	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	300	39.2	26.1	mg/Kg			1	6010C
7782-49-2	Selenium	2.1	5.2	0.52	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.65	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	153	183	17.0	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.8	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	28.1	0.65	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	45.2	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.046	0.023	0.0093	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD819 | Lab Sample ID: 480-49854-19

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 84.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4570	13.0	5.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.4	0.52	mg/Kg			1	6010C
7440-38-2	Arsenic	1.2	2.6	0.52	mg/Kg	J		1	6010C
7440-39-3	Barium	124	0.65	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.15	0.26	0.036	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.26	0.039	mg/Kg			1	6010C
7440-70-2	Calcium	2930	64.8	4.3	mg/Kg		B	1	6010C
7440-47-3	Chromium	37.6	0.65	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	13.9	0.65	0.065	mg/Kg			1	6010C
7440-50-8	Copper	65.6	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	14900	13.0	1.4	mg/Kg			1	6010C
7439-92-1	Lead	13.4	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	3080	25.9	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	1010	0.26	0.041	mg/Kg			1	6010C
7440-02-0	Nickel	63.8	6.5	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	410	38.9	25.9	mg/Kg			1	6010C
7782-49-2	Selenium	2.2	5.2	0.52	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.65	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	109	182	16.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.8	0.39	mg/Kg			1	6010C
7440-62-2	Vanadium	15.9	0.65	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	91.9	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.041	0.023	0.0092	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD820 | Lab Sample ID: 480-49854-20

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 79.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3730	12.0	5.3	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.9	0.48	mg/Kg			1	6010C
7440-38-2	Arsenic	1.4	2.4	0.48	mg/Kg	J		1	6010C
7440-39-3	Barium	125	0.60	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.13	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.041	0.24	0.036	mg/Kg	J		1	6010C
7440-70-2	Calcium	2630	59.8	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	31.4	0.60	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	12.0	0.60	0.060	mg/Kg			1	6010C
7440-50-8	Copper	61.6	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	14100	12.0	1.3	mg/Kg			1	6010C
7439-92-1	Lead	10.4	1.2	0.29	mg/Kg			1	6010C
7439-95-4	Magnesium	2890	23.9	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	1190	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	54.0	6.0	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	377	35.9	23.9	mg/Kg			1	6010C
7782-49-2	Selenium	2.2	4.8	0.48	mg/Kg	J	B	1	6010C
7440-22-4	Silver	ND	0.60	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	100	167	15.5	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.2	0.36	mg/Kg			1	6010C
7440-62-2	Vanadium	12.6	0.60	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	86.5	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.043	0.024	0.0096	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD821 | Lab Sample ID: 480-49854-21

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 70.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3140	13.2	5.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.8	0.53	mg/Kg			1	6010C
7440-38-2	Arsenic	ND	2.6	0.53	mg/Kg			1	6010C
7440-39-3	Barium	76.5	0.66	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.17	0.26	0.037	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.14	0.26	0.040	mg/Kg	J		1	6010C
7440-70-2	Calcium	2720	66.1	4.4	mg/Kg		B	1	6010C
7440-47-3	Chromium	39.8	0.66	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	13.6	0.66	0.066	mg/Kg			1	6010C
7440-50-8	Copper	53.7	1.3	0.28	mg/Kg			1	6010C
7439-89-6	Iron	9030	13.2	1.5	mg/Kg			1	6010C
7439-92-1	Lead	12.0	1.3	0.32	mg/Kg			1	6010C
7439-95-4	Magnesium	2930	26.4	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	339	0.26	0.042	mg/Kg			1	6010C
7440-02-0	Nickel	62.2	6.6	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	276	39.7	26.4	mg/Kg			1	6010C
7782-49-2	Selenium	1.8	5.3	0.53	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.66	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	121	185	17.2	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.9	0.40	mg/Kg			1	6010C
7440-62-2	Vanadium	16.3	0.66	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	50.4	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.072	0.027	0.011	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD822 | Lab Sample ID: 480-49854-22

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 81.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3960	11.8	5.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.7	0.47	mg/Kg			1	6010C
7440-38-2	Arsenic	0.70	2.4	0.47	mg/Kg	J		1	6010C
7440-39-3	Barium	82.8	0.59	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.21	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.18	0.24	0.035	mg/Kg	J		1	6010C
7440-70-2	Calcium	2970	58.9	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	37.6	0.59	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	17.3	0.59	0.059	mg/Kg			1	6010C
7440-50-8	Copper	144	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	12600	11.8	1.3	mg/Kg			1	6010C
7439-92-1	Lead	16.1	1.2	0.28	mg/Kg			1	6010C
7439-95-4	Magnesium	4490	23.6	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	600	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	77.0	5.9	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	429	35.4	23.6	mg/Kg			1	6010C
7782-49-2	Selenium	1.5	4.7	0.47	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.59	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	105	165	15.3	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.1	0.35	mg/Kg			1	6010C
7440-62-2	Vanadium	14.7	0.59	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	78.4	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.052	0.023	0.0093	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD823 Lab Sample ID: 480-49854-23

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG ID.:

Matrix: Solid Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY Date Received: 11/09/2013 01:30

% Solids: 82.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3540	12.2	5.4	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.3	0.49	mg/Kg			1	6010C
7440-38-2	Arsenic	0.57	2.4	0.49	mg/Kg	J		1	6010C
7440-39-3	Barium	73.4	0.61	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.17	0.24	0.034	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.099	0.24	0.037	mg/Kg	J		1	6010C
7440-70-2	Calcium	2950	61.0	4.0	mg/Kg		B	1	6010C
7440-47-3	Chromium	30.2	0.61	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	10.3	0.61	0.061	mg/Kg			1	6010C
7440-50-8	Copper	61.0	1.2	0.26	mg/Kg			1	6010C
7439-89-6	Iron	11200	12.2	1.3	mg/Kg			1	6010C
7439-92-1	Lead	10.9	1.2	0.29	mg/Kg			1	6010C
7439-95-4	Magnesium	3770	24.4	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	315	0.24	0.039	mg/Kg			1	6010C
7440-02-0	Nickel	45.3	6.1	0.28	mg/Kg			1	6010C
7440-09-7	Potassium	325	36.6	24.4	mg/Kg			1	6010C
7782-49-2	Selenium	0.82	4.9	0.49	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.61	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	164	171	15.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.3	0.37	mg/Kg			1	6010C
7440-62-2	Vanadium	10.0	0.61	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	53.6	2.4	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.030	0.025	0.010	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD824 | Lab Sample ID: 480-49854-24

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 89.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3070	11.8	5.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.6	0.47	mg/Kg			1	6010C
7440-38-2	Arsenic	0.56	2.4	0.47	mg/Kg	J		1	6010C
7440-39-3	Barium	85.4	0.59	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.18	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.12	0.24	0.035	mg/Kg	J		1	6010C
7440-70-2	Calcium	3260	58.8	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	32.4	0.59	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	13.4	0.59	0.059	mg/Kg			1	6010C
7440-50-8	Copper	58.3	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	11500	11.8	1.3	mg/Kg			1	6010C
7439-92-1	Lead	10.1	1.2	0.28	mg/Kg			1	6010C
7439-95-4	Magnesium	3820	23.5	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	630	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	54.0	5.9	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	290	35.3	23.5	mg/Kg			1	6010C
7782-49-2	Selenium	1.3	4.7	0.47	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.59	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	117	165	15.3	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.1	0.35	mg/Kg			1	6010C
7440-62-2	Vanadium	10.3	0.59	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	66.4	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.036	0.022	0.0088	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD825 | Lab Sample ID: 480-49854-25

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 84.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	8650	13.2	5.8	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.8	0.53	mg/Kg			1	6010C
7440-38-2	Arsenic	3.7	2.6	0.53	mg/Kg			1	6010C
7440-39-3	Barium	160	0.66	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.40	0.26	0.037	mg/Kg			1	6010C
7440-43-9	Cadmium	0.32	0.26	0.040	mg/Kg			1	6010C
7440-70-2	Calcium	4180	66.0	4.4	mg/Kg		B	1	6010C
7440-47-3	Chromium	65.8	0.66	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	33.2	0.66	0.066	mg/Kg			1	6010C
7440-50-8	Copper	267	1.3	0.28	mg/Kg			1	6010C
7439-89-6	Iron	27400	13.2	1.5	mg/Kg			1	6010C
7439-92-1	Lead	34.0	1.3	0.32	mg/Kg			1	6010C
7439-95-4	Magnesium	5440	26.4	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	1820	0.26	0.042	mg/Kg			1	6010C
7440-02-0	Nickel	145	6.6	0.30	mg/Kg			1	6010C
7440-09-7	Potassium	487	39.6	26.4	mg/Kg			1	6010C
7782-49-2	Selenium	3.6	5.3	0.53	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.66	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	213	185	17.2	mg/Kg			1	6010C
7440-28-0	Thallium	ND	7.9	0.40	mg/Kg			1	6010C
7440-62-2	Vanadium	29.4	0.66	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	153	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.12	0.024	0.0098	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD826 | Lab Sample ID: 480-49854-26

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 82.7

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3540	11.9	5.3	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.9	0.48	mg/Kg			1	6010C
7440-38-2	Arsenic	0.63	2.4	0.48	mg/Kg	J		1	6010C
7440-39-3	Barium	74.6	0.60	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.20	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.19	0.24	0.036	mg/Kg	J		1	6010C
7440-70-2	Calcium	2570	59.7	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	37.6	0.60	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	16.3	0.60	0.060	mg/Kg			1	6010C
7440-50-8	Copper	83.1	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	9690	11.9	1.3	mg/Kg			1	6010C
7439-92-1	Lead	12.6	1.2	0.29	mg/Kg			1	6010C
7439-95-4	Magnesium	3260	23.9	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	154	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	68.4	6.0	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	265	35.8	23.9	mg/Kg			1	6010C
7782-49-2	Selenium	1.3	4.8	0.48	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.60	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	200	167	15.5	mg/Kg			1	6010C
7440-28-0	Thallium	ND	7.2	0.36	mg/Kg			1	6010C
7440-62-2	Vanadium	13.6	0.60	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	98.1	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.053	0.023	0.0091	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD827 | Lab Sample ID: 480-49854-27

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 80.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4630	13.3	5.9	mg/Kg			1	6010C
7440-36-0	Antimony	ND	20.0	0.53	mg/Kg			1	6010C
7440-38-2	Arsenic	ND	2.7	0.53	mg/Kg			1	6010C
7440-39-3	Barium	88.2	0.67	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.23	0.27	0.037	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.16	0.27	0.040	mg/Kg	J		1	6010C
7440-70-2	Calcium	2970	66.7	4.4	mg/Kg		B	1	6010C
7440-47-3	Chromium	44.5	0.67	0.27	mg/Kg			1	6010C
7440-48-4	Cobalt	15.2	0.67	0.067	mg/Kg			1	6010C
7440-50-8	Copper	90.7	1.3	0.28	mg/Kg			1	6010C
7439-89-6	Iron	13500	13.3	1.5	mg/Kg			1	6010C
7439-92-1	Lead	14.4	1.3	0.32	mg/Kg			1	6010C
7439-95-4	Magnesium	4840	26.7	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	362	0.27	0.043	mg/Kg			1	6010C
7440-02-0	Nickel	69.2	6.7	0.31	mg/Kg			1	6010C
7440-09-7	Potassium	368	40.0	26.7	mg/Kg			1	6010C
7782-49-2	Selenium	1.0	5.3	0.53	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.67	0.27	mg/Kg			1	6010C
7440-23-5	Sodium	104	187	17.4	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	8.0	0.40	mg/Kg			1	6010C
7440-62-2	Vanadium	14.3	0.67	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	97.2	2.7	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.050	0.025	0.010	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD828 | Lab Sample ID: 480-49854-28

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 75.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3320	14.2	6.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	21.3	0.57	mg/Kg			1	6010C
7440-38-2	Arsenic	0.58	2.8	0.57	mg/Kg	J		1	6010C
7440-39-3	Barium	147	0.71	0.16	mg/Kg			1	6010C
7440-41-7	Beryllium	0.19	0.28	0.040	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.18	0.28	0.043	mg/Kg	J		1	6010C
7440-70-2	Calcium	2830	71.0	4.7	mg/Kg		B	1	6010C
7440-47-3	Chromium	36.1	0.71	0.28	mg/Kg			1	6010C
7440-48-4	Cobalt	14.6	0.71	0.071	mg/Kg			1	6010C
7440-50-8	Copper	86.1	1.4	0.30	mg/Kg			1	6010C
7439-89-6	Iron	11500	14.2	1.6	mg/Kg			1	6010C
7439-92-1	Lead	11.9	1.4	0.34	mg/Kg			1	6010C
7439-95-4	Magnesium	3700	28.4	1.3	mg/Kg			1	6010C
7439-96-5	Manganese	162	0.28	0.045	mg/Kg			1	6010C
7440-02-0	Nickel	61.4	7.1	0.33	mg/Kg			1	6010C
7440-09-7	Potassium	257	42.6	28.4	mg/Kg			1	6010C
7782-49-2	Selenium	1.4	5.7	0.57	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.71	0.28	mg/Kg			1	6010C
7440-23-5	Sodium	155	199	18.5	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	8.5	0.43	mg/Kg			1	6010C
7440-62-2	Vanadium	12.8	0.71	0.16	mg/Kg			1	6010C
7440-66-6	Zinc	94.2	2.8	0.22	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.059	0.025	0.0099	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD829 | Lab Sample ID: 480-49854-29

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 79.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	1930	12.2	5.4	mg/Kg			1	6010C
7440-36-0	Antimony	ND	18.3	0.49	mg/Kg			1	6010C
7440-38-2	Arsenic	1.4	2.4	0.49	mg/Kg	J		1	6010C
7440-39-3	Barium	134	0.61	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.16	0.24	0.034	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.28	0.24	0.037	mg/Kg			1	6010C
7440-70-2	Calcium	4700	61.2	4.0	mg/Kg		B	1	6010C
7440-47-3	Chromium	28.4	0.61	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	10.3	0.61	0.061	mg/Kg			1	6010C
7440-50-8	Copper	88.7	1.2	0.26	mg/Kg			1	6010C
7439-89-6	Iron	11900	12.2	1.3	mg/Kg			1	6010C
7439-92-1	Lead	9.2	1.2	0.29	mg/Kg			1	6010C
7439-95-4	Magnesium	2260	24.5	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	893	0.24	0.039	mg/Kg			1	6010C
7440-02-0	Nickel	54.2	6.1	0.28	mg/Kg			1	6010C
7440-09-7	Potassium	133	36.7	24.5	mg/Kg			1	6010C
7782-49-2	Selenium	1.5	4.9	0.49	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.61	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	47.5	171	15.9	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.3	0.37	mg/Kg			1	6010C
7440-62-2	Vanadium	8.7	0.61	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	65.5	2.4	0.19	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.053	0.025	0.010	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD830 | Lab Sample ID: 480-49854-30

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 83.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	6540	12.8	5.6	mg/Kg			1	6010C
7440-36-0	Antimony	ND	19.2	0.51	mg/Kg			1	6010C
7440-38-2	Arsenic	0.56	2.6	0.51	mg/Kg	J		1	6010C
7440-39-3	Barium	127	0.64	0.14	mg/Kg			1	6010C
7440-41-7	Beryllium	0.32	0.26	0.036	mg/Kg			1	6010C
7440-43-9	Cadmium	0.27	0.26	0.038	mg/Kg			1	6010C
7440-70-2	Calcium	3740	64.1	4.2	mg/Kg		B	1	6010C
7440-47-3	Chromium	75.3	0.64	0.26	mg/Kg			1	6010C
7440-48-4	Cobalt	14.5	0.64	0.064	mg/Kg			1	6010C
7440-50-8	Copper	426	1.3	0.27	mg/Kg			1	6010C
7439-89-6	Iron	13400	12.8	1.4	mg/Kg			1	6010C
7439-92-1	Lead	30.3	1.3	0.31	mg/Kg			1	6010C
7439-95-4	Magnesium	4140	25.6	1.2	mg/Kg			1	6010C
7439-96-5	Manganese	339	0.26	0.041	mg/Kg			1	6010C
7440-02-0	Nickel	105	6.4	0.29	mg/Kg			1	6010C
7440-09-7	Potassium	358	38.5	25.6	mg/Kg			1	6010C
7782-49-2	Selenium	3.3	5.1	0.51	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.64	0.26	mg/Kg			1	6010C
7440-23-5	Sodium	144	180	16.7	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.7	0.38	mg/Kg			1	6010C
7440-62-2	Vanadium	21.3	0.64	0.14	mg/Kg			1	6010C
7440-66-6	Zinc	80.6	2.6	0.20	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.12	0.024	0.0096	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD831 | Lab Sample ID: 480-49854-31

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/07/2013 16:03

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 84.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	4260	11.7	5.1	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.5	0.47	mg/Kg			1	6010C
7440-38-2	Arsenic	0.57	2.3	0.47	mg/Kg	J		1	6010C
7440-39-3	Barium	89.6	0.58	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.21	0.23	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.18	0.23	0.035	mg/Kg	J		1	6010C
7440-70-2	Calcium	2680	58.5	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	43.7	0.58	0.23	mg/Kg			1	6010C
7440-48-4	Cobalt	14.7	0.58	0.058	mg/Kg			1	6010C
7440-50-8	Copper	126	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	10400	11.7	1.3	mg/Kg			1	6010C
7439-92-1	Lead	17.3	1.2	0.28	mg/Kg			1	6010C
7439-95-4	Magnesium	2610	23.4	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	281	0.23	0.037	mg/Kg			1	6010C
7440-02-0	Nickel	70.2	5.8	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	280	35.1	23.4	mg/Kg			1	6010C
7782-49-2	Selenium	2.0	4.7	0.47	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.58	0.23	mg/Kg			1	6010C
7440-23-5	Sodium	97.4	164	15.2	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.0	0.35	mg/Kg			1	6010C
7440-62-2	Vanadium	14.8	0.58	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	75.8	2.3	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.068	0.024	0.0096	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD806 DUP
Lab Sample ID: 480-49854-32
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/08/2013 11:10
Reporting Basis: DRY
Date Received: 11/09/2013 01:30
% Solids: 86.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3130	11.8	5.2	mg/Kg			1	6010C
7440-36-0	Antimony	ND	17.7	0.47	mg/Kg			1	6010C
7440-38-2	Arsenic	2.0	2.4	0.47	mg/Kg	J		1	6010C
7440-39-3	Barium	50.2	0.59	0.13	mg/Kg			1	6010C
7440-41-7	Beryllium	0.15	0.24	0.033	mg/Kg	J		1	6010C
7440-43-9	Cadmium	ND	0.24	0.035	mg/Kg			1	6010C
7440-70-2	Calcium	1550	59.1	3.9	mg/Kg		B	1	6010C
7440-47-3	Chromium	17.3	0.59	0.24	mg/Kg			1	6010C
7440-48-4	Cobalt	7.6	0.59	0.059	mg/Kg			1	6010C
7440-50-8	Copper	12.9	1.2	0.25	mg/Kg			1	6010C
7439-89-6	Iron	13500	11.8	1.3	mg/Kg			1	6010C
7439-92-1	Lead	4.1	1.2	0.28	mg/Kg			1	6010C
7439-95-4	Magnesium	4230	23.7	1.1	mg/Kg			1	6010C
7439-96-5	Manganese	454	0.24	0.038	mg/Kg			1	6010C
7440-02-0	Nickel	27.6	5.9	0.27	mg/Kg			1	6010C
7440-09-7	Potassium	449	35.5	23.7	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.7	0.47	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.59	0.24	mg/Kg			1	6010C
7440-23-5	Sodium	54.4	166	15.4	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	7.1	0.35	mg/Kg			1	6010C
7440-62-2	Vanadium	16.4	0.59	0.13	mg/Kg			1	6010C
7440-66-6	Zinc	61.1	2.4	0.18	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.022	0.0087	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD816 DUP
Lab Sample ID: 480-49854-33
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/07/2013 16:04
Reporting Basis: DRY
Date Received: 11/09/2013 01:30
% Solids: 89.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	2840	11.2	4.9	mg/Kg			1	6010C
7440-36-0	Antimony	ND	16.8	0.45	mg/Kg			1	6010C
7440-38-2	Arsenic	ND	2.2	0.45	mg/Kg			1	6010C
7440-39-3	Barium	33.5	0.56	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.14	0.22	0.031	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.034	0.22	0.034	mg/Kg	J		1	6010C
7440-70-2	Calcium	1110	56.1	3.7	mg/Kg		B	1	6010C
7440-47-3	Chromium	14.7	0.56	0.22	mg/Kg			1	6010C
7440-48-4	Cobalt	7.0	0.56	0.056	mg/Kg			1	6010C
7440-50-8	Copper	14.1	1.1	0.24	mg/Kg			1	6010C
7439-89-6	Iron	10000	11.2	1.2	mg/Kg			1	6010C
7439-92-1	Lead	3.0	1.1	0.27	mg/Kg			1	6010C
7439-95-4	Magnesium	4850	22.4	1.0	mg/Kg			1	6010C
7439-96-5	Manganese	113	0.22	0.036	mg/Kg			1	6010C
7440-02-0	Nickel	39.2	5.6	0.26	mg/Kg			1	6010C
7440-09-7	Potassium	346	33.6	22.4	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.5	0.45	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.56	0.22	mg/Kg			1	6010C
7440-23-5	Sodium	65.0	157	14.6	mg/Kg	J		1	6010C
7440-28-0	Thallium	ND	6.7	0.34	mg/Kg			1	6010C
7440-62-2	Vanadium	7.4	0.56	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	39.6	2.2	0.17	mg/Kg		B	1	6010C
7439-97-6	Mercury	ND	0.020	0.0082	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: SD825 DUP
Lab Sample ID: 480-49854-34
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/07/2013 16:04
Reporting Basis: DRY
Date Received: 11/09/2013 01:30
% Solids: 71.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	10700	13.9	6.1	mg/Kg			1	6010C
7440-36-0	Antimony	ND	20.9	0.56	mg/Kg			1	6010C
7440-38-2	Arsenic	3.4	2.8	0.56	mg/Kg			1	6010C
7440-39-3	Barium	166	0.70	0.15	mg/Kg			1	6010C
7440-41-7	Beryllium	0.47	0.28	0.039	mg/Kg			1	6010C
7440-43-9	Cadmium	0.43	0.28	0.042	mg/Kg			1	6010C
7440-70-2	Calcium	4830	69.7	4.6	mg/Kg		B	1	6010C
7440-47-3	Chromium	82.3	0.70	0.28	mg/Kg			1	6010C
7440-48-4	Cobalt	37.4	0.70	0.070	mg/Kg			1	6010C
7440-50-8	Copper	314	1.4	0.29	mg/Kg			1	6010C
7439-89-6	Iron	35100	13.9	1.5	mg/Kg			1	6010C
7439-92-1	Lead	39.5	1.4	0.33	mg/Kg			1	6010C
7439-95-4	Magnesium	6730	27.9	1.3	mg/Kg			1	6010C
7439-96-5	Manganese	947	0.28	0.045	mg/Kg			1	6010C
7440-02-0	Nickel	183	7.0	0.32	mg/Kg			1	6010C
7440-09-7	Potassium	613	41.8	27.9	mg/Kg			1	6010C
7782-49-2	Selenium	3.2	5.6	0.56	mg/Kg	J		1	6010C
7440-22-4	Silver	ND	0.70	0.28	mg/Kg			1	6010C
7440-23-5	Sodium	281	195	18.1	mg/Kg			1	6010C
7440-28-0	Thallium	ND	8.4	0.42	mg/Kg			1	6010C
7440-62-2	Vanadium	37.1	0.70	0.15	mg/Kg			1	6010C
7440-66-6	Zinc	173	2.8	0.21	mg/Kg		B	1	6010C
7439-97-6	Mercury	0.14	0.027	0.011	mg/Kg			1	7471B

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00221 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00136

Analyte	ICV 480-152283/5 11/14/2013 09:42				CCV 480-152283/11 11/14/2013 09:57				CCV 480-152283/15 11/14/2013 10:07			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	19.01		18.8	101	25.50		25.0	102	24.98		25.0	100
Antimony	0.385		0.375	103	0.517		0.500	103	0.502		0.500	100
Arsenic	0.383		0.375	102	0.508		0.500	102	0.499		0.500	100
Barium	0.390		0.375	104	0.508		0.500	102	0.497		0.500	99
Beryllium	0.377		0.375	100	0.503		0.500	101	0.497		0.500	99
Cadmium	0.374		0.375	100	0.501		0.500	100	0.490		0.500	98
Calcium	18.86		18.8	101	25.05		25.0	100	24.70		25.0	99
Chromium	0.385		0.375	103	0.512		0.500	102	0.499		0.500	100
Cobalt	0.369		0.375	98	0.497		0.500	99	0.487		0.500	97
Copper	0.379		0.375	101	0.508		0.500	102	0.494		0.500	99
Iron	18.40		18.8	98	24.64		25.0	99	24.29		25.0	97
Lead	0.373		0.375	99	0.499		0.500	100	0.489		0.500	98
Magnesium	18.28		18.8	97	24.46		25.0	98	23.98		25.0	96
Manganese	0.383		0.375	102	0.511		0.500	102	0.501		0.500	100
Nickel	0.372		0.375	99	0.501		0.500	100	0.493		0.500	99
Potassium	18.55		18.8	99	24.97		25.0	100	24.50		25.0	98
Selenium	0.372		0.375	99	0.503		0.500	101	0.493		0.500	99
Silver	0.376		0.375	100	0.505		0.500	101	0.489		0.500	98
Sodium	18.56		18.8	99	24.92		25.0	100	24.42		25.0	98
Thallium	0.375		0.375	100	0.507		0.500	101	0.494		0.500	99
Vanadium	0.381		0.375	102	0.507		0.500	101	0.491		0.500	98
Zinc	0.380		0.375	101	0.506		0.500	101	0.493		0.500	99

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00221 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00136

Analyte	CCV 480-152283/27 11/14/2013 10:36				CCV 480-152283/39 11/14/2013 11:04				CCV 480-152283/46 11/14/2013 11:33			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	25.05		25.0	100	25.34		25.0	101	25.22		25.0	101
Antimony	0.500		0.500	100	0.497		0.500	99	0.502		0.500	100
Arsenic	0.502		0.500	100	0.504		0.500	101	0.503		0.500	101
Barium	0.500		0.500	100	0.504		0.500	101	0.503		0.500	101
Beryllium	0.497		0.500	99	0.494		0.500	99	0.495		0.500	99
Cadmium	0.490		0.500	98	0.491		0.500	98	0.489		0.500	98
Calcium	24.89		25.0	100	25.21		25.0	101	25.00		25.0	100
Chromium	0.505		0.500	101	0.508		0.500	102	0.511		0.500	102
Cobalt	0.489		0.500	98	0.489		0.500	98	0.488		0.500	98
Copper	0.500		0.500	100	0.501		0.500	100	0.504		0.500	101
Iron	24.34		25.0	97	24.27		25.0	97	24.26		25.0	97
Lead	0.492		0.500	98	0.492		0.500	98	0.489		0.500	98
Magnesium	24.12		25.0	96	24.20		25.0	97	24.04		25.0	96
Manganese	0.503		0.500	101	0.503		0.500	101	0.503		0.500	101
Nickel	0.491		0.500	98	0.490		0.500	98	0.488		0.500	98
Potassium	24.84		25.0	99	25.12		25.0	100	25.18		25.0	101
Selenium	0.492		0.500	98	0.492		0.500	98	0.488		0.500	98
Silver	0.495		0.500	99	0.494		0.500	99	0.496		0.500	99
Sodium	24.64		25.0	99	24.96		25.0	100	24.98		25.0	100
Thallium	0.491		0.500	98	0.492		0.500	98	0.488		0.500	98
Vanadium	0.500		0.500	100	0.503		0.500	101	0.501		0.500	100
Zinc	0.500		0.500	100	0.506		0.500	101	0.500		0.500	100

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_06_CRI_00084 Concentration Units: mg/L

CCV Source: MEI_06_CRI_00084

Analyte	ICVL 480-152283/8 11/14/2013 09:50				CCVL 480-152283/13 11/14/2013 10:02				CCVL 480-152283/17 11/14/2013 10:12			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	0.203		0.200	102	0.217		0.200	108	0.205		0.200	103
Antimony	0.0186	J	0.0200	93	0.0192	J	0.0200	96	0.0181	J	0.0200	90
Arsenic	0.0107		0.0100	107	0.00999	J	0.0100	100	0.00988	J	0.0100	99
Barium	0.00214		0.00200	107	0.00212		0.00200	106	0.00212		0.00200	106
Beryllium	0.00206		0.00200	103	0.00201		0.00200	101	0.00198	J	0.00200	99
Cadmium	0.000830	J	0.00100	83	0.000810	J	0.00100	81	0.000800	J	0.00100	80
Calcium	0.504		0.500	101	0.510		0.500	102	0.507		0.500	101
Chromium	0.00377	J	0.00400	94	0.00356	J	0.00400	89	0.00355	J	0.00400	89
Cobalt	0.00399	J	0.00400	100	0.00408		0.00400	102	0.00395	J	0.00400	99
Copper	0.00992	J	0.0100	99	0.0100		0.0100	100	0.00968	J	0.0100	97
Iron	0.0465	J	0.0500	93	0.0462	J	0.0500	92	0.0464	J	0.0500	93
Lead	0.00368	J	0.00500	74	0.00444	J	0.00500	89	0.00449	J	0.00500	90
Magnesium	0.206		0.200	103	0.206		0.200	103	0.204		0.200	102
Manganese	0.00337		0.00300	112	0.00327		0.00300	109	0.00330		0.00300	110
Nickel	0.00993	J	0.0100	99	0.00966	J	0.0100	97	0.0103		0.0100	103
Potassium	0.471	J	0.500	94	0.511		0.500	102	0.485	J	0.500	97
Selenium	0.0162		0.0150	108	0.0136	J	0.0150	90	0.0117	J	0.0150	78
Silver	0.00330		0.00300	110	0.00300		0.00300	100	0.00310		0.00300	103
Sodium	0.922	J	1.00	92	0.933	J	1.00	93	0.934	J	1.00	93
Thallium	0.0169	J	0.0200	85	0.0182	J	0.0200	91	0.0183	J	0.0200	91
Vanadium	0.00465	J	0.00500	93	0.00470	J	0.00500	94	0.00496	J	0.00500	99
Zinc	0.0104		0.0100	104	0.0106		0.0100	106	0.0102		0.0100	102

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_06_CRI_00084 Concentration Units: mg/L

CCV Source: MEI_06_CRI_00084

Analyte	CCVL 480-152283/29 11/14/2013 10:40				CCVL 480-152283/41 11/14/2013 11:09				CCVL 480-152283/48 11/14/2013 11:38			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	0.208		0.200	104	0.214		0.200	107	0.212		0.200	106
Antimony	0.0185	J	0.0200	92	0.0193	J	0.0200	96	0.0196	J	0.0200	98
Arsenic	0.0116		0.0100	116	0.0101		0.0100	101	0.00997	J	0.0100	100
Barium	0.00216		0.00200	108	0.00214		0.00200	107	0.00212		0.00200	106
Beryllium	0.00202		0.00200	101	0.00194	J	0.00200	97	0.00196	J	0.00200	98
Cadmium	0.000810	J	0.00100	81	0.000810	J	0.00100	81	0.000730	J	0.00100	73
Calcium	0.517		0.500	103	0.507		0.500	101	0.501		0.500	100
Chromium	0.00382	J	0.00400	96	0.00345	J	0.00400	86	0.00382	J	0.00400	96
Cobalt	0.00405		0.00400	101	0.00400		0.00400	100	0.00400		0.00400	100
Copper	0.0104		0.0100	104	0.0102		0.0100	102	0.00999	J	0.0100	100
Iron	0.0469	J	0.0500	94	0.0510		0.0500	102	0.0443	J	0.0500	89
Lead	0.00395	J	0.00500	79	0.00409	J	0.00500	82	0.00350	J	0.00500	70
Magnesium	0.204		0.200	102	0.204		0.200	102	0.204		0.200	102
Manganese	0.00331		0.00300	110	0.00332		0.00300	111	0.00330		0.00300	110
Nickel	0.00985	J	0.0100	99	0.00964	J	0.0100	96	0.00984	J	0.0100	98
Potassium	0.450	J	0.500	90	0.503		0.500	101	0.469	J	0.500	94
Selenium	0.0131	J	0.0150	87	0.0123	J	0.0150	82	0.0133	J	0.0150	88
Silver	0.00262	J	0.00300	87	0.00277	J	0.00300	92	0.00268	J	0.00300	89
Sodium	0.946	J	1.00	95	0.936	J	1.00	94	0.936	J	1.00	94
Thallium	0.0175	J	0.0200	87	0.0186	J	0.0200	93	0.0200		0.0200	100
Vanadium	0.00484	J	0.00500	97	0.00498	J	0.00500	100	0.00461	J	0.00500	92
Zinc	0.0106		0.0100	106	0.0106		0.0100	106	0.0100		0.0100	100

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00221 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00134

Analyte	ICV 480-152587/5 11/15/2013 09:39				CCV 480-152587/14 11/15/2013 12:28				CCV 480-152587/26 11/15/2013 12:57			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.383		0.375	102	0.507		0.500	101	0.508		0.500	102
Cadmium	0.376		0.375	100	0.493		0.500	99	0.495		0.500	99
Iron	18.39		18.8	98	24.05		25.0	96	24.18		25.0	97
Lead	0.373		0.375	99	0.495		0.500	99	0.497		0.500	99
Manganese	0.381		0.375	102	0.503		0.500	101	0.506		0.500	101
Silver	0.372		0.375	99	0.506		0.500	101	0.507		0.500	101

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00221 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00134

Analyte	CCV 480-152587/38 11/15/2013 13:26				CCV 480-152587/47 11/15/2013 13:54							
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.507		0.500	101	0.524		0.500	105				
Cadmium	0.496		0.500	99	0.511		0.500	102				
Iron	24.21		25.0	97	25.05		25.0	100				
Lead	0.496		0.500	99	0.509		0.500	102				
Manganese	0.502		0.500	100	0.519		0.500	104				
Silver	0.498		0.500	100	0.513		0.500	103				

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_06_CRI_00084 Concentration Units: mg/L

CCV Source: MEI_06_CRI_00084

Analyte	ICVL 480-152587/8 11/15/2013 09:46				CCVL 480-152587/16 11/15/2013 12:33				CCVL 480-152587/28 11/15/2013 13:02			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.0109		0.0100	109					0.0134		0.0100	134
Cadmium	0.00102		0.00100	102	0.000940	J	0.00100	94	0.000990	J	0.00100	99
Iron	0.0478	J	0.0500	96	0.0460	J	0.0500	92	0.0432	J	0.0500	86
Lead	0.00451	J	0.00500	90	0.00407	J	0.00500	81	0.00496	J	0.00500	99
Manganese	0.00339		0.00300	113	0.00331		0.00300	110	0.00340		0.00300	113
Silver	0.00246	J	0.00300	82	0.00268	J	0.00300	89	0.00269	J	0.00300	90

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_06_CRI_00084 Concentration Units: mg/L

CCV Source: MEI_06_CRI_00084

Analyte	CCVL 480-152587/40 11/15/2013 13:31				CCVL 480-152587/49 11/15/2013 13:59							
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Arsenic	0.0126		0.0100	126	0.0114		0.0100	114				
Cadmium	0.00101		0.00100	101	0.00103		0.00100	103				
Iron	0.0464	J	0.0500	93	0.0503		0.0500	101				
Lead	0.00517		0.00500	103	0.00445	J	0.00500	89				
Manganese	0.00334		0.00300	111	0.00332		0.00300	111				
Silver	0.00252	J	0.00300	84	0.00236	J	0.00300	79				

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00223 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00136

Analyte	ICV 480-152314/5 11/14/2013 10:34				CCV 480-152314/14 11/14/2013 16:27				CCV 480-152314/19 11/14/2013 16:55			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	19.09		18.8	102	24.45		25.0	98	24.55		25.0	98
Antimony	0.385		0.375	103	0.519		0.500	104	0.516		0.500	103
Arsenic	0.383		0.375	102	0.503		0.500	101	0.503		0.500	101
Barium	0.386		0.375	103	0.510		0.500	102	0.505		0.500	101
Beryllium	0.379		0.375	101	0.484		0.500	97	0.483		0.500	97
Cadmium	0.377		0.375	100	0.498		0.500	100	0.496		0.500	99
Calcium	18.88		18.8	101	24.97		25.0	100	24.98		25.0	100
Chromium	0.385		0.375	103	0.488		0.500	98	0.491		0.500	98
Cobalt	0.371		0.375	99	0.485		0.500	97	0.487		0.500	97
Copper	0.377		0.375	101	0.500		0.500	100	0.496		0.500	99
Iron	18.53		18.8	99	24.36		25.0	97	24.24		25.0	97
Lead	0.372		0.375	99	0.475		0.500	95	0.480		0.500	96
Magnesium	18.59		18.8	99	23.55		25.0	94	23.60		25.0	94
Manganese	0.388		0.375	103	0.497		0.500	99	0.500		0.500	100
Nickel	0.374		0.375	100	0.477		0.500	95	0.478		0.500	96
Potassium	18.88		18.8	101	26.42		25.0	106	26.13		25.0	105
Selenium	0.375		0.375	100	0.497		0.500	99	0.498		0.500	100
Silver	0.378		0.375	101	0.481		0.500	96	0.482		0.500	96
Sodium	18.80		18.8	100	25.06		25.0	100	24.83		25.0	99
Thallium	0.380		0.375	101	0.491		0.500	98	0.488		0.500	98
Vanadium	0.380		0.375	101	0.488		0.500	98	0.491		0.500	98
Zinc	0.384		0.375	102	0.484		0.500	97	0.492		0.500	98

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_04_ICV_00223 Concentration Units: mg/L

CCV Source: MEI_09_CCV_00136

Analyte	CCV 480-152314/31 11/14/2013 17:23				CCV 480-152314/43 11/14/2013 17:50				CCV 480-152314/52 11/14/2013 18:18			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	24.61		25.0	98	24.38		25.0	98	24.67		25.0	99
Antimony	0.513		0.500	103	0.506		0.500	101	0.511		0.500	102
Arsenic	0.504		0.500	101	0.500		0.500	100	0.504		0.500	101
Barium	0.509		0.500	102	0.500		0.500	100	0.509		0.500	102
Beryllium	0.484		0.500	97	0.481		0.500	96	0.485		0.500	97
Cadmium	0.495		0.500	99	0.493		0.500	99	0.495		0.500	99
Calcium	25.03		25.0	100	24.74		25.0	99	24.67		25.0	99
Chromium	0.494		0.500	99	0.491		0.500	98	0.498		0.500	100
Cobalt	0.486		0.500	97	0.484		0.500	97	0.489		0.500	98
Copper	0.495		0.500	99	0.494		0.500	99	0.498		0.500	100
Iron	24.21		25.0	97	23.92		25.0	96				
Lead	0.481		0.500	96	0.481		0.500	96	0.485		0.500	97
Magnesium	23.74		25.0	95	23.68		25.0	95	24.05		25.0	96
Manganese	0.500		0.500	100	0.496		0.500	99				
Nickel	0.479		0.500	96	0.480		0.500	96	0.489		0.500	98
Potassium	25.84		25.0	103	25.55		25.0	102	25.51		25.0	102
Selenium	0.493		0.500	99	0.492		0.500	98	0.498		0.500	100
Silver	0.484		0.500	97	0.482		0.500	96	0.488		0.500	98
Sodium	24.74		25.0	99	24.55		25.0	98	24.72		25.0	99
Thallium	0.490		0.500	98	0.491		0.500	98	0.495		0.500	99
Vanadium	0.492		0.500	98	0.492		0.500	98	0.497		0.500	99
Zinc	0.497		0.500	99	0.496		0.500	99	0.495		0.500	99

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_10_CCVL_00001 Concentration Units: mg/L

CCV Source: MEI_10_CCVL_00001

Analyte	ICVL 480-152314/7 11/14/2013 10:39				CCVL 480-152314/16 11/14/2013 16:32				CCVL 480-152314/21 11/14/2013 16:59			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	0.193	J	0.200	96	0.191	J	0.200	95	0.163	J	0.200	82
Antimony	0.0163	J	0.0200	81	0.0169	J	0.0200	85	0.0171	J	0.0200	85
Arsenic	0.0112		0.0100	112	0.0121		0.0100	121	0.0111		0.0100	111
Barium	0.00201		0.00200	101	0.00202		0.00200	101	0.00202		0.00200	101
Beryllium	0.00182	J	0.00200	91	0.00190	J	0.00200	95	0.00183	J	0.00200	92
Cadmium	0.000960	J	0.00100	96	0.000960	J	0.00100	96	0.000900	J	0.00100	90
Calcium	0.488	J	0.500	98	0.486	J	0.500	97	0.487	J	0.500	97
Chromium	0.00332	J	0.00400	83	0.00383	J	0.00400	96	0.00362	J	0.00400	91
Cobalt	0.00402		0.00400	101	0.00388	J	0.00400	97	0.00384	J	0.00400	96
Copper	0.00946	J	0.0100	95	0.0104		0.0100	104	0.0106		0.0100	106
Iron	0.0448	J	0.0500	90	0.0406	J	0.0500	81	0.0441	J	0.0500	88
Lead	0.00585		0.00500	117	0.00457	J	0.00500	91	0.00587		0.00500	117
Magnesium	0.209		0.200	104	0.202		0.200	101	0.203		0.200	101
Manganese	0.00337		0.00300	112	0.00317		0.00300	106	0.00321		0.00300	107
Nickel	0.0100		0.0100	100	0.00884	J	0.0100	88	0.00958	J	0.0100	96
Potassium	0.516		0.500	103	0.519		0.500	104	0.495	J	0.500	99
Selenium	0.0126	J	0.0150	84	0.0184		0.0150	123	0.0154		0.0150	103
Silver	0.00305		0.00300	102	0.00263	J	0.00300	88	0.00243	J	0.00300	81
Sodium	0.984	J	1.00	98	0.991	J	1.00	99	1.00		1.00	100
Thallium	0.0185	J	0.0200	92	0.0200		0.0200	100	0.0205		0.0200	102
Vanadium	0.00463	J	0.00500	93	0.00448	J	0.00500	90	0.00483	J	0.00500	97
Zinc	0.0106		0.0100	106	0.00989	J	0.0100	99	0.0104		0.0100	104

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEI_10_CCVL_00001 Concentration Units: mg/L

CCV Source: MEI_10_CCVL_00001

Analyte	CCVL 480-152314/33 11/14/2013 17:27				CCVL 480-152314/45 11/14/2013 17:55				CCVL 480-152314/54 11/14/2013 18:22			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Aluminum	0.168	J	0.200	84	0.188	J	0.200	94	0.181	J	0.200	91
Antimony	0.0167	J	0.0200	83	0.0179	J	0.0200	89	0.0179	J	0.0200	90
Arsenic	0.00944	J	0.0100	94	0.0125		0.0100	125	0.0141		0.0100	141
Barium	0.00202		0.00200	101	0.00219		0.00200	110	0.00217		0.00200	109
Beryllium	0.00178	J	0.00200	89	0.00189	J	0.00200	95	0.00194	J	0.00200	97
Cadmium	0.000910	J	0.00100	91	0.000850	J	0.00100	85	0.00101		0.00100	101
Calcium	0.479	J	0.500	96	0.493	J	0.500	99	0.485	J	0.500	97
Chromium	0.00354	J	0.00400	89	0.00324	J	0.00400	81	0.00398	J	0.00400	100
Cobalt	0.00397	J	0.00400	99	0.00397	J	0.00400	99	0.00412		0.00400	103
Copper	0.0109		0.0100	109	0.0106		0.0100	106	0.0101		0.0100	101
Iron	0.0447	J	0.0500	89								
Lead					0.00425	J	0.00500	85	0.00515		0.00500	103
Magnesium	0.196	J	0.200	98	0.213		0.200	106	0.215		0.200	107
Manganese	0.00322		0.00300	107								
Nickel	0.00935	J	0.0100	94	0.00961	J	0.0100	96	0.00967	J	0.0100	97
Potassium	0.508		0.500	102	0.511		0.500	102	0.491	J	0.500	98
Selenium	0.0177		0.0150	118	0.0150		0.0150	100	0.0142	J	0.0150	95
Silver					0.00290	J	0.00300	97	0.00246	J	0.00300	82
Sodium	0.993	J	1.00	99	1.00		1.00	100	0.979	J	1.00	98
Thallium	0.0193	J	0.0200	97	0.0214		0.0200	107	0.0210		0.0200	105
Vanadium	0.00482	J	0.00500	96	0.00498	J	0.00500	100	0.00508		0.00500	102
Zinc	0.0101		0.0100	101	0.0106		0.0100	106	0.0108		0.0100	108

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEH_HG2_WKG_00495 Concentration Units: mg/L

CCV Source: MEH_HG2_WKG_00495

Analyte	ICV 480-151516/1 11/12/2013 10:48				ICVL 480-151516/3 11/12/2013 10:52				CCV 480-151516/28 11/12/2013 11:39			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00295		0.00300	98	0.000168	J	0.000200	84	0.00200		0.00200	100

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEH_HG2_WKG_00495 Concentration Units: mg/L

CCV Source: MEH_HG2_WKG_00495

Analyte	CCV 480-151516/40 11/12/2013 12:02				CCV 480-151516/52 11/12/2013 12:24				CCV 480-151516/64 11/12/2013 12:48			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00199		0.00200	100	0.00198		0.00200	99	0.00198		0.00200	99

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2A-IN
CALIBRATION VERIFICATIONS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEH_HG2_WKG_00495 Concentration Units: mg/L

CCV Source: MEH_HG2_WKG_00495

Analyte	CCV 480-151516/76 11/12/2013 13:11				CCV 480-151516/88 11/12/2013 13:34				CCVL 480-151516/96 11/12/2013 13:50			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00198		0.00200	99	0.00197		0.00200	99	0.000167	J	0.000200	84

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

ICV Source: MEH_HG2_WKG_00495 Concentration Units: mg/L

CCV Source: MEH_HG2_WKG_00495

Analyte	CCV 480-151516/97 11/12/2013 13:51				CCVL 480-151516/103 11/12/2013 14:28				CCV 480-151516/104 11/12/2013 14:30			
	Found	C	True	%R	Found	C	True	%R	Found	C	True	%R
Mercury	0.00197		0.00200	99	0.000169	J	0.000200	85	0.00197		0.00200	99

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.
Italicized analytes were not requested for this sequence.

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Method: 6010C Instrument ID: ICAP1

Lab Sample ID: CRI 480-152283/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00085

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Aluminum	0.400	0.414		103	70-130
Antimony	0.0400	0.0392		98	70-130
Arsenic	0.0200	0.0184		92	70-130
Barium	0.00400	0.00429		107	70-130
Beryllium	0.00400	0.00411		103	70-130
Cadmium	0.00200	0.00197		99	70-130
Calcium	1.00	1.01		101	70-130
Chromium	0.00800	0.00759		95	70-130
Cobalt	0.00800	0.00795		99	70-130
Copper	0.0200	0.0203		101	70-130
Iron	0.100	0.101		101	70-130
Lead	0.0100	0.00955		96	70-130
Magnesium	0.400	0.397		99	70-130
Manganese	0.00600	0.00648		108	70-130
Nickel	0.0200	0.0194		97	70-130
Potassium	1.00	0.964		96	70-130
Selenium	0.0300	0.0292		97	70-130
Silver	0.00600	0.00558		93	70-130
Sodium	2.00	1.89		95	70-130
Thallium	0.0400	0.0374		93	70-130
Vanadium	0.0100	0.0102		102	70-130
Zinc	0.0200	0.0202		101	70-130

Lab Sample ID: CRI 480-152587/7 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00085

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Arsenic	0.0200	0.0219		109	70-130
Cadmium	0.00200	0.00212		106	70-130
Iron	0.100	0.0961		96	70-130
Lead	0.0100	0.0104		104	70-130
Manganese	0.00600	0.00645		108	70-130
Silver	0.00600	0.00570		95	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

2B-IN
CRQL CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Method: 6010C Instrument ID: ICAP2

Lab Sample ID: CRI 480-152314/8 Concentration Units: mg/L

CRQL Check Standard Source: MEI_06_CRI_00085

Analyte	CRQL Check Standard				
	True	Found	Qualifiers	%R(1)	Limits
Aluminum	0.400	0.385		96	70-130
Antimony	0.0400	0.0375		94	70-130
Arsenic	0.0200	0.0205		102	70-130
Barium	0.00400	0.00417		104	70-130
Beryllium	0.00400	0.00397		99	70-130
Cadmium	0.00200	0.00177		89	70-130
Calcium	1.00	0.980		98	70-130
Chromium	0.00800	0.00801		100	70-130
Cobalt	0.00800	0.00782		98	70-130
Copper	0.0200	0.0204		102	70-130
Iron	0.100	0.100		100	70-130
Lead	0.0100	0.0105		105	70-130
Magnesium	0.400	0.401		100	70-130
Manganese	0.00600	0.00641		107	70-130
Nickel	0.0200	0.0197		99	70-130
Potassium	1.00	1.01		101	70-130
Selenium	0.0300	0.0314		105	70-130
Silver	0.00600	0.00603		101	70-130
Sodium	2.00	2.01		100	70-130
Thallium	0.0400	0.0388		97	70-130
Vanadium	0.0100	0.00992		99	70-130
Zinc	0.0200	0.0205		103	70-130

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IIB-IN

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 480-152283/6 11/14/2013 09:45		CCB 480-152283/12 11/14/2013 10:00		CCB 480-152283/16 11/14/2013 10:09		CCB 480-152283/28 11/14/2013 10:38	
		Found	C	Found	C	Found	C	Found	C
Aluminum	0.20	ND		ND		ND		ND	
Antimony	0.020	ND		ND		ND		ND	
Arsenic	0.010	ND		ND		ND		ND	
Barium	0.0020	ND		ND		ND		ND	
Beryllium	0.0020	ND		ND		ND		ND	
Cadmium	0.0010	ND		ND		ND		ND	
Calcium	0.50	ND		ND		ND		ND	
Chromium	0.0040	ND		ND		ND		ND	
Cobalt	0.0040	ND		ND		ND		ND	
Copper	0.010	ND		ND		ND		ND	
Iron	0.050	ND		ND		ND		ND	
Lead	0.0050	ND		ND		ND		ND	
Magnesium	0.20	ND		ND		ND		ND	
Manganese	0.0030	ND		ND		ND		ND	
Nickel	0.010	ND		ND		ND		ND	
Potassium	0.50	ND		ND		ND		ND	
Selenium	0.015	ND		ND		ND		ND	
Silver	0.0030	ND		ND		ND		ND	
Sodium	1.0	ND		ND		ND		ND	
Thallium	0.020	ND		ND		ND		ND	
Vanadium	0.0050	ND		ND		ND		ND	
Zinc	0.010	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	CCB 480-152283/40 11/14/2013 11:07		CCB 480-152283/47 11/14/2013 11:36					
		Found	C	Found	C	Found	C	Found	C
Aluminum	0.20	ND		ND					
Antimony	0.020	ND		ND					
Arsenic	0.010	ND		ND					
Barium	0.0020	ND		ND					
Beryllium	0.0020	ND		ND					
Cadmium	0.0010	ND		ND					
Calcium	0.50	ND		ND					
Chromium	0.0040	ND		ND					
Cobalt	0.0040	ND		ND					
Copper	0.010	ND		ND					
Iron	0.050	ND		ND					
Lead	0.0050	ND		ND					
Magnesium	0.20	ND		ND					
Manganese	0.0030	ND		ND					
Nickel	0.010	ND		ND					
Potassium	0.50	ND		ND					
Selenium	0.015	ND		ND					
Silver	0.0030	ND		ND					
Sodium	1.0	ND		ND					
Thallium	0.020	ND		ND					
Vanadium	0.0050	ND		ND					
Zinc	0.010	ND		ND					

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 480-152587/6 11/15/2013 09:41		CCB 480-152587/15 11/15/2013 12:31		CCB 480-152587/27 11/15/2013 13:00		CCB 480-152587/39 11/15/2013 13:28	
		Found	C	Found	C	Found	C	Found	C
Arsenic	0.010	ND		ND		ND		ND	
Cadmium	0.0010	ND		ND		ND		ND	
Iron	0.050	ND		ND		ND		ND	
Lead	0.0050	ND		ND		ND		ND	
Manganese	0.0030	ND		ND		ND		ND	
Silver	0.0030	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	CCB 480-152587/48 11/15/2013 13:57							
		Found	C	Found	C	Found	C	Found	C
Arsenic	0.010	ND							
Cadmium	0.0010	ND							
Iron	0.050	ND							
Lead	0.0050	ND							
Manganese	0.0030	ND							
Silver	0.0030	ND							

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 480-152314/6 11/14/2013 10:36		CCB 480-152314/15 11/14/2013 16:30		CCB 480-152314/20 11/14/2013 16:57		CCB 480-152314/32 11/14/2013 17:25	
		Found	C	Found	C	Found	C	Found	C
Aluminum	0.20	ND		ND		ND		ND	
Antimony	0.020	ND		ND		ND		ND	
Arsenic	0.010	ND		ND		ND		ND	
Barium	0.0020	ND		ND		ND		ND	
Beryllium	0.0020	ND		ND		ND		ND	
Cadmium	0.0010	ND		ND		ND		ND	
Calcium	0.50	ND		ND		ND		ND	
Chromium	0.0040	ND		ND		ND		ND	
Cobalt	0.0040	ND		ND		ND		ND	
Copper	0.010	ND		0.00172	J	ND		ND	
Iron	0.050	ND		ND		ND		ND	
Lead	0.0050	ND		ND		ND		ND	
Magnesium	0.20	ND		ND		ND		ND	
Manganese	0.0030	ND		ND		ND		ND	
Nickel	0.010	ND		ND		ND		ND	
Potassium	0.50	ND		ND		ND		ND	
Selenium	0.015	ND		ND		ND		ND	
Silver	0.0030	ND		ND		ND		ND	
Sodium	1.0	ND		ND		ND		ND	
Thallium	0.020	ND		ND		ND		ND	
Vanadium	0.0050	ND		ND		ND		ND	
Zinc	0.010	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	CCB 480-152314/44 11/14/2013 17:52		CCB 480-152314/53 11/14/2013 18:20					
		Found	C	Found	C	Found	C	Found	C
Aluminum	0.20	ND		ND					
Antimony	0.020	ND		ND					
Arsenic	0.010	ND		ND					
Barium	0.0020	ND		ND					
Beryllium	0.0020	ND		ND					
Cadmium	0.0010	ND		ND					
Calcium	0.50	ND		ND					
Chromium	0.0040	ND		ND					
Cobalt	0.0040	ND		ND					
Copper	0.010	0.00160	J	ND					
Iron	0.050	ND							
Lead	0.0050	ND		ND					
Magnesium	0.20	ND		ND					
Manganese	0.0030	0.000860	J						
Nickel	0.010	ND		ND					
Potassium	0.50	ND		ND					
Selenium	0.015	ND		ND					
Silver	0.0030	ND		ND					
Sodium	1.0	ND		ND					
Thallium	0.020	ND		ND					
Vanadium	0.0050	ND		ND					
Zinc	0.010	ND		ND					

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	ICB 480-151516/2 11/12/2013 10:50		CCB 480-151516/29 11/12/2013 11:41		CCB 480-151516/41 11/12/2013 12:04		CCB 480-151516/53 11/12/2013 12:26	
		Found	C	Found	C	Found	C	Found	C
Mercury	0.00020	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	CCB 480-151516/65 11/12/2013 12:49		CCB 480-151516/77 11/12/2013 13:13		CCB 480-151516/89 11/12/2013 13:35		CCB 480-151516/98 11/12/2013 13:53	
		Found	C	Found	C	Found	C	Found	C
Mercury	0.00020	ND		ND		ND		ND	

Italicized analytes were not requested for this sequence.

3-IN
INSTRUMENT BLANKS
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/L

Analyte	RL	CCB 480-151516/105 11/12/2013 14:31							
		Found	C	Found	C	Found	C	Found	C
Mercury	0.00020	ND							

Italicized analytes were not requested for this sequence.

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 480-151401/1-A

Instrument Code: ICAP1 Batch No.: 152283

CAS No.	Analyte	Concentration	C	Q	Method
7429-90-5	Aluminum	ND			6010C
7440-36-0	Antimony	ND			6010C
7440-38-2	Arsenic	ND			6010C
7440-39-3	Barium	ND			6010C
7440-41-7	Beryllium	ND			6010C
7440-43-9	Cadmium	ND			6010C
7440-70-2	Calcium	4.28	J		6010C
7440-47-3	Chromium	ND			6010C
7440-48-4	Cobalt	ND			6010C
7440-50-8	Copper	ND			6010C
7439-89-6	Iron	ND			6010C
7439-92-1	Lead	ND			6010C
7439-95-4	Magnesium	ND			6010C
7439-96-5	Manganese	ND			6010C
7440-02-0	Nickel	ND			6010C
7440-09-7	Potassium	ND			6010C
7782-49-2	Selenium	ND			6010C
7440-22-4	Silver	ND			6010C
7440-23-5	Sodium	ND			6010C
7440-28-0	Thallium	ND			6010C
7440-62-2	Vanadium	ND			6010C
7440-66-6	Zinc	0.379	J		6010C

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 480-151394/1-A

Instrument Code: ICAP2 Batch No.: 152314

CAS No.	Analyte	Concentration	C	Q	Method
7429-90-5	Aluminum	ND			6010C
7440-36-0	Antimony	ND			6010C
7440-38-2	Arsenic	ND			6010C
7440-39-3	Barium	ND			6010C
7440-41-7	Beryllium	ND			6010C
7440-43-9	Cadmium	ND			6010C
7440-70-2	Calcium	4.41	J		6010C
7440-47-3	Chromium	ND			6010C
7440-48-4	Cobalt	ND			6010C
7440-50-8	Copper	ND			6010C
7439-89-6	Iron	ND			6010C
7439-92-1	Lead	ND			6010C
7439-95-4	Magnesium	ND			6010C
7439-96-5	Manganese	ND			6010C
7440-02-0	Nickel	ND			6010C
7440-09-7	Potassium	ND			6010C
7782-49-2	Selenium	0.462	J		6010C
7440-22-4	Silver	ND			6010C
7440-23-5	Sodium	ND			6010C
7440-28-0	Thallium	ND			6010C
7440-62-2	Vanadium	ND			6010C
7440-66-6	Zinc	0.321	J		6010C

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 480-151269/1-A

Instrument Code: LEEMAN3 Batch No.: 151516

CAS No.	Analyte	Concentration	C	Q	Method
7439-97-6	Mercury	ND			7471B

3-IN
METHOD BLANK
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Concentration Units: mg/Kg Lab Sample ID: MB 480-151288/1-A

Instrument Code: LEEMAN3 Batch No.: 151516

CAS No.	Analyte	Concentration	C	Q	Method
7439-97-6	Mercury	ND			7471B

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSA 480-152283/9 Instrument ID: ICAP1

Lab File ID: I1111413A-1.asc ICS Source: MEI_07_ICSA_00055

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Aluminum	**501**	**553**	**110**
Antimony		**-0.0236**	
Arsenic		**-0.0047**	
Barium		**0.0020**	
Beryllium		**0.0000**	
Cadmium		**0.0005**	
Calcium	**500**	**501**	**100**
Chromium		**0.0007**	
Cobalt		**-0.0011**	
Copper		**0.0022**	
Iron	**200**	**203**	**102**
Lead		**-0.0066**	
Magnesium	**500**	**516**	**103**
Manganese		**0.0014**	
Manganese		**0.0020**	
Nickel		**-0.0008**	
Potassium		**0.0166**	
Selenium		**-0.0034**	
Silver		**0.0007**	
Sodium		**0.0804**	
Thallium		**0.0030**	
Vanadium		**-0.0007**	
Zinc		**0.0039**	
Boron		*-0.0005*	
Lithium		*0.0026*	
Molybdenum		*-0.0008*	
Strontium		*0.0050*	
Tin		*0.0020*	
Titanium		*0.0030*	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSAB 480-152283/10 Instrument ID: ICAP1

Lab File ID: I1111413A-1.asc ICS Source: MEI_08_ICSAB_00074

Concentration Units: mg/L

Analyte	True Solution AB	Found Solution AB	Percent Recovery
Aluminum	**501**	**530**	**106**
Antimony	**0.600**	**0.601**	**100**
Arsenic	**0.100**	**0.0976**	**98**
Barium	**0.500**	**0.529**	**106**
Beryllium	**0.500**	**0.521**	**104**
Cadmium	**1.00**	**1.05**	**105**
Calcium	**501**	**497**	**99**
Chromium	**0.500**	**0.486**	**97**
Cobalt	**0.500**	**0.513**	**103**
Copper	**0.500**	**0.552**	**110**
Iron	**100**	**96.8**	**97**
Lead	**0.0500**	**0.0433**	**87**
Magnesium	**501**	**517**	**103**
Manganese	**0.500**	**0.476**	**95**
Manganese	**0.500**	**0.523**	**105**
Nickel	**1.00**	**0.993**	**99**
Potassium		**0.0134**	
Selenium	**0.0500**	**0.0499**	**100**
Silver	**0.200**	**0.224**	**112**
Sodium		**0.0597**	
Thallium	**0.100**	**0.100**	**100**
Vanadium	**0.500**	**0.493**	**99**
Zinc	**1.00**	**0.962**	**96**
Boron		*0.0043*	
Lithium	*0.500*	*0.570*	*114*
Molybdenum		*-0.0003*	
Strontium	*0.500*	*0.533*	*107*
Tin		*0.0023*	
Titanium		*0.0026*	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSA 480-152587/9 Instrument ID: ICAP1

Lab File ID: ICS Source: MEI_07_ICSA_00055

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Arsenic		**-0.0045**	
Cadmium		**0.0006**	
Iron	**200**	**202**	**101**
Lead		**0.0046**	
Magnesium	**500**	**518**	**104**
Manganese		**0.0014**	
Manganese		**0.0011**	
Silver		**-0.0003**	
Aluminum	*501*	*552*	*110*
Antimony		*-0.0137*	
Barium		*0.0019*	
Beryllium		*0.0002*	
Boron		*-0.0006*	
Calcium	*500*	*502*	*100*
Chromium		*0.0000*	
Cobalt		*-0.0011*	
Copper		*0.0022*	
Lithium		*0.0028*	
Molybdenum		*-0.0018*	
Nickel		*0.0002*	
Potassium		*0.0232*	
Selenium		*-0.0034*	
Sodium		*0.0785*	
Strontium		*0.0049*	
Thallium		*0.0029*	
Tin		*0.0010*	
Titanium		*0.0031*	
Vanadium		*-0.0008*	
Zinc		*0.0038*	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSAB 480-152587/10 Instrument ID: ICAP1

Lab File ID: ICS Source: MEI_08_ICSAB_00074

Concentration Units: mg/L

Analyte	True Solution AB	Found Solution AB	Found Percent Recovery
Arsenic	**0.100**	**0.100**	**100**
Cadmium	**1.00**	**1.06**	**106**
Iron	**100**	**97.1**	**97**
Lead	**0.0500**	**0.0571**	**114**
Magnesium	**501**	**521**	**104**
Manganese	**0.500**	**0.476**	**95**
Manganese	**0.500**	**0.524**	**105**
Silver	**0.200**	**0.224**	**112**
Aluminum	*501*	*532*	*106*
Antimony	*0.600*	*0.616*	*103*
Barium	*0.500*	*0.531*	*106*
Beryllium	*0.500*	*0.524*	*105*
Boron		*0.0043*	
Calcium	*501*	*496*	*99*
Chromium	*0.500*	*0.484*	*97*
Cobalt	*0.500*	*0.511*	*102*
Copper	*0.500*	*0.549*	*110*
Lithium	*0.500*	*0.571*	*114*
Molybdenum		*-0.0005*	
Nickel	*1.00*	*0.988*	*99*
Potassium		*0.0281*	
Selenium	*0.0500*	*0.0439*	*88*
Sodium		*0.0641*	
Strontium	*0.500*	*0.524*	*105*
Thallium	*0.100*	*0.104*	*104*
Tin		*0.0007*	
Titanium		*0.0029*	
Vanadium	*0.500*	*0.494*	*99*
Zinc	*1.00*	*0.962*	*96*

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSA 480-152314/9 Instrument ID: ICAP2

Lab File ID: I2111413A-11.asc ICS Source: MEI_07_ICSA_00055

Concentration Units: mg/L

Analyte	True Solution A	Found Solution A	Percent Recovery
Aluminum	**501**	**551**	**110**
Antimony		**-0.0089**	
Arsenic		**-0.0003**	
Barium		**0.0019**	
Beryllium		**-0.0001**	
Cadmium		**-0.0015**	
Calcium	**500**	**519**	**104**
Chromium		**0.0008**	
Cobalt		**-0.0007**	
Copper		**0.0034**	
Iron	**200**	**205**	**102**
Lead		**-0.0039**	
Magnesium	**500**	**536**	**107**
Manganese		**0.0020**	
Nickel		**-0.0001**	
Potassium		**-0.0455**	
Selenium		**-0.0012**	
Silver		**0.0014**	
Sodium		**0.0971**	
Thallium		**-0.0061**	
Vanadium		**0.0000**	
Zinc		**0.0031**	
Boron		*-0.0037*	
Lithium		*0.0079*	
Molybdenum		*-0.0024*	
Strontium		*0.0050*	
Tin		*0.0017*	
Titanium		*0.0028*	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

4A-IN
INTERFERENCE CHECK STANDARD
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Lab Sample ID: ICSAB 480-152314/10 Instrument ID: ICAP2

Lab File ID: I2111413A-11.asc ICS Source: MEI_08_ICSAB_00074

Concentration Units: mg/L

Analyte	True Solution AB	Found Solution AB	Found Percent Recovery
Aluminum	**501**	**543**	**108**
Antimony	**0.600**	**0.617**	**103**
Arsenic	**0.100**	**0.116**	**116**
Barium	**0.500**	**0.517**	**103**
Beryllium	**0.500**	**0.524**	**105**
Cadmium	**1.00**	**1.06**	**106**
Calcium	**501**	**523**	**104**
Chromium	**0.500**	**0.501**	**100**
Cobalt	**0.500**	**0.518**	**104**
Copper	**0.500**	**0.572**	**114**
Iron	**100**	**100**	**100**
Lead	**0.0500**	**0.0527**	**105**
Magnesium	**501**	**542**	**108**
Manganese	**0.500**	**0.486**	**97**
Nickel	**1.00**	**1.00**	**100**
Potassium		**0.0327**	
Selenium	**0.0500**	**0.0587**	**117**
Silver	**0.200**	**0.227**	**113**
Sodium		**0.0814**	
Thallium	**0.100**	**0.102**	**102**
Vanadium	**0.500**	**0.509**	**102**
Zinc	**1.00**	**0.983**	**98**
Boron		*0.0018*	
Lithium	*0.500*	*0.547*	*109*
Molybdenum		*-0.0025*	
Strontium	*0.500*	*0.544*	*109*
Tin		*0.0015*	
Titanium		*0.0021*	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM IVA-IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: SD802 MS
Lab ID: 480-49854-2 MS
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg
% Solids: 83.0

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	8582		4460		2420	170	75-125	F	6010C
Antimony	40.81		ND		48.5	84	75-125		6010C
Arsenic	48.52		2.1	J	48.5	96	75-125		6010C
Barium	113.2		59.3		48.5	111	75-125		6010C
Beryllium	46.58		0.12	J	48.5	96	75-125		6010C
Cadmium	46.80		ND		48.5	97	75-125		6010C
Calcium	5410		1930		2420	144	75-125	F	6010C
Chromium	69.89		17.5		48.5	108	75-125		6010C
Cobalt	59.44		12.1		48.5	98	75-125		6010C
Copper	71.24		21.7		48.5	102	75-125		6010C
Iron	15180		12800		2420	98	75-125	4	6010C
Lead	56.60		8.1		48.5	100	75-125		6010C
Magnesium	7458		4530		2420	121	75-125		6010C
Manganese	167.8		139		48.5	59	75-125	F	6010C
Nickel	79.61		30.7		48.5	101	75-125		6010C
Potassium	3359		737		2430	108	75-125		6010C
Selenium	48.29		1.1	J	48.5	97	75-125		6010C
Silver	11.83		ND		12.1	98	75-125		6010C
Sodium	2574		70.5	J	2430	103	75-125		6010C
Thallium	45.86		ND		48.5	95	75-125		6010C
Vanadium	70.63		17.7		48.5	109	75-125		6010C
Zinc	131.9		82.1		48.5	103	75-125		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VA - IN

5A-IN
MATRIX SPIKE SAMPLE RECOVERY
METALS

Client ID: SD823 MS
Lab ID: 480-49854-23 MS
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg
% Solids: 82.1

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	6835		3540		2370	139	75-125	F	6010C
Antimony	40.10		ND		47.4	85	75-125		6010C
Arsenic	46.62		0.57	J	47.4	97	75-125		6010C
Barium	152.6		73.4		47.4	167	75-125	F	6010C
Beryllium	46.95		0.17	J	47.4	99	75-125		6010C
Cadmium	45.10		0.099	J	47.4	95	75-125		6010C
Calcium	5688		2950		2370	116	75-125		6010C
Chromium	85.60		30.2		47.4	117	75-125		6010C
Cobalt	57.52		10.3		47.4	100	75-125		6010C
Copper	131.5		61.0		47.4	149	75-125	F	6010C
Iron	14400		11200		2370	136	75-125	4	6010C
Lead	58.94		10.9		47.4	101	75-125		6010C
Magnesium	5490		3770		2370	73	75-125	F	6010C
Manganese	455.4		315		47.4	296	75-125	4	6010C
Nickel	102.4		45.3		47.4	121	75-125		6010C
Potassium	2740		325		2370	102	75-125		6010C
Selenium	45.85		0.82	J	47.4	95	75-125		6010C
Silver	11.26		ND		11.8	95	75-125		6010C
Sodium	2540		164	J	2370	100	75-125		6010C
Thallium	44.56		ND		47.4	94	75-125		6010C
Vanadium	60.31		10.0		47.4	106	75-125		6010C
Zinc	104.1		53.6		47.4	107	75-125		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VA - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: SD802 MSD
Lab ID: 480-49854-2 MSD
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg
% Solids: 83.0

Analyte	(SDR) C		Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Aluminum	8544		2390	170	75-125	0	20	F	6010C
Antimony	38.44		47.9	80	75-125	6	20		6010C
Arsenic	48.11		47.9	96	75-125	1	20		6010C
Barium	115.0		47.9	116	75-125	2	20		6010C
Beryllium	46.06		47.9	96	75-125	1	20		6010C
Cadmium	46.03		47.9	96	75-125	2	20		6010C
Calcium	5483		2390	149	75-125	1	20	F	6010C
Chromium	69.48		47.9	109	75-125	1	20		6010C
Cobalt	59.68		47.9	99	75-125	0	20		6010C
Copper	70.46		47.9	102	75-125	1	20		6010C
Iron	16240		2390	143	75-125	7	20	4	6010C
Lead	55.67		47.9	99	75-125	2	20		6010C
Magnesium	7353		2390	118	75-125	1	20		6010C
Manganese	207.4		47.9	142	75-125	21	20	F	6010C
Nickel	79.12		47.9	101	75-125	1	20		6010C
Potassium	3330		2390	108	75-125	1	20		6010C
Selenium	46.45		47.9	95	75-125	4	20		6010C
Silver	11.70		12.0	98	75-125	1	20		6010C
Sodium	2567		2400	104	75-125	0	20		6010C
Thallium	45.33		47.9	95	75-125	1	20		6010C
Vanadium	70.36		47.9	110	75-125	0	20		6010C
Zinc	133.7		47.9	108	75-125	1	20		6010C

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: SD823 MSD
Lab ID: 480-49854-23 MSD
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg
% Solids: 82.1

Analyte	(SDR) C		Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Aluminum	6664		2270	138	75-125	3	20	F	6010C
Antimony	38.08		45.3	84	75-125	5	20		6010C
Arsenic	44.16		45.3	96	75-125	5	20		6010C
Barium	138.7		45.3	144	75-125	9	20	F	6010C
Beryllium	44.95		45.3	99	75-125	4	20		6010C
Cadmium	43.00		45.3	95	75-125	5	20		6010C
Calcium	5843		2270	128	75-125	3	20	F	6010C
Chromium	84.61		45.3	120	75-125	1	20		6010C
Cobalt	55.36		45.3	99	75-125	4	20		6010C
Copper	124.3		45.3	140	75-125	6	20	F	6010C
Iron	13410		2270	99	75-125	7	20	4	6010C
Lead	56.43		45.3	100	75-125	4	20		6010C
Magnesium	5818		2270	91	75-125	6	20		6010C
Manganese	460.8		45.3	322	75-125	1	20	4	6010C
Nickel	94.78		45.3	109	75-125	8	20		6010C
Potassium	2672		2270	104	75-125	2	20		6010C
Selenium	42.89		45.3	93	75-125	7	20		6010C
Silver	10.94		11.3	97	75-125	3	20		6010C
Sodium	2476		2270	102	75-125	3	20		6010C
Thallium	43.30		45.3	96	75-125	3	20		6010C
Vanadium	58.27		45.3	106	75-125	3	20		6010C
Zinc	93.52		45.3	88	75-125	11	20		6010C

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: SD802 PDS | Lab ID: 480-49854-2 PDS

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG No.:

Matrix: Solid | Concentration Units: mg/Kg

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	6984		4460		2630	96	75-125		6010C
Antimony	56.84		ND		52.5	108	75-125		6010C
Arsenic	59.38		2.1	J	52.5	109	75-125		6010C
Barium	113.0		59.3		52.5	102	75-125		6010C
Beryllium	56.83		0.12	J	52.5	108	75-125		6010C
Cadmium	56.96		ND		52.5	109	75-125		6010C
Calcium	4671		1930		2630	105	75-125		6010C
Chromium	73.14		17.5		52.5	106	75-125		6010C
Cobalt	70.09		12.1		52.5	110	75-125		6010C
Copper	78.23		21.7		52.5	108	75-125		6010C
Iron	15250		12800		2630	93	75-125		6010C
Magnesium	7129		4530		2630	99	75-125		6010C
Manganese	190.1		139		52.5	97	75-125		6010C
Nickel	85.97		30.7		52.5	105	75-125		6010C
Potassium	3411		737		2630	102	75-125		6010C
Selenium	58.81		1.1	J	52.5	110	75-125		6010C
Sodium	2653		70.5	J	2630	98	75-125		6010C
Thallium	55.91		ND		52.5	106	75-125		6010C
Vanadium	74.13		17.7		52.5	107	75-125		6010C
Zinc	132.3		82.1		52.5	96	75-125		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VB - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: SD803 PDS
Lab ID: 480-49854-3 PDS
Lab Name: TestAmerica Buffalo
Job No.: 480-49854-1
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Lead	102.6		10.1		61.8	150	75-125	W	6010C
Silver	13.60		ND		15.4	88	75-125		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VB - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: SD823 PDS | Lab ID: 480-49854-23 PDS

Lab Name: TestAmerica Buffalo | Job No.: 480-49854-1

SDG No.:

Matrix: Solid | Concentration Units: mg/Kg

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	5634		3540		2440	86	75-125		6010C
Antimony	36.96		ND		48.8	76	75-125		6010C
Arsenic	37.67		0.57	J	48.8	76	75-125		6010C
Barium	113.6		73.4		48.8	82	75-125		6010C
Beryllium	46.24		0.17	J	48.8	94	75-125		6010C
Cadmium	37.02		0.099	J	48.8	76	75-125		6010C
Calcium	4984		2950		2440	84	75-125		6010C
Chromium	71.72		30.2		48.8	85	75-125		6010C
Cobalt	49.25		10.3		48.8	80	75-125		6010C
Copper	100.2		61.0		48.8	80	75-125		6010C
Iron	12700		11200		2440	62	75-125	W	6010C
Lead	48.27		10.9		48.8	77	75-125		6010C
Magnesium	5700		3770		2440	79	75-125		6010C
Manganese	340.3		315		48.8	52	75-125	W	6010C
Nickel	82.27		45.3		48.8	76	75-125		6010C
Potassium	2325		325		2440	82	75-125		6010C
Selenium	36.64		0.82	J	48.8	73	75-125	W	6010C
Silver	9.69		ND		12.2	79	75-125		6010C
Sodium	2213		164	J	2440	84	75-125		6010C
Thallium	36.42		ND		48.8	75	75-125		6010C
Vanadium	52.73		10.0		48.8	88	75-125		6010C
Zinc	89.82		53.6		48.8	74	75-125	W	6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VB - IN

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 480-151401/2-A

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

Sample Matrix: Solid LCS Source: MED_SRM_D080_00001

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Aluminum	8840	7099		80.3	42.0	158.4		6010C
Antimony	88.2	63.62		72.1	26.3	289.1		6010C
Arsenic	99.6	93.21		93.6	69.3	130.5		6010C
Barium	310	285.2		92.0	74.2	126.1		6010C
Beryllium	72.3	68.99		95.4	73.9	126.1		6010C
Cadmium	182	168.2		92.4	73.6	126.4		6010C
Calcium	6790	6135		90.4	74.2	125.8		6010C
Chromium	136	125.7		92.5	70.4	130.1		6010C
Cobalt	128	125.7		98.2	74.1	125.0		6010C
Copper	102	98.30		96.4	74.3	126.5		6010C
Iron	12600	9496		75.4	31.0	168.3		6010C
Lead	115	113.0		98.3	72.1	128.7		6010C
Magnesium	3010	2516		83.6	66.1	133.9		6010C
Manganese	323	288.7		89.4	74.9	125.1		6010C
Nickel	153	152.7		99.8	73.2	126.1		6010C
Potassium	2840	2533		89.2	62.0	138.0		6010C
Selenium	150	141.8		94.6	67.3	132.7		6010C
Silver	40.4	36.40		90.1	65.8	133.7		6010C
Sodium	2760	2642		95.7	65.9	134.1		6010C
Thallium	174	168.7		96.9	69.0	131.6		6010C
Vanadium	97.6	87.74		89.9	65.2	135.2		6010C
Zinc	161	142.9		88.7	68.3	131.7		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 480-151394/2-A

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

Sample Matrix: Solid LCS Source: MED_SRM_D080_00001

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Aluminum	8830	7162		81.1	42.0	158.4		6010C
Antimony	88.1	89.07		101.1	26.3	289.1		6010C
Arsenic	99.4	100.3		100.9	69.3	130.5		6010C
Barium	310	315.6		102.0	74.2	126.1		6010C
Beryllium	72.2	71.51		99.1	73.9	126.1		6010C
Cadmium	182	181.5		99.9	73.6	126.4		6010C
Calcium	6780	6616		97.6	74.2	125.8		6010C
Chromium	136	130.1		95.8	70.4	130.1		6010C
Cobalt	128	131.8		103.1	74.1	125.0		6010C
Copper	102	103.1		101.2	74.3	126.5		6010C
Iron	12600	10630		84.5	31.0	168.3		6010C
Lead	115	113.8		99.1	72.1	128.7		6010C
Magnesium	3010	2641		87.9	66.1	133.9		6010C
Manganese	322	307.5		95.4	74.9	125.1		6010C
Nickel	153	155.4		101.8	73.2	126.1		6010C
Potassium	2840	2779		98.0	62.0	138.0		6010C
Selenium	150	151.9		101.4	67.3	132.7		6010C
Silver	40.3	38.00		94.2	65.8	133.7		6010C
Sodium	2760	2767		100.4	65.9	134.1		6010C
Thallium	174	174.8		100.6	69.0	131.6		6010C
Vanadium	97.4	93.30		95.8	65.2	135.2		6010C
Zinc	161	149.2		92.8	68.3	131.7		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 480-151269/2-A

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

Sample Matrix: Solid LCS Source: MEH_SRM_D071_00003

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Mercury	3.77	3.91		103.7	50.9	149.1		7471B

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

7D-IN
LCSD - CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCDSRM 480-151269/3-A

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

Sample Matrix: Solid LCS Source: MEH_SRM_D071_00003

Analyte	(SDR)	C	Spike Added	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Mercury	4.48		3.77	118.9	.9-149.1	14	20		7471B

SDR = Spike Duplicate Results
Calculations are performed before rounding to avoid round-off errors in calculated results.

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
METALS

Lab ID: LCSSRM 480-151288/2-A

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

Sample Matrix: Solid LCS Source: MEH_SRM_D071_00003

Analyte	Solid(mg/Kg)							
	True	Found	C	%R	Limits		Q	Method
Mercury	3.77	4.03		106.9	50.9	149.1		7471B

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA - IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 480-49854-2

SDG No:

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

Matrix: Solid Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Aluminum	4460		4587		2.7		6010C
Antimony	ND		ND		NC		6010C
Arsenic	2.1	J	ND		NC		6010C
Barium	59.3		61.29		3.4		6010C
Beryllium	0.12	J	ND		NC		6010C
Cadmium	ND		ND		NC		6010C
Calcium	1930		2030		5.4		6010C
Chromium	17.5		17.69		1.2		6010C
Cobalt	12.1		11.99		0.99		6010C
Copper	21.7		22.75		4.9		6010C
Iron	12800		13620		6.3		6010C
Magnesium	4530		4786		5.6		6010C
Manganese	139		147.5		5.9		6010C
Nickel	30.7		30.73	J	0.03		6010C
Potassium	737		750.4		1.8		6010C
Selenium	1.1	J	4.44	J	NC		6010C
Sodium	70.5	J	86.62	J	NC		6010C
Thallium	ND		ND		NC		6010C
Vanadium	17.7		18.30		3.2		6010C
Zinc	82.1		85.99		4.7		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 480-49854-3

SDG No:

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

Matrix: Solid Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Lead	10.1		11.51		13	V	6010C
Silver	ND		ND		NC		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 480-49854-23

SDG No:

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

Matrix: Solid Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Aluminum	3540		3545		0.23		6010C
Antimony	ND		ND		NC		6010C
Arsenic	0.57	J	ND		NC		6010C
Barium	73.4		77.38		5.4		6010C
Beryllium	0.17	J	0.207	J	NC		6010C
Cadmium	0.099	J	ND		NC		6010C
Calcium	2950		3002		1.9		6010C
Chromium	30.2		30.84		2.0		6010C
Cobalt	10.3		10.20		1.0		6010C
Copper	61.0		61.65		1.1		6010C
Iron	11200		11240		0.58		6010C
Lead	10.9		11.42		4.8		6010C
Magnesium	3770		3916		4.0		6010C
Manganese	315		330.5		4.9		6010C
Nickel	45.3		45.51		0.48		6010C
Potassium	325		302.2		NC		6010C
Selenium	0.82	J	ND		NC		6010C
Silver	ND		ND		NC		6010C
Sodium	164	J	154.9	J	NC		6010C
Thallium	ND		ND		NC		6010C
Vanadium	10.0		10.11		0.97		6010C
Zinc	53.6		55.61		3.8		6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: ICAP1

Method: 6010C MDL Date: 07/17/2013 10:52

Prep Method: 3050B

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Aluminum	308.215	10	4.4
Antimony	206.833	15	0.4
Arsenic	189.042	2	0.4
Barium	455.403	0.5	0.11
Beryllium	313.042	0.2	0.028
Cadmium	228.802	0.2	0.03
Calcium	317.933	50	3.3
Chromium	267.716	0.5	0.2
Cobalt	228.616	0.5	0.05
Copper	324.754	1	0.21
Iron	259.940	10	1.1
Lead	220.353	1	0.24
Magnesium	279.079	20	0.927
Manganese	257.610	0.2	0.032
Nickel	231.604	5	0.23
Potassium	766.490	30	20
Selenium	196.090	4	0.4
Silver	328.068	0.5	0.2
Sodium	589.592	140	13
Thallium	190.856	6	0.3
Vanadium	292.402	0.5	0.11
Zinc	206.200	2	0.153

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: ICAP1

Method: 6010C XMDL Date: 07/17/2013 10:53

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Aluminum	308.215	0.2	0.06
Antimony	206.833	0.02	0.00679
Arsenic	189.042	0.01	0.00555
Barium	455.403	0.002	0.0007
Beryllium	313.042	0.002	0.0003
Cadmium	228.802	0.001	0.0005
Calcium	317.933	0.5	0.1
Chromium	267.716	0.004	0.001
Cobalt	228.616	0.004	0.00063
Copper	324.754	0.01	0.0016
Iron	259.940	0.05	0.0193
Lead	220.353	0.005	0.003
Magnesium	279.079	0.2	0.0434
Manganese	257.610	0.003	0.0004
Nickel	231.604	0.01	0.00126
Potassium	766.490	0.5	0.1
Selenium	196.090	0.015	0.0087
Silver	328.068	0.003	0.0017
Sodium	589.592	1	0.324
Thallium	190.856	0.02	0.01024
Vanadium	292.402	0.005	0.0015
Zinc	206.200	0.01	0.0015

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: ICAP2

Method: 6010C MDL Date: 07/17/2013 10:52

Prep Method: 3050B

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Aluminum	308.215	10	4.4
Antimony	206.833	15	0.4
Arsenic	189.042	2	0.4
Barium	455.403	0.5	0.11
Beryllium	313.042	0.2	0.028
Cadmium	228.802	0.2	0.03
Calcium	317.933	50	3.3
Chromium	267.716	0.5	0.2
Cobalt	228.616	0.5	0.05
Copper	324.754	1	0.21
Iron	259.940	10	1.1
Lead	220.353	1	0.24
Magnesium	279.079	20	0.927
Manganese	257.610	0.2	0.032
Nickel	231.604	5	0.23
Potassium	766.490	30	20
Selenium	196.090	4	0.4
Silver	328.068	0.5	0.2
Sodium	589.592	140	13
Thallium	190.856	6	0.3
Vanadium	292.402	0.5	0.11
Zinc	206.200	2	0.153

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: ICAP2

Method: 6010C XMDL Date: 07/17/2013 10:53

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Aluminum	308.215	0.2	0.06
Antimony	206.833	0.02	0.00679
Arsenic	189.042	0.01	0.00555
Barium	455.403	0.002	0.0007
Beryllium	313.042	0.002	0.0003
Cadmium	228.802	0.001	0.0005
Calcium	317.933	0.5	0.1
Chromium	267.716	0.004	0.001
Cobalt	228.616	0.004	0.00063
Copper	324.754	0.01	0.0016
Iron	259.940	0.05	0.0193
Lead	220.353	0.005	0.003
Magnesium	279.079	0.2	0.0434
Manganese	257.610	0.003	0.0004
Nickel	231.604	0.01	0.00126
Potassium	766.490	0.5	0.1
Selenium	196.090	0.015	0.0087
Silver	328.068	0.003	0.0017
Sodium	589.592	1	0.324
Thallium	190.856	0.02	0.01024
Vanadium	292.402	0.005	0.0015
Zinc	206.200	0.01	0.0015

9-IN
DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: LEEMAN3

Method: 7471B MDL Date: 01/29/2010 00:00

Prep Method: 7471B

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Mercury	253.7	0.02	0.0081

9-IN
CALIBRATION BLANK DETECTION LIMITS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: LEEMAN3

Method: 7471B XMDL Date: 01/29/2010 00:00

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Mercury	253.7	0.0002	0.00012

10-IN
ICP-AES INTERELEMENT CORRECTION FACTORS
METALS

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG No.:

ICP-AES Instrument ID: ICAP1 Date: 05/17/2013

Analyte	Wave Length	Al	As	Co	Cr	Fe	Mo	Ni	Si	Ti	V				
Antimony	206.833				0.017875										
Arsenic	189.042				-0.018613										
Beryllium	313.042									-0.000801	0.000048				
Boron	208.959						0.035582								
Cadmium	228.802		0.003178			0.000002		-0.000080							
Cobalt	228.616						-0.001011			0.001848					
Copper	324.754									-0.000426	-0.000325				
Lead	220.353	-0.000018				0.000015	-0.001722		0.000411	-0.000571					
Selenium	196.090	-0.000035													
Silver	328.068										0.000102				
Thallium	190.856			003615						-0.000573	0.000614				
Titanium	334.904				0.000153										
Vanadium	292.402					0.000026	-0.005071			0.000717					
Zinc	206.200				-0.001820										

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Date: 08/15/2013 12:05

Analyte	Integ. Time (Sec.)	Concentration (mg/L)	Method
Aluminum	15	1000	6010C
Antimony	15	50	6010C
Arsenic	15	30	6010C
Barium	15	10	6010C
Beryllium	15	25	6010C
Cadmium	15	5	6010C
Calcium	15	1000	6010C
Chromium	15	40	6010C
Cobalt	15	20	6010C
Copper	15	25	6010C
Iron	15	800	6010C
Lead	15	120	6010C
Magnesium	15	500	6010C
Manganese	15	100	6010C
Nickel	15	20	6010C
Potassium	15	600	6010C
Selenium	15	60	6010C
Silver	15	2	6010C
Sodium	15	5000	6010C
Thallium	15	40	6010C
Vanadium	15	50	6010C
Zinc	15	20	6010C

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

SDG No.:

Instrument ID: ICAP2 Date: 08/15/2013 12:05

Analyte	Integ. Time (Sec.)	Concentration (mg/L)	Method
Aluminum	15	1000	6010C
Antimony	15	50	6010C
Arsenic	15	30	6010C
Barium	15	10	6010C
Beryllium	15	25	6010C
Cadmium	15	5	6010C
Calcium	15	1000	6010C
Chromium	15	40	6010C
Cobalt	15	20	6010C
Copper	15	25	6010C
Iron	15	800	6010C
Lead	15	120	6010C
Magnesium	15	500	6010C
Manganese	15	100	6010C
Nickel	15	20	6010C
Potassium	15	600	6010C
Selenium	15	60	6010C
Silver	15	2	6010C
Sodium	15	5000	6010C
Thallium	15	40	6010C
Vanadium	15	50	6010C
Zinc	15	20	6010C

11-IN
LINEAR RANGES
METALS

Lab Name: TestAmerica Buffalo Job No: 480-49854-1

SDG No.:

Instrument ID: LEEMAN3 Date: 02/12/2013 11:28

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Mercury	10	10	7471B

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Prep Method: 3050B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 480-151394/1-A	11/12/2013 10:30	151394	+0.4601		50
LCSSRM 480-151394/2-A	11/12/2013 10:30	151394	+0.5008		50
480-49854-1	11/12/2013 10:30	151394	+0.4750		50
480-49854-2	11/12/2013 10:30	151394	+0.4587		50
480-49854-2 MS	11/12/2013 10:30	151394	+0.4967		50
480-49854-2 MSD	11/12/2013 10:30	151394	+0.5031		50
480-49854-3	11/12/2013 10:30	151394	+0.4720		50
480-49854-4	11/12/2013 10:30	151394	+0.4762		50
480-49854-5	11/12/2013 10:30	151394	+0.5409		50
480-49854-6	11/12/2013 10:30	151394	+0.5236		50
480-49854-7	11/12/2013 10:30	151394	+0.5168		50
480-49854-8	11/12/2013 10:30	151394	+0.5346		50
480-49854-9	11/12/2013 10:30	151394	+0.4878		50
480-49854-10	11/12/2013 10:30	151394	+0.4767		50
480-49854-11	11/12/2013 10:30	151394	+0.5010		50
480-49854-12	11/12/2013 10:30	151394	+0.4511		50
480-49854-13	11/12/2013 10:30	151394	+0.4655		50
480-49854-14	11/12/2013 10:30	151394	+0.4860		50
480-49854-15	11/12/2013 10:30	151394	+0.5096		50
480-49854-16	11/12/2013 10:30	151394	+0.4664		50
480-49854-17	11/12/2013 10:30	151394	+0.5294		50
480-49854-18	11/12/2013 10:30	151394	+0.4594		50
480-49854-19	11/12/2013 10:30	151394	+0.4565		50
480-49854-20	11/12/2013 10:30	151394	+0.5293		50

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Prep Method: 3050B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 480-151401/1-A	11/12/2013 10:30	151401	+0.4806		50
LCSSRM 480-151401/2-A	11/12/2013 10:30	151401	+0.5000		50
480-49854-21	11/12/2013 10:30	151401	+0.5392		50
480-49854-22	11/12/2013 10:30	151401	+0.5196		50
480-49854-23	11/12/2013 10:30	151401	+0.4994		50
480-49854-23 MS	11/12/2013 10:30	151401	+0.5145		50
480-49854-23 MSD	11/12/2013 10:30	151401	+0.5377		50
480-49854-24	11/12/2013 10:30	151401	+0.4748		50
480-49854-25	11/12/2013 10:30	151401	+0.4504		50
480-49854-26	11/12/2013 10:30	151401	+0.5063		50
480-49854-27	11/12/2013 10:30	151401	+0.4631		50
480-49854-28	11/12/2013 10:30	151401	+0.4642		50
480-49854-29	11/12/2013 10:30	151401	+0.5150		50
480-49854-30	11/12/2013 10:30	151401	+0.4694		50
480-49854-31	11/12/2013 10:30	151401	+0.5062		50
480-49854-32	11/12/2013 10:30	151401	+0.4890		50
480-49854-33	11/12/2013 10:30	151401	+0.4982		50
480-49854-34	11/12/2013 10:30	151401	+0.5048		50

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Prep Method: 7471B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 480-151269/1-A	11/12/2013 07:15	151269	+0.6311		50
LCSSRM 480-151269/2-A	11/12/2013 07:15	151269	+0.0532		50
LCDSRM 480-151269/3-A	11/12/2013 07:15	151269	+0.0531		50
480-49854-1	11/12/2013 07:15	151269	+0.6646		50
480-49854-2	11/12/2013 07:15	151269	+0.5990		50
480-49854-3	11/12/2013 07:15	151269	+0.5941		50
480-49854-4	11/12/2013 07:15	151269	+0.6499		50
480-49854-5	11/12/2013 07:15	151269	+0.6280		50
480-49854-6	11/12/2013 07:15	151269	+0.6306		50
480-49854-7	11/12/2013 07:15	151269	+0.5928		50
480-49854-8	11/12/2013 07:15	151269	+0.6800		50
480-49854-9	11/12/2013 07:15	151269	+0.6284		50
480-49854-10	11/12/2013 07:15	151269	+0.5996		50
480-49854-11	11/12/2013 07:15	151269	+0.5939		50
480-49854-12	11/12/2013 07:15	151269	+0.5949		50
480-49854-13	11/12/2013 07:15	151269	+0.6165		50
480-49854-14	11/12/2013 07:15	151269	+0.6155		50
480-49854-15	11/12/2013 07:15	151269	+0.6737		50
480-49854-16	11/12/2013 07:15	151269	+0.5838		50
480-49854-17	11/12/2013 07:15	151269	+0.6383		50
480-49854-18	11/12/2013 07:15	151269	+0.6279		50

12-IN
PREPARATION LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Prep Method: 7471B

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 480-151288/1-A	11/12/2013 07:15	151288	+0.6540		50
LCSSRM 480-151288/2-A	11/12/2013 07:15	151288	+0.0532		50
480-49854-19	11/12/2013 07:15	151288	+0.6252		50
480-49854-20	11/12/2013 07:15	151288	+0.6381		50
480-49854-21	11/12/2013 07:15	151288	+0.6457		50
480-49854-22	11/12/2013 07:15	151288	+0.6406		50
480-49854-23	11/12/2013 07:15	151288	+0.5941		50
480-49854-24	11/12/2013 07:15	151288	+0.6145		50
480-49854-25	11/12/2013 07:15	151288	+0.5892		50
480-49854-26	11/12/2013 07:15	151288	+0.6432		50
480-49854-27	11/12/2013 07:15	151288	+0.5948		50
480-49854-28	11/12/2013 07:15	151288	+0.6444		50
480-49854-29	11/12/2013 07:15	151288	+0.6073		50
480-49854-30	11/12/2013 07:15	151288	+0.6086		50
480-49854-31	11/12/2013 07:15	151288	+0.6016		50
480-49854-32	11/12/2013 07:15	151288	+0.6436		50
480-49854-33	11/12/2013 07:15	151288	+0.6661		50
480-49854-34	11/12/2013 07:15	151288	+0.6145		50

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/14/2013 09:33 End Date: 11/14/2013 11:38

Lab Sample ID	D/F	Type	Time	Analytes																			
				Ag	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Tl
IC 480-152283/1			09:33	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152283/2			09:35	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152283/3			09:38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152283/4			09:40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICV 480-152283/5	1		09:42	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICB 480-152283/6	1		09:45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRI 480-152283/7	1		09:47	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICVL 480-152283/8	1		09:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICSA 480-152283/9	1		09:52	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICSAB 480-152283/10	1		09:55	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152283/11	1		09:57	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152283/12	1		10:00	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152283/13	1		10:02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MB 480-151401/1-A	1	T	10:04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152283/15	1		10:07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152283/16	1		10:09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152283/17	1		10:12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCSSRM 480-151401/2-A	1	T	10:14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-21	1	T	10:16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-22	1	T	10:19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-23	1	T	10:21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-23 SD	5	T	10:24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-23 PDS	1	T	10:26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-23 MS	1	T	10:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-23 MSD	1	T	10:31	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-24	1	T	10:33	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152283/27	1		10:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152283/28	1		10:38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152283/29	1		10:40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-25	1	T	10:43	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-26	1	T	10:45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-27	1	T	10:48	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-28	1	T	10:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-29	1	T	10:52	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-30	1	T	10:55	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-31	1	T	10:57	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-32	1	T	10:59	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-33	1	T	11:02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152283/39	1		11:04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152283/40	1		11:07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152283/41	1		11:09	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-34	1	T	11:11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/14/2013 09:33 End Date: 11/14/2013 11:38

Lab Sample ID	D / F	Type	Time	Analytes																			
				Ag	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Tl
ZZZZZZ			11:14																				
ZZZZZZ			11:16																				
ZZZZZZ			11:19																				
CCV 480-152283/46	1		11:33	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152283/47	1		11:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152283/48	1		11:38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/14/2013 09:33 End Date: 11/14/2013 11:38

Lab Sample ID	D / F	Type	Time	Analytes																			
				V	Zn																		
IC 480-152283/1			09:33	X	X																		
IC 480-152283/2			09:35	X	X																		
IC 480-152283/3			09:38	X	X																		
IC 480-152283/4			09:40	X	X																		
ICV 480-152283/5	1		09:42	X	X																		
ICB 480-152283/6	1		09:45	X	X																		
CRI 480-152283/7	1		09:47	X	X																		
ICVL 480-152283/8	1		09:50	X	X																		
ICSA 480-152283/9	1		09:52	X	X																		
ICSAB 480-152283/10	1		09:55	X	X																		
CCV 480-152283/11	1		09:57	X	X																		
CCB 480-152283/12	1		10:00	X	X																		
CCVL 480-152283/13	1		10:02	X	X																		
MB 480-151401/1-A	1	T	10:04	X	X																		
CCV 480-152283/15	1		10:07	X	X																		
CCB 480-152283/16	1		10:09	X	X																		
CCVL 480-152283/17	1		10:12	X	X																		
LCSSRM 480-151401/2-A	1	T	10:14	X	X																		
480-49854-21	1	T	10:16	X	X																		
480-49854-22	1	T	10:19	X	X																		
480-49854-23	1	T	10:21	X	X																		
480-49854-23 SD	5	T	10:24	X	X																		
480-49854-23 PDS	1	T	10:26	X	X																		
480-49854-23 MS	1	T	10:28	X	X																		
480-49854-23 MSD	1	T	10:31	X	X																		
480-49854-24	1	T	10:33	X	X																		
CCV 480-152283/27	1		10:36	X	X																		
CCB 480-152283/28	1		10:38	X	X																		
CCVL 480-152283/29	1		10:40	X	X																		
480-49854-25	1	T	10:43	X	X																		
480-49854-26	1	T	10:45	X	X																		
480-49854-27	1	T	10:48	X	X																		
480-49854-28	1	T	10:50	X	X																		
480-49854-29	1	T	10:52	X	X																		
480-49854-30	1	T	10:55	X	X																		
480-49854-31	1	T	10:57	X	X																		
480-49854-32	1	T	10:59	X	X																		
480-49854-33	1	T	11:02	X	X																		
CCV 480-152283/39	1		11:04	X	X																		
CCB 480-152283/40	1		11:07	X	X																		
CCVL 480-152283/41	1		11:09	X	X																		
480-49854-34	1	T	11:11	X	X																		

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/14/2013 09:33 End Date: 11/14/2013 11:38

Lab Sample ID	D / F	Type	Time	Analytes																			
				V	Zn																		
ZZZZZZ			11:14																				
ZZZZZZ			11:16																				
ZZZZZZ			11:19																				
CCV 480-152283/46	1		11:33	X	X																		
CCB 480-152283/47	1		11:36	X	X																		
CCVL 480-152283/48	1		11:38	X	X																		

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/15/2013 09:30 End Date: 11/15/2013 13:59

Lab Sample ID	D/F	Type	Time	Analytes																			
				Ag	As	Cd	Fe	Mg	Mn	Pb													
IC 480-152587/1			09:30	X	X	X	X	X	X	X													
IC 480-152587/2			09:32	X	X	X	X	X	X	X													
IC 480-152587/3			09:34	X	X	X	X	X	X	X													
IC 480-152587/4			09:37	X	X	X	X	X	X	X													
ICV 480-152587/5	1		09:39	X	X	X	X		X	X													
ICB 480-152587/6	1		09:41	X	X	X	X		X	X													
CRI 480-152587/7	1		09:44	X	X	X	X		X	X													
ICVL 480-152587/8	1		09:46	X	X	X	X		X	X													
ICSA 480-152587/9	1		09:49	X	X	X	X	X	X	X													
ICSAB 480-152587/10	1		09:51	X	X	X	X	X	X	X													
CCV 480-152587/11			09:54																				
CCB 480-152587/12			09:56																				
CCVL 480-152587/13			09:59																				
CCV 480-152587/14	1		12:28	X	X	X	X		X	X													
CCB 480-152587/15	1		12:31	X	X	X	X		X	X													
CCVL 480-152587/16	1		12:33	X		X	X		X	X													
480-49854-1	1	T	12:36	X						X													
480-49854-2	1	T	12:38	X						X													
480-49854-2 MS	1	T	12:40	X						X													
480-49854-2 MSD	1	T	12:43	X						X													
480-49854-3	1	T	12:45	X						X													
480-49854-3 SD	5	T	12:47	X						X													
480-49854-3 PDS	1	T	12:50	X						X													
480-49854-4	1	T	12:52	X						X													
480-49854-5	1	T	12:55	X						X													
CCV 480-152587/26	1		12:57	X	X	X	X		X	X													
CCB 480-152587/27	1		13:00	X	X	X	X		X	X													
CCVL 480-152587/28	1		13:02	X	X	X	X		X	X													
480-49854-6	1	T	13:04		X		X		X														
480-49854-7	1	T	13:07				X		X														
480-49854-8	1	T	13:09		X	X	X		X														
480-49854-9	1	T	13:12	X			X		X	X													
480-49854-10	1	T	13:14	X			X		X	X													
480-49854-11	1	T	13:16	X			X		X	X													
480-49854-12	1	T	13:19	X		X	X		X	X													
480-49854-13	1	T	13:21	X			X		X	X													
480-49854-14	1	T	13:23	X			X	X		X													
CCV 480-152587/38	1		13:26	X	X	X	X		X	X													
CCB 480-152587/39	1		13:28	X	X	X	X		X	X													
CCVL 480-152587/40	1		13:31	X	X	X	X		X	X													
480-49854-16	1	T	13:33	X			X		X	X													
480-49854-17	1	T	13:35	X			X		X	X													

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP1 Method: 6010C

Start Date: 11/15/2013 09:30 End Date: 11/15/2013 13:59

Lab Sample ID	D / F	Type	Time	Analytes																			
				Ag	As	Cd	Fe	Mg	Mn	Pb													
480-49854-18	1	T	13:38		X		X		X														
480-49854-19	1	T	13:40		X		X		X														
480-49854-20	1	T	13:43		X		X		X														
480-49854-15	1	T	13:47	X			X		X	X													
CCV 480-152587/47	1		13:54	X	X	X	X		X	X													
CCB 480-152587/48	1		13:57	X	X	X	X		X	X													
CCVL 480-152587/49	1		13:59	X	X	X	X		X	X													

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP2 Method: 6010C

Start Date: 11/14/2013 10:25 End Date: 11/14/2013 18:22

Lab Sample ID	D/F	Type	Time	Analytes																			
				Ag	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Tl
IC 480-152314/1			10:25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152314/2			10:28	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152314/3			10:30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IC 480-152314/4			10:32	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICV 480-152314/5	1		10:34	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICB 480-152314/6	1		10:36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICVL 480-152314/7	1		10:39	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRI 480-152314/8	1		10:41	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICSA 480-152314/9	1		10:43	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICSAB 480-152314/10	1		10:45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152314/11			10:48																				
CCB 480-152314/12			10:50																				
CCVL 480-152314/13			10:52																				
CCV 480-152314/14	1		16:27	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152314/15	1		16:30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152314/16	1		16:32	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MB 480-151394/1-A	1	T	16:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCSSRM 480-151394/2-A	1	T	16:53	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCV 480-152314/19	1		16:55	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152314/20	1		16:57	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152314/21	1		16:59	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
480-49854-1	1	T	17:01		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-2	1	T	17:04		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-2 SD	5	T	17:06		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-2 PDS	1	T	17:08		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-2 MS	1	T	17:10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-2 MSD	1	T	17:13		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-3	1	T	17:15		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-4	1	T	17:18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-5	1	T	17:20		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
CCV 480-152314/31	1		17:23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152314/32	1		17:25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152314/33	1		17:27		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
480-49854-9	1	T	17:30		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-10	1	T	17:32		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-11	1	T	17:34		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-12	1	T	17:36		X	X	X	X	X		X	X	X		X	X		X	X		X	X	X
480-49854-13	1	T	17:39		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-14	1	T	17:41		X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	X
480-49854-15	1	T	17:43		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-16	1	T	17:45		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X
480-49854-17	1	T	17:48		X	X	X	X	X	X	X	X	X		X	X		X	X		X	X	X

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP2 Method: 6010C

Start Date: 11/14/2013 10:25 End Date: 11/14/2013 18:22

Lab Sample ID	D/F	Type	Time	Analytes																			
				Ag	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Tl
CCV 480-152314/43	1		17:50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCB 480-152314/44	1		17:52	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CCVL 480-152314/45	1		17:55	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-18	1	T	17:57	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-19	1	T	17:59	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-20	1	T	18:02	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-6	1	T	18:04	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-7	1	T	18:06	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
480-49854-8	1	T	18:08	X	X		X	X	X		X	X	X		X	X		X	X	X	X	X	X
CCV 480-152314/52	1		18:18	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
CCB 480-152314/53	1		18:20	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
CCVL 480-152314/54	1		18:22	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP2 Method: 6010C

Start Date: 11/14/2013 10:25 End Date: 11/14/2013 18:22

Lab Sample ID	D / F	Type	Time	Analytes																			
				V	Zn																		
IC 480-152314/1			10:25	X	X																		
IC 480-152314/2			10:28	X	X																		
IC 480-152314/3			10:30	X	X																		
IC 480-152314/4			10:32	X	X																		
ICV 480-152314/5	1		10:34	X	X																		
ICB 480-152314/6	1		10:36	X	X																		
ICVL 480-152314/7	1		10:39	X	X																		
CRI 480-152314/8	1		10:41	X	X																		
ICSA 480-152314/9	1		10:43	X	X																		
ICSAB 480-152314/10	1		10:45	X	X																		
CCV 480-152314/11			10:48																				
CCB 480-152314/12			10:50																				
CCVL 480-152314/13			10:52																				
CCV 480-152314/14	1		16:27	X	X																		
CCB 480-152314/15	1		16:30	X	X																		
CCVL 480-152314/16	1		16:32	X	X																		
MB 480-151394/1-A	1	T	16:50	X	X																		
LCSSRM 480-151394/2-A	1	T	16:53	X	X																		
CCV 480-152314/19	1		16:55	X	X																		
CCB 480-152314/20	1		16:57	X	X																		
CCVL 480-152314/21	1		16:59	X	X																		
480-49854-1	1	T	17:01	X	X																		
480-49854-2	1	T	17:04	X	X																		
480-49854-2 SD	5	T	17:06	X	X																		
480-49854-2 PDS	1	T	17:08	X	X																		
480-49854-2 MS	1	T	17:10	X	X																		
480-49854-2 MSD	1	T	17:13	X	X																		
480-49854-3	1	T	17:15	X	X																		
480-49854-4	1	T	17:18	X	X																		
480-49854-5	1	T	17:20	X	X																		
CCV 480-152314/31	1		17:23	X	X																		
CCB 480-152314/32	1		17:25	X	X																		
CCVL 480-152314/33	1		17:27	X	X																		
480-49854-9	1	T	17:30	X	X																		
480-49854-10	1	T	17:32	X	X																		
480-49854-11	1	T	17:34	X	X																		
480-49854-12	1	T	17:36	X	X																		
480-49854-13	1	T	17:39	X	X																		
480-49854-14	1	T	17:41	X	X																		
480-49854-15	1	T	17:43	X	X																		
480-49854-16	1	T	17:45	X	X																		
480-49854-17	1	T	17:48	X	X																		

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: ICAP2 Method: 6010C

Start Date: 11/14/2013 10:25 End Date: 11/14/2013 18:22

Lab Sample ID	D / F	Type	Time	Analytes																			
				V	Zn																		
CCV 480-152314/43	1		17:50	X	X																		
CCB 480-152314/44	1		17:52	X	X																		
CCVL 480-152314/45	1		17:55	X	X																		
480-49854-18	1	T	17:57	X	X																		
480-49854-19	1	T	17:59	X	X																		
480-49854-20	1	T	18:02	X	X																		
480-49854-6	1	T	18:04	X	X																		
480-49854-7	1	T	18:06	X	X																		
480-49854-8	1	T	18:08	X	X																		
CCV 480-152314/52	1		18:18	X	X																		
CCB 480-152314/53	1		18:20	X	X																		
CCVL 480-152314/54	1		18:22	X	X																		

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: LEEMAN3 Method: 7471B

Start Date: 11/12/2013 10:48 End Date: 11/12/2013 14:31

Lab Sample ID	D / F	Type	Time	Analytes																				
				Hg																				
ICV 480-151516/1	1		10:48	X																				
ICB 480-151516/2	1		10:50	X																				
ICVL 480-151516/3	1		10:52	X																				
CCV 480-151516/4			10:53																					
CCB 480-151516/5			10:55																					
ZZZZZZ			10:57																					
ZZZZZZ			10:59																					
ZZZZZZ			11:00																					
ZZZZZZ			11:02																					
ZZZZZZ			11:04																					
ZZZZZZ			11:06																					
ZZZZZZ			11:08																					
ZZZZZZ			11:09																					
ZZZZZZ			11:11																					
ZZZZZZ			11:12																					
CCV 480-151516/16			11:15																					
CCB 480-151516/17			11:16																					
ZZZZZZ			11:18																					
ZZZZZZ			11:20																					
ZZZZZZ			11:22																					
ZZZZZZ			11:24																					
ZZZZZZ			11:26																					
ZZZZZZ			11:28																					
ZZZZZZ			11:30																					
ZZZZZZ			11:32																					
ZZZZZZ			11:35																					
ZZZZZZ			11:37																					
CCV 480-151516/28	1		11:39	X																				
CCB 480-151516/29	1		11:41	X																				
ZZZZZZ			11:43																					
ZZZZZZ			11:44																					
ZZZZZZ			11:46																					
ZZZZZZ			11:48																					
ZZZZZZ			11:50																					
MB 480-151269/1-A	1	T	11:52	X																				
LCSSRM 480-151269/2-A	1	T	11:54	X																				
LCDSRM 480-151269/3-A	1	T	11:56	X																				
ZZZZZZ			11:58																					
ZZZZZZ			12:00																					
CCV 480-151516/40	1		12:02	X																				
CCB 480-151516/41	1		12:04	X																				
ZZZZZZ			12:06																					

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: LEEMAN3 Method: 7471B

Start Date: 11/12/2013 10:48 End Date: 11/12/2013 14:31

Lab Sample ID	D/F	Type	Time	Analytes																				
				Hg																				
ZZZZZZ			12:08																					
ZZZZZZ			12:09																					
480-49854-1	1	T	12:11	X																				
480-49854-2	1	T	12:13	X																				
480-49854-3	1	T	12:15	X																				
480-49854-4	1	T	12:17	X																				
480-49854-5	1	T	12:19	X																				
480-49854-6	1	T	12:21	X																				
480-49854-7	1	T	12:22	X																				
CCV 480-151516/52	1		12:24	X																				
CCB 480-151516/53	1		12:26	X																				
480-49854-8	1	T	12:28	X																				
480-49854-9	1	T	12:30	X																				
480-49854-10	1	T	12:32	X																				
480-49854-11	1	T	12:34	X																				
480-49854-12	1	T	12:36	X																				
480-49854-13	1	T	12:38	X																				
480-49854-14	1	T	12:40	X																				
480-49854-15	1	T	12:41	X																				
480-49854-16	1	T	12:43	X																				
480-49854-17	1	T	12:45	X																				
CCV 480-151516/64	1		12:48	X																				
CCB 480-151516/65	1		12:49	X																				
480-49854-18	1	T	12:51	X																				
MB 480-151288/1-A	1	T	12:53	X																				
LCSSRM 480-151288/2-A	1	T	12:55	X																				
480-49854-19	1	T	12:57	X																				
480-49854-20	1	T	13:00	X																				
480-49854-21	1	T	13:02	X																				
480-49854-22	1	T	13:03	X																				
480-49854-23	1	T	13:05	X																				
480-49854-24	1	T	13:07	X																				
480-49854-25	1	T	13:08	X																				
CCV 480-151516/76	1		13:11	X																				
CCB 480-151516/77	1		13:13	X																				
480-49854-26	1	T	13:15	X																				
480-49854-27	1	T	13:17	X																				
480-49854-28	1	T	13:19	X																				
480-49854-29	1	T	13:21	X																				
480-49854-30	1	T	13:22	X																				
480-49854-31	1	T	13:24	X																				
480-49854-32	1	T	13:26	X																				

13-IN
ANALYSIS RUN LOG
METALS

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: LEEMAN3 Method: 7471B

Start Date: 11/12/2013 10:48 End Date: 11/12/2013 14:31

Lab Sample ID	D / F	Type	Time	Analytes																			
				Hg																			
480-49854-33	1	T	13:28	X																			
480-49854-34	1	T	13:30	X																			
ZZZZZZ			13:32																				
CCV 480-151516/88	1		13:34	X																			
CCB 480-151516/89	1		13:35	X																			
ZZZZZZ			13:37																				
ZZZZZZ			13:39																				
ZZZZZZ			13:41																				
ZZZZZZ			13:44																				
ZZZZZZ			13:46																				
ZZZZZZ			13:48																				
CCVL 480-151516/96	1		13:50	X																			
CCV 480-151516/97	1		13:51	X																			
CCB 480-151516/98	1		13:53	X																			
ZZZZZZ			14:20																				
ZZZZZZ			14:22																				
ZZZZZZ			14:24																				
ZZZZZZ			14:26																				
CCVL 480-151516/103	1		14:28	X																			
CCV 480-151516/104	1		14:30	X																			
CCB 480-151516/105	1		14:31	X																			

Prep Types

T = Total/NA

Run File: I1111413A Instrument: ICAP1

Analyst: JRK Data Review: LMH 11/15/13

Spikes IDs: 1653961(W1), 1311054 (W2), 1622883(Sn), 1684515(Ag), 1451136(Si), 1320125(TCLP), 1296944 (Sr TCLP)
Pipette IDs: 08-20-13-(1-7,8,10,13,14)
Internal Standard: 1739112

Seq#	Run File ID	Sample ID	Date / Time	Type
1	I1111413A	IC-1749384	11/14/13 09:33 AM	Standard
2	I1111413A	IC-1757696	11/14/13 09:35 AM	Standard
3	I1111413A	IC-1757694	11/14/13 09:38 AM	Standard
4	I1111413A	IC-1757693	11/14/13 09:40 AM	Standard
5	I1111413A	ICV-1734477	11/14/13 09:42 AM	QC
6	I1111413A	ICB-1734412	11/14/13 09:45 AM	QC
7	I1111413A	CRI-1739110	11/14/13 09:47 AM	QC
8	I1111413A	ICVL-1723353	11/14/13 09:50 AM	QC
9	I1111413A	ICSA-1716849	11/14/13 09:52 AM	QC
10	I1111413A	ICSAB-1723354	11/14/13 09:55 AM	QC
11	I1111413A	ccv-1757648	11/14/13 09:57 AM	QC
12	I1111413A	CCB-1734412	11/14/13 10:00 AM	QC
13	I1111413A	CCVL	11/14/13 10:02 AM	QC
14	I1111413A	mb 480-151401/1-a	11/14/13 10:04 AM	Unknown
15	I1111413A	CCV	11/14/13 10:07 AM	QC
16	I1111413A	CCB	11/14/13 10:09 AM	QC
17	I1111413A	CCVL	11/14/13 10:12 AM	QC
18	I1111413A	lcssrm 480-151401/2-	11/14/13 10:14 AM	Unknown
19	I1111413A	480-49854-a-21-b	11/14/13 10:16 AM	Unknown
20	I1111413A	480-49854-a-22-b	11/14/13 10:19 AM	Unknown
21	I1111413A	480-49854-a-23-b	11/14/13 10:21 AM	Unknown
22	I1111413A	480-49854-a-23-bSD@5	11/14/13 10:24 AM	Unknown
23	I1111413A	480-49854-a-23-b PDS	11/14/13 10:26 AM	Unknown
24	I1111413A	480-49854-a-23-c ms	11/14/13 10:28 AM	Unknown
25	I1111413A	480-49854-a-23-d msd	11/14/13 10:31 AM	Unknown
26	I1111413A	480-49854-a-24-b	11/14/13 10:33 AM	Unknown
27	I1111413A	CCV	11/14/13 10:36 AM	QC
28	I1111413A	CCB	11/14/13 10:38 AM	QC
29	I1111413A	CCVL	11/14/13 10:40 AM	QC
30	I1111413A	480-49854-a-25-b	11/14/13 10:43 AM	Unknown
31	I1111413A	480-49854-a-26-b	11/14/13 10:45 AM	Unknown
32	I1111413A	480-49854-a-27-b	11/14/13 10:48 AM	Unknown
33	I1111413A	480-49854-a-28-b	11/14/13 10:50 AM	Unknown
34	I1111413A	480-49854-a-29-b	11/14/13 10:52 AM	Unknown
35	I1111413A	480-49854-a-30-b	11/14/13 10:55 AM	Unknown
36	I1111413A	480-49854-a-31-b	11/14/13 10:57 AM	Unknown
37	I1111413A	480-49854-a-32-b	11/14/13 10:59 AM	Unknown
38	I1111413A	480-49854-a-33-b	11/14/13 11:02 AM	Unknown
39	I1111413A	CCV	11/14/13 11:04 AM	QC
40	I1111413A	CCB	11/14/13 11:07 AM	QC

41	I1111413A	CCVL	11/14/13 11:09 AM QC
42	I1111413A	480-49854-a-34-b	11/14/13 11:11 AM Unknown
43	I1111413A	480-49784-c-1-a	11/14/13 11:14 AM Unknown
44	I1111413A	480-49784-c-2-a	11/14/13 11:16 AM Unknown
45	I1111413A	480-49825-a-1-b	11/14/13 11:19 AM Unknown
46	I1111413A	MB 480-151769/1-A	11/14/13 11:21 AM Unknown
47	I1111413A	LCSSRM 480-151769/2-	11/14/13 11:24 AM Unknown
48	I1111413A	480-49776-A-1-C	11/14/13 11:26 AM Unknown
49	I1111413A	480-49776-A-1-C sd@5	11/14/13 11:29 AM Unknown
50	I1111413A	480-49776-A-1-C pds	11/14/13 11:31 AM Unknown
51	I1111413A	CCV	11/14/13 11:33 AM QC
52	I1111413A	CCB	11/14/13 11:36 AM QC
53	I1111413A	CCVL	11/14/13 11:38 AM QC
54	I1111413A	480-49776-A-1-D MS	11/14/13 11:41 AM Unknown
55	I1111413A	480-49776-A-1-E MSD	11/14/13 11:43 AM Unknown
56	I1111413A	480-48428-A-8-B	11/14/13 11:45 AM Unknown
57	I1111413A	480-49946-A-1-A	11/14/13 11:48 AM Unknown
58	I1111413A	480-49482-A-1-B@5	11/14/13 11:50 AM Unknown
59	I1111413A	MB 480-151372/1-A	11/14/13 11:53 AM Unknown
60	I1111413A	LCS 480-151372/2-A	11/14/13 11:55 AM Unknown
61	I1111413A	480-49887-E-2-A	11/14/13 11:57 AM Unknown
62	I1111413A	480-49887-E-2-Asd@5	11/14/13 12:00 PM Unknown
63	I1111413A	CCV	11/14/13 12:02 PM QC
64	I1111413A	CCB	11/14/13 12:05 PM QC
65	I1111413A	CCVL	11/14/13 12:07 PM QC
66	I1111413A	480-49887-E-2-A pds	11/14/13 12:09 PM Unknown
67	I1111413A	480-49887-E-2-B MS	11/14/13 12:12 PM Unknown
68	I1111413A	480-49887-E-2-C MSD	11/14/13 12:14 PM Unknown
69	I1111413A	480-49571-C-1-A	11/14/13 12:16 PM Unknown
70	I1111413A	MB 480-151641/1-A	11/14/13 12:19 PM Unknown
71	I1111413A	LCS 480-151641/2-A	11/14/13 12:21 PM Unknown
72	I1111413A	480-49903-F-1-A	11/14/13 12:24 PM Unknown
73	I1111413A	480-49903-F-1-A sd@5	11/14/13 12:26 PM Unknown
74	I1111413A	480-49903-F-1-A pds	11/14/13 12:28 PM Unknown
75	I1111413A	CCV	11/14/13 12:31 PM QC
76	I1111413A	CCB	11/14/13 12:33 PM QC
77	I1111413A	CCVL	11/14/13 12:36 PM QC
78	I1111413A	480-49903-F-1-B MS	11/14/13 12:38 PM Unknown
79	I1111413A	480-49903-F-1-C MSD	11/14/13 12:40 PM Unknown
80	I1111413A	480-48677-G-2-C	11/14/13 12:43 PM Unknown
81	I1111413A	480-48677-G-3-C	11/14/13 12:45 PM Unknown
82	I1111413A	480-49275-C-4-A	11/14/13 12:48 PM Unknown
83	I1111413A	MB 480-151076/1-B	11/14/13 12:50 PM Unknown
84	I1111413A	LCS 480-151076/2-B	11/14/13 12:53 PM Unknown
85	I1111413A	LCSD 480-151076/31-B	11/14/13 12:55 PM Unknown
86	I1111413A	480-49805-E-2-A	11/14/13 12:57 PM Unknown
87	I1111413A	CCV	11/14/13 01:00 PM QC
88	I1111413A	CCB	11/14/13 01:02 PM QC
89	I1111413A	CCVL	11/14/13 01:05 PM QC
90	I1111413A	480-49805-B-4-A	11/14/13 01:07 PM Unknown

91	I1111413A	480-49805-E-6-A	11/14/13 01:10 PM Unknown
92	I1111413A	480-49805-E-7-A	11/14/13 01:12 PM Unknown
93	I1111413A	480-49805-B-9-A	11/14/13 01:14 PM Unknown
94	I1111413A	480-49844-A-1-A	11/14/13 01:17 PM Unknown
95	I1111413A	480-49844-A-1-Asd@5	11/14/13 01:20 PM Unknown
96	I1111413A	480-49844-A-1-A pds	11/14/13 01:22 PM Unknown
97	I1111413A	480-49844-A-1-B MS	11/14/13 01:24 PM Unknown
98	I1111413A	480-49844-A-1-C MSD	11/14/13 01:27 PM Unknown
99	I1111413A	CCV	11/14/13 01:29 PM QC
100	I1111413A	CCB	11/14/13 01:32 PM QC
101	I1111413A	CCVL	11/14/13 01:34 PM QC
102	I1111413A	480-49844-A-2-A	11/14/13 01:37 PM Unknown
103	I1111413A	480-49844-A-3-A	11/14/13 01:39 PM Unknown
104	I1111413A	480-49844-C-6-A	11/14/13 01:42 PM Unknown
105	I1111413A	480-49844-C-7-A	11/14/13 01:44 PM Unknown
106	I1111413A	480-49844-C-8-A	11/14/13 01:47 PM Unknown
107	I1111413A	480-49844-C-9-A	11/14/13 01:49 PM Unknown
108	I1111413A	480-49844-A-10-A	11/14/13 01:52 PM Unknown
109	I1111413A	480-49844-A-11-A	11/14/13 01:54 PM Unknown
110	I1111413A	480-49844-A-12-A	11/14/13 01:57 PM Unknown
111	I1111413A	CCV	11/14/13 01:59 PM QC
112	I1111413A	CCB	11/14/13 02:02 PM QC
113	I1111413A	CCVL	11/14/13 02:04 PM QC
114	I1111413A	MB 480-149751/1-A	11/14/13 02:07 PM Unknown
115	I1111413A	LCS 480-149751/2-A	11/14/13 02:09 PM Unknown
116	I1111413A	480-49278-A-1-A	11/14/13 02:11 PM Unknown
117	I1111413A	480-49278-A-2-A	11/14/13 02:14 PM Unknown
118	I1111413A	480-49278-A-2-A sd@5	11/14/13 02:16 PM Unknown
119	I1111413A	480-49278-A-2-A pds	11/14/13 02:19 PM Unknown
120	I1111413A	480-49278-A-2-B MS	11/14/13 02:21 PM Unknown
121	I1111413A	480-49278-A-2-C MSD	11/14/13 02:23 PM Unknown
122	I1111413A	480-49278-A-3-A	11/14/13 02:26 PM Unknown
123	I1111413A	CCV	11/14/13 02:28 PM QC
124	I1111413A	CCB	11/14/13 02:31 PM QC
125	I1111413A	CCVL	11/14/13 02:33 PM QC
126	I1111413A	480-49278-A-4-A	11/14/13 02:36 PM Unknown
127	I1111413A	480-49278-A-5-A	11/14/13 02:38 PM Unknown
128	I1111413A	480-49278-A-6-A	11/14/13 02:40 PM Unknown
129	I1111413A	480-49312-A-1-A	11/14/13 02:43 PM Unknown
130	I1111413A	480-49312-A-2-A	11/14/13 02:45 PM Unknown
131	I1111413A	480-49312-A-3-A	11/14/13 02:48 PM Unknown
132	I1111413A	480-49312-A-4-A	11/14/13 02:50 PM Unknown
133	I1111413A	480-49312-A-5-A	11/14/13 02:53 PM Unknown
134	I1111413A	480-49312-A-6-A	11/14/13 02:55 PM Unknown
135	I1111413A	CCV	11/14/13 02:58 PM QC
136	I1111413A	CCB	11/14/13 03:00 PM QC
137	I1111413A	ccvl	11/14/13 03:02 PM QC
138	I1111413A	480-49312-A-7-A	11/14/13 03:05 PM Unknown
139	I1111413A	480-49312-A-8-A	11/14/13 03:07 PM Unknown
140	I1111413A	480-49312-A-9-A	11/14/13 03:10 PM Unknown

141	I1111413A	480-49312-A-10-A	11/14/13 03:12 PM Unknown
142	I1111413A	480-49312-A-11-A	11/14/13 03:15 PM Unknown
143	I1111413A	480-49312-A-12-A	11/14/13 03:17 PM Unknown
144	I1111413A	480-49312-A-13-A	11/14/13 03:20 PM Unknown
145	I1111413A	480-49312-A-14-A	11/14/13 03:22 PM Unknown
146	I1111413A	MB 480-150770/1-A	11/14/13 03:25 PM Unknown
147	I1111413A	CCV	11/14/13 03:27 PM QC
148	I1111413A	CCB	11/14/13 03:29 PM QC
149	I1111413A	ccvl	11/14/13 03:32 PM QC
150	I1111413A	LCS 480-150770/2-A	11/14/13 03:34 PM Unknown
151	I1111413A	480-48362-N-2-A	11/14/13 03:37 PM Unknown
152	I1111413A	MB 480-150948/1-A	11/14/13 03:39 PM Unknown
153	I1111413A	LCSSRM 480-150948/2-	11/14/13 03:42 PM Unknown
154	I1111413A	LCDSRM 480-150948/3-	11/14/13 03:44 PM Unknown
155	I1111413A	480-49651-C-1-A	11/14/13 03:46 PM Unknown
156	I1111413A	480-49651-B-2-A	11/14/13 03:49 PM Unknown
157	I1111413A	480-49651-B-2-A sd@5	11/14/13 03:52 PM Unknown
158	I1111413A	480-49651-B-2-A pds	11/14/13 03:54 PM Unknown
159	I1111413A	CCV	11/14/13 03:56 PM QC
160	I1111413A	CCB	11/14/13 03:59 PM QC
161	I1111413A	CCVL	11/14/13 04:01 PM QC
162	I1111413A	480-49651-B-2-B MS	11/14/13 04:04 PM Unknown
163	I1111413A	480-49651-B-2-C MSD	11/14/13 04:06 PM Unknown
164	I1111413A	480-49651-C-3-A	11/14/13 04:08 PM Unknown
165	I1111413A	480-49651-C-4-A	11/14/13 04:11 PM Unknown
166	I1111413A	480-49560-C-1-A	11/14/13 04:13 PM Unknown
167	I1111413A	480-49486-C-1-A	11/14/13 04:15 PM Unknown
168	I1111413A	480-49407-B-1-A@5	11/14/13 04:18 PM Unknown
169	I1111413A	480-49401-B-1-A	11/14/13 04:20 PM Unknown
170	I1111413A	480-49401-B-2-A	11/14/13 04:23 PM Unknown
171	I1111413A	CCV	11/14/13 04:25 PM QC
172	I1111413A	CCB	11/14/13 04:28 PM QC
173	I1111413A	ccvl	11/14/13 04:30 PM QC
174	I1111413A	480-49423-H-1-A	11/14/13 04:33 PM Unknown
175	I1111413A	480-49651-B-2-A@2	11/14/13 04:35 PM Unknown
176	I1111413A	480-49407-B-1-A	11/14/13 04:38 PM Unknown
177	I1111413A	MB 480-148698/1-A	11/14/13 04:40 PM Unknown
178	I1111413A	LCS 480-148698/2-A	11/14/13 04:42 PM Unknown
179	I1111413A	480-48963-E-1-A	11/14/13 04:45 PM Unknown
180	I1111413A	480-48963-E-1-B MS	11/14/13 04:47 PM Unknown
181	I1111413A	480-48963-E-1-C MSD	11/14/13 04:49 PM Unknown
182	I1111413A	480-48963-E-2-A	11/14/13 04:52 PM Unknown
183	I1111413A	CCV	11/14/13 04:54 PM QC
184	I1111413A	CCB	11/14/13 04:57 PM QC
185	I1111413A	CCVL	11/14/13 04:59 PM QC
186	I1111413A	480-48963-E-2-A sd@5	11/14/13 05:02 PM Unknown
187	I1111413A	480-48963-E-2-A pds	11/14/13 05:04 PM Unknown
188	I1111413A	480-48963-E-3-A	11/14/13 05:06 PM Unknown
189	I1111413A	480-48963-E-4-A	11/14/13 05:09 PM Unknown
190	I1111413A	480-48970-F-1-A	11/14/13 05:11 PM Unknown

191	I1111413A	480-48970-F-2-A	11/14/13 05:14 PM Unknown
192	I1111413A	480-48970-F-2-A@2	11/14/13 05:16 PM Unknown
193	I1111413A	480-48976-C-1-A	11/14/13 05:19 PM Unknown
194	I1111413A	480-49393-C-1-C	11/14/13 05:21 PM Unknown
195	I1111413A	CCV	11/14/13 05:24 PM QC
196	I1111413A	CCB	11/14/13 05:26 PM QC
197	I1111413A	ccvl	11/14/13 05:29 PM QC
198	I1111413A	480-49393-B-4-C	11/14/13 05:31 PM Unknown
199	I1111413A	480-48472-B-3-A@100	11/14/13 05:34 PM Unknown
200	I1111413A	48472-B-3-A sd@500	11/14/13 05:36 PM Unknown
201	I1111413A	48472-B-3-A pds@100	11/14/13 05:38 PM Unknown
202	I1111413A	48472-B-3-B MS@100	11/14/13 05:41 PM Unknown
203	I1111413A	48472-B-3-C MSD@100	11/14/13 05:43 PM Unknown
204	I1111413A	480-48472-A-4-A@100	11/14/13 05:45 PM Unknown
205	I1111413A	480-48472-A-4-A@200	11/14/13 05:48 PM Unknown
206	I1111413A	480-48453-E-5-A	11/14/13 05:50 PM Unknown
207	I1111413A	CCV	11/14/13 05:53 PM QC
208	I1111413A	CCB	11/14/13 05:55 PM QC
209	I1111413A	CCVL	11/14/13 05:58 PM QC
210	I1111413A	480-48453-E-5-A@5	11/14/13 06:00 PM Unknown
211	I1111413A	480-49577-A-1-E@10	11/14/13 06:02 PM Unknown
212	I1111413A	480-49577-A-1-E@50	11/14/13 06:05 PM Unknown
213	I1111413A	480-48966-C-1-B@100	11/14/13 06:07 PM Unknown
214	I1111413A	480-48966-C-1-B@200	11/14/13 06:10 PM Unknown
215	I1111413A	480-49111-L-1-B@100	11/14/13 06:12 PM Unknown
216	I1111413A	480-49111-L-1-B@200	11/14/13 06:15 PM Unknown
217	I1111413A	480-49467-B-1-B	11/14/13 06:17 PM Unknown
218	I1111413A	480-49467-B-1-B sd@5	11/14/13 06:20 PM Unknown
219	I1111413A	CCV	11/14/13 06:22 PM QC
220	I1111413A	CCB	11/14/13 06:24 PM QC
221	I1111413A	CCVL	11/14/13 06:27 PM QC
222	I1111413A	480-49467-B-1-C MS	11/14/13 06:29 PM Unknown
223	I1111413A	480-49467-B-1-D MSD	11/14/13 06:32 PM Unknown
224	I1111413A	480-49467-A-2-B	11/14/13 06:34 PM Unknown
225	I1111413A	480-49467-A-3-B	11/14/13 06:37 PM Unknown
226	I1111413A	480-49467-A-4-B	11/14/13 06:39 PM Unknown
227	I1111413A	480-49467-A-4-B sd@5	11/14/13 06:42 PM Unknown
228	I1111413A	480-49467-A-4-B pds	11/14/13 06:44 PM Unknown
229	I1111413A	480-48473-A-2-A@5	11/14/13 06:46 PM Unknown
230	I1111413A	480-48473-B-15-A@50	11/14/13 06:49 PM Unknown
231	I1111413A	CCV	11/14/13 06:51 PM QC
232	I1111413A	CCB	11/14/13 06:53 PM QC
233	I1111413A	CCVL	11/14/13 06:56 PM QC
234	I1111413A	mb 480-149467/17-b	11/14/13 06:58 PM Unknown
235	I1111413A	lcs 480-149467/18-b	11/14/13 07:01 PM Unknown
236	I1111413A	lcsd 480-150322/3-a	11/14/13 07:03 PM Unknown
237	I1111413A	480-49465-c-2-a	11/14/13 07:05 PM Unknown
238	I1111413A	480-49465-c-2-a@5	11/14/13 07:08 PM Unknown
239	I1111413A	mb 480-148703/1-a	11/14/13 07:10 PM Unknown
240	I1111413A	lcs 480-148703/2-a	11/14/13 07:13 PM Unknown

241	I1111413A	480-48971-e-1-a	11/14/13 07:15 PM Unknown
242	I1111413A	480-48971-e-1-b ms	11/14/13 07:17 PM Unknown
243	I1111413A	CCV	11/14/13 07:20 PM QC
244	I1111413A	CCB	11/14/13 07:22 PM QC
245	I1111413A	CCVL	11/14/13 07:25 PM QC
246	I1111413A	480-48971-e-1-c msd	11/14/13 07:27 PM Unknown
247	I1111413A	480-48971-e-2-a	11/14/13 07:29 PM Unknown
248	I1111413A	480-48971-e-2-a SD@5	11/14/13 07:32 PM Unknown
249	I1111413A	480-48971-e-2-a PDS	11/14/13 07:34 PM Unknown
250	I1111413A	480-48971-e-3-a	11/14/13 07:36 PM Unknown
251	I1111413A	480-48971-e-4-a	11/14/13 07:39 PM Unknown
252	I1111413A	480-48971-e-5-a	11/14/13 07:41 PM Unknown
253	I1111413A	480-48971-e-6-a	11/14/13 07:44 PM Unknown
254	I1111413A	480-48972-c-1-a	11/14/13 07:46 PM Unknown
255	I1111413A	CCV	11/14/13 07:48 PM QC
256	I1111413A	CCB	11/14/13 07:51 PM QC
257	I1111413A	CCVL	11/14/13 07:53 PM QC
258	I1111413A	480-48972-c-2-a	11/14/13 07:56 PM Unknown
259	I1111413A	480-48972-c-3-a	11/14/13 07:58 PM Unknown
260	I1111413A	480-48972-c-4-a	11/14/13 08:01 PM Unknown
261	I1111413A	480-48973-a-1-a	11/14/13 08:03 PM Unknown
262	I1111413A	480-48973-c-3-a	11/14/13 08:05 PM Unknown
263	I1111413A	480-48973-c-4-a	11/14/13 08:08 PM Unknown
264	I1111413A	480-48973-c-5-a	11/14/13 08:10 PM Unknown
265	I1111413A	480-48973-c-6-a	11/14/13 08:13 PM Unknown
266	I1111413A	480-48973-c-7-a	11/14/13 08:15 PM Unknown
267	I1111413A	CCV	11/14/13 08:18 PM QC
268	I1111413A	CCB	11/14/13 08:20 PM QC
269	I1111413A	CCVL	11/14/13 08:22 PM QC
270	I1111413A	480-48973-c-8-a	11/14/13 08:25 PM Unknown
271	I1111413A	480-48973-c-9-a	11/14/13 08:27 PM Unknown
272	I1111413A	480-48979-c-1-a	11/14/13 08:30 PM Unknown
273	I1111413A	480-48979-c-2-a	11/14/13 08:32 PM Unknown
274	I1111413A	CCVL	11/14/13 08:35 PM QC
275	I1111413A	icsa-1716849	11/14/13 08:37 PM QC
276	I1111413A	icsab-1723354	11/14/13 08:40 PM QC
277	I1111413A	CCV	11/14/13 08:42 PM QC
278	I1111413A	CCB	11/14/13 08:44 PM QC

I1111413A

Author: JRK

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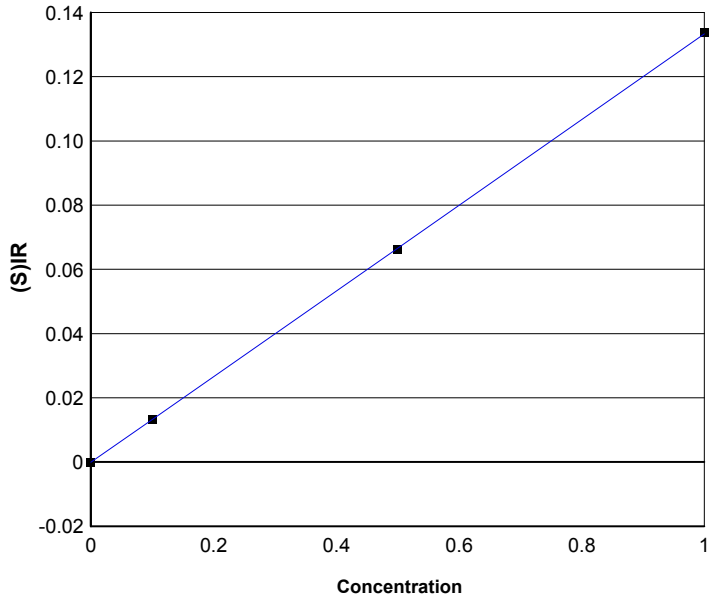
Instrument Name: iCAP1 Serial Number: 20094603

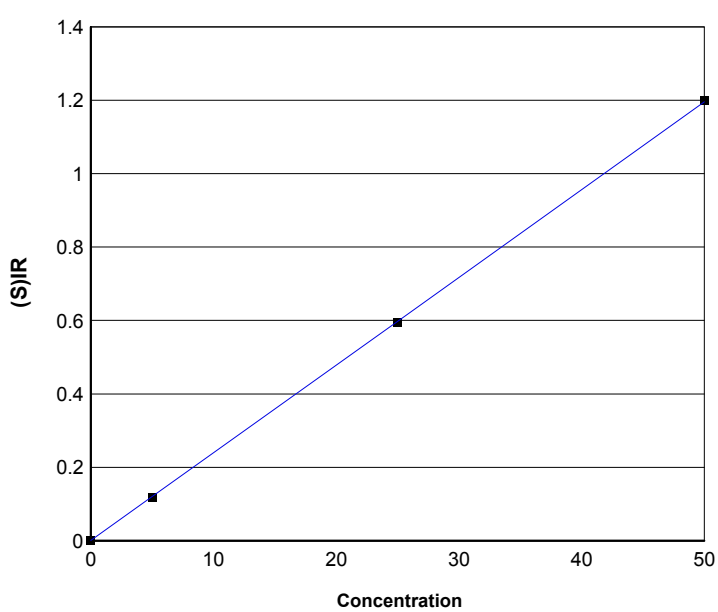
Method Name: ICAP1 (4)



Element Name:	Ag
Element Wavelength:	Ag 328.068 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.000088426
A1 (Gain):	0.13343
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

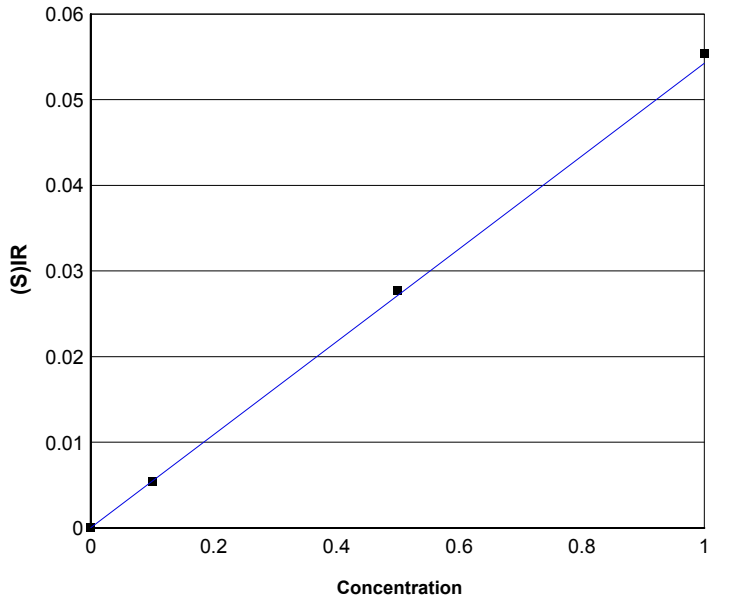
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000006633	0.0000006633	0.00000	-0.000088338	0.000065301	1
IC4	1.0000	1.0037	0.0037489	0.37489	0.13385	0.000011213	1
IC2	0.10000	0.099640	-0.00036046	-0.36046	0.013207	0.0000050542	1
IC3	0.50000	0.49661	-0.0033885	-0.67769	0.066179	0.000013925	1



Element Name:	Al
Element Wavelength:	Al 308.215 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00094631
A1 (Gain):	0.023886
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

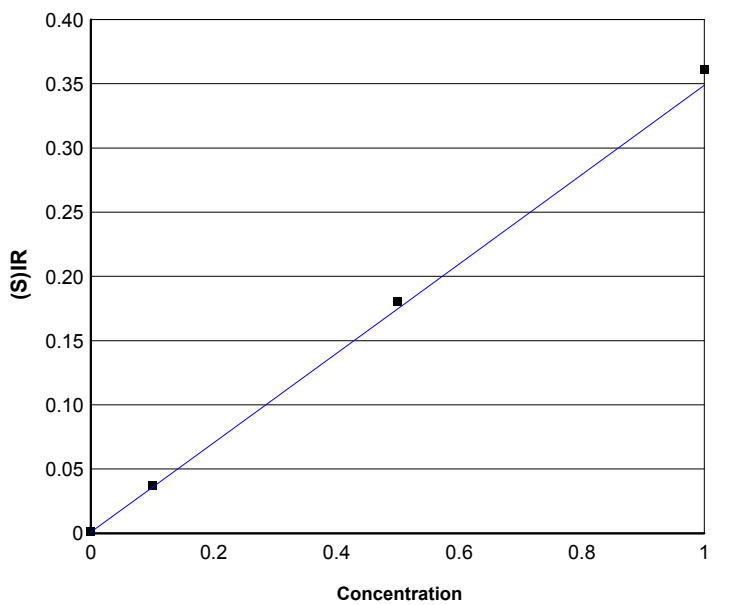
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000070229	0.000070229	0.00000	0.00094799	0.00022088	1
IC4	50.000	50.218	0.21765	0.43529	1.2005	0.0014654	1
IC2	5.0000	4.9394	-0.060580	-1.2116	0.11893	0.0010050	1
IC3	25.000	24.843	-0.15707	-0.62826	0.59435	0.0023633	1



Element Name:	As
Element Wavelength:	As 189.042 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.000049257
A1 (Gain):	0.054220
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

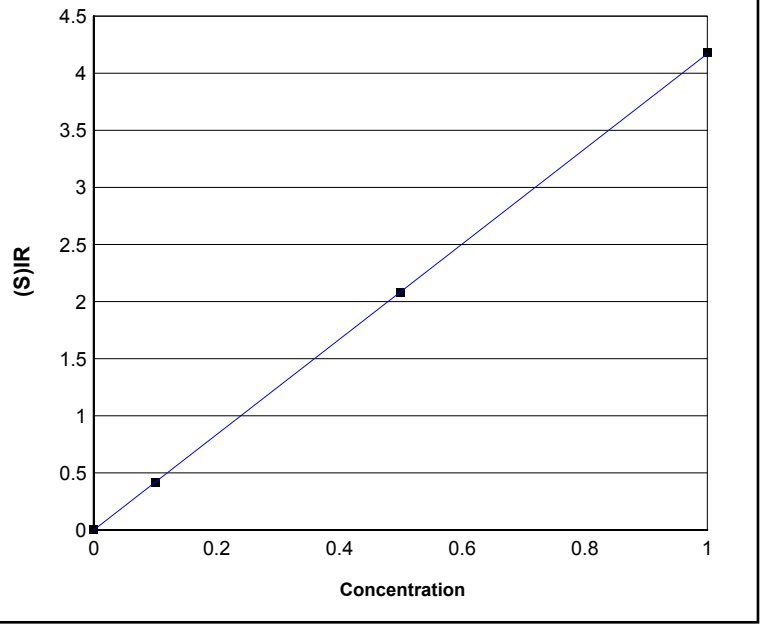
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000016880	0.0000016880	0.00000	0.000049348	0.00011926	1
IC4	1.0000	1.0016	0.0015609	0.15609	0.055363	0.00041876	1
IC2	0.10000	0.098085	-0.0019149	-1.9149	0.0054683	0.00015466	1
IC3	0.50000	0.50035	0.00035399	0.070798	0.027683	0.00022362	1



Element Name:	B
Element Wavelength:	B 208.959 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.00097534
A1 (Gain):	0.34778
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

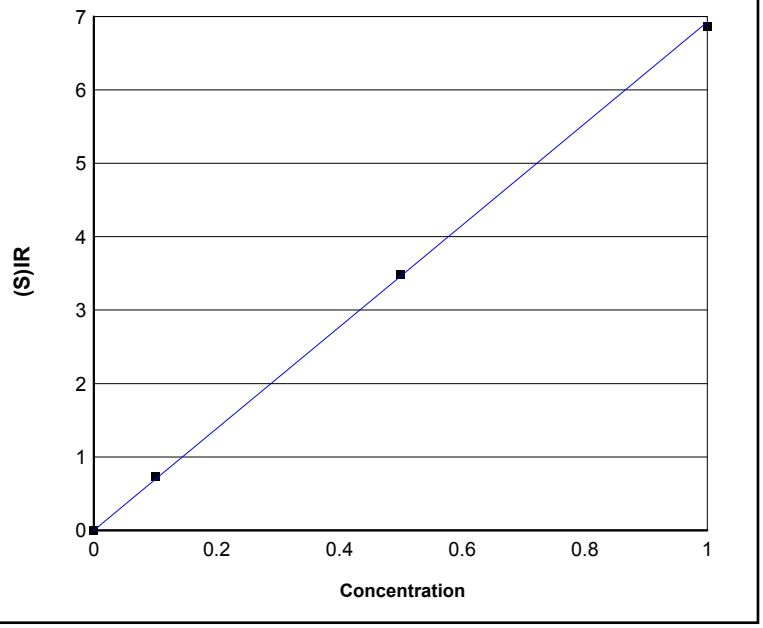
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000008417	-0.0000008417	0.00000	0.00097504	0.000049447	1
IC4	1.0000	0.99966	-0.00034456	-0.034456	0.36101	0.00062550	1
IC2	0.10000	0.10101	0.0010091	1.0091	0.037342	0.00017650	1
IC3	0.50000	0.49934	-0.00066454	-0.13291	0.18082	0.00045751	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.00088187
A1 (Gain):	4.1688
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

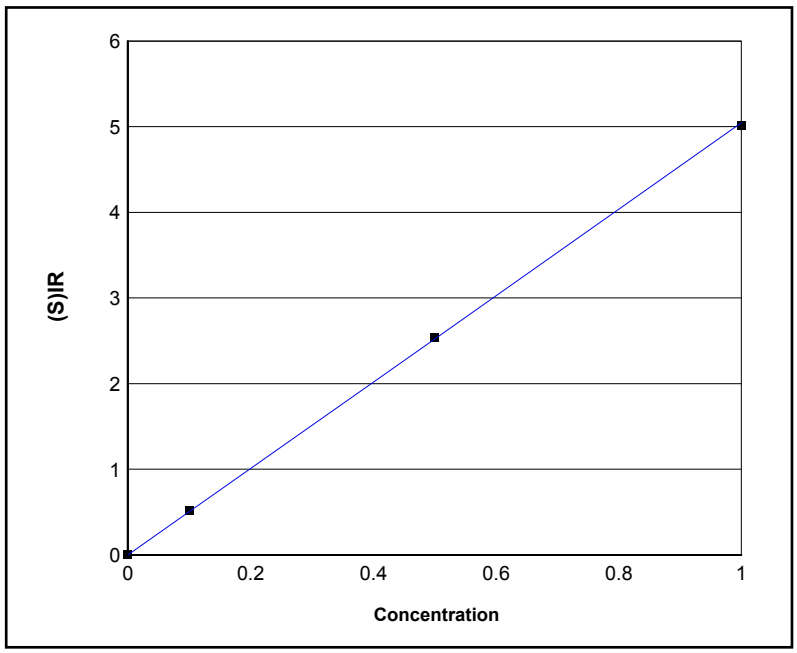
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000005493	0.0000005493	0.00000	0.00088416	0.00072182	1
IC4	1.0000	1.0019	0.0019193	0.19193	4.1777	0.010276	1
IC2	0.10000	0.099553	-0.00044675	-0.44675	0.41590	0.00059195	1
IC3	0.50000	0.49853	-0.0014725	-0.29451	2.0791	0.0031026	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99989
A0 (Offset):	0.00067656
A1 (Gain):	6.9263
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

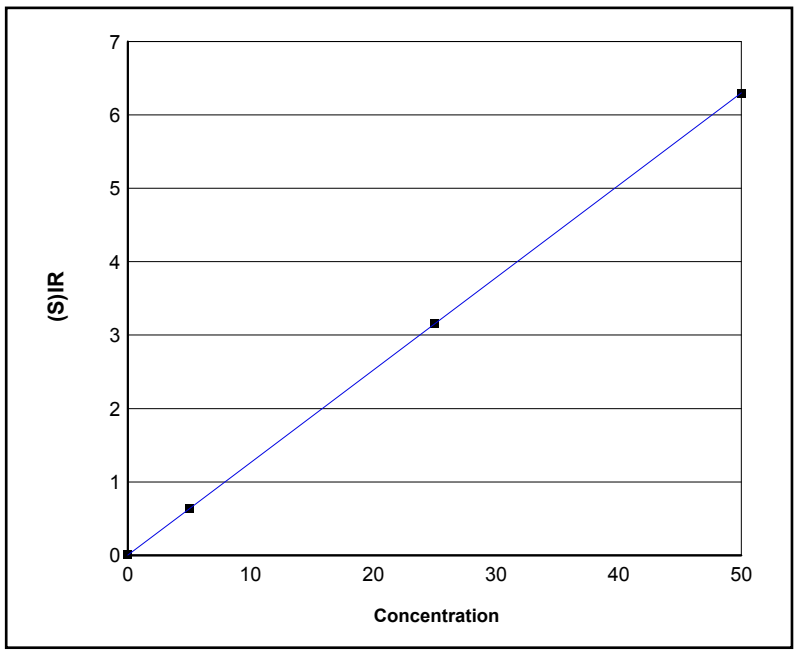
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000049789	-0.0000049789	0.00000	0.00064208	0.000026270	1
IC4	1.0000	0.99122	-0.0087850	-0.87850	6.8662	0.021428	1
IC2	0.10000	0.10513	0.0051255	5.1255	0.72881	0.0010865	1
IC3	0.50000	0.50366	0.0036595	0.73190	3.4892	0.017274	1



Element Name:	Be
Element Wavelength:	Be 313.042 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	0.00063703
A1 (Gain):	5.0441
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

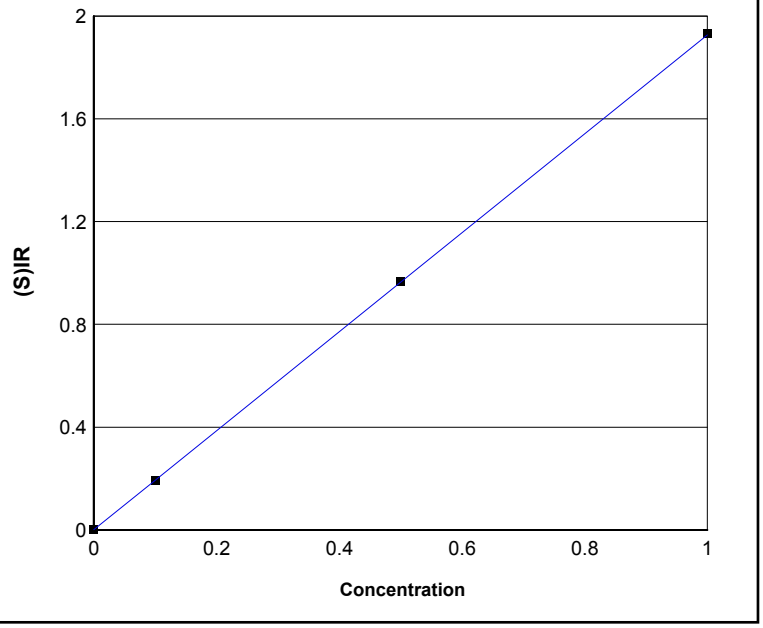
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000019958	-0.0000019958	0.00000	0.00062696	0.00011631	1
IC4	1.0000	0.99402	-0.0059775	-0.59775	5.0108	0.014697	1
IC2	0.10000	0.10175	0.0017475	1.7475	0.51348	0.0020930	1
IC3	0.50000	0.50423	0.0042300	0.84600	2.5421	0.0030314	1



Element Name:	Ca
Element Wavelength:	Ca 317.933 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.0049819
A1 (Gain):	0.12591
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

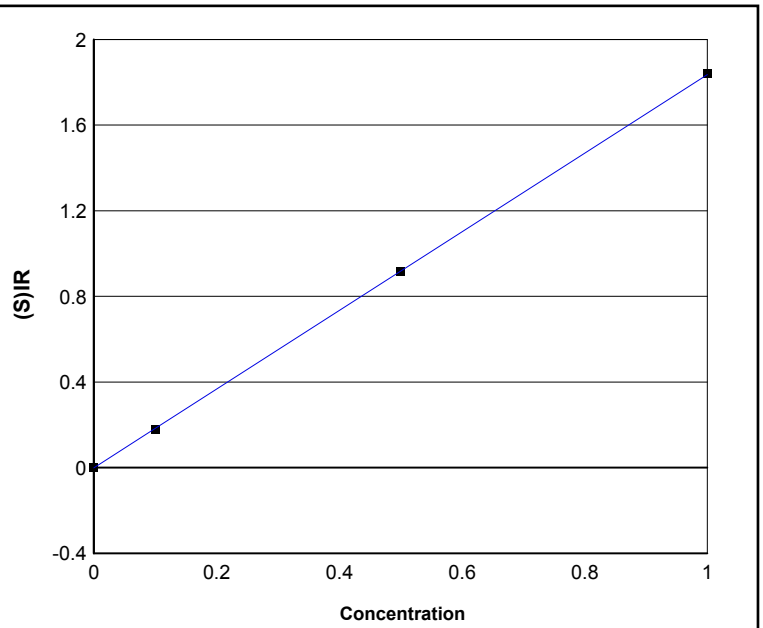
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000021972	-0.000021972	0.00000	0.0049791	0.0011136	1
IC4	50.000	49.961	-0.038543	-0.077087	6.2959	0.0050515	1
IC2	5.0000	5.0226	0.022647	0.45294	0.63741	0.0038453	1
IC3	25.000	25.016	0.015896	0.063586	3.1549	0.027384	1



Element Name:	Cd
Element Wavelength:	Cd 228.802 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.0015061
A1 (Gain):	1.9256
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

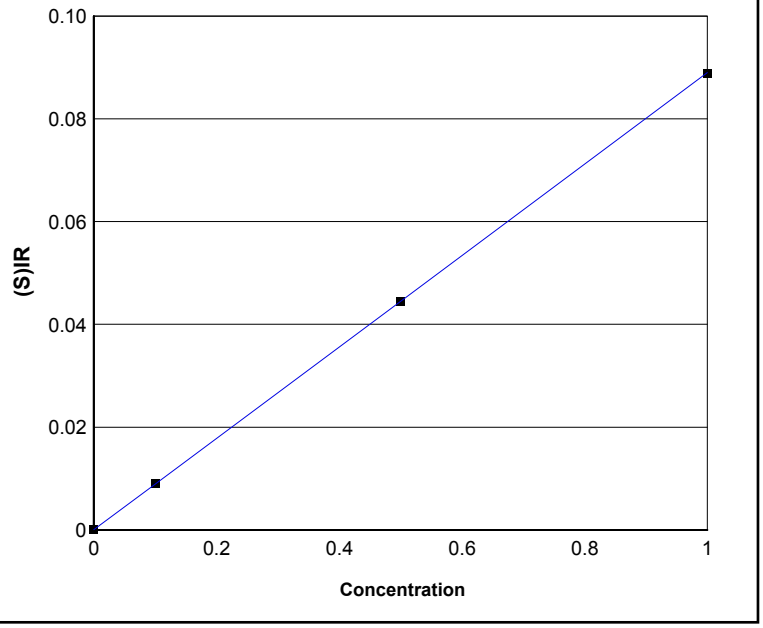
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000002044	0.0000002044	0.00000	0.0015065	0.000095908	1
IC4	1.0000	0.99943	-0.00057499	-0.057499	1.9322	0.00064886	1
IC2	0.10000	0.099673	-0.00032741	-0.32741	0.19405	0.000051502	1
IC3	0.50000	0.50090	0.00090241	0.18048	0.96913	0.00073905	1



Element Name:	Co
Element Wavelength:	Co 228.616 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00054644
A1 (Gain):	1.8370
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

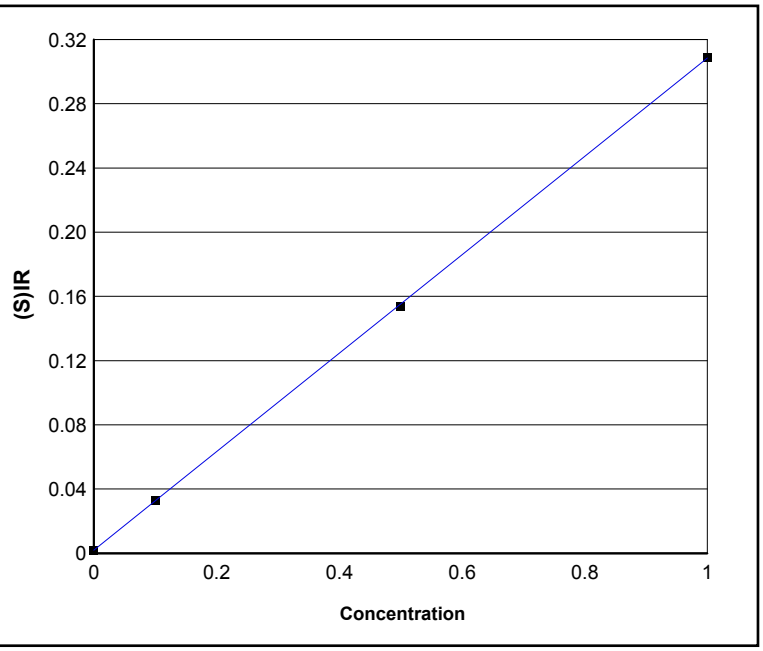
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000015470	0.0000015470	0.00000	-0.00054360	0.000087677	1
IC4	1.0000	1.0029	0.0028745	0.28745	1.8433	0.0013763	1
IC2	0.10000	0.098426	-0.0015745	-1.5745	0.18042	0.0000055632	1
IC3	0.50000	0.49870	-0.0013000	-0.26000	0.91635	0.00049002	1



Element Name:	Cr
Element Wavelength:	Cr 267.716 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.000028407
A1 (Gain):	0.088964
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

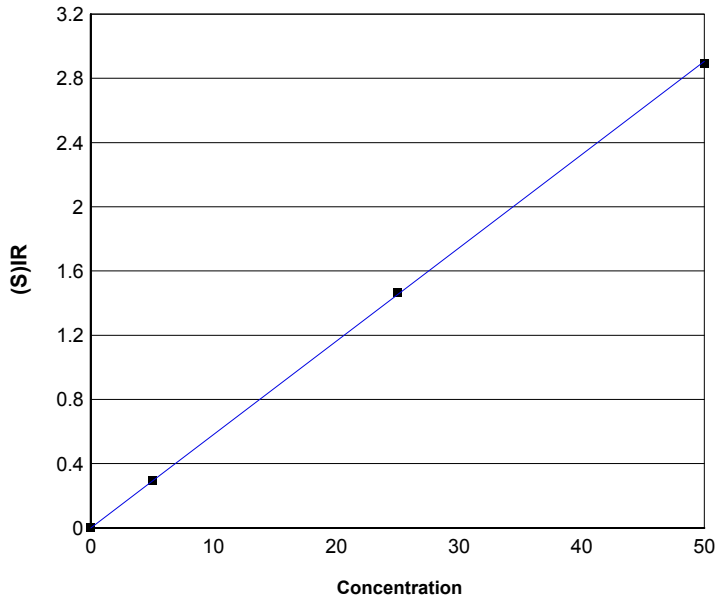
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000010902	-0.0000010902	0.00000	0.000028310	0.000023474	1
IC4	1.0000	0.99851	-0.0014865	-0.14865	0.088860	0.000065100	1
IC2	0.10000	0.10118	0.0011769	1.1769	0.0090295	0.000011878	1
IC3	0.50000	0.50031	0.00030960	0.061919	0.044538	0.000095030	1



Element Name:	Cu
Element Wavelength:	Cu 324.754 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0020293
A1 (Gain):	0.30641
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

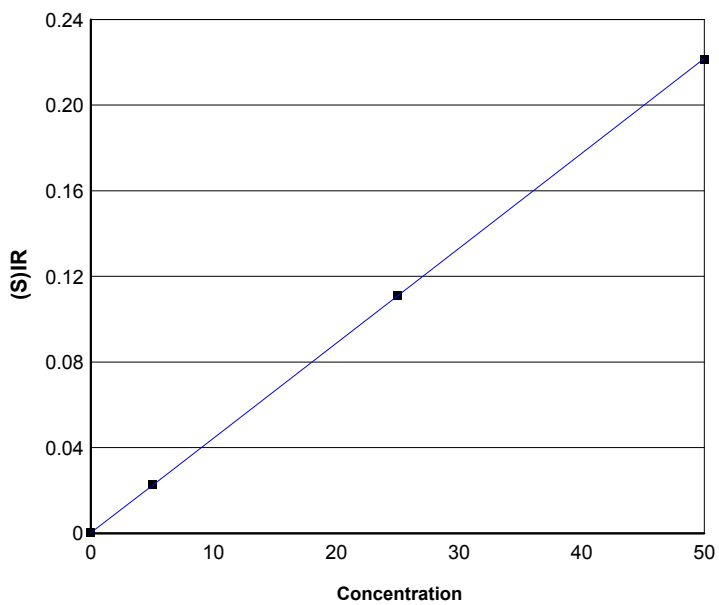
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000002292	0.0000002292	0.00000	0.0020294	0.000015087	1
IC4	1.0000	1.0032	0.0031503	0.31503	0.30907	0.00059182	1
IC2	0.10000	0.10011	0.00010730	0.10730	0.032669	0.000023506	1
IC3	0.50000	0.49674	-0.0032576	-0.65152	0.15407	0.00020190	1



Element Name:	Fe
Element Wavelength:	Fe 259.940 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00053281
A1 (Gain):	0.058095
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

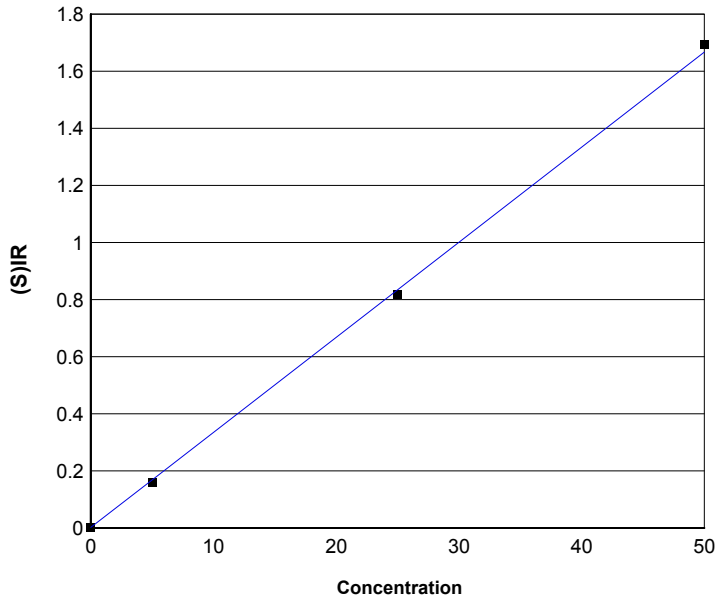
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000076111	-0.000076111	0.00000	0.00052839	0.0000001269	1
IC4	50.000	49.740	-0.25991	-0.51981	2.8902	0.0066434	1
IC2	5.0000	5.0627	0.062651	1.2530	0.29465	0.0010992	1
IC3	25.000	25.197	0.19726	0.78902	1.4644	0.0032349	1



Element Name:	Fe
Element Wavelength:	Fe 271.441 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00023797
A1 (Gain):	0.0044316
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

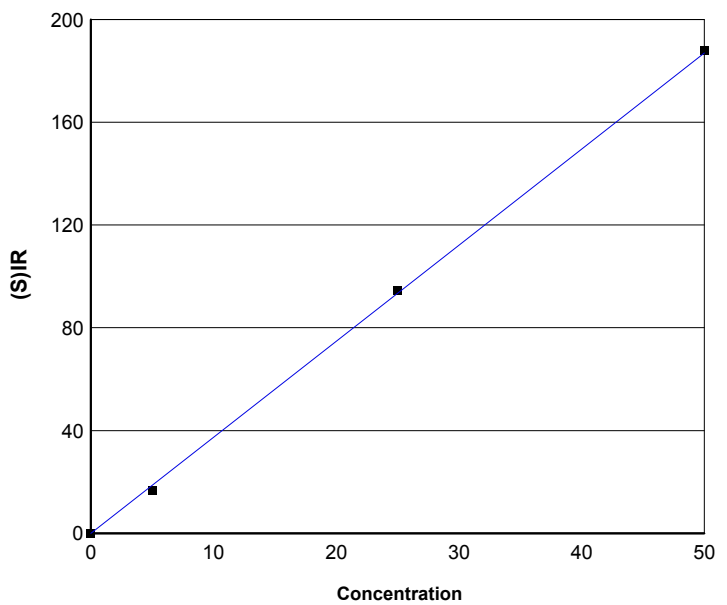
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000099268	-0.000099268	0.00000	0.00023753	0.000022751	1
IC4	50.000	49.857	-0.14297	-0.28595	0.22118	0.0013707	1
IC2	5.0000	5.1062	0.10621	2.1243	0.022867	0.0000029012	1
IC3	25.000	25.037	0.036761	0.14704	0.11119	0.0014207	1



Element Name:	K
Element Wavelength:	K 766.490 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99973
A0 (Offset):	0.0025237
A1 (Gain):	0.033286
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

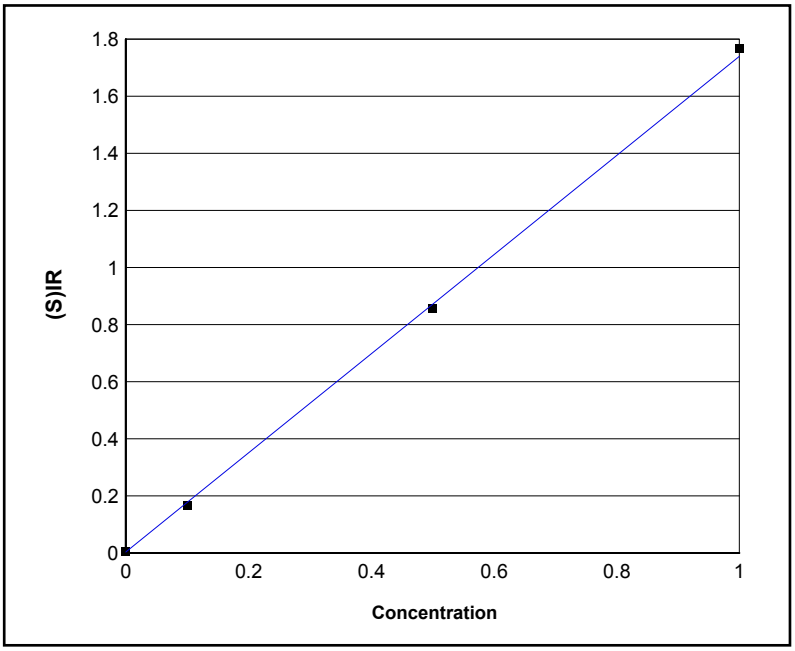
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00032362	0.00032362	0.00000	0.0025344	0.00073058	1
IC4	50.000	50.825	0.82519	1.6504	1.6943	0.00085525	1
IC2	5.0000	4.6986	-0.30138	-6.0276	0.15892	0.00092379	1
IC3	25.000	24.476	-0.52381	-2.0952	0.81724	0.0011612	1



Element Name:	K
Element Wavelength:	K 766.490 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99964
A0 (Offset):	0.0080502
A1 (Gain):	3.7392
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

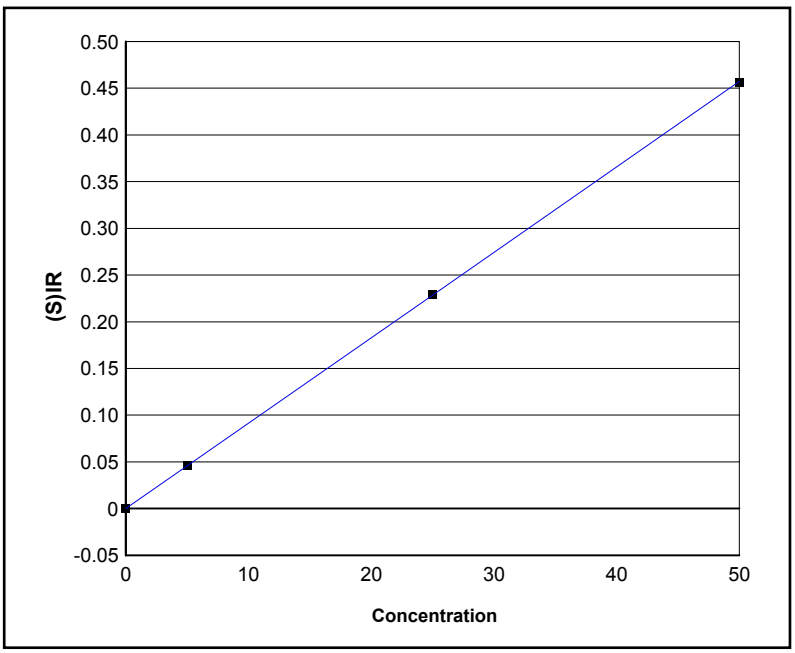
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00044571	0.00044571	0.00000	0.0097168	0.000046716	1
IC4	50.000	50.294	0.29404	0.58809	188.07	0.32710	1
IC2	5.0000	4.4796	-0.52038	-10.408	16.758	0.057509	1
IC3	25.000	25.226	0.22634	0.90536	94.334	0.85655	1



Element Name:	Li
Element Wavelength:	Li 670.784 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99974
A0 (Offset):	0.0036552
A1 (Gain):	1.7362
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

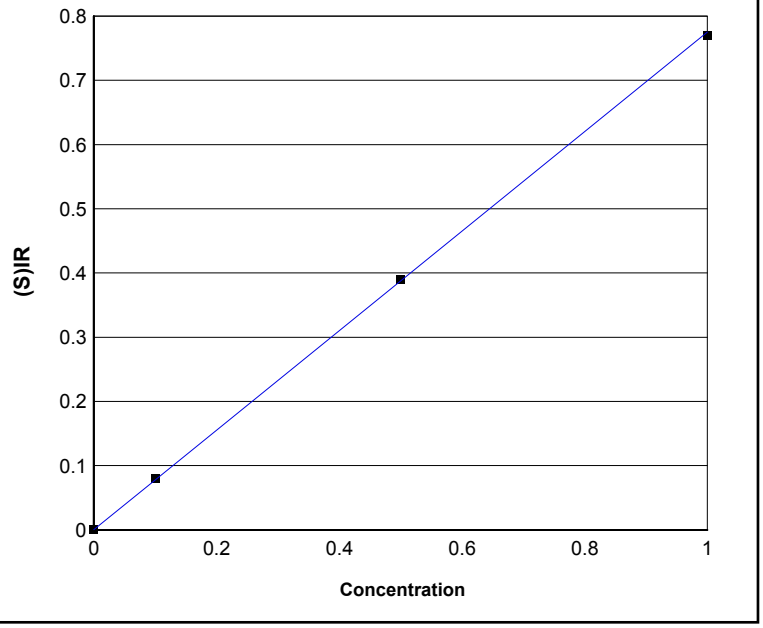
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000065571	0.0000065571	0.00000	0.0036666	0.0010485	1
IC2	0.10000	0.093810	-0.0061895	-6.1895	0.16653	0.00072222	1
IC3	0.50000	0.49013	-0.0098654	-1.9731	0.85462	0.00071629	1
IC4	1.0000	1.0161	0.016055	1.6055	1.7677	0.0065842	1



Element Name:	Mg
Element Wavelength:	Mg 279.079 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.0000004762
A1 (Gain):	0.0091457
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

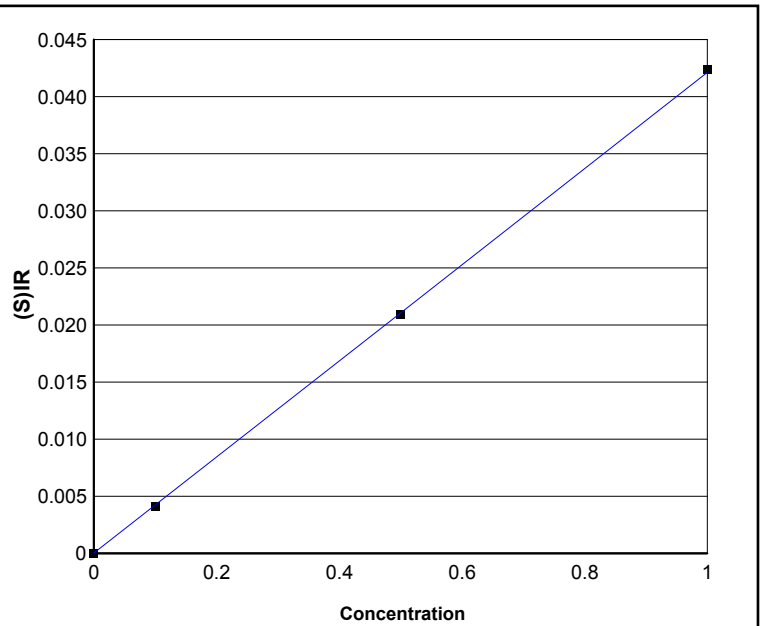
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000035509	-0.000035509	0.00000	-0.0000008009	0.000014677	1
IC4	50.000	49.926	-0.074184	-0.14837	0.45661	0.000084864	1
IC2	5.0000	5.0351	0.035113	0.70227	0.046049	0.000043294	1
IC3	25.000	25.039	0.039070	0.15628	0.22900	0.00043895	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99995
A0 (Offset):	0.00030451
A1 (Gain):	0.77504
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

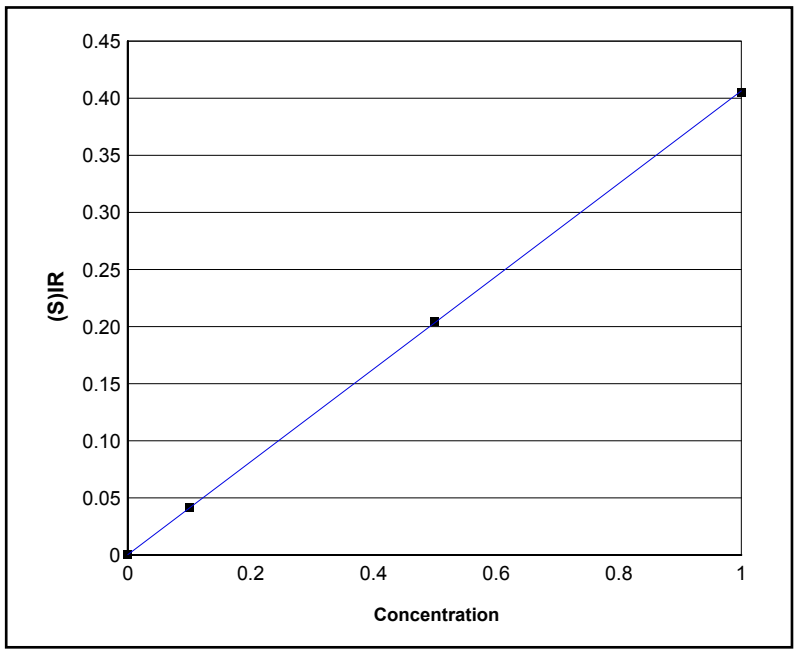
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000031142	-0.0000031142	0.00000	0.00030210	0.000063332	1
IC4	1.0000	0.99339	-0.0066098	-0.66098	0.77022	0.000095472	1
IC2	0.10000	0.10307	0.0030665	3.0665	0.080185	0.00011445	1
IC3	0.50000	0.50354	0.0035433	0.70866	0.39057	0.00044701	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	0.000022908
A1 (Gain):	0.042098
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

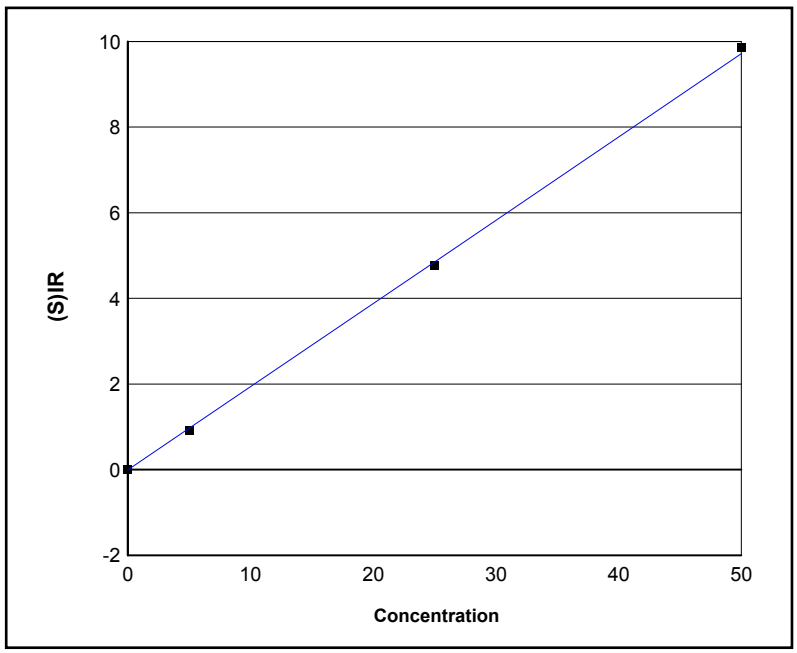
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000023186	0.0000023186	0.00000	0.000023006	0.0000099221	1
IC4	1.0000	1.0056	0.0055874	0.55874	0.042356	0.00011983	1
IC2	0.10000	0.097800	-0.0021998	-2.1998	0.0041401	0.000038268	1
IC3	0.50000	0.49661	-0.0033876	-0.67753	0.020929	0.000035761	1



Element Name:	Mo
Element Wavelength:	Mo 202.030 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.00025613
A1 (Gain):	0.40624
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

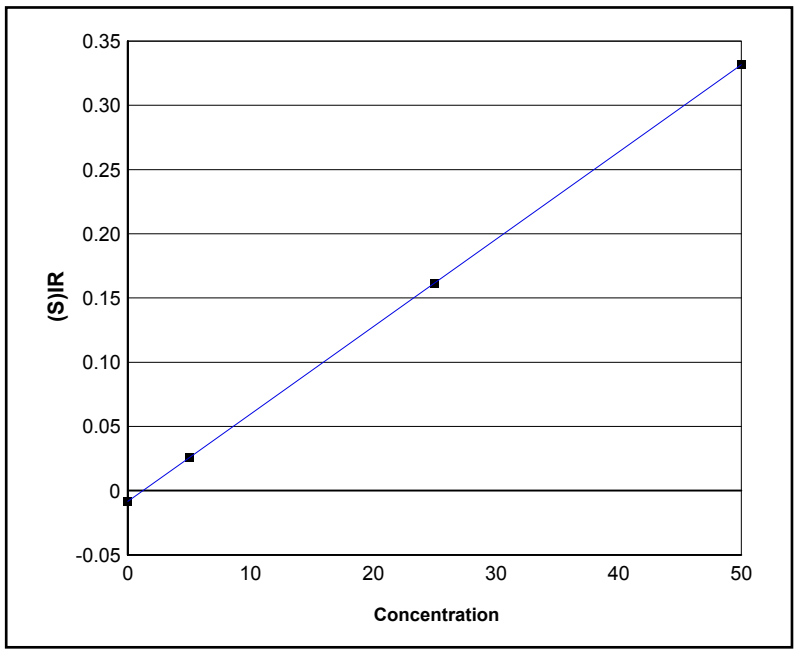
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000011178	-0.0000011178	0.00000	0.00025567	0.000017959	1
IC4	1.0000	0.99634	-0.0036592	-0.36592	0.40501	0.00024712	1
IC2	0.10000	0.10094	0.00093983	0.93983	0.041262	0.00010988	1
IC3	0.50000	0.50272	0.0027194	0.54387	0.20448	0.00050822	1



Element Name:	Na
Element Wavelength:	Na 589.592 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99980
A0 (Offset):	-0.0043064
A1 (Gain):	0.19439
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

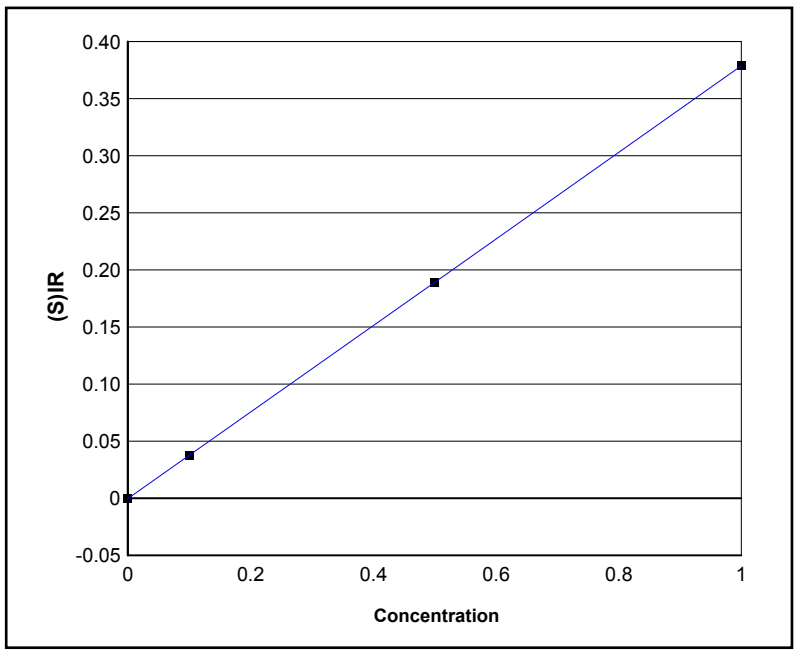
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00027306	0.00027306	0.00000	-0.0042533	0.000030920	1
IC4	50.000	50.729	0.72862	1.4572	9.8569	0.026944	1
IC2	5.0000	4.7498	-0.25024	-5.0048	0.91900	0.0023325	1
IC3	25.000	24.522	-0.47838	-1.9135	4.7625	0.014247	1



Element Name:	Na
Element Wavelength:	Na 818.326 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.0082518
A1 (Gain):	0.0067979
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

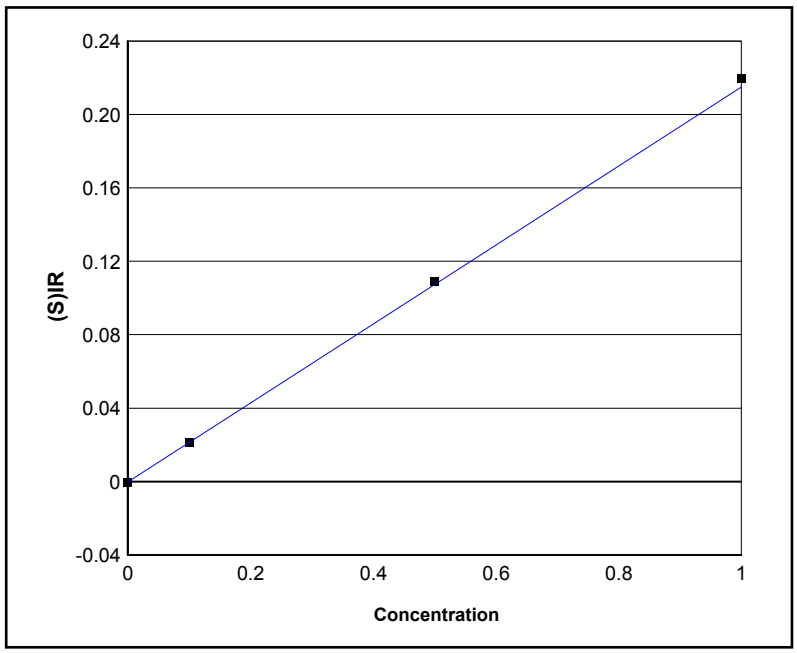
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000009865	-0.0000009865	0.00000	-0.0082518	0.00087008	1
IC4	50.000	50.043	0.043107	0.086214	0.33194	0.0033117	1
IC2	5.0000	5.0066	0.0066216	0.13243	0.025783	0.00029438	1
IC3	25.000	24.950	-0.049729	-0.19891	0.16136	0.0015155	1



Element Name:	Ni
Element Wavelength:	Ni 231.604 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.00036891
A1 (Gain):	0.37902
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

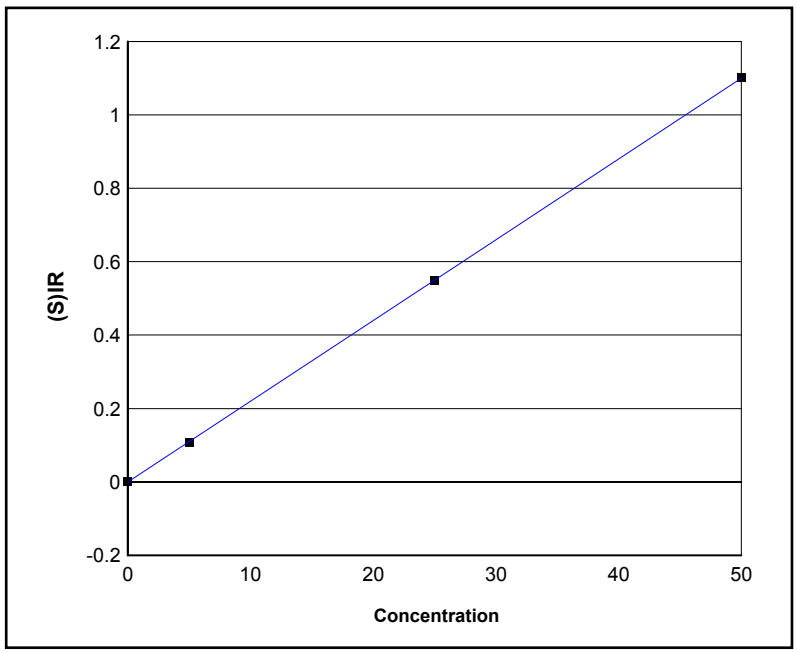
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000007337	0.0000007337	0.00000	-0.00036863	0.000088286	1
IC4	1.0000	1.0004	0.00041438	0.041438	0.37881	0.00043183	1
IC2	0.10000	0.099135	-0.00086537	-0.86537	0.037205	0.00013851	1
IC3	0.50000	0.50045	0.00045099	0.090198	0.18931	0.00017007	1



Element Name:	Pb
Element Wavelength:	Pb 220.353 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	-0.00025703
A1 (Gain):	0.21525
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

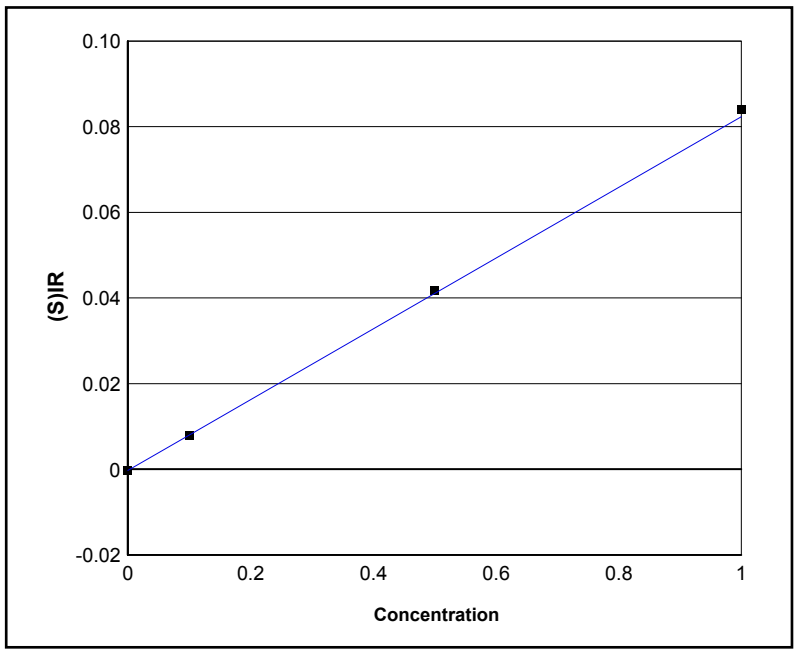
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000025438	0.0000025438	0.00000	-0.00025648	0.000024225	1
IC4	1.0000	1.0042	0.0042469	0.42469	0.21956	0.00059064	1
IC2	0.10000	0.097351	-0.0026489	-2.6489	0.021063	0.00011018	1
IC3	0.50000	0.49840	-0.0015980	-0.31960	0.10885	0.000032365	1



Element Name:	S
Element Wavelength:	S 182.034 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.0000
A0 (Offset):	-0.0001590
A1 (Gain):	0.02201
A2 (Curvature):	0.0000
n (Exponent):	1.000

Reslope		QC Normalize	
Slope:	1.000	**Slope factor:**	1.000
Y Int:	0.0000	**Offset:**	0.0000

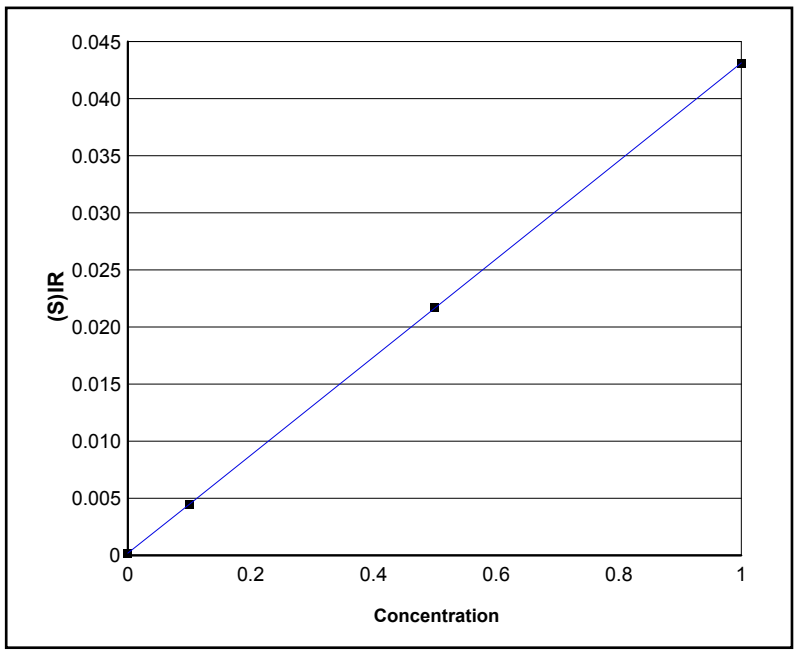
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.0000	0.00009256	0.00009256	0.0000	-0.0001570	0.00009240	1
IC2	5.000	4.900	-0.09958	-1.992	0.1077	0.0001784	1
IC3	25.00	24.97	-0.02944	-0.1178	0.5494	0.0002779	1
IC4	50.00	50.13	0.1290	0.2580	1.103	0.001418	1



Element Name:	Sb
Element Wavelength:	Sb 206.833 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00028271
A1 (Gain):	0.082634
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

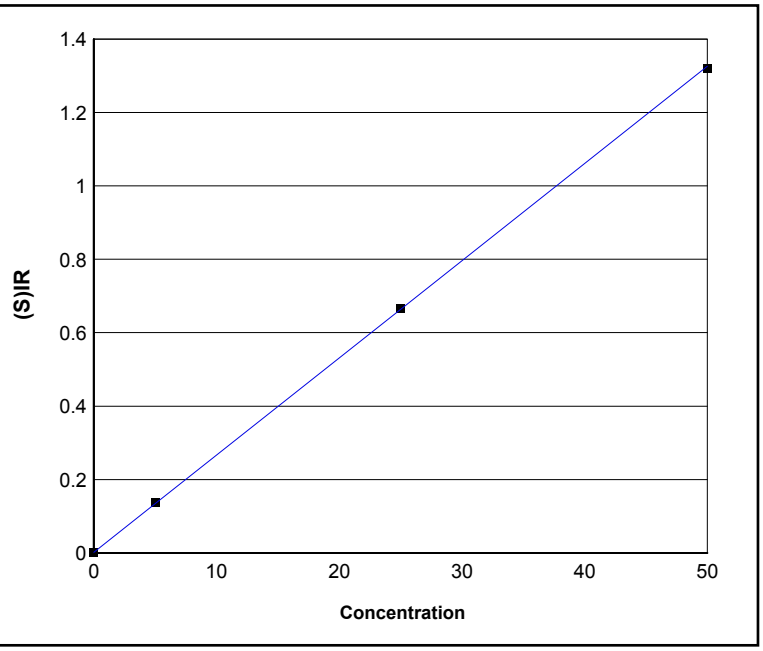
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000015952	0.0000015952	0.00000	-0.00028258	0.000074182	1
IC4	1.0000	1.0012	0.0011566	0.11566	0.083924	0.00026631	1
IC2	0.10000	0.098151	-0.0018494	-1.8494	0.0079756	0.00013875	1
IC3	0.50000	0.50069	0.00069282	0.13856	0.041830	0.00022503	1



Element Name:	Se
Element Wavelength:	Se 196.090 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.00018232
A1 (Gain):	0.042947
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

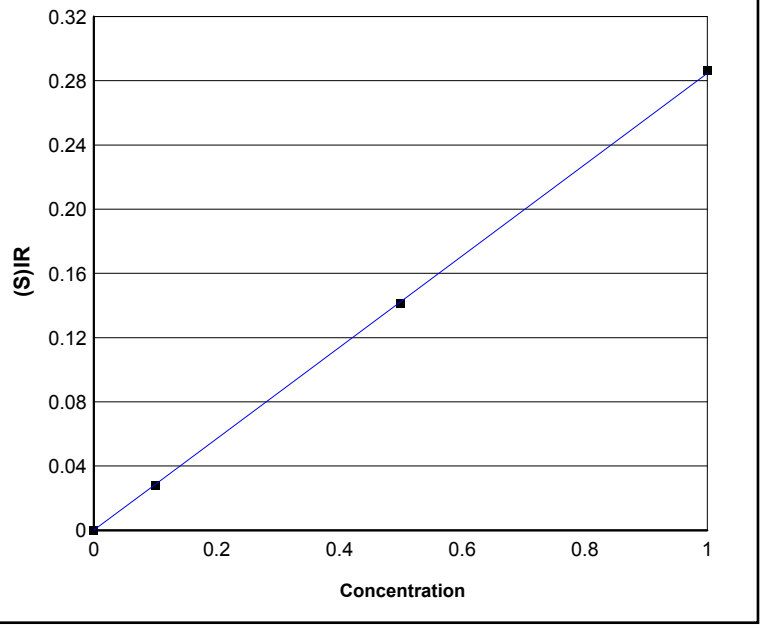
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000002294	0.0000002294	0.00000	0.00018233	0.000071340	1
IC4	1.0000	0.99868	-0.0013177	-0.13177	0.043060	0.00013082	1
IC2	0.10000	0.099549	-0.00045148	-0.45148	0.0044563	0.000095202	1
IC3	0.50000	0.50177	0.0017692	0.35383	0.021725	0.00016602	1



Element Name:	Si
Element Wavelength:	Si 288.158 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	0.0017581
A1 (Gain):	0.026479
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

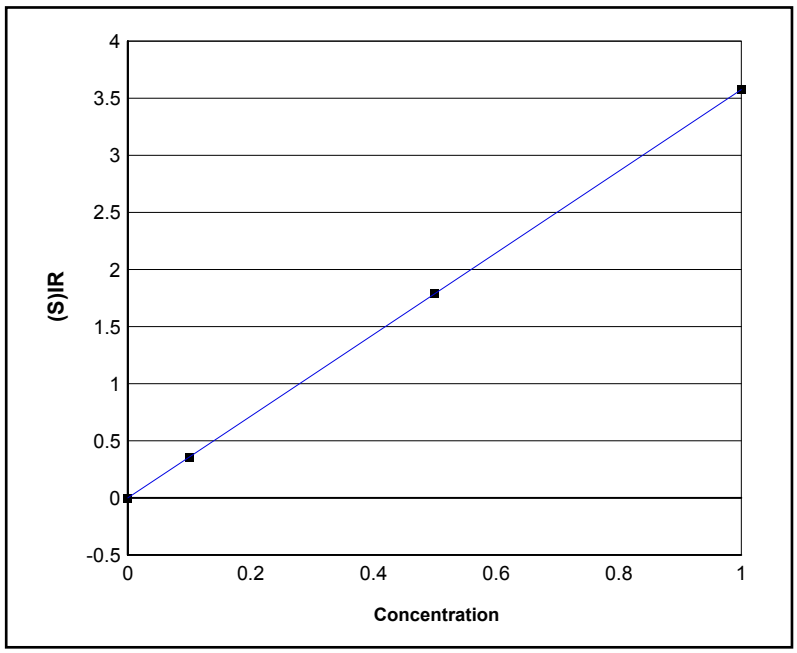
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.00013120	-0.00013120	0.00000	0.0017546	0.00063137	1
IC2	5.0000	5.1342	0.13415	2.6830	0.13771	0.00094446	1
IC3	25.000	25.105	0.10466	0.41863	0.66651	0.0014066	1
IC4	50.000	49.761	-0.23881	-0.47762	1.3194	0.00068185	1



Element Name:	Sn
Element Wavelength:	Sn 189.989 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.000081573
A1 (Gain):	0.28459
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

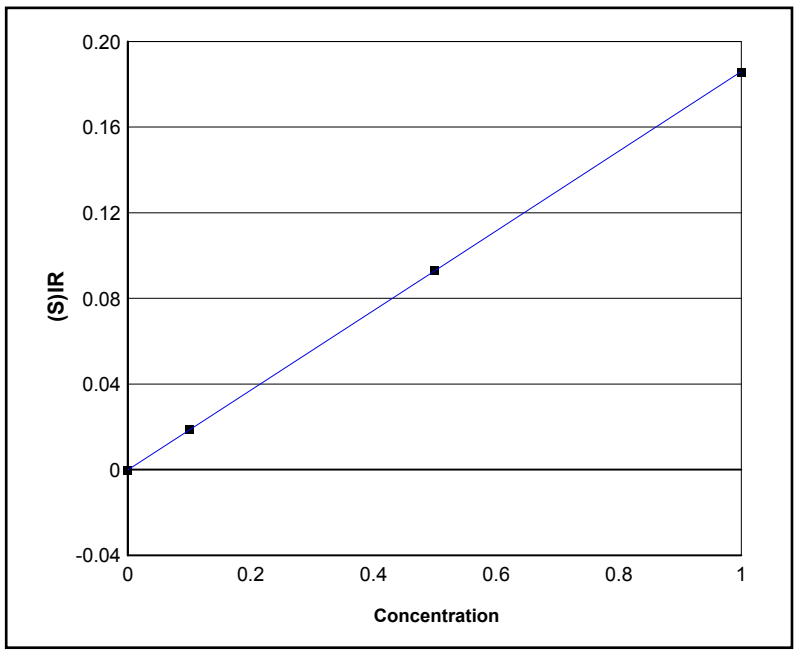
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000018109	0.0000018109	0.00000	0.000082088	0.00010671	1
IC4	1.0000	1.0050	0.0049561	0.49561	0.28608	0.00090317	1
IC2	0.10000	0.098356	-0.0016441	-1.6441	0.028072	0.00024456	1
IC3	0.50000	0.49669	-0.0033120	-0.66241	0.14143	0.00033651	1



Element Name:	Sr
Element Wavelength:	Sr 407.771 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.0015021
A1 (Gain):	3.5779
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

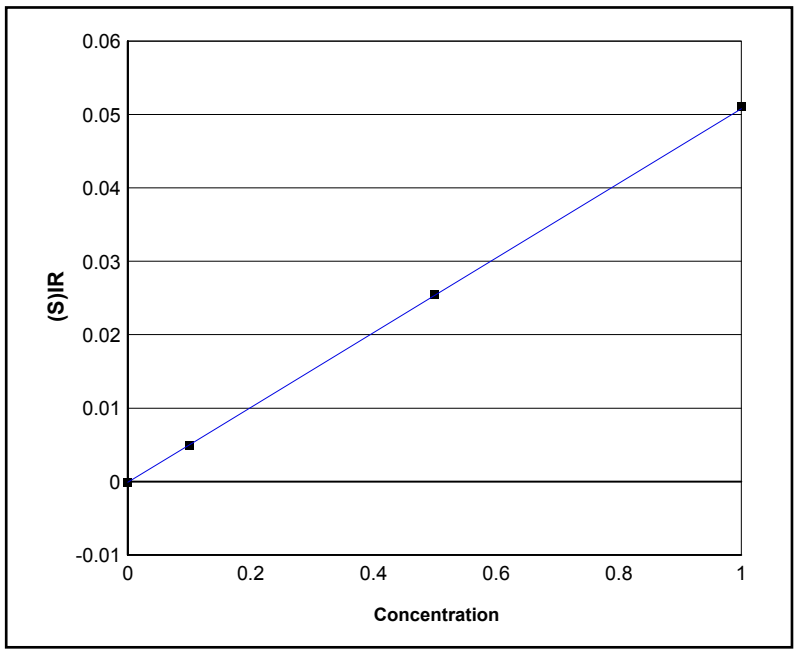
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000857	0.0000000857	0.00000	-0.0015018	0.000026584	1
IC2	0.10000	0.099772	-0.00022788	-0.22788	0.35547	0.0010476	1
IC3	0.50000	0.50119	0.0011939	0.23878	1.7917	0.0028649	1
IC4	1.0000	0.99903	-0.00096602	-0.096602	3.5729	0.011117	1



Element Name:	Ti
Element Wavelength:	Ti 334.904 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.00012920
A1 (Gain):	0.18605
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

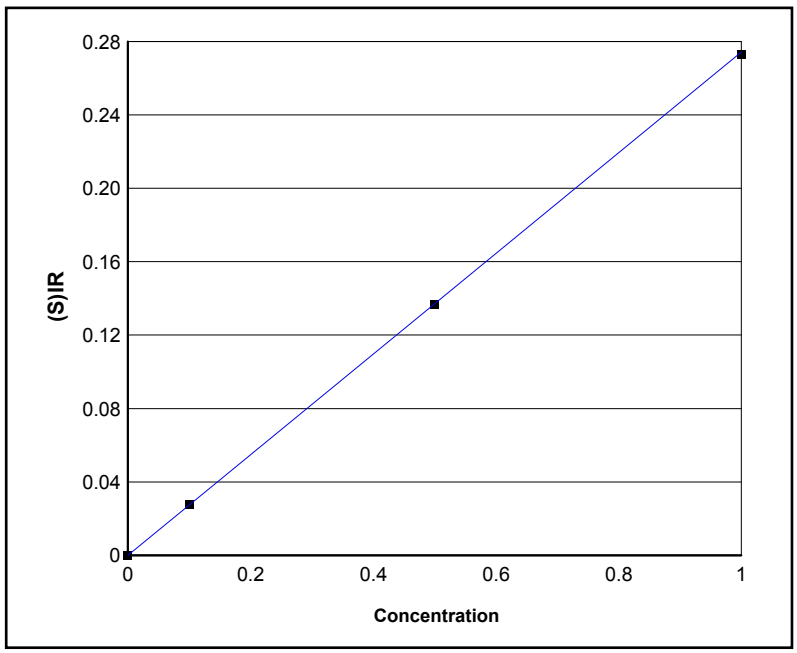
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000007347	-0.0000007347	0.00000	-0.00012934	0.000028497	1
IC4	1.0000	0.99816	-0.0018433	-0.18433	0.18560	0.00026416	1
IC2	0.10000	0.10069	0.00068802	0.68802	0.018606	0.000027655	1
IC3	0.50000	0.50116	0.0011552	0.23105	0.093124	0.000087226	1



Element Name:	Tl
Element Wavelength:	Tl 190.856 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.000084521
A1 (Gain):	0.050855
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

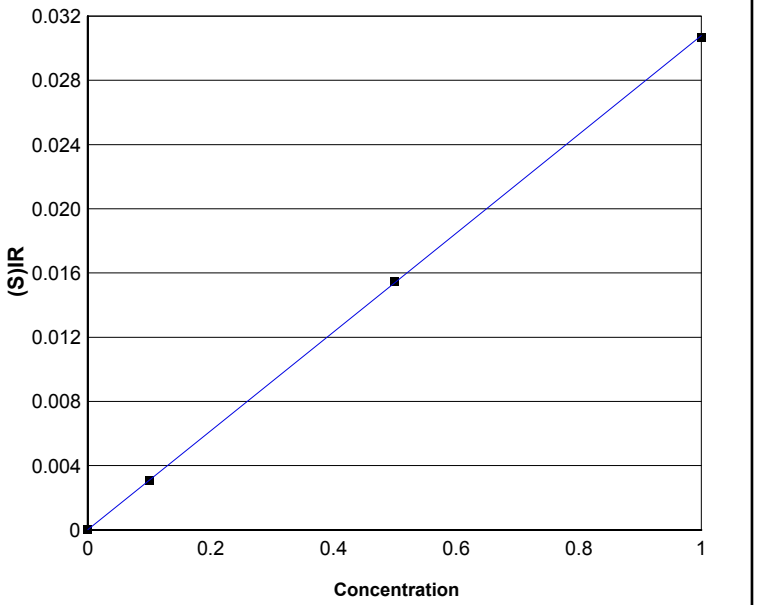
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000020223	0.0000020223	0.00000	-0.000084418	0.00011364	1
IC4	1.0000	1.0018	0.0017957	0.17957	0.051048	0.000074988	1
IC2	0.10000	0.097697	-0.0023034	-2.3034	0.0049024	0.000023536	1
IC3	0.50000	0.50051	0.00050774	0.10155	0.025462	0.000058374	1



Element Name:	V
Element Wavelength:	V 292.402 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.000027247
A1 (Gain):	0.27414
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000015401	-0.0000015401	0.00000	0.000026825	0.0000054288	1
IC4	1.0000	0.99765	-0.0023545	-0.23545	0.27269	0.00079087	1
IC2	0.10000	0.10163	0.0016308	1.6308	0.027805	0.000040978	1
IC3	0.50000	0.50072	0.00072371	0.14474	0.13688	0.000038672	1



Element Name:	Zn
Element Wavelength:	Zn 206.200 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 9:42:55AM
Date of Fit:	11/14/2013 9:42:55AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.000010170
A1 (Gain):	0.030767
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000004607	-0.0000004607	0.00000	0.000010156	0.0000000134	1
IC4	1.0000	0.99756	-0.0024422	-0.24422	0.030646	0.000098326	1
IC2	0.10000	0.10027	0.00027058	0.27058	0.0030896	0.0000026784	1
IC3	0.50000	0.50217	0.0021716	0.43432	0.015433	0.000070706	1

Sample Name: IC1 Acquired: 11/14/2013 9:33:34 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**-.00009**	**.00095**	**.00005**	**.00098**	**.00088**	**.00064**	**.00063**
Stddev	.00007	.00022	.00012	.00005	.00072	.00003	.00012
%RSD	73.922	23.300	241.68	5.0713	81.639	4.0914	18.552
#1	-.00004	.00110	-.00003	.00094	.00139	.00066	.00054
#2	-.00013	.00079	.00013	.00101	.00037	.00062	.00071

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00498**	**.00151**	**-.00054**	**.00003**	**.00203**	**.00053**	**.00024**
Stddev	.00111	.00010	.00009	.00002	.00002	.00000	.00002
%RSD	22.365	6.3665	16.129	82.916	.74342	.02402	9.5780
#1	.00419	.00157	-.00048	.00001	.00202	.00053	.00022
#2	.00577	.00144	-.00061	.00004	.00204	.00053	.00025

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00253**	**.00972**	**.00367**	**-.00000**	**.00030**	**.00002**	**.00026**
Stddev	.00073	.00005	.00105	.00001	.00006	.00001	.00002
%RSD	28.826	.48078	28.597	1832.5	20.964	43.129	7.0243
#1	.00305	.00975	.00293	-.00001	.00035	.00002	.00027
#2	.00202	.00968	.00441	.00001	.00026	.00003	.00024

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**-.00425**	**-.00825**	**-.00037**	**-.00026**	**-.0002**	**-.00028**	**.00018**
Stddev	.00003	.00087	.00009	.00002	.0001	.00007	.00007
%RSD	.72696	10.544	23.950	9.4450	58.87	26.251	39.127
#1	-.00428	-.00764	-.00043	-.00027	-.0001	-.00034	.00023
#2	-.00423	-.00887	-.00031	-.00024	-.0002	-.00023	.00013

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00175**	**.00008**	**-.00150**	**-.00013**	**-.00008**	**.00003**	**.00001**
Stddev	.00063	.00011	.00003	.00003	.00011	.00001	.00000
%RSD	35.984	130.00	1.7701	22.033	134.62	20.238	.13212
#1	.00220	.00016	-.00148	-.00015	-.00016	.00003	.00001
#2	.00131	.00001	-.00152	-.00011	-.00000	.00002	.00001

Sample Name: IC1 Acquired: 11/14/2013 9:33:34 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3378.3	4948.8	78069.	7456.4
Stddev	1.3	.1	94.	30.7
%RSD	.03925	.00115	.12007	.41130
#1	3377.3	4948.7	78003.	7434.7
#2	3379.2	4948.8	78136.	7478.0

Sample Name: IC2 Acquired: 11/14/2013 9:35:59 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.01321**	**.11893**	**.00547**	**.03734**	**.41590**	**.72881**	**.51348**
Stddev	.00001	.00100	.00015	.00018	.00059	.00109	.00209
%RSD	.03827	.84501	2.8282	.47266	.14233	.14907	.40761
#1	.01320	.11964	.00558	.03722	.41632	.72804	.51200
#2	.01321	.11822	.00536	.03747	.41548	.72958	.51496

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.63741**	**.19405**	**.18042**	**.00903**	**.03267**	**.29465**	**.02287**
Stddev	.00385	.00005	.00001	.00001	.00002	.00110	.00000
%RSD	.60327	.02654	.00308	.13155	.07195	.37305	.01269
#1	.64013	.19409	.18041	.00904	.03269	.29542	.02287
#2	.63469	.19402	.18042	.00902	.03265	.29387	.02286

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.15892**	**16.758**	**.16653**	**.04605**	**.08018**	**.00414**	**.04126**
Stddev	.00092	.058	.00072	.00004	.00011	.00004	.00011
%RSD	.58128	.34317	.43370	.09402	.14273	.92432	.26629
#1	.15958	16.799	.16704	.04608	.08027	.00417	.04118
#2	.15827	16.718	.16602	.04602	.08010	.00411	.04134

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.91900**	**.02578**	**.03721**	**.02106**	**.1077**	**.00798**	**.00446**
Stddev	.00233	.00029	.00014	.00011	.0002	.00014	.00010
%RSD	.25381	1.1418	.37227	.52312	.1656	1.7397	2.1363
#1	.92065	.02557	.03711	.02114	.1076	.00807	.00439
#2	.91735	.02599	.03730	.02098	.1078	.00788	.00452

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.13771**	**.02807**	**.35547**	**.01861**	**.00490**	**.02780**	**.00309**
Stddev	.00094	.00024	.00105	.00003	.00002	.00004	.00000
%RSD	.68585	.87118	.29472	.14863	.48008	.14738	.08669
#1	.13837	.02825	.35473	.01859	.00489	.02783	.00309
#2	.13704	.02790	.35621	.01863	.00492	.02778	.00309

Sample Name: IC2 Acquired: 11/14/2013 9:35:59 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3336.5	4933.7	76578.	7350.9
Stddev	9.1	10.0	157.	53.0
%RSD	.27158	.20214	.20478	.72043
#1	3342.9	4940.8	76467.	7313.5
#2	3330.1	4926.7	76689.	7388.4

Sample Name: IC3 Acquired: 11/14/2013 9:38:17 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.06618**	**.59435**	**.02768**	**.18082**	**2.0791**	**3.4892**	**2.5421**
Stddev	.00001	.00236	.00022	.00046	.0031	.0173	.0030
%RSD	.02104	.39762	.80780	.25302	.14923	.49506	.11925
#1	.06619	.59602	.02784	.18050	2.0813	3.5014	2.5443
#2	.06617	.59268	.02752	.18115	2.0769	3.4770	2.5400

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3.1549**	**.96913**	**.91635**	**.04454**	**.15407**	**1.4644**	**.11119**
Stddev	.0274	.00074	.00049	.00010	.00020	.0032	.00142
%RSD	.86800	.07626	.05348	.21337	.13104	.22091	1.2777
#1	3.1742	.96861	.91670	.04447	.15392	1.4666	.11220
#2	3.1355	.96965	.91601	.04461	.15421	1.4621	.11019

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.81724**	**94.334**	**.85462**	**.22900**	**.39057**	**.02093**	**.20448**
Stddev	.00116	.857	.00072	.00044	.00045	.00004	.00051
%RSD	.14209	.90800	.08381	.19168	.11445	.17087	.24854
#1	.81642	94.940	.85512	.22931	.39088	.02090	.20484
#2	.81806	93.728	.85411	.22869	.39025	.02095	.20412

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4.7625**	**.16136**	**.18931**	**.10885**	**.5494**	**.04183**	**.02173**
Stddev	.0143	.00152	.00017	.00003	.0003	.00023	.00017
%RSD	.29915	.93919	.08984	.02973	.0506	.53795	.76420
#1	4.7725	.16029	.18943	.10887	.5496	.04199	.02184
#2	4.7524	.16243	.18919	.10883	.5492	.04167	.02161

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.66651**	**.14143**	**1.7917**	**.09312**	**.02546**	**.13688**	**.01543**
Stddev	.00141	.00034	.0029	.00009	.00006	.00004	.00007
%RSD	.21104	.23793	.15990	.09367	.22926	.02825	.45816
#1	.66750	.14167	1.7897	.09319	.02550	.13685	.01538
#2	.66552	.14119	1.7937	.09306	.02542	.13691	.01548

Sample Name: IC3 Acquired: 11/14/2013 9:38:17 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3180.1	4853.1	74852.	7378.0
Stddev	.3	3.2	11.	35.1
%RSD	.01079	.06684	.01523	.47515
#1	3179.9	4850.8	74844.	7353.2
#2	3180.4	4855.4	74860.	7402.7

Sample Name: IC4 Acquired: 11/14/2013 9:40:39 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.13385	1.2005	.05536	.36101	4.1777	6.8662	5.0108
Stddev	.00001	.0015	.00042	.00063	.0103	.0214	.0147
%RSD	.00838	.12207	.75640	.17326	.24596	.31208	.29330
#1	.13386	1.2015	.05566	.36146	4.1849	6.8813	5.0212
#2	.13384	1.1994	.05507	.36057	4.1704	6.8510	5.0004

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	6.2959	1.9322	1.8433	.08886	.30907	2.8902	.22118
Stddev	.0050	.0006	.0014	.00007	.00059	.0066	.00137
%RSD	.08024	.03358	.07466	.07326	.19149	.22986	.61973
#1	6.2923	1.9326	1.8443	.08881	.30865	2.8949	.22021
#2	6.2994	1.9317	1.8423	.08891	.30949	2.8855	.22215

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.6943	188.07	1.7677	.45661	.77022	.04236	.40501
Stddev	.0009	.33	.0066	.00008	.00010	.00012	.00025
%RSD	.05048	.17393	.37247	.01859	.01240	.28292	.06102
#1	1.6949	187.84	1.7724	.45655	.77015	.04244	.40518
#2	1.6937	188.30	1.7631	.45667	.77028	.04227	.40483

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	9.8569	.33194	.37881	.21956	1.103	.08392	.04306
Stddev	.0269	.00331	.00043	.00059	.001	.00027	.00013
%RSD	.27335	.99770	.11400	.26901	.1285	.31732	.30382
#1	9.8759	.33428	.37851	.21914	1.102	.08411	.04297
#2	9.8378	.32960	.37912	.21997	1.104	.08374	.04315

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.3194	.28608	3.5729	.18560	.05105	.27269	.03065
Stddev	.0007	.00090	.0111	.00026	.00007	.00079	.00010
%RSD	.05168	.31571	.31113	.14233	.14690	.29003	.32084
#1	1.3189	.28672	3.5808	.18579	.05110	.27213	.03058
#2	1.3199	.28544	3.5651	.18542	.05099	.27325	.03072

Sample Name: IC4 Acquired: 11/14/2013 9:40:39 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3047.2	4764.0	72754.	7336.4
Stddev	4.5	8.1	54.	8.6
%RSD	.14775	.17011	.07390	.11670
#1	3044.1	4758.3	72792.	7330.4
#2	3050.4	4769.8	72716.	7342.5

Sample Name: ICV-1734477 Acquired: 11/14/2013 9:42:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.37615**	**19.012**	**.38311**	**.37423**	**.38968**	**.37650**	**18.856**
Stddev	.00189	.076	.00090	.00187	.00017	.00029	.015
%RSD	.50207	.39835	.23562	.50032	.04324	.07725	.08004
#1	.37749	18.958	.38247	.37290	.38956	.37630	18.866
#2	.37482	19.065	.38375	.37555	.38980	.37671	18.845
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.37440**	**.36889**	**.38459**	**.37902**	**18.400**	**18.554**	**18.851**
Stddev	.00139	.00069	.00076	.00018	.003	.050	.081
%RSD	.37109	.18828	.19645	.04817	.01654	.27209	.42945
#1	.37341	.36839	.38512	.37915	18.402	18.518	18.909
#2	.37538	.36938	.38405	.37889	18.398	18.590	18.794
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.36702**	**18.280**	**.38300**	**.37554**	**.37866**	**18.555**	**.37159**
Stddev	.00154	.049	.00019	.00025	.00211	.082	.00126
%RSD	.41898	.26748	.04906	.06709	.55684	.44239	.34018
#1	.36593	18.314	.38314	.37536	.37717	18.497	.37069
#2	.36810	18.245	.38287	.37572	.38015	18.613	.37248
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ICV-1734477 Acquired: 11/14/2013 9:42:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37252	18.67	.38523	.37215	19.013	.37920	.37532
Stddev	.00140	.03	.00063	.00228	.074	.00002	.00063
%RSD	.37491	.1537	.16325	.61135	.38788	.00419	.16710
#1	.37154	18.65	.38567	.37054	18.961	.37919	.37576
#2	.37351	18.69	.38478	.37376	19.065	.37922	.37488
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.38386	.37533	.38099	.38004
Stddev	.00102	.00307	.00124	.00279
%RSD	.26664	.81795	.32564	.73283
#1	.38458	.37315	.38186	.38201
#2	.38314	.37750	.38011	.37807
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3237.5	4885.4	75101.	7388.6
Stddev	2.3	12.3	142.	16.4
%RSD	.07077	.25214	.18943	.22225
#1	3239.1	4894.1	75000.	7377.0
#2	3235.8	4876.7	75202.	7400.2

Sample Name: ICB-1734412 Acquired: 11/14/2013 9:45:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**.00029**	**.00009**	**.00046**	**.00001**	**.00001**	**-.00681**
Stddev	.00025	.02533	.00035	.00041	.00000	.00003	.00221
%RSD	54.063	8742.8	410.69	88.111	32.419	557.93	32.433
#1	.00063	.01820	-.00016	.00075	.00001	.00003	-.00525
#2	.00028	-.01762	.00034	.00017	.00001	-.00002	-.00837
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**.00006**	**-.00021**	**-.00015**	**-.00351**	**.02086**	**.00208**
Stddev	.00012	.00002	.00006	.00024	.00140	.00227	.00029
%RSD	174.10	37.970	27.640	162.62	39.878	10.896	13.873
#1	-.00015	.00007	-.00017	-.00032	-.00450	.02247	.00187
#2	.00002	.00004	-.00026	.00002	-.00252	.01925	.00228
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00076**	**-.00119**	**-.00005**	**.00047**	**-.00016**	**-.00140**	**-.00010**
Stddev	.00089	.00552	.00003	.00015	.00005	.00566	.00016
%RSD	117.00	465.10	64.125	32.002	32.695	404.67	153.97
#1	-.00139	.00272	-.00003	.00058	-.00020	.00260	-.00021
#2	-.00013	-.00509	-.00008	.00036	-.00013	-.00540	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: ICB-1734412 Acquired: 11/14/2013 9:45:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00159**	**-.0020**	**-.00146**	**-.00371**	**-.00830**	**.00000**	**-.00007**
Stddev	.00164	.0058	.00040	.00049	.01532	.00041	.00009
%RSD	103.19	285.8	27.389	13.058	184.72	8920.6	129.61
#1	-.00275	.0021	-.00118	-.00337	-.01913	-.00029	-.00001
#2	-.00043	-.0061	-.00175	-.00406	.00254	.00030	-.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00014**	**-.00245**	**-.00028**	**-.00010**
Stddev	.00012	.00105	.00007	.00012
%RSD	84.479	42.891	26.356	127.55
#1	-.00022	-.00171	-.00023	-.00019
#2	-.00006	-.00320	-.00033	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3398.5**	**4963.4**	**78212.**	**7424.9**
Stddev	4.8	8.7	41.	41.9
%RSD	.14061	.17617	.05204	.56468
#1	3401.9	4969.6	78241.	7454.6
#2	3395.1	4957.2	78183.	7395.3

Sample Name: CRI-1739110 Acquired: 11/14/2013 9:47:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00558**	**.41353**	**.01836**	**.03912**	**.00429**	**.00411**	**1.0079**
Stddev	.00064	.00005	.00307	.00041	.00000	.00008	.0051
%RSD	11.443	.01101	16.729	1.0438	.08017	1.9775	.50307
#1	.00603	.41350	.02053	.03883	.00429	.00416	1.0115
#2	.00513	.41356	.01619	.03941	.00429	.00405	1.0043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00197**	**.00795**	**.00759**	**.02025**	**.10147**	**.96420**	**.85239**
Stddev	.00001	.00009	.00013	.00010	.00016	.04656	.00884
%RSD	.43977	1.1395	1.6795	.50846	.15358	4.8289	1.0366
#1	.00196	.00801	.00768	.02018	.10158	.93128	.85864
#2	.00197	.00789	.00750	.02032	.10136	.99712	.84615
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05601**	**.39680**	**.00648**	**.00560**	**.01983**	**1.8903**	**.01938**
Stddev	.00007	.00560	.00007	.00018	.00041	.0038	.00004
%RSD	.12103	1.4101	1.0632	3.2304	2.0530	.20232	.22358
#1	.05606	.40076	.00653	.00547	.01955	1.8930	.01941
#2	.05596	.39285	.00644	.00573	.02012	1.8876	.01935
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CRI-1739110 Acquired: 11/14/2013 9:47:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00955	.3948	.03916	.02923	1.0181	.01887	.00979
Stddev	.00108	.0078	.00270	.00236	.0142	.00029	.00011
%RSD	11.285	1.968	6.9053	8.0855	1.3920	1.5426	1.1348
#1	.00879	.4002	.04107	.02756	1.0080	.01866	.00987
#2	.01032	.3893	.03725	.03091	1.0281	.01907	.00971
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00972	.03735	.01022	.02015
Stddev	.00009	.00232	.00038	.00056
%RSD	.92330	6.2094	3.7208	2.7732
#1	.00978	.03571	.01049	.01975
#2	.00966	.03899	.00995	.02054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3400.8	4955.6	77374.	7360.7
Stddev	9.4	2.9	44.	26.9
%RSD	.27561	.05764	.05723	.36491
#1	3407.5	4957.6	77342.	7341.7
#2	3394.2	4953.6	77405.	7379.7

Sample Name: ICVL-1723353 Acquired: 11/14/2013 9:50:08 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00330**	**.20310**	**.01069**	**.01986**	**.00214**	**.00206**	**.50387**
Stddev	.00035	.00526	.00045	.00006	.00001	.00001	.00276
%RSD	10.627	2.5912	4.2451	.29932	.33396	.40773	.54776
#1	.00305	.19938	.01037	.01991	.00214	.00205	.50582
#2	.00355	.20682	.01101	.01982	.00215	.00206	.50192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**.00399**	**.00377**	**.00992**	**.04652**	**.47078**	**.42219**
Stddev	.00001	.00009	.00018	.00016	.00042	.00711	.00400
%RSD	1.0131	2.2019	4.6569	1.5858	.90477	1.5096	.94631
#1	.00083	.00393	.00389	.00981	.04682	.47580	.41936
#2	.00084	.00405	.00364	.01003	.04622	.46575	.42501
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02717**	**.20584**	**.00337**	**.00356**	**.00976**	**.92180**	**.00993**
Stddev	.00022	.00019	.00003	.00047	.00009	.00005	.00015
%RSD	.79423	.09025	.82972	13.188	.90300	.00562	1.5506
#1	.02702	.20597	.00335	.00389	.00983	.92176	.00982
#2	.02733	.20571	.00339	.00322	.00970	.92183	.01004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ICVL-1723353 Acquired: 11/14/2013 9:50:08 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00368	.2078	.01862	.01620	.48875	.00948	.00493
Stddev	.00034	.0062	.00024	.00131	.02682	.00033	.00009
%RSD	9.2196	2.987	1.2868	8.0615	5.4878	3.4930	1.8922
#1	.00344	.2034	.01845	.01712	.46978	.00925	.00486
#2	.00392	.2121	.01879	.01528	.50771	.00972	.00499
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00512	.01693	.00465	.01039
Stddev	.00017	.00023	.00008	.00025
%RSD	3.2358	1.3868	1.7426	2.4010
#1	.00523	.01709	.00459	.01056
#2	.00500	.01676	.00471	.01021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3419.5	5036.2	78715.	7557.6
Stddev	3.6	12.7	90.	22.9
%RSD	.10498	.25244	.11417	.30269
#1	3422.1	5045.2	78779.	7573.7
#2	3417.0	5027.2	78651.	7541.4

Sample Name: ICSA-1716849 Acquired: 11/14/2013 9:52:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00066	552.60	-.00473	-.00045	.00195	-.00001	500.79
Stddev	.00029	.90	.00439	.00029	.00001	.00005	1.34
%RSD	44.108	.16344	92.806	63.913	.62782	951.48	.26774
#1	.00045	551.96	-.00162	-.00066	.00194	.00003	499.84
#2	.00086	553.24	-.00783	-.00025	.00196	-.00004	501.73
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00051	-.00106	.00069	.00215	203.33	.01660	.00619
Stddev	.00007	.00040	.00009	.00010	.92	.01612	.00026
%RSD	14.493	37.847	12.851	4.4893	.45088	97.099	4.2641
#1	.00045	-.00078	.00063	.00222	202.68	.02800	.00638
#2	.00056	-.00135	.00076	.00208	203.98	.00520	.00601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00258	516.25	.00140	.00201	-.00078	.08037	-.00077
Stddev	.00036	.20	.00012	.00044	.00023	.00458	.00071
%RSD	14.097	.03814	8.2608	21.653	29.430	5.6983	92.932
#1	.00283	516.39	.00148	.00232	-.00094	.07713	-.00026
#2	.00232	516.11	.00131	.00171	-.00062	.08361	-.00127
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: ICSA-1716849 Acquired: 11/14/2013 9:52:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00659**	**-.1070**	**-.02360**	**-.00339**	**.00144**	**.00201**	**.00504**
Stddev	.00143	.0016	.00261	.00526	.01037	.00065	.00012
%RSD	21.687	1.530	11.049	155.20	718.65	32.160	2.4530
#1	-.00558	-.1081	-.02175	.00033	-.00589	.00155	.00513
#2	-.00760	-.1058	-.02544	-.00711	.00877	.00247	.00496
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00304**	**.00303**	**-.00068**	**.00385**
Stddev	.00042	.00198	.00032	.00012
%RSD	13.665	65.229	47.202	3.1611
#1	.00275	.00163	-.00090	.00376
#2	.00334	.00443	-.00045	.00393
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2588.6**	**4416.9**	**66230.**	**6942.3**
Stddev	2.9	3.0	65.	10.2
%RSD	.11031	.06803	.09791	.14709
#1	2590.6	4419.0	66184.	6949.5
#2	2586.6	4414.8	66276.	6935.1

Sample Name: ICSAB-1723354 Acquired: 11/14/2013 9:55:08 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.22380**	**530.40**	**.09756**	**.00434**	**.52858**	**.52068**	**497.28**
Stddev	.00100	2.50	.00079	.00033	.00118	.00128	.40
%RSD	.44726	.47170	.80545	7.5259	.22412	.24509	.08044
#1	.22451	528.63	.09811	.00411	.52774	.51978	497.00
#2	.22309	532.17	.09700	.00457	.52942	.52158	497.56
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0459**	**.51277**	**.48603**	**.55247**	**96.830**	**.01335**	**.02004**
Stddev	.0006	.00052	.00206	.00084	.708	.02086	.00033
%RSD	.05461	.10175	.42348	.15283	.73154	156.26	1.6512
#1	1.0463	.51314	.48749	.55307	96.329	-.00140	.01981
#2	1.0455	.51240	.48458	.55187	97.331	.02810	.02028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.56998**	**517.33**	**.47615**	**.52321**	**-.00030**	**.05969**	**.99276**
Stddev	.00464	3.24	.00099	.00088	.00054	.00803	.00169
%RSD	.81433	.62659	.20779	.16807	183.14	13.451	.17004
#1	.56670	519.62	.47685	.52383	.00009	.05401	.99395
#2	.57326	515.03	.47545	.52259	-.00068	.06536	.99157
Check ?	None	Chk Pass	Chk Pass	Chk Pass	None	None	Chk Pass
Value							
Range							

Sample Name: ICSAB-1723354 Acquired: 11/14/2013 9:55:08 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.04325	F .3674	.60093	.04985	1.0909	.00226	.53343
Stddev	.00124	.0082	.00307	.00642	.0387	.00124	.00026
%RSD	2.8677	2.236	.51084	12.875	3.5495	54.744	.04956
#1	.04413	.3732	.60310	.04531	1.0635	.00139	.53325
#2	.04238	.3616	.59876	.05438	1.1183	.00314	.53362
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value		.2000					
Range		20.00%					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00255	.10032	.49345	.96224
Stddev	.00002	.00388	.00141	.00883
%RSD	.68062	3.8686	.28665	.91742
#1	.00254	.10307	.49445	.96848
#2	.00257	.09758	.49245	.95600
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2606.7	4430.2	66335.	6924.2
Stddev	2.8	4.1	297.	14.2
%RSD	.10582	.09347	.44736	.20478
#1	2604.8	4427.2	66125.	6934.3
#2	2608.7	4433.1	66545.	6914.2

Sample Name: ccv-1757648 Acquired: 11/14/2013 9:57:40 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50481**	**25.498**	**.50795**	**.49189**	**.50753**	**.50313**	**25.045**
Stddev	.00246	.093	.00074	.00058	.00081	.00132	.084
%RSD	.48725	.36390	.14617	.11872	.15931	.26334	.33583
#1	.50308	25.432	.50848	.49148	.50695	.50407	24.986
#2	.50655	25.564	.50743	.49230	.50810	.50219	25.105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50101**	**.49692**	**.51150**	**.50795**	**24.636**	**24.966**	**25.987**
Stddev	.00030	.00003	.00278	.00155	.013	.066	.234
%RSD	.06031	.00692	.54260	.30523	.05345	.26326	.90084
#1	.50080	.49694	.50954	.50686	24.645	24.919	26.153
#2	.50122	.49690	.51346	.50905	24.626	25.012	25.822
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49710**	**24.456**	**.51087**	**.50141**	**.50641**	**24.921**	**.50065**
Stddev	.00183	.100	.00158	.00209	.00055	.095	.00039
%RSD	.36876	.40997	.30951	.41743	.10891	.38055	.07826
#1	.49581	24.385	.50975	.49993	.50602	24.854	.50093
#2	.49840	24.527	.51199	.50289	.50680	24.989	.50038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ccv-1757648 Acquired: 11/14/2013 9:57:40 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49909	25.20	.51710	.50255	24.776	.50813	.50385
Stddev	.00077	.03	.00173	.00564	.051	.00142	.00232
%RSD	.15353	.1303	.33520	1.1231	.20480	.27910	.46020
#1	.49855	25.18	.51832	.50654	24.740	.50913	.50549
#2	.49964	25.22	.51587	.49856	24.812	.50713	.50221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51096	.50708	.50724	.50578
Stddev	.00009	.00045	.00420	.00492
%RSD	.01666	.08809	.82759	.97337
#1	.51090	.50677	.50427	.50230
#2	.51102	.50740	.51021	.50926
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3182.0	4840.5	74287.	7308.3
Stddev	6.1	.4	328.	8.5
%RSD	.19227	.00836	.44124	.11638
#1	3177.6	4840.2	74519.	7314.3
#2	3186.3	4840.8	74055.	7302.2

Sample Name: CCB-1734412 Acquired: 11/14/2013 10:00:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**-.01136**	**.00071**	**-.00050**	**.00000**	**-.00003**	**-.00579**
Stddev	.00036	.00128	.00336	.00028	.00001	.00009	.00390
%RSD	287.88	11.249	472.98	55.556	334.98	316.70	67.292
#1	.00038	-.01045	.00308	-.00069	.00001	-.00009	-.00855
#2	-.00013	-.01226	-.00166	-.00030	-.00000	.00003	-.00304
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**.00010**	**-.00076**	**.00008**	**.00285**	**.01831**	**.00093**
Stddev	.00001	.00009	.00032	.00010	.00185	.03911	.00022
%RSD	107.46	84.263	42.089	132.60	64.725	213.58	23.500
#1	-.00000	.00016	-.00053	.00015	.00155	.04597	.00108
#2	-.00001	.00004	-.00099	.00000	.00416	-.00934	.00078
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**-.00214**	**-.00004**	**.00015**	**-.00013**	**-.00090**	**-.00002**
Stddev	.00025	.00085	.00004	.00013	.00008	.00312	.00007
%RSD	104.90	39.872	100.71	84.380	60.338	348.48	435.46
#1	.00041	-.00154	-.00001	.00024	-.00019	.00131	.00003
#2	.00006	-.00275	-.00007	.00006	-.00008	-.00310	-.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB-1734412 Acquired: 11/14/2013 10:00:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00085**	**-.0020**	**-.00053**	**-.00091**	**-.00224**	**.00018**	**-.00008**
Stddev	.00135	.0016	.00010	.00176	.01113	.00026	.00006
%RSD	157.85	81.03	18.038	193.67	497.70	147.73	76.457
#1	.00010	-.0032	-.00060	-.00216	-.01011	-.00001	-.00012
#2	-.00181	-.0009	-.00047	.00034	.00563	.00036	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00001**	**-.00502**	**-.00021**	**.00022**
Stddev	.00035	.00342	.00018	.00019
%RSD	3621.8	67.991	82.684	85.947
#1	-.00025	-.00261	-.00034	.00009
#2	.00024	-.00744	-.00009	.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3409.3**	**4977.5**	**78369.**	**7356.5**
Stddev	4.3	3.1	52.	2.0
%RSD	.12655	.06268	.06662	.02670
#1	3412.3	4979.7	78332.	7355.1
#2	3406.2	4975.3	78406.	7357.9

Sample Name: CCVL Acquired: 11/14/2013 10:02:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00300**	**.21676**	**.00999**	**.01916**	**.00212**	**.00201**	**.51038**
Stddev	.00017	.00156	.00060	.00006	.00001	.00000	.00527
%RSD	5.5239	.71805	6.0362	.33117	.58519	.21576	1.0324
#1	.00312	.21786	.00957	.01912	.00213	.00201	.51410
#2	.00289	.21566	.01042	.01921	.00211	.00201	.50665
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00081**	**.00408**	**.00356**	**.01000**	**.04618**	**.51143**	**.42799**
Stddev	.00000	.00018	.00020	.00007	.00046	.00600	.00210
%RSD	.29118	4.4544	5.7330	.71900	1.0031	1.1732	.49119
#1	.00082	.00421	.00370	.00995	.04585	.50719	.42650
#2	.00081	.00396	.00341	.01005	.04651	.51568	.42947
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02797**	**.20595**	**.00327**	**.00345**	**.00952**	**.93257**	**.00966**
Stddev	.00053	.00074	.00002	.00064	.00017	.00067	.00041
%RSD	1.8939	.35972	.74472	18.496	1.7856	.07235	4.1999
#1	.02834	.20647	.00326	.00390	.00964	.93305	.00995
#2	.02759	.20542	.00329	.00300	.00940	.93210	.00938
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 10:02:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00444	.2023	.01921	.01357	.49983	.00984	.00469
Stddev	.00032	.0013	.00113	.00060	.01509	.00021	.00001
%RSD	7.1037	.6373	5.8877	4.4284	3.0188	2.1288	.19831
#1	.00422	.2032	.02001	.01400	.48916	.00998	.00470
#2	.00466	.2014	.01841	.01315	.51050	.00969	.00469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00479	.01818	.00470	.01064
Stddev	.00002	.00021	.00016	.00052
%RSD	.44019	1.1584	3.5017	4.8836
#1	.00480	.01833	.00482	.01101
#2	.00477	.01803	.00459	.01028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3415.2	5028.1	78257.	7434.4
Stddev	10.4	20.8	26.	15.7
%RSD	.30334	.41305	.03322	.21121
#1	3422.6	5042.8	78239.	7445.5
#2	3407.9	5013.4	78276.	7423.3

Sample Name: mb 480-151401/1-a Acquired: 11/14/2013 10:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00027**	**.00863**	**.00144**	**.00013**	**.00016**
Stddev	.00022	.00635	.00285	.00001	.00002
%RSD	82.385	73.571	197.16	7.1667	15.148
#1	-.00042	.00414	-.00057	.00012	.00015
#2	-.00011	.01313	.00346	.00013	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.04114**	**.00013**	**.00001**	**-.00024**
Stddev	.00002	.00181	.00010	.00005	.00008
%RSD	51.108	4.3879	75.419	479.94	33.886
#1	.00002	.03986	.00006	-.00002	-.00018
#2	.00004	.04242	.00020	.00005	-.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00043**	**.00512**	**.05772**	**.03495**	**-.00067**
Stddev	.00006	.00149	.02143	.00016	.00036
%RSD	14.576	29.161	37.122	.44832	53.647
#1	.00039	.00406	.07288	.03484	-.00042
#2	.00048	.00617	.04257	.03506	-.00093
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-151401/1-a Acquired: 11/14/2013 10:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**.00010**	**.00022**	**-.00003**	**.01833**
Stddev	.00261	.00005	.00059	.00014	.00638
%RSD	774.24	50.740	273.60	477.77	34.821
#1	-.00151	.00014	.00063	-.00013	.02284
#2	.00218	.00007	-.00020	.00007	.01381
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**.00028**	**.0034**	**.00014**	**.00292**
Stddev	.00012	.00170	.0013	.00041	.00203
%RSD	109.88	607.70	37.59	298.51	69.473
#1	.00019	-.00092	.0043	.00043	.00149
#2	.00002	.00148	.0025	-.00015	.00436
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14024**	F **.05005**	**.00009**	**.00039**	**-.00470**
Stddev	.00920	.00047	.00012	.00003	.00403
%RSD	6.5633	.93919	132.60	8.6292	85.743
#1	.13373	.05038	.00001	.00041	-.00755
#2	.14675	.04972	.00018	.00036	-.00185
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		.01000			
Low Limit		-.01000			

Sample Name: mb 480-151401/1-a Acquired: 11/14/2013 10:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00006**	**.00364**
Stddev	.00002	.00050
%RSD	27.008	13.726
#1	-.00005	.00328
#2	-.00007	.00399
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3351.4**	**4877.3**	**76328.**	**7150.2**
Stddev	4.8	11.6	191.	6.9
%RSD	.14277	.23797	.25003	.09712
#1	3348.0	4869.1	76463.	7155.2
#2	3354.8	4885.5	76193.	7145.3

Sample Name: CCV Acquired: 11/14/2013 10:07:20 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48929**	**24.982**	**.49890**	**.48323**	**.49741**	**.49705**	**24.698**
Stddev	.00052	.061	.00330	.00108	.00045	.00007	.019
%RSD	.10719	.24501	.66185	.22267	.08968	.01347	.07684
#1	.48966	25.026	.50124	.48247	.49772	.49701	24.685
#2	.48891	24.939	.49657	.48399	.49709	.49710	24.712
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48964**	**.48701**	**.49862**	**.49380**	**24.287**	**24.495**	**25.299**
Stddev	.00098	.00029	.00209	.00110	.026	.004	.102
%RSD	.19957	.06028	.41936	.22315	.10733	.01812	.40172
#1	.49033	.48722	.49714	.49302	24.306	24.498	25.371
#2	.48895	.48681	.50009	.49458	24.269	24.492	25.227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48721**	**23.984**	**.50122**	**.49261**	**.49516**	**24.415**	**.49272**
Stddev	.00375	.052	.00209	.00041	.00016	.068	.00019
%RSD	.76916	.21615	.41675	.08358	.03268	.28033	.03956
#1	.48985	23.947	.49974	.49232	.49505	24.463	.49258
#2	.48456	24.020	.50269	.49290	.49527	24.366	.49285
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 10:07:20 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48947	24.89	.50216	.49289	24.429	.49664	.49463
Stddev	.00038	.00	.00026	.00037	.087	.00070	.00039
%RSD	.07800	.0191	.05095	.07603	.35553	.14093	.07841
#1	.48920	24.89	.50198	.49316	24.368	.49714	.49435
#2	.48974	24.89	.50234	.49263	24.490	.49615	.49490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49789	.49363	.49095	.49293
Stddev	.00047	.00081	.00022	.00268
%RSD	.09515	.16369	.04385	.54393
#1	.49823	.49306	.49080	.49104
#2	.49756	.49421	.49110	.49483
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3208.8	4893.5	75354.	7390.1
Stddev	5.5	13.7	244.	25.5
%RSD	.17154	.27942	.32336	.34541
#1	3212.7	4903.2	75526.	7408.2
#2	3204.9	4883.8	75181.	7372.1

Sample Name: CCB Acquired: 11/14/2013 10:09:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**.00344**	**.00238**	**-.00001**	**.00002**	**-.00009**	**-.00413**
Stddev	.00065	.01364	.00126	.00029	.00001	.00003	.00451
%RSD	133.37	396.17	52.879	2780.7	40.021	34.965	109.04
#1	.00003	.01308	.00149	-.00022	.00001	-.00007	-.00732
#2	.00094	-.00620	.00327	.00020	.00003	-.00011	-.00095
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**-.00006**	**-.00027**	**-.00017**	**-.00149**	**.01267**	**.00085**
Stddev	.00002	.00003	.00032	.00010	.00282	.04621	.00036
%RSD	32.102	49.886	116.60	62.096	189.99	364.77	43.036
#1	-.00008	-.00004	-.00050	-.00024	.00051	-.02001	.00059
#2	-.00005	-.00008	-.00005	-.00009	-.00348	.04535	.00110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**-.00256**	**-.00001**	**.00054**	**-.00001**	**-.00321**	**-.00036**
Stddev	.00042	.00269	.00000	.00031	.00013	.00275	.00057
%RSD	72.604	105.07	33.392	57.453	1667.8	85.675	158.36
#1	.00028	-.00066	-.00001	.00032	-.00010	-.00515	-.00076
#2	.00087	-.00446	-.00002	.00076	.00008	-.00126	.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 10:09:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00176	-.0017	-.00130	.00165	.01020	-.00017	-.00008
Stddev	.00007	.0013	.00063	.00058	.01373	.00022	.00004
%RSD	4.0479	76.63	48.508	35.187	134.66	126.30	46.023
#1	-.00170	-.0026	-.00175	.00206	.01990	-.00033	-.00005
#2	-.00181	-.0008	-.00085	.00124	.00049	-.00002	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00018	-.00179	-.00027	.00002
Stddev	.00009	.00192	.00007	.00071
%RSD	49.546	107.11	24.335	4126.1
#1	.00024	-.00043	-.00032	-.00048
#2	.00011	-.00315	-.00023	.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3400.1	4970.7	78223.	7348.9
Stddev	2.3	6.9	92.	49.4
%RSD	.06833	.13823	.11811	.67201
#1	3401.7	4965.9	78158.	7314.0
#2	3398.4	4975.6	78289.	7383.8

Sample Name: CCVL Acquired: 11/14/2013 10:12:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00310**	**.20511**	**.00988**	**.01921**	**.00212**	**.00198**	**.50665**
Stddev	.00013	.00804	.00012	.00000	.00001	.00005	.00084
%RSD	4.0518	3.9217	1.1881	.00250	.40369	2.7120	.16579
#1	.00301	.21080	.00997	.01921	.00212	.00194	.50724
#2	.00319	.19942	.00980	.01921	.00211	.00202	.50605
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00080**	**.00395**	**.00355**	**.00968**	**.04642**	**.48457**	**.42592**
Stddev	.00001	.00012	.00033	.00015	.00263	.03480	.00049
%RSD	1.4312	2.9939	9.4058	1.5567	5.6651	7.1818	.11620
#1	.00079	.00386	.00379	.00979	.04456	.45996	.42627
#2	.00081	.00403	.00331	.00957	.04828	.50917	.42557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02708**	**.20404**	**.00330**	**.00341**	**.00935**	**.93350**	**.01031**
Stddev	.00031	.00064	.00002	.00027	.00014	.00524	.00065
%RSD	1.1411	.31162	.64460	7.8856	1.5310	.56143	6.3528
#1	.02730	.20359	.00332	.00360	.00925	.93721	.00984
#2	.02686	.20448	.00329	.00322	.00945	.92980	.01077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 10:12:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00449	.2065	.01808	.01174	.48978	.00957	.00499
Stddev	.00142	.0022	.00077	.00070	.00487	.00016	.00012
%RSD	31.543	1.077	4.2865	5.9388	.99510	1.6574	2.4729
#1	.00549	.2049	.01862	.01223	.48633	.00968	.00507
#2	.00349	.2080	.01753	.01125	.49322	.00946	.00490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00476	.01829	.00496	.01017
Stddev	.00003	.00090	.00038	.00048
%RSD	.63935	4.9415	7.7279	4.7168
#1	.00473	.01893	.00469	.00983
#2	.00478	.01765	.00523	.01051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3411.0	5017.3	78557.	7424.4
Stddev	14.8	27.1	58.	3.3
%RSD	.43506	.53915	.07383	.04436
#1	3421.5	5036.4	78598.	7422.1
#2	3400.5	4998.1	78516.	7426.8

Sample Name: Icssrm 480-151401/2- Acquired: 11/14/2013 10:14:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.36395	70.988	.93211	1.3563	2.8516
Stddev	.00182	.087	.00328	.0019	.0112
%RSD	.50110	.12233	.35162	.14289	.39096
#1	.36524	71.050	.92980	1.3550	2.8595
#2	.36266	70.927	.93443	1.3577	2.8437
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.68992	61.348	1.6824	1.2569	1.2574
Stddev	.00120	.205	.0022	.0025	.0191
%RSD	.17368	.33475	.13201	.19830	1.5220
#1	.68907	61.203	1.6809	1.2587	1.2710
#2	.69077	61.494	1.6840	1.2552	1.2439
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.98304	94.961	25.326	26.993	.07009
Stddev	.00940	.099	.114	.036	.00094
%RSD	.95606	.10400	.45180	.13260	1.3415
#1	.98969	94.892	25.407	26.967	.07076
#2	.97640	95.031	25.245	27.018	.06943
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit					
Low Limit					

Sample Name: lcssrm 480-151401/2- Acquired: 11/14/2013 10:14:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.160**	**2.8869**	**2.9006**	**1.3196**	**26.418**
Stddev	.069	.0106	.0147	.0037	.175
%RSD	.27558	.36636	.50517	.27794	.66398
#1	25.209	2.8944	2.9109	1.3170	26.542
#2	25.111	2.8794	2.8902	1.3221	26.294
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5266**	**1.1301**	**2.150**	**.63623**	**1.4183**
Stddev	.0004	.0024	.000	.00197	.0046
%RSD	.02294	.20889	.0080	.31035	.32112
#1	1.5264	1.1284	2.150	.63483	1.4216
#2	1.5269	1.1318	2.150	.63762	1.4151
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.967**	**.89533**	**.95335**	**2.6648**	**1.6869**
Stddev	.097	.00161	.00117	.0018	.0001
%RSD	.74572	.17949	.12311	.06816	.00400
#1	13.035	.89646	.95418	2.6636	1.6869
#2	12.898	.89419	.95252	2.6661	1.6870
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcssrm 480-151401/2- Acquired: 11/14/2013 10:14:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.87739**	**1.4286**
Stddev	.00876	.0083
%RSD	.99856	.58404
#1	.88358	1.4345
#2	.87119	1.4227
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3019.2**	**4910.0**	**75189.**	**7376.7**
Stddev	3.7	3.8	672.	1.1
%RSD	.12244	.07723	.89394	.01558
#1	3016.6	4912.7	74714.	7375.8
#2	3021.8	4907.3	75664.	7377.5

Sample Name: 480-49854-a-21-b Acquired: 11/14/2013 10:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**23.735**	**.00084**	**.01697**	**.57819**
Stddev	.00016	.059	.00152	.00014	.00004
%RSD	78.854	.24937	179.82	.79956	.00615
#1	-.00031	23.693	.00192	.01687	.57816
#2	-.00009	23.777	-.00023	.01707	.57821
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00132**	**20.585**	**.00109**	**.10282**	**.30105**
Stddev	.00005	.094	.00010	.00006	.00202
%RSD	3.4910	.45545	9.1299	.05355	.66951
#1	.00128	20.519	.00102	.10286	.30248
#2	.00135	20.652	.00116	.10278	.29963
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.40644**	**68.300**	**2.0869**	**2.1214**	**.02098**
Stddev	.00163	.074	.0080	.0023	.00084
%RSD	.39995	.10828	.38168	.10984	4.0195
#1	.40758	68.248	2.0925	2.1198	.02039
#2	.40529	68.353	2.0813	2.1231	.02158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-21-b Acquired: 11/14/2013 10:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**22.135**	**2.5654**	**2.4891**	**.00029**	**.91157**
Stddev	.107	.0093	.0176	.00006	.01695
%RSD	.48279	.36254	.70633	19.106	1.8592
#1	22.211	2.5720	2.5015	.00033	.89959
#2	22.059	2.5589	2.4766	.00025	.92355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.47066**	**.09041**	F **11.10**	**-.00254**	**.01325**
Stddev	.00055	.00189	.02	.00113	.00434
%RSD	.11782	2.0858	.1680	44.506	32.759
#1	.47105	.08908	11.08	-.00174	.01632
#2	.47026	.09174	11.11	-.00333	.01018
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.2946**	**.03018**	**.08048**	**1.3908**	**-.00133**
Stddev	.0165	.00008	.00059	.0040	.00172
%RSD	.22640	.26799	.73771	.28481	129.27
#1	7.2830	.03023	.08006	1.3936	-.00254
#2	7.3063	.03012	.08090	1.3880	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-21-b Acquired: 11/14/2013 10:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.12310**	**.38110**
Stddev	.00095	.00178
%RSD	.77461	.46679
#1	.12377	.38236
#2	.12242	.37985
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3224.8**	**4891.5**	**75535.**	**7297.8**
Stddev	5.5	8.1	397.	13.3
%RSD	.16954	.16622	.52527	.18273
#1	3221.0	4885.8	75255.	7307.2
#2	3228.7	4897.2	75816.	7288.4

Sample Name: 480-49854-a-22-b Acquired: 11/14/2013 10:19:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**33.594**	**.00595**	**.02258**	**.70222**
Stddev	.00014	.200	.00127	.00051	.00445
%RSD	167.47	.59451	21.371	2.2484	.63428
#1	.00002	33.735	.00684	.02294	.70537
#2	-.00018	33.453	.00505	.02222	.69907
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00181**	**25.191**	**.00154**	**.14690**	**.31922**
Stddev	.00005	.173	.00003	.00008	.00089
%RSD	2.9496	.68665	1.9132	.05295	.27765
#1	.00177	25.314	.00152	.14695	.31859
#2	.00185	25.069	.00157	.14684	.31984
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.2209**	**107.20**	**3.6392**	**3.8815**	**.03520**
Stddev	.0006	.91	.0215	.0357	.00061
%RSD	.04517	.85157	.58932	.92095	1.7395
#1	1.2213	107.84	3.6544	3.9067	.03563
#2	1.2205	106.55	3.6240	3.8562	.03476
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-22-b Acquired: 11/14/2013 10:19:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**38.095**	**5.0901**	**5.0866**	**-.00004**	**.89113**
Stddev	.087	.0156	.0293	.00001	.00713
%RSD	.22941	.30642	.57574	29.176	.80047
#1	38.033	5.0790	5.0659	-.00003	.88609
#2	38.157	5.1011	5.1073	-.00004	.89618
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.65383**	**.13634**	F **10.17**	**-.00440**	**.01265**
Stddev	.00040	.00142	.00	.00028	.00086
%RSD	.06109	1.0436	.0397	6.3538	6.8243
#1	.65411	.13534	10.17	-.00420	.01204
#2	.65355	.13735	10.17	-.00460	.01326
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.5898**	**.05053**	**.08824**	**2.0948**	**-.00294**
Stddev	.0815	.00004	.00024	.0033	.00266
%RSD	.84970	.07555	.27382	.15879	90.258
#1	9.6475	.05056	.08841	2.0925	-.00482
#2	9.5322	.05050	.08807	2.0972	-.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-22-b Acquired: 11/14/2013 10:19:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12484	.66520
Stddev	.00078	.00398
%RSD	.62458	.59774
#1	.12428	.66239
#2	.12539	.66801
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3158.5	4898.0	75947.	7291.1
Stddev	6.8	13.4	204.	74.1
%RSD	.21524	.27402	.26889	1.0160
#1	3153.7	4888.5	76091.	7238.7
#2	3163.3	4907.5	75803.	7343.5

Sample Name: 480-49854-a-23-b Acquired: 11/14/2013 10:21:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**29.003**	**.00465**	**.01797**	**.60186**
Stddev	.00061	.108	.00012	.00070	.00016
%RSD	657.26	.37117	2.5853	3.8741	.02677
#1	-.00053	29.079	.00456	.01847	.60197
#2	.00034	28.927	.00473	.01748	.60175
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00137**	**24.153**	**.00081**	**.08453**	**.24800**
Stddev	.00004	.078	.00003	.00029	.00174
%RSD	3.0900	.32195	3.7486	.34478	.70036
#1	.00134	24.208	.00083	.08474	.24677
#2	.00140	24.098	.00078	.08433	.24923
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.49987**	**91.621**	**2.6653**	**2.8117**	**.02616**
Stddev	.00087	.667	.0147	.0039	.00053
%RSD	.17396	.72765	.55156	.13995	2.0414
#1	.49925	92.093	2.6549	2.8145	.02653
#2	.50048	91.150	2.6757	2.8090	.02578
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-b Acquired: 11/14/2013 10:21:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**30.869**	**2.5833**	**2.5015**	**-.00065**	**1.3477**
Stddev	.057	.0069	.0103	.00018	.0009
%RSD	.18563	.26825	.41058	28.033	.06399
#1	30.828	2.5784	2.4943	-.00078	1.3471
#2	30.910	2.5882	2.5088	-.00052	1.3484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.37138**	**.08931**	**5.755**	**-.00417**	**.00672**
Stddev	.00008	.00024	.018	.00161	.00027
%RSD	.02201	.27093	.3166	38.674	4.0230
#1	.37132	.08914	5.768	-.00303	.00692
#2	.37144	.08948	5.742	-.00531	.00653
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.5601**	**.03605**	**.10419**	**1.4902**	**-.00313**
Stddev	.0469	.00001	.00059	.0015	.00357
%RSD	.49007	.03958	.56190	.10383	114.20
#1	9.5269	.03604	.10378	1.4891	-.00566
#2	9.5932	.03606	.10461	1.4913	-.00060
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-b Acquired: 11/14/2013 10:21:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.08210	.43922
Stddev	.00009	.00291
%RSD	.11074	.66245
#1	.08216	.43717
#2	.08203	.44128
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3191.5	4899.5	75503.	7219.8
Stddev	.9	1.5	44.	17.0
%RSD	.02889	.03037	.05833	.23577
#1	3190.9	4898.5	75471.	7207.7
#2	3192.2	4900.6	75534.	7231.8

Sample Name: 480-49854-a-23-bSD@5 Acquired: 11/14/2013 10:24:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00057**	**5.8137**	**-.00148**	**.00340**	**.12689**
Stddev	.00023	.0275	.00008	.00009	.00002
%RSD	40.671	.47229	5.5761	2.7209	.01511
#1	-.00041	5.7943	-.00142	.00333	.12690
#2	-.00074	5.8332	-.00154	.00346	.12688
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**4.9218**	**.00020**	**.01673**	**.05057**
Stddev	.00004	.0098	.00007	.00000	.00008
%RSD	10.672	.19938	37.016	.02728	.15552
#1	.00032	4.9288	.00015	.01673	.05051
#2	.00037	4.9149	.00025	.01673	.05062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10109**	**18.431**	**.49549**	**.48347**	**.00500**
Stddev	.00017	.054	.00750	.00197	.00005
%RSD	.16513	.29374	1.5142	.40688	.97179
#1	.10121	18.393	.50080	.48208	.00504
#2	.10098	18.469	.49018	.48486	.00497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-bSD@5 Acquired: 11/14/2013 10:24:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.4218**	**.54190**	**.50523**	**-.00033**	**.25407**
Stddev	.0336	.00221	.00065	.00003	.00145
%RSD	.52272	.40839	.12906	9.2034	.57110
#1	6.4455	.54346	.50569	-.00031	.25510
#2	6.3980	.54033	.50477	-.00036	.25304
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.07463**	**.01872**	**1.179**	**-.00311**	**.00221**
Stddev	.00052	.00011	.005	.00055	.00181
%RSD	.69470	.59579	.4608	17.824	82.135
#1	.07500	.01880	1.183	-.00350	.00093
#2	.07426	.01864	1.175	-.00272	.00349
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.8962**	**.00760**	**.02083**	**.30578**	**-.00128**
Stddev	.0051	.00019	.00007	.00084	.00247
%RSD	.26845	2.5012	.35471	.27321	193.21
#1	1.8926	.00746	.02078	.30519	.00047
#2	1.8998	.00773	.02088	.30637	-.00302
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-bSD@5 Acquired: 11/14/2013 10:24:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01658**	**.09118**
Stddev	.00028	.00026
%RSD	1.6946	.28527
#1	.01638	.09137
#2	.01678	.09100
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3362.9**	**4978.3**	**77388.**	**7338.1**
Stddev	7.1	4.2	255.	6.9
%RSD	.21124	.08512	.32915	.09399
#1	3367.9	4981.3	77208.	7343.0
#2	3357.9	4975.3	77568.	7333.2

Sample Name: 480-49854-a-23-b PDS Acquired: 11/14/2013 10:26:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.07947**	**46.193**	**.30882**	**.28255**	**.93133**
Stddev	.00312	.229	.01400	.01272	.00678
%RSD	3.9198	.49622	4.5328	4.5022	.72816
#1	.08167	46.355	.31871	.29154	.93612
#2	.07727	46.031	.29892	.27355	.92653
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.37909**	**40.861**	**.30354**	**.40376**	**.58798**
Stddev	.00368	.042	.01134	.01085	.01303
%RSD	.96976	.10206	3.7369	2.6863	2.2159
#1	.38169	40.831	.31156	.41143	.59719
#2	.37649	40.890	.29552	.39609	.57876
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.82156**	**104.11**	**19.058**	**19.009**	**.37966**
Stddev	.01714	.14	.394	.616	.00842
%RSD	2.0863	.13528	2.0692	3.2425	2.2181
#1	.83368	104.21	19.336	19.445	.38561
#2	.80944	104.01	18.779	18.573	.37370
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-b PDS Acquired: 11/14/2013 10:26:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**46.731**	**2.7899**	**2.7836**	**.32866**	**18.140**
Stddev	.601	.0163	.0241	.01079	.379
%RSD	1.2851	.58437	.86482	3.2840	2.0876
#1	47.155	2.8014	2.8006	.33629	18.408
#2	46.306	2.7783	2.7666	.32103	17.872
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67452**	**.39579**	**5.647**	**.30302**	**.30040**
Stddev	.01152	.01053	.009	.01358	.01421
%RSD	1.7076	2.6595	.1669	4.4808	4.7310
#1	.68266	.40324	5.654	.31262	.31045
#2	.66637	.38835	5.641	.29342	.29035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.603**	**.33446**	**.45096**	**1.7595**	**.29863**
Stddev	.169	.01159	.00527	.0084	.01551
%RSD	.65984	3.4648	1.1696	.47904	5.1945
#1	25.722	.34265	.45469	1.7655	.30960
#2	25.483	.32626	.44723	1.7536	.28766
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-b PDS Acquired: 11/14/2013 10:26:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.43233**	**.73640**
Stddev	.01076	.01346
%RSD	2.4888	1.8281
#1	.43994	.74592
#2	.42472	.72688
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3096.7**	**4835.5**	**74362.**	**7219.7**
Stddev	6.1	5.7	624.	34.1
%RSD	.19568	.11830	.83884	.47288
#1	3092.4	4831.4	73921.	7243.9
#2	3101.0	4839.5	74803.	7195.6

Sample Name: 480-49854-a-23-c ms Acquired: 11/14/2013 10:28:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09509**	**57.731**	**.39376**	**.40328**	**1.2887**
Stddev	.00001	.105	.00401	.00048	.0026
%RSD	.00588	.18230	1.0179	.11925	.19913
#1	.09509	57.806	.39659	.40362	1.2905
#2	.09510	57.657	.39093	.40294	1.2869
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39661**	**48.045**	**.38091**	**.48582**	**.72302**
Stddev	.00110	.041	.00020	.00043	.00326
%RSD	.27735	.08580	.05339	.08799	.45129
#1	.39739	48.074	.38105	.48552	.72532
#2	.39583	48.016	.38076	.48613	.72071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.1110**	**121.62**	**23.142**	**24.674**	**.43951**
Stddev	.0050	.11	.098	.056	.00241
%RSD	.44724	.08954	.42151	.22721	.54799
#1	1.1145	121.55	23.211	24.714	.44121
#2	1.1075	121.70	23.073	24.635	.43780
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-c ms Acquired: 11/14/2013 10:28:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**46.375**	**3.8464**	**3.8507**	**.39807**	**21.453**
Stddev	.073	.0091	.0064	.00018	.065
%RSD	.15715	.23771	.16541	.04592	.30471
#1	46.323	3.8400	3.8462	.39820	21.500
#2	46.427	3.8529	3.8552	.39794	21.407
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.86531**	**.49786**	F **26.51**	**.33871**	**.38724**
Stddev	.00152	.00295	.01	.00113	.00175
%RSD	.17561	.59319	.0549	.33382	.45187
#1	.86423	.49577	26.50	.33951	.38848
#2	.86638	.49995	26.52	.33791	.38600
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**30.391**	**.42783**	**.52712**	**2.2785**	**.37642**
Stddev	.147	.00022	.00200	.0042	.00115
%RSD	.48287	.05081	.37943	.18620	.30680
#1	30.495	.42767	.52854	2.2755	.37560
#2	30.288	.42798	.52571	2.2815	.37724
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-c ms Acquired: 11/14/2013 10:28:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.50941**	**.87907**
Stddev	.00087	.00253
%RSD	.17126	.28768
#1	.51002	.88086
#2	.50879	.87728
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3054.9**	**4817.0**	**73595.**	**7193.2**
Stddev	1.9	11.4	115.	32.0
%RSD	.06117	.23681	.15635	.44498
#1	3053.6	4808.9	73514.	7170.6
#2	3056.2	4825.0	73677.	7215.9

Sample Name: 480-49854-a-23-d msd Acquired: 11/14/2013 10:31:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09659**	**58.824**	**.38984**	**.40948**	**1.2247**
Stddev	.00029	.075	.00416	.00004	.0009
%RSD	.30383	.12816	1.0662	.00967	.07700
#1	.09638	58.877	.39278	.40950	1.2240
#2	.09680	58.771	.38690	.40945	1.2253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39677**	**51.575**	**.37957**	**.48871**	**.74693**
Stddev	.00024	.090	.00014	.00105	.00607
%RSD	.06015	.17440	.03777	.21512	.81219
#1	.39694	51.639	.37946	.48796	.74264
#2	.39660	51.512	.37967	.48945	.75122
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0974**	**118.42**	**23.590**	**25.448**	**.44723**
Stddev	.0044	.51	.086	.100	.00001
%RSD	.40025	.42964	.36544	.39363	.00316
#1	1.0943	118.78	23.651	25.377	.44724
#2	1.1005	118.06	23.529	25.519	.44722
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-d msd Acquired: 11/14/2013 10:31:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**51.360**	**4.0681**	**4.0789**	**.39510**	**21.856**
Stddev	.217	.0208	.0208	.00009	.037
%RSD	.42296	.51120	.50861	.02192	.16745
#1	51.206	4.0534	4.0642	.39504	21.882
#2	51.513	4.0828	4.0936	.39516	21.830
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.83666**	**.49810**	F **27.38**	**.33618**	**.37865**
Stddev	.00052	.00422	.03	.00252	.00550
%RSD	.06257	.84754	.0932	.75049	1.4538
#1	.83704	.50108	27.39	.33796	.38255
#2	.83629	.49511	27.36	.33439	.37476
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.320**	**.43134**	**.54084**	**2.4479**	**.38222**
Stddev	.055	.00086	.00315	.0010	.00135
%RSD	.19309	.19964	.58210	.04155	.35244
#1	28.358	.43073	.53862	2.4472	.38317
#2	28.281	.43195	.54307	2.4487	.38126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-23-d msd Acquired: 11/14/2013 10:31:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.51438**	**.82554**
Stddev	.00489	.00846
%RSD	.95125	1.0245
#1	.51092	.81956
#2	.51784	.83152
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3051.6**	**4838.8**	**73278.**	**7175.0**
Stddev	7.6	17.0	301.	10.1
%RSD	.24946	.35068	.41115	.14094
#1	3046.2	4826.8	73491.	7167.9
#2	3057.0	4850.8	73065.	7182.2

Sample Name: 480-49854-a-24-b Acquired: 11/14/2013 10:33:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**26.096**	**.00476**	**.01796**	**.72673**
Stddev	.00034	.038	.00145	.00041	.00015
%RSD	64.096	.14420	30.495	2.2601	.02032
#1	.00077	26.069	.00373	.01824	.72662
#2	.00029	26.123	.00578	.01767	.72683
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00152**	**27.774**	**.00106**	**.11425**	**.27550**
Stddev	.00004	.064	.00008	.00020	.00035
%RSD	2.5022	.22952	7.2534	.17792	.12583
#1	.00155	27.819	.00101	.11439	.27575
#2	.00149	27.729	.00111	.11410	.27526
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.49651**	**98.070**	**2.4719**	**2.5722**	**.02637**
Stddev	.00024	.405	.0058	.0011	.00087
%RSD	.04915	.41309	.23470	.04213	3.2968
#1	.49669	97.783	2.4678	2.5730	.02576
#2	.49634	98.356	2.4760	2.5714	.02699
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-24-b Acquired: 11/14/2013 10:33:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**32.488**	**5.3645**	**5.3185**	**-.00007**	**.99301**
Stddev	.033	.0079	.0278	.00003	.00487
%RSD	.10234	.14810	.52275	50.217	.49084
#1	32.511	5.3701	5.2989	-.00004	.98956
#2	32.464	5.3589	5.3382	-.00009	.99645
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.45954**	**.08583**	**8.708**	**-.00170**	**.01118**
Stddev	.00008	.00103	.008	.00163	.00091
%RSD	.01765	1.1975	.0920	96.006	8.0932
#1	.45949	.08510	8.713	-.00286	.01182
#2	.45960	.08656	8.702	-.00055	.01054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.3543**	**.03533**	**.12273**	**1.4588**	**-.00252**
Stddev	.0237	.00013	.00025	.0005	.00081
%RSD	.25312	.35812	.20662	.03314	32.376
#1	9.3710	.03542	.12255	1.4585	-.00194
#2	9.3375	.03524	.12291	1.4592	-.00309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-24-b Acquired: 11/14/2013 10:33:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.08792	.56538
Stddev	.00015	.00051
%RSD	.17206	.09043
#1	.08781	.56574
#2	.08803	.56501
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3185.3	4906.1	75755.	7252.9
Stddev	.5	4.0	92.	34.4
%RSD	.01579	.08159	.12207	.47459
#1	3184.9	4903.2	75690.	7228.5
#2	3185.6	4908.9	75820.	7277.2

Sample Name: CCV Acquired: 11/14/2013 10:36:05 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49538**	**25.054**	**.50190**	**.48445**	**.50033**	**.49678**	**24.891**
Stddev	.00135	.027	.00218	.00228	.00070	.00010	.080
%RSD	.27342	.10809	.43473	.47163	.13970	.01983	.32188
#1	.49633	25.073	.50345	.48607	.50082	.49685	24.947
#2	.49442	25.035	.50036	.48284	.49983	.49671	24.834
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49007**	**.48933**	**.50494**	**.50040**	**24.343**	**24.843**	**25.475**
Stddev	.00039	.00008	.00029	.00174	.040	.046	.109
%RSD	.07898	.01539	.05669	.34812	.16324	.18613	.42600
#1	.49035	.48938	.50515	.50163	24.371	24.876	25.399
#2	.48980	.48928	.50474	.49917	24.315	24.810	25.552
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48949**	**24.122**	**.50287**	**.49425**	**.49474**	**24.637**	**.49147**
Stddev	.00094	.059	.00011	.00230	.00030	.079	.00021
%RSD	.19157	.24368	.02277	.46522	.06058	.31958	.04230
#1	.49015	24.081	.50279	.49263	.49453	24.693	.49161
#2	.48882	24.164	.50295	.49588	.49495	24.581	.49132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 10:36:05 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49246	24.70	.49981	.49150	24.799	.50084	.49405
Stddev	.00243	.00	.00201	.00373	.021	.00301	.00004
%RSD	.49259	.0141	.40160	.75917	.08343	.60128	.00760
#1	.49418	24.70	.50123	.49414	24.814	.49871	.49403
#2	.49074	24.69	.49839	.48886	24.785	.50297	.49408
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50299	.49112	.49971	.49998
Stddev	.00032	.00149	.00111	.00100
%RSD	.06451	.30251	.22251	.19922
#1	.50276	.49217	.50049	.50068
#2	.50322	.49007	.49892	.49927
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3221.8	4921.3	75253.	7359.2
Stddev	4.1	5.7	32.	11.4
%RSD	.12595	.11540	.04275	.15507
#1	3224.6	4925.3	75230.	7351.1
#2	3218.9	4917.2	75276.	7367.3

Sample Name: CCB Acquired: 11/14/2013 10:38:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**-.00873**	**-.00026**	**.00031**	**.00001**	**-.00000**	**-.00624**
Stddev	.00014	.02641	.00260	.00025	.00000	.00000	.00098
%RSD	76.493	302.60	985.79	81.370	25.141	104.24	15.669
#1	.00008	.00995	.00157	.00013	.00002	-.00001	-.00555
#2	.00028	-.02740	-.00210	.00048	.00001	-.00000	-.00693
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00001**	**-.00040**	**-.00001**	**.00297**	**.04343**	**.00162**
Stddev	.00002	.00005	.00001	.00005	.00267	.00013	.00010
%RSD	82.065	345.06	2.3836	611.87	90.094	.29639	6.4325
#1	-.00003	.00002	-.00041	-.00004	.00108	.04352	.00169
#2	-.00001	-.00005	-.00040	.00003	.00486	.04333	.00154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**-.00176**	**-.00002**	**.00036**	**-.00028**	**-.00161**	**.00015**
Stddev	.00004	.00341	.00005	.00013	.00017	.00130	.00017
%RSD	42.502	193.72	243.44	35.094	63.281	80.533	119.84
#1	.00012	.00065	-.00005	.00027	-.00040	-.00069	.00002
#2	.00007	-.00417	.00001	.00045	-.00015	-.00253	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 10:38:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00133	-.0002	-.00259	.00066	.00691	.00038	-.00004
Stddev	.00105	.0025	.00050	.00443	.00607	.00011	.00007
%RSD	78.724	1089.	19.435	670.98	87.886	29.756	169.04
#1	-.00059	-.0020	-.00223	.00379	.01121	.00046	-.00009
#2	-.00208	.0015	-.00294	-.00247	.00262	.00030	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00011	-.00287	-.00030	-.00021
Stddev	.00010	.00304	.00025	.00006
%RSD	89.279	106.04	83.450	29.031
#1	.00018	-.00502	-.00047	-.00025
#2	.00004	-.00072	-.00012	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3416.6	4993.3	77529.	7276.1
Stddev	3.7	9.0	168.	2.7
%RSD	.10859	.18114	.21629	.03716
#1	3419.2	4999.7	77411.	7274.2
#2	3414.0	4986.9	77648.	7278.0

Sample Name: CCVL Acquired: 11/14/2013 10:40:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00262**	**.20841**	**.01160**	**.01942**	**.00216**	**.00202**	**.51712**
Stddev	.00064	.00510	.00038	.00045	.00001	.00001	.01323
%RSD	24.538	2.4483	3.3163	2.3117	.58834	.50772	2.5587
#1	.00217	.21202	.01187	.01974	.00215	.00201	.52648
#2	.00308	.20480	.01133	.01911	.00217	.00203	.50776
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00081**	**.00405**	**.00382**	**.01036**	**.04693**	**.45030**	**.43681**
Stddev	.00003	.00008	.00034	.00005	.00176	.04106	.00144
%RSD	3.6860	2.0905	8.9111	.44705	3.7442	9.1192	.33016
#1	.00083	.00399	.00358	.01039	.04817	.42127	.43579
#2	.00079	.00411	.00406	.01032	.04569	.47934	.43783
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02719**	**.20353**	**.00331**	**.00380**	**.00954**	**.94625**	**.00985**
Stddev	.00142	.00237	.00007	.00107	.00032	.00023	.00041
%RSD	5.2120	1.1624	2.1429	28.123	3.3108	.02416	4.1468
#1	.02619	.20186	.00336	.00455	.00932	.94641	.01014
#2	.02820	.20521	.00326	.00304	.00977	.94609	.00956
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 10:40:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00395	.2047	.01848	.01312	.51391	.00912	.00485
Stddev	.00055	.0051	.00103	.00119	.00120	.00011	.00002
%RSD	14.032	2.514	5.5536	9.0611	.23304	1.1566	.46327
#1	.00434	.2011	.01775	.01396	.51475	.00919	.00484
#2	.00356	.2084	.01920	.01228	.51306	.00904	.00487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00499	.01745	.00484	.01064
Stddev	.00024	.00041	.00016	.00037
%RSD	4.7474	2.3320	3.3843	3.5052
#1	.00482	.01716	.00495	.01091
#2	.00515	.01773	.00472	.01038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3431.0	5058.5	77772.	7366.9
Stddev	11.3	15.7	148.	3.4
%RSD	.32959	.31107	.19066	.04593
#1	3439.0	5069.7	77876.	7369.3
#2	3423.0	5047.4	77667.	7364.5

Sample Name: 480-49854-a-25-b Acquired: 11/14/2013 10:43:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00188**	**65.509**	**.02807**	**.01542**	**1.2095**
Stddev	.00047	.121	.00145	.00005	.0035
%RSD	25.299	.18457	5.1642	.30415	.28929
#1	.00221	65.595	.02705	.01538	1.2120
#2	.00154	65.424	.02910	.01545	1.2071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00300**	**31.648**	**.00241**	**.25187**	**.49876**
Stddev	.00003	.180	.00015	.00018	.00221
%RSD	1.0767	.56964	6.0400	.06983	.44410
#1	.00302	31.521	.00251	.25175	.49719
#2	.00297	31.776	.00230	.25200	.50032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.0253**	**207.49**	**3.6923**	**4.1055**	**.06235**
Stddev	.0102	1.14	.0062	.0047	.00128
%RSD	.50363	.55094	.16704	.11463	2.0589
#1	2.0181	206.68	3.6879	4.1022	.06326
#2	2.0325	208.30	3.6966	4.1089	.06144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-25-b Acquired: 11/14/2013 10:43:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**41.226**	**13.820**	**14.665**	**.00049**	**1.6154**
Stddev	.022	.078	.040	.00007	.0156
%RSD	.05357	.56369	.27311	14.606	.96275
#1	41.211	13.765	14.637	.00054	1.6264
#2	41.242	13.875	14.693	.00044	1.6044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0962**	**.25760**	**4.048**	**-.00731**	**.02754**
Stddev	.0006	.00050	.024	.00013	.00089
%RSD	.05379	.19433	.5887	1.7500	3.2462
#1	1.0966	.25796	4.031	-.00740	.02691
#2	1.0958	.25725	4.065	-.00722	.02818
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.432**	**.08030**	**.16167**	**2.7931**	**.00115**
Stddev	.036	.00047	.00034	.0071	.00097
%RSD	.29007	.57955	.20980	.25517	84.280
#1	12.457	.08063	.16191	2.7981	.00184
#2	12.406	.07997	.16143	2.7880	.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-25-b Acquired: 11/14/2013 10:43:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.22235	1.1560
Stddev	.00116	.0051
%RSD	.52029	.43971
#1	.22153	1.1524
#2	.22316	1.1596
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3065.3	4883.7	74941.	7285.8
Stddev	4.6	12.6	8.	2.9
%RSD	.15113	.25875	.01105	.03983
#1	3062.0	4874.8	74947.	7283.7
#2	3068.6	4892.7	74935.	7287.9

Sample Name: 480-49854-a-26-b Acquired: 11/14/2013 10:45:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**29.631**	**.00530**	**.01835**	**.62410**
Stddev	.00016	.042	.00129	.00037	.00014
%RSD	47.930	.14185	24.270	1.9952	.02269
#1	-.00044	29.661	.00621	.01861	.62420
#2	-.00022	29.601	.00439	.01809	.62400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00170**	**21.539**	**.00161**	**.13608**	**.31447**
Stddev	.00008	.014	.00000	.00053	.00113
%RSD	4.6012	.06559	.09070	.39300	.35805
#1	.00164	21.529	.00162	.13646	.31526
#2	.00175	21.549	.00161	.13571	.31367
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.69565**	**81.112**	**2.2222**	**2.3542**	**.02653**
Stddev	.00063	.059	.0521	.0028	.00119
%RSD	.09064	.07290	2.3436	.11930	4.4818
#1	.69610	81.154	2.2590	2.3562	.02569
#2	.69520	81.070	2.1854	2.3522	.02737
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-26-b Acquired: 11/14/2013 10:45:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.321**	**1.2863**	**1.2434**	**.00068**	**1.6725**
Stddev	.185	.0078	.0066	.00001	.0133
%RSD	.67841	.60581	.52892	1.3070	.79310
#1	27.452	1.2918	1.2480	.00069	1.6819
#2	27.190	1.2808	1.2387	.00067	1.6632
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.57285**	**.10522**	**7.788**	**-.00450**	**.01119**
Stddev	.00015	.00062	.022	.00071	.00325
%RSD	.02548	.59296	.2846	15.764	29.068
#1	.57295	.10566	7.773	-.00400	.00889
#2	.57274	.10478	7.804	-.00500	.01350
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.212**	**.03877**	**.08660**	**1.7227**	**-.00258**
Stddev	.023	.00003	.00004	.0039	.00131
%RSD	.16058	.07861	.04107	.22394	50.833
#1	14.196	.03875	.08662	1.7254	-.00350
#2	14.228	.03879	.08657	1.7200	-.00165
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-26-b Acquired: 11/14/2013 10:45:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.11358**	**.82131**
Stddev	.00052	.01191
%RSD	.45989	1.4499
#1	.11394	.82973
#2	.11321	.81289
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3208.4**	**4919.2**	**75856.**	**7292.0**
Stddev	7.1	.6	497.	23.0
%RSD	.22018	.01133	.65561	.31572
#1	3203.4	4919.6	75505.	7275.7
#2	3213.4	4918.8	76208.	7308.3

Sample Name: 480-49854-a-27-b Acquired: 11/14/2013 10:48:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00024**	**34.673**	**.00234**	**.01814**	**.66076**
Stddev	.00055	.053	.00057	.00035	.00133
%RSD	227.49	.15285	24.548	1.9141	.20176
#1	-.00063	34.636	.00193	.01790	.65982
#2	.00015	34.711	.00274	.01839	.66171
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00171**	**22.220**	**.00117**	**.11413**	**.33364**
Stddev	.00012	.018	.00005	.00014	.00170
%RSD	6.9310	.08185	4.2072	.12383	.50940
#1	.00163	22.207	.00121	.11423	.33484
#2	.00179	22.233	.00114	.11403	.33244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67932**	**100.86**	**2.7606**	**2.9840**	**.03255**
Stddev	.00297	.13	.0234	.0002	.00004
%RSD	.43745	.13279	.84739	.00521	.11818
#1	.68143	100.95	2.7771	2.9839	.03258
#2	.67722	100.76	2.7440	2.9841	.03252
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-27-b Acquired: 11/14/2013 10:48:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.266**	**2.7149**	**2.6496**	**-.00017**	**.77725**
Stddev	.043	.0096	.0074	.00008	.00039
%RSD	.11839	.35295	.27798	50.930	.05082
#1	36.296	2.7217	2.6548	-.00022	.77753
#2	36.235	2.7081	2.6444	-.00011	.77697
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51810**	**.10821**	**9.531**	**-.00436**	**.00773**
Stddev	.00273	.00064	.024	.00090	.00175
%RSD	.52709	.58792	.2517	20.518	22.687
#1	.51617	.10776	9.514	-.00373	.00897
#2	.52003	.10866	9.548	-.00500	.00649
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.578**	**.03599**	**.09757**	**1.9834**	**-.00411**
Stddev	.057	.00080	.00017	.0014	.00196
%RSD	.49526	2.2318	.17341	.07042	47.681
#1	11.618	.03655	.09745	1.9824	-.00272
#2	11.537	.03542	.09769	1.9844	-.00549
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-27-b Acquired: 11/14/2013 10:48:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.10743**	**.72833**
Stddev	.00013	.00217
%RSD	.12477	.29783
#1	.10752	.72680
#2	.10733	.72987
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3189.5**	**4916.2**	**75393.**	**7249.0**
Stddev	2.7	6.5	276.	19.4
%RSD	.08515	.13274	.36573	.26790
#1	3187.6	4911.6	75198.	7235.2
#2	3191.4	4920.8	75588.	7262.7

Sample Name: 480-49854-a-28-b Acquired: 11/14/2013 10:50:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**23.416**	**.00407**	**.01772**	**1.0386**
Stddev	.00029	.048	.00401	.00001	.0003
%RSD	35.396	.20302	98.593	.07170	.03254
#1	-.00103	23.383	.00691	.01773	1.0384
#2	-.00062	23.450	.00123	.01771	1.0388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00131**	**19.934**	**.00129**	**.10315**	**.25456**
Stddev	.00001	.159	.00011	.00015	.00172
%RSD	.41294	.79559	8.3071	.14080	.67713
#1	.00132	19.822	.00121	.10305	.25578
#2	.00131	20.046	.00136	.10326	.25334
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.60602**	**81.241**	**1.8112**	**1.9122**	**.02122**
Stddev	.00241	.337	.0041	.0004	.00025
%RSD	.39766	.41452	.22474	.02228	1.1660
#1	.60773	81.003	1.8141	1.9125	.02105
#2	.60432	81.479	1.8083	1.9119	.02140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-28-b Acquired: 11/14/2013 10:50:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.050**	**1.1425**	**1.1002**	**-.00021**	**1.0884**
Stddev	.070	.0018	.0001	.00009	.0112
%RSD	.26712	.15516	.01170	41.652	1.0329
#1	26.099	1.1437	1.1003	-.00027	1.0804
#2	26.001	1.1412	1.1001	-.00014	1.0963
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.43222**	**.08391**	**8.457**	**-.00366**	**.00951**
Stddev	.00026	.00106	.022	.00130	.00490
%RSD	.06117	1.2612	.2664	35.413	51.548
#1	.43203	.08466	8.441	-.00275	.01298
#2	.43241	.08317	8.473	-.00458	.00604
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.373**	**.03643**	**.07123**	**1.3612**	**-.00304**
Stddev	.004	.00039	.00035	.0004	.00264
%RSD	.03760	1.0766	.49460	.02779	87.035
#1	11.370	.03615	.07148	1.3609	-.00117
#2	11.376	.03670	.07099	1.3614	-.00490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-28-b Acquired: 11/14/2013 10:50:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.09048	.66327
Stddev	.00040	.00162
%RSD	.43840	.24385
#1	.09076	.66441
#2	.09020	.66212
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3219.8	4914.8	75405.	7242.9
Stddev	7.9	10.9	341.	26.1
%RSD	.24654	.22213	.45177	.36014
#1	3214.2	4907.1	75164.	7261.3
#2	3225.4	4922.5	75646.	7224.5

Sample Name: 480-49854-a-29-b Acquired: 11/14/2013 10:52:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00096**	**15.808**	**.01133**	**.02079**	**1.0945**
Stddev	.00063	.007	.00211	.00031	.0020
%RSD	65.473	.04709	18.588	1.4951	.18561
#1	.00051	15.814	.01282	.02057	1.0959
#2	.00140	15.803	.00984	.02101	1.0931
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00129**	**38.385**	**.00227**	**.08380**	**.23192**
Stddev	.00004	.133	.00001	.00009	.00077
%RSD	3.1415	.34569	.49017	.10512	.33097
#1	.00132	38.291	.00228	.08374	.23247
#2	.00126	38.479	.00226	.08387	.23138
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.72535**	**96.972**	**1.0833**	**1.0920**	**.01239**
Stddev	.00246	.316	.0310	.0021	.00027
%RSD	.33912	.32616	2.8590	.19115	2.1928
#1	.72709	96.749	1.1052	1.0905	.01259
#2	.72361	97.196	1.0614	1.0935	.01220
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-29-b Acquired: 11/14/2013 10:52:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**18.441**	**7.2991**	**7.2863**	**-.00050**	**.38823**
Stddev	.015	.0314	.0226	.00017	.00895
%RSD	.08398	.43047	.31068	33.833	2.3042
#1	18.452	7.3213	7.3023	-.00062	.38191
#2	18.430	7.2769	7.2703	-.00038	.39456
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.44311**	**.07550**	F **11.09**	**-.00522**	**.01190**
Stddev	.00032	.00152	.00	.00201	.00293
%RSD	.07277	2.0130	.0387	38.505	24.591
#1	.44289	.07442	11.09	-.00380	.01397
#2	.44334	.07657	11.08	-.00665	.00983
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.249**	**.04013**	**.14668**	**.85128**	**-.00232**
Stddev	.033	.00020	.00016	.00224	.00183
%RSD	.32315	.50422	.10583	.26275	79.101
#1	10.272	.04027	.14679	.84970	-.00361
#2	10.225	.03998	.14657	.85286	-.00102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-29-b Acquired: 11/14/2013 10:52:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.07121	.53524
Stddev	.00027	.00251
%RSD	.37740	.46875
#1	.07140	.53702
#2	.07102	.53347
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3190.3	4889.9	75668.	7270.5
Stddev	3.3	3.8	380.	.3
%RSD	.10271	.07710	.50214	.00429
#1	3188.0	4887.2	75400.	7270.7
#2	3192.6	4892.6	75937.	7270.2

Sample Name: 480-49854-a-30-b Acquired: 11/14/2013 10:55:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**51.011**	**.00434**	**.01613**	**.99224**
Stddev	.00038	.311	.00118	.00041	.00376
%RSD	318.35	.60998	27.096	2.5305	.37864
#1	.00015	51.231	.00351	.01642	.99490
#2	-.00039	50.791	.00517	.01584	.98958
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00252**	**29.141**	**.00210**	**.11304**	**.58729**
Stddev	.00004	.039	.00009	.00031	.00479
%RSD	1.4137	.13524	4.2400	.27755	.81502
#1	.00250	29.169	.00203	.11282	.58390
#2	.00255	29.113	.00216	.11326	.59067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3258**	**104.25**	**2.7949**	**3.0509**	**.04194**
Stddev	.0115	.36	.0022	.0070	.00156
%RSD	.34546	.34230	.07782	.23017	3.7110
#1	3.3177	104.50	2.7964	3.0559	.04304
#2	3.3340	104.00	2.7933	3.0460	.04084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-30-b Acquired: 11/14/2013 10:55:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**32.303**	**2.6403**	**2.5750**	**.00030**	**1.1242**
Stddev	.063	.0065	.0219	.00002	.0037
%RSD	.19392	.24480	.84902	5.8828	.33263
#1	32.259	2.6358	2.5596	.00032	1.1269
#2	32.348	2.6449	2.5905	.00029	1.1216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.82047**	**.23627**	**6.279**	**-.00771**	**.02556**
Stddev	.00089	.00091	.004	.00058	.00096
%RSD	.10883	.38488	.0643	7.5721	3.7404
#1	.82110	.23691	6.282	-.00813	.02488
#2	.81984	.23563	6.276	-.00730	.02624
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.3079**	**.06991**	**.14763**	**2.2401**	**-.00734**
Stddev	.0088	.00117	.00046	.0005	.00104
%RSD	.10587	1.6776	.31432	.02050	14.177
#1	8.3017	.07074	.14730	2.2397	-.00661
#2	8.3141	.06908	.14796	2.2404	-.00808
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-30-b Acquired: 11/14/2013 10:55:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.16635**	**.62832**
Stddev	.00066	.00602
%RSD	.39724	.95820
#1	.16589	.62407
#2	.16682	.63258
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3165.0**	**4948.3**	**76254.**	**7319.4**
Stddev	6.7	11.1	147.	34.6
%RSD	.21301	.22364	.19330	.47206
#1	3160.3	4940.4	76358.	7295.0
#2	3169.8	4956.1	76150.	7343.9

Sample Name: 480-49854-a-31-b Acquired: 11/14/2013 10:57:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**36.421**	**.00487**	**.01972**	**.76573**
Stddev	.00067	.301	.00002	.00044	.00398
%RSD	186.41	.82665	.38858	2.2280	.51992
#1	-.00083	36.634	.00488	.01941	.76854
#2	.00011	36.209	.00486	.02003	.76291
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00182**	**22.894**	**.00157**	**.12559**	**.37387**
Stddev	.00000	.029	.00003	.00003	.00000
%RSD	.19027	.12636	1.7471	.02395	.00018
#1	.00182	22.874	.00155	.12561	.37387
#2	.00182	22.915	.00159	.12557	.37387
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0758**	**88.904**	**2.3923**	**2.5248**	**.03178**
Stddev	.0033	.605	.0052	.0122	.00045
%RSD	.30471	.68016	.21860	.48343	1.4219
#1	1.0781	89.332	2.3886	2.5334	.03146
#2	1.0735	88.477	2.3960	2.5162	.03210
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-31-b Acquired: 11/14/2013 10:57:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**22.341**	**2.4056**	**2.3332**	**.00072**	**.83245**
Stddev	.044	.0022	.0040	.00015	.00558
%RSD	.19524	.09282	.17163	20.506	.67029
#1	22.311	2.4040	2.3304	.00083	.83640
#2	22.372	2.4071	2.3361	.00062	.82851
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.60063**	**.14805**	F **14.23**	**-.00569**	**.01724**
Stddev	.00023	.00003	.05	.00352	.00048
%RSD	.03747	.01982	.3468	61.928	2.8014
#1	.60079	.14807	14.20	-.00320	.01758
#2	.60047	.14803	14.27	-.00818	.01690
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.096**	**.03906**	**.11245**	**1.8226**	**.00080**
Stddev	.034	.00040	.00018	.0003	.00030
%RSD	.30986	1.0349	.16212	.01870	37.784
#1	11.120	.03935	.11232	1.8224	.00059
#2	11.071	.03878	.11258	1.8229	.00102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-31-b Acquired: 11/14/2013 10:57:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12619	.64834
Stddev	.00022	.00443
%RSD	.17714	.68349
#1	.12603	.64521
#2	.12635	.65147
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3209.9	4937.5	75901.	7283.0
Stddev	3.6	4.1	113.	16.6
%RSD	.11191	.08255	.14873	.22856
#1	3207.3	4940.3	75821.	7271.3
#2	3212.4	4934.6	75981.	7294.8

Sample Name: 480-49854-a-32-b Acquired: 11/14/2013 10:59:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00064**	**26.481**	**.01664**	**.00216**	**.42407**
Stddev	.00001	.078	.00189	.00021	.00261
%RSD	1.3871	.29562	11.371	9.7155	.61487
#1	-.00064	26.425	.01530	.00231	.42223
#2	-.00063	26.536	.01797	.00201	.42592
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00128**	**13.126**	**.00027**	**.06397**	**.14651**
Stddev	.00005	.011	.00004	.00004	.00206
%RSD	3.9605	.08195	13.251	.06157	1.4095
#1	.00124	13.134	.00030	.06395	.14505
#2	.00131	13.119	.00025	.06400	.14797
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10892**	**114.41**	**3.7939**	**3.9239**	**.03192**
Stddev	.00048	.17	.0254	.0031	.00007
%RSD	.44375	.14691	.66975	.07842	.21779
#1	.10857	114.29	3.7759	3.9217	.03197
#2	.10926	114.53	3.8118	3.9261	.03187
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-32-b Acquired: 11/14/2013 10:59:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**35.753**	**3.8368**	**3.7275**	**-.00010**	**.45972**
Stddev	.123	.0127	.0179	.00009	.01012
%RSD	.34321	.32986	.48042	86.329	2.2009
#1	35.667	3.8279	3.7148	-.00016	.45257
#2	35.840	3.8458	3.7402	-.00004	.46688
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23310**	**.03436**	**.8219**	**-.00458**	**.00277**
Stddev	.00032	.00018	.0051	.00410	.00071
%RSD	.13888	.52703	.6258	89.694	25.438
#1	.23287	.03423	.8183	-.00748	.00327
#2	.23333	.03449	.8255	-.00167	.00227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.4275**	**.04690**	**.05376**	**1.8178**	**-.00105**
Stddev	.0087	.00012	.00011	.0069	.00375
%RSD	.09234	.26433	.20996	.38059	357.36
#1	9.4336	.04698	.05368	1.8129	.00160
#2	9.4213	.04681	.05384	1.8227	-.00370
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-32-b Acquired: 11/14/2013 10:59:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.13823**	**.51641**
Stddev	.00143	.00730
%RSD	1.0317	1.4143
#1	.13722	.51124
#2	.13924	.52157
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3193.8**	**4895.5**	**75274.**	**7294.7**
Stddev	1.9	9.0	300.	26.6
%RSD	.05984	.18295	.39839	.36485
#1	3195.2	4889.1	75486.	7275.9
#2	3192.5	4901.8	75062.	7313.6

Sample Name: 480-49854-a-33-b Acquired: 11/14/2013 11:02:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00058**	**25.291**	**.00246**	**.01578**	**.29868**
Stddev	.00042	.060	.00600	.00016	.00004
%RSD	73.008	.23777	243.77	.98469	.01502
#1	-.00028	25.249	.00670	.01589	.29865
#2	-.00087	25.334	-.00178	.01567	.29871
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00126**	**9.9246**	**.00030**	**.06209**	**.13108**
Stddev	.00001	.1248	.00004	.00015	.00028
%RSD	1.1567	1.2576	13.018	.24687	.21330
#1	.00127	9.8364	.00027	.06220	.13128
#2	.00125	10.013	.00033	.06198	.13088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.12551**	**89.442**	**3.0859**	**3.1473**	**.03130**
Stddev	.00014	.920	.0881	.0339	.00007
%RSD	.11062	1.0291	2.8554	1.0766	.23422
#1	.12541	88.792	3.0236	3.1233	.03135
#2	.12561	90.093	3.1482	3.1713	.03124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-33-b Acquired: 11/14/2013 11:02:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.214**	**1.0073**	**.96737**	**-.00087**	**.57944**
Stddev	.102	.0033	.00286	.00010	.00010
%RSD	.23528	.32468	.29548	11.168	.01641
#1	43.142	1.0050	.96939	-.00080	.57951
#2	43.286	1.0096	.96535	-.00093	.57937
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.34936**	**.02654**	**.8177**	**-.00533**	**-.00197**
Stddev	.00088	.00070	.0024	.00148	.00146
%RSD	.25118	2.6198	.2890	27.812	74.086
#1	.34998	.02703	.8193	-.00638	-.00301
#2	.34874	.02605	.8160	-.00428	-.00094
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.825**	**.05278**	**.04957**	**1.8151**	**-.00526**
Stddev	.067	.00042	.00015	.0013	.00249
%RSD	.56834	.78665	.31111	.06889	47.284
#1	11.777	.05307	.04968	1.8160	-.00702
#2	11.872	.05248	.04946	1.8142	-.00350
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-33-b Acquired: 11/14/2013 11:02:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.06629	.35281
Stddev	.00002	.00094
%RSD	.02635	.26587
#1	.06628	.35215
#2	.06630	.35347
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3196.3	4865.3	74802.	7188.8
Stddev	3.2	8.6	72.	53.1
%RSD	.09989	.17625	.09576	.73827
#1	3194.0	4859.2	74752.	7226.3
#2	3198.5	4871.3	74853.	7151.3

Sample Name: CCV Acquired: 11/14/2013 11:04:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49420**	**25.338**	**.50407**	**.48433**	**.50363**	**.49432**	**25.207**
Stddev	.00139	.029	.00547	.00015	.00066	.00101	.133
%RSD	.28117	.11317	1.0843	.03153	.13126	.20414	.52905
#1	.49321	25.358	.50794	.48443	.50410	.49503	25.301
#2	.49518	25.318	.50021	.48422	.50317	.49360	25.112
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49059**	**.48874**	**.50822**	**.50115**	**24.272**	**25.118**	**26.029**
Stddev	.00027	.00024	.00076	.00147	.062	.058	.211
%RSD	.05602	.04838	.14911	.29344	.25450	.23249	.80927
#1	.49040	.48890	.50875	.50011	24.316	25.159	26.178
#2	.49078	.48857	.50768	.50218	24.229	25.076	25.880
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49501**	**24.199**	**.50338**	**.49081**	**.49553**	**24.961**	**.49037**
Stddev	.00103	.044	.00061	.00221	.00121	.017	.00000
%RSD	.20850	.18194	.12172	.44935	.24346	.06636	.00013
#1	.49428	24.230	.50382	.49237	.49638	24.949	.49037
#2	.49574	24.167	.50295	.48925	.49467	24.973	.49037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 11:04:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49229	24.58	.49739	.49176	24.888	.50241	.49108
Stddev	.00364	.07	.00415	.00326	.069	.00035	.00017
%RSD	.73961	.2903	.83349	.66335	.27676	.06965	.03514
#1	.49487	24.53	.49446	.48946	24.936	.50266	.49120
#2	.48972	24.63	.50032	.49407	24.839	.50216	.49095
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50379	.49168	.50316	.50625
Stddev	.00197	.00300	.00051	.00112
%RSD	.39008	.60967	.10188	.22144
#1	.50518	.49380	.50353	.50705
#2	.50240	.48956	.50280	.50546
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3217.9	4911.0	74986.	7309.1
Stddev	9.6	12.7	189.	13.9
%RSD	.29852	.25943	.25144	.19015
#1	3224.7	4920.0	75120.	7299.2
#2	3211.1	4902.0	74853.	7318.9

Sample Name: CCB Acquired: 11/14/2013 11:07:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**-.02236**	**-.00256**	**-.00035**	**.00001**	**.00003**	**-.00609**
Stddev	.00058	.02082	.00110	.00027	.00000	.00002	.00416
%RSD	8773.7	93.097	42.864	77.011	31.030	65.731	68.360
#1	.00041	-.00764	-.00334	-.00016	.00001	.00005	-.00315
#2	-.00040	-.03708	-.00178	-.00054	.00001	.00002	-.00903
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**-.00003**	**-.00063**	**.00002**	**.00168**	**.02103**	**.00090**
Stddev	.00016	.00001	.00022	.00002	.00255	.00013	.00021
%RSD	159.30	39.024	35.296	125.36	152.26	.61197	23.547
#1	.00001	-.00003	-.00079	.00004	-.00013	.02094	.00105
#2	-.00021	-.00004	-.00047	.00000	.00348	.02112	.00075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**-.00453**	**-.00005**	**.00031**	**-.00021**	**-.01013**	**-.00048**
Stddev	.00048	.00206	.00001	.00121	.00007	.01205	.00007
%RSD	3677.2	45.554	12.962	390.19	36.317	119.02	14.673
#1	.00035	-.00599	-.00005	-.00054	-.00026	-.00160	-.00043
#2	-.00032	-.00307	-.00005	.00116	-.00015	-.01865	-.00053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 11:07:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00065	F -.0043	-.00075	.00016	-.00118	-.00006	.00003
Stddev	.00023	.0008	.00030	.00066	.00795	.00038	.00001
%RSD	35.230	17.95	40.089	405.50	671.40	631.59	23.466
#1	-.00049	-.0038	-.00053	-.00030	-.00680	-.00033	.00003
#2	-.00081	-.0049	-.00096	.00063	.00444	.00021	.00004
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00029	-.00059	-.00011	-.00040
Stddev	.00038	.00090	.00019	.00039
%RSD	133.27	152.69	172.92	96.864
#1	.00056	-.00122	.00002	-.00068
#2	.00002	.00005	-.00025	-.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3415.9	4997.4	78177.	7316.9
Stddev	1.1	5.1	210.	18.5
%RSD	.03351	.10246	.26803	.25245
#1	3415.1	4993.8	78029.	7303.9
#2	3416.7	5001.0	78325.	7330.0

Sample Name: CCVL Acquired: 11/14/2013 11:09:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00277**	**.21441**	**.01011**	**.01900**	**.00214**	**.00194**	**.50696**
Stddev	.00102	.01650	.00161	.00061	.00000	.00002	.00700
%RSD	37.008	7.6934	15.956	3.2109	.19865	1.2055	1.3799
#1	.00349	.22607	.01125	.01943	.00214	.00195	.51190
#2	.00204	.20274	.00897	.01857	.00214	.00192	.50201
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00081**	**.00400**	**.00345**	**.01019**	**.05095**	**.50335**	**.43091**
Stddev	.00006	.00008	.00009	.00004	.00050	.01420	.00028
%RSD	7.4054	2.1244	2.7190	.42676	.99092	2.8209	.06399
#1	.00077	.00394	.00338	.01022	.05059	.49331	.43110
#2	.00086	.00406	.00351	.01015	.05131	.51339	.43071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02738**	**.20392**	**.00332**	**.00336**	**.00951**	**.93552**	**.00964**
Stddev	.00037	.00016	.00003	.00067	.00021	.00565	.00014
%RSD	1.3511	.07753	.92317	20.112	2.2260	.60430	1.4092
#1	.02712	.20403	.00334	.00383	.00966	.93152	.00973
#2	.02764	.20381	.00330	.00288	.00936	.93952	.00954
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 11:09:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00409	.2041	.01926	.01232	.49507	.00981	.00476
Stddev	.00034	.0024	.00055	.00064	.00366	.00013	.00006
%RSD	8.4038	1.169	2.8583	5.1841	.74023	1.2917	1.3087
#1	.00385	.2024	.01965	.01187	.49766	.00990	.00480
#2	.00434	.2058	.01887	.01278	.49248	.00972	.00471
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00463	.01860	.00498	.01064
Stddev	.00028	.00166	.00029	.00018
%RSD	6.1330	8.9493	5.8997	1.6960
#1	.00483	.01742	.00518	.01051
#2	.00443	.01978	.00477	.01077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3443.8	5079.5	78402.	7483.0
Stddev	4.9	3.2	165.	8.4
%RSD	.14187	.06281	.21038	.11197
#1	3447.2	5081.7	78519.	7489.0
#2	3440.3	5077.2	78286.	7477.1

Sample Name: 480-49854-a-34-b Acquired: 11/14/2013 11:11:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**77.017**	**.02470**	**.01693**	**1.1916**
Stddev	.00014	.090	.00053	.00019	.0002
%RSD	28.840	.11672	2.1602	1.0971	.01683
#1	.00038	76.954	.02432	.01680	1.1915
#2	.00058	77.081	.02507	.01706	1.1917
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00338**	**34.653**	**.00306**	**.26848**	**.59029**
Stddev	.00009	.099	.00006	.00010	.00282
%RSD	2.5707	.28653	1.8394	.03827	.47716
#1	.00344	34.583	.00302	.26855	.58830
#2	.00332	34.723	.00310	.26841	.59228
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2525**	**251.63**	**4.3942**	**5.0160**	**.07011**
Stddev	.0012	.85	.0127	.0074	.00110
%RSD	.05283	.33920	.28783	.14756	1.5720
#1	2.2517	251.03	4.3853	5.0212	.07089
#2	2.2534	252.23	4.4032	5.0108	.06933
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-34-b Acquired: 11/14/2013 11:11:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**48.237**	**6.7913**	**6.9182**	**.00014**	**2.0150**
Stddev	.119	.0127	.0076	.00002	.0032
%RSD	.24750	.18717	.11027	13.904	.15831
#1	48.152	6.7823	6.9128	.00016	2.0173
#2	48.321	6.8003	6.9236	.00013	2.0127
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.3154**	**.28343**	**4.858**	**-.00977**	**.02294**
Stddev	.0004	.00041	.021	.00150	.00305
%RSD	.02976	.14469	.4334	15.351	13.272
#1	1.3151	.28372	4.843	-.00871	.02079
#2	1.3156	.28314	4.873	-.01084	.02510
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.647**	**.08361**	**.16938**	**3.1621**	**-.00085**
Stddev	.038	.00046	.00019	.0006	.00118
%RSD	.30000	.54938	.11191	.01773	139.02
#1	12.674	.08329	.16951	3.1617	-.00001
#2	12.621	.08394	.16924	3.1625	-.00168
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-34-b Acquired: 11/14/2013 11:11:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.26614	1.2383
Stddev	.00040	.0031
%RSD	.15196	.24606
#1	.26585	1.2361
#2	.26642	1.2404
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3037.3	4890.5	74857.	7261.0
Stddev	7.0	14.9	1.	11.3
%RSD	.23035	.30493	.00148	.15551
#1	3032.3	4880.0	74856.	7253.0
#2	3042.2	4901.1	74858.	7268.9

Sample Name: 480-49784-c-1-a Acquired: 11/14/2013 11:14:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00150**	**50.734**	**.09347**	**.08942**	**.63372**
Stddev	.00011	.002	.00168	.00019	.00281
%RSD	7.1783	.00301	1.7993	.21661	.44398
#1	.00143	50.733	.09228	.08928	.63571
#2	.00158	50.735	.09466	.08955	.63173
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00395**	**499.25**	**.00960**	**.04957**	**.08845**
Stddev	.00005	3.42	.00003	.00010	.00106
%RSD	1.1612	.68490	.31910	.21005	1.1987
#1	.00398	496.83	.00962	.04950	.08770
#2	.00391	501.67	.00958	.04964	.08920
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.56447**	**134.59**	**10.002**	**13.533**	**.09155**
Stddev	.00090	.94	.095	.098	.00058
%RSD	.15982	.69816	.95139	.72747	.63504
#1	.56383	133.92	10.069	13.464	.09196
#2	.56511	135.25	9.9348	13.603	.09114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49784-c-1-a Acquired: 11/14/2013 11:14:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**122.69**	**2.8739**	**3.0377**	**.00382**	**1.3666**
Stddev	.23	.0062	.0010	.00020	.0058
%RSD	.18485	.21657	.03254	5.1214	.42586
#1	122.85	2.8783	3.0384	.00368	1.3707
#2	122.53	2.8695	3.0370	.00396	1.3624
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13541**	**1.6333**	**4.744**	**.00042**	**.00962**
Stddev	.00063	.0059	.003	.00028	.00369
%RSD	.46513	.36347	.0592	67.365	38.360
#1	.13497	1.6291	4.742	.00062	.01223
#2	.13586	1.6375	4.746	.00022	.00701
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.546**	**.30484**	**.93022**	**1.0487**	**-.00443**
Stddev	.026	.00106	.00268	.0004	.00556
%RSD	.22889	.34866	.28805	.04030	125.58
#1	11.527	.30559	.93211	1.0490	-.00836
#2	11.564	.30409	.92832	1.0484	-.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49784-c-1-a Acquired: 11/14/2013 11:14:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12360	1.2168
Stddev	.00020	.0079
%RSD	.16554	.64596
#1	.12374	1.2223
#2	.12345	1.2112
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2767.0	4714.8	71256.	7270.2
Stddev	3.6	1.0	195.	5.9
%RSD	.12987	.02052	.27317	.08171
#1	2769.5	4714.1	71119.	7274.4
#2	2764.5	4715.5	71394.	7266.0

Sample Name: 480-49784-c-2-a Acquired: 11/14/2013 11:16:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**44.961**	**.09503**	**.07205**	**.43023**
Stddev	.00004	.017	.00057	.00023	.00046
%RSD	4.4947	.03806	.59603	.32528	.10788
#1	-.00079	44.949	.09543	.07221	.43056
#2	-.00084	44.973	.09463	.07188	.42990
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00382**	**324.48**	**.00667**	**.04729**	**.07841**
Stddev	.00004	3.21	.00001	.00026	.00062
%RSD	.99984	.98956	.10037	.54514	.78879
#1	.00379	322.21	.00667	.04747	.07885
#2	.00385	326.75	.00668	.04711	.07797
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31637**	**146.24**	**9.5250**	**12.202**	**.08535**
Stddev	.00063	.08	.0153	.011	.00062
%RSD	.19854	.05389	.16062	.09013	.72119
#1	.31682	146.19	9.5358	12.194	.08579
#2	.31593	146.30	9.5141	12.210	.08492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49784-c-2-a Acquired: 11/14/2013 11:16:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**98.662**	**3.7943**	**3.9465**	**.00405**	**.98765**
Stddev	.038	.0042	.0010	.00039	.00452
%RSD	.03872	.10960	.02648	9.5805	.45789
#1	98.689	3.7972	3.9458	.00378	.98445
#2	98.635	3.7913	3.9473	.00433	.99085
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.12351**	**.65954**	**3.239**	**-.00385**	**.00052**
Stddev	.00084	.00088	.004	.00468	.00086
%RSD	.68300	.13293	.1359	121.59	166.79
#1	.12410	.65892	3.242	-.00054	.00112
#2	.12291	.66016	3.236	-.00715	-.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.557**	**.05051**	**.46052**	**.70089**	**-.00205**
Stddev	.001	.00021	.00037	.00106	.00179
%RSD	.00503	.41608	.07985	.15185	87.204
#1	11.557	.05036	.46078	.70014	-.00332
#2	11.556	.05066	.46026	.70164	-.00079
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49784-c-2-a Acquired: 11/14/2013 11:16:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12509	.70231
Stddev	.00006	.00521
%RSD	.04421	.74166
#1	.12513	.70599
#2	.12505	.69863
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2847.8	4871.7	74102.	7498.6
Stddev	1.1	6.0	308.	7.6
%RSD	.04006	.12379	.41628	.10098
#1	2847.0	4867.5	73884.	7493.2
#2	2848.6	4876.0	74320.	7503.9

Sample Name: 480-49825-a-1-b Acquired: 11/14/2013 11:19:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00208**	**34.010**	**.04354**	**.07682**	**1.6446**
Stddev	.00041	.121	.00116	.00009	.0045
%RSD	19.523	.35556	2.6590	.11497	.27147
#1	.00180	33.925	.04436	.07676	1.6414
#2	.00237	34.096	.04273	.07688	1.6477
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**572.62**	**.01648**	**.48899**	**1.4027**
Stddev	.00011	.10	.00002	.00101	.0027
%RSD	10.143	.01774	.14119	.20721	.19299
#1	.00112	572.69	.01649	.48828	1.4008
#2	.00097	572.55	.01646	.48971	1.4046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5469**	**134.55**	**4.7607**	**6.7492**	**.06282**
Stddev	.0047	.05	.0049	.0747	.00030
%RSD	.30128	.04011	.10381	1.1065	.48389
#1	1.5436	134.51	4.7572	6.8020	.06304
#2	1.5502	134.59	4.7642	6.6963	.06261
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49825-a-1-b Acquired: 11/14/2013 11:19:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.647**	**1.8896**	**1.9698**	**.35855**	**1.1058**
Stddev	.014	.0003	.0077	.00038	.0102
%RSD	.03396	.01486	.39102	.10553	.92048
#1	42.657	1.8898	1.9644	.35828	1.1130
#2	42.637	1.8894	1.9753	.35882	1.0986
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2931**	**1.3930**	F **42.75**	**.00130**	**.00889**
Stddev	.0144	.0015	.15	.00039	.00027
%RSD	.27108	.10676	.3432	30.380	3.0767
#1	5.2829	1.3920	42.86	.00102	.00869
#2	5.3032	1.3941	42.65	.00158	.00908
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.995**	**.09171**	**.84510**	**.78514**	**-.00476**
Stddev	.005	.00098	.00069	.00175	.00186
%RSD	.04988	1.0652	.08130	.22313	39.096
#1	10.991	.09102	.84558	.78638	-.00344
#2	10.999	.09240	.84461	.78390	-.00607
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49825-a-1-b Acquired: 11/14/2013 11:19:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.17499	3.0084
Stddev	.00026	.0050
%RSD	.14892	.16752
#1	.17481	3.0119
#2	.17518	3.0048
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2791.0	4650.9	70438.	7040.5
Stddev	1.4	14.4	66.	35.1
%RSD	.04995	.31011	.09308	.49827
#1	2790.0	4640.7	70392.	7015.7
#2	2792.0	4661.1	70485.	7065.3

Sample Name: MB 480-151769/1-A Acquired: 11/14/2013 11:21:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00065**	**.01675**	**-.00157**	**-.00046**	**.00018**
Stddev	.00019	.02641	.00109	.00021	.00001
%RSD	28.858	157.73	69.351	46.070	7.9108
#1	-.00078	-.00193	-.00080	-.00031	.00017
#2	-.00052	.03542	-.00234	-.00061	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**.09245**	**.00004**	**-.00018**	**-.00054**
Stddev	.00015	.00135	.00014	.00003	.00006
%RSD	199.95	1.4587	376.25	14.756	11.594
#1	.00018	.09340	-.00006	-.00016	-.00049
#2	-.00003	.09150	.00014	-.00020	-.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**.00311**	**.01501**	**.02678**	**-.00067**
Stddev	.00022	.00311	.00245	.00010	.00087
%RSD	43.300	99.833	16.336	.37650	129.26
#1	.00065	.00531	.01328	.02685	-.00006
#2	.00035	.00091	.01674	.02671	-.00129
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151769/1-A Acquired: 11/14/2013 11:21:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.00029**	**.00062**	**-.00020**	**.01945**
Stddev	.00433	.00003	.00022	.00022	.00095
%RSD	18464.	10.759	34.790	110.98	4.9105
#1	.00309	.00027	.00047	-.00035	.02012
#2	-.00304	.00031	.00077	-.00004	.01877
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**-.00175**	**.0102**	**-.00132**	**.00251**
Stddev	.00021	.00098	.0015	.00199	.00112
%RSD	116.15	56.070	14.68	150.80	44.662
#1	-.00033	-.00244	.0113	-.00272	.00331
#2	-.00003	-.00106	.0092	.00009	.00172
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19389**	F **.03339**	**.00018**	**.00019**	**-.00373**
Stddev	.00022	.00005	.00016	.00003	.00141
%RSD	.11146	.13708	86.347	13.850	37.823
#1	.19405	.03342	.00029	.00021	-.00473
#2	.19374	.03336	.00007	.00017	-.00273
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		.01000			
Low Limit		-.01000			

Sample Name: MB 480-151769/1-A Acquired: 11/14/2013 11:21:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00019**	**.00301**
Stddev	.00003	.00001
%RSD	16.213	.27646
#1	-.00021	.00301
#2	-.00017	.00302
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3398.2**	**4946.2**	**77352.**	**7211.1**
Stddev	5.4	3.4	15.	12.4
%RSD	.15902	.06922	.01992	.17162
#1	3394.3	4948.7	77362.	7219.9
#2	3402.0	4943.8	77341.	7202.4

Sample Name: LCSSRM 480-151769/2- Acquired: 11/14/2013 11:24:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.38375	73.948	.95955	1.3776	2.9311
Stddev	.00084	.112	.00204	.0006	.0009
%RSD	.21967	.15095	.21249	.03962	.02920
#1	.38435	73.869	.96099	1.3772	2.9305
#2	.38316	74.026	.95811	1.3780	2.9317
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.71598	64.994	1.7544	1.3129	1.3302
Stddev	.00172	.219	.0011	.0005	.0033
%RSD	.24039	.33688	.06526	.03596	.24935
#1	.71720	64.839	1.7536	1.3132	1.3326
#2	.71476	65.148	1.7552	1.3126	1.3279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	1.0434	107.62	26.623	28.537	.07209
Stddev	.0025	.68	.073	.010	.00085
%RSD	.23643	.62816	.27301	.03640	1.1851
#1	1.0452	107.15	26.572	28.530	.07149
#2	1.0417	108.10	26.675	28.544	.07270
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit					
Low Limit					

Sample Name: LCSSRM 480-151769/2- Acquired: 11/14/2013 11:24:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.072**	**2.9858**	**2.9738**	**1.3768**	**27.729**
Stddev	.019	.0035	.0195	.0014	.103
%RSD	.07376	.11660	.65483	.09859	.37294
#1	26.086	2.9882	2.9875	1.3758	27.656
#2	26.059	2.9833	2.9600	1.3778	27.802
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5971**	**1.1733**	**2.564**	**.91996**	**1.4612**
Stddev	.0003	.0008	.023	.00188	.0032
%RSD	.01647	.06460	.8932	.20447	.21877
#1	1.5973	1.1738	2.548	.91863	1.4635
#2	1.5969	1.1728	2.580	.92129	1.4590
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.7746**	**.99594**	**.95104**	**2.7585**	**1.7523**
Stddev	.0018	.00372	.00613	.0080	.0035
%RSD	.01821	.37376	.64421	.29001	.19807
#1	9.7758	.99858	.95538	2.7642	1.7499
#2	9.7733	.99331	.94671	2.7528	1.7548
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCSSRM 480-151769/2- Acquired: 11/14/2013 11:24:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.93083**	**1.4950**
Stddev	.00043	.0017
%RSD	.04609	.11199
#1	.93113	1.4962
#2	.93052	1.4938
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3044.8**	**4993.1**	**75992.**	**7391.5**
Stddev	8.0	9.4	196.	14.2
%RSD	.26192	.18848	.25819	.19270
#1	3039.2	4986.5	75854.	7401.5
#2	3050.4	4999.8	76131.	7381.4

Sample Name: 480-49776-A-1-C Acquired: 11/14/2013 11:26:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**39.591**	**.04812**	**.03292**	**.74551**
Stddev	.00051	.054	.00391	.00005	.00221
%RSD	103.70	.13675	8.1357	.13835	.29703
#1	.00013	39.553	.05088	.03295	.74708
#2	.00086	39.630	.04535	.03289	.74394
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00239**	**29.890**	**.00782**	**.03001**	**.19792**
Stddev	.00002	.131	.00011	.00009	.00054
%RSD	.86799	.43693	1.3835	.30809	.27455
#1	.00238	29.798	.00790	.03007	.19830
#2	.00241	29.983	.00774	.02994	.19753
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.49864**	**121.67**	**9.3174**	**9.7722**	**.07887**
Stddev	.00165	.75	.0282	.0772	.00094
%RSD	.33008	.61838	.30273	.79027	1.1932
#1	.49980	121.14	9.3373	9.8268	.07820
#2	.49747	122.21	9.2974	9.7176	.07953
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C Acquired: 11/14/2013 11:26:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**18.545**	**1.0774**	**1.0427**	**.01897**	**2.2722**
Stddev	.015	.0012	.0072	.00006	.0080
%RSD	.08103	.11194	.69304	.32344	.35135
#1	18.535	1.0783	1.0478	.01901	2.2779
#2	18.556	1.0766	1.0376	.01893	2.2666
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09831**	**.16573**	**3.685**	**.11004**	**-.00174**
Stddev	.00002	.00083	.009	.00068	.00302
%RSD	.01691	.50042	.2544	.62189	173.40
#1	.09832	.16632	3.691	.11052	-.00388
#2	.09830	.16515	3.678	.10955	.00039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.3298**	**.06950**	**.16171**	**1.8697**	**-.00174**
Stddev	.0051	.00056	.00015	.0060	.00036
%RSD	.06902	.80829	.09092	.31930	20.525
#1	7.3334	.06989	.16161	1.8655	-.00149
#2	7.3263	.06910	.16181	1.8740	-.00199
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C Acquired: 11/14/2013 11:26:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.10099**	**2.6797**
Stddev	.00039	.0107
%RSD	.38732	.40065
#1	.10071	2.6873
#2	.10126	2.6721
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3183.0**	**4905.1**	**75348.**	**7261.6**
Stddev	.3	6.5	77.	22.5
%RSD	.00857	.13209	.10192	.31004
#1	3182.8	4909.7	75294.	7277.5
#2	3183.2	4900.5	75402.	7245.6

Sample Name: 480-49776-A-1-C sd@5 Acquired: 11/14/2013 11:29:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**7.9735**	**.00859**	**.00686**	**.15743**
Stddev	.00019	.0335	.00064	.00056	.00040
%RSD	76.411	.41960	7.4262	8.1125	.25689
#1	-.00012	7.9972	.00814	.00647	.15715
#2	-.00039	7.9499	.00904	.00726	.15772
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**6.1050**	**.00175**	**.00596**	**.03987**
Stddev	.00002	.0350	.00002	.00014	.00021
%RSD	4.8308	.57245	.96399	2.2789	.52624
#1	.00052	6.1297	.00176	.00605	.03972
#2	.00049	6.0803	.00174	.00586	.04002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09890**	**24.526**	**1.8869**	**1.7010**	**.01552**
Stddev	.00033	.026	.0266	.0142	.00033
%RSD	.32956	.10737	1.4075	.83228	2.1051
#1	.09867	24.507	1.9057	1.7110	.01529
#2	.09913	24.545	1.8682	1.6910	.01575
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C sd@5 Acquired: 11/14/2013 11:29:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.8963**	**.22469**	**.20818**	**.00321**	**.43327**
Stddev	.0087	.00031	.00195	.00012	.00396
%RSD	.22277	.13877	.93702	3.7938	.91294
#1	3.9024	.22447	.20680	.00312	.43606
#2	3.8902	.22491	.20956	.00329	.43047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02014**	**.03143**	**.7583**	**.02142**	**.00044**
Stddev	.00032	.00105	.0014	.00018	.00191
%RSD	1.5881	3.3351	.1787	.82387	435.83
#1	.01992	.03069	.7573	.02130	.00178
#2	.02037	.03217	.7593	.02155	-.00091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4750**	**.01374**	**.03292**	**.38376**	**-.00414**
Stddev	.0165	.00099	.00009	.00069	.00134
%RSD	1.1203	7.1774	.27467	.18106	32.245
#1	1.4867	.01304	.03286	.38327	-.00320
#2	1.4633	.01444	.03299	.38426	-.00509
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C sd@5 Acquired: 11/14/2013 11:29:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.02017	.55893
Stddev	.00008	.00030
%RSD	.39891	.05322
#1	.02023	.55872
#2	.02011	.55914
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3364.5	5003.2	77751.	7367.8
Stddev	6.8	3.9	191.	45.3
%RSD	.20261	.07822	.24586	.61424
#1	3369.3	5005.9	77886.	7335.8
#2	3359.7	5000.4	77616.	7399.8

Sample Name: 480-49776-A-1-C pds Acquired: 11/14/2013 11:31:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09674**	**59.061**	**.44759**	**.41903**	**1.1292**
Stddev	.00001	.391	.00058	.00067	.0086
%RSD	.00567	.66178	.12983	.15966	.75989
#1	.09674	58.785	.44800	.41856	1.1231
#2	.09674	59.337	.44718	.41950	1.1352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.40629**	**48.485**	**.39883**	**.43797**	**.59567**
Stddev	.00182	.041	.00092	.00069	.00051
%RSD	.44702	.08517	.23100	.15807	.08642
#1	.40501	48.456	.39948	.43846	.59530
#2	.40758	48.514	.39818	.43748	.59603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.88536**	**135.90**	**29.920**	**31.523**	**.50193**
Stddev	.00403	.45	.267	.299	.00514
%RSD	.45502	.32780	.89369	.94915	1.0240
#1	.88820	135.59	29.731	31.734	.49830
#2	.88251	136.22	30.110	31.311	.50557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C pds Acquired: 11/14/2013 11:31:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**37.384**	**1.4128**	**1.3999**	**.42893**	**22.743**
Stddev	.091	.0005	.0035	.00115	.237
%RSD	.24467	.03426	.25312	.26876	1.0432
#1	37.449	1.4132	1.3974	.42975	22.575
#2	37.319	1.4125	1.4024	.42812	22.911
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.49492**	**.56755**	**3.559**	**.49673**	**.40036**
Stddev	.00079	.00286	.017	.00107	.00662
%RSD	.15867	.50383	.4840	.21604	1.6536
#1	.49547	.56553	3.571	.49749	.39568
#2	.49436	.56957	3.547	.49597	.40504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.439**	**.45600**	**.55153**	**2.1786**	**.39105**
Stddev	.146	.00090	.00295	.0048	.00225
%RSD	.53211	.19788	.53428	.22197	.57631
#1	27.336	.45536	.54945	2.1820	.38946
#2	27.543	.45663	.55361	2.1752	.39264
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-C pds Acquired: 11/14/2013 11:31:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.50646**	**2.9380**
Stddev	.00317	.0006
%RSD	.62576	.02130
#1	.50870	2.9376
#2	.50422	2.9384
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3067.5**	**4843.6**	**73797.**	**7192.1**
Stddev	1.7	8.7	95.	1.6
%RSD	.05635	.17865	.12826	.02198
#1	3066.2	4837.4	73730.	7193.2
#2	3068.7	4849.7	73864.	7190.9

Sample Name: CCV Acquired: 11/14/2013 11:33:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49619**	**25.220**	**.50340**	**.48443**	**.50261**	**.49527**	**24.996**
Stddev	.00223	.131	.00103	.00195	.00057	.00105	.183
%RSD	.44909	.52100	.20540	.40220	.11305	.21157	.73386
#1	.49461	25.313	.50413	.48581	.50302	.49452	25.126
#2	.49776	25.127	.50267	.48305	.50221	.49601	24.866
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48914**	**.48767**	**.51090**	**.50393**	**24.257**	**25.179**	**25.957**
Stddev	.00057	.00074	.00026	.00190	.014	.000	.125
%RSD	.11746	.15215	.05013	.37769	.05753	.00053	.47975
#1	.48954	.48819	.51072	.50258	24.247	25.179	25.869
#2	.48873	.48715	.51109	.50527	24.267	25.179	26.045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49729**	**24.044**	**.50272**	**.49094**	**.49432**	**24.979**	**.48841**
Stddev	.00002	.029	.00040	.00244	.00031	.085	.00119
%RSD	.00328	.11950	.07872	.49611	.06245	.33991	.24337
#1	.49727	24.064	.50244	.48922	.49410	25.039	.48925
#2	.49730	24.024	.50300	.49266	.49454	24.919	.48757
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 11:33:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48919	24.75	.50159	.48768	25.019	.49753	.49067
Stddev	.00159	.05	.00133	.00555	.101	.00213	.00288
%RSD	.32457	.2170	.26506	1.1373	.40436	.42882	.58714
#1	.48807	24.71	.50065	.49160	25.090	.49904	.48863
#2	.49032	24.79	.50253	.48375	24.947	.49603	.49270
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49931	.48847	.50095	.49961
Stddev	.00035	.00228	.00049	.00053
%RSD	.06948	.46700	.09879	.10675
#1	.49956	.48686	.50060	.49999
#2	.49907	.49008	.50130	.49923
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3216.7	4905.8	74744.	7279.4
Stddev	2.4	.9	20.	35.8
%RSD	.07336	.01818	.02709	.49173
#1	3218.4	4906.4	74759.	7254.0
#2	3215.1	4905.2	74730.	7304.7

Sample Name: CCB Acquired: 11/14/2013 11:36:20 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.00640**	**-.00103**	**-.00001**	**.00002**	**-.00001**	**.00033**
Stddev	.00009	.04202	.00063	.00030	.00001	.00008	.00941
%RSD	80.290	656.76	61.838	2634.9	26.821	778.57	2817.9
#1	.00005	.02331	-.00148	-.00022	.00002	.00005	-.00632
#2	.00018	-.03611	-.00058	.00020	.00003	-.00007	.00698
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.00008**	**-.00032**	**.00016**	**-.00198**	**.03143**	**.00172**
Stddev	.00012	.00000	.00023	.00001	.00270	.07989	.00026
%RSD	662.35	4.9819	72.180	4.6138	136.64	254.21	14.880
#1	-.00007	.00009	-.00048	.00017	-.00007	.08791	.00153
#2	.00010	.00008	-.00015	.00016	-.00388	-.02506	.00190
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00031**	**-.00466**	**-.00002**	**.00002**	**.00006**	**-.00590**	**.00024**
Stddev	.00023	.00377	.00001	.00006	.00005	.01276	.00035
%RSD	74.784	80.898	61.903	227.44	77.538	216.28	147.75
#1	-.00048	-.00732	-.00001	.00006	.00010	.00312	-.00001
#2	-.00015	-.00199	-.00003	-.00002	.00003	-.01492	.00049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 11:36:20 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00024**	F **-.0056**	**-.00052**	**-.00075**	**-.00656**	**.00049**	**.00007**
Stddev	.00049	.0036	.00132	.00192	.00369	.00051	.00002
%RSD	199.56	63.05	256.57	257.62	56.274	104.11	29.913
#1	-.00059	-.0031	.00042	.00061	-.00395	.00013	.00006
#2	.00010	-.0081	-.00145	-.00210	-.00917	.00085	.00009
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00361**	**-.00017**	**-.00009**
Stddev	.00003	.00086	.00001	.00028
%RSD	183.12	23.858	6.7156	300.58
#1	.00001	-.00300	-.00016	-.00029
#2	-.00004	-.00422	-.00018	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3407.6**	**4987.7**	**78078.**	**7284.4**
Stddev	2.6	6.9	263.	18.3
%RSD	.07749	.13750	.33624	.25110
#1	3405.8	4982.8	77892.	7271.5
#2	3409.5	4992.5	78263.	7297.3

Sample Name: CCVL Acquired: 11/14/2013 11:38:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00268**	**.21181**	**.00997**	**.01899**	**.00212**	**.00196**	**.50064**
Stddev	.00038	.01283	.00020	.00000	.00000	.00006	.01045
%RSD	14.201	6.0587	2.0358	.02100	.11211	2.8439	2.0865
#1	.00241	.20274	.01011	.01900	.00213	.00192	.50803
#2	.00295	.22089	.00982	.01899	.00212	.00200	.49325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**.00400**	**.00382**	**.00999**	**.04429**	**.46898**	**.42977**
Stddev	.00006	.00002	.00001	.00008	.00233	.01452	.00035
%RSD	8.2613	.61373	.39102	.82915	5.2658	3.0955	.08056
#1	.00077	.00398	.00381	.00993	.04264	.47925	.42952
#2	.00069	.00402	.00383	.01005	.04594	.45872	.43001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02737**	**.20395**	**.00330**	**.00318**	**.00948**	**.93566**	**.00984**
Stddev	.00136	.00207	.00003	.00033	.00003	.00453	.00102
%RSD	4.9533	1.0160	.76516	10.497	.30784	.48429	10.397
#1	.02641	.20248	.00328	.00294	.00950	.93245	.01056
#2	.02833	.20541	.00332	.00341	.00946	.93886	.00911
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 11:38:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00350	.2005	.01956	.01325	.48924	.00985	.00478
Stddev	.00034	.0010	.00009	.00359	.01617	.00070	.00017
%RSD	9.5926	.4831	.45638	27.122	3.3055	7.1218	3.4597
#1	.00326	.1998	.01950	.01071	.47781	.00935	.00490
#2	.00374	.2012	.01962	.01579	.50068	.01035	.00466
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00477	.01999	.00461	.01004
Stddev	.00020	.00231	.00001	.00066
%RSD	4.2041	11.573	.26222	6.5805
#1	.00463	.02162	.00461	.00957
#2	.00491	.01835	.00462	.01050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3441.9	5061.5	78574.	7431.6
Stddev	17.1	14.3	144.	3.8
%RSD	.49747	.28274	.18313	.05164
#1	3454.0	5071.6	78676.	7434.3
#2	3429.8	5051.4	78473.	7428.9

Sample Name: 480-49776-A-1-D MS Acquired: 11/14/2013 11:41:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.09654	73.231	.45583	.42228	1.1897
Stddev	.00090	.367	.00139	.00014	.0020
%RSD	.92949	.50153	.30411	.03406	.16714
#1	.09717	72.971	.45681	.42238	1.1883
#2	.09590	73.491	.45485	.42218	1.1911
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.39133	44.083	.38896	.43690	.71079
Stddev	.00045	.075	.00093	.00089	.00463
%RSD	.11504	.17042	.23921	.20446	.65146
#1	.39101	44.030	.38962	.43627	.70751
#2	.39164	44.136	.38830	.43753	.71406
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	1.1121	188.85	31.237	32.683	.50148
Stddev	.0017	.12	.142	.001	.00109
%RSD	.14798	.06485	.45428	.00279	.21752
#1	1.1109	188.93	31.137	32.684	.50071
#2	1.1132	188.76	31.337	32.683	.50226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-D MS Acquired: 11/14/2013 11:41:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**35.368**	**1.5730**	**1.5615**	**.42908**	**23.181**
Stddev	.149	.0103	.0145	.00009	.045
%RSD	.42240	.65614	.92857	.02023	.19247
#1	35.262	1.5657	1.5513	.42914	23.150
#2	35.473	1.5803	1.5718	.42901	23.213
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.54462**	**.62750**	F **23.39**	**.53801**	**.38330**
Stddev	.00275	.00372	.00	.00085	.01382
%RSD	.50492	.59307	.0109	.15857	3.6053
#1	.54267	.62487	23.39	.53862	.39308
#2	.54656	.63013	23.38	.53741	.37353
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.030**	**.47922**	**.51707**	**2.9392**	**.37938**
Stddev	.038	.00074	.00042	.0085	.00700
%RSD	.15625	.15391	.08037	.29010	1.8457
#1	24.003	.47869	.51678	2.9331	.38433
#2	24.057	.47974	.51737	2.9452	.37443
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-D MS Acquired: 11/14/2013 11:41:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.53491**	**4.3132**
Stddev	.00275	.0523
%RSD	.51322	1.2121
#1	.53297	4.2763
#2	.53685	4.3502
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3025.5**	**4822.4**	**73736.**	**7217.9**
Stddev	7.2	24.6	206.	7.5
%RSD	.23857	.51113	.27955	.10440
#1	3020.4	4805.0	73882.	7212.5
#2	3030.6	4839.9	73590.	7223.2

Sample Name: 480-49776-A-1-E MSD Acquired: 11/14/2013 11:43:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09884**	**68.651**	**.44863**	**.42708**	**1.2488**
Stddev	.00022	.051	.00517	.00078	.0019
%RSD	.21981	.07491	1.1530	.18356	.14941
#1	.09899	68.615	.45228	.42653	1.2501
#2	.09868	68.687	.44497	.42764	1.2475
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39612**	**52.812**	**.40078**	**.43585**	**.67929**
Stddev	.00005	.141	.00029	.00008	.00545
%RSD	.01162	.26670	.07298	.01819	.80278
#1	.39615	52.713	.40098	.43590	.67544
#2	.39609	52.912	.40057	.43579	.68315
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.2773**	**204.88**	**29.941**	**31.750**	**.49699**
Stddev	.0068	.33	.010	.341	.00128
%RSD	.52973	.15999	.03456	1.0745	.25808
#1	1.2726	204.65	29.934	31.991	.49790
#2	1.2821	205.12	29.949	31.509	.49608
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-E MSD Acquired: 11/14/2013 11:43:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**34.469**	**1.7009**	**1.6955**	**.43186**	**23.273**
Stddev	.106	.0042	.0119	.00056	.021
%RSD	.30732	.24657	.70238	.12882	.08929
#1	34.394	1.6979	1.6871	.43146	23.288
#2	34.544	1.7038	1.7039	.43225	23.259
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.56015**	**.66822**	F **23.76**	**.65577**	**.38875**
Stddev	.00049	.00331	.04	.00001	.00841
%RSD	.08812	.49578	.1538	.00168	2.1644
#1	.55980	.66588	23.73	.65577	.38280
#2	.56050	.67056	23.78	.65576	.39470
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.943**	**.49531**	**.53626**	**3.0309**	**.37812**
Stddev	.080	.00039	.00041	.0047	.00259
%RSD	.29653	.07775	.07677	.15419	.68543
#1	26.887	.49504	.53655	3.0276	.37629
#2	27.000	.49558	.53596	3.0342	.37995
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49776-A-1-E MSD Acquired: 11/14/2013 11:43:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.53124**	**4.6166**
Stddev	.00412	.0398
%RSD	.77545	.86106
#1	.52832	4.5885
#2	.53415	4.6447
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3030.6**	**4830.4**	**73552.**	**7209.6**
Stddev	.1	2.2	261.	21.2
%RSD	.00283	.04504	.35441	.29462
#1	3030.5	4828.9	73736.	7194.6
#2	3030.6	4832.0	73367.	7224.7

Sample Name: 480-48428-A-8-B Acquired: 11/14/2013 11:45:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11015**	**9.0230**	F **-.15250**	**.41561**	**.14574**
Stddev	.00050	.0780	.00173	.00009	.00025
%RSD	.45327	.86389	1.1370	.02180	.17493
#1	.10980	9.0782	-.15372	.41568	.14592
#2	.11050	8.9679	-.15127	.41555	.14556
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09092**	**65.610**	**.04470**	**2.6429**	**5.3311**
Stddev	.00030	.066	.00000	.0028	.0171
%RSD	.32873	.10086	.00091	.10647	.32173
#1	.09113	65.563	.04470	2.6409	5.3432
#2	.09071	65.656	.04470	2.6448	5.3190
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.0062**	**56.266**	**.36851**	**.38378**	**.02013**
Stddev	.0024	.023	.05371	.00286	.00093
%RSD	.02623	.04077	14.574	.74492	4.6218
#1	9.0079	56.282	.33054	.38176	.02079
#2	9.0045	56.249	.40649	.38581	.01947
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-A-8-B Acquired: 11/14/2013 11:45:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.991**	**.40166**	**.38775**	**.32046**	**1.1327**
Stddev	.007	.00042	.00014	.00055	.0043
%RSD	.05231	.10497	.03606	.17174	.38237
#1	13.996	.40196	.38785	.32085	1.1296
#2	13.986	.40136	.38765	.32007	1.1357
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.8280**	**.04156**	**9.070**	F **-.02185**	**.08703**
Stddev	.0054	.00079	.015	.00126	.00342
%RSD	.19154	1.9126	.1624	5.7732	3.9287
#1	2.8241	.04100	9.060	-.02274	.08945
#2	2.8318	.04213	9.081	-.02095	.08461
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				50.000	
Low Limit				-.02000	

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6932**	**.03814**	**.12001**	**.93915**	**-.00247**
Stddev	.0149	.00027	.00007	.00335	.00313
%RSD	.88005	.69952	.05688	.35710	126.58
#1	1.6826	.03796	.12005	.93678	-.00026
#2	1.7037	.03833	.11996	.94152	-.00468
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-A-8-B Acquired: 11/14/2013 11:45:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.11615**	**2.6179**
Stddev	.00080	.0150
%RSD	.68620	.57281
#1	.11671	2.6286
#2	.11559	2.6073
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3198.9**	**4757.5**	**73592.**	**7197.7**
Stddev	2.6	12.0	233.	6.6
%RSD	.08221	.25213	.31666	.09218
#1	3200.8	4749.0	73427.	7202.4
#2	3197.0	4766.0	73757.	7193.0

Sample Name: 480-49946-A-1-A Acquired: 11/14/2013 11:48:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**1.0310**	**.01609**	**.00191**	**.29186**
Stddev	.00003	.0248	.00087	.00013	.00089
%RSD	25.996	2.4014	5.4012	6.6304	.30557
#1	-.00014	1.0485	.01670	.00200	.29123
#2	-.00010	1.0135	.01547	.00182	.29249
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**2.5384**	**.00019**	**.00277**	**.00659**
Stddev	.00004	.0036	.00015	.00005	.00012
%RSD	34.317	.14169	76.336	1.9737	1.8215
#1	.00016	2.5359	.00030	.00281	.00667
#2	.00009	2.5410	.00009	.00273	.00650
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19710**	**41.584**	**.23115**	**.19555**	**.00286**
Stddev	.00055	.082	.00260	.00019	.00094
%RSD	.27826	.19662	1.1254	.09914	32.824
#1	.19672	41.526	.23299	.19568	.00220
#2	.19749	41.642	.22931	.19541	.00352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49946-A-1-A Acquired: 11/14/2013 11:48:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22673**	**.19460**	**.17947**	**.00001**	**.16849**
Stddev	.00016	.00003	.00211	.00029	.00607
%RSD	.06889	.01496	1.1729	2535.6	3.5998
#1	.22662	.19458	.17799	.00022	.17278
#2	.22684	.19462	.18096	-.00020	.16421
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00637**	**.03869**	**2.456**	**.00070**	**.00249**
Stddev	.00050	.00064	.010	.00117	.00313
%RSD	7.8003	1.6590	.4182	166.35	125.35
#1	.00672	.03914	2.449	-.00012	.00471
#2	.00602	.03824	2.463	.00153	.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.99748**	**.03598**	**.02112**	**.01665**	**-.00247**
Stddev	.02088	.00019	.00006	.00003	.00242
%RSD	2.0929	.53626	.30175	.18375	97.900
#1	.98272	.03611	.02107	.01663	-.00419
#2	1.0122	.03584	.02116	.01667	-.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49946-A-1-A Acquired: 11/14/2013 11:48:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00250	.08573
Stddev	.00038	.00042
%RSD	15.350	.48703
#1	.00223	.08544
#2	.00277	.08603
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3374.7	4938.7	77515.	7331.7
Stddev	2.6	1.6	178.	14.5
%RSD	.07703	.03338	.22963	.19840
#1	3376.5	4939.9	77641.	7321.4
#2	3372.9	4937.5	77390.	7342.0

Sample Name: 480-49482-A-1-B@5 Acquired: 11/14/2013 11:50:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00067**	**.00996**	**.00319**	**.22258**	**.04608**
Stddev	.00031	.00670	.00163	.00048	.00012
%RSD	46.676	67.333	50.942	.21730	.25386
#1	-.00089	.01470	.00204	.22223	.04599
#2	-.00045	.00522	.00434	.22292	.04616
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**173.95**	**.00041**	**.01163**	**.00499**
Stddev	.00002	.54	.00019	.00019	.00053
%RSD	40.767	.31253	45.457	1.6118	10.704
#1	.00006	174.33	.00054	.01150	.00461
#2	.00003	173.56	.00028	.01176	.00537
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02705**	**.00125**	**28.324**	**40.105**	**.01119**
Stddev	.00023	.00107	.099	.211	.00010
%RSD	.84153	85.642	.34903	.52714	.89861
#1	.02688	.00049	28.394	39.955	.01112
#2	.02721	.00201	28.254	40.254	.01126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49482-A-1-B@5 Acquired: 11/14/2013 11:50:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.9844**	**.00015**	**.00098**	**.00738**	**398.38**
Stddev	.0039	.00003	.00089	.00042	1.10
%RSD	.09733	17.619	90.349	5.7093	.27640
#1	3.9872	.00016	.00036	.00767	399.16
#2	3.9817	.00013	.00161	.00708	397.60
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00882**	**-.00342**	**4.405**	**-.00150**	**.00183**
Stddev	.00055	.00237	.019	.00039	.00495
%RSD	6.2816	69.314	.4218	25.816	270.84
#1	.00922	-.00509	4.418	-.00123	.00532
#2	.00843	-.00174	4.392	-.00178	-.00167
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.2796**	**.00011**	**.45890**	**.00102**	**-.00148**
Stddev	.1005	.00034	.00054	.00070	.00082
%RSD	1.2133	315.09	.11850	68.280	55.137
#1	8.3507	.00035	.45929	.00053	-.00091
#2	8.2086	-.00013	.45852	.00152	-.00206
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49482-A-1-B@5 Acquired: 11/14/2013 11:50:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01935**	**.00193**
Stddev	.00016	.00001
%RSD	.84609	.63323
#1	.01923	.00192
#2	.01946	.00194
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2903.5**	**4583.0**	**68463.**	**7283.2**
Stddev	4.4	3.6	206.	5.5
%RSD	.15216	.07801	.30067	.07593
#1	2906.6	4585.5	68609.	7287.1
#2	2900.3	4580.5	68318.	7279.3

Sample Name: MB 480-151372/1-A Acquired: 11/14/2013 11:53:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**.02473**	**.00121**	**.00312**	**.00007**
Stddev	.00008	.00706	.00116	.00005	.00001
%RSD	53.481	28.556	96.318	1.5486	12.572
#1	-.00022	.01974	.00203	.00316	.00008
#2	-.00010	.02972	.00038	.00309	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**.03638**	**-.00007**	**-.00010**	**-.00043**
Stddev	.00007	.00267	.00003	.00010	.00007
%RSD	656.15	7.3275	46.393	102.07	16.140
#1	-.00004	.03449	-.00010	-.00003	-.00048
#2	.00006	.03826	-.00005	-.00017	-.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00023**	**-.00515**	**.01226**	**.00265**	**-.00002**
Stddev	.00005	.00315	.04017	.00045	.00072
%RSD	20.802	61.247	327.61	16.979	4177.1
#1	-.00020	-.00738	-.01614	.00296	.00049
#2	-.00026	-.00292	.04067	.00233	-.00053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151372/1-A Acquired: 11/14/2013 11:53:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00078**	**-.00006**	**.00053**	**-.00021**	**.02019**
Stddev	.00094	.00004	.00053	.00004	.00187
%RSD	121.52	70.577	99.296	20.876	9.2699
#1	.00011	-.00009	.00016	-.00024	.01887
#2	.00145	-.00003	.00091	-.00017	.02151
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**-.00137**	**.0025**	**-.00227**	**-.00158**
Stddev	.00002	.00060	.0021	.00036	.00456
%RSD	13.481	43.571	85.32	15.715	288.64
#1	.00017	-.00179	.0040	-.00252	-.00480
#2	.00014	-.00095	.0010	-.00202	.00164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01469**	**-.00002**	**.00019**	**-.00012**	**-.00376**
Stddev	.01109	.00026	.00004	.00008	.00258
%RSD	75.526	1277.1	19.203	64.695	68.536
#1	.00684	-.00020	.00021	-.00018	-.00194
#2	.02253	.00016	.00016	-.00007	-.00559
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151372/1-A Acquired: 11/14/2013 11:53:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00008**	**.00035**
Stddev	.00016	.00076
%RSD	216.87	216.86
#1	-.00019	.00089
#2	.00004	-.00019
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3442.2**	**5035.8**	**79155.**	**7426.7**
Stddev	1.1	2.9	58.	11.5
%RSD	.03320	.05774	.07304	.15501
#1	3441.4	5037.9	79196.	7434.8
#2	3443.1	5033.8	79114.	7418.5

Sample Name: LCS 480-151372/2-A Acquired: 11/14/2013 11:55:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05100**	**10.700**	**.20925**	**.20706**	**.21715**
Stddev	.00005	.133	.00009	.00036	.00008
%RSD	.09694	1.2471	.04204	.17514	.03910
#1	.05104	10.794	.20931	.20732	.21709
#2	.05097	10.605	.20919	.20680	.21721
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20728**	**10.370**	**.20243**	**.20367**	**.21332**
Stddev	.00031	.025	.00036	.00026	.00091
%RSD	.14964	.24444	.17829	.13008	.42885
#1	.20750	10.388	.20268	.20348	.21396
#2	.20706	10.353	.20217	.20386	.21267
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20962**	**10.225**	**10.293**	**10.479**	**.21018**
Stddev	.00054	.039	.083	.004	.00085
%RSD	.25938	.38546	.80394	.04130	.40528
#1	.20923	10.253	10.352	10.482	.21078
#2	.21000	10.197	10.235	10.475	.20958
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151372/2-A Acquired: 11/14/2013 11:55:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.476**	**.20709**	**.19617**	**.21043**	**10.330**
Stddev	.012	.00010	.00038	.00081	.005
%RSD	.11174	.04664	.19191	.38441	.05098
#1	10.484	.20716	.19590	.21100	10.334
#2	10.468	.20702	.19643	.20986	10.326
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20080**	**.20541**	**10.03**	**.20184**	**.20535**
Stddev	.00041	.00058	.01	.00108	.00076
%RSD	.20615	.27999	.0735	.53697	.36964
#1	.20109	.20582	10.03	.20261	.20589
#2	.20051	.20500	10.02	.20108	.20481
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.217**	**.20262**	**.20351**	**.19921**	**.20024**
Stddev	.017	.00191	.00066	.00016	.00220
%RSD	.16378	.94151	.32293	.08245	1.1007
#1	10.229	.20397	.20304	.19933	.20180
#2	10.205	.20128	.20397	.19909	.19868
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151372/2-A Acquired: 11/14/2013 11:55:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21132**	**.20479**
Stddev	.00010	.00024
%RSD	.04759	.11556
#1	.21125	.20496
#2	.21139	.20462
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3325.8**	**4955.3**	**76350.**	**7301.1**
Stddev	8.1	5.0	27.	8.9
%RSD	.24393	.10090	.03473	.12171
#1	3331.5	4958.8	76369.	7294.8
#2	3320.0	4951.7	76331.	7307.4

Sample Name: 480-49887-E-2-A Acquired: 11/14/2013 11:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**.04656**	**.00149**	**.26712**	**.05546**
Stddev	.00034	.01356	.00193	.00020	.00007
%RSD	94.414	29.120	129.51	.07481	.12666
#1	-.00012	.05615	.00013	.26726	.05541
#2	-.00060	.03697	.00286	.26697	.05550
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**96.163**	**.00038**	**.00177**	**.00059**
Stddev	.00005	.045	.00004	.00009	.00032
%RSD	281.87	.04648	9.7952	5.2072	54.423
#1	-.00002	96.194	.00041	.00184	.00036
#2	.00005	96.131	.00036	.00171	.00082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01548**	**.01018**	**6.5334**	**9.1396**	**.04223**
Stddev	.00022	.00374	.0636	.1205	.00044
%RSD	1.4308	36.730	.97410	1.3181	1.0319
#1	.01532	.00754	6.5784	9.0544	.04254
#2	.01564	.01283	6.4884	9.2248	.04192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-A Acquired: 11/14/2013 11:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**59.589**	**.15098**	**.15387**	**.00538**	**125.13**
Stddev	.075	.00004	.00062	.00010	.62
%RSD	.12592	.02779	.39987	1.8818	.49785
#1	59.642	.15101	.15343	.00530	125.57
#2	59.536	.15095	.15430	.00545	124.69
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00584**	**-.00191**	F **66.59**	**-.00232**	**-.00172**
Stddev	.00025	.00077	.03	.00038	.00305
%RSD	4.2039	40.221	.0422	16.424	177.51
#1	.00601	-.00246	66.61	-.00259	-.00388
#2	.00566	-.00137	66.57	-.00205	.00044
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.1706**	**-.00014**	**4.4202**	**.00074**	**.00282**
Stddev	.0419	.00039	.0043	.00035	.00305
%RSD	.58400	286.71	.09782	47.463	108.24
#1	7.2002	.00014	4.4233	.00099	.00497
#2	7.1410	-.00041	4.4172	.00049	.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-A Acquired: 11/14/2013 11:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00039	.01942
Stddev	.00005	.00037
%RSD	12.808	1.8846
#1	.00042	.01968
#2	.00035	.01916
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3063.9	4641.1	70592.	7325.3
Stddev	.0	4.8	36.	11.9
%RSD	.00036	.10315	.05094	.16243
#1	3063.9	4644.5	70618.	7333.7
#2	3063.9	4637.7	70567.	7316.9

Sample Name: 480-49887-E-2-Asd@5 Acquired: 11/14/2013 12:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00045**	**.00692**	**.00161**	**.05170**	**.01136**
Stddev	.00014	.01666	.00201	.00007	.00001
%RSD	30.321	240.83	125.01	.13294	.10960
#1	.00055	.01870	.00019	.05166	.01137
#2	.00035	-.00486	.00303	.05175	.01135
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**19.705**	**.00003**	**.00032**	**-.00008**
Stddev	.00001	.134	.00001	.00003	.00033
%RSD	102.72	.68202	19.066	10.464	397.92
#1	-.00000	19.610	.00004	.00030	.00015
#2	-.00002	19.800	.00003	.00035	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00346**	**.00644**	**1.2462**	**1.3443**	**.00842**
Stddev	.00012	.00415	.0457	.0109	.00005
%RSD	3.3825	64.366	3.6677	.81242	.64795
#1	.00338	.00351	1.2138	1.3365	.00845
#2	.00355	.00937	1.2785	1.3520	.00838
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-Asd@5 Acquired: 11/14/2013 12:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.720**	**.03049**	**.02976**	**.00081**	**25.029**
Stddev	.025	.00005	.00030	.00025	.031
%RSD	.21658	.17851	1.0209	31.051	.12406
#1	11.702	.03046	.02997	.00063	25.007
#2	11.738	.03053	.02954	.00098	25.051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**-.00107**	F **12.65**	**-.00095**	**-.00038**
Stddev	.00008	.00047	.01	.00041	.00384
%RSD	7.9609	43.689	.0850	43.023	1017.1
#1	.00108	-.00074	12.64	-.00124	-.00309
#2	.00097	-.00140	12.66	-.00066	.00234
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4462**	**.00004**	**.87674**	**.00026**	**-.00219**
Stddev	.0127	.00010	.00137	.00019	.00016
%RSD	.88053	271.60	.15607	72.099	7.1279
#1	1.4372	.00010	.87577	.00040	-.00208
#2	1.4552	-.00003	.87770	.00013	-.00230
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-Asd@5 Acquired: 11/14/2013 12:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00005**	**.00359**
Stddev	.00018	.00012
%RSD	325.31	3.2557
#1	.00007	.00351
#2	-.00018	.00367
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3296.7**	**4852.5**	**74311.**	**7196.8**
Stddev	.1	.9	173.	35.8
%RSD	.00176	.01764	.23214	.49725
#1	3296.7	4853.1	74189.	7222.1
#2	3296.7	4851.9	74433.	7171.5

Sample Name: CCV Acquired: 11/14/2013 12:02:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49118**	**25.170**	**.50012**	**.48543**	**.50299**	**.49106**	**24.752**
Stddev	.00026	.050	.00180	.00076	.00009	.00026	.007
%RSD	.05334	.19732	.35959	.15626	.01765	.05229	.02709
#1	.49137	25.205	.50139	.48597	.50293	.49088	24.757
#2	.49100	25.135	.49884	.48489	.50306	.49125	24.747
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48739**	**.48614**	**.50236**	**.49852**	**24.008**	**25.128**	**25.552**
Stddev	.00094	.00052	.00069	.00022	.023	.015	.042
%RSD	.19254	.10621	.13706	.04450	.09643	.06118	.16610
#1	.48672	.48577	.50285	.49836	23.991	25.139	25.582
#2	.48805	.48650	.50187	.49868	24.024	25.117	25.522
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49967**	**23.941**	**.49946**	**.48244**	**.49280**	**25.029**	**.48843**
Stddev	.00061	.089	.00114	.00175	.00073	.027	.00159
%RSD	.12218	.37149	.22764	.36347	.14744	.10726	.32457
#1	.49923	24.004	.50026	.48368	.49229	25.010	.48731
#2	.50010	23.878	.49865	.48120	.49331	25.048	.48955
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 12:02:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48932	24.74	.50162	.49635	24.599	.49514	.48935
Stddev	.00194	.03	.00583	.00200	.133	.00011	.00050
%RSD	.39615	.1233	1.1617	.40320	.53987	.02183	.10205
#1	.48795	24.76	.50574	.49776	24.505	.49522	.48900
#2	.49069	24.72	.49750	.49493	24.693	.49506	.48971
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49695	.49122	.49499	.48990
Stddev	.00029	.00288	.00105	.00303
%RSD	.05872	.58698	.21130	.61912
#1	.49716	.49326	.49573	.49204
#2	.49675	.48918	.49425	.48775
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3207.9	4885.8	75033.	7268.8
Stddev	4.6	5.2	70.	14.5
%RSD	.14493	.10550	.09289	.19974
#1	3204.7	4882.2	74983.	7279.0
#2	3211.2	4889.5	75082.	7258.5

Sample Name: CCB Acquired: 11/14/2013 12:05:04 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**-.00290**	**-.00093**	**-.00034**	**.00001**	**-.00013**	**-.00142**
Stddev	.00047	.02547	.00040	.00004	.00002	.00009	.00433
%RSD	147.77	877.19	42.473	11.403	210.31	67.995	305.14
#1	.00001	-.02091	-.00065	-.00037	.00002	-.00007	-.00448
#2	-.00065	.01511	-.00121	-.00031	-.00000	-.00019	.00164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**-.00002**	**-.00041**	**.00002**	**-.00118**	**.01436**	**.00137**
Stddev	.00006	.00004	.00009	.00005	.00365	.00321	.00051
%RSD	107.60	153.07	21.969	297.34	309.31	22.363	37.307
#1	-.00010	.00000	-.00047	.00005	.00140	.01209	.00174
#2	-.00001	-.00005	-.00035	-.00002	-.00376	.01664	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**-.00254**	**-.00002**	**.00022**	**-.00003**	**-.00609**	**.00026**
Stddev	.00053	.00014	.00005	.00050	.00010	.00020	.00011
%RSD	239.59	5.4709	203.91	228.24	356.14	3.3043	42.765
#1	.00015	-.00244	.00001	.00057	.00004	-.00595	.00033
#2	-.00059	-.00264	-.00006	-.00013	-.00010	-.00623	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 12:05:04 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00041	F .0085	-.00018	-.00198	.01491	-.00022	-.00003
Stddev	.00063	.0013	.00067	.00312	.01224	.00057	.00028
%RSD	154.37	14.95	377.15	158.07	82.143	258.18	806.30
#1	.00004	.0076	.00029	.00023	.02356	.00018	.00016
#2	-.00085	.0094	-.00065	-.00418	.00625	-.00062	-.00023
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00016	-.00178	-.00011	.00010
Stddev	.00018	.00160	.00028	.00056
%RSD	108.01	89.576	240.44	538.32
#1	.00029	-.00065	-.00031	-.00029
#2	.00004	-.00291	.00008	.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3405.3	4984.9	77797.	7298.6
Stddev	3.9	1.4	128.	13.9
%RSD	.11453	.02762	.16496	.19095
#1	3402.5	4985.9	77707.	7288.7
#2	3408.1	4983.9	77888.	7308.4

Sample Name: CCVL Acquired: 11/14/2013 12:07:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00293**	**.20048**	**.01055**	**.01950**	**.00214**	**.00200**	**.50259**
Stddev	.00012	.01906	.00022	.00022	.00002	.00014	.00117
%RSD	4.0011	9.5052	2.0775	1.1276	1.1219	6.7973	.23216
#1	.00285	.18700	.01039	.01965	.00213	.00190	.50177
#2	.00302	.21395	.01070	.01934	.00216	.00209	.50342
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**.00400**	**.00336**	**.01030**	**.04857**	**.44957**	**.42881**
Stddev	.00009	.00021	.00040	.00018	.00168	.00955	.00390
%RSD	10.642	5.2661	11.770	1.7885	3.4532	2.1247	.91054
#1	.00095	.00385	.00364	.01017	.04739	.44281	.42605
#2	.00082	.00415	.00308	.01043	.04976	.45632	.43158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02803**	**.20528**	**.00325**	**.00322**	**.00910**	**.94001**	**.00989**
Stddev	.00105	.00626	.00003	.00041	.00011	.01184	.00010
%RSD	3.7373	3.0481	.79006	12.721	1.1880	1.2592	1.0286
#1	.02729	.20086	.00323	.00351	.00902	.93164	.00996
#2	.02877	.20970	.00327	.00293	.00917	.94838	.00982
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 12:07:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00357	.2108	.01615	.01369	.46032	.00900	.00477
Stddev	.00025	.0034	.00021	.00157	.00421	.00011	.00001
%RSD	7.0351	1.600	1.2865	11.440	.91442	1.2111	.28713
#1	.00339	.2084	.01600	.01480	.46330	.00892	.00478
#2	.00375	.2132	.01629	.01258	.45734	.00908	.00476
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00489	.01953	.00504	.01038
Stddev	.00010	.00265	.00000	.00041
%RSD	2.0555	13.596	.00972	3.9618
#1	.00496	.01765	.00504	.01067
#2	.00482	.02140	.00504	.01009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3428.5	5041.1	78091.	7434.9
Stddev	9.3	13.9	498.	65.5
%RSD	.27071	.27568	.63780	.88072
#1	3435.1	5051.0	78443.	7481.2
#2	3422.0	5031.3	77738.	7388.6

Sample Name: 480-49887-E-2-A pds Acquired: 11/14/2013 12:09:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04116**	**13.793**	**.34153**	**.54520**	**.33066**
Stddev	.00203	.035	.00667	.00478	.00110
%RSD	4.9289	.25322	1.9518	.87679	.33414
#1	.04259	13.769	.33682	.54182	.32988
#2	.03972	13.818	.34624	.54858	.33144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.29145**	**109.91**	**.32154**	**.32104**	**.30839**
Stddev	.00039	.32	.00810	.00873	.00227
%RSD	.13445	.28841	2.5190	2.7191	.73509
#1	.29117	110.14	.31582	.31487	.30679
#2	.29173	109.69	.32727	.32721	.30999
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.33517**	**14.195**	**21.933**	**28.263**	**.34115**
Stddev	.00337	.052	.030	.092	.00092
%RSD	1.0067	.36883	.13759	.32575	.26982
#1	.33278	14.158	21.911	28.328	.34180
#2	.33755	14.232	21.954	28.198	.34050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-A pds Acquired: 11/14/2013 12:09:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**73.153**	**.44022**	**.44338**	**.33194**	**137.71**
Stddev	.185	.00114	.00113	.00897	.09
%RSD	.25256	.25861	.25548	2.7034	.06784
#1	73.284	.43942	.44419	.32559	137.64
#2	73.022	.44103	.44258	.33829	137.77
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31706**	**.32933**	F **64.32**	**.32160**	**.34023**
Stddev	.00788	.00522	.04	.01045	.01242
%RSD	2.4863	1.5837	.0610	3.2493	3.6499
#1	.31148	.32564	64.30	.31421	.33145
#2	.32263	.33302	64.35	.32899	.34901
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.808**	**.12490**	**4.6090**	**.29143**	**.32141**
Stddev	.023	.00304	.0174	.00189	.01208
%RSD	.18190	2.4356	.37676	.64877	3.7573
#1	12.825	.12706	4.6213	.29009	.31288
#2	12.792	.12275	4.5968	.29277	.32995
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-A pds Acquired: 11/14/2013 12:09:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.31414**	**.31214**
Stddev	.00188	.00034
%RSD	.59896	.11052
#1	.31281	.31239
#2	.31548	.31190
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2988.8**	**4640.5**	**70245.**	**7213.1**
Stddev	5.4	4.3	226.	7.2
%RSD	.17955	.09347	.32176	.09932
#1	2992.6	4643.5	70085.	7208.0
#2	2985.0	4637.4	70405.	7218.2

Sample Name: 480-49887-E-2-B MS Acquired: 11/14/2013 12:12:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05367	11.029	.22656	.48204	.26993
Stddev	.00015	.024	.00056	.00034	.00030
%RSD	.28384	.21511	.24919	.07080	.11060
#1	.05357	11.046	.22696	.48180	.27014
#2	.05378	11.012	.22616	.48228	.26972
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20777	107.53	.21216	.21022	.21451
Stddev	.00018	.26	.00002	.00022	.00257
%RSD	.08558	.24476	.01127	.10462	1.1962
#1	.20790	107.72	.21217	.21037	.21633
#2	.20764	107.34	.21214	.21006	.21270
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.23495	10.198	18.270	24.133	.27374
Stddev	.00049	.018	.067	.249	.00034
%RSD	.20824	.17833	.36848	1.0337	.12261
#1	.23530	10.211	18.318	24.309	.27350
#2	.23461	10.185	18.223	23.956	.27398
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-B MS Acquired: 11/14/2013 12:12:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**69.895**	**.35621**	**.36497**	**.22209**	**136.92**
Stddev	.194	.00022	.00330	.00003	.28
%RSD	.27775	.06310	.90479	.01301	.20631
#1	70.033	.35637	.36731	.22207	137.12
#2	69.758	.35605	.36264	.22211	136.72
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20961**	**.21038**	F **77.15**	**.21613**	**.22093**
Stddev	.00053	.00191	.02	.00251	.00035
%RSD	.25251	.90837	.0199	1.1594	.16030
#1	.20924	.21174	77.16	.21436	.22118
#2	.20999	.20903	77.14	.21790	.22068
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.543**	**.20978**	**4.6320**	**.20309**	**.20485**
Stddev	.084	.00028	.0034	.00061	.00267
%RSD	.48153	.13380	.07254	.29919	1.3029
#1	17.603	.20998	4.6343	.20352	.20297
#2	17.484	.20958	4.6296	.20266	.20674
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-B MS Acquired: 11/14/2013 12:12:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21694	.22221
Stddev	.00015	.00186
%RSD	.06768	.83787
#1	.21704	.22352
#2	.21683	.22089
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2998.8	4614.9	70298.	7252.0
Stddev	2.1	.4	47.	8.1
%RSD	.07115	.00834	.06671	.11205
#1	2997.3	4614.7	70265.	7257.8
#2	3000.3	4615.2	70331.	7246.3

Sample Name: 480-49887-E-2-C MSD Acquired: 11/14/2013 12:14:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05302	10.799	.22143	.47432	.26612
Stddev	.00012	.079	.00049	.00050	.00086
%RSD	.21887	.73299	.22195	.10529	.32281
#1	.05293	10.743	.22108	.47467	.26673
#2	.05310	10.855	.22178	.47397	.26552
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20614	105.49	.20982	.20753	.21160
Stddev	.00023	.06	.00025	.00004	.00003
%RSD	.11038	.05420	.12029	.01982	.01278
#1	.20598	105.53	.21000	.20756	.21162
#2	.20631	105.45	.20964	.20750	.21158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.23251	10.079	17.897	23.795	.26992
Stddev	.00131	.018	.013	.146	.00039
%RSD	.56371	.18041	.06997	.61486	.14524
#1	.23344	10.092	17.906	23.691	.26964
#2	.23159	10.066	17.889	23.898	.27019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-C MSD Acquired: 11/14/2013 12:14:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**68.789**	**.35167**	**.35889**	**.21871**	**134.91**
Stddev	.014	.00036	.00194	.00002	.47
%RSD	.01964	.10200	.53955	.01019	.35065
#1	68.779	.35142	.36026	.21872	135.24
#2	68.798	.35193	.35753	.21869	134.57
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20632**	**.20740**	F **76.16**	**.20947**	**.22116**
Stddev	.00086	.00305	.08	.00015	.00189
%RSD	.41451	1.4699	.1024	.06928	.85546
#1	.20572	.20956	76.11	.20937	.22250
#2	.20693	.20525	76.22	.20957	.21982
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.251**	**.20731**	**4.5939**	**.20075**	**.20072**
Stddev	.027	.00029	.0015	.00011	.00122
%RSD	.15439	.14186	.03197	.05323	.60726
#1	17.270	.20752	4.5929	.20068	.20158
#2	17.232	.20710	4.5949	.20083	.19986
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49887-E-2-C MSD Acquired: 11/14/2013 12:14:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21414	.21898
Stddev	.00165	.00103
%RSD	.76946	.47222
#1	.21531	.21972
#2	.21298	.21825
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3006.7	4624.8	70704.	7256.1
Stddev	7.3	6.0	47.	16.8
%RSD	.24374	.13002	.06654	.23104
#1	3011.9	4629.1	70671.	7267.9
#2	3001.5	4620.6	70738.	7244.2

Sample Name: 480-49571-C-1-A Acquired: 11/14/2013 12:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**1.0876**	**.00846**	**.11908**	**.29914**
Stddev	.00036	.0161	.00401	.00019	.00117
%RSD	119.30	1.4841	47.366	.16150	.39151
#1	-.00055	1.0990	.00563	.11895	.29997
#2	-.00005	1.0762	.01129	.11922	.29831
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**214.18**	**.00045**	**.01475**	**.00359**
Stddev	.00005	.78	.00017	.00009	.00004
%RSD	158.42	.36282	38.887	.64044	1.2276
#1	.00007	214.73	.00057	.01469	.00356
#2	-.00000	213.63	.00032	.01482	.00363
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02788**	**9.4447**	**9.2833**	**11.738**	**.01099**
Stddev	.00046	.0002	.0395	.091	.00022
%RSD	1.6484	.00221	.42548	.77429	2.0357
#1	.02820	9.4449	9.2554	11.802	.01115
#2	.02755	9.4446	9.3112	11.674	.01083
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49571-C-1-A Acquired: 11/14/2013 12:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**16.542**	**.35625**	**.35833**	**.01207**	**20.070**
Stddev	.019	.00092	.00096	.00046	.043
%RSD	.11599	.25842	.26893	3.8412	.21309
#1	16.556	.35690	.35901	.01240	20.101
#2	16.529	.35560	.35764	.01174	20.040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01668**	**.56183**	F **163.4**	**.01840**	**-.00132**
Stddev	.00005	.00122	.2	.00209	.00275
%RSD	.31565	.21781	.1328	11.332	208.03
#1	.01672	.56270	163.5	.01693	-.00327
#2	.01664	.56097	163.2	.01988	.00062
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.002**	**.00371**	**.82043**	**.02708**	**-.00235**
Stddev	.046	.00065	.00202	.00073	.00064
%RSD	.35145	17.435	.24609	2.6841	27.193
#1	13.034	.00325	.81900	.02759	-.00190
#2	12.970	.00417	.82186	.02656	-.00280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49571-C-1-A Acquired: 11/14/2013 12:16:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01248**	**.17965**
Stddev	.00047	.00092
%RSD	3.7581	.51197
#1	.01215	.18030
#2	.01281	.17900
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3108.5**	**4625.6**	**71580.**	**7252.1**
Stddev	5.1	1.3	194.	16.9
%RSD	.16442	.02768	.27065	.23326
#1	3112.1	4626.5	71443.	7240.1
#2	3104.9	4624.7	71717.	7264.0

Sample Name: MB 480-151641/1-A Acquired: 11/14/2013 12:19:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**.04190**	**-.00084**	**.00312**	**.00007**
Stddev	.00003	.00095	.00081	.00006	.00001
%RSD	13.082	2.2760	95.786	1.9828	13.569
#1	.00026	.04258	-.00027	.00316	.00006
#2	.00021	.04123	-.00141	.00307	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**.04100**	**-.00010**	**-.00007**	**-.00056**
Stddev	.00005	.00122	.00000	.00000	.00026
%RSD	78.155	2.9698	1.2972	5.6360	46.698
#1	-.00003	.04014	-.00011	-.00007	-.00074
#2	-.00009	.04186	-.00010	-.00007	-.00037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**-.00126**	**-.02156**	**.00255**	**-.00031**
Stddev	.00003	.00204	.03243	.00044	.00069
%RSD	33.676	161.93	150.42	17.306	222.53
#1	.00008	.00018	-.04449	.00286	-.00080
#2	.00012	-.00270	.00137	.00224	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151641/1-A Acquired: 11/14/2013 12:19:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00446**	**.00012**	**.00025**	**-.00029**	**.01089**
Stddev	.00106	.00005	.00017	.00017	.00021
%RSD	23.790	42.565	67.821	56.146	1.8836
#1	-.00521	.00015	.00013	-.00018	.01103
#2	-.00371	.00008	.00037	-.00041	.01074
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**-.00166**	**.0329**	**-.00324**	**-.00393**
Stddev	.00047	.00056	.0004	.00102	.00185
%RSD	359.13	33.958	1.082	31.343	46.952
#1	.00020	-.00205	.0331	-.00396	-.00524
#2	-.00046	-.00126	.0326	-.00252	-.00263
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00630**	**-.00038**	**.00024**	**-.00006**	**-.00145**
Stddev	.00029	.00001	.00005	.00032	.00117
%RSD	4.6057	1.6071	19.150	530.55	80.266
#1	-.00609	-.00038	.00021	-.00029	-.00228
#2	-.00650	-.00038	.00027	.00017	-.00063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151641/1-A Acquired: 11/14/2013 12:19:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00002**	**.00035**
Stddev	.00018	.00001
%RSD	782.71	2.9502
#1	.00010	.00036
#2	-.00015	.00034
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3420.3**	**4988.3**	**78766.**	**7315.1**
Stddev	1.4	5.2	222.	4.9
%RSD	.04060	.10371	.28162	.06718
#1	3421.3	4992.0	78923.	7311.6
#2	3419.3	4984.7	78609.	7318.5

Sample Name: LCS 480-151641/2-A Acquired: 11/14/2013 12:21:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05029**	**10.599**	**.20865**	**.20755**	**.21673**
Stddev	.00026	.011	.00166	.00031	.00003
%RSD	.50936	.10462	.79423	.15137	.01384
#1	.05047	10.607	.20748	.20732	.21675
#2	.05011	10.591	.20982	.20777	.21671
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20633**	**10.248**	**.20261**	**.20288**	**.21181**
Stddev	.00009	.040	.00088	.00028	.00056
%RSD	.04404	.39042	.43457	.13925	.26226
#1	.20627	10.276	.20323	.20268	.21221
#2	.20639	10.219	.20198	.20308	.21142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20994**	**10.168**	**10.181**	**10.405**	**.20947**
Stddev	.00064	.013	.031	.120	.00075
%RSD	.30353	.12564	.30630	1.1500	.35705
#1	.20949	10.177	10.203	10.490	.21000
#2	.21039	10.159	10.159	10.320	.20894
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151641/2-A Acquired: 11/14/2013 12:21:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.490**	**.20688**	**.19861**	**.21201**	**10.251**
Stddev	.006	.00005	.00028	.00004	.042
%RSD	.05631	.02458	.14057	.01952	.41045
#1	10.486	.20685	.19880	.21204	10.281
#2	10.494	.20692	.19841	.21198	10.221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20018**	**.20521**	**10.02**	**.20323**	**.20653**
Stddev	.00060	.00230	.04	.00055	.00178
%RSD	.29959	1.1191	.3490	.26952	.86173
#1	.20060	.20359	10.05	.20284	.20527
#2	.19975	.20684	9.996	.20361	.20779
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.194**	**.20110**	**.20257**	**.19956**	**.20311**
Stddev	.030	.00033	.00050	.00024	.00063
%RSD	.29007	.16199	.24537	.11779	.31259
#1	10.215	.20133	.20222	.19973	.20356
#2	10.173	.20087	.20292	.19940	.20267
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151641/2-A Acquired: 11/14/2013 12:21:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21231	.20788
Stddev	.00005	.00013
%RSD	.02300	.06241
#1	.21228	.20779
#2	.21235	.20797
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3330.6	4927.2	76134.	7323.6
Stddev	3.8	4.5	34.	21.6
%RSD	.11266	.09088	.04423	.29442
#1	3333.2	4930.3	76110.	7308.3
#2	3327.9	4924.0	76158.	7338.8

Sample Name: 480-49903-F-1-A Acquired: 11/14/2013 12:24:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**.00588**	**-.00174**	**.00795**	**.00952**
Stddev	.00060	.01397	.00376	.00008	.00000
%RSD	150.10	237.58	215.70	1.0605	.01273
#1	-.00082	-.00400	.00091	.00801	.00953
#2	.00002	.01575	-.00440	.00789	.00952
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**9.7080**	**.00016**	**-.00003**	**-.00039**
Stddev	.00001	.0394	.00003	.00009	.00011
%RSD	7.4439	.40612	16.090	314.89	27.898
#1	-.00007	9.7359	.00017	-.00009	-.00031
#2	-.00006	9.6802	.00014	.00004	-.00047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00159**	**.12336**	**.36268**	**.32644**	**.00089**
Stddev	.00002	.00306	.02893	.00276	.00018
%RSD	1.0333	2.4831	7.9774	.84474	20.151
#1	.00158	.12552	.34222	.32839	.00101
#2	.00160	.12119	.38314	.32449	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A Acquired: 11/14/2013 12:24:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.42648**	**.00985**	**.00971**	**.00001**	**.18593**
Stddev	.00297	.00009	.00036	.00005	.00550
%RSD	.69632	.92515	3.7172	326.56	2.9608
#1	.42858	.00979	.00946	.00005	.18982
#2	.42438	.00992	.00997	-.00002	.18203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00187**	**-.00107**	**1.066**	**-.00320**	**-.00121**
Stddev	.00045	.00015	.006	.00063	.00039
%RSD	23.953	13.869	.6117	19.663	32.535
#1	.00219	-.00097	1.062	-.00365	-.00149
#2	.00155	-.00118	1.071	-.00276	-.00093
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.6271**	**.00019**	**.02695**	**.00026**	**-.00199**
Stddev	.0341	.00059	.00020	.00004	.00143
%RSD	1.2983	308.29	.74840	15.710	71.940
#1	2.6030	-.00023	.02681	.00024	-.00098
#2	2.6512	.00061	.02709	.00029	-.00301
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A Acquired: 11/14/2013 12:24:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00008**	**.02079**
Stddev	.00018	.00005
%RSD	234.45	.25808
#1	-.00021	.02075
#2	.00005	.02083
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3424.1**	**4963.0**	**77477.**	**7316.2**
Stddev	6.8	1.8	271.	7.1
%RSD	.19727	.03553	.35023	.09676
#1	3419.3	4961.7	77285.	7311.1
#2	3428.9	4964.2	77669.	7321.2

Sample Name: 480-49903-F-1-A sd@5 Acquired: 11/14/2013 12:26:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**.01187**	**-.00037**	**.00106**	**.00200**
Stddev	.00016	.01918	.00296	.00027	.00001
%RSD	63.322	161.56	790.04	25.239	.65902
#1	-.00014	.02544	-.00246	.00087	.00201
#2	-.00038	-.00169	.00172	.00125	.00199
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**1.9278**	**.00006**	**-.00007**	**-.00061**
Stddev	.00000	.0010	.00000	.00002	.00005
%RSD	99.001	.05296	3.7150	30.382	8.3800
#1	.00000	1.9271	.00005	-.00005	-.00057
#2	.00000	1.9285	.00006	-.00008	-.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**.02525**	**.05104**	**.05851**	**-.00020**
Stddev	.00007	.00223	.03613	.00024	.00032
%RSD	22.097	8.8137	70.787	.40841	164.16
#1	.00037	.02368	.07658	.05868	.00003
#2	.00027	.02682	.02549	.05834	-.00042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A sd@5 Acquired: 11/14/2013 12:26:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.08547**	**.00201**	**.00228**	**-.00026**	**.03856**
Stddev	.00478	.00003	.00016	.00006	.00442
%RSD	5.5972	1.3230	6.9744	24.481	11.463
#1	.08208	.00199	.00239	-.00022	.04168
#2	.08885	.00202	.00217	-.00031	.03543
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**-.00134**	**.2130**	**-.00131**	**-.00091**
Stddev	.00001	.00088	.0025	.00035	.00193
%RSD	6.3539	65.202	1.195	26.866	211.42
#1	.00018	-.00196	.2148	-.00106	-.00228
#2	.00020	-.00072	.2112	-.00156	.00045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.50728**	**.00027**	**.00539**	**-.00023**	**-.00325**
Stddev	.01201	.00001	.00010	.00007	.00055
%RSD	2.3678	2.0704	1.8025	28.619	16.935
#1	.49879	.00027	.00546	-.00019	-.00286
#2	.51577	.00028	.00532	-.00028	-.00364
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A sd@5 Acquired: 11/14/2013 12:26:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00003**	**.00441**
Stddev	.00014	.00012
%RSD	414.55	2.7524
#1	-.00014	.00432
#2	.00007	.00449
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3395.2**	**4959.8**	**77619.**	**7273.8**
Stddev	3.1	7.0	239.	22.6
%RSD	.09261	.14111	.30785	.31018
#1	3397.4	4964.7	77450.	7289.7
#2	3393.0	4954.8	77788.	7257.8

Sample Name: 480-49903-F-1-A pds Acquired: 11/14/2013 12:28:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.04915	10.668	.20277	.21284	.22507
Stddev	.00070	.008	.00139	.00066	.00021
%RSD	1.4154	.07833	.68430	.31081	.09310
#1	.04964	10.662	.20375	.21237	.22522
#2	.04865	10.674	.20179	.21331	.22493
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20360	19.485	.19882	.19926	.20582
Stddev	.00017	.207	.00010	.00001	.00009
%RSD	.08184	1.0605	.04975	.00252	.04214
#1	.20372	19.631	.19875	.19925	.20576
#2	.20348	19.339	.19889	.19926	.20588
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20657	10.112	10.681	11.264	.21156
Stddev	.00012	.077	.120	.156	.00311
%RSD	.05700	.76546	1.1199	1.3865	1.4707
#1	.20665	10.167	10.596	11.154	.20936
#2	.20648	10.058	10.765	11.375	.21376
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A pds Acquired: 11/14/2013 12:28:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.643**	**.21124**	**.20350**	**.20712**	**10.556**
Stddev	.022	.00043	.00171	.00039	.100
%RSD	.20588	.20171	.83874	.18694	.94513
#1	10.658	.21154	.20471	.20740	10.486
#2	10.627	.21093	.20230	.20685	10.627
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19803**	**.20243**	**1.041**	**.19498**	**.20434**
Stddev	.00065	.00072	.005	.00047	.00015
%RSD	.32596	.35382	.5097	.24063	.07383
#1	.19848	.20193	1.038	.19465	.20445
#2	.19757	.20294	1.045	.19532	.20424
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.873**	**.19568**	**.23022**	**.19439**	**.19739**
Stddev	.000	.00082	.00164	.00056	.00188
%RSD	.00030	.42067	.71175	.29006	.95219
#1	12.873	.19510	.22906	.19399	.19606
#2	12.873	.19626	.23138	.19478	.19872
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-A pds Acquired: 11/14/2013 12:28:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20738**	**.21790**
Stddev	.00054	.00019
%RSD	.25885	.08719
#1	.20700	.21776
#2	.20776	.21803
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3306.2**	**4922.3**	**76333.**	**7308.6**
Stddev	12.5	9.4	31.	43.7
%RSD	.37898	.19137	.04089	.59818
#1	3315.1	4929.0	76355.	7339.6
#2	3297.4	4915.7	76311.	7277.7

Sample Name: CCV Acquired: 11/14/2013 12:31:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49517**	**25.395**	**.50443**	**.48580**	**.50675**	**.49107**	**24.814**
Stddev	.00024	.081	.00011	.00034	.00064	.00024	.017
%RSD	.04803	.31782	.02132	.07030	.12713	.04882	.06996
#1	.49534	25.452	.50435	.48605	.50721	.49124	24.827
#2	.49500	25.338	.50451	.48556	.50630	.49090	24.802
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48662**	**.48419**	**.50773**	**.50715**	**23.997**	**25.469**	**26.151**
Stddev	.00040	.00039	.00079	.00006	.048	.072	.049
%RSD	.08260	.08041	.15462	.01087	.20021	.28151	.18554
#1	.48690	.48446	.50828	.50719	24.031	25.520	26.116
#2	.48633	.48391	.50717	.50711	23.963	25.418	26.185
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50822**	**23.973**	**.49902**	**.48791**	**.49064**	**25.412**	**.48739**
Stddev	.00161	.001	.00005	.00264	.00052	.057	.00010
%RSD	.31660	.00617	.00966	.54035	.10647	.22615	.02131
#1	.50936	23.974	.49905	.48978	.49027	25.452	.48731
#2	.50708	23.972	.49898	.48605	.49101	25.371	.48746
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 12:31:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48438	24.72	.50165	.49290	24.791	.49413	.48873
Stddev	.00137	.00	.00364	.00472	.076	.00160	.00158
%RSD	.28360	.0035	.72614	.95772	.30654	.32434	.32363
#1	.48536	24.72	.50422	.48957	24.737	.49526	.48985
#2	.48341	24.72	.49907	.49624	24.845	.49300	.48761
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49681	.48885	.49981	.49236
Stddev	.00213	.00042	.00058	.00270
%RSD	.42888	.08515	.11561	.54797
#1	.49531	.48915	.50022	.49045
#2	.49832	.48856	.49940	.49427
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3191.6	4853.6	74079.	7222.8
Stddev	6.0	3.2	18.	4.3
%RSD	.18787	.06684	.02405	.05989
#1	3187.4	4851.3	74066.	7219.7
#2	3195.9	4855.9	74091.	7225.9

Sample Name: CCB Acquired: 11/14/2013 12:33:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00015**	**.00730**	**-.00027**	**-.00031**	**.00001**	**-.00000**	**-.00675**
Stddev	.00020	.01796	.00417	.00066	.00001	.00010	.00421
%RSD	130.60	246.18	1528.1	213.91	57.701	2124.3	62.322
#1	-.00001	-.00540	.00268	.00016	.00001	-.00007	-.00378
#2	-.00029	.01999	-.00322	-.00077	.00002	.00007	-.00973
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**-.00006**	**-.00022**	**-.00008**	**-.00056**	**.02431**	**.00160**
Stddev	.00013	.00003	.00027	.00013	.00012	.03567	.00010
%RSD	112.09	53.838	121.57	167.13	21.688	146.73	6.2988
#1	-.00021	-.00008	-.00003	.00001	-.00065	-.00091	.00167
#2	-.00002	-.00004	-.00042	-.00017	-.00048	.04953	.00152
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**-.00077**	**-.00005**	**-.00028**	**-.00019**	**-.00464**	**.00020**
Stddev	.00002	.00115	.00001	.00030	.00021	.00555	.00001
%RSD	15.924	148.80	21.275	106.62	110.80	119.53	7.2693
#1	.00013	-.00159	-.00005	-.00007	-.00034	-.00856	.00019
#2	.00010	.00004	-.00006	-.00050	-.00004	-.00072	.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 12:33:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00149	.0010	-.00138	-.00004	.01031	-.00015	.00001
Stddev	.00045	.0010	.00015	.00085	.02696	.00012	.00006
%RSD	30.463	96.25	11.034	1954.6	261.39	80.848	405.43
#1	-.00117	.0017	-.00149	-.00065	.02938	-.00006	.00005
#2	-.00181	.0003	-.00127	.00056	-.00875	-.00024	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00014	-.00253	-.00011	-.00025
Stddev	.00038	.00057	.00008	.00014
%RSD	269.94	22.663	74.052	56.738
#1	.00041	-.00212	-.00005	-.00035
#2	-.00013	-.00293	-.00017	-.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3397.5	4964.0	77654.	7237.4
Stddev	7.7	12.7	171.	16.1
%RSD	.22734	.25504	.22010	.22312
#1	3392.0	4955.1	77533.	7226.0
#2	3402.9	4973.0	77775.	7248.8

Sample Name: CCVL Acquired: 11/14/2013 12:36:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00297**	**.21191**	**.00988**	**.01909**	**.00213**	**.00197**	**.50066**
Stddev	.00006	.01328	.00075	.00014	.00002	.00007	.00363
%RSD	2.1064	6.2653	7.5472	.70917	.73510	3.3558	.72410
#1	.00302	.22130	.00936	.01919	.00212	.00201	.49809
#2	.00293	.20252	.01041	.01900	.00214	.00192	.50322
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.00396**	**.00346**	**.01011**	**.04657**	**.48698**	**.42899**
Stddev	.00005	.00009	.00008	.00016	.00065	.01493	.00403
%RSD	5.5701	2.1718	2.2866	1.5346	1.3879	3.0664	.94017
#1	.00089	.00402	.00352	.01000	.04612	.49754	.42613
#2	.00083	.00390	.00341	.01022	.04703	.47642	.43184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02846**	**.20494**	**.00330**	**.00382**	**.00948**	**.93449**	**.01013**
Stddev	.00118	.00228	.00005	.00000	.00017	.01284	.00011
%RSD	4.1635	1.1143	1.4818	.11862	1.7512	1.3737	1.0417
#1	.02930	.20655	.00327	.00382	.00937	.92541	.01021
#2	.02762	.20333	.00334	.00381	.00960	.94357	.01006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 12:36:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00364	.2084	.01901	.01242	.48397	.00967	.00481
Stddev	.00048	.0015	.00201	.00539	.01169	.00072	.00004
%RSD	13.270	.6960	10.582	43.360	2.4157	7.4527	.87704
#1	.00398	.2074	.01758	.00861	.49224	.00916	.00484
#2	.00330	.2094	.02043	.01623	.47570	.01018	.00478
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00469	.01795	.00482	.01021
Stddev	.00034	.00437	.00020	.00062
%RSD	7.3596	24.321	4.2020	6.0962
#1	.00493	.02104	.00497	.00977
#2	.00444	.01487	.00468	.01065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3419.1	5028.0	78209.	7430.8
Stddev	8.9	18.7	200.	20.2
%RSD	.26146	.37230	.25515	.27186
#1	3425.4	5041.2	78350.	7445.1
#2	3412.8	5014.7	78067.	7416.5

Sample Name: 480-49903-F-1-B MS Acquired: 11/14/2013 12:38:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05047**	**10.543**	**.20706**	**.21140**	**.22386**
Stddev	.00006	.044	.00001	.00018	.00012
%RSD	.11877	.41606	.00613	.08308	.05431
#1	.05052	10.574	.20707	.21128	.22395
#2	.05043	10.512	.20705	.21153	.22377
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20745**	**19.644**	**.20248**	**.20203**	**.20929**
Stddev	.00045	.015	.00011	.00026	.00011
%RSD	.21606	.07535	.05618	.13108	.05367
#1	.20714	19.655	.20256	.20185	.20921
#2	.20777	19.634	.20240	.20222	.20936
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21026**	**10.306**	**10.465**	**11.049**	**.20891**
Stddev	.00042	.024	.039	.008	.00005
%RSD	.20090	.22941	.36850	.07408	.02316
#1	.21056	10.289	10.438	11.055	.20888
#2	.20997	10.323	10.493	11.044	.20895
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-B MS Acquired: 11/14/2013 12:38:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.814**	**.21428**	**.20505**	**.21153**	**10.379**
Stddev	.003	.00067	.00050	.00018	.005
%RSD	.02884	.31454	.24389	.08726	.04461
#1	10.816	.21380	.20540	.21140	10.376
#2	10.812	.21475	.20469	.21166	10.382
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20143**	**.20508**	F **11.16**	**.20191**	**.21013**
Stddev	.00097	.00018	.02	.00192	.00136
%RSD	.47986	.08794	.1582	.94993	.64701
#1	.20211	.20495	11.15	.20327	.20917
#2	.20075	.20521	11.17	.20055	.21109
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.611**	**.20030**	**.23081**	**.19751**	**.20011**
Stddev	.087	.00045	.00014	.00137	.00103
%RSD	.69005	.22319	.05865	.69347	.51661
#1	12.673	.20062	.23071	.19848	.20084
#2	12.550	.19999	.23090	.19655	.19938
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-B MS Acquired: 11/14/2013 12:38:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20929**	**.22223**
Stddev	.00010	.00007
%RSD	.04575	.03093
#1	.20923	.22228
#2	.20936	.22218
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3299.5**	**4898.0**	**76219.**	**7346.8**
Stddev	5.2	1.2	34.	20.8
%RSD	.15830	.02485	.04494	.28265
#1	3303.2	4898.8	76195.	7361.4
#2	3295.8	4897.1	76244.	7332.1

Sample Name: 480-49903-F-1-C MSD Acquired: 11/14/2013 12:40:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04904**	**10.270**	**.20609**	**.20649**	**.21875**
Stddev	.00035	.058	.00470	.00019	.00043
%RSD	.71055	.56864	2.2811	.08968	.19574
#1	.04929	10.229	.20277	.20662	.21844
#2	.04879	10.312	.20942	.20636	.21905
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20226**	**19.138**	**.19764**	**.19757**	**.20538**
Stddev	.00010	.001	.00049	.00006	.00185
%RSD	.05031	.00564	.24670	.03072	.90039
#1	.20233	19.138	.19798	.19761	.20407
#2	.20218	19.137	.19729	.19753	.20668
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20590**	**10.028**	**10.264**	**10.736**	**.20439**
Stddev	.00056	.057	.031	.055	.00066
%RSD	.27357	.56575	.30316	.51383	.32087
#1	.20550	9.9883	10.286	10.775	.20485
#2	.20630	10.069	10.242	10.697	.20392
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-C MSD Acquired: 11/14/2013 12:40:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.597**	**.20922**	**.20153**	**.20648**	**10.108**
Stddev	.024	.00009	.00197	.00005	.004
%RSD	.22835	.04437	.97763	.02601	.04100
#1	10.580	.20929	.20014	.20652	10.106
#2	10.614	.20915	.20293	.20645	10.111
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19602**	**.20096**	F **10.80**	**.19941**	**.20354**
Stddev	.00026	.00048	.04	.00095	.00348
%RSD	.13189	.23986	.3426	.47675	1.7111
#1	.19620	.20130	10.77	.20008	.20601
#2	.19584	.20062	10.82	.19874	.20108
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.310**	**.19558**	**.22347**	**.19330**	**.19880**
Stddev	.042	.00027	.00009	.00027	.00081
%RSD	.34111	.13950	.04063	.13937	.40755
#1	12.281	.19578	.22354	.19349	.19938
#2	12.340	.19539	.22341	.19311	.19823
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49903-F-1-C MSD Acquired: 11/14/2013 12:40:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.20607	.21702
Stddev	.00111	.00084
%RSD	.54054	.38758
#1	.20528	.21643
#2	.20686	.21761
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3296.9	4895.5	75840.	7336.2
Stddev	.6	1.6	249.	19.6
%RSD	.01703	.03288	.32823	.26733
#1	3297.3	4894.3	76016.	7350.0
#2	3296.5	4896.6	75664.	7322.3

Sample Name: 480-48677-G-2-C Acquired: 11/14/2013 12:43:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00077	58.083	.09173	.15065	.42397
Stddev	.00078	.273	.00110	.00020	.00082
%RSD	100.73	.47026	1.1941	.13148	.19261
#1	.00022	58.276	.09096	.15079	.42339
#2	.00132	57.890	.09251	.15051	.42455
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00330	301.52	.00122	.06863	.09283
Stddev	.00011	2.24	.00017	.00028	.00003
%RSD	3.4763	.74199	14.113	.41110	.03140
#1	.00322	303.10	.00110	.06843	.09281
#2	.00339	299.93	.00135	.06883	.09285
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21671	160.60	21.321	26.581	.10145
Stddev	.00095	1.10	.022	.107	.00047
%RSD	.43819	.68523	.10239	.40153	.46133
#1	.21738	161.37	21.336	26.506	.10112
#2	.21604	159.82	21.306	26.657	.10178
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48677-G-2-C Acquired: 11/14/2013 12:43:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**131.46**	**8.0510**	**8.7104**	**.00628**	**9.0225**
Stddev	.19	.0382	.0404	.00039	.0326
%RSD	.14687	.47390	.46332	6.2710	.36148
#1	131.32	8.0240	8.6819	.00656	9.0455
#2	131.59	8.0780	8.7389	.00600	8.9994
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.17332**	**.10957**	F **22.23**	**-.00699**	**.00717**
Stddev	.00118	.00108	.05	.00053	.00265
%RSD	.68320	.98984	.2300	7.5442	36.989
#1	.17248	.10880	22.19	-.00662	.00529
#2	.17416	.11033	22.26	-.00737	.00904
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**85.614**	**.00390**	**.26324**	**1.5245**	**.00057**
Stddev	.255	.00037	.00043	.0067	.00233
%RSD	.29796	9.5996	.16271	.43724	409.00
#1	85.794	.00416	.26293	1.5198	.00222
#2	85.434	.00364	.26354	1.5292	-.00108
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48677-G-2-C Acquired: 11/14/2013 12:43:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.13947	.55550
Stddev	.00010	.00081
%RSD	.07179	.14553
#1	.13940	.55607
#2	.13954	.55493
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2853.4	4680.7	71755.	7244.6
Stddev	12.5	23.2	161.	34.5
%RSD	.43733	.49530	.22479	.47632
#1	2862.2	4697.1	71869.	7220.2
#2	2844.6	4664.3	71641.	7269.0

Sample Name: 480-48677-G-3-C Acquired: 11/14/2013 12:45:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00117	1.6092	-.00065	.10825	.20165
Stddev	.00073	.0014	.00052	.00015	.00032
%RSD	62.895	.08935	80.007	.14173	.15818
#1	.00065	1.6082	-.00028	.10814	.20187
#2	.00169	1.6102	-.00102	.10835	.20142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00011	131.73	.00026	.00984	.00326
Stddev	.00013	.37	.00005	.00011	.00031
%RSD	114.74	.28460	19.035	1.0934	9.4320
#1	.00020	131.99	.00022	.00992	.00348
#2	.00002	131.46	.00029	.00976	.00305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00650	2.5142	7.0781	9.5621	.00977
Stddev	.00004	.0102	.0011	.0963	.00158
%RSD	.62466	.40480	.01577	1.0067	16.186
#1	.00653	2.5214	7.0789	9.4940	.00865
#2	.00647	2.5070	7.0773	9.6302	.01089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48677-G-3-C Acquired: 11/14/2013 12:45:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**62.449**	**4.7979**	**5.0050**	**.00185**	**97.653**
Stddev	.206	.0182	.0148	.00047	.041
%RSD	.33035	.37935	.29608	25.653	.04161
#1	62.595	4.8107	5.0155	.00218	97.682
#2	62.303	4.7850	4.9945	.00151	97.625
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00910**	**-.00226**	F **23.96**	**-.00286**	**.00854**
Stddev	.00029	.00173	.13	.00236	.00124
%RSD	3.2303	76.466	.5599	82.457	14.467
#1	.00889	-.00348	24.06	-.00119	.00942
#2	.00931	-.00104	23.87	-.00452	.00767
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.461**	**.00037**	**.23724**	**.06106**	**.00161**
Stddev	.008	.00092	.00147	.00132	.00007
%RSD	.07707	247.94	.61882	2.1551	4.5748
#1	10.455	-.00028	.23828	.06013	.00155
#2	10.467	.00102	.23620	.06199	.00166
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48677-G-3-C Acquired: 11/14/2013 12:45:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00360	.01130
Stddev	.00004	.00020
%RSD	1.2181	1.8103
#1	.00363	.01115
#2	.00357	.01144
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3034.2	4630.1	70416.	7320.2
Stddev	8.0	10.6	88.	10.8
%RSD	.26226	.22959	.12451	.14717
#1	3028.6	4622.6	70478.	7312.5
#2	3039.8	4637.6	70354.	7327.8

Sample Name: 480-49275-C-4-A Acquired: 11/14/2013 12:48:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**3.4679**	**.00069**	**.22402**	**.19847**
Stddev	.00034	.0209	.00127	.00011	.00039
%RSD	173.73	.60118	183.17	.04855	.19859
#1	-.00004	3.4826	.00159	.22409	.19819
#2	.00043	3.4532	-.00020	.22394	.19875
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**67.865**	**.00015**	**.00072**	**.00456**
Stddev	.00002	.130	.00001	.00001	.00006
%RSD	27.790	.19178	5.5320	.79946	1.3198
#1	.00007	67.957	.00014	.00073	.00452
#2	.00005	67.773	.00015	.00072	.00460
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00279**	**1.7759**	**2.8624**	**3.4433**	**.06646**
Stddev	.00012	.0121	.0488	.0134	.00134
%RSD	4.2080	.67985	1.7040	.38817	2.0171
#1	.00271	1.7845	2.8969	3.4339	.06740
#2	.00287	1.7674	2.8279	3.4528	.06551
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49275-C-4-A Acquired: 11/14/2013 12:48:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.805**	**.03775**	**.03715**	**.00022**	**32.162**
Stddev	.026	.00002	.00080	.00006	.027
%RSD	.11035	.04485	2.1452	27.513	.08306
#1	23.823	.03776	.03658	.00017	32.143
#2	23.786	.03774	.03771	.00026	32.181
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00361**	**-.00391**	**9.054**	**-.00216**	**-.00178**
Stddev	.00032	.00118	.006	.00070	.00124
%RSD	8.9269	30.117	.0671	32.254	69.561
#1	.00384	-.00308	9.058	-.00265	-.00266
#2	.00338	-.00474	9.049	-.00167	-.00091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.415**	**.00023**	**1.3126**	**.06846**	**-.00365**
Stddev	.037	.00039	.0019	.00224	.00097
%RSD	.32610	171.15	.14618	3.2721	26.573
#1	11.442	.00050	1.3112	.07004	-.00296
#2	11.389	-.00005	1.3140	.06687	-.00433
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49275-C-4-A Acquired: 11/14/2013 12:48:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00705**	**.02101**
Stddev	.00007	.00000
%RSD	1.0109	.02121
#1	.00710	.02101
#2	.00699	.02102
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3187.3**	**4767.3**	**73795.**	**7203.2**
Stddev	3.2	3.5	37.	9.4
%RSD	.10193	.07347	.05019	.13071
#1	3189.6	4764.8	73821.	7196.5
#2	3185.0	4769.8	73769.	7209.8

Sample Name: MB 480-151076/1-B Acquired: 11/14/2013 12:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**.01613**	**.00088**	**.00294**	**.00008**
Stddev	.00010	.01341	.00053	.00040	.00002
%RSD	33.610	83.144	60.127	13.782	21.979
#1	.00023	.02561	.00126	.00322	.00009
#2	.00038	.00665	.00051	.00265	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**.04477**	**-.00009**	**-.00002**	**-.00078**
Stddev	.00000	.00486	.00005	.00017	.00006
%RSD	2.5308	10.865	60.000	799.38	8.0014
#1	-.00005	.04821	-.00005	-.00014	-.00074
#2	-.00005	.04133	-.00013	.00010	-.00083
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.00071**	**.01058**	**.00263**	**.00007**
Stddev	.00009	.00047	.02453	.00012	.00004
%RSD	333.21	65.813	231.77	4.3736	60.340
#1	.00009	.00038	.02793	.00255	.00004
#2	-.00004	.00105	-.00676	.00271	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151076/1-B Acquired: 11/14/2013 12:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00290**	**-.00009**	**.00068**	**-.00007**	**.01058**
Stddev	.00266	.00004	.00108	.00003	.00820
%RSD	91.861	46.982	160.11	41.281	77.523
#1	-.00102	-.00006	.00144	-.00010	.01637
#2	-.00478	-.00012	-.00009	-.00005	.00478
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**-.00145**	**.0045**	**-.00094**	**.00174**
Stddev	.00003	.00053	.0012	.00122	.00096
%RSD	69.757	36.796	27.68	128.98	55.187
#1	-.00002	-.00107	.0054	-.00181	.00242
#2	-.00006	-.00183	.0036	-.00008	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00929**	**-.00015**	**.00010**	**.00003**	**-.00196**
Stddev	.00298	.00016	.00004	.00013	.00022
%RSD	32.097	104.91	39.446	471.05	11.390
#1	-.01140	-.00027	.00007	.00012	-.00180
#2	-.00718	-.00004	.00012	-.00006	-.00211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-151076/1-B Acquired: 11/14/2013 12:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00014**	**.00048**
Stddev	.00024	.00004
%RSD	174.53	9.2326
#1	.00003	.00045
#2	-.00031	.00051
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3422.0**	**4975.5**	**78174.**	**7323.6**
Stddev	1.9	8.2	121.	28.0
%RSD	.05475	.16579	.15505	.38268
#1	3423.3	4981.3	78260.	7303.8
#2	3420.7	4969.6	78088.	7343.4

Sample Name: LCS 480-151076/2-B Acquired: 11/14/2013 12:53:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04943**	**10.543**	**.20677**	**.20417**	**.21480**
Stddev	.00018	.172	.00269	.00004	.00023
%RSD	.35748	1.6279	1.3009	.01876	.10675
#1	.04930	10.665	.20867	.20415	.21497
#2	.04955	10.422	.20487	.20420	.21464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20293**	**10.140**	**.19784**	**.19886**	**.21034**
Stddev	.00060	.087	.00001	.00058	.00039
%RSD	.29567	.86167	.00731	.28933	.18450
#1	.20251	10.202	.19783	.19845	.21061
#2	.20336	10.079	.19785	.19926	.21007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20930**	**9.9987**	**10.170**	**10.498**	**.20806**
Stddev	.00070	.0426	.013	.046	.00047
%RSD	.33453	.42619	.13240	.43752	.22657
#1	.20980	10.029	10.180	10.465	.20773
#2	.20881	9.9686	10.161	10.530	.20839
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151076/2-B Acquired: 11/14/2013 12:53:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.330**	**.20273**	**.19304**	**.20679**	**10.267**
Stddev	.020	.00023	.00002	.00076	.061
%RSD	.19184	.11539	.00868	.36857	.59575
#1	10.316	.20289	.19305	.20625	10.310
#2	10.344	.20256	.19303	.20733	10.223
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19643**	**.20246**	**9.833**	**.20026**	**.20270**
Stddev	.00033	.00075	.002	.00169	.00203
%RSD	.16666	.36978	.0148	.84487	1.0017
#1	.19666	.20299	9.832	.19906	.20127
#2	.19619	.20193	9.834	.20145	.20414
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.085**	**.19530**	**.19918**	**.19569**	**.19758**
Stddev	.029	.00021	.00042	.00051	.00102
%RSD	.28954	.10909	.21075	.25888	.51673
#1	10.106	.19545	.19889	.19533	.19831
#2	10.065	.19515	.19948	.19604	.19686
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-151076/2-B Acquired: 11/14/2013 12:53:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20948**	**.20108**
Stddev	.00045	.00081
%RSD	.21482	.40446
#1	.20980	.20166
#2	.20916	.20051
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3317.8**	**4921.4**	**75609.**	**7288.1**
Stddev	1.8	6.5	45.	32.9
%RSD	.05445	.13201	.05931	.45193
#1	3319.0	4926.0	75577.	7264.8
#2	3316.5	4916.8	75640.	7311.4

Sample Name: LCSD 480-151076/31-B Acquired: 11/14/2013 12:55:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04990**	**10.457**	**.20387**	**.20456**	**.21419**
Stddev	.00041	.058	.00175	.00144	.00089
%RSD	.82981	.55625	.85853	.70599	.41548
#1	.05019	10.415	.20511	.20558	.21482
#2	.04960	10.498	.20263	.20354	.21356
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20355**	**10.030**	**.19835**	**.19866**	**.20835**
Stddev	.00055	.030	.00006	.00027	.00048
%RSD	.26988	.30339	.02856	.13670	.23218
#1	.20394	10.051	.19839	.19847	.20869
#2	.20316	10.008	.19831	.19885	.20800
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20780**	**10.018**	**10.123**	**10.327**	**.20721**
Stddev	.00073	.061	.026	.164	.00105
%RSD	.35344	.60844	.25941	1.5911	.50707
#1	.20832	10.061	10.141	10.443	.20795
#2	.20728	9.9745	10.104	10.211	.20647
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCSD 480-151076/31-B Acquired: 11/14/2013 12:55:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.282**	**.20215**	**.19555**	**.20788**	**10.146**
Stddev	.021	.00028	.00170	.00017	.021
%RSD	.19953	.13880	.87081	.08265	.20921
#1	10.296	.20235	.19675	.20800	10.161
#2	10.267	.20195	.19434	.20775	10.131
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19650**	**.20351**	**9.855**	**.20194**	**.20407**
Stddev	.00002	.00030	.054	.00375	.00158
%RSD	.01107	.14585	.5498	1.8568	.77596
#1	.19652	.20330	9.816	.19929	.20295
#2	.19649	.20372	9.893	.20459	.20519
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.9975**	**.19478**	**.20143**	**.19416**	**.20158**
Stddev	.0138	.00129	.00065	.00036	.00333
%RSD	.13806	.66400	.32280	.18367	1.6528
#1	10.007	.19570	.20097	.19391	.19923
#2	9.9878	.19387	.20189	.19441	.20394
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCSD 480-151076/31-B Acquired: 11/14/2013 12:55:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20748**	**.19816**
Stddev	.00080	.00039
%RSD	.38498	.19780
#1	.20805	.19843
#2	.20692	.19788
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3323.5**	**4917.7**	**76047.**	**7330.7**
Stddev	6.4	1.5	131.	1.3
%RSD	.19376	.03134	.17238	.01757
#1	3328.1	4916.6	75955.	7331.6
#2	3319.0	4918.8	76140.	7329.8

Sample Name: 480-49805-E-2-A Acquired: 11/14/2013 12:57:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00065**	**.03172**	**.00687**	**.03021**	**.07768**
Stddev	.00035	.00633	.00237	.00078	.00016
%RSD	53.186	19.948	34.565	2.5855	.20175
#1	-.00040	.02725	.00854	.02965	.07757
#2	-.00089	.03619	.00519	.03076	.07779
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**20.733**	**.00005**	**.00048**	**-.00011**
Stddev	.00008	.027	.00005	.00014	.00042
%RSD	92.114	.13155	101.04	29.225	370.85
#1	.00003	20.714	.00001	.00058	-.00041
#2	.00015	20.752	.00009	.00038	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00573**	**3.1610**	**4.7559**	**7.6712**	**.00147**
Stddev	.00044	.0121	.0076	.0089	.00053
%RSD	7.7218	.38158	.15904	.11648	35.788
#1	.00542	3.1525	4.7506	7.6648	.00184
#2	.00604	3.1696	4.7613	7.6775	.00110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-2-A Acquired: 11/14/2013 12:57:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.5302**	**.23773**	**.24622**	**.00116**	**370.76**
Stddev	.0033	.00013	.00094	.00030	1.42
%RSD	.13003	.05577	.38257	25.878	.38342
#1	2.5325	.23782	.24556	.00095	369.76
#2	2.5278	.23763	.24689	.00137	371.77
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00201**	**-.00005**	F **10.74**	**-.00196**	**-.00488**
Stddev	.00006	.00034	.01	.00375	.00245
%RSD	2.7545	707.88	.1046	191.60	50.179
#1	.00205	.00019	10.73	-.00461	-.00315
#2	.00197	-.00029	10.75	.00069	-.00662
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.5291**	**-.00008**	**.12121**	**.00038**	**-.00119**
Stddev	.0160	.00036	.00065	.00010	.00177
%RSD	.63097	437.74	.53645	27.930	149.09
#1	2.5178	.00017	.12075	.00030	.00006
#2	2.5404	-.00034	.12167	.00045	-.00244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-2-A Acquired: 11/14/2013 12:57:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00113**	**.02519**
Stddev	.00049	.00014
%RSD	42.780	.55309
#1	.00079	.02510
#2	.00148	.02529
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3009.0**	**4663.3**	**69345.**	**7355.2**
Stddev	5.9	21.0	327.	25.7
%RSD	.19618	.45090	.47100	.34943
#1	3013.2	4678.1	69576.	7373.4
#2	3004.8	4648.4	69114.	7337.0

Sample Name: CCV Acquired: 11/14/2013 13:00:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49527**	**25.208**	**.50319**	**.48628**	**.50452**	**.49124**	**24.641**
Stddev	.00014	.164	.00102	.00066	.00177	.00027	.071
%RSD	.02769	.65231	.20299	.13565	.35178	.05408	.28720
#1	.49517	25.092	.50247	.48674	.50326	.49106	24.591
#2	.49537	25.324	.50391	.48581	.50577	.49143	24.691
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48680**	**.48469**	**.50647**	**.50711**	**24.001**	**25.280**	**26.043**
Stddev	.00014	.00013	.00055	.00170	.016	.177	.223
%RSD	.02782	.02583	.10851	.33529	.06519	.70123	.85600
#1	.48671	.48478	.50608	.50591	23.990	25.155	25.886
#2	.48690	.48461	.50685	.50831	24.012	25.405	26.201
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50410**	**23.876**	**.49790**	**.48698**	**.49200**	**25.230**	**.48711**
Stddev	.00341	.004	.00042	.00139	.00034	.183	.00046
%RSD	.67554	.01792	.08343	.28516	.06941	.72440	.09374
#1	.50169	23.879	.49761	.48600	.49176	25.101	.48744
#2	.50651	23.872	.49820	.48797	.49224	25.359	.48679
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 13:00:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48770	24.74	.50429	.49502	24.514	.49486	.49140
Stddev	.00116	.01	.00027	.00058	.101	.00147	.00065
%RSD	.23822	.0503	.05367	.11642	.41085	.29712	.13278
#1	.48688	24.75	.50410	.49542	24.443	.49382	.49093
#2	.48852	24.73	.50449	.49461	24.585	.49590	.49186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49613	.48835	.50077	.49269
Stddev	.00128	.00281	.00252	.00186
%RSD	.25771	.57605	.50344	.37721
#1	.49704	.49034	.49899	.49138
#2	.49523	.48636	.50256	.49400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3187.7	4837.5	74067.	7221.3
Stddev	.7	8.9	104.	6.8
%RSD	.02222	.18466	.14084	.09405
#1	3188.2	4843.8	74141.	7226.1
#2	3187.2	4831.2	73993.	7216.5

Sample Name: CCB Acquired: 11/14/2013 13:02:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**-.00115**	**-.00232**	**-.00036**	**.00001**	**.00007**	**-.00079**
Stddev	.00087	.00583	.00078	.00012	.00000	.00013	.00033
%RSD	342.97	507.44	33.570	32.886	3.2862	193.49	41.607
#1	.00036	.00297	-.00287	-.00027	.00001	.00016	-.00102
#2	-.00087	-.00527	-.00177	-.00044	.00001	-.00002	-.00056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**-.00009**	**-.00038**	**-.00011**	**.00216**	**.03503**	**.00159**
Stddev	.00000	.00006	.00025	.00015	.00365	.03368	.00002
%RSD	8.7197	69.463	64.357	129.50	168.93	96.137	1.4621
#1	.00002	-.00005	-.00056	-.00001	-.00042	.01122	.00157
#2	.00002	-.00014	-.00021	-.00022	.00475	.05884	.00160
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00062**	**-.00037**	**-.00002**	**.00021**	**-.00015**	**.00140**	**-.00021**
Stddev	.00110	.00086	.00003	.00021	.00033	.00029	.00040
%RSD	176.03	232.96	138.23	98.093	228.50	20.870	191.92
#1	-.00140	.00024	-.00000	.00036	-.00038	.00160	-.00049
#2	.00015	-.00098	-.00005	.00006	.00009	.00119	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 13:02:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00101**	**-.0013**	**-.00147**	**-.00355**	**.01341**	**-.00007**	**-.00010**
Stddev	.00154	.0017	.00074	.00191	.01881	.00095	.00003
%RSD	152.83	131.9	50.231	53.664	140.27	1296.7	24.933
#1	-.00210	-.0001	-.00199	-.00490	.02671	.00060	-.00012
#2	.00008	-.0025	-.00095	-.00221	.00011	-.00074	-.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00005**	**-.00186**	**-.00023**	**-.00011**
Stddev	.00011	.00049	.00015	.00048
%RSD	211.56	26.322	65.933	435.67
#1	.00012	-.00151	-.00034	-.00045
#2	-.00002	-.00220	-.00012	.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3389.8**	**4948.1**	**77619.**	**7257.0**
Stddev	6.5	4.5	151.	17.8
%RSD	.19192	.09157	.19517	.24535
#1	3394.4	4951.3	77512.	7244.4
#2	3385.2	4944.9	77727.	7269.6

Sample Name: CCVL Acquired: 11/14/2013 13:05:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00282**	**.19294**	**.01135**	**.01907**	**.00211**	**.00197**	**.49541**
Stddev	.00003	.00344	.00302	.00006	.00001	.00002	.00081
%RSD	.90849	1.7810	26.628	.33142	.34663	.84200	.16414
#1	.00280	.19051	.00922	.01911	.00212	.00195	.49483
#2	.00284	.19537	.01349	.01902	.00211	.00198	.49598
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.00388**	**.00344**	**.00963**	**.04351**	**.48765**	**.42489**
Stddev	.00007	.00009	.00012	.00004	.00133	.05118	.00161
%RSD	8.5802	2.4179	3.3488	.39181	3.0607	10.495	.37993
#1	.00090	.00382	.00336	.00965	.04257	.45146	.42604
#2	.00079	.00395	.00352	.00960	.04445	.52384	.42375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02773**	**.20248**	**.00330**	**.00297**	**.00940**	**.93169**	**.00986**
Stddev	.00109	.00270	.00000	.00010	.00010	.01283	.00006
%RSD	3.9168	1.3348	.01547	3.3237	1.0537	1.3771	.64290
#1	.02696	.20439	.00330	.00304	.00947	.92262	.00982
#2	.02850	.20057	.00330	.00290	.00933	.94076	.00991
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 13:05:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00331	.2041	.01940	.01484	.49398	.00970	.00479
Stddev	.00123	.0043	.00054	.00090	.00189	.00052	.00003
%RSD	37.259	2.102	2.7894	6.0752	.38230	5.3857	.52709
#1	.00244	.2011	.01902	.01548	.49531	.00933	.00477
#2	.00418	.2072	.01978	.01420	.49264	.01007	.00481
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00479	.01897	.00469	.00992
Stddev	.00002	.00149	.00003	.00009
%RSD	.33049	7.8693	.62446	.87279
#1	.00480	.01791	.00467	.00998
#2	.00478	.02003	.00471	.00986
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3417.6	5019.6	78617.	7452.3
Stddev	3.0	13.6	100.	17.6
%RSD	.08844	.27058	.12710	.23614
#1	3419.7	5029.2	78546.	7464.8
#2	3415.4	5010.0	78688.	7439.9

Sample Name: 480-49805-B-4-A Acquired: 11/14/2013 13:07:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**.05177**	**.00889**	**.03647**	**.04284**
Stddev	.00012	.02177	.00313	.00011	.00012
%RSD	40.201	42.062	35.148	.30609	.28890
#1	-.00021	.03637	.01110	.03640	.04275
#2	-.00038	.06717	.00668	.03655	.04293
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**19.073**	**.00017**	**.00045**	**.00102**
Stddev	.00009	.060	.00002	.00019	.00010
%RSD	366.75	.31511	11.473	42.695	9.6335
#1	.00009	19.116	.00019	.00031	.00109
#2	-.00004	19.031	.00016	.00058	.00095
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01739**	**.01559**	**3.8999**	**4.9017**	**.00066**
Stddev	.00013	.00038	.0089	.0118	.00060
%RSD	.76783	2.4294	.22748	.24029	91.950
#1	.01749	.01532	3.9062	4.9100	.00023
#2	.01730	.01585	3.8936	4.8933	.00108
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-B-4-A Acquired: 11/14/2013 13:07:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.8753**	**.02526**	**.02521**	**.00015**	**80.642**
Stddev	.0084	.00004	.00047	.00023	.034
%RSD	.29169	.14502	1.8468	155.16	.04216
#1	2.8813	.02523	.02553	.00031	80.618
#2	2.8694	.02528	.02488	-.00001	80.666
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00211**	**-.00226**	**9.008**	**-.00076**	**-.00126**
Stddev	.00019	.00013	.020	.00252	.00076
%RSD	8.9307	5.8852	.2205	331.33	60.082
#1	.00224	-.00217	9.022	.00102	-.00179
#2	.00198	-.00236	8.994	-.00254	-.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3489**	**-.00030**	**.08443**	**.00058**	**-.00401**
Stddev	.0190	.00023	.00020	.00018	.00101
%RSD	.56761	78.528	.23898	31.546	25.196
#1	3.3623	-.00046	.08457	.00071	-.00329
#2	3.3355	-.00013	.08429	.00045	-.00472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-B-4-A Acquired: 11/14/2013 13:07:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00010**	**.19410**
Stddev	.00002	.00055
%RSD	16.820	.28355
#1	.00009	.19449
#2	.00011	.19371
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3234.9**	**4803.2**	**73774.**	**7356.0**
Stddev	4.3	4.7	4.	17.0
%RSD	.13284	.09825	.00562	.23083
#1	3238.0	4806.5	73771.	7344.0
#2	3231.9	4799.9	73776.	7368.0

Sample Name: 480-49805-E-6-A Acquired: 11/14/2013 13:10:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**.05101**	**.01163**	**.03935**	**.04024**
Stddev	.00020	.02497	.00351	.00052	.00008
%RSD	180.98	48.954	30.215	1.3182	.20541
#1	.00003	.03335	.01412	.03898	.04030
#2	-.00026	.06866	.00915	.03972	.04018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**15.211**	**-.00001**	**.00007**	**.00001**
Stddev	.00003	.029	.00006	.00006	.00041
%RSD	57.914	.19031	727.99	84.777	3407.6
#1	.00007	15.232	.00004	.00011	-.00028
#2	.00003	15.191	-.00005	.00003	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00354**	**1.7930**	**4.1140**	**5.3434**	**.00120**
Stddev	.00000	.0098	.0075	.0335	.00011
%RSD	.01394	.54778	.18286	.62623	9.0748
#1	.00354	1.8000	4.1193	5.3197	.00128
#2	.00354	1.7861	4.1086	5.3671	.00112
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-6-A Acquired: 11/14/2013 13:10:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.3629**	**.17735**	**.17500**	**.00029**	**101.82**
Stddev	.0097	.00064	.00098	.00009	.17
%RSD	.40824	.36239	.55734	29.360	.16601
#1	2.3697	.17781	.17569	.00023	101.93
#2	2.3560	.17690	.17431	.00035	101.70
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00122**	**-.00006**	**6.063**	**-.00210**	**-.00077**
Stddev	.00033	.00012	.015	.00078	.00460
%RSD	27.179	207.33	.2460	37.347	598.45
#1	.00099	.00003	6.052	-.00265	-.00402
#2	.00146	-.00014	6.073	-.00154	.00248
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.8636**	**.00016**	**.07696**	**.00019**	**-.00314**
Stddev	.0104	.00051	.00015	.00005	.00160
%RSD	.36460	316.57	.19232	25.852	51.086
#1	2.8710	-.00020	.07707	.00015	-.00201
#2	2.8562	.00052	.07686	.00022	-.00428
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-6-A Acquired: 11/14/2013 13:10:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00096**	**.02009**
Stddev	.00023	.00046
%RSD	23.987	2.2722
#1	.00080	.01976
#2	.00113	.02041
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3213.6**	**4808.5**	**73293.**	**7356.8**
Stddev	6.8	13.6	207.	4.0
%RSD	.21179	.28330	.28304	.05370
#1	3218.4	4818.1	73146.	7359.5
#2	3208.8	4798.8	73439.	7354.0

Sample Name: 480-49805-E-7-A Acquired: 11/14/2013 13:12:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.01191**	**.00103**	**.05714**	**.04963**
Stddev	.00073	.01665	.00076	.00086	.00028
%RSD	1326.4	139.77	73.774	1.5092	.56160
#1	-.00046	.00014	.00049	.05653	.04943
#2	.00057	.02368	.00157	.05775	.04982
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**21.396**	**.00002**	**.00007**	**-.00008**
Stddev	.00005	.006	.00001	.00004	.00003
%RSD	97.605	.02930	34.824	56.636	44.616
#1	.00009	21.391	.00001	.00009	-.00005
#2	.00002	21.400	.00002	.00004	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00096**	**2.0818**	**4.8825**	**7.0928**	**.00024**
Stddev	.00006	.0018	.0449	.0558	.00072
%RSD	6.6162	.08656	.91928	.78701	299.41
#1	.00091	2.0805	4.8507	7.0534	.00075
#2	.00100	2.0830	4.9142	7.1323	-.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-7-A Acquired: 11/14/2013 13:12:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.9577**	**.28851**	**.29262**	**-.00031**	**217.02**
Stddev	.0006	.00018	.00008	.00006	.35
%RSD	.01984	.06336	.02878	18.402	.16176
#1	2.9573	.28838	.29268	-.00035	216.77
#2	2.9581	.28864	.29256	-.00027	217.26
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00084**	**-.00052**	**3.415**	**-.00323**	**-.00117**
Stddev	.00015	.00115	.007	.00041	.00245
%RSD	18.172	218.92	.2035	12.714	209.72
#1	.00094	-.00134	3.420	-.00294	.00056
#2	.00073	.00029	3.410	-.00352	-.00290
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2294**	**.00027**	**.10790**	**.00033**	**-.00142**
Stddev	.0329	.00002	.00029	.00043	.00362
%RSD	.62908	5.7128	.27101	132.32	255.24
#1	5.2527	.00026	.10769	.00002	-.00398
#2	5.2062	.00028	.10811	.00063	.00114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-E-7-A Acquired: 11/14/2013 13:12:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00175	.00260
Stddev	.00001	.00049
%RSD	.29347	18.862
#1	.00175	.00294
#2	.00176	.00225
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3100.9	4739.4	71388.	7379.8
Stddev	3.1	3.1	397.	11.8
%RSD	.09899	.06470	.55622	.15992
#1	3098.7	4741.6	71669.	7388.1
#2	3103.0	4737.2	71108.	7371.4

Sample Name: 480-49805-B-9-A Acquired: 11/14/2013 13:14:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**.04180**	**.01102**	**.04985**	**.17763**
Stddev	.00044	.02412	.00191	.00027	.00010
%RSD	4157.2	57.700	17.364	.54537	.05788
#1	-.00032	.02475	.01237	.04965	.17756
#2	.00030	.05885	.00966	.05004	.17771
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**59.567**	**.00215**	**.00262**	**.00015**
Stddev	.00002	.050	.00007	.00032	.00025
%RSD	86.537	.08318	3.3378	12.193	172.27
#1	-.00001	59.532	.00220	.00285	.00033
#2	-.00003	59.602	.00210	.00240	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00926**	**.08090**	**11.217**	**20.627**	**.00338**
Stddev	.00009	.00257	.034	.168	.00088
%RSD	.98766	3.1774	.30006	.81382	26.070
#1	.00933	.07908	11.240	20.508	.00276
#2	.00920	.08271	11.193	20.745	.00400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-B-9-A Acquired: 11/14/2013 13:14:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.4855**	**.50917**	**.56640**	**-.00027**	**1105.6**
Stddev	.0259	.00068	.00147	.00045	2.8
%RSD	.34552	.13411	.25986	168.17	.25321
#1	7.4672	.50869	.56536	.00005	1107.6
#2	7.5038	.50965	.56744	-.00059	1103.7
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00563**	**-.00021**	F **20.27**	**-.00295**	**-.00038**
Stddev	.00015	.00003	.01	.00019	.00285
%RSD	2.6994	14.231	.0698	6.3637	760.36
#1	.00574	-.00023	20.26	-.00281	.00164
#2	.00553	-.00019	20.28	-.00308	-.00239
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9067**	**.00001**	**.35833**	**.00001**	**-.00206**
Stddev	.0165	.00049	.00099	.00038	.00118
%RSD	.33583	3452.8	.27494	3058.7	57.416
#1	4.9184	.00036	.35903	.00028	-.00122
#2	4.8951	-.00033	.35764	-.00026	-.00289
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49805-B-9-A Acquired: 11/14/2013 13:14:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00006**	**.06865**
Stddev	.00021	.00170
%RSD	326.64	2.4730
#1	-.00021	.06745
#2	.00008	.06985
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2745.1**	**4445.3**	**64001.**	**7295.3**
Stddev	3.2	8.3	144.	21.5
%RSD	.11783	.18726	.22476	.29465
#1	2747.4	4451.2	64103.	7310.5
#2	2742.8	4439.4	63899.	7280.1

Sample Name: 480-49844-A-1-A Acquired: 11/14/2013 13:17:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00195**	**.06614**	**-.00182**	**.03003**	**.14724**
Stddev	.00036	.00201	.00151	.00040	.00076
%RSD	18.649	3.0427	82.898	1.3314	.51295
#1	.00221	.06472	-.00289	.03031	.14777
#2	.00169	.06756	-.00076	.02975	.14670
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**100.69**	**.00178**	**.00525**	**.00727**
Stddev	.00003	.06	.00004	.00017	.00027
%RSD	62.520	.05535	2.3631	3.1856	3.7502
#1	.00007	100.66	.00181	.00513	.00746
#2	.00003	100.73	.00175	.00537	.00708
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00598**	**.00845**	**27.056**	**36.177**	**.00879**
Stddev	.00013	.00457	.145	.403	.00038
%RSD	2.1101	54.061	.53490	1.1144	4.3143
#1	.00607	.00522	26.953	36.462	.00852
#2	.00589	.01168	27.158	35.892	.00905
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-A Acquired: 11/14/2013 13:17:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.164**	**4.6028**	**4.8553**	**-.00049**	**278.80**
Stddev	.063	.0157	.0245	.00031	.02
%RSD	.26054	.34179	.50430	62.290	.00695
#1	24.208	4.6139	4.8726	-.00071	278.78
#2	24.119	4.5917	4.8380	-.00028	278.81
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03141**	F **-.00504**	F **17.99**	**-.00338**	**.00055**
Stddev	.00006	.00287	.01	.00202	.00163
%RSD	.19273	56.861	.0496	59.868	295.11
#1	.03137	-.00302	17.99	-.00481	.00171
#2	.03145	-.00707	17.98	-.00195	-.00060
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.076**	**-.00018**	**.69585**	**.00050**	**-.00065**
Stddev	.026	.00033	.00246	.00014	.00101
%RSD	.25337	185.14	.35394	28.356	155.65
#1	10.094	-.00042	.69760	.00040	.00007
#2	10.058	.00006	.69411	.00060	-.00136
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-A Acquired: 11/14/2013 13:17:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.01652
Stddev	.00013	.00053
%RSD	2486.3	3.1823
#1	-.00008	.01690
#2	.00010	.01615
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2973.3	4603.9	69266.	7272.2
Stddev	4.3	8.8	235.	11.6
%RSD	.14454	.19179	.33954	.15954
#1	2976.3	4610.2	69099.	7280.4
#2	2970.2	4597.7	69432.	7264.0

Sample Name: 480-49844-A-1-Asd@5 Acquired: 11/14/2013 13:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**.00342**	**-.00091**	**.00499**	**.03053**
Stddev	.00015	.01552	.00343	.00004	.00004
%RSD	26.377	454.16	377.79	.86406	.11841
#1	.00068	-.00756	.00152	.00496	.03056
#2	.00047	.01439	-.00334	.00502	.03050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**20.403**	**.00028**	**.00098**	**.00101**
Stddev	.00007	.136	.00018	.00005	.00018
%RSD	121.80	.66420	62.450	4.9063	17.311
#1	-.00011	20.499	.00016	.00094	.00114
#2	-.00001	20.307	.00041	.00101	.00089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00144**	**-.00034**	**4.9724**	**5.6782**	**.00193**
Stddev	.00019	.00618	.0249	.0530	.00022
%RSD	13.261	1810.0	.50075	.93314	11.669
#1	.00130	-.00471	4.9548	5.7156	.00177
#2	.00157	.00403	4.9900	5.6407	.00209
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-Asd@5 Acquired: 11/14/2013 13:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.8874**	**.95216**	**.92412**	**-.00025**	**55.012**
Stddev	.0067	.00010	.00433	.00026	.358
%RSD	.13711	.01023	.46893	105.23	.65070
#1	4.8827	.95209	.92105	-.00006	55.265
#2	4.8921	.95223	.92718	-.00044	54.759
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00643**	**-.00161**	**3.412**	**-.00409**	**-.00077**
Stddev	.00032	.00142	.018	.00219	.00104
%RSD	5.0224	87.942	.5431	53.555	135.36
#1	.00620	-.00061	3.399	-.00254	-.00151
#2	.00666	-.00261	3.425	-.00564	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.9876**	**-.00026**	**.14016**	**.00032**	**-.00130**
Stddev	.0259	.00044	.00027	.00010	.00185
%RSD	1.3049	168.13	.19462	31.584	142.35
#1	2.0059	.00005	.13997	.00039	.00001
#2	1.9693	-.00057	.14035	.00025	-.00261
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-Asd@5 Acquired: 11/14/2013 13:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00006**	**.00334**
Stddev	.00057	.00045
%RSD	910.38	13.381
#1	.00034	.00366
#2	-.00047	.00303
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3252.8**	**4820.7**	**73242.**	**7206.8**
Stddev	.6	3.0	67.	28.6
%RSD	.01841	.06306	.09189	.39657
#1	3253.2	4818.6	73290.	7186.6
#2	3252.4	4822.9	73194.	7227.0

Sample Name: 480-49844-A-1-A pds Acquired: 11/14/2013 13:22:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05512	11.009	.22179	.24156	.35129
Stddev	.00010	.080	.00181	.00004	.00051
%RSD	.18616	.72662	.81416	.01735	.14533
#1	.05505	10.952	.22307	.24153	.35093
#2	.05520	11.066	.22052	.24159	.35165
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20693	109.59	.21162	.21482	.21951
Stddev	.00016	.36	.00070	.00029	.00050
%RSD	.07554	.32636	.33252	.13422	.22840
#1	.20682	109.34	.21211	.21502	.21916
#2	.20704	109.84	.21112	.21462	.21987
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.22153	10.185	38.387	48.813	.24192
Stddev	.00028	.018	.252	.158	.00323
%RSD	.12437	.17283	.65768	.32345	1.3338
#1	.22172	10.173	38.208	48.701	.23964
#2	.22133	10.198	38.565	48.924	.24420
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-A pds Acquired: 11/14/2013 13:22:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.831**	**4.6394**	**4.8934**	**.21186**	**282.97**
Stddev	.065	.0131	.0056	.00012	1.66
%RSD	.19145	.28236	.11381	.05880	.58546
#1	33.785	4.6301	4.8973	.21177	281.79
#2	33.877	4.6486	4.8894	.21195	284.14
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23571**	**.21065**	F **17.34**	**.20349**	**.21788**
Stddev	.00071	.00120	.02	.00054	.00075
%RSD	.30048	.56763	.1394	.26651	.34637
#1	.23521	.21150	17.32	.20387	.21841
#2	.23621	.20981	17.36	.20310	.21734
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.313**	**.20621**	**.88197**	**.20213**	**.20403**
Stddev	.028	.00001	.00091	.00033	.00049
%RSD	.13991	.00346	.10340	.16392	.23798
#1	20.292	.20621	.88133	.20190	.20437
#2	20.333	.20620	.88262	.20237	.20368
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-A pds Acquired: 11/14/2013 13:22:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21557**	**.22238**
Stddev	.00016	.00070
%RSD	.07579	.31470
#1	.21545	.22189
#2	.21568	.22288
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2940.5**	**4632.0**	**69791.**	**7221.9**
Stddev	4.8	1.3	289.	46.6
%RSD	.16188	.02700	.41461	.64588
#1	2943.9	4632.9	69996.	7254.9
#2	2937.1	4631.1	69587.	7188.9

Sample Name: 480-49844-A-1-B MS Acquired: 11/14/2013 13:24:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05398	10.600	.21328	.23499	.34853
Stddev	.00105	.006	.00082	.00028	.00012
%RSD	1.9436	.05999	.38604	.11795	.03559
#1	.05472	10.596	.21270	.23519	.34845
#2	.05323	10.605	.21386	.23480	.34862
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20142	110.22	.20556	.20795	.21395
Stddev	.00029	.41	.00019	.00035	.00155
%RSD	.14556	.37311	.09216	.16679	.72263
#1	.20162	110.51	.20569	.20819	.21286
#2	.20121	109.93	.20542	.20770	.21505
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21759	9.8827	38.521	48.849	.23710
Stddev	.00025	.0424	.083	.215	.00042
%RSD	.11373	.42933	.21431	.44091	.17851
#1	.21776	9.9127	38.579	49.001	.23740
#2	.21741	9.8527	38.462	48.697	.23680
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-B MS Acquired: 11/14/2013 13:24:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.782**	**4.6945**	**4.9618**	**.20544**	**286.62**
Stddev	.099	.0227	.0077	.00005	.78
%RSD	.29451	.48254	.15518	.02505	.27374
#1	33.711	4.6785	4.9564	.20541	287.18
#2	33.852	4.7105	4.9673	.20548	286.07
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22877**	**.20160**	F **28.01**	**.20137**	**.20967**
Stddev	.00041	.00252	.05	.00054	.00119
%RSD	.17847	1.2484	.1717	.27040	.56799
#1	.22906	.19982	28.05	.20098	.20882
#2	.22848	.20338	27.98	.20175	.21051
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.171**	**.20175**	**.88897**	**.19672**	**.19636**
Stddev	.030	.00065	.00042	.00017	.00257
%RSD	.14958	.32383	.04759	.08813	1.3084
#1	20.193	.20129	.88867	.19660	.19454
#2	20.150	.20221	.88927	.19685	.19818
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-B MS Acquired: 11/14/2013 13:24:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21002**	**.21744**
Stddev	.00078	.00109
%RSD	.37095	.50228
#1	.20947	.21667
#2	.21057	.21822
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2939.5**	**4619.3**	**69321.**	**7188.6**
Stddev	1.2	2.6	294.	9.3
%RSD	.04091	.05731	.42365	.12896
#1	2938.7	4621.1	69528.	7182.0
#2	2940.4	4617.4	69113.	7195.2

Sample Name: 480-49844-A-1-C MSD Acquired: 11/14/2013 13:27:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05376	10.583	.21459	.23574	.34902
Stddev	.00103	.026	.00088	.00062	.00086
%RSD	1.9102	.24336	.41020	.26359	.24660
#1	.05449	10.602	.21522	.23618	.34963
#2	.05303	10.565	.21397	.23531	.34841
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20081	110.93	.20529	.20787	.21429
Stddev	.00080	.17	.00061	.00054	.00060
%RSD	.39898	.15093	.29903	.26024	.28101
#1	.20024	110.81	.20486	.20825	.21472
#2	.20138	111.05	.20573	.20748	.21387
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21739	9.8269	38.766	48.449	.23668
Stddev	.00018	.0506	.135	.088	.00121
%RSD	.08346	.51486	.34850	.18098	.51193
#1	.21726	9.7911	38.670	48.387	.23582
#2	.21752	9.8626	38.861	48.511	.23754
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-C MSD Acquired: 11/14/2013 13:27:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.849**	**4.6822**	**4.9784**	**.20531**	**289.33**
Stddev	.042	.0326	.0141	.00063	.49
%RSD	.12546	.69735	.28428	.30727	.17090
#1	33.819	4.7053	4.9884	.20486	288.98
#2	33.879	4.6591	4.9684	.20575	289.68
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22948**	**.20253**	F **28.05**	**.20130**	**.21503**
Stddev	.00040	.00003	.02	.00072	.00010
%RSD	.17525	.01355	.0588	.35676	.04859
#1	.22977	.20255	28.04	.20079	.21510
#2	.22920	.20251	28.06	.20181	.21495
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.170**	**.20125**	**.89303**	**.19667**	**.19605**
Stddev	.000	.00039	.00424	.00014	.00353
%RSD	.00007	.19243	.47435	.07170	1.8009
#1	20.170	.20098	.89004	.19657	.19855
#2	20.170	.20152	.89603	.19677	.19355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-1-C MSD Acquired: 11/14/2013 13:27:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.20972	.21772
Stddev	.00149	.00046
%RSD	.70823	.21357
#1	.21077	.21805
#2	.20867	.21739
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2939.5	4615.0	69260.	7194.9
Stddev	3.5	8.6	8.	34.0
%RSD	.11763	.18723	.01167	.47255
#1	2937.0	4621.1	69254.	7219.0
#2	2941.9	4608.9	69266.	7170.9

Sample Name: CCV Acquired: 11/14/2013 13:29:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49488**	**25.512**	**.50092**	**.48697**	**.51005**	**.49107**	**24.990**
Stddev	.00040	.037	.00458	.00038	.00125	.00046	.168
%RSD	.08165	.14533	.91398	.07764	.24531	.09283	.67162
#1	.49460	25.538	.50415	.48723	.51094	.49139	25.108
#2	.49517	25.485	.49768	.48670	.50917	.49075	24.871
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48712**	**.48505**	**.50931**	**.50653**	**24.076**	**25.807**	**26.075**
Stddev	.00038	.00086	.00019	.00173	.145	.125	.328
%RSD	.07740	.17762	.03727	.34112	.60176	.48558	1.2565
#1	.48739	.48444	.50944	.50530	24.178	25.896	26.306
#2	.48685	.48566	.50917	.50775	23.973	25.719	25.843
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51281**	**23.991**	**.49946**	**.48468**	**.49184**	**25.740**	**.48815**
Stddev	.00119	.054	.00094	.00039	.00230	.098	.00034
%RSD	.23266	.22570	.18796	.07970	.46704	.37927	.06910
#1	.51366	24.029	.49880	.48495	.49346	25.809	.48791
#2	.51197	23.952	.50013	.48440	.49021	25.671	.48839
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 13:29:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48925	24.77	.50424	.49390	24.937	.49594	.48903
Stddev	.00128	.01	.00139	.00086	.000	.00041	.00056
%RSD	.26198	.0500	.27557	.17444	.00030	.08255	.11525
#1	.49016	24.78	.50522	.49450	24.937	.49623	.48943
#2	.48834	24.76	.50326	.49329	24.937	.49565	.48863
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49886	.48598	.50222	.49369
Stddev	.00066	.00430	.00213	.00290
%RSD	.13238	.88486	.42442	.58833
#1	.49839	.48902	.50071	.49164
#2	.49932	.48294	.50373	.49575
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3181.3	4832.8	73775.	7131.8
Stddev	3.2	.5	45.	41.7
%RSD	.10023	.01008	.06151	.58485
#1	3183.5	4832.4	73807.	7102.3
#2	3179.0	4833.1	73743.	7161.3

Sample Name: CCB Acquired: 11/14/2013 13:32:10 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00021**	**.00657**	**.00101**	**-.00059**	**.00001**	**-.00002**	**-.00099**
Stddev	.00011	.00068	.00096	.00049	.00001	.00000	.00181
%RSD	50.148	10.342	94.442	83.310	77.828	14.616	183.30
#1	-.00014	.00705	.00169	-.00024	.00001	-.00002	.00029
#2	-.00029	.00609	.00034	-.00094	.00000	-.00002	-.00227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**.00002**	**-.00063**	**.00010**	**-.00011**	**.05370**	**.00276**
Stddev	.00000	.00005	.00045	.00022	.00099	.03533	.00021
%RSD	19.681	290.42	70.294	222.85	912.34	65.791	7.7378
#1	-.00001	-.00002	-.00032	.00025	-.00081	.02872	.00261
#2	-.00002	.00006	-.00095	-.00006	.00059	.07868	.00291
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**-.00097**	**-.00001**	**.00021**	**-.00012**	**.02268**	**.00007**
Stddev	.00131	.00026	.00001	.00019	.00002	.00548	.00023
%RSD	507.99	26.822	81.715	93.306	18.035	24.170	334.57
#1	-.00118	-.00079	-.00002	.00007	-.00011	.01880	-.00009
#2	.00067	-.00115	-.00001	.00035	-.00014	.02655	.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 13:32:10 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00046**	F **-.0043**	**.00011**	**.00077**	**.00463**	**.00018**	**.00001**
Stddev	.00033	.0012	.00032	.00363	.00999	.00063	.00003
%RSD	71.407	26.86	293.70	472.67	215.47	351.78	181.91
#1	-.00070	-.0052	.00034	.00333	.01170	-.00027	-.00000
#2	-.00023	-.0035	-.00012	-.00180	-.00243	.00063	.00003
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00028**	**-.00288**	**-.00022**	**.00037**
Stddev	.00036	.00009	.00009	.00048
%RSD	129.71	3.1389	40.324	130.58
#1	-.00002	-.00294	-.00028	.00003
#2	-.00053	-.00281	-.00015	.00071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3388.5**	**4937.6**	**77038.**	**7206.9**
Stddev	6.4	2.8	15.	44.4
%RSD	.18832	.05642	.01958	.61658
#1	3393.0	4935.6	77049.	7238.3
#2	3384.0	4939.6	77027.	7175.4

Sample Name: CCVL Acquired: 11/14/2013 13:34:37 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00280**	**.19325**	**.00932**	**.01964**	**.00216**	**.00203**	**.50446**
Stddev	.00006	.02456	.00166	.00004	.00000	.00001	.00330
%RSD	2.2923	12.707	17.781	.18309	.21300	.43735	.65463
#1	.00285	.21061	.00815	.01961	.00216	.00203	.50680
#2	.00276	.17589	.01049	.01967	.00215	.00204	.50213
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00084**	**.00405**	**.00369**	**.01011**	**.04310**	**.51816**	**.43708**
Stddev	.00010	.00025	.00000	.00041	.00508	.01173	.00087
%RSD	11.747	6.1641	.07418	4.0105	11.784	2.2631	.19920
#1	.00077	.00423	.00369	.00982	.03951	.50987	.43647
#2	.00091	.00388	.00369	.01039	.04670	.52645	.43770
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02834**	**.20386**	**.00330**	**.00356**	**.00937**	**.97524**	**.00974**
Stddev	.00006	.00473	.00004	.00022	.00014	.00239	.00025
%RSD	.22750	2.3216	1.3312	6.1834	1.4532	.24486	2.5331
#1	.02838	.20051	.00333	.00341	.00947	.97693	.00956
#2	.02829	.20720	.00327	.00372	.00927	.97355	.00991
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 13:34:37 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00400	.2021	.01906	.01181	.49442	.00966	.00488
Stddev	.00002	.0014	.00017	.00129	.01097	.00039	.00017
%RSD	.51276	.6849	.87524	10.962	2.2196	4.0109	3.3875
#1	.00399	.2011	.01918	.01272	.50218	.00993	.00476
#2	.00402	.2031	.01895	.01089	.48666	.00939	.00500
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00487	.01960	.00493	.01030
Stddev	.00000	.00200	.00026	.00083
%RSD	.07323	10.228	5.1708	8.0510
#1	.00488	.01818	.00475	.01089
#2	.00487	.02102	.00511	.00971
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3418.4	5013.2	77886.	7342.4
Stddev	14.4	20.5	112.	3.3
%RSD	.42075	.40920	.14369	.04477
#1	3428.5	5027.7	77806.	7344.8
#2	3408.2	4998.6	77965.	7340.1

Sample Name: 480-49844-A-2-A Acquired: 11/14/2013 13:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**.01889**	**-.00176**	**.03507**	**.07074**
Stddev	.00022	.00076	.00032	.00003	.00001
%RSD	185.56	4.0296	18.373	.09243	.01860
#1	.00028	.01835	-.00199	.03509	.07075
#2	-.00004	.01943	-.00153	.03505	.07073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**49.456**	**-.00004**	**.00025**	**.00030**
Stddev	.00006	.180	.00014	.00009	.00006
%RSD	137.29	.36462	372.74	35.370	21.466
#1	.00008	49.583	-.00014	.00031	.00034
#2	.00000	49.328	.00006	.00018	.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00125**	**20.881**	**17.629**	**24.612**	**.00915**
Stddev	.00033	.060	.002	.242	.00031
%RSD	26.800	.28769	.01070	.98125	3.3679
#1	.00101	20.924	17.631	24.783	.00936
#2	.00148	20.839	17.628	24.441	.00893
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-2-A Acquired: 11/14/2013 13:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.541**	**2.9089**	**3.0238**	**.00277**	**272.92**
Stddev	.001	.0056	.0038	.00008	.01
%RSD	.00367	.19420	.12481	2.8416	.00371
#1	14.542	2.9049	3.0212	.00282	272.91
#2	14.541	2.9129	3.0265	.00271	272.93
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00487**	**-.00255**	F **28.83**	**-.00284**	**-.00023**
Stddev	.00032	.00019	.04	.00081	.00091
%RSD	6.5351	7.5713	.1476	28.413	388.24
#1	.00510	-.00241	28.80	-.00342	-.00088
#2	.00465	-.00269	28.86	-.00227	.00041
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.4220**	**-.00002**	**.29251**	**.00041**	**-.00143**
Stddev	.0080	.00085	.00020	.00010	.00219
%RSD	.08529	4832.8	.06759	23.589	153.84
#1	9.4277	.00058	.29265	.00034	-.00298
#2	9.4164	-.00062	.29237	.00048	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-2-A Acquired: 11/14/2013 13:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00016**	**.01073**
Stddev	.00020	.00034
%RSD	127.16	3.1384
#1	.00030	.01050
#2	.00002	.01097
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3007.5**	**4642.4**	**70087.**	**7318.0**
Stddev	2.5	9.1	55.	25.0
%RSD	.08260	.19655	.07870	.34225
#1	3005.7	4648.8	70126.	7300.3
#2	3009.2	4635.9	70048.	7335.7

Sample Name: 480-49844-A-3-A Acquired: 11/14/2013 13:39:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00218**	**.04433**	**-.00366**	**.02678**	**.00751**
Stddev	.00050	.01072	.00295	.00010	.00003
%RSD	23.170	24.184	80.443	.37195	.45602
#1	.00182	.05191	-.00575	.02671	.00753
#2	.00253	.03675	-.00158	.02685	.00748
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**80.658**	**.00020**	**-.00019**	**.07034**
Stddev	.00002	.150	.00013	.00010	.00094
%RSD	50.904	.18631	62.109	52.454	1.3331
#1	.00005	80.552	.00011	-.00012	.07100
#2	.00002	80.764	.00029	-.00025	.06967
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00270**	**.00611**	**65.077**	**71.321**	**.00920**
Stddev	.00022	.00034	.211	.136	.00053
%RSD	8.1405	5.5668	.32454	.19116	5.7581
#1	.00286	.00635	64.928	71.417	.00883
#2	.00255	.00587	65.226	71.225	.00958
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-3-A Acquired: 11/14/2013 13:39:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**21.711**	**9.0503**	**9.8434**	**-.00056**	**271.44**
Stddev	.060	.0977	.0767	.00006	.08
%RSD	.27459	1.0792	.77886	10.448	.02906
#1	21.753	9.1194	9.8976	-.00060	271.38
#2	21.669	8.9813	9.7892	-.00052	271.49
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00622**	**-.00228**	F **16.18**	**-.00256**	**.00168**
Stddev	.00036	.00010	.02	.00013	.00451
%RSD	5.7220	4.4408	.1058	4.9372	268.35
#1	.00597	-.00235	16.17	-.00247	-.00151
#2	.00647	-.00221	16.19	-.00265	.00486
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.8881**	**-.00057**	**.53833**	**.00070**	**.00186**
Stddev	.0125	.00024	.00013	.00040	.00139
%RSD	.18163	41.962	.02497	57.521	74.555
#1	6.8793	-.00040	.53824	.00041	.00284
#2	6.8970	-.00074	.53843	.00098	.00088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-3-A Acquired: 11/14/2013 13:39:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00016	.00509
Stddev	.00004	.00070
%RSD	26.408	13.794
#1	.00013	.00460
#2	.00019	.00559
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2970.7	4585.2	68960.	7252.1
Stddev	4.1	3.5	322.	36.7
%RSD	.13836	.07592	.46704	.50573
#1	2973.6	4587.6	68732.	7278.0
#2	2967.8	4582.7	69188.	7226.1

Sample Name: 480-49844-C-6-A Acquired: 11/14/2013 13:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**.05867**	**.02985**	**.04316**	**.10976**
Stddev	.00018	.00532	.00200	.00128	.00032
%RSD	57.102	9.0702	6.6894	2.9695	.29307
#1	.00019	.06243	.03126	.04226	.10999
#2	.00045	.05491	.02844	.04407	.10954
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**125.30**	**.00005**	**.02731**	**.00205**
Stddev	.00005	.29	.00006	.00017	.00007
%RSD	85.201	.23282	116.44	.63767	3.2183
#1	.00009	125.10	.00001	.02719	.00210
#2	.00002	125.51	.00009	.02743	.00201
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00171**	**41.793**	**25.127**	**36.018**	**.01028**
Stddev	.00025	.017	.194	.074	.00010
%RSD	14.783	.04015	.77251	.20669	.99871
#1	.00189	41.805	24.990	35.965	.01021
#2	.00153	41.781	25.264	36.071	.01036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-6-A Acquired: 11/14/2013 13:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.729**	**3.8119**	**4.1047**	**.00094**	**444.95**
Stddev	.095	.0081	.0098	.00009	3.04
%RSD	.36819	.21391	.23885	9.5985	.68409
#1	25.796	3.8176	4.1116	.00088	442.80
#2	25.662	3.8061	4.0978	.00101	447.11
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01538**	**.00067**	F **15.33**	**-.00357**	**.00032**
Stddev	.00012	.00009	.04	.00046	.00151
%RSD	.79400	13.552	.2716	12.943	466.65
#1	.01529	.00061	15.36	-.00389	-.00074
#2	.01546	.00074	15.30	-.00324	.00139
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.077**	**.00011**	**.80239**	**.00070**	**-.00040**
Stddev	.036	.00042	.00060	.00044	.00118
%RSD	.32291	400.23	.07450	63.240	291.91
#1	11.052	-.00019	.80196	.00039	-.00124
#2	11.103	.00041	.80281	.00102	.00043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-6-A Acquired: 11/14/2013 13:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00314	.02173
Stddev	.00016	.00002
%RSD	5.1540	.07733
#1	.00325	.02172
#2	.00302	.02175
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2857.5	4515.8	67603.	7251.2
Stddev	1.3	5.2	183.	25.2
%RSD	.04502	.11570	.27126	.34808
#1	2858.4	4519.5	67473.	7269.1
#2	2856.6	4512.1	67732.	7233.4

Sample Name: 480-49844-C-7-A Acquired: 11/14/2013 13:44:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**.05887**	**.00382**	**.14481**	**.18608**
Stddev	.00011	.01770	.00295	.00010	.00068
%RSD	28.398	30.067	77.207	.06669	.36683
#1	-.00048	.04636	.00591	.14475	.18656
#2	-.00032	.07139	.00173	.14488	.18559
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**156.46**	**.00002**	**.00008**	**.00227**
Stddev	.00003	.18	.00001	.00001	.00050
%RSD	33.326	.11627	29.316	16.340	21.944
#1	.00010	156.58	.00002	.00007	.00191
#2	.00006	156.33	.00001	.00009	.00262
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00196**	**27.636**	**38.629**	**57.522**	**.00297**
Stddev	.00010	.004	.012	.784	.00014
%RSD	5.0259	.01556	.03149	1.3634	4.5778
#1	.00189	27.633	38.621	58.077	.00287
#2	.00203	27.639	38.638	56.968	.00306
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-7-A Acquired: 11/14/2013 13:44:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.968**	**1.5866**	**1.7775**	**-.00062**	**1014.3**
Stddev	.071	.0066	.0129	.00029	.2
%RSD	.50745	.41812	.72575	45.874	.02226
#1	14.018	1.5913	1.7867	-.00082	1014.1
#2	13.918	1.5819	1.7684	-.00042	1014.4
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00107**	**-.00193**	F **11.36**	**-.00167**	**-.00102**
Stddev	.00070	.00100	.01	.00120	.00311
%RSD	65.271	51.902	.0977	71.860	303.09
#1	.00156	-.00122	11.37	-.00082	-.00322
#2	.00057	-.00264	11.35	-.00251	.00117
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.8307**	**-.00053**	**1.1976**	**.00208**	**.00026**
Stddev	.0044	.00005	.0007	.00005	.00115
%RSD	.06430	8.9597	.06132	2.2712	442.80
#1	6.8276	-.00056	1.1971	.00212	-.00055
#2	6.8338	-.00050	1.1981	.00205	.00107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-7-A Acquired: 11/14/2013 13:44:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00520	.00115
Stddev	.00002	.00079
%RSD	.42784	68.790
#1	.00518	.00171
#2	.00521	.00059
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2688.5	4384.6	64258.	7241.1
Stddev	6.6	5.8	315.	1.2
%RSD	.24415	.13179	.49066	.01725
#1	2693.1	4388.7	64035.	7241.9
#2	2683.8	4380.5	64481.	7240.2

Sample Name: 480-49844-C-8-A Acquired: 11/14/2013 13:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**.06895**	**.00443**	**.01945**	**.14720**
Stddev	.00066	.02304	.00017	.00006	.00015
%RSD	74.795	33.420	3.9210	.32951	.10508
#1	.00041	.05265	.00455	.01941	.14731
#2	.00134	.08524	.00430	.01950	.14709
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**130.90**	**-.00001**	**.06114**	**.00220**
Stddev	.00000	.36	.00014	.00022	.00017
%RSD	6.4631	.27605	2282.2	.36703	7.5581
#1	.00004	131.15	.00009	.06098	.00208
#2	.00005	130.64	-.00010	.06129	.00232
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00196**	**53.958**	**30.392**	**42.405**	**.01963**
Stddev	.00004	.411	.052	.029	.00080
%RSD	1.9875	.76107	.17066	.06952	4.0605
#1	.00199	54.248	30.428	42.426	.02019
#2	.00193	53.667	30.355	42.384	.01906
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-8-A Acquired: 11/14/2013 13:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**30.729**	**7.6577**	**8.4895**	**-.00112**	**452.79**
Stddev	.012	.0086	.0126	.00017	.43
%RSD	.03777	.11199	.14874	15.272	.09529
#1	30.737	7.6637	8.4984	-.00125	453.09
#2	30.721	7.6516	8.4806	-.00100	452.48
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.08645**	**-.00093**	F **14.34**	**-.00276**	**.00134**
Stddev	.00046	.00020	.02	.00094	.00287
%RSD	.53445	21.483	.1506	33.947	213.67
#1	.08612	-.00079	14.32	-.00342	.00337
#2	.08678	-.00107	14.35	-.00210	-.00069
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.142**	**.00016**	**.89632**	**.00059**	**.00390**
Stddev	.087	.00083	.00122	.00040	.00219
%RSD	.78446	517.35	.13635	67.472	56.065
#1	11.204	-.00043	.89546	.00031	.00545
#2	11.080	.00075	.89719	.00087	.00236
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-8-A Acquired: 11/14/2013 13:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00317**	**.01781**
Stddev	.00020	.00003
%RSD	6.3990	.15935
#1	.00332	.01783
#2	.00303	.01779
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2841.0**	**4496.0**	**67335.**	**7237.5**
Stddev	5.6	11.5	82.	2.4
%RSD	.19707	.25557	.12175	.03321
#1	2845.0	4504.1	67393.	7239.2
#2	2837.1	4487.9	67277.	7235.8

Sample Name: 480-49844-C-9-A Acquired: 11/14/2013 13:49:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00080**	**.17910**	**.00532**	**.03619**	**.00795**
Stddev	.00037	.00643	.00033	.00016	.00003
%RSD	45.812	3.5892	6.1225	.43471	.38993
#1	-.00054	.18365	.00509	.03608	.00793
#2	-.00106	.17456	.00556	.03630	.00798
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**17.546**	**-.00001**	**.00008**	**.00188**
Stddev	.00004	.076	.00012	.00008	.00011
%RSD	89.044	.43443	1070.0	98.876	5.6045
#1	.00007	17.600	.00007	.00002	.00195
#2	.00002	17.492	-.00010	.00014	.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00112**	**1.3867**	**6.3390**	**7.6249**	**.01047**
Stddev	.00008	.0042	.0081	.0378	.00044
%RSD	7.4389	.30199	.12713	.49595	4.2329
#1	.00118	1.3897	6.3333	7.5981	.01015
#2	.00106	1.3838	6.3447	7.6516	.01078
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-9-A Acquired: 11/14/2013 13:49:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.0703**	**.07452**	**.07286**	**.00203**	**74.063**
Stddev	.0101	.00020	.00100	.00006	.261
%RSD	.48875	.26596	1.3681	2.9416	.35296
#1	2.0774	.07466	.07215	.00199	73.878
#2	2.0631	.07438	.07356	.00208	74.248
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00114**	**-.00166**	**2.753**	**-.00051**	**-.00087**
Stddev	.00002	.00061	.009	.00007	.00086
%RSD	1.6594	36.742	.3317	13.888	98.784
#1	.00115	-.00123	2.759	-.00046	-.00147
#2	.00113	-.00209	2.746	-.00057	-.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2894**	**.00039**	**.12143**	**.00474**	**-.00305**
Stddev	.0315	.00047	.00030	.00028	.00028
%RSD	1.3740	118.89	.24423	5.8300	9.3055
#1	2.2672	.00006	.12122	.00454	-.00285
#2	2.3117	.00072	.12164	.00494	-.00325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-C-9-A Acquired: 11/14/2013 13:49:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00317**	**.00479**
Stddev	.00010	.00031
%RSD	3.0742	6.3921
#1	.00310	.00457
#2	.00324	.00500
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3236.5**	**4801.1**	**73419.**	**7336.5**
Stddev	4.9	16.6	133.	9.6
%RSD	.15274	.34589	.18130	.13095
#1	3240.0	4812.8	73513.	7343.3
#2	3233.0	4789.3	73325.	7329.7

Sample Name: 480-49844-A-10-A Acquired: 11/14/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00132**	**.01791**	**.00214**	**.01873**	**.18041**
Stddev	.00026	.02642	.00147	.00017	.00104
%RSD	20.032	147.48	68.674	.92707	.57457
#1	.00151	-.00077	.00110	.01885	.18115
#2	.00113	.03659	.00318	.01861	.17968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**82.085**	**.00012**	**.06925**	**.00163**
Stddev	.00002	.011	.00004	.00009	.00007
%RSD	14.837	.01376	33.493	.12834	4.0860
#1	.00016	82.093	.00009	.06919	.00158
#2	.00013	82.077	.00015	.06932	.00168
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00121**	**16.509**	**14.805**	**18.531**	**.02485**
Stddev	.00008	.047	.076	.050	.00027
%RSD	6.5255	.28263	.51620	.26883	1.0889
#1	.00126	16.476	14.751	18.567	.02465
#2	.00115	16.542	14.859	18.496	.02504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-10-A Acquired: 11/14/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.876**	**7.8326**	**8.1693**	**-.00093**	**100.88**
Stddev	.076	.0065	.0107	.00003	.41
%RSD	.27408	.08349	.13083	3.0785	.40802
#1	27.930	7.8280	8.1769	-.00095	100.58
#2	27.822	7.8372	8.1618	-.00091	101.17
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13549**	F **-.00650**	F **23.12**	**-.00365**	**.00164**
Stddev	.00027	.00206	.06	.00219	.00004
%RSD	.19691	31.710	.2419	59.832	2.1856
#1	.13530	-.00504	23.16	-.00211	.00161
#2	.13568	-.00795	23.08	-.00520	.00166
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.645**	**-.00066**	**.54642**	**.00045**	**.00034**
Stddev	.063	.00039	.00122	.00024	.00089
%RSD	.35818	58.882	.22255	52.755	257.53
#1	17.601	-.00039	.54556	.00061	.00097
#2	17.690	-.00094	.54728	.00028	-.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-10-A Acquired: 11/14/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00035**	**.07791**
Stddev	.00022	.00002
%RSD	63.897	.02410
#1	.00051	.07790
#2	.00019	.07793
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3088.5**	**4667.2**	**71165.**	**7226.3**
Stddev	1.8	7.3	144.	8.1
%RSD	.05950	.15541	.20253	.11264
#1	3089.8	4662.1	71063.	7232.0
#2	3087.2	4672.3	71267.	7220.5

Sample Name: 480-49844-A-11-A Acquired: 11/14/2013 13:54:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.03785**	**.00117**	**.01404**	**.14390**
Stddev	.00006	.00082	.00022	.00009	.00053
%RSD	72.643	2.1601	18.791	.63416	.37064
#1	-.00013	.03728	.00132	.01397	.14353
#2	-.00004	.03843	.00101	.01410	.14428
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**61.725**	**.00013**	**.00217**	**.00070**
Stddev	.00003	.343	.00009	.00011	.00043
%RSD	20.912	.55613	69.302	5.2295	62.220
#1	.00012	61.968	.00019	.00225	.00039
#2	.00016	61.482	.00007	.00209	.00100
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00150**	**27.531**	**12.962**	**16.591**	**.02439**
Stddev	.00030	.027	.076	.062	.00069
%RSD	20.000	.09629	.58789	.37214	2.8152
#1	.00171	27.550	13.016	16.635	.02487
#2	.00129	27.512	12.908	16.548	.02390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-11-A Acquired: 11/14/2013 13:54:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**16.135**	**2.5838**	**2.6265**	**-.00055**	**124.99**
Stddev	.015	.0004	.0066	.00019	.50
%RSD	.09456	.01361	.25072	35.402	.40175
#1	16.124	2.5836	2.6219	-.00041	125.34
#2	16.146	2.5841	2.6312	-.00069	124.63
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01393**	**-.00392**	F **14.09**	**-.00335**	**.00001**
Stddev	.00031	.00238	.04	.00158	.00189
%RSD	2.2047	60.799	.2611	47.068	31822.
#1	.01372	-.00560	14.06	-.00446	-.00133
#2	.01415	-.00223	14.11	-.00223	.00134
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.721**	**-.00005**	**.40503**	**.00024**	**.00191**
Stddev	.042	.00004	.00082	.00001	.00225
%RSD	.28428	79.819	.20235	4.4010	117.74
#1	14.751	-.00008	.40445	.00024	.00350
#2	14.691	-.00002	.40561	.00023	.00032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-11-A Acquired: 11/14/2013 13:54:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00014**	**.49355**
Stddev	.00001	.00144
%RSD	9.5781	.29095
#1	-.00013	.49254
#2	-.00015	.49457
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3101.1**	**4689.1**	**71094.**	**7274.6**
Stddev	5.2	.8	263.	15.1
%RSD	.16610	.01777	.37049	.20744
#1	3104.7	4689.7	71280.	7263.9
#2	3097.4	4688.5	70908.	7285.2

Sample Name: 480-49844-A-12-A Acquired: 11/14/2013 13:57:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00375**	**.01596**	F **-.01267**	**.01950**	**.00270**
Stddev	.00045	.00043	.00158	.00005	.00000
%RSD	11.871	2.6662	12.498	.26669	.11545
#1	.00407	.01566	-.01155	.01954	.00271
#2	.00344	.01626	-.01379	.01947	.00270
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**80.879**	**.00033**	**-.00008**	**.36760**
Stddev	.00007	.183	.00011	.00002	.00161
%RSD	216.87	.22594	34.921	21.336	.43882
#1	.00008	81.008	.00041	-.00009	.36646
#2	-.00002	80.750	.00025	-.00006	.36874
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00094**	**.00267**	**73.082**	**70.891**	**.02394**
Stddev	.00011	.00406	.165	.362	.00011
%RSD	11.153	152.19	.22588	.51037	.45235
#1	.00087	.00554	73.199	70.635	.02402
#2	.00102	-.00020	72.965	71.146	.02386
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-12-A Acquired: 11/14/2013 13:57:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.472**	F **20.147**	F **22.877**	**-.00135**	**118.24**
Stddev	.027	.168	.059	.00003	.56
%RSD	.09609	.83180	.25643	2.5089	.47375
#1	28.453	20.029	22.835	-.00137	118.63
#2	28.491	20.266	22.918	-.00133	117.84
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01024**	**-.00404**	F **19.63**	**-.00588**	**.00789**
Stddev	.00022	.00248	.06	.00069	.00268
%RSD	2.1357	61.398	.3104	11.708	33.914
#1	.01009	-.00229	19.68	-.00637	.00600
#2	.01040	-.00580	19.59	-.00539	.00979
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**16.028**	**.00028**	**.46298**	**.00039**	**.00572**
Stddev	.025	.00010	.00230	.00018	.00150
%RSD	.15583	34.533	.49638	45.069	26.135
#1	16.045	.00035	.46136	.00027	.00466
#2	16.010	.00021	.46461	.00052	.00678
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49844-A-12-A Acquired: 11/14/2013 13:57:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00079	.00861
Stddev	.00003	.00048
%RSD	4.4016	5.5231
#1	.00077	.00894
#2	.00081	.00827
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3054.4	4640.5	70589.	7264.4
Stddev	1.5	7.8	244.	6.0
%RSD	.04854	.16771	.34547	.08201
#1	3053.4	4635.0	70762.	7268.6
#2	3055.5	4646.0	70417.	7260.1

Sample Name: CCV Acquired: 11/14/2013 13:59:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49496**	**25.505**	**.50561**	**.48840**	**.51178**	**.49335**	**24.930**
Stddev	.00131	.070	.00218	.00037	.00034	.00142	.064
%RSD	.26476	.27567	.43085	.07580	.06702	.28743	.25739
#1	.49588	25.555	.50407	.48814	.51202	.49234	24.975
#2	.49403	25.455	.50715	.48866	.51154	.49435	24.884
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48822**	**.48719**	**.50659**	**.50804**	**24.088**	**25.805**	**25.805**
Stddev	.00064	.00017	.00084	.00076	.026	.029	.038
%RSD	.13066	.03543	.16536	.15012	.10858	.11101	.14688
#1	.48777	.48731	.50719	.50858	24.070	25.825	25.832
#2	.48867	.48707	.50600	.50750	24.107	25.785	25.778
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51355**	**23.964**	**.50061**	**.48637**	**.49433**	**25.719**	**.48878**
Stddev	.00010	.010	.00018	.00295	.00073	.048	.00008
%RSD	.02039	.04355	.03549	.60685	.14798	.18656	.01615
#1	.51363	23.956	.50049	.48428	.49381	25.753	.48873
#2	.51348	23.971	.50074	.48846	.49485	25.685	.48884
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 13:59:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48936	24.93	.50475	.49664	24.925	.49732	.49231
Stddev	.00047	.02	.00106	.00450	.025	.00188	.00146
%RSD	.09572	.0991	.21073	.90579	.09891	.37796	.29602
#1	.48903	24.92	.50550	.49982	24.942	.49865	.49128
#2	.48969	24.95	.50400	.49346	24.908	.49599	.49334
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49884	.49195	.50128	.49293
Stddev	.00093	.00213	.00089	.00005
%RSD	.18686	.43289	.17730	.01043
#1	.49818	.49044	.50191	.49296
#2	.49949	.49346	.50065	.49289
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3182.4	4837.2	74097.	7177.3
Stddev	2.8	.2	7.	19.2
%RSD	.08719	.00370	.00982	.26739
#1	3180.5	4837.3	74102.	7163.8
#2	3184.4	4837.0	74092.	7190.9

Sample Name: CCB Acquired: 11/14/2013 14:02:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**-.00717**	**.00018**	**-.00028**	**.00001**	**.00007**	**-.00560**
Stddev	.00007	.02317	.00202	.00026	.00000	.00003	.00059
%RSD	19.604	323.28	1110.5	90.576	5.5825	42.052	10.482
#1	-.00029	-.02355	.00161	-.00047	.00001	.00009	-.00519
#2	-.00038	.00922	-.00125	-.00010	.00001	.00005	-.00602
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**-.00004**	**-.00045**	**.00020**	**.00190**	**.04548**	**.00385**
Stddev	.00001	.00006	.00007	.00006	.00525	.00430	.00045
%RSD	5.3481	126.39	14.799	29.940	275.98	9.4508	11.812
#1	-.00010	-.00000	-.00040	.00025	.00561	.04852	.00417
#2	-.00010	-.00008	-.00049	.00016	-.00181	.04244	.00352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00096**	**-.00060**	**.00001**	**.00008**	**-.00010**	**.02562**	**.00023**
Stddev	.00010	.00088	.00001	.00034	.00025	.00149	.00021
%RSD	9.9783	148.16	99.447	412.86	236.58	5.8118	91.571
#1	.00089	-.00122	.00000	.00033	-.00028	.02667	.00008
#2	.00102	.00003	.00002	-.00016	.00007	.02456	.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 14:02:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00072	.0007	-.00233	.00032	.02592	.00022	-.00014
Stddev	.00000	.0009	.00106	.00213	.01857	.00009	.00002
%RSD	.22577	141.8	45.551	662.34	71.663	39.609	15.586
#1	-.00072	-.0000	-.00308	-.00119	.01278	.00016	-.00016
#2	-.00073	.0013	-.00158	.00183	.03905	.00028	-.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00023	-.00128	-.00008	-.00056
Stddev	.00032	.00030	.00018	.00026
%RSD	141.54	23.078	222.13	46.245
#1	-.00000	-.00107	-.00020	-.00074
#2	.00046	-.00149	.00005	-.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3382.4	4924.6	76670.	7195.1
Stddev	5.1	5.1	470.	12.3
%RSD	.14993	.10383	.61243	.17110
#1	3386.0	4921.0	76338.	7186.4
#2	3378.8	4928.2	77002.	7203.8

Sample Name: CCVL Acquired: 11/14/2013 14:04:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00295**	**.20556**	**.00885**	**.01941**	**.00214**	**.00196**	**.50508**
Stddev	.00050	.00040	.00218	.00018	.00000	.00002	.00780
%RSD	16.871	.19673	24.588	.93676	.02907	.83544	1.5442
#1	.00260	.20528	.00731	.01954	.00214	.00198	.49956
#2	.00331	.20585	.01038	.01928	.00214	.00195	.51059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00089**	**.00396**	**.00376**	**.00996**	**.04626**	**.50350**	**.43110**
Stddev	.00004	.00006	.00026	.00021	.00338	.00665	.00239
%RSD	4.0630	1.4305	6.8833	2.0663	7.3145	1.3201	.55425
#1	.00087	.00392	.00394	.00981	.04866	.50820	.42941
#2	.00092	.00400	.00358	.01010	.04387	.49880	.43279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02853**	**.20346**	**.00333**	**.00331**	**.00953**	**.96561**	**.00975**
Stddev	.00012	.00341	.00003	.00038	.00039	.00499	.00014
%RSD	.43718	1.6767	1.0289	11.357	4.1414	.51631	1.4491
#1	.02844	.20105	.00330	.00358	.00925	.96914	.00985
#2	.02862	.20587	.00335	.00305	.00980	.96209	.00965
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 14:04:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00350	.2078	.01928	.01240	.48588	.00961	.00485
Stddev	.00045	.0018	.00081	.00086	.02549	.00007	.00000
%RSD	12.802	.8527	4.2082	6.9205	5.2458	.72810	.09117
#1	.00318	.2065	.01871	.01180	.46786	.00956	.00485
#2	.00382	.2090	.01985	.01301	.50390	.00966	.00485
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00482	.01935	.00478	.00999
Stddev	.00006	.00177	.00003	.00039
%RSD	1.1685	9.1352	.70882	3.9152
#1	.00486	.01810	.00481	.00972
#2	.00478	.02060	.00476	.01027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3414.5	5004.2	78252.	7415.6
Stddev	14.9	22.5	501.	17.3
%RSD	.43722	.44918	.64055	.23361
#1	3425.1	5020.1	78606.	7427.9
#2	3404.0	4988.3	77897.	7403.4

Sample Name: MB 480-149751/1-A Acquired: 11/14/2013 14:07:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00061**	**.02729**	**-.00126**	**.00224**	**.00007**
Stddev	.00053	.00344	.00219	.00007	.00000
%RSD	87.490	12.610	174.02	3.2075	6.7750
#1	-.00023	.02486	.00029	.00229	.00007
#2	-.00098	.02973	-.00281	.00219	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**.03390**	**-.00009**	**.00003**	**-.00050**
Stddev	.00001	.00247	.00000	.00008	.00032
%RSD	143.55	7.2738	3.1975	276.76	65.505
#1	.00001	.03564	-.00009	.00008	-.00027
#2	-.00000	.03215	-.00009	-.00003	-.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.00184**	**.01939**	**.00278**	**.00001**
Stddev	.00005	.00576	.04930	.00061	.00071
%RSD	42.893	312.93	254.18	21.749	5858.8
#1	.00009	-.00591	.05425	.00236	-.00049
#2	.00016	.00223	-.01546	.00321	.00051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-149751/1-A Acquired: 11/14/2013 14:07:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00092**	**.00038**	**.00123**	**-.00048**	**.01632**
Stddev	.00393	.00000	.00069	.00013	.00283
%RSD	425.43	.11782	55.531	27.859	17.317
#1	.00186	.00038	.00172	-.00058	.01832
#2	-.00370	.00038	.00075	-.00039	.01432
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**-.00190**	**-.0005**	**-.00171**	**-.00164**
Stddev	.00001	.00048	.0002	.00044	.00169
%RSD	7.4947	25.266	36.57	25.704	103.45
#1	.00019	-.00224	-.0007	-.00140	-.00283
#2	.00017	-.00156	-.0004	-.00203	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01977**	**-.00033**	**.00008**	**.00004**	**-.00234**
Stddev	.00774	.00071	.00005	.00008	.00103
%RSD	39.168	213.70	60.641	213.87	44.084
#1	-.02525	-.00084	.00012	-.00002	-.00161
#2	-.01430	.00017	.00005	.00009	-.00307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-149751/1-A Acquired: 11/14/2013 14:07:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00019**	**.00068**
Stddev	.00006	.00023
%RSD	30.130	34.077
#1	-.00022	.00052
#2	-.00015	.00085
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3403.8**	**4938.2**	**78251.**	**7320.5**
Stddev	4.4	6.6	422.	8.9
%RSD	.12841	.13393	.53882	.12206
#1	3406.9	4942.9	78549.	7326.8
#2	3400.7	4933.6	77953.	7314.2

Sample Name: LCS 480-149751/2-A Acquired: 11/14/2013 14:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05057**	**10.611**	**.20692**	**.20604**	**.21639**
Stddev	.00008	.038	.00058	.00007	.00004
%RSD	.15600	.35834	.27921	.03162	.01634
#1	.05052	10.584	.20651	.20609	.21636
#2	.05063	10.638	.20733	.20600	.21641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20434**	**10.248**	**.20066**	**.20087**	**.21159**
Stddev	.00009	.037	.00029	.00021	.00134
%RSD	.04180	.36485	.14438	.10410	.63525
#1	.20440	10.274	.20086	.20072	.21254
#2	.20428	10.221	.20045	.20102	.21064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20966**	**10.096**	**10.357**	**10.538**	**.20990**
Stddev	.00005	.032	.019	.063	.00204
%RSD	.02240	.32142	.17938	.59593	.96967
#1	.20963	10.119	10.344	10.494	.20846
#2	.20970	10.073	10.370	10.583	.21134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-149751/2-A Acquired: 11/14/2013 14:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.368**	**.20432**	**.19644**	**.20945**	**10.401**
Stddev	.011	.00011	.00021	.00028	.046
%RSD	.10638	.05425	.10496	.13178	.44622
#1	10.360	.20440	.19629	.20965	10.368
#2	10.376	.20425	.19658	.20926	10.434
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19750**	**.20100**	**9.997**	**.19975**	**.20435**
Stddev	.00082	.00102	.017	.00097	.00018
%RSD	.41500	.50828	.1716	.48707	.08884
#1	.19692	.20173	9.985	.20044	.20448
#2	.19808	.20028	10.01	.19906	.20422
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.108**	**.19507**	**.20194**	**.19723**	**.19863**
Stddev	.045	.00073	.00010	.00046	.00168
%RSD	.44884	.37542	.05194	.23515	.84502
#1	10.141	.19455	.20187	.19756	.19744
#2	10.076	.19559	.20201	.19690	.19981
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-149751/2-A Acquired: 11/14/2013 14:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.20955	.20181
Stddev	.00004	.00093
%RSD	.01989	.46026
#1	.20952	.20116
#2	.20958	.20247
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3308.0	4889.4	75667.	7247.9
Stddev	8.0	.3	40.	8.0
%RSD	.24127	.00629	.05302	.11067
#1	3313.7	4889.6	75639.	7242.2
#2	3302.4	4889.1	75695.	7253.5

Sample Name: 480-49278-A-1-A Acquired: 11/14/2013 14:11:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.07824**	**.00441**	**.04850**	**.14567**
Stddev	.00003	.01940	.00293	.00032	.00030
%RSD	14.714	24.796	66.478	.67002	.20653
#1	.00022	.06452	.00234	.04873	.14589
#2	.00018	.09195	.00648	.04827	.14546
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**143.68**	**.00015**	**.00355**	**.00041**
Stddev	.00005	.99	.00006	.00001	.00004
%RSD	275.20	.69176	38.606	.29183	10.866
#1	-.00006	144.38	.00019	.00356	.00038
#2	.00002	142.98	.00011	.00354	.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00171**	**2.5803**	**2.9565**	**4.0578**	**.00325**
Stddev	.00021	.0206	.0372	.0496	.00075
%RSD	12.046	.79982	1.2578	1.2231	23.233
#1	.00156	2.5949	2.9302	4.0929	.00378
#2	.00185	2.5657	2.9828	4.0227	.00271
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-1-A Acquired: 11/14/2013 14:11:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.806**	**1.9518**	**1.9857**	**-.00024**	**82.709**
Stddev	.016	.0033	.0056	.00003	.364
%RSD	.11842	.17053	.28437	14.406	.43972
#1	13.818	1.9541	1.9817	-.00027	82.451
#2	13.794	1.9494	1.9897	-.00022	82.966
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00757**	**-.00425**	**7.148**	**-.00306**	**-.00008**
Stddev	.00055	.00032	.008	.00129	.00418
%RSD	7.2470	7.4180	.1180	42.267	5128.3
#1	.00718	-.00448	7.154	-.00398	-.00304
#2	.00796	-.00403	7.142	-.00215	.00288
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.5386**	**-.00015**	**.43372**	**.00132**	**.00185**
Stddev	.0357	.00053	.00120	.00007	.00294
%RSD	.54533	352.93	.27590	5.4497	158.81
#1	6.5638	-.00052	.43288	.00127	.00393
#2	6.5134	.00022	.43457	.00137	-.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-1-A Acquired: 11/14/2013 14:11:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00046	.03622
Stddev	.00006	.00009
%RSD	13.918	.24869
#1	.00041	.03628
#2	.00050	.03615
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3092.1	4638.4	70580.	7232.2
Stddev	1.1	1.4	17.	23.7
%RSD	.03524	.03058	.02369	.32821
#1	3092.8	4637.4	70568.	7215.4
#2	3091.3	4639.4	70592.	7249.0

Sample Name: 480-49278-A-2-A Acquired: 11/14/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**.02136**	**.04549**	**.46831**	**.38784**
Stddev	.00047	.01565	.00136	.00197	.00016
%RSD	64.574	73.289	2.9945	.42162	.04101
#1	.00106	.03243	.04453	.46691	.38773
#2	.00040	.01029	.04646	.46970	.38795
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**219.91**	**.00003**	**.00627**	**.00007**
Stddev	.00006	.19	.00002	.00002	.00007
%RSD	1015.1	.08508	75.331	.36220	100.37
#1	.00004	219.78	.00004	.00629	.00012
#2	-.00005	220.04	.00001	.00626	.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00185**	**27.903**	**6.3102**	**9.1669**	**.00464**
Stddev	.00015	.124	.0399	.0726	.00054
%RSD	8.2658	.44484	.63267	.79189	11.616
#1	.00196	27.816	6.3385	9.2183	.00502
#2	.00174	27.991	6.2820	9.1156	.00426
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A Acquired: 11/14/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.129**	**1.9790**	**2.0619**	**.00203**	**133.65**
Stddev	.048	.0053	.0065	.00006	.24
%RSD	.14356	.26973	.31661	3.1916	.17956
#1	33.095	1.9752	2.0573	.00199	133.48
#2	33.163	1.9827	2.0666	.00208	133.82
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01461**	**-.00274**	**1.087**	**-.00230**	**-.00083**
Stddev	.00052	.00129	.001	.00057	.00050
%RSD	3.5788	47.106	.0515	24.618	60.090
#1	.01498	-.00365	1.087	-.00190	-.00048
#2	.01424	-.00183	1.087	-.00270	-.00119
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.0152**	**.00055**	**.80832**	**.00070**	**.00009**
Stddev	.0406	.00040	.00328	.00000	.00200
%RSD	.50594	72.795	.40571	.38850	2213.8
#1	8.0439	.00083	.80600	.00070	.00150
#2	7.9865	.00027	.81064	.00071	-.00132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A Acquired: 11/14/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00215**	**.00175**
Stddev	.00003	.00003
%RSD	1.3573	1.9065
#1	.00213	.00177
#2	.00217	.00172
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2945.5**	**4525.1**	**69481.**	**7210.5**
Stddev	6.9	11.4	69.	15.2
%RSD	.23462	.25301	.09872	.21146
#1	2950.4	4533.2	69530.	7221.3
#2	2940.7	4517.0	69433.	7199.8

Sample Name: 480-49278-A-2-A sd@5 Acquired: 11/14/2013 14:16:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**.00501**	**.00894**	**.08971**	**.07887**
Stddev	.00029	.01649	.00099	.00024	.00000
%RSD	343.41	328.99	11.094	.26661	.00547
#1	.00029	-.00665	.00965	.08954	.07888
#2	-.00012	.01667	.00824	.08988	.07887
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**43.043**	**-.00001**	**.00126**	**.00023**
Stddev	.00004	.196	.00003	.00004	.00056
%RSD	62.399	.45486	303.04	3.3658	240.77
#1	-.00004	42.904	.00001	.00129	-.00016
#2	-.00009	43.181	-.00003	.00123	.00063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00071**	**5.5692**	**1.1018**	**1.2895**	**.00073**
Stddev	.00017	.0104	.0295	.0088	.00002
%RSD	23.524	.18650	2.6728	.68303	2.2699
#1	.00083	5.5618	1.0810	1.2833	.00074
#2	.00059	5.5765	1.1226	1.2957	.00071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A sd@5 Acquired: 11/14/2013 14:16:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.5296**	**.40164**	**.39044**	**.00011**	**26.118**
Stddev	.0233	.00078	.00051	.00007	.193
%RSD	.35698	.19479	.13180	62.921	.74080
#1	6.5461	.40219	.39080	.00016	25.982
#2	6.5131	.40109	.39007	.00006	26.255
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00302**	**.00013**	**.1909**	**-.00259**	**.00028**
Stddev	.00049	.00008	.0017	.00056	.00335
%RSD	16.276	56.713	.8685	21.698	1205.9
#1	.00337	.00008	.1897	-.00299	.00264
#2	.00268	.00019	.1921	-.00219	-.00209
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5455**	**.00008**	**.16116**	**.00039**	**-.00213**
Stddev	.0155	.00016	.00053	.00015	.00249
%RSD	1.0037	190.46	.32883	38.457	116.54
#1	1.5345	.00019	.16153	.00049	-.00038
#2	1.5564	-.00003	.16078	.00028	-.00389
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A sd@5 Acquired: 11/14/2013 14:16:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00044	-.00018
Stddev	.00002	.00030
%RSD	4.2679	169.28
#1	.00043	-.00039
#2	.00046	.00004
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3244.3	4748.9	73514.	7246.5
Stddev	.0	.0	133.	33.9
%RSD	.00029	.00045	.18126	.46735
#1	3244.3	4748.9	73420.	7270.5
#2	3244.3	4748.9	73608.	7222.6

Sample Name: 480-49278-A-2-A pds Acquired: 11/14/2013 14:19:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05181	10.910	.25950	.66455	.58647
Stddev	.00040	.059	.00086	.00302	.00247
%RSD	.77005	.53921	.33020	.45513	.42168
#1	.05152	10.951	.26011	.66241	.58822
#2	.05209	10.868	.25890	.66669	.58473
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20455	225.66	.20797	.21250	.20536
Stddev	.00062	1.07	.00096	.00005	.00036
%RSD	.30278	.47435	.46273	.02249	.17433
#1	.20498	226.42	.20729	.21253	.20511
#2	.20411	224.91	.20865	.21246	.20561
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21660	37.224	17.780	24.168	.23649
Stddev	.00025	.092	.005	.041	.00339
%RSD	.11434	.24709	.02640	.17041	1.4345
#1	.21642	37.289	17.783	24.197	.23889
#2	.21677	37.159	17.776	24.139	.23409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A pds Acquired: 11/14/2013 14:19:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.102**	**2.0974**	**2.1907**	**.21248**	**141.21**
Stddev	.029	.0031	.0128	.00053	.02
%RSD	.06848	.14564	.58394	.24867	.01140
#1	42.081	2.0953	2.1816	.21211	141.20
#2	42.122	2.0996	2.1997	.21285	141.23
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21550**	**.20768**	**1.043**	**.20674**	**.21651**
Stddev	.00036	.00148	.000	.00271	.00271
%RSD	.16865	.71331	.0363	1.3111	1.2523
#1	.21524	.20873	1.043	.20482	.21842
#2	.21575	.20663	1.042	.20865	.21459
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.558**	**.20245**	**.99625**	**.19992**	**.19793**
Stddev	.200	.00046	.00180	.00110	.00096
%RSD	.97108	.22806	.18068	.54784	.48296
#1	20.417	.20213	.99497	.19915	.19861
#2	20.699	.20278	.99752	.20069	.19726
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-A pds Acquired: 11/14/2013 14:19:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21268**	**.19670**
Stddev	.00099	.00088
%RSD	.46374	.44779
#1	.21198	.19608
#2	.21338	.19733
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2920.5**	**4577.5**	**70472.**	**7188.6**
Stddev	5.1	13.6	346.	17.4
%RSD	.17486	.29724	.49098	.24268
#1	2924.1	4587.1	70716.	7176.2
#2	2916.9	4567.8	70227.	7200.9

Sample Name: 480-49278-A-2-B MS Acquired: 11/14/2013 14:21:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05256**	**10.874**	**.26177**	**.67721**	**.60290**
Stddev	.00009	.088	.00209	.00075	.00311
%RSD	.17417	.81032	.79928	.11120	.51660
#1	.05263	10.812	.26029	.67667	.60070
#2	.05250	10.936	.26325	.67774	.60510
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20312**	**231.62**	**.20624**	**.21048**	**.20281**
Stddev	.00037	.16	.00005	.00039	.00185
%RSD	.18082	.07015	.02572	.18712	.91204
#1	.20286	231.51	.20620	.21076	.20151
#2	.20338	231.74	.20628	.21021	.20412
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21543**	**37.946**	**18.163**	**24.464**	**.23906**
Stddev	.00226	.005	.103	.058	.00270
%RSD	1.0504	.01286	.56474	.23784	1.1307
#1	.21383	37.943	18.090	24.423	.23715
#2	.21703	37.950	18.235	24.506	.24098
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-B MS Acquired: 11/14/2013 14:21:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.804**	**2.1525**	**2.2501**	**.21105**	**145.85**
Stddev	.213	.0084	.0144	.00061	.02
%RSD	.49863	.39055	.64033	.29093	.01429
#1	42.653	2.1466	2.2399	.21062	145.83
#2	42.955	2.1585	2.2603	.21148	145.86
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21351**	**.20642**	F **11.64**	**.20614**	**.22005**
Stddev	.00238	.00173	.00	.00103	.00462
%RSD	1.1138	.83641	.0113	.50124	2.1001
#1	.21519	.20764	11.64	.20687	.22332
#2	.21182	.20520	11.64	.20541	.21678
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.594**	**.20507**	**1.0221**	**.19851**	**.19922**
Stddev	.033	.00131	.0003	.00012	.00293
%RSD	.18841	.63720	.02524	.06178	1.4727
#1	17.617	.20415	1.0223	.19859	.20130
#2	17.570	.20599	1.0219	.19842	.19715
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-B MS Acquired: 11/14/2013 14:21:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21168	.19487
Stddev	.00119	.00194
%RSD	.56451	.99395
#1	.21083	.19350
#2	.21252	.19624
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2909.9	4550.6	70008.	7144.9
Stddev	3.1	5.7	463.	10.8
%RSD	.10650	.12438	.66183	.15148
#1	2912.1	4554.6	70335.	7152.5
#2	2907.7	4546.6	69680.	7137.2

Sample Name: 480-49278-A-2-C MSD Acquired: 11/14/2013 14:23:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05279	10.865	.26114	.67238	.59652
Stddev	.00025	.008	.00290	.00103	.00135
%RSD	.48150	.06961	1.1102	.15378	.22588
#1	.05261	10.871	.26319	.67165	.59557
#2	.05297	10.860	.25909	.67311	.59747
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20500	228.28	.20705	.21168	.20693
Stddev	.00008	.41	.00006	.00090	.00127
%RSD	.04092	.18053	.02944	.42303	.61586
#1	.20506	228.57	.20709	.21105	.20783
#2	.20494	227.99	.20701	.21232	.20603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21855	37.770	18.024	24.297	.23996
Stddev	.00044	.010	.051	.027	.00237
%RSD	.20145	.02705	.28076	.11111	.98923
#1	.21886	37.763	17.989	24.316	.23829
#2	.21824	37.778	18.060	24.278	.24164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-C MSD Acquired: 11/14/2013 14:23:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.681**	**2.1351**	**2.2457**	**.21130**	**144.20**
Stddev	.111	.0102	.0053	.00011	.28
%RSD	.26038	.47760	.23715	.05115	.19086
#1	42.760	2.1423	2.2494	.21138	144.39
#2	42.602	2.1279	2.2419	.21123	144.01
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21516**	**.20788**	F **11.59**	**.20672**	**.21829**
Stddev	.00024	.00041	.02	.00030	.00085
%RSD	.11028	.19493	.1966	.14544	.38849
#1	.21533	.20759	11.57	.20694	.21769
#2	.21500	.20817	11.61	.20651	.21889
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.336**	**.20739**	**1.0185**	**.19972**	**.20056**
Stddev	.012	.00087	.0043	.00011	.00030
%RSD	.06806	.41767	.41696	.05526	.14808
#1	17.327	.20678	1.0155	.19964	.20077
#2	17.344	.20800	1.0215	.19980	.20035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-2-C MSD Acquired: 11/14/2013 14:23:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21391	.19585
Stddev	.00074	.00188
%RSD	.34594	.96133
#1	.21443	.19718
#2	.21338	.19452
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2910.7	4561.2	69827.	7172.5
Stddev	5.4	8.7	102.	6.5
%RSD	.18552	.18996	.14617	.09111
#1	2914.6	4567.4	69754.	7167.9
#2	2906.9	4555.1	69899.	7177.1

Sample Name: 480-49278-A-3-A Acquired: 11/14/2013 14:26:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**.11570**	**.00075**	**.02115**	**.06603**
Stddev	.00009	.00616	.00101	.00000	.00032
%RSD	79.370	5.3233	135.30	.02131	.49014
#1	-.00018	.11135	.00003	.02115	.06626
#2	-.00005	.12006	.00146	.02116	.06581
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**146.98**	**.00009**	**-.00017**	**.00099**
Stddev	.00001	.01	.00011	.00004	.00038
%RSD	17.191	.00766	124.14	25.638	38.726
#1	-.00004	146.98	.00017	-.00014	.00072
#2	-.00005	146.99	.00001	-.00020	.00126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**.06246**	**1.3030**	**1.5182**	**.00246**
Stddev	.00004	.00096	.0396	.0051	.00007
%RSD	3.7695	1.5337	3.0353	.33584	2.8368
#1	.00101	.06178	1.3309	1.5218	.00241
#2	.00107	.06313	1.2750	1.5146	.00251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-3-A Acquired: 11/14/2013 14:26:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.4458**	**.05602**	**.05567**	**.00033**	**3.7419**
Stddev	.0025	.00033	.00010	.00026	.0096
%RSD	.03815	.58815	.17672	77.261	.25688
#1	6.4475	.05625	.05574	.00051	3.7351
#2	6.4441	.05578	.05560	.00015	3.7487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00130**	**-.00329**	F **11.16**	**-.00253**	**-.00227**
Stddev	.00050	.00079	.02	.00094	.00376
%RSD	38.750	24.070	.1973	37.093	165.56
#1	.00165	-.00385	11.15	-.00187	.00039
#2	.00094	-.00273	11.18	-.00320	-.00493
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.3516**	**-.00001**	**.36944**	**.00188**	**-.00038**
Stddev	.0336	.00020	.00095	.00015	.00006
%RSD	.62805	1732.1	.25788	7.7082	16.061
#1	5.3279	.00013	.37012	.00178	-.00042
#2	5.3754	-.00015	.36877	.00199	-.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-3-A Acquired: 11/14/2013 14:26:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00049**	**.00605**
Stddev	.00000	.00015
%RSD	.92346	2.4301
#1	.00049	.00595
#2	.00049	.00616
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3198.5**	**4719.0**	**72712.**	**7226.3**
Stddev	4.1	3.0	258.	3.1
%RSD	.12799	.06408	.35457	.04293
#1	3201.4	4721.2	72529.	7228.5
#2	3195.6	4716.9	72894.	7224.1

Sample Name: CCV Acquired: 11/14/2013 14:28:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49857**	**25.504**	**.50519**	**.49019**	**.50964**	**.48988**	**24.977**
Stddev	.00036	.006	.00283	.00004	.00067	.00151	.010
%RSD	.07139	.02443	.55924	.00720	.13230	.30802	.03933
#1	.49883	25.508	.50319	.49016	.51012	.49095	24.984
#2	.49832	25.500	.50718	.49021	.50917	.48881	24.970
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48826**	**.48668**	**.51277**	**.51161**	**24.054**	**25.732**	**26.285**
Stddev	.00062	.00029	.00161	.00184	.092	.108	.112
%RSD	.12597	.05941	.31435	.35911	.38360	.41947	.42721
#1	.48783	.48648	.51163	.51291	24.119	25.656	26.206
#2	.48870	.48688	.51391	.51031	23.989	25.808	26.365
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51098**	**24.038**	**.49981**	**.48530**	**.49457**	**25.629**	**.48771**
Stddev	.00131	.046	.00084	.00073	.00052	.104	.00164
%RSD	.25581	.18972	.16863	.15013	.10531	.40631	.33701
#1	.51006	24.006	.49921	.48582	.49420	25.555	.48655
#2	.51190	24.070	.50041	.48479	.49494	25.703	.48887
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 14:28:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49053	24.62	.50325	.49333	24.888	.50045	.49099
Stddev	.00004	.06	.00043	.00384	.093	.00102	.00148
%RSD	.00891	.2329	.08480	.77913	.37455	.20327	.30085
#1	.49050	24.58	.50355	.49605	24.822	.50117	.49204
#2	.49057	24.66	.50295	.49062	24.954	.49973	.48995
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50043	.49109	.50890	.49895
Stddev	.00001	.00225	.00145	.00147
%RSD	.00194	.45895	.28412	.29395
#1	.50044	.49268	.50788	.49791
#2	.50042	.48950	.50992	.49999
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3190.3	4834.3	73537.	7166.6
Stddev	3.5	2.7	12.	7.8
%RSD	.10974	.05482	.01611	.10838
#1	3192.8	4836.2	73529.	7161.1
#2	3187.8	4832.5	73546.	7172.1

Sample Name: CCB Acquired: 11/14/2013 14:31:11 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**-.01413**	**-.00338**	**.00026**	**.00000**	**.00001**	**-.00009**
Stddev	.00010	.02346	.00165	.00022	.00000	.00009	.00025
%RSD	25.524	166.00	48.756	82.482	30.407	820.24	287.87
#1	-.00033	-.03072	-.00455	.00011	.00001	.00007	.00009
#2	-.00047	.00246	-.00221	.00042	.00000	-.00005	-.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**-.00008**	**-.00036**	**.00023**	**-.00472**	**.01936**	**.00166**
Stddev	.00002	.00008	.00009	.00026	.00044	.04427	.00076
%RSD	18.696	108.21	25.687	112.38	9.2296	228.69	45.439
#1	.00008	-.00002	-.00042	.00041	-.00502	.05066	.00220
#2	.00011	-.00013	-.00029	.00005	-.00441	-.01194	.00113
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00096**	**-.00034**	**-.00004**	**.00061**	**.00005**	**.00852**	**-.00026**
Stddev	.00034	.00576	.00007	.00009	.00017	.00387	.00022
%RSD	35.426	1693.9	187.88	15.295	373.88	45.444	85.392
#1	-.00072	.00373	.00001	.00068	-.00007	.01126	-.00010
#2	-.00120	-.00441	-.00009	.00055	.00017	.00578	-.00042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 14:31:11 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00063	-.0030	-.00085	-.00047	.00063	-.00004	-.00004
Stddev	.00176	.0055	.00009	.00210	.02049	.00033	.00005
%RSD	277.97	183.6	10.125	450.87	3268.4	781.03	146.15
#1	-.00188	.0009	-.00091	.00102	-.01386	-.00027	-.00007
#2	.00061	-.0069	-.00079	-.00195	.01512	.00019	.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00002	-.00398	-.00008	-.00021
Stddev	.00041	.00065	.00003	.00001
%RSD	2489.7	16.409	36.126	5.3478
#1	-.00027	-.00352	-.00011	-.00021
#2	.00030	-.00444	-.00006	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3386.4	4926.5	76830.	7212.0
Stddev	1.7	6.3	237.	16.5
%RSD	.05012	.12737	.30895	.22894
#1	3385.2	4922.1	76662.	7223.7
#2	3387.6	4930.9	76998.	7200.3

Sample Name: CCVL Acquired: 11/14/2013 14:33:38 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00276**	**.20060**	**.01074**	**.01981**	**.00216**	**.00198**	**.50850**
Stddev	.00003	.00231	.00065	.00014	.00002	.00002	.00539
%RSD	1.2518	1.1517	6.0212	.69855	.90716	1.0336	1.0605
#1	.00273	.19897	.01120	.01991	.00215	.00196	.51232
#2	.00278	.20223	.01029	.01971	.00217	.00199	.50469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.00393**	**.00382**	**.01024**	**.04648**	**.51082**	**.43617**
Stddev	.00001	.00019	.00018	.00006	.00071	.04772	.00003
%RSD	1.2924	4.7979	4.8266	.57378	1.5350	9.3421	.00730
#1	.00087	.00407	.00369	.01020	.04597	.54456	.43614
#2	.00085	.00380	.00395	.01028	.04698	.47707	.43619
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02855**	**.20307**	**.00330**	**.00324**	**.00962**	**.96977**	**.01027**
Stddev	.00060	.00742	.00001	.00006	.00010	.01154	.00051
%RSD	2.1005	3.6535	.38102	1.8004	1.0586	1.1895	4.9894
#1	.02897	.20832	.00329	.00320	.00954	.96162	.00991
#2	.02812	.19783	.00331	.00328	.00969	.97793	.01063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 14:33:38 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00268	.2025	.01828	.01404	.47795	.00951	.00478
Stddev	.00036	.0048	.00102	.00103	.00862	.00040	.00008
%RSD	13.364	2.391	5.5540	7.3404	1.8026	4.2325	1.7396
#1	.00293	.1990	.01900	.01477	.47185	.00980	.00483
#2	.00243	.2059	.01757	.01331	.48404	.00923	.00472
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00476	.01871	.00481	.01044
Stddev	.00011	.00371	.00026	.00000
%RSD	2.3469	19.811	5.4781	.00365
#1	.00484	.01609	.00463	.01044
#2	.00468	.02133	.00500	.01044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3416.0	5011.4	77720.	7370.1
Stddev	11.4	10.9	622.	2.7
%RSD	.33383	.21741	.80084	.03643
#1	3424.1	5019.1	78160.	7372.0
#2	3407.9	5003.7	77280.	7368.2

Sample Name: 480-49278-A-4-A Acquired: 11/14/2013 14:36:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**1.1299**	**.00114**	**.22414**	**.20560**
Stddev	.00017	.0124	.00162	.00004	.00195
%RSD	123.48	1.0970	141.88	.01730	.95016
#1	-.00026	1.1387	.00228	.22411	.20698
#2	-.00002	1.1212	-.00000	.22417	.20422
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**68.658**	**.00015**	**.00037**	**.00140**
Stddev	.00011	.647	.00002	.00014	.00004
%RSD	525.89	.94227	9.8401	37.419	2.5069
#1	-.00010	69.116	.00017	.00027	.00142
#2	.00006	68.201	.00014	.00047	.00137
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00161**	**.70784**	**2.2646**	**2.7602**	**.05906**
Stddev	.00014	.01114	.0154	.0511	.00034
%RSD	8.7443	1.5732	.67834	1.8513	.57701
#1	.00171	.71572	2.2755	2.7963	.05930
#2	.00151	.69997	2.2538	2.7241	.05882
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-4-A Acquired: 11/14/2013 14:36:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.607**	**.03247**	**.03219**	**.00038**	**31.741**
Stddev	.125	.00012	.00012	.00002	.039
%RSD	.52835	.37216	.37373	5.6975	.12281
#1	23.695	.03256	.03211	.00040	31.713
#2	23.519	.03239	.03228	.00037	31.768
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00198**	**-.00274**	**8.566**	**-.00237**	**-.00442**
Stddev	.00020	.00056	.009	.00132	.00067
%RSD	10.308	20.331	.1045	55.871	15.132
#1	.00212	-.00313	8.559	-.00143	-.00489
#2	.00183	-.00234	8.572	-.00330	-.00394
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.4308**	**-.00034**	**1.3845**	**.02109**	**-.00139**
Stddev	.0264	.00032	.0025	.00021	.00121
%RSD	.35551	96.323	.18311	.98890	86.773
#1	7.4495	-.00011	1.3863	.02094	-.00225
#2	7.4121	-.00056	1.3827	.02124	-.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-4-A Acquired: 11/14/2013 14:36:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00400**	**.01164**
Stddev	.00014	.00043
%RSD	3.5252	3.7341
#1	.00410	.01133
#2	.00390	.01195
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3197.9**	**4759.3**	**73397.**	**7256.6**
Stddev	7.1	5.3	535.	45.4
%RSD	.22159	.11183	.72855	.62559
#1	3202.9	4763.1	73019.	7224.5
#2	3192.8	4755.5	73776.	7288.7

Sample Name: 480-49278-A-5-A Acquired: 11/14/2013 14:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00125**	**.03183**	**.00369**	**.03467**	**.05204**
Stddev	.00064	.01361	.00137	.00032	.00009
%RSD	51.493	42.753	37.062	.92540	.17648
#1	.00170	.04145	.00273	.03444	.05210
#2	.00079	.02221	.00466	.03489	.05197
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	**172.86**	**.00007**	**.00356**	**.00197**
Stddev	.00002	1.07	.00016	.00004	.00003
%RSD	927.93	.61933	235.46	1.0183	1.5881
#1	.00001	173.62	.00018	.00354	.00199
#2	-.00001	172.10	-.00004	.00359	.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00101**	**.01572**	**1.6947**	**2.1952**	**.00160**
Stddev	.00005	.00193	.0012	.0146	.00057
%RSD	4.5389	12.285	.07066	.66405	35.814
#1	.00104	.01708	1.6938	2.2055	.00201
#2	.00098	.01435	1.6955	2.1849	.00120
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-5-A Acquired: 11/14/2013 14:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.716**	**7.1087**	**7.3527**	**-.00043**	**26.622**
Stddev	.023	.0433	.0064	.00021	.144
%RSD	.14719	.60897	.08666	48.122	.53916
#1	15.700	7.1394	7.3482	-.00058	26.723
#2	15.733	7.0781	7.3572	-.00029	26.520
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00369**	**-.00088**	F **15.29**	**-.00180**	**.00237**
Stddev	.00038	.00124	.04	.00010	.00298
%RSD	10.262	140.48	.2456	5.3960	125.70
#1	.00343	-.00001	15.27	-.00187	.00447
#2	.00396	-.00176	15.32	-.00173	.00026
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.4414**	**-.00014**	**.50440**	**.00093**	**.00225**
Stddev	.0474	.00024	.00250	.00051	.00020
%RSD	1.0685	174.53	.49630	54.907	8.8628
#1	4.4750	-.00030	.50263	.00057	.00239
#2	4.4079	.00003	.50617	.00130	.00211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-5-A Acquired: 11/14/2013 14:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00014**	**.02495**
Stddev	.00036	.00028
%RSD	257.82	1.1269
#1	.00039	.02515
#2	-.00011	.02475
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3115.3**	**4651.5**	**71729.**	**7255.4**
Stddev	11.7	13.0	27.	17.0
%RSD	.37603	.27999	.03789	.23373
#1	3123.6	4660.8	71709.	7243.4
#2	3107.1	4642.3	71748.	7267.4

Sample Name: 480-49278-A-6-A Acquired: 11/14/2013 14:40:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**3.1129**	**-.00101**	**.00661**	**.06027**
Stddev	.00022	.0285	.00107	.00053	.00014
%RSD	65.349	.91514	105.93	7.9780	.23447
#1	-.00018	3.0928	-.00177	.00699	.06017
#2	-.00049	3.1331	-.00025	.00624	.06037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**6.4293**	**-.00002**	**.00260**	**.00245**
Stddev	.00003	.0654	.00003	.00009	.00001
%RSD	15.468	1.0165	145.23	3.2856	.24640
#1	.00023	6.3831	.00000	.00254	.00245
#2	.00018	6.4755	-.00005	.00266	.00244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00162**	**.61508**	**.63144**	**.61181**	**.00346**
Stddev	.00006	.00728	.03605	.00012	.00024
%RSD	3.9632	1.1840	5.7093	.02024	6.8848
#1	.00157	.60993	.65693	.61190	.00363
#2	.00167	.62023	.60595	.61172	.00329
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-6-A Acquired: 11/14/2013 14:40:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.9692**	**.03224**	**.03066**	**-.00013**	**7.0707**
Stddev	.0010	.00013	.00036	.00002	.0808
%RSD	.05260	.41002	1.1893	13.565	1.1429
#1	1.9685	.03215	.03091	-.00011	7.0136
#2	1.9700	.03234	.03040	-.00014	7.1279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00384**	**-.00195**	**.0872**	**-.00226**	**-.00003**
Stddev	.00041	.00100	.0032	.00089	.00072
%RSD	10.621	51.481	3.668	39.506	2374.0
#1	.00355	-.00266	.0895	-.00288	-.00054
#2	.00413	-.00124	.0850	-.00163	.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.101**	**-.00029**	**.02370**	**.02372**	**.00011**
Stddev	.182	.00044	.00015	.00260	.00142
%RSD	1.5073	150.03	.63764	10.946	1303.8
#1	11.972	.00002	.02360	.02189	.00112
#2	12.230	-.00061	.02381	.02556	-.00090
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49278-A-6-A Acquired: 11/14/2013 14:40:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00226**	**.00889**
Stddev	.00010	.00037
%RSD	4.3239	4.2158
#1	.00233	.00863
#2	.00219	.00916
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3375.7**	**4918.8**	**76659.**	**7334.9**
Stddev	2.2	3.0	383.	56.0
%RSD	.06535	.06026	.49990	.76390
#1	3377.3	4920.9	76930.	7374.5
#2	3374.2	4916.7	76388.	7295.3

Sample Name: 480-49312-A-1-A Acquired: 11/14/2013 14:43:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00057**	**.03531**	**.00020**	**.00660**	**.00179**
Stddev	.00073	.00200	.00011	.00005	.00002
%RSD	128.33	5.6745	54.094	.72325	.99534
#1	-.00108	.03389	.00012	.00657	.00181
#2	-.00005	.03672	.00027	.00664	.00178
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**5.9588**	**.00010**	**.00042**	**.00166**
Stddev	.00007	.0227	.00009	.00016	.00026
%RSD	216.54	.38179	95.404	37.718	15.476
#1	-.00008	5.9749	.00016	.00031	.00147
#2	.00002	5.9427	.00003	.00053	.00184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00770**	**.00360**	**.73783**	**1.2086**	**.01176**
Stddev	.00006	.00060	.00814	.0048	.00031
%RSD	.84290	16.540	1.1037	.40039	2.6113
#1	.00765	.00402	.73207	1.2121	.01154
#2	.00774	.00318	.74358	1.2052	.01198
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-1-A Acquired: 11/14/2013 14:43:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.07085**	**.00070**	**.00155**	**.00098**	**3310.8**
Stddev	.00006	.00005	.00011	.00007	4.1
%RSD	.08738	6.5900	7.1846	6.7178	.12263
#1	.07089	.00073	.00163	.00103	3313.7
#2	.07081	.00066	.00147	.00093	3308.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**-.00211**	F **18.67**	**-.00377**	**-.00110**
Stddev	.00091	.00034	.03	.00120	.00026
%RSD	155.20	16.170	.1530	31.856	23.956
#1	-.00006	-.00187	18.69	-.00292	-.00091
#2	.00122	-.00235	18.65	-.00462	-.00128
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09786**	**.00092**	**.09349**	**.00106**	**-.00562**
Stddev	.00053	.00042	.00046	.00025	.00221
%RSD	.54635	45.994	.48847	23.655	39.231
#1	.09824	.00122	.09317	.00088	-.00406
#2	.09749	.00062	.09382	.00123	-.00718
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-1-A Acquired: 11/14/2013 14:43:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00052**	**.00606**
Stddev	.00017	.00027
%RSD	32.355	4.4833
#1	.00040	.00625
#2	.00064	.00587
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2459.0**	**4187.8**	**58008.**	**7176.3**
Stddev	1.7	.7	219.	15.3
%RSD	.06939	.01625	.37835	.21251
#1	2457.8	4188.3	57853.	7165.5
#2	2460.2	4187.3	58163.	7187.0

Sample Name: 480-49312-A-2-A Acquired: 11/14/2013 14:45:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**.03289**	**.00247**	**.00703**	**.00197**
Stddev	.00057	.03981	.00017	.00019	.00000
%RSD	1053.1	121.02	6.7590	2.6802	.08792
#1	.00035	.06104	.00258	.00717	.00198
#2	-.00045	.00474	.00235	.00690	.00197
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**5.8427**	**.00020**	**.00030**	**.00146**
Stddev	.00001	.0028	.00006	.00001	.00012
%RSD	30.243	.04864	32.668	2.7029	7.9676
#1	-.00005	5.8447	.00024	.00031	.00155
#2	-.00003	5.8407	.00015	.00029	.00138
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10591**	**.02759**	**.80168**	**1.1896**	**.01236**
Stddev	.00021	.00282	.05747	.0078	.00006
%RSD	.19912	10.221	7.1683	.65427	.46212
#1	.10606	.02958	.76105	1.1951	.01240
#2	.10577	.02559	.84232	1.1841	.01232
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-2-A Acquired: 11/14/2013 14:45:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3861**	**.00204**	**.00278**	**.00347**	**3231.8**
Stddev	.0024	.00002	.00076	.00012	10.1
%RSD	.07020	1.1658	27.471	3.3400	.31265
#1	3.3878	.00202	.00332	.00339	3224.7
#2	3.3844	.00205	.00224	.00355	3239.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**-.00309**	F **18.32**	**-.00381**	**-.00128**
Stddev	.00038	.00051	.04	.00199	.00278
%RSD	74.582	16.502	.2082	52.270	216.75
#1	.00077	-.00345	18.29	-.00240	.00068
#2	.00024	-.00273	18.35	-.00522	-.00325
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.9172**	**-.00026**	**.09235**	**.00060**	**-.00094**
Stddev	.0201	.00033	.00037	.00020	.00149
%RSD	.51225	127.29	.39922	33.333	158.14
#1	3.9314	-.00003	.09209	.00045	-.00200
#2	3.9030	-.00049	.09261	.00074	.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-2-A Acquired: 11/14/2013 14:45:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00079**	**.03249**
Stddev	.00005	.00030
%RSD	5.9269	.91757
#1	.00076	.03228
#2	.00083	.03270
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2463.9**	**4189.9**	**58249.**	**7194.8**
Stddev	.4	2.1	34.	9.9
%RSD	.01674	.04970	.05798	.13789
#1	2463.6	4188.4	58225.	7201.9
#2	2464.2	4191.3	58273.	7187.8

Sample Name: 480-49312-A-3-A Acquired: 11/14/2013 14:48:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00062**	**.00768**	**.00226**	**.00697**	**.00214**
Stddev	.00034	.00212	.00292	.00012	.00001
%RSD	53.946	27.639	128.77	1.7184	.54956
#1	-.00039	.00918	.00020	.00705	.00213
#2	-.00086	.00618	.00433	.00689	.00215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**11.173**	**.00026**	**.00036**	**.00113**
Stddev	.00005	.067	.00003	.00010	.00010
%RSD	70.369	.60265	10.982	28.964	9.0126
#1	-.00004	11.221	.00024	.00028	.00120
#2	-.00011	11.125	.00028	.00043	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31300**	**.01319**	**.85426**	**1.2023**	**.01149**
Stddev	.00012	.00173	.00957	.0039	.00021
%RSD	.03891	13.138	1.1197	.32256	1.8354
#1	.31308	.01441	.86102	1.2051	.01164
#2	.31291	.01196	.84749	1.1996	.01134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-3-A Acquired: 11/14/2013 14:48:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.79428**	**.00096**	**.00245**	**.00232**	**3180.9**
Stddev	.00293	.00004	.00058	.00005	4.7
%RSD	.36913	4.2316	23.647	2.0968	.14649
#1	.79636	.00093	.00204	.00229	3184.2
#2	.79221	.00099	.00286	.00236	3177.6
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**-.00241**	F **18.11**	**-.00467**	**-.00227**
Stddev	.00018	.00153	.02	.00105	.00081
%RSD	29.909	63.289	.1305	22.499	35.811
#1	.00047	-.00133	18.09	-.00541	-.00169
#2	.00072	-.00349	18.13	-.00392	-.00284
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.2310**	**.00045**	**.09468**	**.00024**	**-.00527**
Stddev	.0668	.00080	.00011	.00059	.00109
%RSD	1.0725	177.18	.11187	241.41	20.612
#1	6.2783	-.00011	.09460	-.00017	-.00604
#2	6.1837	.00102	.09475	.00066	-.00450
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-3-A Acquired: 11/14/2013 14:48:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00064**	**.04753**
Stddev	.00023	.00070
%RSD	36.752	1.4689
#1	.00047	.04704
#2	.00080	.04803
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2461.5**	**4191.4**	**58858.**	**7263.2**
Stddev	2.9	.9	23.	28.7
%RSD	.11827	.02143	.03911	.39526
#1	2459.5	4190.7	58842.	7242.9
#2	2463.6	4192.0	58875.	7283.5

Sample Name: 480-49312-A-4-A Acquired: 11/14/2013 14:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00058**	**.01321**	**.00527**	**.01062**	**.00196**
Stddev	.00056	.00540	.00337	.00029	.00003
%RSD	96.610	40.902	63.950	2.7729	1.6680
#1	-.00098	.00939	.00289	.01083	.00194
#2	-.00019	.01703	.00765	.01041	.00198
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**15.590**	**.00029**	**.00043**	**.00105**
Stddev	.00001	.073	.00004	.00003	.00011
%RSD	8.9572	.46641	15.307	5.9916	10.256
#1	-.00009	15.641	.00026	.00041	.00112
#2	-.00008	15.538	.00033	.00045	.00097
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11403**	**.06384**	**.91447**	**1.1942**	**.01199**
Stddev	.00060	.00243	.02233	.0014	.00007
%RSD	.52606	3.8045	2.4421	.11781	.61241
#1	.11361	.06212	.93026	1.1932	.01194
#2	.11446	.06556	.89867	1.1952	.01205
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-4-A Acquired: 11/14/2013 14:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6709**	**.07131**	**.08431**	**.00410**	**3178.6**
Stddev	.0069	.00010	.00096	.00022	1.2
%RSD	.41243	.14439	1.1353	5.2662	.03629
#1	1.6758	.07124	.08363	.00425	3179.4
#2	1.6661	.07138	.08499	.00394	3177.8
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**-.00374**	F **17.99**	**-.00507**	**.00082**
Stddev	.00035	.00005	.04	.00075	.00079
%RSD	407.32	1.2978	.1999	14.887	96.460
#1	.00033	-.00371	17.97	-.00453	.00139
#2	-.00016	-.00377	18.02	-.00560	.00026
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.962**	**.00021**	**.09267**	**.00061**	**-.00708**
Stddev	.011	.00039	.00054	.00067	.00047
%RSD	.10011	184.98	.58790	109.65	6.6167
#1	10.954	-.00007	.09306	.00108	-.00675
#2	10.970	.00049	.09229	.00014	-.00741
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-4-A Acquired: 11/14/2013 14:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00056**	**.02763**
Stddev	.00004	.00027
%RSD	7.3223	.96677
#1	.00053	.02744
#2	.00059	.02782
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2455.8**	**4174.7**	**58571.**	**7177.4**
Stddev	4.1	15.6	334.	14.0
%RSD	.16695	.37278	.57108	.19532
#1	2458.7	4185.7	58808.	7167.5
#2	2452.9	4163.7	58335.	7187.4

Sample Name: 480-49312-A-5-A Acquired: 11/14/2013 14:53:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**.04038**	**-.00024**	**.00775**	**.00331**
Stddev	.00074	.00632	.00163	.00000	.00001
%RSD	103.75	15.655	684.73	.00388	.30579
#1	-.00019	.03591	-.00139	.00775	.00331
#2	-.00123	.04485	.00091	.00775	.00330
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**5.8851**	**.00026**	**.00022**	**.00142**
Stddev	.00011	.0251	.00005	.00009	.00024
%RSD	1674.5	.42731	20.667	40.122	16.629
#1	.00009	5.8673	.00022	.00028	.00159
#2	-.00007	5.9029	.00030	.00016	.00126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.33548**	**.03169**	**.99189**	**1.2643**	**.01120**
Stddev	.00168	.00261	.04334	.0055	.00201
%RSD	.50131	8.2220	4.3696	.43601	17.912
#1	.33667	.02985	.96124	1.2604	.00978
#2	.33429	.03353	1.0225	1.2682	.01262
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-5-A Acquired: 11/14/2013 14:53:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.9414**	**.00413**	**.00587**	**.00309**	**3217.0**
Stddev	.0237	.00002	.00119	.00014	26.6
%RSD	.26510	.50518	20.293	4.4317	.82558
#1	8.9247	.00411	.00671	.00318	3198.2
#2	8.9582	.00414	.00503	.00299	3235.7
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00112**	**-.00317**	F **18.27**	**-.00282**	**.00108**
Stddev	.00036	.00039	.08	.00156	.00030
%RSD	32.301	12.369	.4604	55.302	27.274
#1	.00138	-.00289	18.21	-.00172	.00088
#2	.00087	-.00345	18.33	-.00392	.00129
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.7740**	**.00037**	**.09520**	**.00056**	**-.00321**
Stddev	.0777	.00019	.00025	.00005	.00202
%RSD	.88541	51.337	.26176	9.2981	62.922
#1	8.7191	.00023	.09503	.00059	-.00178
#2	8.8289	.00050	.09538	.00052	-.00465
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-5-A Acquired: 11/14/2013 14:53:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00064**	**.05582**
Stddev	.00030	.00062
%RSD	47.654	1.1054
#1	.00085	.05538
#2	.00042	.05626
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2454.1**	**4177.2**	**58709.**	**7204.6**
Stddev	4.8	7.0	15.	55.3
%RSD	.19478	.16717	.02597	.76779
#1	2457.4	4182.2	58720.	7243.7
#2	2450.7	4172.3	58698.	7165.5

Sample Name: 480-49312-A-6-A Acquired: 11/14/2013 14:55:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.01376**	**.00358**	**.00756**	**.00330**
Stddev	.00010	.02516	.00323	.00047	.00000
%RSD	23.132	182.86	90.412	6.2765	.04464
#1	-.00035	.03155	.00586	.00789	.00330
#2	-.00049	-.00403	.00129	.00722	.00330
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**5.8762**	**.00017**	**.00035**	**.00133**
Stddev	.00000	.0329	.00006	.00013	.00039
%RSD	.54936	.55947	36.689	38.328	28.990
#1	-.00003	5.8995	.00013	.00045	.00161
#2	-.00003	5.8530	.00022	.00026	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13344**	**.04479**	**.99278**	**1.2495**	**.01123**
Stddev	.00040	.00277	.04305	.0028	.00102
%RSD	.29662	6.1888	4.3362	.22248	9.0636
#1	.13372	.04675	.96234	1.2515	.01195
#2	.13316	.04283	1.0232	1.2475	.01051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-6-A Acquired: 11/14/2013 14:55:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.8604**	**.00462**	**.00568**	**.00231**	**3198.3**
Stddev	.0112	.00001	.00037	.00018	10.3
%RSD	.11335	.23293	6.4963	7.9940	.32077
#1	9.8683	.00461	.00542	.00244	3205.5
#2	9.8525	.00463	.00594	.00218	3191.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**-.00445**	F **18.10**	**-.00359**	**-.00250**
Stddev	.00004	.00118	.02	.00199	.00158
%RSD	8.0525	26.602	.1042	55.527	63.121
#1	.00051	-.00529	18.11	-.00218	-.00361
#2	.00045	-.00361	18.09	-.00500	-.00138
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.9690**	**.00106**	**.09241**	**.00070**	**-.00302**
Stddev	.0664	.00017	.00002	.00004	.00156
%RSD	.66560	16.342	.01890	6.0008	51.654
#1	10.016	.00118	.09243	.00067	-.00412
#2	9.9221	.00094	.09240	.00073	-.00192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-6-A Acquired: 11/14/2013 14:55:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00065**	**.02419**
Stddev	.00046	.00024
%RSD	71.241	.97773
#1	.00032	.02403
#2	.00097	.02436
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2455.1**	**4177.6**	**58600.**	**7184.0**
Stddev	2.3	2.4	82.	23.1
%RSD	.09407	.05818	.13990	.32215
#1	2456.8	4179.4	58542.	7167.6
#2	2453.5	4175.9	58658.	7200.3

Sample Name: CCV Acquired: 11/14/2013 14:58:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49791**	**25.578**	**.50969**	**.49158**	**.51267**	**.49101**	**24.888**
Stddev	.00084	.220	.00110	.00028	.00324	.00251	.173
%RSD	.16776	.86145	.21600	.05646	.63178	.51176	.69686
#1	.49850	25.422	.51046	.49178	.51038	.48923	24.765
#2	.49732	25.734	.50891	.49138	.51496	.49278	25.010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49044**	**.48727**	**.51153**	**.51253**	**23.953**	**26.040**	**26.823**
Stddev	.00018	.00004	.00271	.00038	.105	.049	.029
%RSD	.03584	.00772	.52988	.07470	.43659	.18815	.10790
#1	.49032	.48730	.50961	.51226	23.879	26.006	26.843
#2	.49057	.48724	.51345	.51281	24.027	26.075	26.803
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51691**	**23.992**	**.49885**	**.48180**	**.49638**	**26.616**	**.48873**
Stddev	.00310	.011	.00244	.00132	.00087	.109	.00061
%RSD	.60042	.04385	.48928	.27310	.17582	.40961	.12468
#1	.51471	23.985	.49712	.48087	.49700	26.539	.48830
#2	.51910	24.000	.50058	.48273	.49576	26.693	.48916
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 14:58:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48746	24.81	.50650	.50368	24.871	.49751	.49376
Stddev	.00147	.01	.00168	.00232	.301	.00128	.00146
%RSD	.30186	.0531	.33085	.45984	1.2086	.25710	.29469
#1	.48642	24.80	.50768	.50531	24.658	.49660	.49273
#2	.48850	24.82	.50531	.50204	25.083	.49841	.49479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50112	.49213	.50719	.49768
Stddev	.00223	.00218	.00016	.00531
%RSD	.44592	.44395	.03080	1.0675
#1	.50270	.49368	.50730	.49392
#2	.49954	.49059	.50708	.50143
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3173.9	4804.1	73505.	7096.7
Stddev	1.4	1.3	298.	34.6
%RSD	.04446	.02637	.40529	.48686
#1	3174.9	4803.2	73716.	7121.1
#2	3172.9	4805.0	73295.	7072.2

Sample Name: CCB Acquired: 11/14/2013 15:00:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00023**	**.00412**	**.00199**	**-.00080**	**-.00000**	**-.00004**	**-.00280**
Stddev	.00030	.00545	.00288	.00013	.00001	.00008	.00017
%RSD	127.58	132.13	145.09	16.403	780.10	185.63	6.0892
#1	-.00044	.00797	-.00005	-.00089	.00000	.00001	-.00268
#2	-.00002	.00027	.00403	-.00071	-.00001	-.00010	-.00292
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**-.00001**	**-.00025**	**.00017**	**-.00190**	**.04467**	**.00563**
Stddev	.00019	.00009	.00000	.00017	.00143	.04636	.00038
%RSD	379.05	1044.7	1.7047	99.462	75.098	103.78	6.6945
#1	.00008	-.00007	-.00025	.00029	-.00089	.07745	.00590
#2	-.00018	.00005	-.00025	.00005	-.00291	.01189	.00537
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00080**	**-.00351**	**-.00005**	**.00009**	**-.00000**	**.35038**	**.00007**
Stddev	.00075	.00155	.00002	.00081	.00016	.00085	.00008
%RSD	94.121	44.201	43.699	925.66	7203.0	.24180	106.28
#1	.00027	-.00461	-.00003	-.00048	-.00012	.35098	.00002
#2	.00133	-.00241	-.00006	.00066	.00011	.34978	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 15:00:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00140**	F **-.0053**	**-.00047**	**-.00320**	**.00404**	**-.00016**	**.00002**
Stddev	.00052	.0013	.00039	.00210	.01021	.00062	.00015
%RSD	37.375	24.20	83.412	65.736	252.84	390.24	794.42
#1	-.00103	-.0062	-.00075	-.00469	.01125	.00028	-.00009
#2	-.00176	-.0044	-.00019	-.00171	-.00318	-.00060	.00012
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00014**	**-.00392**	**-.00005**	**-.00029**
Stddev	.00004	.00073	.00011	.00001
%RSD	25.852	18.682	226.62	3.5506
#1	.00012	-.00340	-.00013	-.00029
#2	.00017	-.00444	.00003	-.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3368.1**	**4901.2**	**76824.**	**7147.8**
Stddev	.7	1.3	84.	33.9
%RSD	.01951	.02618	.10957	.47391
#1	3367.7	4900.3	76764.	7123.8
#2	3368.6	4902.1	76883.	7171.7

Sample Name: ccvl Acquired: 11/14/2013 15:02:55 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00258**	**.20661**	**.00856**	**.01911**	**.00215**	**.00195**	**.50259**
Stddev	.00027	.02947	.00097	.00002	.00001	.00001	.00305
%RSD	10.547	14.263	11.343	.11625	.43291	.64502	.60704
#1	.00238	.22744	.00787	.01909	.00214	.00196	.50474
#2	.00277	.18577	.00924	.01913	.00216	.00194	.50043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00080**	**.00405**	**.00354**	**.01029**	**.04487**	**.48560**	**.43792**
Stddev	.00000	.00008	.00003	.00019	.00648	.02386	.00010
%RSD	.61418	2.0046	.93801	1.8672	14.446	4.9130	.02294
#1	.00079	.00399	.00356	.01015	.04945	.46873	.43799
#2	.00080	.00411	.00351	.01043	.04028	.50247	.43785
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02848**	**.20416**	**.00321**	**.00322**	**.00920**	**1.1899**	**.00989**
Stddev	.00038	.00065	.00006	.00013	.00009	.0077	.00014
%RSD	1.3302	.31732	1.7402	3.8872	.92486	.64501	1.4010
#1	.02821	.20370	.00317	.00314	.00926	1.1953	.00980
#2	.02875	.20461	.00325	.00331	.00914	1.1844	.00999
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ccvl Acquired: 11/14/2013 15:02:55 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00329	.1999	.01880	.01209	.47841	.00968	.00486
Stddev	.00013	.0028	.00136	.00278	.00047	.00101	.00005
%RSD	3.9979	1.395	7.2486	23.039	.09846	10.389	.97089
#1	.00338	.2018	.01783	.01406	.47874	.01039	.00489
#2	.00320	.1979	.01976	.01012	.47808	.00897	.00483
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00495	.01804	.00470	.01056
Stddev	.00019	.00103	.00023	.00089
%RSD	3.8087	5.7052	4.9927	8.4057
#1	.00482	.01877	.00453	.00993
#2	.00508	.01732	.00486	.01118
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3411.7	4987.9	77843.	7326.3
Stddev	.0	14.9	340.	7.4
%RSD	.00043	.29792	.43737	.10082
#1	3411.7	4998.5	78084.	7331.5
#2	3411.7	4977.4	77602.	7321.1

Sample Name: 480-49312-A-7-A Acquired: 11/14/2013 15:05:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00079**	**.02942**	**.00048**	**.01006**	**.00402**
Stddev	.00015	.01284	.00272	.00045	.00001
%RSD	18.907	43.646	572.56	4.5134	.21295
#1	-.00089	.02034	-.00145	.01038	.00402
#2	-.00068	.03850	.00240	.00974	.00401
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**5.9670**	**.00021**	**.00045**	**.00150**
Stddev	.00001	.0186	.00012	.00013	.00025
%RSD	13.536	.31179	57.525	28.926	16.616
#1	-.00008	5.9802	.00030	.00036	.00168
#2	-.00010	5.9539	.00013	.00055	.00132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.25318**	**.01681**	**.85237**	**1.3064**	**.01105**
Stddev	.00211	.00436	.01438	.0040	.00020
%RSD	.83184	25.920	1.6871	.30401	1.8444
#1	.25467	.01990	.84220	1.3092	.01120
#2	.25170	.01373	.86254	1.3035	.01091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-7-A Acquired: 11/14/2013 15:05:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.327**	**.00532**	**.00708**	**.00280**	**3244.6**
Stddev	.025	.00005	.00021	.00020	7.8
%RSD	.17479	1.0036	2.9143	7.0385	.24138
#1	14.344	.00535	.00694	.00266	3239.1
#2	14.309	.00528	.00723	.00294	3250.2
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00065**	**-.00354**	F **18.37**	**-.00340**	**-.00218**
Stddev	.00023	.00123	.02	.00060	.00086
%RSD	35.437	34.902	.1318	17.736	39.753
#1	.00049	-.00441	18.35	-.00298	-.00156
#2	.00082	-.00266	18.39	-.00383	-.00279
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.009**	**.00104**	**.09423**	**.00053**	**-.00676**
Stddev	.053	.00017	.00018	.00054	.00050
%RSD	.35433	16.473	.19023	101.79	7.4537
#1	14.972	.00092	.09410	.00092	-.00640
#2	15.047	.00116	.09435	.00015	-.00712
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-7-A Acquired: 11/14/2013 15:05:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00069**	**.04043**
Stddev	.00005	.00106
%RSD	7.5706	2.6167
#1	.00065	.03968
#2	.00073	.04118
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2446.6**	**4159.6**	**58496.**	**7159.4**
Stddev	.2	10.9	147.	6.5
%RSD	.00614	.26094	.25197	.09067
#1	2446.5	4167.3	58392.	7154.8
#2	2446.7	4152.0	58600.	7164.0

Sample Name: 480-49312-A-8-A Acquired: 11/14/2013 15:07:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00050**	**.02609**	**.00152**	**.01121**	**.01488**
Stddev	.00038	.00947	.00201	.00047	.00002
%RSD	77.186	36.287	131.58	4.1785	.14997
#1	-.00023	.03278	.00011	.01154	.01490
#2	-.00077	.01940	.00294	.01087	.01487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**5.6243**	**.00041**	**.00010**	**.00359**
Stddev	.00010	.0096	.00006	.00026	.00018
%RSD	907.79	.17099	15.669	268.18	4.9421
#1	.00008	5.6311	.00045	-.00009	.00346
#2	-.00006	5.6175	.00036	.00028	.00371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.17293**	**.01786**	**.93575**	**1.2140**	**.06753**
Stddev	.00064	.00010	.03212	.0024	.00030
%RSD	.37113	.58182	3.4330	.19864	.44017
#1	.17338	.01778	.91304	1.2123	.06774
#2	.17247	.01793	.95847	1.2157	.06732
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-8-A Acquired: 11/14/2013 15:07:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.3583**	**.00369**	**.00486**	**.01055**	**3096.7**
Stddev	.0154	.00013	.00046	.00017	5.9
%RSD	.16456	3.4751	9.4595	1.6145	.18920
#1	9.3474	.00378	.00519	.01043	3100.9
#2	9.3691	.00360	.00454	.01067	3092.6
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00144**	**-.00489**	F **17.35**	**-.00273**	**.01161**
Stddev	.00073	.00063	.04	.00099	.00209
%RSD	50.837	12.951	.2476	36.423	17.989
#1	.00195	-.00444	17.38	-.00203	.01013
#2	.00092	-.00534	17.32	-.00343	.01309
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.7749**	**.00088**	**1.1624**	**.00077**	**-.00697**
Stddev	.0279	.00011	.0043	.00038	.00306
%RSD	.28506	12.540	.36805	49.756	43.904
#1	9.7552	.00080	1.1655	.00104	-.00913
#2	9.7946	.00096	1.1594	.00050	-.00481
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-8-A Acquired: 11/14/2013 15:07:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00123**	**.04030**
Stddev	.00039	.00001
%RSD	31.761	.02421
#1	.00095	.04030
#2	.00151	.04031
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2461.8**	**4179.6**	**58649.**	**7196.5**
Stddev	3.7	3.6	101.	5.1
%RSD	.15010	.08563	.17276	.07049
#1	2464.5	4177.1	58577.	7193.0
#2	2459.2	4182.2	58721.	7200.1

Sample Name: 480-49312-A-9-A Acquired: 11/14/2013 15:10:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00029**	**.02207**	**.00947**	**.00979**	**.00804**
Stddev	.00030	.00788	.00236	.00072	.00005
%RSD	102.09	35.719	24.945	7.3354	.65563
#1	-.00050	.01649	.00780	.00928	.00801
#2	-.00008	.02764	.01114	.01030	.00808
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**5.7035**	**.00051**	**-.00040**	**.00850**
Stddev	.00000	.0260	.00001	.00006	.00021
%RSD	.22550	.45610	1.1166	14.320	2.4719
#1	-.00005	5.6851	.00051	-.00044	.00836
#2	-.00005	5.7219	.00051	-.00036	.00865
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.12694**	**.02716**	**.97169**	**1.2079**	**.06084**
Stddev	.00014	.00193	.03048	.0082	.00025
%RSD	.10930	7.0880	3.1363	.68216	.40511
#1	.12684	.02852	.95014	1.2021	.06067
#2	.12704	.02580	.99324	1.2137	.06102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-9-A Acquired: 11/14/2013 15:10:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.3474**	**.00184**	**.00258**	**.00372**	**3167.7**
Stddev	.0217	.00000	.00063	.00002	.1
%RSD	.40582	.22455	24.401	.41307	.00371
#1	5.3321	.00183	.00302	.00371	3167.8
#2	5.3628	.00184	.00213	.00373	3167.6
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00112**	F **-.00540**	F **17.65**	**-.00069**	**.03010**
Stddev	.00031	.00013	.00	.00154	.00287
%RSD	27.541	2.4181	.0226	225.22	9.5221
#1	.00133	-.00550	17.66	-.00178	.02807
#2	.00090	-.00531	17.65	.00041	.03212
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.5135**	**.00022**	**.68368**	**.00057**	**-.00273**
Stddev	.0055	.00051	.00105	.00045	.00130
%RSD	.10023	233.18	.15373	77.795	47.551
#1	5.5174	.00058	.68443	.00089	-.00364
#2	5.5096	-.00014	.68294	.00026	-.00181
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-9-A Acquired: 11/14/2013 15:10:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00128**	**.02284**
Stddev	.00005	.00056
%RSD	3.5233	2.4606
#1	.00125	.02324
#2	.00131	.02244
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2456.9**	**4171.0**	**58152.**	**7114.9**
Stddev	4.1	3.8	119.	42.5
%RSD	.16840	.09191	.20535	.59735
#1	2454.0	4168.3	58237.	7145.0
#2	2459.8	4173.7	58068.	7084.9

Sample Name: 480-49312-A-10-A Acquired: 11/14/2013 15:12:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00087**	**.00703**	**.00708**	**.00990**	**.00989**
Stddev	.00054	.00842	.00067	.00004	.00005
%RSD	62.042	119.70	9.4087	.35653	.45874
#1	-.00049	.00108	.00755	.00988	.00986
#2	-.00125	.01298	.00661	.00993	.00993
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**5.5939**	**.00036**	**-.00009**	**.00607**
Stddev	.00012	.0362	.00016	.00004	.00013
%RSD	343.06	.64659	45.205	46.031	2.1365
#1	-.00012	5.5683	.00047	-.00006	.00598
#2	.00005	5.6195	.00024	-.00012	.00616
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18589**	**.03432**	**.94076**	**1.1738**	**.10883**
Stddev	.00112	.00300	.01154	.0118	.00123
%RSD	.60031	8.7353	1.2264	1.0055	1.1291
#1	.18511	.03220	.93260	1.1655	.10970
#2	.18668	.03644	.94892	1.1822	.10796
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-10-A Acquired: 11/14/2013 15:12:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.1857**	**.00257**	**.00362**	**.00433**	**3072.2**
Stddev	.0039	.00001	.00029	.00004	1.3
%RSD	.05393	.43352	8.1155	1.0138	.04124
#1	7.1829	.00258	.00383	.00429	3071.3
#2	7.1884	.00256	.00342	.00436	3073.1
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**-.00323**	F **17.18**	**-.00292**	**.01384**
Stddev	.00091	.00212	.00	.00009	.00257
%RSD	143.33	65.577	.0174	3.1755	18.548
#1	.00128	-.00473	17.18	-.00298	.01565
#2	-.00001	-.00173	17.18	-.00285	.01202
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.9344**	**.00060**	**.87829**	**.00068**	**-.00447**
Stddev	.0289	.00045	.00046	.00032	.00319
%RSD	.36381	75.212	.05211	47.624	71.369
#1	7.9140	.00092	.87797	.00045	-.00672
#2	7.9548	.00028	.87862	.00091	-.00221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-10-A Acquired: 11/14/2013 15:12:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00099**	**.03279**
Stddev	.00013	.00090
%RSD	13.291	2.7372
#1	.00090	.03215
#2	.00109	.03342
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2467.1**	**4184.8**	**58457.**	**7107.2**
Stddev	1.6	.2	182.	33.8
%RSD	.06378	.00372	.31152	.47620
#1	2466.0	4184.7	58585.	7131.1
#2	2468.2	4184.9	58328.	7083.2

Sample Name: 480-49312-A-11-A Acquired: 11/14/2013 15:15:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**.01847**	**.00202**	**.01093**	**.01335**
Stddev	.00052	.01254	.00272	.00029	.00004
%RSD	94.090	67.905	134.35	2.6738	.31700
#1	-.00092	.00960	.00010	.01113	.01338
#2	-.00018	.02734	.00395	.01072	.01332
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**5.4103**	**.00028**	**.00024**	**.01698**
Stddev	.00000	.0140	.00002	.00017	.00008
%RSD	7.4910	.25800	7.6193	71.142	.48214
#1	-.00006	5.4202	.00027	.00036	.01704
#2	-.00006	5.4004	.00030	.00012	.01692
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.27238**	**.02301**	**.88246**	**1.1365**	**.07434**
Stddev	.00025	.00026	.05223	.0020	.00055
%RSD	.08997	1.1284	5.9189	.17863	.74190
#1	.27255	.02319	.84553	1.1379	.07473
#2	.27221	.02282	.91940	1.1350	.07395
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-11-A Acquired: 11/14/2013 15:15:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.270**	**.00445**	**.00589**	**.01248**	**2917.0**
Stddev	.033	.00004	.00054	.00023	.9
%RSD	.29507	.88458	9.1303	1.8036	.03208
#1	11.293	.00443	.00551	.01264	2917.7
#2	11.246	.00448	.00627	.01232	2916.4
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00123**	F **-.00614**	F **16.29**	**-.00415**	**.00201**
Stddev	.00014	.00062	.06	.00240	.00040
%RSD	11.421	10.157	.3388	57.810	20.029
#1	.00133	-.00570	16.25	-.00245	.00229
#2	.00113	-.00658	16.33	-.00584	.00173
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.567**	**.00104**	**1.0319**	**.00099**	**-.00454**
Stddev	.019	.00091	.0022	.00027	.00111
%RSD	.16370	86.736	.21768	27.726	24.387
#1	11.554	.00169	1.0303	.00119	-.00532
#2	11.581	.00040	1.0335	.00080	-.00376
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-11-A Acquired: 11/14/2013 15:15:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00094**	**.05090**
Stddev	.00016	.00046
%RSD	16.770	.91236
#1	.00083	.05123
#2	.00105	.05058
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2485.7**	**4193.3**	**58829.**	**7129.3**
Stddev	4.7	10.6	6.	6.2
%RSD	.18868	.25270	.01020	.08667
#1	2489.0	4200.8	58825.	7133.6
#2	2482.4	4185.8	58833.	7124.9

Sample Name: 480-49312-A-12-A Acquired: 11/14/2013 15:17:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00072**	**.02882**	**.00072**	**.01456**	**.00416**
Stddev	.00067	.00828	.00127	.00036	.00002
%RSD	93.565	28.713	175.20	2.5004	.46643
#1	-.00119	.03468	-.00017	.01431	.00415
#2	-.00024	.02297	.00162	.01482	.00417
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**5.7319**	**.00098**	**.00033**	**.00254**
Stddev	.00002	.0543	.00014	.00008	.00019
%RSD	62.240	.94758	14.043	25.169	7.6737
#1	.00004	5.7703	.00107	.00039	.00268
#2	.00002	5.6935	.00088	.00027	.00240
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.34134**	**.01114**	**.94806**	**1.2993**	**.01066**
Stddev	.00128	.00098	.03065	.0007	.00047
%RSD	.37549	8.7840	3.2327	.05345	4.3920
#1	.34043	.01045	.96973	1.2998	.01099
#2	.34224	.01183	.92639	1.2988	.01033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-12-A Acquired: 11/14/2013 15:17:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.823**	**.00426**	**.00472**	**.04231**	**3140.5**
Stddev	.033	.00008	.00060	.00008	7.4
%RSD	.25834	1.9547	12.795	.19147	.23436
#1	12.846	.00432	.00515	.04225	3145.7
#2	12.799	.00420	.00429	.04236	3135.3
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00181**	**-.00160**	F **17.67**	**-.00177**	**.00238**
Stddev	.00034	.00072	.05	.00025	.00022
%RSD	18.467	44.843	.3024	14.125	9.2324
#1	.00205	-.00210	17.71	-.00159	.00222
#2	.00158	-.00109	17.64	-.00194	.00253
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.099**	**.00110**	**.11274**	**.00054**	**-.00454**
Stddev	.077	.00068	.00032	.00008	.00266
%RSD	.59087	61.469	.28279	15.102	58.632
#1	13.154	.00158	.11251	.00060	-.00642
#2	13.045	.00062	.11297	.00048	-.00266
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-12-A Acquired: 11/14/2013 15:17:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00124	.09161
Stddev	.00025	.00038
%RSD	20.163	.41476
#1	.00142	.09188
#2	.00106	.09134
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2460.1	4171.1	58540.	7152.7
Stddev	1.8	5.3	86.	40.8
%RSD	.07384	.12800	.14768	.57001
#1	2461.4	4174.8	58601.	7123.9
#2	2458.8	4167.3	58479.	7181.5

Sample Name: 480-49312-A-13-A Acquired: 11/14/2013 15:20:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00090**	**.02772**	**.00050**	**.01727**	**.01803**
Stddev	.00021	.01076	.00055	.00015	.00013
%RSD	23.033	38.807	109.73	.85047	.69564
#1	-.00075	.03533	.00011	.01737	.01794
#2	-.00105	.02011	.00089	.01717	.01812
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**5.6784**	**.00064**	**.00021**	**.00298**
Stddev	.00000	.0069	.00002	.00006	.00020
%RSD	10.219	.12182	3.3845	29.956	6.5750
#1	.00003	5.6832	.00063	.00016	.00312
#2	.00004	5.6735	.00066	.00025	.00284
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.37575**	**.00883**	**.98415**	**1.3509**	**.11972**
Stddev	.00455	.00162	.06309	.0107	.00113
%RSD	1.2107	18.317	6.4101	.79384	.94375
#1	.37253	.00998	.93954	1.3433	.11892
#2	.37896	.00769	1.0288	1.3584	.12052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-13-A Acquired: 11/14/2013 15:20:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.198**	**.00696**	**.00832**	**.02058**	**3059.8**
Stddev	.020	.00005	.00051	.00006	4.6
%RSD	.08346	.77501	6.1059	.28919	.14949
#1	24.213	.00693	.00867	.02054	3056.5
#2	24.184	.00700	.00796	.02062	3063.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00202**	F **-.00794**	F **17.15**	**-.00392**	**.00131**
Stddev	.00094	.00213	.02	.00037	.00612
%RSD	46.642	26.883	.1438	9.3573	467.41
#1	.00135	-.00944	17.13	-.00366	.00563
#2	.00269	-.00643	17.17	-.00418	-.00302
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.488**	**.00066**	**1.6343**	**.00054**	**-.00278**
Stddev	.022	.00012	.0013	.00037	.00324
%RSD	.08139	18.589	.07620	69.484	116.39
#1	27.472	.00075	1.6352	.00080	-.00507
#2	27.504	.00057	1.6334	.00027	-.00049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-13-A Acquired: 11/14/2013 15:20:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00195	.05958
Stddev	.00039	.00069
%RSD	19.940	1.1608
#1	.00167	.06007
#2	.00222	.05909
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2465.0	4171.1	58787.	7130.0
Stddev	6.8	8.3	510.	15.7
%RSD	.27523	.19961	.86723	.21956
#1	2469.8	4177.0	59148.	7141.1
#2	2460.2	4165.2	58427.	7119.0

Sample Name: 480-49312-A-14-A Acquired: 11/14/2013 15:22:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**.03620**	**.00661**	**.01000**	**.00613**
Stddev	.00014	.01085	.00012	.00006	.00005
%RSD	55.786	29.973	1.7945	.64760	.73498
#1	-.00015	.04387	.00669	.01005	.00610
#2	-.00034	.02853	.00653	.00996	.00616
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**5.6780**	**.00058**	**-.00024**	**.00504**
Stddev	.00005	.0400	.00003	.00002	.00000
%RSD	157.00	.70504	4.7955	9.5556	.03432
#1	-.00000	5.6497	.00060	-.00023	.00504
#2	.00007	5.7063	.00056	-.00026	.00504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.29872**	**.02021**	**.89595**	**1.2173**	**.03059**
Stddev	.00048	.00135	.00834	.0055	.00055
%RSD	.15928	6.6600	.93114	.45249	1.7830
#1	.29906	.01926	.90185	1.2134	.03097
#2	.29838	.02116	.89005	1.2212	.03020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-14-A Acquired: 11/14/2013 15:22:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.6032**	**.00283**	**.00342**	**.01469**	**3071.5**
Stddev	.0205	.00009	.00049	.00046	8.1
%RSD	.23874	3.0239	14.307	3.1447	.26437
#1	8.5887	.00289	.00308	.01502	3065.7
#2	8.6178	.00277	.00377	.01436	3077.2
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00062**	**-.00211**	F **17.10**	**.00011**	**.02379**
Stddev	.00025	.00076	.02	.00152	.00184
%RSD	41.067	35.880	.0912	1376.5	7.7378
#1	.00044	-.00265	17.09	-.00097	.02509
#2	.00080	-.00158	17.12	.00119	.02249
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.0197**	**.00052**	**.32375**	**.00055**	**-.00506**
Stddev	.0390	.00001	.00102	.00039	.00113
%RSD	.43257	1.8787	.31555	71.149	22.390
#1	8.9921	.00053	.32302	.00028	-.00587
#2	9.0473	.00052	.32447	.00083	-.00426
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49312-A-14-A Acquired: 11/14/2013 15:22:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00136**	**.05564**
Stddev	.00006	.00062
%RSD	4.5093	1.1075
#1	.00132	.05521
#2	.00141	.05608
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2465.6**	**4180.4**	**58139.**	**7108.9**
Stddev	4.4	4.9	121.	58.2
%RSD	.17884	.11713	.20840	.81839
#1	2468.7	4183.9	58224.	7150.0
#2	2462.5	4177.0	58053.	7067.7

Sample Name: MB 480-150770/1-A Acquired: 11/14/2013 15:25:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.00454**	**.00030**	**.00236**	**.00008**
Stddev	.00016	.00461	.00035	.00009	.00001
%RSD	211.53	101.69	114.66	3.7950	7.2909
#1	-.00019	.00127	.00055	.00243	.00007
#2	.00004	.00780	.00006	.00230	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**.03795**	**-.00003**	**-.00008**	**-.00053**
Stddev	.00002	.00000	.00013	.00020	.00019
%RSD	94.745	.00008	461.05	245.27	35.967
#1	-.00001	.03795	.00006	-.00023	-.00039
#2	-.00004	.03795	-.00012	.00006	-.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00038**	**-.00086**	**.06187**	**.00801**	**.00062**
Stddev	.00004	.00266	.01477	.00010	.00040
%RSD	11.037	308.73	23.864	1.2649	64.422
#1	.00035	.00102	.05143	.00793	.00090
#2	.00041	-.00274	.07231	.00808	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-150770/1-A Acquired: 11/14/2013 15:25:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00220**	**.00009**	**-.00004**	**-.00025**	F **1.0006**
Stddev	.00150	.00001	.00037	.00014	.0552
%RSD	68.108	8.6676	1002.7	56.062	5.5129
#1	-.00326	.00008	.00022	-.00015	1.0396
#2	-.00114	.00009	-.00030	-.00036	.96156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit					1.0000
Low Limit					-.50000

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**-.00006**	**.0011**	**-.00274**	**-.00250**
Stddev	.00021	.00051	.0012	.00121	.00135
%RSD	95.851	897.54	111.4	44.025	53.748
#1	.00037	-.00042	.0002	-.00189	-.00346
#2	.00007	.00031	.0020	-.00360	-.00155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02805**	**-.00015**	**.00007**	**-.00003**	**-.00233**
Stddev	.02428	.00008	.00001	.00009	.00110
%RSD	86.546	51.001	15.230	284.42	47.283
#1	-.04522	-.00009	.00008	-.00010	-.00155
#2	-.01088	-.00020	.00006	.00003	-.00311
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-150770/1-A Acquired: 11/14/2013 15:25:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00012**	**.00055**
Stddev	.00026	.00033
%RSD	216.04	60.608
#1	.00006	.00031
#2	-.00031	.00078
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3397.9**	**4903.9**	**77168.**	**7165.6**
Stddev	2.1	8.0	122.	46.8
%RSD	.06068	.16404	.15825	.65321
#1	3396.5	4909.6	77254.	7132.5
#2	3399.4	4898.2	77081.	7198.7

Sample Name: CCV Acquired: 11/14/2013 15:27:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49479**	**25.440**	**.51021**	**.49177**	**.51254**	**.48997**	**24.734**
Stddev	.00107	.133	.00146	.00040	.00062	.00082	.017
%RSD	.21682	.52177	.28699	.08203	.12122	.16774	.06826
#1	.49403	25.534	.50918	.49149	.51298	.49055	24.746
#2	.49554	25.346	.51125	.49206	.51210	.48939	24.722
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49208**	**.48688**	**.50267**	**.50384**	**23.903**	**25.942**	**26.379**
Stddev	.00036	.00089	.00152	.00056	.013	.106	.262
%RSD	.07368	.18313	.30173	.11170	.05525	.40698	.99365
#1	.49234	.48625	.50159	.50345	23.912	26.017	26.194
#2	.49183	.48751	.50374	.50424	23.894	25.868	26.565
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51720**	**23.972**	**.49809**	**.47589**	**.49880**	**26.294**	**.48805**
Stddev	.00487	.023	.00107	.00144	.00084	.176	.00060
%RSD	.94253	.09658	.21438	.30201	.16905	.66787	.12274
#1	.52065	23.956	.49734	.47488	.49820	26.418	.48763
#2	.51375	23.988	.49885	.47691	.49939	26.170	.48847
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 15:27:30 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48992	24.86	.50861	.50372	24.752	.49812	.49509
Stddev	.00376	.02	.00326	.00242	.096	.00100	.00167
%RSD	.76793	.0981	.64129	.48041	.38758	.20131	.33810
#1	.48726	24.88	.51091	.50201	24.684	.49741	.49627
#2	.49258	24.85	.50630	.50543	24.820	.49883	.49391
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50349	.48941	.50048	.48980
Stddev	.00070	.00005	.00124	.00204
%RSD	.13896	.01055	.24727	.41656
#1	.50399	.48944	.50135	.48835
#2	.50300	.48937	.49960	.49124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3172.6	4791.4	73971.	7098.2
Stddev	2.3	3.3	76.	19.8
%RSD	.07359	.06865	.10231	.27857
#1	3171.0	4789.1	73918.	7084.2
#2	3174.3	4793.8	74025.	7112.1

Sample Name: CCB Acquired: 11/14/2013 15:29:52 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**-.00257**	**.00059**	**-.00087**	**.00002**	**-.00008**	**-.00157**
Stddev	.00041	.03040	.00060	.00005	.00001	.00009	.00055
%RSD	99.378	1181.3	101.51	5.5286	36.174	116.53	34.846
#1	-.00012	-.02407	.00101	-.00084	.00001	-.00014	-.00118
#2	-.00070	.01892	.00017	-.00090	.00002	-.00001	-.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00013**	**-.00038**	**.00033**	**.00280**	**.07507**	**.00489**
Stddev	.00006	.00008	.00032	.00011	.00335	.02962	.00013
%RSD	322.39	57.009	84.133	32.553	119.28	39.459	2.6262
#1	.00002	-.00019	-.00061	.00041	.00517	.05413	.00498
#2	-.00006	-.00008	-.00016	.00026	.00044	.09602	.00480
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**-.00238**	**-.00003**	**.00057**	**-.00011**	**.35171**	**.00009**
Stddev	.00031	.00013	.00001	.00008	.00015	.00159	.00005
%RSD	267.32	5.4239	42.847	14.433	136.45	.45318	56.314
#1	-.00034	-.00229	-.00002	.00052	-.00022	.35058	.00006
#2	.00010	-.00247	-.00003	.00063	-.00000	.35284	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 15:29:52 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00050	-.0016	-.00166	-.00147	.00503	-.00011	-.00007
Stddev	.00014	.0018	.00015	.00626	.00783	.00091	.00009
%RSD	28.091	114.8	8.8514	425.49	155.71	795.53	130.09
#1	-.00040	-.0029	-.00156	-.00589	-.00051	.00053	-.00014
#2	-.00060	-.0003	-.00177	.00295	.01056	-.00076	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00023	-.00107	-.00025	-.00056
Stddev	.00014	.00102	.00011	.00034
%RSD	62.300	95.869	44.347	60.448
#1	.00013	-.00179	-.00032	-.00080
#2	.00033	-.00034	-.00017	-.00032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3369.4	4892.6	76301.	7109.6
Stddev	4.3	3.2	247.	23.6
%RSD	.12737	.06515	.32323	.33181
#1	3372.4	4894.8	76127.	7126.2
#2	3366.3	4890.3	76475.	7092.9

Sample Name: ccvl Acquired: 11/14/2013 15:32:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00350**	**.22320**	**.00985**	**.01892**	**.00218**	**.00198**	**.51404**
Stddev	.00042	.00879	.00282	.00005	.00002	.00005	.00331
%RSD	11.970	3.9372	28.603	.27431	.69480	2.4468	.64328
#1	.00320	.22941	.00785	.01896	.00219	.00202	.51170
#2	.00380	.21698	.01184	.01889	.00216	.00195	.51638
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00075**	**.00396**	**.00380**	**.01058**	**.04459**	**.56657**	**.44623**
Stddev	.00004	.00001	.00018	.00000	.00456	.02579	.00022
%RSD	5.8686	.15796	4.8076	.02798	10.228	4.5523	.04887
#1	.00072	.00396	.00367	.01058	.04781	.54833	.44608
#2	.00078	.00396	.00393	.01058	.04136	.58480	.44639
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02935**	**.20365**	**.00335**	**.00330**	**.00948**	**1.2695**	**.01006**
Stddev	.00065	.00238	.00010	.00034	.00010	.0120	.00006
%RSD	2.2135	1.1696	2.9151	10.230	1.0560	.94285	.62682
#1	.02981	.20534	.00342	.00354	.00955	1.2780	.01001
#2	.02889	.20197	.00328	.00307	.00941	1.2611	.01010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ccvl Acquired: 11/14/2013 15:32:18 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00428	.1978	.01872	.01058	.48988	.00959	.00487
Stddev	.00101	.0012	.00164	.00186	.01907	.00026	.00009
%RSD	23.639	.6046	8.7598	17.584	3.8919	2.6712	1.8751
#1	.00356	.1970	.01988	.00927	.47640	.00977	.00480
#2	.00499	.1987	.01756	.01190	.50337	.00940	.00493
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00488	.01686	.00502	.01064
Stddev	.00025	.00086	.00016	.00023
%RSD	5.1165	5.0790	3.2212	2.1854
#1	.00470	.01625	.00491	.01048
#2	.00506	.01746	.00514	.01081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3394.3	4966.7	76761.	7210.0
Stddev	3.4	8.4	88.	10.4
%RSD	.10078	.16924	.11495	.14404
#1	3396.7	4972.6	76824.	7202.6
#2	3391.9	4960.8	76699.	7217.3

Sample Name: LCS 480-150770/2-A Acquired: 11/14/2013 15:34:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05076**	**10.580**	**.20906**	**.20829**	**.21839**
Stddev	.00017	.038	.00027	.00001	.00060
%RSD	.33903	.36015	.12874	.00343	.27630
#1	.05064	10.553	.20925	.20830	.21796
#2	.05089	10.607	.20887	.20829	.21882
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20356**	**10.140**	**.20184**	**.20110**	**.21098**
Stddev	.00044	.053	.00001	.00043	.00192
%RSD	.21728	.52161	.00503	.21207	.90886
#1	.20324	10.178	.20185	.20140	.20963
#2	.20387	10.103	.20183	.20080	.21234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21135**	**10.013**	**10.396**	**10.578**	**.21262**
Stddev	.00088	.012	.010	.124	.00012
%RSD	.41515	.12211	.09582	1.1706	.05708
#1	.21073	10.005	10.403	10.491	.21253
#2	.21197	10.022	10.389	10.666	.21270
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-150770/2-A Acquired: 11/14/2013 15:34:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.411**	**.20416**	**.19198**	**.21131**	**10.686**
Stddev	.005	.00066	.00189	.00016	.035
%RSD	.04666	.32552	.98285	.07609	.32760
#1	10.414	.20369	.19065	.21119	10.710
#2	10.407	.20463	.19332	.21142	10.661
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19779**	**.20284**	**9.950**	**.20277**	**.20816**
Stddev	.00021	.00064	.021	.00073	.00206
%RSD	.10695	.31722	.2109	.36038	.99015
#1	.19794	.20329	9.935	.20329	.20671
#2	.19764	.20238	9.965	.20225	.20962
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.024**	**.19886**	**.20272**	**.19934**	**.19980**
Stddev	.047	.00072	.00033	.00119	.00068
%RSD	.46738	.36035	.16173	.59455	.33801
#1	10.057	.19936	.20295	.20018	.19932
#2	9.9904	.19835	.20249	.19850	.20028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-150770/2-A Acquired: 11/14/2013 15:34:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21178**	**.20267**
Stddev	.00099	.00059
%RSD	.46864	.29090
#1	.21108	.20226
#2	.21248	.20309
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3298.8**	**4858.0**	**75353.**	**7205.4**
Stddev	4.1	7.4	221.	12.5
%RSD	.12417	.15250	.29294	.17349
#1	3301.7	4863.3	75509.	7196.5
#2	3295.9	4852.8	75197.	7214.2

Sample Name: 480-48362-N-2-A Acquired: 11/14/2013 15:37:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00033**	**.33947**	**.12930**	**19.039**	**.93034**
Stddev	.00080	.00392	.00435	.025	.00025
%RSD	241.73	1.1562	3.3672	.12987	.02665
#1	.00089	.33669	.12622	19.056	.93052
#2	-.00023	.34224	.13238	19.021	.93017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**122.59**	**.00076**	**.05279**	**.25235**
Stddev	.00007	.13	.00012	.00002	.00236
%RSD	82.804	.10654	16.111	.03473	.93596
#1	.00004	122.68	.00067	.05280	.25068
#2	.00014	122.50	.00085	.05278	.25402
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02271**	**5.1056**	F **981.62**	^ *****	**.57242**
Stddev	.00008	.0231	4.87	-----	.00131
%RSD	.36437	.45181	.49570	-----	.22798
#1	.02265	5.1219	985.06	^ -----	.57334
#2	.02277	5.0893	978.18	^ -----	.57150
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			600.00		
Low Limit			-.50000		

Sample Name: 480-48362-N-2-A Acquired: 11/14/2013 15:37:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**286.09**	**.23380**	**.28236**	**.01615**	**2501.3**
Stddev	1.06	.00036	.00066	.00001	5.2
%RSD	.37147	.15353	.23395	.06574	.20914
#1	285.34	.23355	.28189	.01614	2505.0
#2	286.85	.23406	.28283	.01615	2497.6
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.43696**	**.00334**	F **45.28**	**.02217**	**.01356**
Stddev	.00204	.00252	.10	.00105	.00341
%RSD	.46646	75.503	.2266	4.7259	25.186
#1	.43552	.00156	45.20	.02143	.01597
#2	.43841	.00512	45.35	.02291	.01114
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.497**	**.08198**	**5.6427**	**.22480**	**-.00405**
Stddev	.003	.00047	.0325	.00080	.00096
%RSD	.01089	.57758	.57635	.35776	23.648
#1	28.494	.08231	5.6657	.22424	-.00473
#2	28.499	.08164	5.6197	.22537	-.00337
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48362-N-2-A Acquired: 11/14/2013 15:37:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.04883	.40647
Stddev	.00019	.00274
%RSD	.38259	.67475
#1	.04897	.40453
#2	.04870	.40841
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2317.9	3880.3	55851.	7044.2
Stddev	1.2	4.2	201.	11.2
%RSD	.05365	.10715	.36024	.15894
#1	2318.8	3877.3	55994.	7036.3
#2	2317.0	3883.2	55709.	7052.2

Sample Name: MB 480-150948/1-A Acquired: 11/14/2013 15:39:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**-.00129**	**-.00005**	F **.02068**	**.00018**
Stddev	.00057	.01008	.00143	.00195	.00001
%RSD	1051.2	783.75	2785.9	9.4483	2.7858
#1	-.00035	.00584	.00096	.02206	.00019
#2	.00046	-.00841	-.00106	.01930	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				.02000	
Low Limit				-.00800	

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.04868**	**-.00002**	**-.00015**	**-.00026**
Stddev	.00006	.00189	.00012	.00011	.00020
%RSD	77.097	3.8728	656.39	74.294	74.908
#1	-.00004	.05001	-.00010	-.00007	-.00040
#2	-.00012	.04735	.00006	-.00023	-.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**.00932**	F **.63673**	**.07681**	**.00090**
Stddev	.00011	.00121	.02515	.00352	.00009
%RSD	12.140	13.022	3.9495	4.5777	9.8821
#1	.00085	.00846	.65451	.07929	.00084
#2	.00101	.01018	.61895	.07432	.00097
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			.50000		
Low Limit			-.50000		

Sample Name: MB 480-150948/1-A Acquired: 11/14/2013 15:39:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00381**	**.00036**	**.00035**	**-.00013**	**.49046**
Stddev	.00440	.00002	.00030	.00005	.02181
%RSD	115.57	4.3253	86.301	41.148	4.4458
#1	.00692	.00035	.00057	-.00009	.50588
#2	.00070	.00037	.00014	-.00016	.47504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**-.00192**	**.0170**	**-.00108**	**-.00356**
Stddev	.00020	.00066	.0010	.00010	.00147
%RSD	53.660	34.566	5.972	9.1096	41.250
#1	-.00052	-.00238	.0163	-.00101	-.00460
#2	-.00024	-.00145	.0177	-.00115	-.00252
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.34492**	F **.04956**	**.00005**	**-.00013**	**-.00472**
Stddev	.00379	.00073	.00001	.00002	.00148
%RSD	1.0982	1.4747	11.251	17.234	31.440
#1	.34760	.04904	.00005	-.00015	-.00367
#2	.34225	.05008	.00005	-.00012	-.00577
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		.01000			
Low Limit		-.01000			

Sample Name: MB 480-150948/1-A Acquired: 11/14/2013 15:39:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00015**	**.00630**
Stddev	.00010	.00052
%RSD	68.412	8.2546
#1	-.00008	.00666
#2	-.00022	.00593
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3304.5**	**4766.4**	**74674.**	**6840.6**
Stddev	11.4	14.2	150.	45.5
%RSD	.34596	.29702	.20040	.66500
#1	3296.4	4756.4	74568.	6808.4
#2	3312.6	4776.4	74780.	6872.7

Sample Name: LCSSRM 480-150948/2- Acquired: 11/14/2013 15:42:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.41141	78.149	1.0360	1.5365	3.2626
Stddev	.00167	.304	.0038	.0013	.0126
%RSD	.40584	.38963	.36780	.08627	.38562
#1	.41259	78.365	1.0333	1.5375	3.2715
#2	.41023	77.934	1.0387	1.5356	3.2537
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.74395	67.998	1.8437	1.3777	1.4372
Stddev	.00293	.238	.0001	.0001	.0056
%RSD	.39375	.35061	.00762	.00962	.38589
#1	.74188	67.829	1.8436	1.3778	1.4411
#2	.74602	68.166	1.8438	1.3776	1.4333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	1.1123	112.09	29.970	29.299	.08044
Stddev	.0024	.23	.202	.070	.00106
%RSD	.21658	.20679	.67560	.23780	1.3173
#1	1.1140	112.26	30.113	29.250	.08119
#2	1.1106	111.93	29.827	29.348	.07969
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit					
Low Limit					

Sample Name: LCSSRM 480-150948/2- Acquired: 11/14/2013 15:42:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.810**	**3.1172**	**3.0695**	**1.4400**	**30.905**
Stddev	.066	.0110	.0080	.0012	.216
%RSD	.23765	.35395	.26231	.08079	.69977
#1	27.857	3.1250	3.0752	1.4392	31.058
#2	27.763	3.1094	3.0638	1.4408	30.752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6469**	**1.2665**	**2.290**	**.88650**	**1.5713**
Stddev	.0006	.0060	.014	.00159	.0094
%RSD	.03732	.47337	.6229	.17901	.59825
#1	1.6464	1.2707	2.300	.88538	1.5779
#2	1.6473	1.2622	2.280	.88762	1.5646
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.515**	**1.0768**	**.99586**	**3.3822**	**1.8649**
Stddev	.039	.0037	.00249	.0023	.0027
%RSD	.14011	.34440	.25031	.06706	.14526
#1	27.542	1.0794	.99410	3.3838	1.8630
#2	27.488	1.0742	.99762	3.3806	1.8668
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCSSRM 480-150948/2- Acquired: 11/14/2013 15:42:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**1.0042**	**1.6050**
Stddev	.0020	.0024
%RSD	.19471	.14789
#1	1.0056	1.6067
#2	1.0029	1.6034
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2995.0**	**4851.3**	**73567.**	**7141.1**
Stddev	5.3	4.8	242.	11.1
%RSD	.17699	.09791	.32829	.15536
#1	2991.2	4847.9	73397.	7148.9
#2	2998.7	4854.6	73738.	7133.3

Sample Name: LCDSRM 480-150948/3- Acquired: 11/14/2013 15:44:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.40903	77.970	1.0306	1.5120	3.1637
Stddev	.00004	.347	.0044	.0044	.0060
%RSD	.00893	.44491	.42941	.29143	.18965
#1	.40900	77.725	1.0338	1.5151	3.1594
#2	.40905	78.216	1.0275	1.5089	3.1679
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.73715	69.456	1.8205	1.3630	1.3933
Stddev	.00001	.177	.0004	.0014	.0049
%RSD	.00192	.25495	.02332	.10410	.35088
#1	.73716	69.331	1.8208	1.3620	1.3967
#2	.73714	69.581	1.8202	1.3640	1.3898
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	1.0845	113.95	29.272	29.377	.07884
Stddev	.0028	.92	.007	.014	.00163
%RSD	.25838	.80652	.02396	.04767	2.0702
#1	1.0865	113.30	29.277	29.367	.07769
#2	1.0825	114.60	29.267	29.387	.07999
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
High Limit					
Low Limit					

Sample Name: LCDSRM 480-150948/3- Acquired: 11/14/2013 15:44:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.347**	**3.2984**	**3.2436**	**1.4069**	**30.134**
Stddev	.012	.0023	.0005	.0008	.125
%RSD	.04558	.06955	.01665	.05536	.41445
#1	27.338	3.3000	3.2433	1.4075	30.045
#2	27.356	3.2968	3.2440	1.4064	30.222
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6216**	**1.2416**	**2.293**	**.82216**	**1.5656**
Stddev	.0018	.0031	.003	.00141	.0028
%RSD	.11300	.24581	.1439	.17110	.17636
#1	1.6203	1.2395	2.295	.82316	1.5675
#2	1.6229	1.2438	2.290	.82117	1.5636
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.705**	**1.0637**	**.96360**	**3.2408**	**1.8512**
Stddev	.022	.0046	.00105	.0132	.0039
%RSD	.08762	.42978	.10904	.40604	.21307
#1	24.690	1.0605	.96285	3.2315	1.8484
#2	24.720	1.0669	.96434	3.2501	1.8540
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCDSRM 480-150948/3- Acquired: 11/14/2013 15:44:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.98735	1.5670
Stddev	.00018	.0053
%RSD	.01872	.33901
#1	.98722	1.5632
#2	.98748	1.5707
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2997.6	4867.1	74516.	7201.7
Stddev	.3	12.7	258.	3.1
%RSD	.00958	.26193	.34566	.04263
#1	2997.4	4858.1	74334.	7199.5
#2	2997.8	4876.1	74698.	7203.9

Sample Name: 480-49651-C-1-A Acquired: 11/14/2013 15:46:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **-.00309**	**95.714**	**.15617**	**.13630**	**.69952**
Stddev	.00020	.609	.00324	.00020	.00242
%RSD	6.6067	.63655	2.0758	.14527	.34557
#1	-.00294	95.283	.15847	.13616	.69781
#2	-.00323	96.144	.15388	.13644	.70123
Check ?	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	2.0000				
Low Limit	-.00300				

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01470**	**252.55**	**.00165**	**.06738**	**.17754**
Stddev	.00006	.55	.00005	.00046	.00198
%RSD	.43804	.21891	3.0819	.68200	1.1170
#1	.01475	252.16	.00168	.06706	.17614
#2	.01465	252.94	.00161	.06771	.17894
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5266**	**601.74**	**16.239**	**19.423**	**.16848**
Stddev	.0094	3.20	.101	.054	.00211
%RSD	.61628	.53245	.62427	.28054	1.2537
#1	1.5199	599.47	16.168	19.384	.16698
#2	1.5332	604.01	16.311	19.461	.16997
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-1-A Acquired: 11/14/2013 15:46:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**49.550**	**5.7492**	**6.0757**	**.02358**	**6.6782**
Stddev	.272	.0470	.0420	.00056	.0565
%RSD	.54867	.81790	.69162	2.3952	.84616
#1	49.358	5.7160	6.0460	.02318	6.6382
#2	49.743	5.7825	6.1054	.02398	6.7181
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.77443**	**1.3781**	F **12.39**	**.04880**	**.01596**
Stddev	.00156	.0021	.00	.00094	.00303
%RSD	.20122	.15323	.0016	1.9347	18.990
#1	.77333	1.3766	12.39	.04947	.01382
#2	.77553	1.3796	12.39	.04813	.01810
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**64.791**	**.23002**	**.51170**	**3.4365**	**-.01669**
Stddev	.052	.00207	.00047	.0021	.00168
%RSD	.08053	.90145	.09134	.06109	10.084
#1	64.828	.22855	.51203	3.4380	-.01550
#2	64.754	.23149	.51137	3.4350	-.01788
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-1-A Acquired: 11/14/2013 15:46:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.13488**	**.59500**
Stddev	.00068	.00326
%RSD	.50434	.54765
#1	.13440	.59269
#2	.13536	.59730
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2652.9**	**5387.8**	**82946.**	**8301.0**
Stddev	2.9	1.7	280.	11.6
%RSD	.10815	.03063	.33806	.14004
#1	2654.9	5386.7	83145.	8292.8
#2	2650.9	5389.0	82748.	8309.2

Sample Name: 480-49651-B-2-A Acquired: 11/14/2013 15:49:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00181	64.255	.13811	.10704	1.4588
Stddev	.00046	.095	.00180	.00087	.0004
%RSD	25.277	.14821	1.3062	.81613	.02462
#1	.00213	64.187	.13684	.10642	1.4585
#2	.00148	64.322	.13939	.10766	1.4590
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00691	160.35	.01661	.05150	.19611
Stddev	.00007	.28	.00011	.00001	.00019
%RSD	.95361	.17378	.68993	.00983	.09438
#1	.00696	160.15	.01669	.05151	.19597
#2	.00686	160.55	.01653	.05150	.19624
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.87107	179.81	9.3738	10.555	.11024
Stddev	.00178	1.31	.0563	.158	.00101
%RSD	.20435	.73054	.60052	1.4966	.91341
#1	.86981	178.88	9.4136	10.443	.11095
#2	.87233	180.74	9.3340	10.667	.10953
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A Acquired: 11/14/2013 15:49:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**47.970**	**3.4242**	**3.4015**	**.01787**	**1.7506**
Stddev	.084	.0126	.0164	.00003	.0052
%RSD	.17525	.36867	.48365	.15618	.29620
#1	47.910	3.4152	3.3899	.01789	1.7469
#2	48.029	3.4331	3.4132	.01785	1.7543
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19501**	**3.3921**	**8.926**	**.00948**	**.00905**
Stddev	.00117	.0012	.040	.00214	.00417
%RSD	.59754	.03556	.4452	22.574	46.031
#1	.19418	3.3930	8.898	.00796	.00610
#2	.19583	3.3913	8.954	.01099	.01199
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.869**	**.11934**	**.57000**	**1.7835**	**-.00197**
Stddev	.031	.00138	.00158	.0039	.00147
%RSD	.09265	1.1558	.27766	.21995	74.801
#1	33.892	.12032	.57112	1.7862	-.00301
#2	33.847	.11837	.56888	1.7807	-.00093
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A Acquired: 11/14/2013 15:49:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.15158**	**2.8879**
Stddev	.00054	.0214
%RSD	.35636	.74132
#1	.15120	2.8727
#2	.15196	2.9030
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2957.7**	**4777.2**	**72720.**	**7121.2**
Stddev	3.8	2.2	179.	3.4
%RSD	.12908	.04510	.24682	.04744
#1	2960.4	4778.8	72847.	7118.8
#2	2955.0	4775.7	72593.	7123.5

Sample Name: 480-49651-B-2-A sd@5 Acquired: 11/14/2013 15:52:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**12.619**	**.02841**	**.02490**	**.30917**
Stddev	.00014	.019	.00062	.00005	.00071
%RSD	41.351	.15171	2.1715	.20334	.23070
#1	-.00043	12.606	.02885	.02494	.30968
#2	-.00024	12.633	.02798	.02487	.30867
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00138**	**33.835**	**.00358**	**.01031**	**.04171**
Stddev	.00005	.028	.00008	.00011	.00022
%RSD	3.2976	.08266	2.2082	1.1074	.52001
#1	.00142	33.854	.00352	.01023	.04156
#2	.00135	33.815	.00363	.01039	.04186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.17681**	**36.042**	**1.7068**	**1.6664**	**.02104**
Stddev	.00131	.018	.0205	.0080	.00022
%RSD	.73979	.05067	1.2001	.48041	1.0312
#1	.17774	36.029	1.6923	1.6721	.02119
#2	.17589	36.055	1.7213	1.6608	.02089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A sd@5 Acquired: 11/14/2013 15:52:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.299**	**.74662**	**.69738**	**.00337**	**.39640**
Stddev	.001	.00152	.00215	.00028	.00040
%RSD	.01181	.20403	.30769	8.4481	.10044
#1	10.300	.74769	.69890	.00317	.39668
#2	10.298	.74554	.69586	.00357	.39612
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03937**	**.69549**	**1.855**	**.00030**	**-.00230**
Stddev	.00000	.00006	.016	.00018	.00349
%RSD	.00879	.00858	.8363	60.599	151.34
#1	.03937	.69553	1.844	.00017	-.00477
#2	.03938	.69545	1.866	.00042	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.8395**	**.02334**	**.11609**	**.35315**	**-.00367**
Stddev	.0109	.00094	.00002	.00541	.00087
%RSD	.18650	4.0273	.01762	1.5325	23.726
#1	5.8472	.02268	.11610	.34932	-.00306
#2	5.8318	.02401	.11608	.35697	-.00429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A sd@5 Acquired: 11/14/2013 15:52:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.03125	.63654
Stddev	.00011	.00050
%RSD	.34904	.07876
#1	.03117	.63689
#2	.03133	.63618
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3279.6	4910.6	75343.	7155.9
Stddev	1.3	7.4	291.	.8
%RSD	.03876	.15167	.38585	.01051
#1	3278.7	4915.9	75137.	7155.4
#2	3280.5	4905.3	75548.	7156.5

Sample Name: 480-49651-B-2-A pds Acquired: 11/14/2013 15:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01583**	**69.215**	**.18741**	**.14481**	**1.5492**
Stddev	.00261	.055	.01036	.00852	.0000
%RSD	16.468	.07886	5.5280	5.8805	.00156
#1	.01767	69.253	.19474	.15083	1.5491
#2	.01398	69.176	.18009	.13879	1.5492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13862**	**164.10**	**.06687**	**.10610**	**.28966**
Stddev	.00797	.11	.01190	.01340	.01510
%RSD	5.7500	.06831	17.790	12.625	5.2138
#1	.14426	164.02	.07528	.11558	.30034
#2	.13298	164.18	.05846	.09663	.27898
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.94907**	**183.19**	**15.070**	**15.458**	**.22041**
Stddev	.01519	.25	.309	.761	.00637
%RSD	1.6003	.13775	2.0512	4.9225	2.8903
#1	.95981	183.01	15.289	15.996	.22492
#2	.93833	183.37	14.852	14.920	.21591
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A pds Acquired: 11/14/2013 15:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**51.770**	**3.4612**	**3.4640**	**.07228**	**7.2137**
Stddev	.523	.0042	.0122	.01285	.3534
%RSD	1.0109	.12121	.35166	17.774	4.8997
#1	52.140	3.4641	3.4554	.08137	7.4637
#2	51.400	3.4582	3.4726	.06320	6.9638
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24822**	**3.4138**	**8.833**	**.06037**	**.06447**
Stddev	.01287	.0164	.043	.00946	.01673
%RSD	5.1847	.48169	.4877	15.662	25.952
#1	.25732	3.4254	8.864	.06706	.07631
#2	.23912	3.4022	8.803	.05369	.05264
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**39.189**	**.14686**	**.66617**	**1.8800**	**.04580**
Stddev	.086	.00584	.00625	.0160	.01075
%RSD	.21987	3.9753	.93774	.85083	23.466
#1	39.128	.15098	.67059	1.8914	.05340
#2	39.250	.14273	.66175	1.8687	.03820
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A pds Acquired: 11/14/2013 15:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.24348**	**2.9025**
Stddev	.01324	.0152
%RSD	5.4359	.52446
#1	.25284	2.8917
#2	.23412	2.9133
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2942.5**	**4770.0**	**72630.**	**7066.8**
Stddev	8.6	2.9	176.	12.1
%RSD	.29321	.06116	.24290	.17138
#1	2936.4	4767.9	72505.	7058.3
#2	2948.6	4772.1	72755.	7075.4

Sample Name: CCV Acquired: 11/14/2013 15:56:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50300**	**25.689**	**.50983**	**.49250**	**.51306**	**.48847**	**25.246**
Stddev	.00020	.027	.00049	.00019	.00115	.00199	.037
%RSD	.03937	.10594	.09662	.03838	.22368	.40664	.14551
#1	.50286	25.708	.51018	.49264	.51225	.48706	25.272
#2	.50314	25.670	.50948	.49237	.51388	.48987	25.220
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49137**	**.48850**	**.52103**	**.51395**	**23.954**	**26.167**	**26.509**
Stddev	.00144	.00037	.00033	.00207	.007	.116	.362
%RSD	.29237	.07483	.06324	.40293	.02957	.44394	1.3650
#1	.49036	.48876	.52080	.51248	23.959	26.085	26.765
#2	.49239	.48824	.52126	.51541	23.949	26.249	26.253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51816**	**24.210**	**.50286**	**.48190**	**.49710**	**26.107**	**.48755**
Stddev	.00149	.112	.00186	.00024	.00106	.006	.00073
%RSD	.28730	.46304	.37063	.04984	.21273	.02121	.15005
#1	.51711	24.290	.50418	.48207	.49635	26.103	.48807
#2	.51922	24.131	.50154	.48173	.49785	26.111	.48704
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 15:56:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49084	24.48	.50574	.49887	25.357	.50460	.49113
Stddev	.00354	.03	.00322	.00737	.017	.00102	.00353
%RSD	.72171	.1362	.63677	1.4768	.06775	.20254	.71857
#1	.48833	24.46	.50347	.49366	25.345	.50388	.48864
#2	.49334	24.51	.50802	.50408	25.369	.50532	.49363
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50908	.49235	.51608	.51084
Stddev	.00305	.00059	.00149	.00028
%RSD	.59912	.12077	.28838	.05416
#1	.51124	.49192	.51713	.51103
#2	.50692	.49277	.51503	.51064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3214.6	4862.9	73838.	7128.1
Stddev	2.2	2.7	26.	5.5
%RSD	.06968	.05463	.03569	.07752
#1	3213.0	4864.8	73819.	7124.2
#2	3216.2	4861.0	73856.	7132.0

Sample Name: CCB Acquired: 11/14/2013 15:59:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00037**	**.00645**	**-.00168**	**.00256**	**.00002**	**.00000**	**-.00207**
Stddev	.00009	.00764	.00259	.00041	.00001	.00008	.00068
%RSD	25.656	118.48	154.20	16.057	63.812	5988.3	32.865
#1	-.00043	.00105	.00015	.00227	.00001	.00006	-.00159
#2	-.00030	.01185	-.00350	.00285	.00003	-.00006	-.00255
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**-.00010**	**-.00061**	**.00024**	**-.00265**	**.07817**	**.00465**
Stddev	.00001	.00003	.00010	.00007	.00321	.00178	.00024
%RSD	10.502	28.298	15.881	29.545	120.98	2.2805	5.1211
#1	-.00013	-.00008	-.00068	.00019	-.00038	.07691	.00448
#2	-.00011	-.00012	-.00054	.00029	-.00492	.07943	.00482
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**-.00140**	**-.00001**	**.00069**	**.00007**	**.08015**	**.00019**
Stddev	.00092	.00127	.00005	.00069	.00018	.00227	.00006
%RSD	14588.	90.550	387.55	98.883	259.21	2.8310	32.123
#1	-.00065	-.00230	.00002	.00118	-.00006	.08175	.00023
#2	.00066	-.00050	-.00005	.00021	.00019	.07854	.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 15:59:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00088**	**-.0027**	**-.00155**	**-.00225**	**.04024**	**-.00046**	**-.00012**
Stddev	.00058	.0066	.00093	.00055	.02183	.00028	.00005
%RSD	65.874	242.3	59.733	24.639	54.255	59.587	40.846
#1	-.00129	.0019	-.00221	-.00264	.02480	-.00027	-.00015
#2	-.00047	-.0074	-.00090	-.00186	.05568	-.00066	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00026**	**-.00474**	**-.00011**	**-.00026**
Stddev	.00009	.00013	.00034	.00043
%RSD	32.525	2.6820	295.78	168.95
#1	.00032	-.00465	-.00035	.00005
#2	.00020	-.00483	.00012	-.00056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3397.5**	**4930.6**	**76755.**	**7127.9**
Stddev	.4	3.4	362.	9.5
%RSD	.01180	.06915	.47209	.13355
#1	3397.2	4928.2	76499.	7121.1
#2	3397.8	4933.1	77011.	7134.6

Sample Name: CCVL Acquired: 11/14/2013 16:01:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00293**	**.20851**	**.01041**	**.02202**	**.00225**	**.00200**	**.50723**
Stddev	.00070	.01630	.00029	.00005	.00001	.00003	.00205
%RSD	23.733	7.8168	2.7451	.22201	.42691	1.5078	.40433
#1	.00342	.19698	.01061	.02199	.00224	.00202	.50868
#2	.00244	.22003	.01021	.02206	.00226	.00197	.50578
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.00387**	**.00357**	**.01023**	**.04372**	**.53738**	**.43659**
Stddev	.00007	.00010	.00038	.00005	.00209	.02578	.00022
%RSD	8.6983	2.5860	10.769	.52192	4.7724	4.7976	.04967
#1	.00090	.00380	.00330	.01027	.04520	.55561	.43644
#2	.00080	.00394	.00384	.01019	.04225	.51915	.43674
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02928**	**.20582**	**.00325**	**.00310**	**.00948**	**1.0384**	**.01030**
Stddev	.00079	.00461	.00006	.00052	.00008	.0062	.00038
%RSD	2.6873	2.2386	1.8622	16.791	.80878	.59762	3.7305
#1	.02872	.20256	.00329	.00273	.00953	1.0340	.01057
#2	.02984	.20908	.00321	.00347	.00942	1.0427	.01002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 16:01:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00360	.1975	.01860	.01229	.51386	.00934	.00469
Stddev	.00066	.0040	.00014	.00129	.00862	.00029	.00009
%RSD	18.231	2.012	.77065	10.493	1.6778	3.1361	1.8425
#1	.00313	.1947	.01871	.01320	.51996	.00913	.00463
#2	.00406	.2003	.01850	.01137	.50777	.00955	.00475
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00481	.01986	.00489	.01033
Stddev	.00018	.00259	.00007	.00005
%RSD	3.7989	13.023	1.4765	.51558
#1	.00468	.01803	.00494	.01029
#2	.00494	.02169	.00484	.01036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3420.4	4995.8	77736.	7276.4
Stddev	12.2	16.3	508.	11.5
%RSD	.35665	.32550	.65349	.15863
#1	3429.1	5007.3	78095.	7284.5
#2	3411.8	4984.3	77377.	7268.2

Sample Name: 480-49651-B-2-B MS Acquired: 11/14/2013 16:04:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.09797	114.29	.45626	.51251	1.3774
Stddev	.00084	.09	.00078	.00037	.0004
%RSD	.85575	.07607	.17148	.07173	.02633
#1	.09856	114.23	.45571	.51225	1.3777
#2	.09738	114.36	.45681	.51277	1.3772
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.39126	100.07	.38853	.47399	.54437
Stddev	.00157	.23	.00014	.00111	.00364
%RSD	.40018	.22735	.03703	.23349	.66799
#1	.39015	99.906	.38843	.47477	.54694
#2	.39237	100.23	.38863	.47321	.54180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.82805	180.66	37.840	39.794	.61298
Stddev	.00440	1.37	.023	.305	.00025
%RSD	.53154	.75964	.06100	.76726	.04091
#1	.83116	179.69	37.824	40.010	.61280
#2	.82494	181.63	37.857	39.578	.61315
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-B MS Acquired: 11/14/2013 16:04:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**56.648**	**2.0641**	**2.0503**	**.40343**	**23.065**
Stddev	.113	.0019	.0000	.00217	.025
%RSD	.19921	.09453	.00003	.53720	.10669
#1	56.728	2.0654	2.0503	.40496	23.048
#2	56.568	2.0627	2.0503	.40189	23.082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.58414**	**1.6800**	F **26.31**	**.27899**	**.38270**
Stddev	.00137	.0007	.09	.00073	.00101
%RSD	.23387	.03973	.3297	.26122	.26373
#1	.58510	1.6795	26.37	.27847	.38341
#2	.58317	1.6805	26.25	.27951	.38199
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.392**	**.46010**	**.72957**	**1.9222**	**.38709**
Stddev	.006	.00353	.00165	.0017	.00339
%RSD	.01559	.76631	.22680	.08721	.87550
#1	36.396	.45761	.72840	1.9211	.38948
#2	36.388	.46259	.73074	1.9234	.38469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-B MS Acquired: 11/14/2013 16:04:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.57388	1.5905
Stddev	.00233	.0090
%RSD	.40539	.56562
#1	.57552	1.5969
#2	.57223	1.5842
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2909.6	4827.0	73099.	7114.7
Stddev	7.7	17.1	490.	23.7
%RSD	.26333	.35438	.67042	.33310
#1	2904.2	4814.9	72753.	7097.9
#2	2915.0	4839.1	73446.	7131.4

Sample Name: 480-49651-B-2-C MSD Acquired: 11/14/2013 16:06:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.09586	112.10	.52955	.55578	2.2693
Stddev	.00054	.76	.00479	.00175	.0070
%RSD	.56472	.68229	.90362	.31405	.30855
#1	.09548	111.56	.53294	.55702	2.2643
#2	.09624	112.64	.52617	.55455	2.2742
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.37931	339.71	.38715	.47635	.62092
Stddev	.00050	2.02	.00104	.00018	.00092
%RSD	.13211	.59316	.26761	.03837	.14792
#1	.37966	338.29	.38642	.47622	.62157
#2	.37896	341.14	.38788	.47648	.62027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	1.3217	206.89	39.201	44.460	.59174
Stddev	.0048	1.64	.214	.236	.00482
%RSD	.36449	.79419	.54637	.53141	.81481
#1	1.3251	205.72	39.049	44.627	.58833
#2	1.3183	208.05	39.352	44.293	.59515
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-C MSD Acquired: 11/14/2013 16:06:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**133.24**	**3.3364**	**3.4431**	**.38578**	**23.036**
Stddev	.01	.0083	.0131	.00151	.159
%RSD	.00399	.24968	.38071	.39097	.69198
#1	133.24	3.3422	3.4524	.38471	22.923
#2	133.25	3.3305	3.4339	.38684	23.149
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.60859**	**3.7200**	F **30.84**	**.26834**	**.37063**
Stddev	.00081	.0101	.03	.00040	.00042
%RSD	.13336	.27199	.0928	.14866	.11267
#1	.60916	3.7129	30.82	.26863	.37034
#2	.60801	3.7272	30.86	.26806	.37093
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**38.571**	**.53945**	**1.0436**	**4.0881**	**.36977**
Stddev	.223	.00015	.0021	.0178	.00346
%RSD	.57769	.02836	.20076	.43440	.93453
#1	38.413	.53956	1.0451	4.0755	.36733
#2	38.728	.53934	1.0421	4.1007	.37222
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-C MSD Acquired: 11/14/2013 16:06:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.71142**	**3.0907**
Stddev	.00436	.0163
%RSD	.61274	.52743
#1	.71450	3.1022
#2	.70834	3.0791
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2723.7**	**4874.3**	**73702.**	**7306.9**
Stddev	1.1	3.3	391.	9.5
%RSD	.03913	.06858	.53088	.13024
#1	2722.9	4871.9	73425.	7313.6
#2	2724.5	4876.7	73978.	7300.2

Sample Name: 480-49651-C-3-A Acquired: 11/14/2013 16:08:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**23.904**	**.05875**	**.34315**	**.31942**
Stddev	.00058	.007	.00056	.00098	.00087
%RSD	287.22	.03047	.95704	.28418	.27258
#1	.00021	23.899	.05836	.34384	.32003
#2	-.00061	23.909	.05915	.34246	.31880
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00349**	**137.78**	**.00182**	**.03790**	**.04428**
Stddev	.00002	.65	.00011	.00013	.00068
%RSD	.66976	.46897	5.9504	.34949	1.5402
#1	.00348	137.32	.00190	.03799	.04476
#2	.00351	138.24	.00174	.03781	.04380
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.45753**	**149.96**	**4.1084**	**4.6292**	**.04447**
Stddev	.00092	.07	.0003	.0172	.00006
%RSD	.20040	.04956	.00704	.37124	.14294
#1	.45818	149.91	4.1086	4.6171	.04443
#2	.45689	150.01	4.1082	4.6414	.04452
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-3-A Acquired: 11/14/2013 16:08:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.894**	**1.8456**	**1.7942**	**.01545**	**.85160**
Stddev	.033	.0004	.0038	.00042	.01520
%RSD	.12180	.02283	.21155	2.7495	1.7848
#1	26.917	1.8453	1.7915	.01514	.86235
#2	26.871	1.8459	1.7969	.01575	.84085
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10766**	**.38261**	**5.459**	**.00212**	**.01048**
Stddev	.00002	.00297	.001	.00356	.00058
%RSD	.01858	.77556	.0160	168.19	5.5692
#1	.10768	.38051	5.459	.00463	.01007
#2	.10765	.38471	5.460	-.00040	.01089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.394**	**.04456**	**.31313**	**1.0416**	**-.00525**
Stddev	.061	.00020	.00133	.0020	.00225
%RSD	.39841	.45067	.42549	.19579	42.819
#1	15.351	.04442	.31219	1.0401	-.00366
#2	15.438	.04470	.31407	1.0430	-.00684
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-3-A Acquired: 11/14/2013 16:08:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.06980	.62098
Stddev	.00049	.00079
%RSD	.69794	.12705
#1	.06945	.62154
#2	.07014	.62043
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3028.6	4741.9	73117.	7127.0
Stddev	3.3	13.4	96.	4.6
%RSD	.10867	.28353	.13179	.06397
#1	3026.3	4732.4	73049.	7130.2
#2	3030.9	4751.4	73185.	7123.7

Sample Name: 480-49651-C-4-A Acquired: 11/14/2013 16:11:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**66.641**	**.03251**	**.07067**	**.40821**
Stddev	.00057	.152	.00076	.00028	.00014
%RSD	104.15	.22800	2.3308	.39187	.03506
#1	-.00014	66.533	.03197	.07087	.40831
#2	-.00095	66.748	.03305	.07048	.40811
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00429**	**152.39**	**.00282**	**.05332**	**.10589**
Stddev	.00005	.58	.00000	.00042	.00029
%RSD	1.2168	.38230	.00223	.78457	.27545
#1	.00425	151.98	.00282	.05303	.10610
#2	.00432	152.81	.00282	.05362	.10568
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.26667**	**135.75**	**7.9148**	**9.0419**	**.13143**
Stddev	.00035	.37	.0685	.0493	.00005
%RSD	.13188	.27359	.86572	.54558	.03931
#1	.26642	135.49	7.9632	9.0767	.13147
#2	.26691	136.02	7.8663	9.0070	.13140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-4-A Acquired: 11/14/2013 16:11:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**31.088**	**1.5739**	**1.5416**	**.01079**	**3.4199**
Stddev	.008	.0036	.0133	.00036	.0137
%RSD	.02517	.22615	.86436	3.3556	.40165
#1	31.093	1.5764	1.5510	.01053	3.4296
#2	31.082	1.5713	1.5322	.01104	3.4102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.16741**	**.38892**	**8.514**	**-.00452**	**.00187**
Stddev	.00022	.00365	.009	.00047	.00218
%RSD	.12902	.93904	.1010	10.378	116.51
#1	.16726	.38634	8.508	-.00485	.00033
#2	.16757	.39150	8.520	-.00419	.00341
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.626**	**.03510**	**.23395**	**.83311**	**-.00451**
Stddev	.034	.00126	.00015	.00520	.00305
%RSD	.16287	3.5836	.06311	.62381	67.618
#1	20.602	.03599	.23405	.83679	-.00666
#2	20.650	.03421	.23384	.82944	-.00235
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-C-4-A Acquired: 11/14/2013 16:11:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.12970**	**.70919**
Stddev	.00002	.00330
%RSD	.01785	.46465
#1	.12972	.71152
#2	.12969	.70686
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2998.3**	**4873.4**	**74602.**	**7166.0**
Stddev	1.0	5.0	296.	6.0
%RSD	.03170	.10179	.39667	.08318
#1	2999.0	4869.9	74393.	7170.2
#2	2997.6	4876.9	74811.	7161.8

Sample Name: 480-49560-C-1-A Acquired: 11/14/2013 16:13:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00263**	**87.935**	**.02148**	**.00374**	**.41405**
Stddev	.00013	.369	.00157	.00013	.00212
%RSD	5.0872	.42017	7.3228	3.5321	.51265
#1	-.00254	88.197	.02037	.00365	.41555
#2	-.00273	87.674	.02259	.00384	.41254
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00471**	**20.307**	**.00017**	**.05764**	**.17138**
Stddev	.00009	.020	.00016	.00001	.00150
%RSD	1.8931	.09841	97.570	.01423	.87499
#1	.00465	20.293	.00028	.05764	.17031
#2	.00477	20.321	.00005	.05763	.17244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14690**	**117.52**	**7.9270**	**8.1402**	**.07626**
Stddev	.00099	.15	.0988	.0083	.00055
%RSD	.67259	.13096	1.2466	.10208	.72523
#1	.14760	117.63	7.9969	8.1344	.07665
#2	.14620	117.41	7.8571	8.1461	.07587
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49560-C-1-A Acquired: 11/14/2013 16:13:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.651**	**1.7149**	**1.6391**	**.00142**	**1.5737**
Stddev	.038	.0021	.0046	.00000	.0244
%RSD	.13892	.12447	.28326	.11860	1.5516
#1	27.624	1.7133	1.6424	.00142	1.5910
#2	27.678	1.7164	1.6358	.00142	1.5565
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11267**	**.05787**	**.2090**	**-.00876**	**-.00330**
Stddev	.00031	.00273	.0017	.00063	.00165
%RSD	.27794	4.7263	.8125	7.1443	50.023
#1	.11289	.05980	.2078	-.00832	-.00213
#2	.11245	.05593	.2102	-.00920	-.00446
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.668**	**.04189**	**.10904**	**6.3919**	**-.00403**
Stddev	.114	.00080	.00051	.0100	.00251
%RSD	.48252	1.9135	.46809	.15570	62.200
#1	23.748	.04246	.10940	6.3989	-.00581
#2	23.587	.04132	.10868	6.3848	-.00226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49560-C-1-A Acquired: 11/14/2013 16:13:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.23945	.23111
Stddev	.00005	.00025
%RSD	.02069	.10939
#1	.23948	.23093
#2	.23941	.23129
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3141.5	5001.8	75920.	7265.4
Stddev	2.2	14.7	76.	6.7
%RSD	.06844	.29396	.09992	.09244
#1	3140.0	4991.4	75866.	7270.2
#2	3143.0	5012.2	75973.	7260.7

Sample Name: 480-49486-C-1-A Acquired: 11/14/2013 16:15:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00646**	**93.860**	**-.00228**	**.02080**	**1.2457**
Stddev	.00059	.108	.00146	.00001	.0022
%RSD	9.1741	.11559	64.109	.02942	.17696
#1	.00688	93.784	-.00125	.02080	1.2442
#2	.00604	93.937	-.00332	.02080	1.2473
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00447**	**20.449**	**.02071**	**.10188**	**1.3674**
Stddev	.00005	.033	.00004	.00019	.0084
%RSD	1.0709	.16025	.17105	.18284	.61715
#1	.00444	20.426	.02069	.10175	1.3614
#2	.00451	20.472	.02074	.10201	1.3734
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.509**	**513.88**	**19.844**	**22.758**	**.18099**
Stddev	.013	1.07	.024	.141	.00156
%RSD	.08815	.20738	.12065	.61993	.86104
#1	14.500	513.13	19.861	22.857	.18209
#2	14.518	514.64	19.827	22.658	.17989
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49486-C-1-A Acquired: 11/14/2013 16:15:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**37.120**	**5.7504**	**5.8232**	**.11983**	**54.030**
Stddev	.141	.0191	.0466	.00018	.277
%RSD	.37929	.33237	.79955	.14689	.51262
#1	37.021	5.7368	5.7902	.11995	53.834
#2	37.220	5.7639	5.8561	.11970	54.226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.55082**	**1.3566**	**2.628**	**.00041**	**.00336**
Stddev	.00199	.0071	.003	.00003	.00120
%RSD	.36101	.52222	.0939	6.5362	35.672
#1	.55222	1.3616	2.626	.00039	.00251
#2	.54941	1.3516	2.630	.00043	.00421
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.683**	**.33822**	**.11985**	**4.1972**	**-.00326**
Stddev	.096	.00034	.00023	.0157	.00146
%RSD	.37254	.09955	.19112	.37329	44.895
#1	25.616	.33846	.11969	4.1861	-.00222
#2	25.751	.33798	.12001	4.2083	-.00429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49486-C-1-A Acquired: 11/14/2013 16:15:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.17584	1.3240
Stddev	.00160	.0150
%RSD	.90820	1.1313
#1	.17471	1.3134
#2	.17697	1.3345
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2899.8	4759.2	72486.	7074.4
Stddev	4.2	.7	213.	3.4
%RSD	.14420	.01545	.29343	.04736
#1	2896.8	4758.7	72636.	7072.1
#2	2902.7	4759.7	72335.	7076.8

Sample Name: 480-49407-B-1-A@5 Acquired: 11/14/2013 16:18:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**3.6317**	**.00235**	**.08617**	**.12792**
Stddev	.00041	.0345	.00068	.00164	.00100
%RSD	122.96	.94990	28.852	1.9017	.78179
#1	-.00004	3.6073	.00283	.08501	.12722
#2	-.00063	3.6561	.00187	.08733	.12863
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00297**	**4.9754**	**.00007**	**.00415**	**.02729**
Stddev	.00008	.0262	.00007	.00005	.00005
%RSD	2.5678	.52760	100.48	1.2456	.19500
#1	.00303	4.9569	.00013	.00419	.02725
#2	.00292	4.9940	.00002	.00412	.02733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.17618**	**5.0926**	**.46731**	**.37310**	**.00284**
Stddev	.00185	.0059	.00964	.00494	.00121
%RSD	1.0522	.11528	2.0636	1.3235	42.624
#1	.17487	5.0884	.47413	.36961	.00370
#2	.17749	5.0967	.46049	.37659	.00198
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49407-B-1-A@5 Acquired: 11/14/2013 16:18:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67763**	**.38435**	**.34595**	**.00218**	**.58457**
Stddev	.00589	.00205	.00014	.00001	.00254
%RSD	.86914	.53417	.04088	.67527	.43438
#1	.67347	.38290	.34605	.00219	.58278
#2	.68180	.38581	.34585	.00216	.58637
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01461**	**.03705**	**1.648**	**-.00053**	**.00099**
Stddev	.00005	.00199	.018	.00135	.00098
%RSD	.32778	5.3768	1.094	252.94	98.579
#1	.01464	.03564	1.635	-.00149	.00168
#2	.01457	.03845	1.660	.00042	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4112**	**.01216**	**.05349**	**.19564**	**-.00335**
Stddev	.0108	.00078	.00031	.00017	.00186
%RSD	.76777	6.4366	.57141	.08447	55.531
#1	1.4036	.01160	.05327	.19552	-.00466
#2	1.4189	.01271	.05371	.19576	-.00203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49407-B-1-A@5 Acquired: 11/14/2013 16:18:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01078**	**.04429**
Stddev	.00021	.00038
%RSD	1.9765	.86735
#1	.01063	.04401
#2	.01093	.04456
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3408.2**	**5011.0**	**78094.**	**7265.3**
Stddev	9.4	9.6	27.	22.2
%RSD	.27636	.19209	.03412	.30623
#1	3414.8	5017.8	78113.	7281.0
#2	3401.5	5004.2	78075.	7249.5

Sample Name: 480-49401-B-1-A Acquired: 11/14/2013 16:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00249**	**297.84**	**.05316**	**.94865**	**4.0349**
Stddev	.00098	.00	.00027	.00081	.0017
%RSD	39.217	.00100	.51675	.08491	.04112
#1	.00180	297.84	.05297	.94922	4.0360
#2	.00318	297.83	.05336	.94808	4.0337
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04796**	F **1327.9**	**.00129**	**.01404**	**.05803**
Stddev	.00023	3.9	.00018	.00027	.00006
%RSD	.47100	.29586	13.808	1.8978	.10735
#1	.04812	1325.1	.00116	.01385	.05799
#2	.04780	1330.7	.00141	.01423	.05808
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		1000.0			
Low Limit		-.50000			

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11615**	**213.75**	**30.717**	**44.176**	**.46976**
Stddev	.00033	.04	.063	.148	.00182
%RSD	.28798	.02077	.20663	.33439	.38692
#1	.11639	213.72	30.673	44.072	.46847
#2	.11591	213.79	30.762	44.281	.47104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49401-B-1-A Acquired: 11/14/2013 16:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**75.320**	F **16.436**	F **19.896**	**.00233**	**8.1599**
Stddev	.392	.034	.090	.00025	.0191
%RSD	.52099	.20811	.45314	10.902	.23428
#1	75.043	16.412	19.832	.00251	8.1464
#2	75.598	16.460	19.960	.00215	8.1734
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03809**	**.14275**	F **39.14**	**-.01654**	**.02650**
Stddev	.00031	.00668	.06	.00386	.00054
%RSD	.81721	4.6822	.1464	23.311	2.0421
#1	.03787	.13803	39.10	-.01381	.02688
#2	.03831	.14748	39.18	-.01926	.02612
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**279.43**	**.04521**	**3.8208**	**6.5540**	**-.00756**
Stddev	.13	.00079	.0150	.0164	.00118
%RSD	.04504	1.7367	.39368	.25074	15.541
#1	279.34	.04465	3.8314	6.5423	-.00673
#2	279.52	.04576	3.8102	6.5656	-.00839
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49401-B-1-A Acquired: 11/14/2013 16:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.11218	.51905
Stddev	.00053	.00558
%RSD	.47166	1.0756
#1	.11180	.51510
#2	.11255	.52300
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2434.6	5266.4	76634.	7718.1
Stddev	.8	4.6	195.	5.9
%RSD	.03364	.08789	.25436	.07614
#1	2434.0	5263.1	76772.	7714.0
#2	2435.1	5269.7	76496.	7722.3

Sample Name: 480-49401-B-2-A Acquired: 11/14/2013 16:23:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**54.740**	**.06233**	**.07099**	**.54232**
Stddev	.00050	.171	.00171	.00060	.00025
%RSD	165.29	.31165	2.7505	.84652	.04653
#1	.00005	54.860	.06111	.07141	.54250
#2	-.00066	54.619	.06354	.07056	.54215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00475**	**159.04**	**.00156**	**.05211**	**.08437**
Stddev	.00012	.14	.00019	.00011	.00113
%RSD	2.5338	.08835	11.851	.20845	1.3368
#1	.00467	159.14	.00143	.05203	.08357
#2	.00484	158.94	.00170	.05219	.08517
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.26192**	**131.51**	**9.4958**	**11.140**	**.10646**
Stddev	.00011	.27	.0045	.138	.00110
%RSD	.04302	.20846	.04777	1.2361	1.0334
#1	.26200	131.71	9.4991	11.043	.10724
#2	.26184	131.32	9.4926	11.238	.10568
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49401-B-2-A Acquired: 11/14/2013 16:23:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**48.251**	**2.0147**	**1.9646**	**.01111**	**.96781**
Stddev	.037	.0006	.0076	.00013	.01592
%RSD	.07588	.03075	.38952	1.1744	1.6452
#1	48.277	2.0143	1.9700	.01102	.97907
#2	48.225	2.0152	1.9592	.01121	.95655
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13133**	**.67573**	**3.606**	**-.00208**	**.00235**
Stddev	.00042	.00107	.002	.00288	.00150
%RSD	.31631	.15868	.0580	138.66	64.088
#1	.13162	.67649	3.607	-.00004	.00128
#2	.13104	.67497	3.604	-.00411	.00341
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.048**	**.07247**	**.32611**	**1.2665**	**.00114**
Stddev	.064	.00078	.00073	.0020	.00489
%RSD	.31833	1.0778	.22478	.15915	428.94
#1	20.093	.07302	.32559	1.2651	-.00232
#2	20.003	.07192	.32663	1.2679	.00460
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49401-B-2-A Acquired: 11/14/2013 16:23:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12101	.61504
Stddev	.00033	.00014
%RSD	.27366	.02308
#1	.12124	.61514
#2	.12077	.61494
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3007.5	4830.9	73654.	7074.6
Stddev	1.1	1.0	63.	9.3
%RSD	.03505	.02159	.08532	.13135
#1	3006.8	4831.6	73610.	7081.2
#2	3008.3	4830.1	73699.	7068.0

Sample Name: CCV Acquired: 11/14/2013 16:25:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49502	25.401	.50379	.48987	.50983	.48977	25.054
Stddev	.00034	.118	.00261	.00011	.00081	.00013	.104
%RSD	.06838	.46384	.51859	.02154	.15932	.02626	.41465
#1	.49478	25.484	.50563	.48995	.51041	.48968	25.127
#2	.49526	25.318	.50194	.48980	.50926	.48986	24.980
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49044	.48831	.50810	.50250	24.038	26.074	26.877
Stddev	.00028	.00113	.00177	.00061	.077	.065	.285
%RSD	.05610	.23151	.34852	.12159	.32051	.25061	1.0612
#1	.49024	.48911	.50935	.50294	24.092	26.120	27.079
#2	.49063	.48751	.50685	.50207	23.983	26.028	26.676
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51338	24.063	.50061	.47378	.49587	25.854	.49152
Stddev	.00091	.042	.00047	.00005	.00047	.061	.00050
%RSD	.17811	.17286	.09348	.01041	.09534	.23547	.10157
#1	.51403	24.092	.50094	.47374	.49554	25.897	.49187
#2	.51273	24.033	.50027	.47381	.49620	25.811	.49117
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 16:25:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48979	24.77	.50404	.49855	25.407	.50134	.49275
Stddev	.00090	.02	.00062	.00372	.010	.00004	.00040
%RSD	.18382	.0661	.12261	.74599	.04025	.00767	.08024
#1	.49042	24.76	.50361	.49592	25.400	.50131	.49247
#2	.48915	24.78	.50448	.50118	25.415	.50137	.49303
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50525	.49589	.50222	.49967
Stddev	.00016	.00359	.00232	.00072
%RSD	.03078	.72476	.46156	.14446
#1	.50514	.49335	.50386	.50018
#2	.50536	.49843	.50058	.49916
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3217.4	4886.1	75078.	7109.7
Stddev	1.2	5.0	144.	27.9
%RSD	.03720	.10156	.19214	.39287
#1	3216.6	4889.6	74976.	7090.0
#2	3218.3	4882.6	75180.	7129.5

Sample Name: CCB Acquired: 11/14/2013 16:28:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00065**	**-.01328**	**.00001**	**.00102**	**.00001**	**.00008**	**-.00336**
Stddev	.00047	.01605	.00100	.00032	.00001	.00002	.00193
%RSD	71.869	120.85	18452.	30.768	142.33	22.508	57.320
#1	-.00098	-.02462	.00072	.00125	.00002	.00009	-.00200
#2	-.00032	-.00193	-.00070	.00080	-.00000	.00007	-.00472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**-.00008**	**-.00035**	**.00018**	**-.00196**	**.04939**	**.00311**
Stddev	.00006	.00000	.00003	.00010	.00332	.07356	.00031
%RSD	167.91	5.8662	7.3448	56.372	169.82	148.93	9.9806
#1	-.00001	-.00008	-.00037	.00025	-.00431	-.00262	.00289
#2	.00008	-.00008	-.00033	.00011	.00039	.10140	.00333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**-.00308**	**-.00005**	**.00042**	**-.00024**	**.04675**	**.00004**
Stddev	.00034	.00176	.00001	.00006	.00005	.00231	.00011
%RSD	181.32	57.069	23.387	15.145	20.818	4.9413	285.15
#1	.00043	-.00432	-.00005	.00038	-.00020	.04512	.00011
#2	-.00005	-.00184	-.00004	.00047	-.00027	.04838	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 16:28:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00151	-.0026	-.00183	.00006	.05840	-.00025	-.00016
Stddev	.00047	.0013	.00044	.00194	.00649	.00044	.00003
%RSD	30.917	50.06	24.042	3071.3	11.105	175.29	16.723
#1	-.00118	-.0017	-.00214	-.00131	.06298	.00006	-.00014
#2	-.00184	-.0035	-.00152	.00143	.05381	-.00056	-.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00017	-.00077	.00004	-.00041
Stddev	.00019	.00070	.00006	.00013
%RSD	116.76	90.645	124.81	32.166
#1	.00003	-.00127	.00008	-.00031
#2	.00030	-.00028	.00001	-.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3418.5	4966.9	77061.	7077.7
Stddev	2.3	2.2	33.	20.4
%RSD	.06799	.04476	.04332	.28760
#1	3420.1	4965.3	77038.	7092.1
#2	3416.8	4968.4	77085.	7063.3

Sample Name: ccvl Acquired: 11/14/2013 16:30:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00291**	**.21322**	**.00996**	**.02076**	**.00215**	**.00192**	**.51817**
Stddev	.00029	.00111	.00333	.00006	.00000	.00002	.00393
%RSD	10.051	.52151	33.478	.27765	.04552	1.2595	.75916
#1	.00271	.21401	.00760	.02072	.00215	.00194	.51539
#2	.00312	.21244	.01232	.02080	.00215	.00190	.52095
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**.00382**	**.00359**	**.01055**	**.04947**	**.51271**	**.45176**
Stddev	.00006	.00009	.00001	.00001	.00093	.05001	.00344
%RSD	7.1107	2.2920	.15734	.08859	1.8765	9.7537	.76104
#1	.00092	.00375	.00360	.01055	.04882	.47735	.44933
#2	.00083	.00388	.00359	.01056	.05013	.54807	.45420
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02926**	**.20515**	**.00331**	**.00327**	**.00938**	**1.0179**	**.00990**
Stddev	.00041	.00337	.00007	.00008	.00005	.0015	.00029
%RSD	1.4147	1.6436	2.2146	2.3532	.57403	.14600	2.9338
#1	.02955	.20753	.00336	.00321	.00942	1.0168	.01011
#2	.02896	.20277	.00326	.00332	.00934	1.0189	.00970
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ccvl Acquired: 11/14/2013 16:30:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00357	.2023	.01991	.01258	.50243	.00930	.00489
Stddev	.00128	.0024	.00106	.00196	.00405	.00107	.00002
%RSD	35.736	1.168	5.3085	15.609	.80573	11.478	.46221
#1	.00448	.2006	.02066	.01397	.49956	.01005	.00490
#2	.00267	.2040	.01916	.01119	.50529	.00854	.00487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00501	.01827	.00522	.01053
Stddev	.00000	.00089	.00010	.00062
%RSD	.09060	4.8856	1.8246	5.8882
#1	.00502	.01890	.00515	.01097
#2	.00501	.01764	.00528	.01009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3426.2	5018.3	77303.	7146.3
Stddev	13.1	22.1	224.	40.9
%RSD	.38333	.44119	.28990	.57235
#1	3435.4	5034.0	77144.	7175.2
#2	3416.9	5002.6	77461.	7117.4

Sample Name: 480-49423-H-1-A Acquired: 11/14/2013 16:33:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**37.478**	**.02691**	**.05743**	**.30275**
Stddev	.00028	.237	.00071	.00040	.00089
%RSD	885.87	.63204	2.6533	.69756	.29521
#1	.00023	37.646	.02640	.05714	.30212
#2	-.00017	37.311	.02741	.05771	.30338
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00212**	**504.86**	**.00257**	**.04100**	**.07869**
Stddev	.00008	1.85	.00006	.00006	.00068
%RSD	3.6359	.36667	2.4548	.15393	.86230
#1	.00217	503.55	.00252	.04096	.07821
#2	.00206	506.17	.00261	.04105	.07917
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19666**	**85.820**	**8.9193**	**12.501**	**.12933**
Stddev	.00104	.276	.0446	.065	.00186
%RSD	.52677	.32140	.49983	.52341	1.4408
#1	.19593	85.625	8.9509	12.548	.13064
#2	.19739	86.015	8.8878	12.455	.12801
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49423-H-1-A Acquired: 11/14/2013 16:33:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**230.06**	**2.5104**	**2.5799**	**.00319**	**1.3674**
Stddev	.61	.0101	.0076	.00028	.0105
%RSD	.26477	.40440	.29274	8.7612	.76568
#1	229.63	2.5033	2.5746	.00299	1.3748
#2	230.49	2.5176	2.5852	.00338	1.3600
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09480**	**.12462**	F **17.84**	**-.00454**	**.00075**
Stddev	.00119	.00246	.01	.00215	.00047
%RSD	1.2511	1.9739	.0618	47.466	63.170
#1	.09396	.12289	17.83	-.00301	.00041
#2	.09564	.12636	17.85	-.00606	.00108
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.594**	**.04295**	**.90616**	**.75984**	**-.00747**
Stddev	.008	.00128	.00146	.00181	.00138
%RSD	.05515	2.9864	.16143	.23805	18.513
#1	14.589	.04204	.90719	.76112	-.00845
#2	14.600	.04386	.90512	.75856	-.00649
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49423-H-1-A Acquired: 11/14/2013 16:33:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.07826**	**.53403**
Stddev	.00044	.00383
%RSD	.55731	.71640
#1	.07857	.53133
#2	.07795	.53674
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2722.4**	**4519.9**	**68930.**	**6910.5**
Stddev	4.5	10.9	100.	.2
%RSD	.16539	.24100	.14549	.00267
#1	2719.2	4512.1	69001.	6910.6
#2	2725.5	4527.6	68859.	6910.4

Sample Name: 480-49651-B-2-A@2 Acquired: 11/14/2013 16:35:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00182**	**51.679**	**.08542**	**.07193**	**.38513**
Stddev	.00031	.114	.00380	.00141	.00032
%RSD	16.950	.22041	4.4463	1.9571	.08333
#1	-.00160	51.760	.08810	.07093	.38490
#2	-.00204	51.599	.08273	.07292	.38535
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00805**	**139.17**	**.00085**	**.03285**	**.10335**
Stddev	.00002	.05	.00011	.00015	.00067
%RSD	.21707	.03734	13.074	.45950	.65232
#1	.00804	139.21	.00077	.03274	.10383
#2	.00806	139.14	.00092	.03295	.10287
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.84412**	**347.54**	**8.5919**	**10.494**	**.08811**
Stddev	.00178	.67	.0596	.014	.00017
%RSD	.21061	.19139	.69387	.13707	.19329
#1	.84287	348.01	8.6341	10.504	.08799
#2	.84538	347.07	8.5498	10.484	.08823
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A@2 Acquired: 11/14/2013 16:35:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.732**	**3.3586**	**3.3143**	**.01301**	**3.5069**
Stddev	.009	.0012	.0033	.00013	.0147
%RSD	.03266	.03439	.10048	.97666	.42029
#1	27.738	3.3594	3.3119	.01292	3.5173
#2	27.725	3.3577	3.3166	.01310	3.4964
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39675**	**.70612**	**6.826**	**.02658**	**.00903**
Stddev	.00070	.00022	.022	.00261	.00286
%RSD	.17654	.03120	.3196	9.8155	31.659
#1	.39626	.70628	6.810	.02843	.00701
#2	.39725	.70596	6.841	.02474	.01106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.337**	**.11649**	**.27665**	**1.8976**	**-.00667**
Stddev	.054	.00053	.00034	.0079	.00040
%RSD	.14993	.45121	.12211	.41743	5.9611
#1	36.376	.11686	.27641	1.8920	-.00639
#2	36.298	.11611	.27689	1.9032	-.00695
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49651-B-2-A@2 Acquired: 11/14/2013 16:35:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.07795	.34780
Stddev	.00014	.00083
%RSD	.18161	.23823
#1	.07785	.34721
#2	.07805	.34838
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2937.9	5140.1	78148.	7592.5
Stddev	5.5	7.6	10.	13.4
%RSD	.18622	.14718	.01250	.17640
#1	2941.8	5145.5	78154.	7583.0
#2	2934.0	5134.8	78141.	7601.9

Sample Name: 480-49407-B-1-A Acquired: 11/14/2013 16:38:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00169**	**18.088**	**.00917**	**.41157**	**.59941**
Stddev	.00070	.122	.00110	.00092	.00183
%RSD	41.270	.67696	12.034	.22252	.30557
#1	.00218	18.174	.00839	.41092	.60071
#2	.00120	18.001	.00995	.41222	.59812
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01488**	**24.405**	**.00074**	**.02115**	**.13277**
Stddev	.00005	.136	.00001	.00017	.00104
%RSD	.31674	.55680	.77334	.81654	.78413
#1	.01485	24.501	.00073	.02127	.13204
#2	.01491	24.309	.00074	.02103	.13351
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.87609**	**24.780**	**2.1259**	**2.0853**	**.01389**
Stddev	.00030	.026	.0460	.0070	.00084
%RSD	.03410	.10490	2.1649	.33783	6.0134
#1	.87630	24.799	2.1585	2.0903	.01330
#2	.87587	24.762	2.0934	2.0803	.01449
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49407-B-1-A Acquired: 11/14/2013 16:38:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.2157**	**1.8258**	**1.6827**	**.01156**	**2.8065**
Stddev	.0056	.0024	.0094	.00023	.0228
%RSD	.17494	.13290	.55936	2.0055	.81184
#1	3.2118	1.8241	1.6760	.01139	2.8226
#2	3.2197	1.8275	1.6893	.01172	2.7904
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.07037**	**.18553**	**7.830**	**-.00530**	**.00472**
Stddev	.00043	.00026	.006	.00020	.00238
%RSD	.61687	.14140	.0805	3.8561	50.452
#1	.07068	.18571	7.835	-.00544	.00304
#2	.07007	.18534	7.826	-.00515	.00641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.4591**	**.05400**	**.26484**	**.93500**	**-.00388**
Stddev	.0315	.00053	.00023	.00023	.00153
%RSD	.48835	.98010	.08608	.02430	39.404
#1	6.4814	.05363	.26468	.93484	-.00496
#2	6.4367	.05438	.26500	.93516	-.00280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49407-B-1-A Acquired: 11/14/2013 16:38:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.05412	.20983
Stddev	.00038	.00054
%RSD	.69896	.25764
#1	.05439	.21021
#2	.05386	.20945
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3274.7	4996.8	76993.	7157.4
Stddev	4.3	6.6	94.	50.5
%RSD	.13267	.13139	.12247	.70492
#1	3271.7	4992.1	76926.	7121.7
#2	3277.8	5001.4	77059.	7193.0

Sample Name: MB 480-148698/1-A Acquired: 11/14/2013 16:40:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**.02350**	**.00075**	**.00306**	**.00013**
Stddev	.00025	.02867	.00422	.00000	.00000
%RSD	49.117	121.98	563.77	.11927	.79616
#1	.00068	.04377	.00374	.00307	.00013
#2	.00033	.00323	-.00224	.00306	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**.03396**	**.00004**	**.00001**	**-.00027**
Stddev	.00011	.00258	.00008	.00003	.00039
%RSD	244.00	7.6001	204.76	314.28	147.11
#1	-.00012	.03579	-.00002	.00003	-.00054
#2	.00003	.03214	.00010	-.00001	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.04480**	**.01320**	**.00340**	**-.00004**
Stddev	.00010	.00082	.02730	.00014	.00036
%RSD	210.28	1.8367	206.84	3.9985	989.29
#1	.00012	.04538	.03250	.00349	-.00029
#2	-.00002	.04422	-.00610	.00330	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-148698/1-A Acquired: 11/14/2013 16:40:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00447**	**.00049**	**.00101**	**-.00029**	**.03037**
Stddev	.00040	.00001	.00001	.00007	.00339
%RSD	8.8522	2.0490	.97796	24.680	11.167
#1	.00419	.00048	.00100	-.00034	.03277
#2	.00475	.00050	.00102	-.00024	.02797
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**-.00060**	**.0319**	**-.00214**	**-.00266**
Stddev	.00005	.00121	.0027	.00086	.00124
%RSD	30.516	200.36	8.330	39.923	46.577
#1	.00014	.00025	.0300	-.00275	-.00178
#2	.00022	-.00146	.0337	-.00154	-.00353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02221**	**-.00029**	**.00006**	**.00022**	**-.00199**
Stddev	.00646	.00022	.00003	.00003	.00155
%RSD	29.095	76.083	49.555	12.860	77.714
#1	.02678	-.00013	.00004	.00024	-.00090
#2	.01764	-.00045	.00008	.00020	-.00308
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: MB 480-148698/1-A Acquired: 11/14/2013 16:40:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00028**	**.00129**
Stddev	.00030	.00006
%RSD	107.42	4.8092
#1	-.00007	.00134
#2	-.00050	.00125
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3448.4**	**5013.4**	**78925.**	**7164.1**
Stddev	10.8	29.1	52.	12.6
%RSD	.31441	.58088	.06577	.17523
#1	3456.1	5034.0	78962.	7173.0
#2	3440.7	4992.9	78888.	7155.2

Sample Name: LCS 480-148698/2-A Acquired: 11/14/2013 16:42:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05139	10.839	.20641	.21237	.22249
Stddev	.00033	.015	.00170	.00018	.00015
%RSD	.64091	.13817	.82426	.08287	.06863
#1	.05116	10.828	.20521	.21225	.22238
#2	.05162	10.850	.20762	.21250	.22260
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20392	10.213	.20120	.20153	.21328
Stddev	.00081	.024	.00004	.00017	.00039
%RSD	.39707	.23526	.02043	.08451	.18323
#1	.20450	10.230	.20117	.20141	.21355
#2	.20335	10.196	.20123	.20165	.21300
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21075	10.055	10.646	11.010	.21717
Stddev	.00039	.024	.045	.021	.00190
%RSD	.18497	.24057	.42065	.19063	.87563
#1	.21048	10.072	10.614	10.995	.21583
#2	.21103	10.038	10.678	11.025	.21852
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-148698/2-A Acquired: 11/14/2013 16:42:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.454**	**.20556**	**.19163**	**.21026**	**10.715**
Stddev	.041	.00017	.00048	.00005	.052
%RSD	.39254	.08254	.25079	.02297	.48861
#1	10.425	.20568	.19129	.21029	10.678
#2	10.483	.20544	.19197	.21022	10.752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19875**	**.20257**	**10.36**	**.20383**	**.20447**
Stddev	.00021	.00161	.01	.00078	.00183
%RSD	.10614	.79642	.1101	.38339	.89399
#1	.19890	.20371	10.35	.20438	.20318
#2	.19860	.20143	10.37	.20328	.20576
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.396**	**.20213**	**.20683**	**.19970**	**.20089**
Stddev	.045	.00059	.00036	.00023	.00145
%RSD	.43537	.29427	.17519	.11565	.72265
#1	10.364	.20255	.20709	.19954	.20192
#2	10.428	.20171	.20658	.19986	.19987
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: LCS 480-148698/2-A Acquired: 11/14/2013 16:42:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21470**	**.20873**
Stddev	.00008	.00059
%RSD	.03867	.28093
#1	.21465	.20832
#2	.21476	.20915
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3331.1**	**4922.7**	**75771.**	**7143.6**
Stddev	.5	.2	166.	14.0
%RSD	.01454	.00322	.21887	.19553
#1	3331.5	4922.6	75889.	7153.4
#2	3330.8	4922.8	75654.	7133.7

Sample Name: 480-48963-E-1-A Acquired: 11/14/2013 16:45:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.11502**	**-.00059**	**.01597**	**.06505**
Stddev	.00037	.03124	.00172	.00018	.00019
%RSD	415.54	27.157	291.06	1.1426	.29201
#1	.00035	.13711	-.00181	.01610	.06519
#2	-.00017	.09293	.00063	.01584	.06492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00028**	**25.849**	**.00191**	**.00573**	**.00968**
Stddev	.00001	.080	.00003	.00010	.00013
%RSD	3.4177	.30861	1.7533	1.6787	1.3743
#1	.00029	25.792	.00189	.00580	.00959
#2	.00027	25.905	.00194	.00566	.00978
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00309**	**13.946**	**4.7919**	**5.1375**	**.00389**
Stddev	.00013	.019	.0470	.0088	.00056
%RSD	4.1361	.13659	.98018	.17203	14.333
#1	.00318	13.933	4.7587	5.1313	.00429
#2	.00300	13.960	4.8251	5.1438	.00350
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-A Acquired: 11/14/2013 16:45:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.695**	**.09240**	**.08539**	**-.00017**	**5.6377**
Stddev	.009	.00026	.00061	.00010	.0380
%RSD	.06513	.28585	.71635	57.491	.67474
#1	13.701	.09259	.08496	-.00023	5.6109
#2	13.688	.09221	.08582	-.00010	5.6646
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01656**	**-.00263**	F **39.60**	**-.00268**	**.00281**
Stddev	.00025	.00114	.01	.00186	.00019
%RSD	1.5242	43.337	.0183	69.425	6.9091
#1	.01674	-.00344	39.59	-.00136	.00294
#2	.01638	-.00182	39.60	-.00399	.00267
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.2273**	**.00016**	**.18978**	**.00057**	**-.00142**
Stddev	.0167	.00020	.00011	.00015	.00054
%RSD	.23042	123.74	.05896	26.247	37.830
#1	7.2155	.00002	.18986	.00047	-.00180
#2	7.2391	.00030	.18970	.00068	-.00104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-A Acquired: 11/14/2013 16:45:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00059**	**.02871**
Stddev	.00015	.00043
%RSD	24.682	1.4934
#1	.00049	.02902
#2	.00069	.02841
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3346.8**	**4871.5**	**74743.**	**7106.9**
Stddev	2.4	8.4	209.	24.8
%RSD	.07141	.17220	.27971	.34913
#1	3348.5	4877.4	74595.	7124.4
#2	3345.1	4865.6	74891.	7089.3

Sample Name: 480-48963-E-1-B MS Acquired: 11/14/2013 16:47:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05160**	**10.753**	**.21263**	**.22460**	**.28217**
Stddev	.00083	.038	.00249	.00120	.00038
%RSD	1.6043	.35130	1.1690	.53278	.13490
#1	.05219	10.780	.21087	.22375	.28190
#2	.05102	10.726	.21438	.22545	.28244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20618**	**35.694**	**.20627**	**.20919**	**.22410**
Stddev	.00013	.008	.00007	.00004	.00012
%RSD	.06527	.02266	.03244	.01844	.05545
#1	.20608	35.699	.20632	.20921	.22418
#2	.20627	35.688	.20622	.20916	.22401
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21838**	**23.733**	**15.662**	**17.344**	**.22406**
Stddev	.00006	.046	.087	.041	.00095
%RSD	.02574	.19237	.55293	.23687	.42316
#1	.21842	23.765	15.723	17.315	.22473
#2	.21834	23.700	15.600	17.373	.22339
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-B MS Acquired: 11/14/2013 16:47:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.947**	**.29648**	**.28047**	**.21341**	**16.460**
Stddev	.023	.00004	.00105	.00015	.080
%RSD	.09519	.01508	.37271	.06853	.48667
#1	23.930	.29651	.27973	.21331	16.517
#2	23.963	.29645	.28121	.21351	16.403
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21669**	**.20450**	F **49.95**	**.20616**	**.21140**
Stddev	.00020	.00007	.13	.00126	.00090
%RSD	.09450	.03450	.2687	.60982	.42447
#1	.21655	.20455	50.04	.20704	.21077
#2	.21684	.20445	49.85	.20527	.21204
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.284**	**.20445**	**.39406**	**.20252**	**.20289**
Stddev	.004	.00077	.00016	.00051	.00245
%RSD	.02459	.37570	.04088	.25232	1.2053
#1	17.287	.20391	.39395	.20288	.20116
#2	17.281	.20500	.39417	.20216	.20462
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-B MS Acquired: 11/14/2013 16:47:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21738**	**.23109**
Stddev	.00096	.00063
%RSD	.44375	.27292
#1	.21806	.23154
#2	.21670	.23065
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3241.9**	**4839.0**	**74126.**	**7102.7**
Stddev	2.8	3.9	186.	4.3
%RSD	.08782	.08003	.25105	.06045
#1	3243.9	4841.8	74257.	7105.7
#2	3239.9	4836.3	73994.	7099.6

Sample Name: 480-48963-E-1-C MSD Acquired: 11/14/2013 16:49:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05226**	**10.977**	**.21976**	**.22841**	**.28640**
Stddev	.00095	.039	.00221	.00000	.00047
%RSD	1.8111	.35544	1.0051	.00004	.16344
#1	.05159	10.949	.21820	.22841	.28606
#2	.05293	11.005	.22133	.22841	.28673
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21195**	**36.757**	**.21153**	**.21435**	**.22789**
Stddev	.00009	.017	.00010	.00003	.00098
%RSD	.04418	.04723	.04931	.01351	.43021
#1	.21201	36.769	.21145	.21437	.22720
#2	.21188	36.744	.21160	.21433	.22858
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22100**	**24.341**	**16.031**	**17.435**	**.22828**
Stddev	.00095	.024	.028	.089	.00004
%RSD	.42804	.09830	.17660	.50978	.01832
#1	.22033	24.358	16.051	17.498	.22825
#2	.22166	24.324	16.011	17.372	.22831
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-C MSD Acquired: 11/14/2013 16:49:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.518**	**.30319**	**.28636**	**.21926**	**16.805**
Stddev	.035	.00053	.00014	.00009	.002
%RSD	.14393	.17513	.05046	.04152	.01196
#1	24.493	.30281	.28626	.21919	16.803
#2	24.543	.30356	.28646	.21932	16.806
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22190**	**.20913**	F **51.25**	**.21356**	**.21889**
Stddev	.00034	.00080	.12	.00122	.00188
%RSD	.15144	.38370	.2368	.57183	.86094
#1	.22214	.20970	51.16	.21442	.22022
#2	.22167	.20857	51.33	.21269	.21755
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.822**	**.20504**	**.40354**	**.20710**	**.20742**
Stddev	.016	.00140	.00072	.00105	.00014
%RSD	.09048	.68101	.17828	.50747	.06772
#1	17.811	.20603	.40405	.20636	.20752
#2	17.833	.20405	.40303	.20785	.20732
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-1-C MSD Acquired: 11/14/2013 16:49:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.22138**	**.23645**
Stddev	.00078	.00227
%RSD	.35043	.95838
#1	.22083	.23485
#2	.22192	.23805
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3239.8**	**4831.4**	**74409.**	**7060.7**
Stddev	4.9	8.9	259.	1.5
%RSD	.15148	.18391	.34752	.02074
#1	3243.3	4837.6	74592.	7061.7
#2	3236.3	4825.1	74226.	7059.7

Sample Name: 480-48963-E-2-A Acquired: 11/14/2013 16:52:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**.38670**	**.00255**	**.07136**	**.03871**
Stddev	.00006	.01088	.00091	.00079	.00008
%RSD	14.983	2.8124	35.771	1.1048	.19992
#1	-.00046	.39439	.00190	.07192	.03865
#2	-.00037	.37901	.00319	.07080	.03876
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**42.789**	**.00003**	**.00028**	**.00356**
Stddev	.00011	.020	.00004	.00012	.00056
%RSD	1264.8	.04570	144.95	41.128	15.830
#1	-.00007	42.775	-.00000	.00037	.00395
#2	.00009	42.803	.00005	.00020	.00316
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00192**	**9.7854**	**5.9652**	**6.5091**	**.06615**
Stddev	.00010	.0488	.0294	.0467	.00028
%RSD	5.0549	.49829	.49346	.71732	.42517
#1	.00199	9.8199	5.9860	6.5421	.06635
#2	.00185	9.7509	5.9444	6.4761	.06596
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A Acquired: 11/14/2013 16:52:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2228**	**.11990**	**.11267**	**.00131**	**12.951**
Stddev	.0203	.00042	.00038	.00017	.011
%RSD	.38864	.34848	.33722	13.159	.08660
#1	5.2084	.11960	.11294	.00143	12.959
#2	5.2371	.12019	.11240	.00119	12.943
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00191**	**-.00418**	**4.070**	**-.00209**	**-.00077**
Stddev	.00050	.00039	.004	.00073	.00134
%RSD	26.345	9.2487	.0949	34.692	173.08
#1	.00155	-.00391	4.067	-.00158	-.00172
#2	.00227	-.00445	4.073	-.00261	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.076**	**-.00010**	**.20809**	**.00852**	**-.00224**
Stddev	.067	.00006	.00047	.00023	.00009
%RSD	.55743	60.864	.22548	2.7525	3.9125
#1	12.028	-.00006	.20842	.00835	-.00218
#2	12.123	-.00014	.20775	.00868	-.00231
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A Acquired: 11/14/2013 16:52:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00240**	**.00751**
Stddev	.00000	.00001
%RSD	.06914	.16628
#1	.00240	.00752
#2	.00240	.00750
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3301.1**	**4851.9**	**74949.**	**7111.8**
Stddev	9.6	8.4	133.	9.7
%RSD	.29177	.17238	.17693	.13639
#1	3307.9	4857.8	75043.	7118.6
#2	3294.3	4846.0	74856.	7104.9

Sample Name: CCV Acquired: 11/14/2013 16:54:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50202**	**25.539**	**.50718**	**.49189**	**.51598**	**.49134**	**25.093**
Stddev	.00022	.017	.00073	.00221	.00150	.00131	.065
%RSD	.04332	.06736	.14354	.44974	.29041	.26756	.25798
#1	.50218	25.527	.50770	.49345	.51492	.49041	25.139
#2	.50187	25.551	.50667	.49032	.51704	.49227	25.047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48941**	**.48773**	**.52262**	**.51837**	**24.032**	**26.391**	**27.328**
Stddev	.00162	.00034	.00040	.00222	.012	.116	.174
%RSD	.33078	.06912	.07683	.42806	.04919	.43911	.63844
#1	.49056	.48749	.52290	.51994	24.024	26.309	27.452
#2	.48827	.48797	.52234	.51680	24.041	26.473	27.205
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52320**	**24.184**	**.50266**	**.47974**	**.49480**	**26.300**	**.48711**
Stddev	.00198	.009	.00016	.00085	.00136	.071	.00094
%RSD	.37923	.03899	.03244	.17759	.27552	.26969	.19221
#1	.52180	24.191	.50254	.48034	.49577	26.250	.48645
#2	.52460	24.177	.50277	.47914	.49384	26.350	.48778
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 16:54:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48900	24.59	.50354	.49897	25.145	.50256	.49457
Stddev	.00013	.02	.00232	.00153	.071	.00000	.00230
%RSD	.02732	.0930	.46029	.30564	.28354	.00007	.46456
#1	.48890	24.60	.50518	.49789	25.095	.50256	.49295
#2	.48909	24.57	.50190	.50004	25.196	.50256	.49620
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50474	.49136	.51625	.50648
Stddev	.00037	.00502	.00073	.00238
%RSD	.07340	1.0225	.14210	.46930
#1	.50500	.49491	.51677	.50480
#2	.50447	.48781	.51573	.50816
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3200.3	4841.9	73140.	6989.3
Stddev	.1	14.4	125.	7.2
%RSD	.00381	.29757	.17060	.10283
#1	3200.2	4831.7	73052.	6984.2
#2	3200.3	4852.0	73229.	6994.4

Sample Name: CCB Acquired: 11/14/2013 16:57:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00067**	**-.00197**	**-.00168**	**.00029**	**.00001**	**-.00005**	**-.00554**
Stddev	.00013	.02982	.00075	.00031	.00000	.00005	.00284
%RSD	19.596	1513.5	44.962	108.93	17.769	98.725	51.345
#1	-.00058	.01912	-.00221	.00051	.00001	-.00002	-.00755
#2	-.00076	-.02306	-.00114	.00007	.00001	-.00009	-.00353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**-.00009**	**-.00059**	**.00023**	**-.00623**	**.04697**	**.00229**
Stddev	.00003	.00010	.00019	.00022	.00106	.03131	.00002
%RSD	100.18	115.03	31.820	95.099	17.027	66.654	1.0078
#1	-.00001	-.00002	-.00046	.00008	-.00698	.02483	.00231
#2	-.00005	-.00016	-.00072	.00038	-.00548	.06911	.00228
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00044**	**-.00142**	**.00001**	**.00082**	**-.00002**	**.02436**	**.00020**
Stddev	.00022	.00099	.00001	.00065	.00000	.00410	.00044
%RSD	50.585	69.460	128.81	79.717	26.258	16.832	220.32
#1	.00028	-.00072	.00000	.00128	-.00002	.02726	-.00011
#2	.00060	-.00212	.00001	.00036	-.00001	.02146	.00051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 16:57:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00066	.0005	-.00072	-.00093	.03355	-.00006	-.00005
Stddev	.00099	.0022	.00050	.00295	.00996	.00034	.00004
%RSD	148.66	441.7	70.002	315.84	29.684	569.66	72.324
#1	-.00136	.0021	-.00107	.00115	.04060	-.00030	-.00008
#2	.00003	-.0011	-.00036	-.00302	.02651	.00018	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	-.00004	-.00229	-.00012	.00016
Stddev	.00003	.00169	.00005	.00030
%RSD	87.515	73.599	42.344	182.29
#1	-.00006	-.00110	-.00016	.00038
#2	-.00002	-.00348	-.00009	-.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3399.3	4946.6	77463.	7019.2
Stddev	2.7	4.4	218.	6.7
%RSD	.07896	.08968	.28154	.09553
#1	3397.4	4943.4	77308.	7014.4
#2	3401.2	4949.7	77617.	7023.9

Sample Name: CCVL Acquired: 11/14/2013 16:59:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00308**	**.20244**	**.00903**	**.01971**	**.00213**	**.00198**	**.50950**
Stddev	.00006	.02477	.00136	.00032	.00001	.00003	.00421
%RSD	1.8092	12.238	15.018	1.6075	.69557	1.5060	.82688
#1	.00312	.18493	.00807	.01949	.00212	.00196	.51248
#2	.00304	.21996	.00999	.01994	.00214	.00200	.50652
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.00399**	**.00358**	**.01034**	**.04293**	**.50133**	**.44890**
Stddev	.00008	.00010	.00015	.00008	.00243	.03169	.00070
%RSD	9.0200	2.3824	4.2460	.73599	5.6607	6.3209	.15546
#1	.00091	.00393	.00368	.01039	.04465	.52374	.44939
#2	.00080	.00406	.00347	.01028	.04121	.47893	.44841
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02885**	**.20313**	**.00336**	**.00273**	**.00948**	**.98222**	**.00981**
Stddev	.00042	.00103	.00003	.00061	.00020	.00682	.00006
%RSD	1.4708	.50939	.86820	22.248	2.0593	.69450	.57472
#1	.02855	.20240	.00338	.00230	.00962	.98705	.00977
#2	.02915	.20387	.00333	.00316	.00935	.97740	.00984
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 16:59:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00585	.2025	.01901	.01217	.48165	.00934	.00488
Stddev	.00024	.0010	.00040	.00225	.03489	.00016	.00016
%RSD	4.1266	.4852	2.1225	18.469	7.2446	1.7042	3.2941
#1	.00568	.2018	.01929	.01058	.50632	.00922	.00499
#2	.00602	.2032	.01872	.01376	.45698	.00945	.00477
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00468	.01679	.00469	.01093
Stddev	.00011	.00263	.00008	.00035
%RSD	2.2472	15.666	1.7700	3.2059
#1	.00461	.01493	.00475	.01118
#2	.00476	.01865	.00463	.01068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3435.5	5018.5	77982.	7227.2
Stddev	5.3	16.5	380.	31.8
%RSD	.15433	.32822	.48726	.44029
#1	3439.2	5030.2	78251.	7204.7
#2	3431.7	5006.9	77713.	7249.7

Sample Name: 480-48963-E-2-A sd@5 Acquired: 11/14/2013 17:02:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00052**	**.08805**	**.00007**	**.01355**	**.00815**
Stddev	.00003	.01103	.00025	.00000	.00002
%RSD	4.8268	12.531	386.02	.01872	.23902
#1	-.00050	.09585	.00024	.01355	.00816
#2	-.00054	.08025	-.00011	.01354	.00813
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**8.6352**	**-.00001**	**.00002**	**.00033**
Stddev	.00001	.0333	.00003	.00002	.00033
%RSD	19.730	.38508	308.60	104.11	99.764
#1	-.00006	8.6117	.00001	.00004	.00056
#2	-.00005	8.6587	-.00003	.00001	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00061**	**1.9559**	**1.1411**	**1.0901**	**.01292**
Stddev	.00001	.0065	.0214	.0022	.00038
%RSD	1.5055	.33381	1.8714	.20555	2.9530
#1	.00061	1.9513	1.1260	1.0885	.01265
#2	.00062	1.9606	1.1562	1.0917	.01319
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A sd@5 Acquired: 11/14/2013 17:02:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0408**	**.02434**	**.02233**	**.00018**	**2.5682**
Stddev	.0108	.00021	.00076	.00004	.0027
%RSD	1.0389	.84565	3.4239	21.983	.10386
#1	1.0484	.02419	.02287	.00015	2.5664
#2	1.0331	.02448	.02179	.00021	2.5701
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.00164**	**.7985**	**-.00330**	**-.00061**
Stddev	.00020	.00067	.0012	.00206	.00238
%RSD	238.49	40.582	.1487	62.354	389.84
#1	.00023	-.00117	.7993	-.00475	.00107
#2	-.00006	-.00212	.7977	-.00184	-.00230
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.4259**	**-.00093**	**.04148**	**.00225**	**-.00512**
Stddev	.0129	.00001	.00006	.00064	.00005
%RSD	.53334	.95631	.14518	28.329	.99667
#1	2.4351	-.00094	.04143	.00180	-.00508
#2	2.4168	-.00092	.04152	.00271	-.00515
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A sd@5 Acquired: 11/14/2013 17:02:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00020**	**.00161**
Stddev	.00013	.00007
%RSD	67.455	4.3785
#1	.00010	.00156
#2	.00029	.00166
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3392.7**	**4931.0**	**75780.**	**7038.9**
Stddev	4.5	5.4	74.	35.7
%RSD	.13362	.11002	.09717	.50748
#1	3389.5	4927.2	75832.	7064.2
#2	3396.0	4934.9	75728.	7013.7

Sample Name: 480-48963-E-2-A pds Acquired: 11/14/2013 17:04:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05479**	**11.353**	**.20214**	**.27377**	**.25526**
Stddev	.00072	.002	.00024	.00238	.00203
%RSD	1.3090	.01646	.11970	.87027	.79673
#1	.05530	11.352	.20197	.27546	.25670
#2	.05428	11.355	.20231	.27209	.25382
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18889**	**50.547**	**.19247**	**.19323**	**.19978**
Stddev	.00019	.103	.00195	.00239	.00172
%RSD	.09989	.20387	1.0151	1.2349	.86026
#1	.18902	50.620	.19109	.19154	.20100
#2	.18875	50.474	.19385	.19492	.19856
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19884**	**18.577**	**17.101**	**18.869**	**.29069**
Stddev	.00058	.060	.020	.243	.00048
%RSD	.29016	.32290	.11802	1.2898	.16378
#1	.19924	18.619	17.115	19.041	.29035
#2	.19843	18.535	17.087	18.697	.29102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A pds Acquired: 11/14/2013 17:04:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.609**	**.30206**	**.28488**	**.20084**	**23.696**
Stddev	.007	.00002	.00198	.00178	.084
%RSD	.04717	.00725	.69675	.88637	.35268
#1	14.613	.30205	.28628	.19958	23.637
#2	14.604	.30208	.28347	.20210	23.755
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19209**	**.19348**	**3.883**	**.19042**	**.19865**
Stddev	.00185	.00001	.006	.00115	.00029
%RSD	.96075	.00501	.1587	.60582	.14450
#1	.19079	.19349	3.879	.18960	.19886
#2	.19340	.19348	3.888	.19123	.19845
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**22.850**	**.20346**	**.40861**	**.19535**	**.19268**
Stddev	.035	.00657	.00127	.00004	.00155
%RSD	.15520	3.2276	.31169	.02074	.80464
#1	22.875	.20810	.40951	.19532	.19159
#2	22.825	.19881	.40771	.19538	.19378
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-2-A pds Acquired: 11/14/2013 17:04:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20076**	**.19548**
Stddev	.00128	.00132
%RSD	.63533	.67390
#1	.20166	.19641
#2	.19986	.19455
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3213.3**	**4835.2**	**74206.**	**7063.5**
Stddev	3.7	1.5	394.	6.6
%RSD	.11379	.03029	.53132	.09373
#1	3215.9	4834.1	73927.	7068.1
#2	3210.7	4836.2	74485.	7058.8

Sample Name: 480-48963-E-3-A Acquired: 11/14/2013 17:06:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00037**	**.08784**	**.00087**	**.78465**	**.02770**
Stddev	.00027	.00325	.00004	.00040	.00010
%RSD	74.232	3.6943	4.3931	.05157	.34898
#1	-.00017	.08555	.00090	.78493	.02776
#2	-.00056	.09014	.00084	.78436	.02763
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**82.317**	**.00596**	**.00250**	**.00158**
Stddev	.00002	.244	.00002	.00021	.00017
%RSD	11.777	.29646	.32953	8.2108	10.713
#1	.00018	82.489	.00597	.00265	.00146
#2	.00015	82.144	.00594	.00236	.00170
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00185**	**2.1007**	**6.2117**	**7.6569**	**.00714**
Stddev	.00006	.0064	.0374	.0037	.00049
%RSD	3.0035	.30606	.60281	.04788	6.8995
#1	.00181	2.0962	6.1852	7.6543	.00679
#2	.00189	2.1053	6.2382	7.6595	.00749
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-3-A Acquired: 11/14/2013 17:06:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**35.339**	**.11846**	**.11321**	**-.00015**	**34.606**
Stddev	.081	.00043	.00123	.00015	.030
%RSD	.22844	.36441	1.0909	100.19	.08748
#1	35.396	.11877	.11408	-.00025	34.585
#2	35.282	.11815	.11234	-.00004	34.627
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04681**	**-.00207**	F **104.3**	**-.00255**	**-.00151**
Stddev	.00049	.00135	.1	.00139	.00230
%RSD	1.0390	65.142	.0789	54.453	152.32
#1	.04647	-.00111	104.3	-.00353	-.00313
#2	.04716	-.00302	104.2	-.00157	.00012
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.8270**	**-.00047**	**.37159**	**.00033**	**-.00246**
Stddev	.0048	.00011	.00219	.00009	.00008
%RSD	.08313	23.810	.59070	27.743	3.0998
#1	5.8305	-.00055	.37004	.00039	-.00251
#2	5.8236	-.00039	.37314	.00026	-.00241
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-3-A Acquired: 11/14/2013 17:06:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00082**	**.04394**
Stddev	.00005	.00011
%RSD	5.7744	.26068
#1	.00078	.04386
#2	.00085	.04402
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3183.9**	**4734.2**	**72745.**	**7093.8**
Stddev	.3	4.5	185.	1.0
%RSD	.00974	.09455	.25379	.01392
#1	3184.1	4737.4	72615.	7093.1
#2	3183.7	4731.0	72876.	7094.5

Sample Name: 480-48963-E-4-A Acquired: 11/14/2013 17:09:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**1.9502**	**.00384**	**.09401**	**.06781**
Stddev	.00028	.0001	.00057	.00004	.00001
%RSD	164.89	.00270	14.780	.03816	.01798
#1	.00003	1.9502	.00424	.09404	.06782
#2	-.00036	1.9502	.00343	.09398	.06780
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00168**	**98.635**	**.02480**	**.10423**	**.01130**
Stddev	.00006	.174	.00002	.00025	.00009
%RSD	3.6240	.17592	.06508	.23732	.82489
#1	.00164	98.512	.02478	.10441	.01136
#2	.00172	98.757	.02481	.10406	.01123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00839**	**9.4692**	**8.4203**	**9.7671**	**.02517**
Stddev	.00025	.0455	.0284	.0661	.00028
%RSD	2.9497	.48055	.33728	.67703	1.1181
#1	.00856	9.4370	8.4403	9.8138	.02497
#2	.00821	9.5013	8.4002	9.7203	.02537
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-4-A Acquired: 11/14/2013 17:09:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.720**	**2.5738**	**2.4746**	**.00030**	**7.5355**
Stddev	.099	.0100	.0055	.00032	.0109
%RSD	.34320	.38878	.22061	104.83	.14484
#1	28.651	2.5667	2.4784	.00053	7.5432
#2	28.790	2.5809	2.4707	.00008	7.5278
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.15057**	F **-.00543**	F **127.3**	**-.00139**	**-.00141**
Stddev	.00016	.00111	.1	.00218	.00102
%RSD	.10511	20.420	.0926	156.94	72.324
#1	.15068	-.00621	127.2	.00015	-.00213
#2	.15046	-.00464	127.4	-.00293	-.00069
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.509**	**-.00002**	**.35056**	**.01998**	**-.00075**
Stddev	.014	.00025	.00026	.00055	.00063
%RSD	.08188	1396.8	.07520	2.7615	84.462
#1	17.499	.00016	.35037	.01959	-.00030
#2	17.519	-.00019	.35074	.02037	-.00120
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48963-E-4-A Acquired: 11/14/2013 17:09:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01876**	**.15199**
Stddev	.00010	.00031
%RSD	.55919	.20517
#1	.01868	.15221
#2	.01883	.15177
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3207.1**	**4778.3**	**73462.**	**7154.3**
Stddev	1.7	10.8	167.	14.1
%RSD	.05249	.22606	.22668	.19686
#1	3208.3	4786.0	73580.	7164.3
#2	3205.9	4770.7	73344.	7144.3

Sample Name: 480-48970-F-1-A Acquired: 11/14/2013 17:11:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.38671**	**-.00118**	**.26730**	**.02645**
Stddev	.00011	.00056	.00314	.00005	.00006
%RSD	30.478	.14513	265.88	.02019	.21687
#1	-.00027	.38631	.00104	.26726	.02640
#2	-.00042	.38710	-.00340	.26734	.02649
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**124.85**	**.00048**	**.00018**	**.00157**
Stddev	.00009	.09	.00003	.00009	.00021
%RSD	420.30	.07398	6.4577	48.099	13.573
#1	.00004	124.78	.00050	.00012	.00142
#2	-.00008	124.92	.00046	.00024	.00172
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03340**	**1.6718**	**5.4924**	**7.5322**	**.29468**
Stddev	.00029	.0015	.0064	.0492	.00080
%RSD	.87707	.09134	.11643	.65289	.26984
#1	.03319	1.6708	5.4879	7.4974	.29412
#2	.03361	1.6729	5.4969	7.5670	.29525
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-1-A Acquired: 11/14/2013 17:11:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**154.71**	**.11620**	**.11444**	**-.00025**	**51.414**
Stddev	.60	.00054	.00000	.00003	.126
%RSD	.38970	.46430	.00343	12.816	.24562
#1	155.14	.11658	.11444	-.00023	51.325
#2	154.28	.11582	.11444	-.00027	51.504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09221**	F **-.00756**	F **315.1**	**-.00141**	**-.00199**
Stddev	.00050	.00059	.8	.00151	.00124
%RSD	.53960	7.8161	.2672	107.36	62.441
#1	.09186	-.00714	314.5	-.00248	-.00286
#2	.09256	-.00798	315.7	-.00034	-.00111
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**22.805**	**.00023**	**.31583**	**.00585**	**-.00067**
Stddev	.005	.00006	.00135	.00061	.00157
%RSD	.02398	27.538	.42685	10.381	236.04
#1	22.801	.00028	.31487	.00542	-.00178
#2	22.809	.00019	.31678	.00628	.00045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-1-A Acquired: 11/14/2013 17:11:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00011	.02502
Stddev	.00007	.00011
%RSD	65.487	.44504
#1	.00006	.02510
#2	.00017	.02494
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3050.4	4604.6	70525.	7038.4
Stddev	3.3	4.2	98.	5.0
%RSD	.10954	.09068	.13858	.07114
#1	3052.8	4607.5	70594.	7041.9
#2	3048.0	4601.6	70456.	7034.9

Sample Name: 480-48970-F-2-A Acquired: 11/14/2013 17:14:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00705**	**19.358**	**.00875**	**17.111**	**.01545**
Stddev	.00020	.035	.00124	.001	.00007
%RSD	2.8495	.17839	14.150	.00747	.44272
#1	.00719	19.383	.00788	17.112	.01550
#2	.00691	19.334	.00963	17.111	.01541
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00850**	**472.91**	**-.00011**	**.24016**	**.00212**
Stddev	.00001	3.62	.00002	.00050	.00032
%RSD	.10036	.76515	20.005	.20728	15.241
#1	.00850	475.47	-.00013	.24051	.00235
#2	.00851	470.35	-.00010	.23981	.00189
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00311**	**520.56**	**23.644**	**34.172**	**.04861**
Stddev	.00007	2.03	.005	.317	.00025
%RSD	2.1148	.38939	.01953	.92714	.51129
#1	.00315	522.00	23.647	34.396	.04878
#2	.00306	519.13	23.641	33.948	.04843
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-2-A Acquired: 11/14/2013 17:14:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**161.37**	F **37.261**	F **49.529**	**-.00653**	**97.926**
Stddev	.71	.074	.285	.00013	.464
%RSD	.43794	.19971	.57474	2.0585	.47381
#1	161.87	37.208	49.730	-.00662	97.598
#2	160.87	37.314	49.328	-.00643	98.254
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.36258**	**.04630**	F **781.7**	**-.01141**	**.01274**
Stddev	.00013	.00078	1.7	.00012	.00578
%RSD	.03500	1.6781	.2237	1.0558	45.372
#1	.36267	.04575	780.4	-.01133	.00865
#2	.36250	.04685	782.9	-.01150	.01682
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.855**	**.00778**	**2.0901**	**.00078**	**.01375**
Stddev	.052	.00069	.0037	.00056	.00020
%RSD	.29275	8.9129	.17447	71.624	1.4831
#1	17.892	.00827	2.0875	.00118	.01361
#2	17.818	.00729	2.0927	.00039	.01390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-2-A Acquired: 11/14/2013 17:14:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01285	.72652
Stddev	.00017	.00887
%RSD	1.2842	1.2209
#1	.01297	.73279
#2	.01274	.72025
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2602.1	4644.5	71382.	7349.2
Stddev	4.1	3.9	230.	7.2
%RSD	.15650	.08334	.32188	.09842
#1	2605.0	4647.3	71219.	7344.1
#2	2599.3	4641.8	71544.	7354.3

Sample Name: 480-48970-F-2-A@2 Acquired: 11/14/2013 17:16:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00243**	**9.5991**	**.00444**	**8.7907**	**.00808**
Stddev	.00012	.0463	.00001	.0094	.00002
%RSD	5.0853	.48206	.25190	.10733	.28796
#1	.00235	9.5664	.00443	8.7974	.00810
#2	.00252	9.6318	.00445	8.7840	.00807
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00433**	**243.64**	**.00012**	**.11408**	**.00146**
Stddev	.00002	.23	.00004	.00046	.00064
%RSD	.37098	.09324	33.236	.40520	44.003
#1	.00432	243.48	.00015	.11375	.00192
#2	.00434	243.80	.00009	.11441	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00192**	**264.39**	**11.262**	**15.416**	**.02285**
Stddev	.00024	.24	.032	.084	.00000
%RSD	12.329	.09170	.28366	.54278	.00307
#1	.00175	264.22	11.285	15.475	.02285
#2	.00208	264.56	11.240	15.357	.02284
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-2-A@2 Acquired: 11/14/2013 17:16:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**82.558**	F **21.927**	F **24.754**	**-.00372**	**48.220**
Stddev	.085	.006	.001	.00003	.064
%RSD	.10302	.02903	.00596	.84875	.13309
#1	82.619	21.923	24.753	-.00370	48.174
#2	82.498	21.932	24.755	-.00374	48.265
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.17330**	**.02168**	F **422.7**	**-.00707**	**.00837**
Stddev	.00087	.00165	.3	.00282	.00162
%RSD	.50342	7.6207	.0777	39.820	19.322
#1	.17392	.02051	423.0	-.00508	.00723
#2	.17268	.02285	422.5	-.00906	.00951
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.8992**	**.00318**	**1.0426**	**.00071**	**.00823**
Stddev	.0344	.00011	.0012	.00036	.00186
%RSD	.38609	3.3940	.11161	50.756	22.653
#1	8.8750	.00311	1.0418	.00045	.00691
#2	8.9235	.00326	1.0434	.00096	.00954
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48970-F-2-A@2 Acquired: 11/14/2013 17:16:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00624**	**.37991**
Stddev	.00030	.00009
%RSD	4.8237	.02494
#1	.00645	.37984
#2	.00603	.37997
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2880.4**	**4676.6**	**71762.**	**7222.3**
Stddev	1.8	.2	34.	17.3
%RSD	.06147	.00424	.04688	.23905
#1	2881.7	4676.8	71786.	7234.5
#2	2879.2	4676.5	71739.	7210.1

Sample Name: 480-48976-C-1-A Acquired: 11/14/2013 17:19:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00707**	**.21748**	**.13420**	F **92.915**	**.09409**
Stddev	.00041	.00606	.00007	.087	.00000
%RSD	5.8669	2.7886	.05363	.09407	.00423
#1	.00736	.22177	.13415	92.853	.09410
#2	.00678	.21319	.13426	92.977	.09409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				20.000	
Low Limit				-.02000	

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	F **1561.4**	**.01346**	**.00101**	**.00855**
Stddev	.00013	5.0	.00027	.00014	.00032
%RSD	31.923	.31796	1.9979	14.099	3.7560
#1	.00051	1564.9	.01327	.00111	.00878
#2	.00032	1557.9	.01365	.00091	.00832
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		1000.0			
Low Limit		-.50000			

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00323**	**.90530**	**202.43**	^ *****	**1.2335**
Stddev	.00022	.00264	.48	-----	.0011
%RSD	6.6897	.29204	.23765	-----	.09073
#1	.00338	.90343	202.77	^ -----	1.2328
#2	.00308	.90717	202.09	^ -----	1.2343
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48976-C-1-A Acquired: 11/14/2013 17:19:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**114.03**	F **34.158**	F **44.735**	**.00053**	**161.16**
Stddev	.39	.051	.183	.00011	.76
%RSD	.33980	.14920	.40918	20.849	.47078
#1	114.31	34.122	44.864	.00045	161.69
#2	113.76	34.194	44.606	.00061	160.62
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00700**	**-.00080**	F **629.1**	**-.00199**	**.24200**
Stddev	.00034	.00158	.3	.00067	.00264
%RSD	4.7860	196.91	.0489	33.436	1.0906
#1	.00724	.00032	628.9	-.00246	.24013
#2	.00677	-.00192	629.3	-.00152	.24386
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.3265**	**.00140**	F **12.694**	**.00528**	**.01443**
Stddev	.0347	.00041	.014	.00030	.00196
%RSD	.54829	29.128	.10940	5.6538	13.573
#1	6.3510	.00169	12.704	.00549	.01582
#2	6.3019	.00111	12.684	.00507	.01305
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.000		
Low Limit			-.00500		

Sample Name: 480-48976-C-1-A Acquired: 11/14/2013 17:19:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00161	.02418
Stddev	.00017	.00015
%RSD	10.793	.63317
#1	.00173	.02407
#2	.00149	.02429
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2466.7	4055.1	60969.	6880.9
Stddev	2.8	3.0	120.	18.8
%RSD	.11294	.07364	.19602	.27352
#1	2468.7	4057.2	60884.	6867.6
#2	2464.8	4053.0	61053.	6894.3

Sample Name: 480-49393-C-1-C Acquired: 11/14/2013 17:21:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**1.8631**	**.01292**	**.58440**	**.14123**
Stddev	.00020	.0124	.00366	.00868	.00050
%RSD	117.92	.66841	28.331	1.4859	.35596
#1	-.00003	1.8719	.01551	.59054	.14088
#2	-.00031	1.8542	.01033	.57826	.14159
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00100**	**231.25**	**.00148**	**.00752**	**.00459**
Stddev	.00005	1.08	.00015	.00008	.00018
%RSD	4.4838	.46732	10.073	1.0172	3.8782
#1	.00104	232.01	.00159	.00757	.00472
#2	.00097	230.48	.00138	.00746	.00447
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00320**	**1.6661**	**21.179**	**38.296**	**.03143**
Stddev	.00018	.0010	.129	.035	.00087
%RSD	5.6271	.06073	.61029	.09063	2.7770
#1	.00332	1.6669	21.270	38.321	.03205
#2	.00307	1.6654	21.087	38.272	.03082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-C-1-C Acquired: 11/14/2013 17:21:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**82.052**	**.88081**	**1.0085**	**.00845**	**2193.7**
Stddev	.327	.00274	.0021	.00003	5.6
%RSD	.39903	.31097	.21001	.38589	.25344
#1	81.821	.87887	1.0070	.00847	2197.6
#2	82.284	.88274	1.0100	.00843	2189.7
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01434**	**.01184**	F **20.12**	**-.00509**	**.00311**
Stddev	.00050	.00066	.03	.00155	.00161
%RSD	3.4722	5.5852	.1673	30.371	51.729
#1	.01470	.01138	20.09	-.00618	.00197
#2	.01399	.01231	20.14	-.00400	.00424
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**22.916**	**.00245**	**.79149**	**.04601**	**-.00299**
Stddev	.032	.00018	.00295	.00100	.00312
%RSD	.14037	7.4160	.37294	2.1794	104.57
#1	22.939	.00232	.79358	.04672	-.00078
#2	22.893	.00258	.78941	.04531	-.00520
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-C-1-C Acquired: 11/14/2013 17:21:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01771	.07894
Stddev	.00018	.00088
%RSD	1.0117	1.1160
#1	.01758	.07956
#2	.01784	.07832
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2470.9	4151.3	59993.	6956.4
Stddev	.7	3.0	261.	8.0
%RSD	.02641	.07316	.43547	.11526
#1	2470.4	4149.2	60178.	6950.8
#2	2471.4	4153.4	59808.	6962.1

Sample Name: CCV Acquired: 11/14/2013 17:24:24 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49608**	**25.400**	**.50714**	F **.55419**	**.51480**	**.49220**	**24.830**
Stddev	.00233	.075	.00193	.00244	.00053	.00059	.047
%RSD	.47061	.29672	.38148	.44041	.10383	.12062	.19107
#1	.49443	25.347	.50578	.55592	.51517	.49178	24.797
#2	.49773	25.453	.50851	.55247	.51442	.49262	24.864
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				.50000			
Range				10.000%			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48946**	**.48756**	**.51058**	**.51118**	**23.999**	**26.424**	**27.368**
Stddev	.00028	.00052	.00053	.00130	.028	.004	.307
%RSD	.05742	.10662	.10441	.25388	.11851	.01522	1.1207
#1	.48926	.48720	.51096	.51026	23.979	26.427	27.151
#2	.48966	.48793	.51020	.51210	24.019	26.421	27.585
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52420**	**24.055**	**.50154**	**.46811**	**.49455**	**26.336**	**.49001**
Stddev	.00047	.053	.00069	.00075	.00120	.021	.00068
%RSD	.08905	.22190	.13820	.15966	.24294	.07784	.13934
#1	.52387	24.093	.50203	.46864	.49370	26.351	.48952
#2	.52453	24.017	.50105	.46758	.49540	26.322	.49049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 17:24:24 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49007	24.92	.51042	.50207	24.891	.49596	.49509
Stddev	.00243	.08	.00067	.00107	.204	.00171	.00050
%RSD	.49681	.3353	.13053	.21284	.81974	.34495	.10138
#1	.49179	24.86	.50995	.50282	24.747	.49475	.49545
#2	.48835	24.98	.51089	.50131	25.035	.49717	.49474
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49863	.49608	.50446	.49415
Stddev	.00161	.00391	.00076	.00248
%RSD	.32249	.78729	.15108	.50105
#1	.49976	.49332	.50500	.49590
#2	.49749	.49884	.50392	.49240
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3189.3	4837.6	73782.	6899.7
Stddev	4.7	2.7	89.	16.1
%RSD	.14833	.05590	.12122	.23266
#1	3192.7	4839.5	73718.	6911.1
#2	3186.0	4835.7	73845.	6888.4

Sample Name: CCB Acquired: 11/14/2013 17:26:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**-.00571**	**-.00207**	F **.04573**	**.00000**	**-.00006**	**-.00207**
Stddev	.00030	.00086	.00075	.00194	.00000	.00001	.00413
%RSD	82.091	15.017	36.323	4.2527	92.331	15.891	199.78
#1	-.00057	-.00510	-.00260	.04710	.00000	-.00007	-.00499
#2	-.00015	-.00632	-.00154	.04435	.00000	-.00005	.00085
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				.02000			
Low Limit				-.02000			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**-.00001**	**.00004**	**-.00004**	**-.00048**	**.09039**	**.00474**
Stddev	.00008	.00001	.00011	.00006	.00163	.10637	.00015
%RSD	80.904	103.20	264.94	162.03	338.60	117.68	3.2068
#1	-.00015	-.00000	.00012	-.00008	-.00164	.01517	.00463
#2	-.00004	-.00001	-.00004	.00001	.00067	.16560	.00484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**-.00487**	**-.00006**	**.00063**	**-.00013**	**.08692**	**-.00016**
Stddev	.00060	.00030	.00002	.00045	.00020	.00595	.00052
%RSD	119.48	6.1933	41.566	71.503	155.03	6.8469	315.67
#1	.00008	-.00508	-.00004	.00094	.00001	.09113	.00020
#2	.00093	-.00466	-.00007	.00031	-.00027	.08271	-.00053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 17:26:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	F **.0130**	**-.00080**	**-.00013**	**.02777**	**-.00006**	**.00003**
Stddev	.00019	.0014	.00038	.00195	.01214	.00028	.00008
%RSD	47.824	10.88	47.598	1480.8	43.708	468.35	274.31
#1	-.00053	.0140	-.00107	.00125	.03635	-.00026	-.00003
#2	-.00026	.0120	-.00053	-.00151	.01918	.00014	.00008
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00028**	**-.00125**	**-.00006**	**.00007**
Stddev	.00012	.00006	.00011	.00002
%RSD	42.076	4.4570	165.31	34.499
#1	.00036	-.00129	.00001	.00005
#2	.00020	-.00121	-.00014	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3403.9**	**4937.3**	**77454.**	**6950.1**
Stddev	1.7	2.5	216.	25.5
%RSD	.04968	.05039	.27831	.36700
#1	3405.1	4939.1	77301.	6932.0
#2	3402.7	4935.5	77606.	6968.1

Sample Name: ccvl Acquired: 11/14/2013 17:29:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00264**	**.21016**	**.00969**	F **.05496**	**.00214**	**.00196**	**.50202**
Stddev	.00004	.00547	.00049	.00074	.00000	.00001	.00322
%RSD	1.3366	2.6014	5.1024	1.3530	.10271	.44320	.64164
#1	.00266	.20629	.01004	.05548	.00213	.00197	.49974
#2	.00261	.21402	.00934	.05443	.00214	.00196	.50430
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				.02000			
Range				50.000%			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**.00399**	**.00358**	**.01012**	**.04431**	**.49303**	**.45492**
Stddev	.00019	.00005	.00005	.00013	.00036	.00698	.00089
%RSD	20.332	1.3790	1.4024	1.2770	.82305	1.4149	.19523
#1	.00080	.00395	.00355	.01021	.04405	.49797	.45555
#2	.00106	.00402	.00362	.01003	.04457	.48810	.45429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02972**	**.20263**	**.00328**	**.00319**	**.00945**	**1.0289**	**.01033**
Stddev	.00144	.00074	.00002	.00032	.00008	.0088	.00014
%RSD	4.8465	.36713	.75140	10.141	.88443	.85809	1.3741
#1	.03074	.20316	.00330	.00341	.00951	1.0227	.01023
#2	.02870	.20210	.00326	.00296	.00939	1.0352	.01043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ccvl Acquired: 11/14/2013 17:29:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00368	.2165	.01763	.01128	.48811	.00917	.00485
Stddev	.00069	.0017	.00059	.00044	.00731	.00009	.00006
%RSD	18.633	.7718	3.3469	3.8674	1.4984	.94826	1.2200
#1	.00416	.2177	.01721	.01159	.48294	.00911	.00489
#2	.00319	.2154	.01805	.01098	.49329	.00923	.00481
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00490	.01888	.00487	.01036
Stddev	.00024	.00074	.00016	.00012
%RSD	4.8351	3.9312	3.2775	1.1811
#1	.00506	.01836	.00476	.01027
#2	.00473	.01941	.00499	.01045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3434.8	5024.9	77943.	7096.0
Stddev	14.0	31.9	297.	29.6
%RSD	.40646	.63414	.38102	.41681
#1	3444.7	5047.5	78152.	7116.9
#2	3424.9	5002.4	77733.	7075.1

Sample Name: 480-49393-B-4-C Acquired: 11/14/2013 17:31:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**2.0069**	**.01149**	**.40410**	**.26002**
Stddev	.00014	.0117	.00173	.00003	.00094
%RSD	127.28	.58340	15.093	.00730	.36138
#1	.00021	1.9986	.01027	.40412	.25936
#2	.00001	2.0151	.01272	.40408	.26069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00162**	**247.27**	**.00124**	**.00665**	**.00610**
Stddev	.00004	.00	.00007	.00010	.00018
%RSD	2.7011	.00121	5.7297	1.5375	2.9680
#1	.00159	247.27	.00119	.00658	.00623
#2	.00165	247.27	.00129	.00673	.00597
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01013**	**1.3697**	**16.960**	**33.054**	**.03785**
Stddev	.00046	.0189	.080	.193	.00059
%RSD	4.5084	1.3769	.47403	.58363	1.5587
#1	.00981	1.3830	16.903	33.191	.03743
#2	.01045	1.3563	17.017	32.918	.03826
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-B-4-C Acquired: 11/14/2013 17:31:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**73.622**	**1.6877**	**1.9117**	**.00751**	**2158.7**
Stddev	.021	.0016	.0001	.00001	1.6
%RSD	.02867	.09492	.00435	.16156	.07236
#1	73.637	1.6889	1.9117	.00752	2159.8
#2	73.607	1.6866	1.9118	.00750	2157.6
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01110**	**.04057**	**9.493**	**-.00297**	**.00744**
Stddev	.00012	.00127	.039	.00090	.00343
%RSD	1.0794	3.1185	.4105	30.222	46.111
#1	.01119	.04146	9.521	-.00233	.00986
#2	.01102	.03967	9.466	-.00360	.00501
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**41.267**	**.00194**	**.74629**	**.03344**	**-.00534**
Stddev	.150	.00009	.00331	.00040	.00185
%RSD	.36366	4.4460	.44377	1.1852	34.659
#1	41.373	.00200	.74863	.03372	-.00403
#2	41.161	.00187	.74394	.03316	-.00665
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-B-4-C Acquired: 11/14/2013 17:31:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01591	.08172
Stddev	.00003	.00032
%RSD	.16757	.39050
#1	.01589	.08195
#2	.01593	.08150
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2472.8	4167.0	60155.	6922.7
Stddev	1.4	6.5	41.	2.5
%RSD	.05693	.15697	.06855	.03623
#1	2473.7	4171.6	60184.	6920.9
#2	2471.8	4162.3	60125.	6924.5

Sample Name: 480-48472-B-3-A@100 Acquired: 11/14/2013 17:34:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00026**	**.69116**	F **-.02459**	**.02661**	**.01310**
Stddev	.00061	.02754	.00229	.00066	.00002
%RSD	230.89	3.9841	9.3122	2.4904	.11908
#1	.00070	.67169	-.02621	.02708	.01309
#2	-.00017	.71063	-.02297	.02614	.01312
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**5.2717**	**.00096**	**.07639**	**.79132**
Stddev	.00005	.0050	.00000	.00008	.00232
%RSD	57.026	.09523	.51751	.10419	.29300
#1	.00011	5.2753	.00096	.07644	.78968
#2	.00005	5.2682	.00096	.07633	.79296
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10266**	**15.021**	**.10777**	**.05416**	**.00202**
Stddev	.00039	.015	.02302	.00022	.00009
%RSD	.37922	.09926	21.362	.40425	4.6645
#1	.10238	15.032	.12405	.05401	.00209
#2	.10293	15.011	.09149	.05431	.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-B-3-A@100 Acquired: 11/14/2013 17:34:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.43744**	**.10868**	**.09491**	**.06992**	**.22089**
Stddev	.00370	.00030	.00116	.00008	.01854
%RSD	.84474	.27229	1.2222	.10993	8.3945
#1	.43483	.10847	.09409	.06998	.23400
#2	.44006	.10889	.09573	.06987	.20778
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.91448**	**.04345**	**.0699**	**-.00661**	**.00032**
Stddev	.00176	.00176	.0033	.00032	.00062
%RSD	.19193	4.0439	4.725	4.8046	196.86
#1	.91573	.04469	.0722	-.00684	-.00012
#2	.91324	.04220	.0676	-.00639	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31014**	**.00684**	**.00968**	**.04897**	**-.00154**
Stddev	.01378	.00028	.00027	.00002	.00105
%RSD	4.4431	4.0585	2.8171	.04747	68.322
#1	.30040	.00704	.00949	.04899	-.00080
#2	.31988	.00665	.00987	.04895	-.00228
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-B-3-A@100 Acquired: 11/14/2013 17:34:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01157	.11567
Stddev	.00004	.00064
%RSD	.31518	.54918
#1	.01154	.11612
#2	.01159	.11522
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3376.1	4934.4	76229.	6881.9
Stddev	5.1	.5	64.	14.5
%RSD	.15110	.00978	.08411	.21017
#1	3372.5	4934.0	76274.	6871.6
#2	3379.7	4934.7	76184.	6892.1

Sample Name: 48472-B-3-A sd@500 Acquired: 11/14/2013 17:36:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.13775**	**-.00558**	**.02116**	**.00265**
Stddev	.00025	.01553	.00089	.00025	.00000
%RSD	332.18	11.272	15.857	1.1693	.14027
#1	-.00025	.12677	-.00621	.02133	.00266
#2	.00010	.14873	-.00496	.02098	.00265
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**1.0258**	**.00020**	**.01510**	**.15246**
Stddev	.00001	.0032	.00016	.00001	.00004
%RSD	22.382	.31637	77.308	.07351	.02512
#1	.00003	1.0235	.00009	.01509	.15249
#2	.00002	1.0281	.00031	.01510	.15243
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02006**	**2.9633**	**.05391**	**.01290**	**.00048**
Stddev	.00011	.0067	.05944	.00007	.00007
%RSD	.55072	.22492	110.25	.55797	14.759
#1	.01998	2.9585	.09594	.01285	.00053
#2	.02014	2.9680	.01188	.01295	.00043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-A sd@500 Acquired: 11/14/2013 17:36:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.08441**	**.02139**	**.01942**	**.01345**	**.09910**
Stddev	.00209	.00008	.00103	.00015	.00435
%RSD	2.4762	.38532	5.3127	1.0967	4.3936
#1	.08293	.02145	.02015	.01335	.10218
#2	.08588	.02133	.01869	.01356	.09602
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18129**	**.00728**	**.0176**	**-.00205**	**.00041**
Stddev	.00040	.00159	.0013	.00016	.00156
%RSD	.21882	21.881	7.344	8.0383	377.11
#1	.18101	.00615	.0167	-.00217	.00152
#2	.18157	.00840	.0185	-.00194	-.00069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05590**	**.00128**	**.00190**	**.00933**	**-.00487**
Stddev	.00483	.00042	.00010	.00070	.00076
%RSD	8.6449	32.800	5.1245	7.5532	15.600
#1	.05248	.00158	.00183	.00983	-.00540
#2	.05932	.00098	.00197	.00883	-.00433
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-A sd@500 Acquired: 11/14/2013 17:36:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00230**	**.02267**
Stddev	.00014	.00051
%RSD	5.9079	2.2309
#1	.00220	.02231
#2	.00239	.02302
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3387.4**	**4942.0**	**77532.**	**6980.5**
Stddev	6.1	12.7	116.	10.3
%RSD	.18059	.25637	.14976	.14697
#1	3391.7	4951.0	77450.	6987.8
#2	3383.0	4933.1	77614.	6973.3

Sample Name: 48472-B-3-A pds@100 Acquired: 11/14/2013 17:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.06064**	**17.459**	**.34529**	**.28774**	**.32826**
Stddev	.00099	.086	.01101	.01019	.00348
%RSD	1.6378	.49134	3.1896	3.5417	1.0601
#1	.06134	17.520	.35308	.29494	.33072
#2	.05994	17.398	.33751	.28053	.32580
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.42331**	**25.600**	**.37711**	**.46316**	**1.1629**
Stddev	.00165	.079	.00769	.00699	.0017
%RSD	.39040	.30781	2.0391	1.5095	.14337
#1	.42447	25.656	.38255	.46811	1.1617
#2	.42214	25.544	.37168	.45822	1.1641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.50822**	**35.007**	**15.462**	**15.459**	**.32884**
Stddev	.00242	.007	.277	.514	.00304
%RSD	.47669	.01987	1.7884	3.3254	.92319
#1	.50993	35.002	15.657	15.822	.33099
#2	.50650	35.012	15.266	15.095	.32669
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-A pds@100 Acquired: 11/14/2013 17:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.970**	**.50595**	**.47762**	**.46985**	**15.742**
Stddev	.146	.00219	.00015	.00813	.289
%RSD	.69676	.43361	.03184	1.7309	1.8381
#1	21.073	.50750	.47751	.47560	15.947
#2	20.867	.50440	.47773	.46410	15.538
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.2662**	**.42494**	**.0597**	**.36774**	**.36988**
Stddev	.0059	.00857	.0036	.00709	.00823
%RSD	.46657	2.0172	5.960	1.9286	2.2264
#1	1.2703	.43100	.0622	.37276	.37570
#2	1.2620	.41888	.0572	.36273	.36406
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.297**	**.24443**	**.32543**	**.44503**	**.34443**
Stddev	.118	.00394	.00319	.00133	.01319
%RSD	.96307	1.6114	.98004	.29810	3.8294
#1	12.381	.24722	.32769	.44597	.35376
#2	12.213	.24165	.32318	.44409	.33511
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-A pds@100 Acquired: 11/14/2013 17:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.43862**	**.50768**
Stddev	.00199	.00025
%RSD	.45349	.04851
#1	.44003	.50785
#2	.43722	.50751
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3234.8**	**4879.4**	**74939.**	**6990.8**
Stddev	4.3	2.8	337.	7.9
%RSD	.13194	.05712	.45022	.11276
#1	3237.8	4877.4	75178.	6996.4
#2	3231.7	4881.4	74701.	6985.3

Sample Name: 48472-B-3-B MS@100 Acquired: 11/14/2013 17:41:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00149	1.0617	.00021	.02407	.02152
Stddev	.00026	.0215	.00301	.00050	.00003
%RSD	17.131	2.0250	1407.4	2.0571	.14652
#1	.00131	1.0465	-.00191	.02372	.02150
#2	.00167	1.0769	.00234	.02442	.02154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00423	3.1621	.00473	.02668	.13918
Stddev	.00005	.0012	.00013	.00009	.00082
%RSD	1.1856	.03887	2.8507	.34653	.58986
#1	.00419	3.1630	.00482	.02662	.13860
#2	.00427	3.1613	.00463	.02675	.13976
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20374	24.017	.29833	.25717	.00558
Stddev	.00051	.012	.02456	.00100	.00029
%RSD	.24838	.05043	8.2310	.38718	5.2691
#1	.20338	24.026	.31569	.25787	.00537
#2	.20409	24.009	.28097	.25646	.00579
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-B MS@100 Acquired: 11/14/2013 17:41:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.54947**	**.20179**	**.17787**	**.05036**	**.27663**
Stddev	.00295	.00015	.00075	.00017	.00431
%RSD	.53649	.07368	.41932	.33886	1.5581
#1	.55155	.20190	.17734	.05024	.27358
#2	.54738	.20169	.17839	.05048	.27968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23178**	**.05384**	**.2537**	**.00063**	**.00273**
Stddev	.00010	.00041	.0023	.00074	.00013
%RSD	.04357	.76602	.9081	117.38	4.9431
#1	.23185	.05414	.2520	.00116	.00283
#2	.23171	.05355	.2553	.00011	.00263
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.29538**	**.01683**	**.01315**	**.06916**	**-.00062**
Stddev	.02003	.00055	.00008	.00017	.00126
%RSD	6.7827	3.2902	.57822	.24057	205.15
#1	.28122	.01644	.01310	.06928	.00028
#2	.30955	.01722	.01321	.06904	-.00151
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-B MS@100 Acquired: 11/14/2013 17:41:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01687**	**.14011**
Stddev	.00027	.00028
%RSD	1.6262	.19776
#1	.01668	.13991
#2	.01707	.14030
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3368.6**	**4941.1**	**76982.**	**7012.8**
Stddev	.6	.3	54.	30.6
%RSD	.01819	.00573	.07033	.43633
#1	3368.2	4941.3	76944.	6991.2
#2	3369.0	4940.9	77021.	7034.4

Sample Name: 48472-B-3-C MSD@100 Acquired: 11/14/2013 17:43:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00082**	**3.5286**	**-.00319**	**.11318**	**.22189**
Stddev	.00051	.0237	.00010	.00032	.00087
%RSD	62.634	.67064	3.2866	.28049	.39286
#1	.00118	3.5454	-.00312	.11341	.22250
#2	.00046	3.5119	-.00327	.11296	.22127
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00319**	**5.7752**	**.00484**	**.08309**	**.17923**
Stddev	.00001	.0145	.00007	.00027	.00128
%RSD	.37319	.25142	1.5332	.32357	.71139
#1	.00318	5.7855	.00489	.08328	.18013
#2	.00320	5.7649	.00479	.08290	.17833
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19398**	**14.492**	**.32763**	**.29499**	**.00423**
Stddev	.00179	.000	.01677	.00108	.00034
%RSD	.92335	.00319	5.1185	.36691	8.0163
#1	.19525	14.492	.31577	.29575	.00399
#2	.19272	14.492	.33949	.29422	.00447
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-C MSD@100 Acquired: 11/14/2013 17:43:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.94616**	**.17643**	**.15492**	**.04728**	**.39835**
Stddev	.00341	.00004	.00050	.00028	.00438
%RSD	.36088	.02027	.32316	.58528	1.0990
#1	.94375	.17641	.15527	.04748	.40144
#2	.94858	.17646	.15456	.04709	.39525
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.64774**	**.07701**	**.2421**	**.00273**	**.00099**
Stddev	.00330	.00017	.0013	.00022	.00405
%RSD	.51010	.21972	.5489	7.9921	408.71
#1	.64540	.07713	.2412	.00258	.00386
#2	.65008	.07689	.2430	.00289	-.00187
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.28182**	**.00968**	**.01636**	**.05532**	**.00133**
Stddev	.01429	.00034	.00007	.00081	.00276
%RSD	5.0708	3.4709	.44680	1.4706	208.13
#1	.29192	.00944	.01631	.05474	.00328
#2	.27171	.00991	.01641	.05589	-.00063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-B-3-C MSD@100 Acquired: 11/14/2013 17:43:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01501	.40406
Stddev	.00017	.00047
%RSD	1.1290	.11676
#1	.01513	.40372
#2	.01489	.40439
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3374.7	4953.3	76650.	6967.1
Stddev	2.6	.4	85.	.1
%RSD	.07568	.00780	.11125	.00213
#1	3376.5	4953.0	76590.	6966.9
#2	3372.9	4953.6	76710.	6967.2

Sample Name: 480-48472-A-4-A@100 Acquired: 11/14/2013 17:45:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**.40758**	F **-.14594**	**.01466**	**.02594**
Stddev	.00000	.02297	.00340	.00029	.00002
%RSD	.43583	5.6352	2.3330	1.9600	.08848
#1	.00058	.39134	-.14353	.01486	.02595
#2	.00058	.42382	-.14835	.01445	.02592
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	**6.5947**	**.00110**	**.02611**	**4.4671**
Stddev	.00003	.0070	.00009	.00003	.0003
%RSD	2342.8	.10560	8.0275	.12135	.00730
#1	-.00002	6.5898	.00116	.02613	4.4673
#2	.00002	6.5997	.00104	.02609	4.4668
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14269**	**21.135**	**.07151**	**.05436**	**.00037**
Stddev	.00036	.009	.00045	.00097	.00030
%RSD	.25145	.04419	.63545	1.7806	80.822
#1	.14294	21.142	.07183	.05505	.00057
#2	.14244	21.129	.07119	.05368	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-A-4-A@100 Acquired: 11/14/2013 17:45:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.69995**	**.46026**	**.40716**	**.10511**	**.05937**
Stddev	.00378	.00025	.00060	.00025	.00788
%RSD	.54005	.05493	.14796	.24193	13.278
#1	.69728	.46008	.40759	.10528	.05380
#2	.70262	.46044	.40674	.10493	.06495
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2372**	**.05058**	**.0489**	F **-.02452**	**.00081**
Stddev	.0043	.00183	.0015	.00253	.00135
%RSD	.19428	3.6132	3.037	10.308	167.98
#1	2.2403	.04929	.0499	-.02273	.00176
#2	2.2342	.05187	.0478	-.02631	-.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				50.000	
Low Limit				-.02000	

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18345**	**.01289**	**.01082**	**.01137**	**-.00202**
Stddev	.00272	.00067	.00014	.00018	.00092
%RSD	1.4821	5.2350	1.2817	1.6211	45.637
#1	.18538	.01336	.01072	.01124	-.00137
#2	.18153	.01241	.01092	.01150	-.00268
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-A-4-A@100 Acquired: 11/14/2013 17:45:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.02910	.10357
Stddev	.00009	.00062
%RSD	.31527	.59807
#1	.02904	.10401
#2	.02917	.10313
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3371.2	4933.2	76503.	6988.1
Stddev	1.2	2.7	51.	11.9
%RSD	.03508	.05479	.06702	.17094
#1	3370.3	4935.1	76467.	6979.7
#2	3372.0	4931.3	76539.	6996.6

Sample Name: 480-48472-A-4-A@200 Acquired: 11/14/2013 17:48:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**.21469**	F **-.07017**	**.01245**	**.01274**
Stddev	.00016	.00981	.00142	.00004	.00001
%RSD	1664.7	4.5712	2.0231	.35246	.07997
#1	-.00010	.20775	-.07117	.01248	.01274
#2	.00012	.22163	-.06916	.01242	.01273
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**3.2187**	**.00047**	**.01268**	**2.1716**
Stddev	.00002	.0083	.00004	.00001	.0035
%RSD	61.861	.25822	9.5628	.10953	.16232
#1	-.00002	3.2128	.00050	.01269	2.1691
#2	-.00006	3.2246	.00044	.01267	2.1741
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.06937**	**10.261**	**.05990**	**.02724**	**.00158**
Stddev	.00020	.036	.03305	.00022	.00012
%RSD	.28246	.34959	55.170	.79712	7.6402
#1	.06951	10.236	.03653	.02739	.00166
#2	.06923	10.287	.08327	.02708	.00149
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-A-4-A@200 Acquired: 11/14/2013 17:48:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.34067**	**.22435**	**.19711**	**.05075**	**.04710**
Stddev	.00056	.00036	.00000	.00019	.00119
%RSD	.16366	.16122	.00084	.37722	2.5224
#1	.34106	.22409	.19711	.05061	.04794
#2	.34027	.22461	.19711	.05088	.04626
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0854**	**.02436**	**.0254**	**-.01487**	**.00083**
Stddev	.0014	.00063	.0021	.00074	.00283
%RSD	.12758	2.5657	8.330	4.9599	340.39
#1	1.0844	.02392	.0239	-.01539	.00283
#2	1.0864	.02481	.0269	-.01435	-.00117
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.10149**	**.00661**	**.00517**	**.00548**	**.00002**
Stddev	.00578	.00020	.00006	.00009	.00112
%RSD	5.6934	3.0071	1.1434	1.6093	5654.3
#1	.10557	.00675	.00512	.00554	-.00077
#2	.09740	.00647	.00521	.00542	.00081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-A-4-A@200 Acquired: 11/14/2013 17:48:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01412**	**.05004**
Stddev	.00027	.00029
%RSD	1.9007	.57499
#1	.01393	.04983
#2	.01431	.05024
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3389.0**	**4950.1**	**77083.**	**6976.3**
Stddev	9.9	7.7	36.	2.4
%RSD	.29070	.15557	.04636	.03447
#1	3396.0	4955.6	77057.	6978.0
#2	3382.0	4944.7	77108.	6974.6

Sample Name: 480-48453-E-5-A Acquired: 11/14/2013 17:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.02084**	**.01394**	**.33486**	**.51445**
Stddev	.00038	.00948	.00075	.00020	.00154
%RSD	43.826	45.509	5.3547	.05882	.29841
#1	.00113	.01414	.01342	.33500	.51553
#2	.00059	.02755	.01447	.33472	.51336
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**132.13**	**.00004**	**.00208**	**.00095**
Stddev	.00002	.12	.00006	.00000	.00036
%RSD	30.701	.08965	147.13	.07682	37.527
#1	.00007	132.05	-.00000	.00208	.00070
#2	.00005	132.22	.00009	.00208	.00120
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00142**	**37.262**	**7.3369**	**9.7933**	**.02326**
Stddev	.00003	.012	.0046	.0669	.00000
%RSD	1.8576	.03173	.06246	.68367	.01593
#1	.00140	37.253	7.3402	9.8407	.02326
#2	.00144	37.270	7.3337	9.7460	.02326
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-E-5-A Acquired: 11/14/2013 17:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**35.617**	**4.1398**	**4.0481**	**.00181**	**67.317**
Stddev	.071	.0055	.0041	.00012	.311
%RSD	.19888	.13334	.10055	6.6334	.46220
#1	35.566	4.1359	4.0452	.00172	67.537
#2	35.667	4.1437	4.0509	.00189	67.097
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00809**	F **-.00784**	F **11.91**	**-.00440**	**-.00192**
Stddev	.00010	.00066	.02	.00068	.00042
%RSD	1.2219	8.4346	.1385	15.391	21.788
#1	.00802	-.00738	11.90	-.00488	-.00163
#2	.00816	-.00831	11.92	-.00392	-.00222
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**32.739**	**.00064**	**1.0763**	**.00068**	**.00075**
Stddev	.051	.00005	.0046	.00010	.00097
%RSD	.15730	7.3066	.42336	14.377	129.94
#1	32.775	.00061	1.0795	.00061	.00144
#2	32.702	.00068	1.0731	.00075	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-E-5-A Acquired: 11/14/2013 17:50:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00049**	**.00447**
Stddev	.00022	.00004
%RSD	45.149	.79574
#1	.00034	.00450
#2	.00065	.00444
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3062.3**	**4673.4**	**71833.**	**7005.7**
Stddev	6.7	8.5	278.	22.8
%RSD	.21973	.18212	.38638	.32478
#1	3067.0	4679.4	72030.	7021.8
#2	3057.5	4667.4	71637.	6989.6

Sample Name: CCV Acquired: 11/14/2013 17:53:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49430**	**25.226**	**.50227**	**.49819**	**.51276**	**.48685**	**24.785**
Stddev	.00122	.108	.00624	.00013	.00136	.00070	.032
%RSD	.24743	.42669	1.2418	.02560	.26432	.14329	.13050
#1	.49516	25.302	.49786	.49810	.51372	.48635	24.808
#2	.49343	25.150	.50668	.49828	.51180	.48734	24.762
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48777**	**.48354**	**.50644**	**.50474**	**23.819**	**26.257**	**27.282**
Stddev	.00017	.00004	.00125	.00008	.056	.184	.555
%RSD	.03460	.00863	.24596	.01631	.23486	.70164	2.0361
#1	.48765	.48351	.50732	.50480	23.780	26.387	27.675
#2	.48789	.48357	.50556	.50468	23.859	26.126	26.889
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52174**	**23.919**	**.49766**	**.46322**	**.49171**	**26.076**	**.48655**
Stddev	.00204	.043	.00118	.00197	.00043	.214	.00001
%RSD	.39112	.17965	.23751	.42602	.08783	.82082	.00118
#1	.52318	23.949	.49850	.46183	.49201	26.227	.48656
#2	.52030	23.888	.49683	.46462	.49140	25.925	.48655
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 17:53:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48799	24.73	.50442	.49699	24.700	.49494	.49210
Stddev	.00046	.05	.00016	.00746	.034	.00152	.00127
%RSD	.09458	.1934	.03255	1.5018	.13898	.30714	.25714
#1	.48766	24.76	.50431	.49172	24.676	.49387	.49120
#2	.48831	24.70	.50454	.50227	24.724	.49602	.49299
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49891	.49001	.50029	.49306
Stddev	.00133	.00172	.00147	.00445
%RSD	.26625	.35050	.29436	.90287
#1	.49797	.49123	.50133	.49621
#2	.49985	.48880	.49925	.48991
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3193.8	4828.9	73931.	6896.7
Stddev	2.0	1.3	5.	3.2
%RSD	.06416	.02607	.00678	.04711
#1	3192.3	4828.0	73927.	6894.4
#2	3195.2	4829.8	73934.	6899.0

Sample Name: CCB Acquired: 11/14/2013 17:55:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.00615**	**-.00010**	**.00931**	**.00001**	**-.00000**	**-.00188**
Stddev	.00007	.01153	.00176	.00010	.00001	.00003	.00164
%RSD	16.323	187.50	1815.4	1.1132	53.998	4129.7	87.643
#1	-.00037	-.00200	-.00134	.00938	.00002	-.00002	-.00304
#2	-.00047	.01430	.00115	.00923	.00001	.00002	-.00071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.00001**	**-.00061**	**.00011**	**-.00290**	**.01489**	**.00228**
Stddev	.00003	.00011	.00001	.00005	.00306	.01214	.00004
%RSD	32.546	1669.8	1.2334	42.290	105.67	81.539	1.5768
#1	-.00012	-.00007	-.00061	.00015	-.00073	.02347	.00225
#2	-.00007	.00008	-.00060	.00008	-.00506	.00630	.00230
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**-.00177**	**-.00000**	**.00030**	**-.00004**	**.03627**	**.00004**
Stddev	.00040	.00242	.00003	.00054	.00015	.00711	.00021
%RSD	223.96	137.14	820.46	181.58	416.76	19.601	480.18
#1	-.00046	-.00348	-.00003	-.00008	-.00014	.03124	.00019
#2	.00010	-.00005	.00002	.00068	.00007	.04130	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 17:55:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00120**	**.0005**	**-.00190**	**.00174**	**.02114**	**-.00005**	**-.00007**
Stddev	.00143	.0014	.00013	.00054	.01261	.00078	.00006
%RSD	119.60	281.8	6.6903	31.311	59.631	1439.9	78.250
#1	-.00018	.0015	-.00181	.00212	.01223	.00050	-.00011
#2	-.00221	-.0005	-.00199	.00135	.03005	-.00061	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00009**	**-.00079**	**-.00014**	**-.00019**
Stddev	.00014	.00003	.00008	.00024
%RSD	152.68	4.0556	58.929	127.49
#1	.00001	-.00081	-.00008	-.00036
#2	-.00019	-.00076	-.00020	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3416.8**	**4952.3**	**77429.**	**7028.7**
Stddev	1.8	10.2	129.	9.8
%RSD	.05161	.20636	.16614	.13917
#1	3415.6	4945.1	77338.	7021.8
#2	3418.1	4959.6	77520.	7035.6

Sample Name: CCVL Acquired: 11/14/2013 17:58:00 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00262**	**.19412**	W **.00681**	W **.02770**	**.00215**	**.00184**	**.50197**
Stddev	.00023	.01161	.00065	.00047	.00001	.00003	.00415
%RSD	8.9409	5.9819	9.4916	1.6996	.47603	1.4570	.82664
#1	.00279	.18591	.00635	.02736	.00214	.00186	.50490
#2	.00246	.20234	.00727	.02803	.00216	.00182	.49903
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Warn	Chk Pass	Chk Pass	Chk Pass
Value			.01000	.02000			
Range			-30.000%	30.000%			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00087**	**.00408**	**.00342**	**.01017**	**.04575**	**.46372**	**.45870**
Stddev	.00001	.00015	.00023	.00027	.00176	.01979	.00026
%RSD	1.5848	3.6463	6.7260	2.6188	3.8565	4.2669	.05644
#1	.00086	.00397	.00359	.01036	.04700	.44973	.45852
#2	.00087	.00418	.00326	.00998	.04450	.47771	.45889
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02901**	**.20342**	**.00331**	**.00315**	**.00954**	**1.0143**	**.00972**
Stddev	.00122	.00106	.00007	.00040	.00024	.0027	.00059
%RSD	4.2054	.52303	2.0549	12.731	2.5436	.26599	6.0673
#1	.02988	.20267	.00326	.00287	.00937	1.0162	.01014
#2	.02815	.20418	.00336	.00343	.00971	1.0124	.00930
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 17:58:00 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00454	.2019	.01925	.01231	.49446	.00907	.00479
Stddev	.00032	.0000	.00055	.00031	.00568	.00088	.00001
%RSD	7.0002	.0021	2.8793	2.5061	1.1480	9.6518	.25796
#1	.00431	.2019	.01886	.01253	.49847	.00845	.00480
#2	.00476	.2019	.01964	.01210	.49044	.00969	.00479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00499	.01996	.00484	.00996
Stddev	.00015	.00003	.00001	.00021
%RSD	2.9538	.14901	.13571	2.1262
#1	.00489	.01998	.00484	.00981
#2	.00510	.01993	.00485	.01011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3430.2	5019.1	77389.	7091.2
Stddev	6.6	11.7	105.	13.9
%RSD	.19231	.23251	.13538	.19639
#1	3434.9	5027.3	77463.	7081.4
#2	3425.6	5010.8	77315.	7101.1

Sample Name: 480-48453-E-5-A@5 Acquired: 11/14/2013 18:00:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**-.01274**	**.00094**	**.07008**	**.10614**
Stddev	.00040	.00193	.00097	.00026	.00001
%RSD	280.68	15.139	103.48	.36461	.00712
#1	.00042	-.01410	.00163	.07026	.10615
#2	-.00014	-.01137	.00025	.06990	.10614
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**26.582**	**-.00001**	**.00036**	**.00008**
Stddev	.00010	.053	.00009	.00002	.00031
%RSD	140.02	.19838	786.19	5.5853	414.86
#1	-.00000	26.544	-.00007	.00038	-.00015
#2	-.00015	26.619	.00005	.00035	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**7.4170**	**1.3639**	**1.4589**	**.00483**
Stddev	.00001	.0366	.0011	.0032	.00127
%RSD	.82970	.49375	.08223	.22150	26.378
#1	.00064	7.3911	1.3631	1.4566	.00573
#2	.00065	7.4429	1.3647	1.4612	.00393
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-E-5-A@5 Acquired: 11/14/2013 18:00:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.0678**	**.84847**	**.77587**	**.00003**	**13.148**
Stddev	.0040	.00153	.00235	.00027	.055
%RSD	.05662	.18069	.30260	824.74	.41599
#1	7.0650	.84739	.77421	-.00016	13.187
#2	7.0707	.84955	.77753	.00022	13.110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00209**	**-.00137**	**2.240**	**-.00235**	**-.00101**
Stddev	.00041	.00046	.003	.00003	.00181
%RSD	19.835	33.790	.1449	1.2477	179.02
#1	.00180	-.00105	2.237	-.00233	-.00229
#2	.00238	-.00170	2.242	-.00237	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.5226**	**-.00050**	**.21097**	**.00013**	**-.00273**
Stddev	.0115	.00019	.00162	.00025	.00189
%RSD	.17617	38.330	.76759	184.92	69.130
#1	6.5145	-.00063	.20983	.00031	-.00407
#2	6.5307	-.00036	.21212	-.00004	-.00140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-E-5-A@5 Acquired: 11/14/2013 18:00:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00020**	**.00094**
Stddev	.00007	.00015
%RSD	33.607	16.363
#1	.00015	.00105
#2	.00025	.00083
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3296.4**	**4844.9**	**74156.**	**6940.3**
Stddev	4.5	2.8	98.	16.6
%RSD	.13782	.05745	.13229	.23904
#1	3293.2	4842.9	74226.	6952.0
#2	3299.6	4846.8	74087.	6928.5

Sample Name: 480-49577-A-1-E@10 Acquired: 11/14/2013 18:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.01908**	F **-.01545**	**.23621**	**.05954**
Stddev	.00064	.00198	.00082	.00002	.00003
%RSD	1033.8	10.370	5.2960	.00938	.05412
#1	.00051	.02048	-.01603	.23620	.05952
#2	-.00039	.01769	-.01487	.23623	.05957
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**106.57**	**.00112**	**.00969**	**.51327**
Stddev	.00003	.73	.00003	.00005	.00028
%RSD	137.67	.68363	2.2653	.56235	.05402
#1	-.00005	106.06	.00111	.00973	.51347
#2	-.00000	107.09	.00114	.00965	.51307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00327**	**-.00107**	**10.321**	**14.599**	**.00624**
Stddev	.00001	.00377	.058	.003	.00020
%RSD	.40724	352.06	.55741	.01962	3.2500
#1	.00327	.00160	10.281	14.597	.00638
#2	.00326	-.00374	10.362	14.601	.00610
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-A-1-E@10 Acquired: 11/14/2013 18:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3085**	**.06201**	**.06098**	**.01859**	**206.57**
Stddev	.0104	.00017	.00005	.00019	.22
%RSD	.31281	.27946	.08703	1.0438	.10695
#1	3.3158	.06214	.06102	.01873	206.41
#2	3.3011	.06189	.06094	.01846	206.72
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00274**	**-.00353**	**1.905**	**-.00559**	**-.00079**
Stddev	.00045	.00047	.013	.00063	.00038
%RSD	16.471	13.265	.6612	11.344	48.206
#1	.00242	-.00386	1.914	-.00604	-.00106
#2	.00306	-.00320	1.896	-.00514	-.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.7992**	**-.00004**	**.21757**	**.00074**	**-.00184**
Stddev	.0356	.00028	.00023	.00019	.00028
%RSD	.93598	752.94	.10522	25.202	15.372
#1	3.8244	.00016	.21773	.00087	-.00164
#2	3.7741	-.00024	.21740	.00061	-.00204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-A-1-E@10 Acquired: 11/14/2013 18:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00252	.26912
Stddev	.00021	.00154
%RSD	8.2285	.57072
#1	.00238	.27020
#2	.00267	.26803
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3018.0	4623.2	69170.	6952.6
Stddev	3.3	1.4	47.	41.6
%RSD	.10885	.03061	.06858	.59828
#1	3015.7	4622.2	69203.	6982.0
#2	3020.3	4624.2	69136.	6923.2

Sample Name: 480-49577-A-1-E@50 Acquired: 11/14/2013 18:05:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**-.01589**	**-.00275**	**.05080**	**.01234**
Stddev	.00017	.00595	.00285	.00032	.00000
%RSD	94.873	37.431	103.35	.63328	.00304
#1	-.00029	-.01168	-.00074	.05103	.01234
#2	-.00006	-.02010	-.00476	.05058	.01234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**21.374**	**.00019**	**.00186**	**.10270**
Stddev	.00005	.140	.00000	.00007	.00026
%RSD	133.24	.65342	1.4266	3.7004	.24939
#1	-.00008	21.472	.00019	.00191	.10288
#2	-.00000	21.275	.00019	.00181	.10251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00081**	**-.00126**	**1.9138**	**2.1570**	**.00105**
Stddev	.00011	.00292	.0135	.0050	.00102
%RSD	13.783	231.87	.70281	.23098	96.536
#1	.00073	.00081	1.9234	2.1606	.00033
#2	.00089	-.00332	1.9043	2.1535	.00177
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-A-1-E@50 Acquired: 11/14/2013 18:05:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67185**	**.01262**	**.01222**	**.00335**	**41.072**
Stddev	.00178	.00001	.00011	.00007	.186
%RSD	.26527	.09418	.86618	2.0275	.45293
#1	.67311	.01262	.01215	.00330	41.203
#2	.67058	.01263	.01230	.00339	40.940
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**-.00096**	**.3651**	**-.00165**	**-.00282**
Stddev	.00057	.00064	.0015	.00144	.00048
%RSD	1454.9	67.151	.4026	87.472	16.877
#1	.00045	-.00050	.3641	-.00267	-.00248
#2	-.00037	-.00141	.3662	-.00063	-.00315
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.73132**	**-.00070**	**.04401**	**.00016**	**-.00043**
Stddev	.00671	.00018	.00030	.00047	.00088
%RSD	.91813	25.242	.67226	305.02	202.87
#1	.72657	-.00058	.04380	.00049	-.00105
#2	.73607	-.00083	.04421	-.00018	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-A-1-E@50 Acquired: 11/14/2013 18:05:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00042**	**.05344**
Stddev	.00035	.00103
%RSD	82.118	1.9309
#1	.00067	.05271
#2	.00018	.05417
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3285.4**	**4838.5**	**73899.**	**7009.5**
Stddev	7.8	1.2	201.	32.5
%RSD	.23667	.02564	.27186	.46328
#1	3290.9	4839.4	74042.	6986.5
#2	3279.9	4837.6	73757.	7032.5

Sample Name: 480-48966-C-1-B@100 Acquired: 11/14/2013 18:07:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**.01430**	**.00004**	**.00984**	F **10.314**
Stddev	.00010	.00036	.00136	.00057	.027
%RSD	24.129	2.4880	3403.2	5.7561	.26141
#1	-.00034	.01404	.00100	.01024	10.333
#2	-.00048	.01455	-.00092	.00944	10.295
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit					10.000
Low Limit					-.00200

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**14.439**	**-.00042**	**-.00159**	**-.00056**
Stddev	.00001	.033	.00002	.00010	.00028
%RSD	25.097	.22653	5.3683	6.1046	49.299
#1	.00005	14.462	-.00040	-.00152	-.00075
#2	.00003	14.416	-.00043	-.00166	-.00036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**.04451**	**.21862**	**.22658**	**.14023**
Stddev	.00012	.00132	.01223	.00088	.00019
%RSD	34.983	2.9744	5.5962	.39036	.13839
#1	.00044	.04357	.20997	.22596	.14010
#2	.00027	.04544	.22727	.22721	.14037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-C-1-B@100 Acquired: 11/14/2013 18:07:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0169**	**.00618**	**.00630**	**-.00044**	**46.981**
Stddev	.0119	.00000	.00000	.00019	.066
%RSD	1.1659	.02009	.02789	43.709	.13976
#1	1.0253	.00618	.00630	-.00057	47.027
#2	1.0085	.00618	.00630	-.00030	46.934
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**-.00139**	**-.0022**	**-.00151**	**-.00236**
Stddev	.00022	.00031	.0009	.00046	.00158
%RSD	148.74	22.347	42.91	30.792	67.197
#1	.00030	-.00117	-.0028	-.00184	-.00124
#2	-.00001	-.00160	-.0015	-.00118	-.00348
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00164**	**-.00028**	**4.8273**	**-.00009**	**-.00314**
Stddev	.01737	.00037	.0032	.00052	.00080
%RSD	1056.6	132.64	.06545	576.82	25.330
#1	-.01064	-.00054	4.8295	-.00045	-.00370
#2	.01393	-.00002	4.8251	.00028	-.00258
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-C-1-B@100 Acquired: 11/14/2013 18:07:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.00043
Stddev	.00008	.00016
%RSD	1220.4	36.424
#1	.00006	.00032
#2	-.00005	.00054
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3271.7	4844.8	73981.	6998.3
Stddev	2.3	.2	118.	17.6
%RSD	.07112	.00425	.15916	.25203
#1	3273.4	4844.9	73898.	7010.8
#2	3270.1	4844.6	74065.	6985.9

Sample Name: 480-48966-C-1-B@200 Acquired: 11/14/2013 18:10:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00028**	**.00326**	**-.00193**	**.00685**	**5.2023**
Stddev	.00044	.02780	.00233	.00014	.0172
%RSD	157.21	852.43	120.51	2.0180	.33071
#1	.00059	.02292	-.00029	.00694	5.2145
#2	-.00003	-.01640	-.00358	.00675	5.1902
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**7.3012**	**-.00019**	**-.00086**	**-.00026**
Stddev	.00001	.0113	.00004	.00004	.00007
%RSD	27.102	.15434	22.555	4.7394	26.752
#1	-.00006	7.3092	-.00016	-.00084	-.00021
#2	-.00004	7.2932	-.00022	-.00089	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**.01789**	**.11733**	**.10309**	**.06837**
Stddev	.00021	.00191	.01072	.00001	.00033
%RSD	97.890	10.680	9.1361	.01188	.48902
#1	.00007	.01654	.12491	.10310	.06814
#2	.00037	.01925	.10975	.10308	.06861
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-C-1-B@200 Acquired: 11/14/2013 18:10:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51514**	**.00314**	**.00356**	**-.00025**	**23.317**
Stddev	.00178	.00004	.00021	.00009	.078
%RSD	.34490	1.2341	5.8155	37.617	.33607
#1	.51640	.00316	.00371	-.00031	23.372
#2	.51389	.00311	.00342	-.00018	23.262
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**-.00090**	**-.0041**	**-.00355**	**-.00081**
Stddev	.00015	.00028	.0032	.00097	.00097
%RSD	78.211	31.215	78.54	27.313	119.52
#1	-.00030	-.00070	-.0064	-.00286	-.00149
#2	-.00009	-.00110	-.0018	-.00423	-.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00651**	**-.00022**	**2.4358**	**-.00016**	**-.00191**
Stddev	.01465	.00048	.0007	.00010	.00344
%RSD	225.10	221.13	.02715	64.477	180.41
#1	-.00385	.00012	2.4353	-.00024	.00053
#2	.01687	-.00055	2.4363	-.00009	-.00434
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-C-1-B@200 Acquired: 11/14/2013 18:10:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00021**	**-.00042**
Stddev	.00016	.00031
%RSD	80.025	72.906
#1	-.00009	-.00020
#2	-.00032	-.00064
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3342.7**	**4895.8**	**74919.**	**6996.2**
Stddev	2.4	4.3	49.	15.9
%RSD	.07031	.08796	.06545	.22681
#1	3344.4	4898.8	74885.	6985.0
#2	3341.0	4892.7	74954.	7007.4

Sample Name: 480-49111-L-1-B@100 Acquired: 11/14/2013 18:12:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**.01481**	**-.00052**	**.00883**	F **10.370**
Stddev	.00002	.00108	.00013	.00000	.004
%RSD	11.044	7.2579	24.049	.05132	.03587
#1	-.00015	.01557	-.00061	.00883	10.372
#2	-.00013	.01405	-.00044	.00884	10.367
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit					10.000
Low Limit					-.00200

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**14.552**	**-.00041**	**-.00161**	**-.00065**
Stddev	.00003	.039	.00012	.00010	.00037
%RSD	128.31	.26828	29.262	5.9451	57.423
#1	-.00005	14.579	-.00032	-.00168	-.00039
#2	-.00000	14.524	-.00049	-.00155	-.00092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00072**	**.04368**	**.24135**	**.23147**	**.14077**
Stddev	.00003	.00118	.00936	.00104	.00140
%RSD	4.3807	2.7122	3.8787	.44774	.99596
#1	.00074	.04452	.23473	.23220	.14176
#2	.00070	.04285	.24797	.23074	.13977
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49111-L-1-B@100 Acquired: 11/14/2013 18:12:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0237**	**.00633**	**.00618**	**-.00030**	**47.125**
Stddev	.0074	.00001	.00041	.00003	.010
%RSD	.71845	.16200	6.6203	9.1525	.02091
#1	1.0185	.00632	.00589	-.00028	47.118
#2	1.0289	.00633	.00647	-.00032	47.132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**-.00221**	**-.0055**	**-.00088**	**-.00119**
Stddev	.00018	.00039	.0025	.00059	.00242
%RSD	58.867	17.740	44.95	66.836	203.24
#1	.00042	-.00248	-.0072	-.00047	-.00290
#2	.00017	-.00193	-.0037	-.00130	.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00650**	**.00017**	**4.8756**	**.00035**	**-.00311**
Stddev	.00537	.00008	.0171	.00017	.00185
%RSD	82.608	47.567	.34998	48.359	59.550
#1	-.01030	.00023	4.8635	.00047	-.00441
#2	-.00270	.00011	4.8876	.00023	-.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49111-L-1-B@100 Acquired: 11/14/2013 18:12:40 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00014**	**-.00050**
Stddev	.00015	.00034
%RSD	106.47	68.009
#1	-.00004	-.00026
#2	-.00025	-.00074
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3271.9**	**4847.3**	**73482.**	**6964.4**
Stddev	.5	2.0	78.	4.1
%RSD	.01509	.04064	.10571	.05892
#1	3271.5	4845.9	73427.	6961.5
#2	3272.2	4848.7	73537.	6967.3

Sample Name: 480-49111-L-1-B@200 Acquired: 11/14/2013 18:15:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.00153**	**-.00213**	**.00582**	**5.2066**
Stddev	.00005	.00290	.00027	.00066	.0100
%RSD	12.396	189.70	12.586	11.386	.19222
#1	-.00046	-.00052	-.00194	.00535	5.2137
#2	-.00039	.00358	-.00232	.00628	5.1996
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**7.2565**	**-.00027**	**-.00069**	**.00002**
Stddev	.00005	.0034	.00008	.00011	.00039
%RSD	233.21	.04660	30.728	15.656	2604.1
#1	-.00006	7.2541	-.00033	-.00062	-.00026
#2	.00002	7.2589	-.00021	-.00077	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00028**	**.02214**	**.09312**	**.10076**	**.06855**
Stddev	.00008	.00186	.05043	.00006	.00080
%RSD	29.046	8.3867	54.155	.06062	1.1610
#1	.00022	.02083	.12878	.10080	.06799
#2	.00034	.02345	.05746	.10071	.06911
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49111-L-1-B@200 Acquired: 11/14/2013 18:15:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51121**	**.00312**	**.00372**	**-.00032**	**23.098**
Stddev	.00670	.00008	.00056	.00009	.089
%RSD	1.3103	2.5803	14.951	26.914	.38409
#1	.50647	.00306	.00333	-.00026	23.161
#2	.51594	.00317	.00411	-.00038	23.036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**-.00086**	**-.0042**	**-.00121**	**-.00002**
Stddev	.00010	.00048	.0010	.00148	.00279
%RSD	53.214	55.813	24.60	122.69	17268.
#1	.00027	-.00119	-.0049	-.00016	-.00199
#2	.00012	-.00052	-.0034	-.00225	.00196
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02131**	**-.00010**	**2.4572**	**-.00003**	**-.00116**
Stddev	.00136	.00070	.0021	.00030	.00088
%RSD	6.3842	707.05	.08512	1108.2	76.125
#1	-.02035	.00040	2.4558	.00019	-.00053
#2	-.02227	-.00059	2.4587	-.00024	-.00178
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49111-L-1-B@200 Acquired: 11/14/2013 18:15:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00014**	**.00010**
Stddev	.00027	.00057
%RSD	189.52	558.60
#1	-.00033	.00050
#2	.00005	-.00030
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3329.1**	**4879.9**	**75391.**	**7050.0**
Stddev	1.5	.1	19.	3.6
%RSD	.04406	.00149	.02566	.05132
#1	3330.1	4879.8	75405.	7047.4
#2	3328.0	4879.9	75377.	7052.5

Sample Name: 480-49467-B-1-B Acquired: 11/14/2013 18:17:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**8.8158**	**.01086**	**.03376**	**.05232**
Stddev	.00075	.0632	.00157	.00010	.00019
%RSD	224.29	.71696	14.453	.28736	.37178
#1	.00020	8.7711	.00975	.03369	.05246
#2	-.00087	8.8605	.01197	.03383	.05218
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00057**	**10.196**	**.00010**	**.01472**	**.02533**
Stddev	.00004	.003	.00005	.00012	.00000
%RSD	6.1150	.03070	49.994	.79502	.01659
#1	.00060	10.194	.00013	.01480	.02533
#2	.00055	10.198	.00006	.01464	.02534
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01579**	**8.3583**	**7.3693**	**9.7508**	**.02239**
Stddev	.00007	.0192	.0208	.0167	.00094
%RSD	.47152	.22937	.28272	.17152	4.1834
#1	.01584	8.3718	7.3546	9.7626	.02172
#2	.01574	8.3447	7.3840	9.7390	.02305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-B Acquired: 11/14/2013 18:17:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.9641**	**.36646**	**.34810**	**.00175**	**118.83**
Stddev	.0006	.00220	.00196	.00042	.61
%RSD	.01409	.60080	.56176	23.819	.51649
#1	3.9637	.36802	.34948	.00146	118.39
#2	3.9645	.36490	.34672	.00205	119.26
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01777**	**-.00077**	F **16.14**	**-.00175**	**-.00109**
Stddev	.00071	.00047	.04	.00112	.00004
%RSD	3.9707	61.343	.2791	63.806	3.4436
#1	.01727	-.00044	16.10	-.00254	-.00106
#2	.01827	-.00110	16.17	-.00096	-.00112
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.389**	**.00008**	**.07591**	**.47832**	**-.00194**
Stddev	.025	.00036	.00000	.00122	.00276
%RSD	.10076	448.94	.00563	.25459	141.91
#1	24.372	.00034	.07590	.47918	.00001
#2	24.406	-.00018	.07591	.47746	-.00389
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-B Acquired: 11/14/2013 18:17:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.02015**	**.09419**
Stddev	.00015	.00042
%RSD	.74782	.44339
#1	.02026	.09389
#2	.02005	.09448
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3199.9**	**4852.4**	**73814.**	**7096.6**
Stddev	6.5	11.0	121.	29.3
%RSD	.20230	.22613	.16378	.41226
#1	3204.4	4860.2	73729.	7117.3
#2	3195.3	4844.7	73900.	7075.9

Sample Name: 480-49467-B-1-B sd@5 Acquired: 11/14/2013 18:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00029**	**1.7927**	**.00265**	**.00914**	**.01146**
Stddev	.00025	.0170	.00317	.00017	.00004
%RSD	88.330	.94805	119.47	1.9097	.35665
#1	.00047	1.8047	.00489	.00926	.01149
#2	.00011	1.7807	.00041	.00901	.01144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**2.0780**	**-.00014**	**.00301**	**.00490**
Stddev	.00001	.0048	.00012	.00012	.00026
%RSD	19.805	.23101	81.881	4.1102	5.2478
#1	.00006	2.0746	-.00006	.00292	.00472
#2	.00005	2.0814	-.00022	.00310	.00509
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00350**	**1.6965**	**1.3973**	**1.5319**	**.00401**
Stddev	.00013	.0026	.0298	.0037	.00020
%RSD	3.5995	.15050	2.1353	.23966	5.0937
#1	.00341	1.6947	1.4184	1.5345	.00416
#2	.00359	1.6983	1.3762	1.5293	.00387
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-B sd@5 Acquired: 11/14/2013 18:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.81043**	**.07592**	**.06810**	**.00026**	**23.783**
Stddev	.00155	.00037	.00032	.00018	.014
%RSD	.19144	.49056	.47278	66.610	.05866
#1	.81153	.07618	.06787	.00039	23.773
#2	.80933	.07565	.06833	.00014	23.793
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00388**	**-.00249**	**3.204**	**-.00178**	**.00071**
Stddev	.00040	.00068	.008	.00076	.00160
%RSD	10.315	27.189	.2378	42.627	225.26
#1	.00416	-.00297	3.210	-.00125	.00184
#2	.00359	-.00201	3.199	-.00232	-.00042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.0204**	**.00052**	**.01535**	**.09911**	**-.00303**
Stddev	.0337	.00002	.00009	.00021	.00342
%RSD	.67183	3.7757	.60298	.20741	113.05
#1	4.9965	.00053	.01528	.09925	-.00061
#2	5.0442	.00051	.01541	.09896	-.00545
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-B sd@5 Acquired: 11/14/2013 18:20:03 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00403	.03989
Stddev	.00029	.00066
%RSD	7.1414	1.6573
#1	.00383	.04036
#2	.00424	.03943
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3358.6	4922.3	74933.	6967.2
Stddev	.0	2.1	156.	.8
%RSD	.00053	.04241	.20871	.01174
#1	3358.6	4923.8	74823.	6967.8
#2	3358.6	4920.8	75044.	6966.6

Sample Name: CCV Acquired: 11/14/2013 18:22:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49477**	**25.274**	**.50547**	**.49097**	**.51237**	**.48665**	**24.870**
Stddev	.00210	.180	.00059	.00065	.00193	.00139	.151
%RSD	.42528	.71105	.11763	.13265	.37600	.28520	.60774
#1	.49328	25.401	.50589	.49143	.51373	.48763	24.977
#2	.49626	25.147	.50505	.49051	.51101	.48567	24.763
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48734**	**.48534**	**.50904**	**.50633**	**23.838**	**26.283**	F **27.834**
Stddev	.00032	.00043	.00290	.00173	.133	.232	.102
%RSD	.06616	.08824	.56954	.34228	.55828	.88167	.36658
#1	.48712	.48504	.50699	.50510	23.932	26.447	27.762
#2	.48757	.48564	.51109	.50756	23.744	26.119	27.906
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51824**	**23.971**	**.49986**	**.46361**	**.49176**	**26.087**	**.48663**
Stddev	.00534	.066	.00048	.00293	.00018	.219	.00001
%RSD	1.0303	.27413	.09610	.63100	.03608	.83884	.00143
#1	.52202	23.924	.49952	.46154	.49164	26.242	.48663
#2	.51447	24.017	.50020	.46568	.49189	25.932	.48664
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 18:22:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48654	24.74	.50514	.49382	24.674	.49666	.49108
Stddev	.00013	.01	.00033	.00098	.005	.00031	.00044
%RSD	.02773	.0435	.06556	.19832	.02004	.06160	.08949
#1	.48644	24.75	.50490	.49451	24.678	.49644	.49077
#2	.48663	24.73	.50537	.49313	24.671	.49688	.49140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49811	.48857	.50217	.49542
Stddev	.00056	.00335	.00002	.00082
%RSD	.11302	.68571	.00418	.16645
#1	.49851	.49094	.50215	.49484
#2	.49772	.48620	.50218	.49601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3200.1	4853.1	74155.	6949.1
Stddev	.5	1.1	201.	44.0
%RSD	.01412	.02367	.27061	.63280
#1	3200.4	4852.2	74297.	6918.0
#2	3199.8	4853.9	74013.	6980.2

Sample Name: CCB Acquired: 11/14/2013 18:24:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**-.00857**	**-.00107**	**.00282**	**.00002**	**-.00000**	**-.00332**
Stddev	.00025	.01577	.00040	.00026	.00001	.00004	.00398
%RSD	61.602	183.95	37.632	9.3226	79.077	1386.5	119.82
#1	-.00058	-.01972	-.00136	.00263	.00001	.00002	-.00051
#2	-.00023	.00258	-.00079	.00300	.00003	-.00003	-.00614
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**-.00001**	**-.00037**	**.00003**	**-.00123**	**.01395**	**.00183**
Stddev	.00001	.00001	.00019	.00007	.00338	.01118	.00047
%RSD	7.4520	192.07	50.988	245.90	275.13	80.127	25.562
#1	-.00007	-.00001	-.00051	-.00002	.00116	.00605	.00216
#2	-.00008	.00000	-.00024	.00008	-.00361	.02185	.00150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.00108**	**-.00003**	**.00028**	**-.00014**	**.03048**	**-.00027**
Stddev	.00045	.00316	.00001	.00000	.00015	.00371	.00045
%RSD	376.97	292.63	39.117	1.3153	106.75	12.173	166.12
#1	.00044	.00116	-.00002	.00028	-.00025	.03311	.00005
#2	-.00020	-.00332	-.00004	.00028	-.00003	.02786	-.00059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 18:24:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00147	-.0032	-.00218	-.00175	.00846	.00012	.00001
Stddev	.00013	.0041	.00017	.00039	.01014	.00054	.00011
%RSD	8.9424	127.6	7.9858	22.312	119.88	452.34	1140.0
#1	-.00137	-.0003	-.00230	-.00147	.00129	-.00026	-.00007
#2	-.00156	-.0061	-.00206	-.00202	.01564	.00050	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00024	-.00282	-.00016	-.00058
Stddev	.00014	.00148	.00024	.00006
%RSD	59.254	52.356	152.91	11.159
#1	.00014	-.00386	-.00033	-.00062
#2	.00034	-.00178	.00001	-.00053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3415.7	4965.0	77566.	7048.6
Stddev	2.2	12.5	150.	11.8
%RSD	.06363	.25207	.19392	.16795
#1	3414.2	4973.8	77459.	7056.9
#2	3417.3	4956.1	77672.	7040.2

Sample Name: CCVL Acquired: 11/14/2013 18:27:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00307**	**.20302**	**.00715**	**.02180**	**.00215**	**.00200**	**.50559**
Stddev	.00093	.01235	.00050	.00042	.00002	.00002	.00045
%RSD	30.339	6.0818	6.9503	1.9148	.78332	.94187	.08809
#1	.00373	.19429	.00680	.02151	.00214	.00202	.50590
#2	.00241	.21175	.00751	.02210	.00216	.00199	.50527
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.00396**	**.00359**	**.01029**	**.04964**	**.51063**	**.46144**
Stddev	.00008	.00002	.00026	.00009	.00055	.01057	.00074
%RSD	9.4824	.59607	7.3450	.83246	1.1092	2.0706	.16030
#1	.00091	.00398	.00378	.01035	.04925	.51810	.46091
#2	.00080	.00394	.00340	.01022	.05003	.50315	.46196
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02954**	**.20645**	**.00327**	**.00341**	**.00944**	**1.0129**	**.00973**
Stddev	.00037	.00214	.00003	.00046	.00015	.0049	.00022
%RSD	1.2582	1.0361	.86509	13.542	1.5570	.48570	2.2861
#1	.02927	.20796	.00325	.00308	.00955	1.0094	.00957
#2	.02980	.20494	.00329	.00373	.00934	1.0164	.00989
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 18:27:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00373	.2032	.01814	.01615	.48273	.00944	.00481
Stddev	.00013	.0009	.00137	.00135	.00605	.00005	.00002
%RSD	3.4228	.4676	7.5301	8.3708	1.2525	.54269	.31454
#1	.00364	.2025	.01910	.01519	.48701	.00940	.00480
#2	.00382	.2038	.01717	.01710	.47846	.00947	.00482
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00494	.01756	.00514	.01047
Stddev	.00024	.00427	.00007	.00046
%RSD	4.8288	24.292	1.4305	4.3581
#1	.00511	.02058	.00509	.01015
#2	.00477	.01454	.00519	.01080
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3445.5	5031.6	77419.	7071.4
Stddev	12.9	26.3	326.	4.1
%RSD	.37338	.52197	.42108	.05773
#1	3454.6	5050.2	77649.	7068.5
#2	3436.4	5013.0	77188.	7074.2

Sample Name: 480-49467-B-1-C MS Acquired: 11/14/2013 18:29:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05271**	**21.355**	**.22490**	**.24199**	**.27435**
Stddev	.00021	.058	.00114	.00072	.00078
%RSD	.39864	.27213	.50522	.29647	.28341
#1	.05286	21.396	.22570	.24250	.27380
#2	.05256	21.314	.22409	.24148	.27490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21087**	**20.890**	**.20880**	**.22612**	**.24219**
Stddev	.00003	.023	.00042	.00003	.00049
%RSD	.01603	.11115	.20027	.01127	.20246
#1	.21090	20.906	.20850	.22614	.24253
#2	.21085	20.873	.20909	.22610	.24184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23207**	**18.656**	**19.366**	**24.604**	**.25634**
Stddev	.00120	.023	.059	.099	.00082
%RSD	.51848	.12299	.30633	.40434	.32169
#1	.23122	18.640	19.408	24.534	.25693
#2	.23292	18.672	19.324	24.674	.25576
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-C MS Acquired: 11/14/2013 18:29:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.475**	**.57407**	**.54882**	**.21651**	**130.91**
Stddev	.067	.00183	.00061	.00056	.15
%RSD	.46070	.31912	.11105	.25764	.11529
#1	14.428	.57278	.54926	.21611	130.80
#2	14.522	.57537	.54839	.21690	131.02
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22560**	**.21084**	F **26.52**	**.20751**	**.21648**
Stddev	.00014	.00096	.04	.00070	.00109
%RSD	.06333	.45702	.1660	.33955	.50518
#1	.22570	.21152	26.55	.20801	.21570
#2	.22550	.21016	26.49	.20701	.21725
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**37.260**	**.20731**	**.28751**	**.73283**	**.20686**
Stddev	.166	.00157	.00026	.00273	.00043
%RSD	.44668	.75859	.08872	.37217	.20884
#1	37.378	.20620	.28769	.73090	.20655
#2	37.142	.20843	.28733	.73475	.20716
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-C MS Acquired: 11/14/2013 18:29:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.23872**	**.23925**
Stddev	.00120	.00038
%RSD	.50079	.15879
#1	.23787	.23898
#2	.23957	.23952
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3130.5**	**4824.2**	**73149.**	**7004.7**
Stddev	5.4	14.8	323.	6.3
%RSD	.17362	.30665	.44133	.08984
#1	3134.4	4834.7	73377.	7009.1
#2	3126.7	4813.8	72920.	7000.2

Sample Name: 480-49467-B-1-D MSD Acquired: 11/14/2013 18:32:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03646**	**15.049**	**.15743**	**.17989**	**.26382**
Stddev	.00027	.035	.00081	.00028	.00042
%RSD	.75270	.23044	.51730	.15364	.15916
#1	.03666	15.025	.15686	.17970	.26411
#2	.03627	15.074	.15801	.18009	.26352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14243**	**35.952**	**.14249**	**.15345**	**.16543**
Stddev	.00085	.050	.00015	.00062	.00012
%RSD	.59918	.14026	.10791	.40382	.07511
#1	.14183	35.916	.14238	.15389	.16551
#2	.14304	35.988	.14260	.15302	.16534
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.16205**	**13.624**	**19.330**	**25.937**	**.17733**
Stddev	.00004	.029	.074	.180	.00203
%RSD	.02548	.21031	.38168	.69407	1.1452
#1	.16202	13.603	19.277	25.809	.17590
#2	.16208	13.644	19.382	26.064	.17877
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-D MSD Acquired: 11/14/2013 18:32:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.755**	**.39372**	**.38526**	**.14684**	**216.57**
Stddev	.011	.00052	.00008	.00038	.47
%RSD	.07808	.13093	.02170	.26170	.21528
#1	13.747	.39336	.38532	.14657	216.24
#2	13.762	.39409	.38520	.14711	216.90
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.15342**	**.14563**	F **20.60**	**.13944**	**.14735**
Stddev	.00085	.00020	.06	.00157	.00305
%RSD	.55502	.13503	.2729	1.1284	2.0714
#1	.15402	.14550	20.64	.13832	.14519
#2	.15281	.14577	20.57	.14055	.14951
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.934**	**.14110**	**.32383**	**.51913**	**.13930**
Stddev	.029	.00075	.00121	.00107	.00079
%RSD	.10381	.53488	.37420	.20568	.56899
#1	27.913	.14056	.32297	.51988	.13986
#2	27.954	.14163	.32468	.51837	.13874
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-B-1-D MSD Acquired: 11/14/2013 18:32:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.16303**	**.17429**
Stddev	.00021	.00052
%RSD	.12683	.29661
#1	.16289	.17393
#2	.16318	.17466
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3061.5**	**4755.7**	**71582.**	**7031.4**
Stddev	.2	.4	32.	1.3
%RSD	.00615	.00802	.04410	.01859
#1	3061.7	4755.9	71605.	7032.3
#2	3061.4	4755.4	71560.	7030.5

Sample Name: 480-49467-A-2-B Acquired: 11/14/2013 18:34:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**1.7897**	**.00702**	**.04651**	**.24329**
Stddev	.00016	.0115	.00186	.00050	.00067
%RSD	45.462	.64461	26.438	1.0656	.27494
#1	.00024	1.7978	.00834	.04686	.24282
#2	.00046	1.7815	.00571	.04616	.24376
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**67.490**	**.00041**	**.00062**	**.00351**
Stddev	.00008	.200	.00009	.00027	.00025
%RSD	52.067	.29620	21.281	44.089	7.2421
#1	.00020	67.632	.00035	.00081	.00369
#2	.00009	67.349	.00048	.00043	.00333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00914**	**3.3230**	**18.760**	**27.624**	**.00464**
Stddev	.00007	.0032	.004	.039	.00005
%RSD	.81344	.09527	.01923	.14120	1.0112
#1	.00919	3.3252	18.762	27.597	.00467
#2	.00908	3.3208	18.757	27.652	.00461
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-2-B Acquired: 11/14/2013 18:34:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.430**	**.02384**	**.02484**	**.00073**	**398.76**
Stddev	.013	.00014	.00023	.00005	.46
%RSD	.10429	.59455	.91446	6.5827	.11570
#1	12.439	.02374	.02468	.00076	398.43
#2	12.421	.02394	.02500	.00070	399.08
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00461**	**.00561**	**8.014**	**-.00443**	**-.00151**
Stddev	.00020	.00095	.026	.00045	.00414
%RSD	4.4436	16.951	.3203	10.125	274.27
#1	.00447	.00628	7.996	-.00412	-.00444
#2	.00476	.00494	8.033	-.00475	.00142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.2100**	**.00036**	**.39779**	**.07855**	**-.00260**
Stddev	.0064	.00018	.00050	.00052	.00093
%RSD	.07839	50.747	.12463	.66233	35.540
#1	8.2054	.00049	.39744	.07818	-.00326
#2	8.2145	.00023	.39814	.07892	-.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-2-B Acquired: 11/14/2013 18:34:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00328	.03960
Stddev	.00015	.00084
%RSD	4.7003	2.1278
#1	.00317	.03901
#2	.00339	.04020
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2944.6	4613.3	68278.	7003.6
Stddev	1.8	6.3	202.	.8
%RSD	.05989	.13604	.29537	.01184
#1	2943.4	4617.8	68420.	7004.2
#2	2945.9	4608.9	68135.	7003.0

Sample Name: 480-49467-A-3-B Acquired: 11/14/2013 18:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00015**	**5.4137**	**.00592**	**.06426**	**.11152**
Stddev	.00055	.0178	.00187	.00025	.00036
%RSD	369.32	.32914	31.646	.38321	.32503
#1	.00024	5.4263	.00460	.06444	.11127
#2	-.00054	5.4011	.00724	.06409	.11178
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**125.11**	**.00052**	**.00720**	**.01315**
Stddev	.00003	.75	.00000	.00018	.00012
%RSD	7.9645	.60077	.07232	2.4812	.89038
#1	.00034	125.64	.00052	.00707	.01306
#2	.00038	124.58	.00052	.00732	.01323
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00642**	**5.0957**	**11.136**	**15.758**	**.01827**
Stddev	.00004	.0094	.014	.033	.00099
%RSD	.61655	.18405	.12577	.21231	5.4193
#1	.00645	5.0891	11.146	15.735	.01897
#2	.00639	5.1023	11.126	15.782	.01757
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-3-B Acquired: 11/14/2013 18:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**34.895**	**.72518**	**.71516**	**.00024**	**189.87**
Stddev	.064	.00154	.00325	.00004	.18
%RSD	.18293	.21194	.45450	17.683	.09261
#1	34.941	.72626	.71286	.00021	190.00
#2	34.850	.72409	.71745	.00027	189.75
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01109**	**-.00297**	F **10.98**	**-.00423**	**.00012**
Stddev	.00008	.00009	.01	.00133	.00107
%RSD	.76088	3.1240	.0542	31.489	860.95
#1	.01115	-.00291	10.98	-.00329	.00088
#2	.01103	-.00304	10.97	-.00517	-.00063
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.320**	**.00071**	**.82325**	**.35583**	**-.00134**
Stddev	.064	.00026	.00075	.00092	.00053
%RSD	.36713	36.953	.09071	.25780	39.758
#1	17.365	.00090	.82272	.35648	-.00172
#2	17.275	.00052	.82378	.35518	-.00096
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-3-B Acquired: 11/14/2013 18:37:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00955**	**.01404**
Stddev	.00049	.00045
%RSD	5.1317	3.1989
#1	.00990	.01372
#2	.00920	.01436
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2996.9**	**4632.9**	**70265.**	**6997.0**
Stddev	6.4	1.0	31.	10.4
%RSD	.21228	.02227	.04379	.14816
#1	3001.4	4632.2	70286.	6989.7
#2	2992.4	4633.6	70243.	7004.4

Sample Name: 480-49467-A-4-B Acquired: 11/14/2013 18:39:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00074**	**1.5602**	**.00824**	**.03346**	**.04651**
Stddev	.00068	.0052	.00404	.00021	.00005
%RSD	92.381	.33083	49.035	.63922	.10076
#1	-.00122	1.5566	.00539	.03331	.04648
#2	-.00026	1.5639	.01110	.03361	.04654
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**30.851**	**.00052**	**.00133**	**.00542**
Stddev	.00006	.120	.00005	.00005	.00003
%RSD	111.68	.38975	10.200	3.8608	.52959
#1	.00010	30.936	.00056	.00136	.00540
#2	.00001	30.766	.00048	.00129	.00544
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00562**	**2.2745**	**14.453**	**20.620**	**.00385**
Stddev	.00019	.0056	.079	.052	.00006
%RSD	3.4224	.24843	.54313	.25060	1.5555
#1	.00576	2.2785	14.508	20.657	.00390
#2	.00549	2.2705	14.397	20.584	.00381
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B Acquired: 11/14/2013 18:39:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.1176**	**.13619**	**.13351**	**.00171**	**265.74**
Stddev	.0103	.00005	.00100	.00014	.20
%RSD	.16883	.03665	.75048	8.0255	.07400
#1	6.1249	.13623	.13421	.00181	265.60
#2	6.1103	.13615	.13280	.00162	265.88
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00449**	**-.00200**	**7.820**	**-.00386**	**-.00033**
Stddev	.00043	.00154	.014	.00046	.00061
%RSD	9.5459	76.966	.1803	12.020	183.41
#1	.00419	-.00308	7.811	-.00354	.00010
#2	.00479	-.00091	7.830	-.00419	-.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.6413**	**.00051**	**.18051**	**.10508**	**-.00235**
Stddev	.0061	.00025	.00076	.00161	.00253
%RSD	.08021	49.125	.42299	1.5336	107.68
#1	7.6456	.00069	.17997	.10622	-.00056
#2	7.6370	.00033	.18105	.10394	-.00413
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B Acquired: 11/14/2013 18:39:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00417	.00544
Stddev	.00019	.00012
%RSD	4.4629	2.2660
#1	.00404	.00553
#2	.00430	.00535
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3051.6	4688.2	70519.	7055.3
Stddev	4.9	4.6	61.	16.9
%RSD	.16063	.09713	.08613	.23994
#1	3055.0	4691.4	70562.	7043.3
#2	3048.1	4685.0	70476.	7067.2

Sample Name: 480-49467-A-4-B sd@5 Acquired: 11/14/2013 18:42:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00048**	**.31293**	**.00281**	**.00747**	**.00973**
Stddev	.00026	.02728	.00405	.00029	.00001
%RSD	54.338	8.7169	143.81	3.9293	.09472
#1	-.00030	.29364	-.00005	.00726	.00972
#2	-.00066	.33222	.00568	.00768	.00974
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**6.1599**	**.00007**	**.00036**	**.00085**
Stddev	.00002	.0148	.00000	.00004	.00011
%RSD	25.832	.23958	6.0735	12.193	12.937
#1	.00010	6.1495	.00007	.00039	.00093
#2	.00007	6.1703	.00008	.00032	.00077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00159**	**.45564**	**2.6364**	**3.0451**	**.00103**
Stddev	.00021	.00194	.0242	.0188	.00023
%RSD	13.214	.42608	.91657	.61614	21.902
#1	.00144	.45701	2.6535	3.0319	.00119
#2	.00174	.45426	2.6193	3.0584	.00087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B sd@5 Acquired: 11/14/2013 18:42:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.2461**	**.02752**	**.02550**	**-.00005**	**52.240**
Stddev	.0017	.00005	.00006	.00017	.142
%RSD	.13702	.17041	.22040	381.24	.27218
#1	1.2473	.02756	.02554	-.00017	52.341
#2	1.2449	.02749	.02546	.00008	52.140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00098**	**-.00102**	**1.500**	**-.00305**	**-.00093**
Stddev	.00029	.00033	.003	.00018	.00030
%RSD	29.840	32.757	.2216	5.9581	32.138
#1	.00077	-.00126	1.498	-.00318	-.00114
#2	.00118	-.00078	1.503	-.00292	-.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5529**	**.00008**	**.03580**	**.02106**	**-.00194**
Stddev	.0097	.00034	.00000	.00009	.00181
%RSD	.62683	427.59	.01055	.43326	93.193
#1	1.5460	-.00016	.03580	.02100	-.00322
#2	1.5598	.00032	.03580	.02113	-.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B sd@5 Acquired: 11/14/2013 18:42:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00076	.00077
Stddev	.00001	.00015
%RSD	1.1992	19.086
#1	.00076	.00087
#2	.00075	.00067
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3287.6	4843.5	73795.	7026.6
Stddev	.1	5.7	41.	.7
%RSD	.00346	.11787	.05562	.00958
#1	3287.5	4847.6	73766.	7026.1
#2	3287.6	4839.5	73824.	7027.1

Sample Name: 480-49467-A-4-B pds Acquired: 11/14/2013 18:44:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05180**	**12.352**	**.21866**	**.24012**	**.25336**
Stddev	.00038	.007	.00075	.00035	.00057
%RSD	.72609	.06047	.34418	.14738	.22403
#1	.05154	12.346	.21919	.24037	.25376
#2	.05207	12.357	.21812	.23987	.25296
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20094**	**40.312**	**.20275**	**.20568**	**.21512**
Stddev	.00112	.070	.00040	.00015	.00033
%RSD	.55546	.17389	.19539	.07404	.15122
#1	.20173	40.362	.20247	.20578	.21535
#2	.20015	40.263	.20303	.20557	.21489
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21568**	**12.070**	**26.295**	**35.552**	**.24019**
Stddev	.00103	.051	.028	.402	.00102
%RSD	.47598	.41953	.10521	1.1321	.42581
#1	.21641	12.105	26.276	35.836	.23947
#2	.21496	12.034	26.315	35.267	.24091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B pds Acquired: 11/14/2013 18:44:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.848**	**.32844**	**.32152**	**.20760**	**266.82**
Stddev	.004	.00056	.00080	.00080	1.01
%RSD	.02478	.17074	.24895	.38738	.37682
#1	15.845	.32884	.32095	.20703	267.53
#2	15.850	.32805	.32209	.20816	266.11
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20462**	**.20529**	**7.419**	**.19894**	**.20541**
Stddev	.00095	.00318	.014	.00029	.00081
%RSD	.46579	1.5477	.1946	.14684	.39210
#1	.20394	.20754	7.430	.19914	.20598
#2	.20529	.20305	7.409	.19873	.20484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.821**	**.21011**	**.37638**	**.29984**	**.19391**
Stddev	.014	.00086	.00127	.00025	.00122
%RSD	.07937	.40773	.33657	.08290	.62914
#1	17.811	.21071	.37728	.29966	.19477
#2	17.831	.20950	.37549	.30002	.19305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49467-A-4-B pds Acquired: 11/14/2013 18:44:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21484**	**.21136**
Stddev	.00010	.00072
%RSD	.04830	.33836
#1	.21477	.21186
#2	.21491	.21085
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3022.8**	**4726.5**	**71055.**	**6977.6**
Stddev	7.1	17.0	79.	10.0
%RSD	.23401	.36025	.11171	.14371
#1	3027.8	4738.6	71111.	6984.7
#2	3017.8	4714.5	70999.	6970.5

Sample Name: 480-48473-A-2-A@5 Acquired: 11/14/2013 18:46:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00139**	**12.117**	F **-.01811**	**.04358**	**.15750**
Stddev	.00047	.006	.00532	.00040	.00001
%RSD	33.813	.04913	29.393	.92440	.00579
#1	.00173	12.121	-.02187	.04330	.15751
#2	.00106	12.113	-.01434	.04387	.15749
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**251.92**	**.00592**	**.84355**	**.89246**
Stddev	.00008	.33	.00001	.01043	.00076
%RSD	23.349	.13008	.19197	1.2368	.08467
#1	.00042	251.69	.00593	.83618	.89300
#2	.00030	252.15	.00591	.85093	.89193
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.48195**	**57.237**	**1.2318**	**1.5849**	**.01434**
Stddev	.00038	.183	.0151	.0050	.00058
%RSD	.07834	.31970	1.2270	.31795	4.0103
#1	.48221	57.108	1.2211	1.5814	.01475
#2	.48168	57.367	1.2425	1.5885	.01393
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-A-2-A@5 Acquired: 11/14/2013 18:46:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**21.442**	**.94033**	**.89770**	**.28459**	**.36287**
Stddev	.023	.00202	.00233	.00183	.00136
%RSD	.10694	.21496	.25930	.64346	.37616
#1	21.426	.93890	.89605	.28329	.36384
#2	21.458	.94176	.89934	.28588	.36191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.5591**	**.39716**	**1.133**	**-.00242**	**.00060**
Stddev	.0656	.00441	.003	.00033	.00403
%RSD	1.1807	1.1105	.2561	13.635	672.95
#1	5.5127	.39404	1.135	-.00266	.00345
#2	5.6055	.40027	1.131	-.00219	-.00225
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.4659**	**.05286**	**.43691**	**.47638**	**-.00323**
Stddev	.0199	.00040	.00051	.00085	.00036
%RSD	.57329	.74860	.11577	.17789	11.274
#1	3.4519	.05258	.43727	.47578	-.00348
#2	3.4800	.05314	.43655	.47698	-.00297
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-A-2-A@5 Acquired: 11/14/2013 18:46:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.05638	.80736
Stddev	.00043	.00247
%RSD	.76018	.30544
#1	.05668	.80910
#2	.05608	.80561
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3013.5	4683.8	71478.	6861.6
Stddev	5.9	1.0	296.	2.7
%RSD	.19472	.02108	.41347	.03920
#1	3017.6	4684.5	71269.	6859.7
#2	3009.3	4683.1	71687.	6863.5

Sample Name: 480-48473-B-15-A@50 Acquired: 11/14/2013 18:49:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**1.1498**	F **-.01858**	**.00728**	**.01604**
Stddev	.00027	.0003	.00326	.00041	.00002
%RSD	143.22	.02785	17.570	5.6276	.14464
#1	.00000	1.1496	-.01627	.00699	.01602
#2	-.00038	1.1501	-.02089	.00757	.01605
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	**16.246**	**.00090**	**.65279**	**.61779**
Stddev	.00001	.098	.00000	.00152	.00038
%RSD	201.63	.60418	.47530	.23239	.06109
#1	.00000	16.316	.00091	.65171	.61805
#2	-.00001	16.177	.00090	.65386	.61752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05345**	**6.8601**	**.11322**	**.08183**	**.00213**
Stddev	.00013	.0162	.03978	.00026	.00014
%RSD	.23438	.23620	35.134	.31207	6.6711
#1	.05354	6.8715	.14135	.08165	.00223
#2	.05336	6.8486	.08509	.08202	.00203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-B-15-A@50 Acquired: 11/14/2013 18:49:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.3376**	**.08505**	**.07491**	**.18945**	**.06504**
Stddev	.0044	.00020	.00085	.00010	.00198
%RSD	.32608	.23737	1.1402	.05155	3.0417
#1	1.3407	.08491	.07431	.18938	.06364
#2	1.3345	.08519	.07551	.18952	.06644
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.6093**	**.03804**	**.1041**	**-.00605**	**-.00066**
Stddev	.0029	.00035	.0028	.00061	.00239
%RSD	.08054	.92503	2.661	10.122	362.89
#1	3.6114	.03829	.1061	-.00649	.00103
#2	3.6073	.03779	.1022	-.00562	-.00235
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.33651**	**.00476**	**.02664**	**.18795**	**-.00130**
Stddev	.02319	.00081	.00003	.00034	.00096
%RSD	6.8927	16.986	.12696	.17926	73.779
#1	.35291	.00419	.02667	.18772	-.00062
#2	.32011	.00533	.02662	.18819	-.00198
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-B-15-A@50 Acquired: 11/14/2013 18:49:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01806**	**.09047**
Stddev	.00013	.00050
%RSD	.74101	.55243
#1	.01796	.09012
#2	.01815	.09083
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3363.9**	**4936.1**	**76378.**	**6979.8**
Stddev	4.4	14.1	153.	26.0
%RSD	.13182	.28557	.19993	.37205
#1	3367.0	4946.1	76486.	6961.4
#2	3360.8	4926.2	76270.	6998.2

Sample Name: CCV Acquired: 11/14/2013 18:51:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49323**	**25.241**	**.49890**	**.48672**	**.51018**	**.48565**	**24.744**
Stddev	.00045	.206	.00052	.00256	.00138	.00154	.030
%RSD	.09165	.81594	.10475	.52511	.27038	.31802	.11958
#1	.49355	25.095	.49927	.48492	.50921	.48455	24.765
#2	.49291	25.387	.49853	.48853	.51116	.48674	24.723
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48659**	**.48472**	**.50672**	**.50440**	**23.764**	**26.103**	**27.220**
Stddev	.00085	.00013	.00104	.00169	.022	.105	.367
%RSD	.17465	.02647	.20455	.33508	.09379	.40136	1.3484
#1	.48719	.48481	.50599	.50320	23.780	26.029	27.479
#2	.48599	.48463	.50745	.50559	23.749	26.177	26.960
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51856**	**23.926**	**.49937**	**.46495**	**.49137**	**25.956**	**.48607**
Stddev	.00429	.037	.00014	.00096	.00045	.187	.00210
%RSD	.82775	.15289	.02737	.20611	.09149	.72069	.43305
#1	.51553	23.900	.49928	.46427	.49105	25.824	.48755
#2	.52160	23.952	.49947	.46563	.49168	26.088	.48458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 18:51:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48816	24.69	.50245	.49515	24.589	.49431	.48827
Stddev	.00296	.12	.00260	.00165	.139	.00009	.00043
%RSD	.60588	.4784	.51668	.33307	.56355	.01730	.08868
#1	.49026	24.77	.50428	.49398	24.491	.49425	.48796
#2	.48607	24.61	.50061	.49632	24.687	.49437	.48857
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49546	.48828	.49833	.49286
Stddev	.00144	.00742	.00140	.00190
%RSD	.29023	1.5205	.28092	.38648
#1	.49444	.49353	.49734	.49151
#2	.49648	.48303	.49931	.49420
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3209.0	4869.9	74456.	7004.0
Stddev	3.8	2.2	295.	.2
%RSD	.11956	.04612	.39684	.00260
#1	3206.2	4871.5	74665.	7003.8
#2	3211.7	4868.3	74247.	7004.1

Sample Name: CCB Acquired: 11/14/2013 18:53:58 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**.00071**	**-.00137**	**.00080**	**.00002**	**-.00004**	**-.00584**
Stddev	.00005	.01167	.00048	.00006	.00002	.00004	.00437
%RSD	31.635	1638.4	34.865	6.9920	107.16	104.75	74.911
#1	-.00020	-.00754	-.00171	.00084	.00003	-.00001	-.00893
#2	-.00013	.00896	-.00103	.00076	.00000	-.00007	-.00275
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**-.00004**	**-.00042**	**.00001**	**-.00156**	**.04337**	**.00181**
Stddev	.00005	.00003	.00009	.00012	.00608	.01074	.00011
%RSD	181.38	74.765	20.732	805.21	390.23	24.769	5.9689
#1	-.00007	-.00002	-.00036	-.00007	-.00586	.05097	.00189
#2	.00001	-.00006	-.00048	.00010	.00274	.03578	.00174
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**-.00501**	**-.00001**	**.00072**	**-.00025**	**.03434**	**.00013**
Stddev	.00131	.00226	.00000	.00078	.00017	.00059	.00024
%RSD	1833.2	44.990	63.904	107.21	67.069	1.7172	193.17
#1	-.00085	-.00342	-.00001	.00017	-.00013	.03476	.00030
#2	.00100	-.00661	-.00000	.00127	-.00037	.03393	-.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 18:53:58 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00073**	F **-.0052**	**-.00129**	**.00083**	**.00193**	**.00020**	**-.00003**
Stddev	.00046	.0030	.00071	.00327	.00379	.00005	.00004
%RSD	63.492	56.91	54.860	392.43	195.76	22.377	128.76
#1	-.00105	-.0031	-.00079	-.00148	.00461	.00017	-.00006
#2	-.00040	-.0073	-.00179	.00315	-.00074	.00024	-.00000
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00024**	**-.00134**	**-.00015**	**-.00027**
Stddev	.00030	.00207	.00018	.00034
%RSD	124.72	154.49	119.67	126.31
#1	-.00003	-.00281	-.00028	-.00003
#2	-.00045	.00012	-.00002	-.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3424.5**	**4981.8**	**77573.**	**7006.4**
Stddev	1.9	8.6	170.	39.1
%RSD	.05460	.17345	.21963	.55785
#1	3425.8	4987.9	77452.	6978.8
#2	3423.2	4975.7	77693.	7034.1

Sample Name: CCVL Acquired: 11/14/2013 18:56:25 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00257**	**.19212**	**.00741**	**.02053**	**.00212**	**.00188**	**.49762**
Stddev	.00075	.00094	.00110	.00027	.00001	.00002	.00539
%RSD	29.186	.49105	14.776	1.3210	.46395	.91937	1.0826
#1	.00310	.19278	.00819	.02073	.00212	.00189	.50143
#2	.00204	.19145	.00664	.02034	.00213	.00187	.49381
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**.00396**	**.00381**	**.01002**	**.04564**	**.52105**	**.45014**
Stddev	.00005	.00006	.00007	.00013	.00568	.03237	.00171
%RSD	6.1070	1.6190	1.7515	1.2862	12.440	6.2120	.38003
#1	.00092	.00391	.00377	.01011	.04163	.49816	.44893
#2	.00084	.00400	.00386	.00993	.04966	.54394	.45135
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02891**	**.20110**	**.00325**	**.00379**	**.00952**	**.99332**	**.00966**
Stddev	.00010	.00247	.00002	.00083	.00012	.01316	.00021
%RSD	.34269	1.2306	.51937	21.976	1.2821	1.3246	2.1591
#1	.02898	.20285	.00324	.00320	.00944	.98401	.00981
#2	.02884	.19935	.00326	.00438	.00961	1.0026	.00951
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 18:56:25 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00350	.1985	.02032	.01108	.47883	.00903	.00462
Stddev	.00082	.0025	.00031	.00397	.01569	.00027	.00002
%RSD	23.535	1.264	1.5427	35.817	3.2759	3.0021	.33636
#1	.00292	.1967	.02010	.01388	.46773	.00884	.00461
#2	.00408	.2002	.02054	.00827	.48992	.00923	.00463
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00495	.01755	.00464	.01029
Stddev	.00021	.00044	.00001	.00001
%RSD	4.1665	2.4990	.17806	.11667
#1	.00480	.01786	.00463	.01028
#2	.00509	.01724	.00464	.01030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3443.1	5037.4	78306.	7145.1
Stddev	6.4	9.6	150.	47.1
%RSD	.18544	.19084	.19098	.65960
#1	3447.6	5044.2	78412.	7178.4
#2	3438.6	5030.6	78200.	7111.8

Sample Name: mb 480-149467/17-b Acquired: 11/14/2013 18:58:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**.03508**	**-.00083**	**.00341**	**.00011**
Stddev	.00059	.00019	.00240	.00033	.00001
%RSD	312.85	.54374	287.23	9.8101	10.954
#1	-.00023	.03495	-.00253	.00317	.00010
#2	.00060	.03522	.00086	.00364	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.03703**	**-.00005**	**-.00004**	**-.00048**
Stddev	.00005	.00371	.00005	.00002	.00001
%RSD	215.37	10.023	115.31	52.306	2.5211
#1	-.00001	.03441	-.00001	-.00006	-.00049
#2	.00005	.03966	-.00009	-.00003	-.00047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**.00113**	**.01303**	**.00267**	**.00055**
Stddev	.00013	.00652	.00121	.00026	.00083
%RSD	27.822	579.38	9.3134	9.8277	152.62
#1	.00037	-.00349	.01218	.00286	-.00004
#2	.00055	.00574	.01389	.00249	.00114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-149467/17-b Acquired: 11/14/2013 18:58:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00230**	**.00032**	**.00067**	**-.00018**	**.05739**
Stddev	.00076	.00004	.00001	.00013	.00078
%RSD	33.254	11.258	1.1311	69.738	1.3645
#1	-.00176	.00035	.00066	-.00009	.05683
#2	-.00284	.00030	.00067	-.00028	.05794
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**-.00062**	**.0134**	**-.00178**	**-.00012**
Stddev	.00025	.00016	.0014	.00048	.00060
%RSD	190.64	25.893	10.32	26.835	511.59
#1	.00005	-.00074	.0144	-.00145	.00031
#2	-.00031	-.00051	.0124	-.00212	-.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00228**	**-.00002**	**.00021**	**.00011**	**-.00152**
Stddev	.01762	.00038	.00010	.00018	.00162
%RSD	771.33	2234.4	47.615	155.52	106.55
#1	-.01018	.00025	.00029	-.00001	-.00037
#2	.01475	-.00028	.00014	.00024	-.00266
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-149467/17-b Acquired: 11/14/2013 18:58:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00011**	**.00098**
Stddev	.00005	.00005
%RSD	48.998	5.0120
#1	-.00007	.00102
#2	-.00015	.00095
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3434.8**	**4978.4**	**77893.**	**7076.7**
Stddev	8.1	5.3	163.	13.1
%RSD	.23645	.10594	.20986	.18469
#1	3429.0	4974.7	77777.	7085.9
#2	3440.5	4982.1	78009.	7067.4

Sample Name: lcs 480-149467/18-b Acquired: 11/14/2013 19:01:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05066**	**10.750**	**.21081**	**.21158**	**.22016**
Stddev	.00077	.004	.00193	.00008	.00048
%RSD	1.5122	.04106	.91619	.03746	.21625
#1	.05120	10.753	.20945	.21152	.22050
#2	.05012	10.746	.21218	.21164	.21982
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20845**	**10.419**	**.20533**	**.20552**	**.21591**
Stddev	.00027	.059	.00041	.00042	.00006
%RSD	.13143	.56417	.20200	.20234	.02800
#1	.20864	10.461	.20563	.20581	.21596
#2	.20826	10.378	.20504	.20522	.21587
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21358**	**10.251**	**10.745**	**11.321**	**.22041**
Stddev	.00001	.027	.016	.023	.00045
%RSD	.00455	.26238	.14586	.20367	.20270
#1	.21358	10.270	10.734	11.337	.22073
#2	.21357	10.232	10.756	11.304	.22010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149467/18-b Acquired: 11/14/2013 19:01:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.597**	**.20943**	**.19067**	**.21386**	**10.798**
Stddev	.016	.00014	.00001	.00004	.043
%RSD	.15285	.06447	.00414	.01747	.39696
#1	10.609	.20952	.19066	.21389	10.828
#2	10.586	.20933	.19068	.21384	10.767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20319**	**.20898**	**10.15**	**.20558**	**.20979**
Stddev	.00020	.00161	.00	.00081	.00111
%RSD	.09614	.77048	.0050	.39573	.53004
#1	.20305	.20784	10.15	.20615	.20901
#2	.20332	.21012	10.15	.20500	.21058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.210**	**.20027**	**.20676**	**.20203**	**.20733**
Stddev	.004	.00077	.00032	.00085	.00241
%RSD	.03436	.38512	.15471	.41854	1.1638
#1	10.207	.19972	.20654	.20263	.20903
#2	10.212	.20081	.20699	.20143	.20562
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149467/18-b Acquired: 11/14/2013 19:01:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21611	F .25510
Stddev	.00043	.00068
%RSD	.19884	.26606
#1	.21581	.25558
#2	.21642	.25462
Check ?	Chk Pass	Chk Fail
High Limit		.23000
Low Limit		.17000

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3317.4	4908.4	75934.	7023.1
Stddev	1.8	7.1	27.	26.3
%RSD	.05460	.14520	.03558	.37379
#1	3318.7	4913.5	75915.	7004.5
#2	3316.2	4903.4	75953.	7041.7

Sample Name: lcsd 480-150322/3-a Acquired: 11/14/2013 19:03:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05179**	**11.050**	**.21338**	**.21383**	**.22498**
Stddev	.00070	.027	.00058	.00099	.00084
%RSD	1.3543	.24035	.27143	.46129	.37446
#1	.05130	11.031	.21297	.21452	.22438
#2	.05229	11.068	.21379	.21313	.22557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21065**	**10.692**	**.20681**	**.20795**	**.22316**
Stddev	.00043	.062	.00013	.00006	.00101
%RSD	.20511	.58248	.06189	.02961	.45182
#1	.21035	10.648	.20690	.20799	.22245
#2	.21096	10.736	.20672	.20790	.22388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22034**	**10.410**	**11.045**	F **11.567**	**.22473**
Stddev	.00134	.000	.018	.084	.00014
%RSD	.60705	.00355	.16367	.72728	.06050
#1	.21939	10.410	11.032	11.508	.22483
#2	.22128	10.410	11.058	11.627	.22464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				11.500	
Low Limit				8.5000	

Sample Name: lcsd 480-150322/3-a Acquired: 11/14/2013 19:03:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.770**	**.21260**	**.19408**	**.21736**	**11.038**
Stddev	.001	.00044	.00082	.00007	.013
%RSD	.00868	.20722	.42312	.03079	.11496
#1	10.771	.21229	.19350	.21731	11.029
#2	10.769	.21292	.19466	.21740	11.047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20439**	**.21049**	**10.20**	**.20655**	**.21357**
Stddev	.00033	.00002	.01	.00149	.00074
%RSD	.16357	.00714	.0918	.72182	.34684
#1	.20415	.21048	10.21	.20549	.21304
#2	.20463	.21050	10.20	.20760	.21409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.460**	**.20253**	**.20779**	**.20560**	**.20712**
Stddev	.053	.00009	.00074	.00003	.00054
%RSD	.50982	.04366	.35514	.01299	.26206
#1	10.423	.20247	.20727	.20562	.20751
#2	10.498	.20259	.20832	.20559	.20674
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcsd 480-150322/3-a Acquired: 11/14/2013 19:03:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.22125	.21102
Stddev	.00102	.00217
%RSD	.45909	1.0278
#1	.22053	.21255
#2	.22197	.20949
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3317.7	4911.7	75223.	6923.9
Stddev	.2	.3	236.	56.4
%RSD	.00723	.00654	.31352	.81490
#1	3317.9	4911.5	75389.	6963.8
#2	3317.6	4912.0	75056.	6884.0

Sample Name: 480-49465-c-2-a Acquired: 11/14/2013 19:05:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.14235**	**.00291**	**.13459**	**.01736**
Stddev	.00041	.01627	.00330	.00000	.00012
%RSD	2299.0	11.428	113.51	.00328	.68589
#1	-.00027	.15386	.00057	.13458	.01745
#2	.00030	.13085	.00524	.13459	.01728
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**21.298**	**-.00004**	**.00180**	**.02173**
Stddev	.00006	.106	.00007	.00014	.00046
%RSD	101.39	.49917	166.89	7.8884	2.1076
#1	-.00011	21.374	.00001	.00170	.02206
#2	-.00002	21.223	-.00010	.00190	.02141
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**13.294**	**4.1850**	**4.5504**	**.00227**
Stddev	.00030	.016	.0947	.0339	.00139
%RSD	29.054	.12101	2.2633	.74526	61.105
#1	.00124	13.306	4.2520	4.5744	.00326
#2	.00082	13.283	4.1180	4.5264	.00129
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49465-c-2-a Acquired: 11/14/2013 19:05:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.3249**	**.54166**	**.49119**	**.00022**	**13.878**
Stddev	.0086	.00120	.00085	.00011	.153
%RSD	.64876	.22157	.17345	49.306	1.1018
#1	1.3310	.54251	.49059	.00014	13.986
#2	1.3189	.54081	.49180	.00029	13.770
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00164**	F **-.00684**	F **11.53**	**-.00283**	**-.00071**
Stddev	.00003	.00076	.02	.00019	.00204
%RSD	2.0581	11.130	.2156	6.5601	287.37
#1	.00166	-.00738	11.52	-.00296	-.00215
#2	.00162	-.00630	11.55	-.00269	.00073
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**21.982**	**.00083**	**.04343**	**.00641**	**-.00177**
Stddev	.155	.00042	.00030	.00025	.00122
%RSD	.70595	51.185	.68425	3.9303	68.636
#1	22.092	.00113	.04322	.00659	-.00263
#2	21.872	.00053	.04364	.00624	-.00091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49465-c-2-a Acquired: 11/14/2013 19:05:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00823	.00304
Stddev	.00021	.00007
%RSD	2.5358	2.3172
#1	.00838	.00309
#2	.00808	.00299
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3336.9	4892.9	75779.	7065.1
Stddev	3.3	3.1	338.	21.2
%RSD	.09795	.06427	.44561	.30023
#1	3339.3	4890.7	75540.	7050.1
#2	3334.6	4895.1	76018.	7080.1

Sample Name: 480-49465-c-2-a@5 Acquired: 11/14/2013 19:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00063**	**.04950**	**.00081**	**.02655**	**.00356**
Stddev	.00005	.02094	.00243	.00018	.00001
%RSD	7.8202	42.299	298.17	.66070	.21353
#1	-.00067	.06430	.00253	.02643	.00356
#2	-.00060	.03469	-.00090	.02667	.00355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**4.2473**	**-.00005**	**.00026**	**.00405**
Stddev	.00000	.0085	.00000	.00005	.00015
%RSD	2.6208	.19982	2.7620	19.434	3.7478
#1	-.00005	4.2533	-.00005	.00022	.00394
#2	-.00005	4.2413	-.00004	.00029	.00415
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**2.6652**	**.80657**	**.74071**	**.00041**
Stddev	.00006	.0072	.00502	.00568	.00057
%RSD	12.710	.26928	.62182	.76652	138.54
#1	.00055	2.6601	.80303	.73670	.00001
#2	.00046	2.6702	.81012	.74473	.00081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49465-c-2-a@5 Acquired: 11/14/2013 19:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.25927**	**.10889**	**.09720**	**-.00012**	**2.6926**
Stddev	.00545	.00021	.00118	.00006	.0107
%RSD	2.1014	.19488	1.2150	50.545	.39919
#1	.26313	.10904	.09804	-.00016	2.6850
#2	.25542	.10874	.09637	-.00008	2.7002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00054**	**-.00296**	**2.229**	**-.00136**	**-.00277**
Stddev	.00006	.00005	.005	.00191	.00125
%RSD	10.660	1.7695	.2277	140.44	45.015
#1	.00058	-.00300	2.226	-.00001	-.00365
#2	.00050	-.00293	2.233	-.00272	-.00189
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.3385**	**.00018**	**.00865**	**.00112**	**-.00182**
Stddev	.0237	.00008	.00014	.00017	.00072
%RSD	.54536	47.580	1.5899	14.867	39.681
#1	4.3552	.00012	.00875	.00100	-.00234
#2	4.3217	.00023	.00856	.00124	-.00131
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49465-c-2-a@5 Acquired: 11/14/2013 19:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00135**	**.00067**
Stddev	.00025	.00021
%RSD	18.586	31.063
#1	.00152	.00052
#2	.00117	.00081
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3392.8**	**4937.4**	**77148.**	**7037.3**
Stddev	3.8	3.5	447.	2.8
%RSD	.11235	.07180	.57973	.03950
#1	3395.5	4939.9	76831.	7035.4
#2	3390.1	4934.9	77464.	7039.3

Sample Name: mb 480-148703/1-a Acquired: 11/14/2013 19:10:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**.04795**	**.00154**	**.00355**	**.00013**
Stddev	.00026	.01971	.00171	.00007	.00001
%RSD	43.012	41.103	111.31	1.9741	5.8180
#1	-.00041	.06189	.00033	.00360	.00013
#2	-.00078	.03402	.00275	.00350	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	**.03858**	**-.00008**	**-.00010**	**-.00034**
Stddev	.00009	.00004	.00001	.00024	.00001
%RSD	8441.3	.10368	13.265	247.12	2.0153
#1	.00006	.03855	-.00007	.00007	-.00034
#2	-.00007	.03861	-.00008	-.00027	-.00033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**-.00019**	**.01575**	**.00376**	**-.00016**
Stddev	.00008	.00000	.03964	.00014	.00008
%RSD	32.755	1.1949	251.74	3.8160	53.506
#1	.00020	-.00019	.04378	.00366	-.00021
#2	.00031	-.00019	-.01228	.00386	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-148703/1-a Acquired: 11/14/2013 19:10:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00302**	**.00007**	**.00068**	**-.00021**	**.03106**
Stddev	.00215	.00002	.00054	.00041	.00576
%RSD	71.286	34.799	78.340	189.18	18.535
#1	-.00150	.00005	.00031	-.00050	.03513
#2	-.00454	.00009	.00106	.00007	.02699
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**-.00142**	**.0054**	**-.00195**	**-.00207**
Stddev	.00026	.00056	.0045	.00068	.00083
%RSD	136.24	39.348	83.37	35.107	40.152
#1	.00001	-.00103	.0086	-.00243	-.00148
#2	.00037	-.00182	.0022	-.00146	-.00266
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00271**	**-.00020**	**.00016**	**-.00009**	**-.00021**
Stddev	.01849	.00014	.00003	.00012	.00072
%RSD	683.10	71.619	18.399	135.08	337.78
#1	.01037	-.00029	.00014	-.00018	-.00072
#2	-.01578	-.00010	.00018	-.00000	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-148703/1-a Acquired: 11/14/2013 19:10:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00015**	**.00097**
Stddev	.00019	.00052
%RSD	127.38	53.667
#1	-.00029	.00060
#2	-.00001	.00134
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3423.7**	**4985.9**	**78068.**	**7075.6**
Stddev	4.0	14.6	26.	13.1
%RSD	.11570	.29350	.03370	.18454
#1	3426.5	4996.2	78050.	7084.9
#2	3420.9	4975.5	78087.	7066.4

Sample Name: lcs 480-148703/2-a Acquired: 11/14/2013 19:13:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05175**	**10.993**	**.20723**	**.21467**	**.22498**
Stddev	.00029	.026	.00254	.00037	.00108
%RSD	.56801	.23629	1.2266	.17310	.47865
#1	.05154	11.012	.20903	.21493	.22422
#2	.05195	10.975	.20543	.21441	.22574
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20549**	**10.299**	**.20219**	**.20314**	**.21463**
Stddev	.00018	.018	.00043	.00024	.00170
%RSD	.08833	.17696	.21022	.11867	.79208
#1	.20561	10.286	.20249	.20297	.21343
#2	.20536	10.312	.20189	.20331	.21583
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21122**	**10.095**	**11.002**	**11.402**	**.22093**
Stddev	.00137	.001	.082	.054	.00159
%RSD	.64789	.00642	.74650	.47683	.72188
#1	.21026	10.096	10.943	11.440	.21980
#2	.21219	10.095	11.060	11.364	.22206
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-148703/2-a Acquired: 11/14/2013 19:13:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.515**	**.20721**	**.18955**	**.21157**	**10.955**
Stddev	.023	.00075	.00264	.00112	.058
%RSD	.22057	.35968	1.3916	.52986	.52750
#1	10.498	.20668	.18768	.21236	10.914
#2	10.531	.20774	.19141	.21078	10.996
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20096**	**.20670**	**10.44**	**.20157**	**.20646**
Stddev	.00073	.00173	.01	.00190	.00002
%RSD	.36470	.83522	.0630	.94313	.01004
#1	.20148	.20548	10.45	.20292	.20644
#2	.20045	.20793	10.44	.20023	.20647
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.445**	**.20290**	**.21037**	**.19941**	**.20299**
Stddev	.073	.00010	.00017	.00003	.00136
%RSD	.70341	.04715	.07918	.01313	.66961
#1	10.393	.20283	.21049	.19943	.20395
#2	10.496	.20297	.21025	.19939	.20203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-148703/2-a Acquired: 11/14/2013 19:13:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21524	.20796
Stddev	.00226	.00121
%RSD	1.0494	.58039
#1	.21364	.20711
#2	.21683	.20881
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3313.4	4923.6	75825.	7046.1
Stddev	4.3	4.5	388.	13.2
%RSD	.13090	.09231	.51176	.18755
#1	3316.4	4926.8	76099.	7055.5
#2	3310.3	4920.3	75550.	7036.8

Sample Name: 480-48971-e-1-a Acquired: 11/14/2013 19:15:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00074**	**4.7293**	**.01769**	**.00717**	**.05571**
Stddev	.00089	.0351	.00084	.00051	.00005
%RSD	120.15	.74159	4.7604	7.0590	.08207
#1	-.00011	4.7045	.01829	.00753	.05568
#2	-.00137	4.7541	.01709	.00681	.05574
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**5.5871**	**.00032**	**.00077**	**.01142**
Stddev	.00002	.0070	.00010	.00002	.00028
%RSD	24.225	.12528	29.408	2.5130	2.4157
#1	.00009	5.5920	.00026	.00078	.01122
#2	.00006	5.5821	.00039	.00076	.01161
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00673**	**110.19**	**1.5124**	**1.6695**	**.00287**
Stddev	.00001	.19	.0085	.0007	.00063
%RSD	.08356	.17235	.56228	.04222	21.789
#1	.00673	110.32	1.5184	1.6700	.00243
#2	.00674	110.06	1.5064	1.6690	.00331
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-a Acquired: 11/14/2013 19:15:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.5405**	**.13672**	**.12564**	**-.00037**	**17.739**
Stddev	.0261	.00020	.00059	.00014	.004
%RSD	.73617	.14368	.47045	38.085	.02048
#1	3.5589	.13686	.12522	-.00027	17.741
#2	3.5220	.13659	.12606	-.00046	17.736
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00739**	**.00706**	**1.033**	**-.00248**	**-.00273**
Stddev	.00017	.00154	.007	.00041	.00077
%RSD	2.2432	21.779	.6724	16.536	28.044
#1	.00728	.00814	1.028	-.00277	-.00327
#2	.00751	.00597	1.038	-.00219	-.00219
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.163**	**.00105**	**.04925**	**.08020**	**-.00308**
Stddev	.056	.00007	.00014	.00046	.00003
%RSD	.55207	6.8756	.29051	.57228	1.1129
#1	10.123	.00100	.04935	.08053	-.00305
#2	10.202	.00110	.04915	.07988	-.00310
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-a Acquired: 11/14/2013 19:15:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01280	.00800
Stddev	.00043	.00023
%RSD	3.3252	2.8157
#1	.01249	.00816
#2	.01310	.00784
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3282.4	4900.5	75524.	7044.2
Stddev	7.1	9.9	67.	8.7
%RSD	.21663	.20157	.08827	.12327
#1	3287.5	4907.4	75476.	7050.4
#2	3277.4	4893.5	75571.	7038.1

Sample Name: 480-48971-e-1-b ms Acquired: 11/14/2013 19:17:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05228**	**19.969**	**.23200**	**.21801**	**.27567**
Stddev	.00025	.190	.00108	.00081	.00107
%RSD	.48152	.95309	.46348	.37160	.38989
#1	.05210	20.104	.23124	.21744	.27491
#2	.05246	19.834	.23276	.21859	.27643
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20680**	**15.862**	**.20522**	**.20797**	**.22529**
Stddev	.00008	.091	.00017	.00027	.00041
%RSD	.03869	.57599	.08231	.12890	.18185
#1	.20686	15.927	.20534	.20815	.22558
#2	.20674	15.798	.20510	.20778	.22500
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21800**	**120.40**	**12.959**	**15.046**	**.22682**
Stddev	.00154	.90	.123	.030	.00213
%RSD	.70799	.74536	.95038	.20025	.93947
#1	.21691	121.03	13.047	15.024	.22833
#2	.21909	119.76	12.872	15.067	.22531
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-b ms Acquired: 11/14/2013 19:17:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.047**	**.34370**	**.31977**	**.21200**	**29.084**
Stddev	.004	.00053	.00250	.00012	.216
%RSD	.02601	.15444	.78321	.05802	.74119
#1	14.044	.34333	.31800	.21191	29.237
#2	14.050	.34408	.32154	.21209	28.932
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21246**	**.21230**	F **11.53**	**.20350**	**.21450**
Stddev	.00010	.00165	.03	.00101	.00042
%RSD	.04788	.77599	.2537	.49777	.19597
#1	.21254	.21114	11.51	.20421	.21479
#2	.21239	.21347	11.55	.20278	.21420
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.128**	**.20452**	**.25984**	**.26000**	**.20350**
Stddev	.240	.00204	.00034	.00482	.00113
%RSD	.95441	.99653	.13272	1.8534	.55704
#1	25.298	.20596	.25960	.26340	.20270
#2	24.959	.20308	.26009	.25659	.20430
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-b ms Acquired: 11/14/2013 19:17:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.22730**	**.21226**
Stddev	.00111	.00010
%RSD	.48801	.04739
#1	.22651	.21219
#2	.22808	.21233
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3187.3**	**4848.4**	**74887.**	**7053.2**
Stddev	1.1	5.8	164.	45.2
%RSD	.03474	.12056	.21855	.64056
#1	3186.5	4852.6	75003.	7021.2
#2	3188.1	4844.3	74771.	7085.1

Sample Name: CCV Acquired: 11/14/2013 19:20:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49300**	**24.732**	**.50124**	**.48565**	**.50631**	**.48916**	**24.346**
Stddev	.00182	.049	.00300	.00038	.00200	.00073	.039
%RSD	.37011	.19799	.59887	.07776	.39427	.14939	.16089
#1	.49429	24.698	.50336	.48592	.50490	.48864	24.318
#2	.49171	24.767	.49912	.48538	.50772	.48968	24.373
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48782**	**.48440**	**.50262**	**.50138**	**23.866**	**25.510**	**26.865**
Stddev	.00030	.00118	.00123	.00040	.017	.044	.056
%RSD	.06059	.24444	.24479	.07956	.07217	.17317	.20818
#1	.48803	.48524	.50349	.50167	23.878	25.479	26.825
#2	.48761	.48357	.50175	.50110	23.853	25.541	26.905
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50847**	**23.926**	**.49905**	**.46555**	**.49218**	**25.301**	**.48625**
Stddev	.00096	.085	.00214	.00012	.00126	.054	.00052
%RSD	.18927	.35476	.42969	.02615	.25594	.21490	.10597
#1	.50778	23.986	.50057	.46546	.49128	25.262	.48661
#2	.50915	23.866	.49753	.46564	.49307	25.339	.48589
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 19:20:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48965	24.88	.50595	.49296	24.136	.49379	.49602
Stddev	.00065	.07	.00124	.00115	.094	.00356	.00149
%RSD	.13213	.2633	.24501	.23395	.39070	.72014	.30108
#1	.48919	24.93	.50682	.49378	24.069	.49128	.49497
#2	.49010	24.84	.50507	.49214	24.202	.49630	.49708
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49658	.48807	.49632	.48946
Stddev	.00187	.00157	.00057	.00281
%RSD	.37678	.32101	.11402	.57389
#1	.49790	.48917	.49672	.49144
#2	.49525	.48696	.49592	.48747
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3199.4	4852.6	74375.	7016.3
Stddev	6.5	7.1	208.	14.0
%RSD	.20328	.14531	.27961	.19894
#1	3194.8	4847.7	74228.	7026.2
#2	3204.0	4857.6	74522.	7006.5

Sample Name: CCB Acquired: 11/14/2013 19:22:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00058**	**.00024**	**.00030**	**.00019**	**.00001**	**-.00005**	**-.00508**
Stddev	.00006	.03137	.00005	.00049	.00001	.00001	.00084
%RSD	10.194	13063.	14.973	256.92	186.73	16.305	16.468
#1	-.00053	-.02194	.00027	.00054	-.00000	-.00005	-.00567
#2	-.00062	.02242	.00034	-.00016	.00001	-.00004	-.00449
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**-.00006**	**-.00059**	**.00009**	**.00093**	**.03298**	**.00224**
Stddev	.00003	.00003	.00014	.00022	.00008	.01098	.00078
%RSD	78.491	47.973	23.774	243.66	8.5071	33.295	34.680
#1	-.00001	-.00004	-.00069	-.00006	.00087	.02522	.00279
#2	-.00005	-.00009	-.00049	.00024	.00098	.04075	.00169
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**-.00221**	**-.00003**	**.00034**	**-.00014**	**.02611**	**.00010**
Stddev	.00032	.00037	.00001	.00008	.00020	.00470	.00007
%RSD	62.177	16.613	27.918	24.839	143.21	17.985	64.624
#1	.00029	-.00195	-.00002	.00028	.00000	.02943	.00006
#2	.00074	-.00247	-.00004	.00040	-.00028	.02279	.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 19:22:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**-.0012**	**-.00160**	**.00013**	**.00737**	**-.00031**	**.00002**
Stddev	.00011	.0006	.00117	.00029	.01988	.00038	.00007
%RSD	76.718	49.44	72.963	219.18	269.73	124.84	296.57
#1	-.00022	-.0016	-.00077	-.00007	.02143	-.00058	-.00003
#2	-.00006	-.0008	-.00242	.00034	-.00669	-.00004	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00015**	**-.00260**	**.00007**	**-.00065**
Stddev	.00013	.00014	.00008	.00008
%RSD	84.544	5.4936	118.59	12.943
#1	.00024	-.00270	.00013	-.00071
#2	.00006	-.00250	.00001	-.00059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3418.3**	**4977.3**	**77737.**	**7015.5**
Stddev	3.4	3.5	80.	29.8
%RSD	.09840	.07082	.10272	.42507
#1	3420.6	4979.8	77680.	7036.6
#2	3415.9	4974.8	77793.	6994.4

Sample Name: CCVL Acquired: 11/14/2013 19:25:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00258**	**.22268**	**.00959**	**.02017**	**.00215**	**.00201**	**.51130**
Stddev	.00044	.02011	.00307	.00021	.00001	.00005	.00429
%RSD	17.076	9.0296	32.003	1.0429	.50853	2.3709	.83849
#1	.00227	.23690	.00742	.02002	.00215	.00204	.51433
#2	.00289	.20847	.01176	.02032	.00216	.00197	.50826
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00080**	**.00404**	**.00358**	**.01046**	**.04924**	**.52580**	**.46579**
Stddev	.00004	.00009	.00015	.00024	.00732	.04467	.00579
%RSD	5.1497	2.1911	4.2980	2.3366	14.874	8.4955	1.2439
#1	.00083	.00410	.00369	.01063	.04406	.49421	.46989
#2	.00077	.00397	.00347	.01029	.05441	.55738	.46169
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02851**	**.20446**	**.00331**	**.00378**	**.00953**	**1.0177**	**.00987**
Stddev	.00112	.00326	.00007	.00020	.00018	.0086	.00046
%RSD	3.9155	1.5943	2.1695	5.2204	1.9138	.84022	4.6334
#1	.02772	.20676	.00336	.00364	.00940	1.0116	.01019
#2	.02930	.20215	.00326	.00392	.00966	1.0237	.00955
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 19:25:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00459	.2057	.01900	.01503	.50681	.00910	.00478
Stddev	.00030	.0034	.00074	.00036	.00755	.00015	.00009
%RSD	6.4734	1.646	3.8769	2.4087	1.4891	1.6358	1.9727
#1	.00480	.2081	.01952	.01529	.50148	.00920	.00485
#2	.00438	.2033	.01848	.01478	.51215	.00899	.00472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00490	.01872	.00498	.01025
Stddev	.00014	.00082	.00012	.00028
%RSD	2.7650	4.3779	2.4985	2.7550
#1	.00480	.01929	.00507	.01005
#2	.00499	.01814	.00490	.01045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3433.3	5032.4	77777.	7039.2
Stddev	3.6	15.7	437.	1.8
%RSD	.10532	.31256	.56218	.02488
#1	3435.9	5043.5	77468.	7038.0
#2	3430.8	5021.2	78086.	7040.5

Sample Name: 480-48971-e-1-c msd Acquired: 11/14/2013 19:27:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05100**	**20.078**	**.23220**	**.21725**	**.27695**
Stddev	.00009	.054	.00013	.00067	.00010
%RSD	.18289	.26680	.05400	.31043	.03530
#1	.05106	20.115	.23211	.21677	.27688
#2	.05093	20.040	.23229	.21773	.27702
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20868**	**16.087**	**.20764**	**.21067**	**.22938**
Stddev	.00018	.036	.00089	.00042	.00160
%RSD	.08783	.22531	.42860	.20168	.69764
#1	.20855	16.112	.20827	.21037	.23051
#2	.20881	16.061	.20701	.21097	.22825
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22186**	**122.72**	**13.198**	**15.332**	**.22947**
Stddev	.00102	.20	.041	.133	.00110
%RSD	.46199	.16267	.31043	.86850	.48112
#1	.22114	122.58	13.227	15.426	.23025
#2	.22259	122.86	13.169	15.238	.22869
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-c msd Acquired: 11/14/2013 19:27:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.216**	**.34558**	**.32087**	**.21447**	**29.647**
Stddev	.008	.00049	.00145	.00005	.001
%RSD	.05597	.14092	.45224	.02438	.00168
#1	14.222	.34592	.31985	.21450	29.647
#2	14.211	.34524	.32190	.21443	29.647
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21489**	**.21714**	F **11.38**	**.20584**	**.21160**
Stddev	.00015	.00093	.05	.00268	.00274
%RSD	.07028	.43026	.4726	1.3033	1.2954
#1	.21500	.21648	11.34	.20395	.20966
#2	.21478	.21780	11.42	.20774	.21354
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.045**	**.20487**	**.25990**	**.23164**	**.20761**
Stddev	.032	.00187	.00056	.00053	.00121
%RSD	.13347	.91242	.21495	.22944	.58493
#1	24.022	.20354	.25950	.23126	.20847
#2	24.067	.20619	.26029	.23201	.20675
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-1-c msd Acquired: 11/14/2013 19:27:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.23132**	**.21658**
Stddev	.00019	.00128
%RSD	.08204	.59215
#1	.23119	.21568
#2	.23146	.21749
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3203.0**	**4864.9**	**74730.**	**7006.7**
Stddev	9.3	4.7	57.	27.4
%RSD	.29030	.09637	.07670	.39055
#1	3209.6	4868.2	74770.	6987.4
#2	3196.5	4861.6	74689.	7026.1

Sample Name: 480-48971-e-2-a Acquired: 11/14/2013 19:29:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**.15663**	**.00665**	**.00562**	**.01818**
Stddev	.00009	.01413	.00218	.00027	.00001
%RSD	28.068	9.0219	32.854	4.7346	.03943
#1	-.00040	.16662	.00819	.00543	.01817
#2	-.00027	.14664	.00510	.00581	.01818
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**15.049**	**-.00007**	**.00865**	**.00031**
Stddev	.00008	.009	.00012	.00005	.00000
%RSD	622.28	.05982	172.41	.57400	.81000
#1	.00005	15.055	.00001	.00868	.00031
#2	-.00007	15.043	-.00015	.00861	.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00089**	**51.659**	**1.8895**	**2.0846**	**.00179**
Stddev	.00001	.201	.0314	.0104	.00093
%RSD	.70526	.38812	1.6600	.49631	52.057
#1	.00089	51.801	1.8673	2.0919	.00245
#2	.00090	51.517	1.9116	2.0773	.00113
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a Acquired: 11/14/2013 19:29:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.0261**	**.26359**	**.24017**	**-.00069**	**11.809**
Stddev	.0138	.00057	.00130	.00006	.081
%RSD	.22841	.21794	.54172	8.8724	.68489
#1	6.0358	.26400	.23925	-.00074	11.866
#2	6.0164	.26318	.24109	-.00065	11.752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00458**	**.00018**	**1.210**	**-.00307**	**.00361**
Stddev	.00053	.00033	.008	.00086	.00002
%RSD	11.578	180.86	.6538	28.048	.46833
#1	.00496	.00041	1.204	-.00246	.00362
#2	.00421	-.00005	1.215	-.00368	.00360
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.7667**	**.00054**	**.03865**	**.00121**	**-.00489**
Stddev	.0027	.00007	.00017	.00022	.00217
%RSD	.09612	12.524	.43634	18.178	44.334
#1	2.7648	.00050	.03853	.00136	-.00643
#2	2.7686	.00059	.03877	.00105	-.00336
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a Acquired: 11/14/2013 19:29:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00070**	**.00515**
Stddev	.00030	.00034
%RSD	42.335	6.5525
#1	.00049	.00539
#2	.00091	.00491
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3312.0**	**4898.8**	**75920.**	**7124.1**
Stddev	7.2	14.4	138.	10.4
%RSD	.21836	.29490	.18180	.14586
#1	3317.1	4909.0	76018.	7131.5
#2	3306.9	4888.6	75822.	7116.8

Sample Name: 480-48971-e-2-a SD@5 Acquired: 11/14/2013 19:32:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.03639**	**.00174**	**.00065**	**.00371**
Stddev	.00032	.01129	.00141	.00013	.00000
%RSD	90.021	31.010	81.099	20.037	.00098
#1	-.00058	.04437	.00274	.00074	.00371
#2	-.00013	.02841	.00074	.00056	.00371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**2.9595**	**-.00005**	**.00163**	**-.00028**
Stddev	.00001	.0022	.00005	.00004	.00054
%RSD	52.759	.07297	87.231	2.1588	192.79
#1	-.00004	2.9610	-.00009	.00165	.00010
#2	-.00002	2.9580	-.00002	.00160	-.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**9.9558**	**.38481**	**.33679**	**.00134**
Stddev	.00029	.0037	.00219	.00042	.00030
%RSD	49.525	.03766	.57009	.12517	22.401
#1	.00038	9.9585	.38637	.33709	.00155
#2	.00078	9.9532	.38326	.33650	.00112
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a SD@5 Acquired: 11/14/2013 19:32:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.1633**	**.05122**	**.04548**	**-.00044**	**2.2831**
Stddev	.0066	.00006	.00078	.00008	.0046
%RSD	.56660	.10771	1.7102	17.717	.20163
#1	1.1587	.05125	.04493	-.00038	2.2799
#2	1.1680	.05118	.04603	-.00049	2.2864
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**-.00132**	**.2225**	**-.00200**	**.00074**
Stddev	.00022	.00019	.0002	.00414	.00217
%RSD	25.474	14.253	.0693	207.09	293.70
#1	.00104	-.00119	.2226	.00093	.00227
#2	.00072	-.00145	.2223	-.00493	-.00079
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.57893**	**-.00012**	**.00746**	**.00053**	**-.00333**
Stddev	.00731	.00020	.00027	.00003	.00002
%RSD	1.2624	163.38	3.6740	5.7096	.67601
#1	.58410	-.00026	.00726	.00051	-.00332
#2	.57376	.00002	.00765	.00055	-.00335
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a SD@5 Acquired: 11/14/2013 19:32:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00010	.00052
Stddev	.00014	.00037
%RSD	148.43	70.005
#1	.00020	.00026
#2	-.00000	.00078
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3383.0	4946.9	76657.	6976.0
Stddev	1.9	5.7	64.	8.4
%RSD	.05671	.11524	.08377	.12060
#1	3381.6	4950.9	76612.	6970.1
#2	3384.3	4942.8	76703.	6982.0

Sample Name: 480-48971-e-2-a PDS Acquired: 11/14/2013 19:34:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05043**	**10.534**	**.21520**	**.20560**	**.22683**
Stddev	.00057	.012	.00055	.00076	.00028
%RSD	1.1313	.11676	.25645	.36875	.12312
#1	.05084	10.525	.21481	.20507	.22664
#2	.05003	10.543	.21559	.20614	.22703
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20316**	**24.567**	**.20124**	**.21151**	**.20984**
Stddev	.00023	.065	.00029	.00001	.00027
%RSD	.11523	.26524	.14352	.00681	.13089
#1	.20332	24.521	.20104	.21152	.21004
#2	.20299	24.613	.20144	.21150	.20965
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20879**	**59.873**	**12.383**	**14.025**	**.21434**
Stddev	.00007	.638	.050	.001	.00044
%RSD	.03304	1.0662	.40715	.00683	.20440
#1	.20884	59.422	12.348	14.024	.21465
#2	.20874	60.325	12.419	14.026	.21403
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a PDS Acquired: 11/14/2013 19:34:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.978**	**.44705**	**.41423**	**.20843**	**21.966**
Stddev	.047	.00106	.00022	.00016	.077
%RSD	.29536	.23653	.05378	.07680	.35252
#1	15.944	.44631	.41438	.20832	21.911
#2	16.011	.44780	.41407	.20855	22.020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20447**	**.20521**	**1.143**	**.20023**	**.20443**
Stddev	.00005	.00184	.001	.00146	.00074
%RSD	.02569	.89818	.0810	.72728	.36381
#1	.20443	.20652	1.142	.19920	.20495
#2	.20450	.20391	1.143	.20126	.20390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.117**	**.19572**	**.23629**	**.20069**	**.20315**
Stddev	.094	.00038	.00041	.00149	.00168
%RSD	.71708	.19617	.17194	.74454	.82938
#1	13.051	.19599	.23600	.19964	.20434
#2	13.184	.19544	.23658	.20175	.20196
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-2-a PDS Acquired: 11/14/2013 19:34:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21075**	**.20830**
Stddev	.00017	.00098
%RSD	.07985	.47076
#1	.21087	.20761
#2	.21064	.20899
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3245.6**	**4910.3**	**75538.**	**7082.1**
Stddev	3.5	10.8	177.	13.2
%RSD	.10679	.21959	.23416	.18641
#1	3248.0	4917.9	75663.	7091.4
#2	3243.1	4902.6	75413.	7072.8

Sample Name: 480-48971-e-3-a Acquired: 11/14/2013 19:36:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**7.2755**	**-.00376**	**.01384**	**.01340**
Stddev	.00014	.0766	.00125	.00024	.00002
%RSD	326.60	1.0524	33.231	1.7496	.16588
#1	-.00006	7.2213	-.00465	.01401	.01339
#2	.00014	7.3296	-.00288	.01367	.01342
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**2.1036**	**.00091**	**.00377**	**.00771**
Stddev	.00000	.0266	.00007	.00013	.00015
%RSD	.49814	1.2637	7.4266	3.3163	1.9478
#1	.00050	2.0848	.00086	.00368	.00782
#2	.00050	2.1224	.00096	.00386	.00761
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00553**	**6.2820**	**2.5076**	**2.4246**	**.01022**
Stddev	.00007	.0122	.0344	.0051	.00059
%RSD	1.2207	.19360	1.3724	.21057	5.8021
#1	.00548	6.2734	2.4832	2.4210	.00980
#2	.00558	6.2906	2.5319	2.4282	.01064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-3-a Acquired: 11/14/2013 19:36:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.7741**	**.54282**	**.48249**	**-.00002**	**1.0159**
Stddev	.0078	.00025	.00205	.00001	.0108
%RSD	.44219	.04536	.42446	35.695	1.0627
#1	1.7686	.54300	.48394	-.00001	1.0083
#2	1.7797	.54265	.48104	-.00002	1.0235
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01382**	**-.00185**	**.3665**	**-.00209**	**-.00196**
Stddev	.00005	.00099	.0017	.00095	.00081
%RSD	.37965	53.618	.4587	45.592	41.328
#1	.01386	-.00115	.3676	-.00141	-.00139
#2	.01379	-.00255	.3653	-.00276	-.00253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**16.175**	**.00026**	**.00342**	**.12292**	**-.00156**
Stddev	.130	.00074	.00013	.00560	.00192
%RSD	.80378	283.42	3.6870	4.5566	123.28
#1	16.083	.00078	.00351	.12688	-.00291
#2	16.267	-.00026	.00333	.11896	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-3-a Acquired: 11/14/2013 19:36:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.01600**	**.03290**
Stddev	.00012	.00019
%RSD	.77074	.57402
#1	.01591	.03303
#2	.01609	.03277
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3414.8**	**5013.2**	**78244.**	**7127.2**
Stddev	.2	.9	251.	48.9
%RSD	.00727	.01883	.32087	.68615
#1	3414.6	5013.8	78421.	7161.8
#2	3414.9	5012.5	78066.	7092.6

Sample Name: 480-48971-e-4-a Acquired: 11/14/2013 19:39:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00094**	**7.5882**	**.00353**	**.01532**	**.02813**
Stddev	.00023	.0293	.00203	.00025	.00009
%RSD	24.701	.38586	57.466	1.6104	.33770
#1	-.00110	7.5675	.00210	.01514	.02806
#2	-.00077	7.6089	.00496	.01549	.02819
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00062**	**47.548**	**.00021**	**.00255**	**.01015**
Stddev	.00006	.013	.00004	.00002	.00025
%RSD	10.049	.02653	16.603	.72767	2.4570
#1	.00058	47.539	.00019	.00257	.00997
#2	.00067	47.557	.00024	.00254	.01032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00651**	**5.9426**	**2.8378**	**3.1755**	**.00711**
Stddev	.00037	.0010	.0119	.0364	.00016
%RSD	5.6142	.01773	.42068	1.1447	2.2085
#1	.00625	5.9434	2.8463	3.2012	.00722
#2	.00677	5.9419	2.8294	3.1498	.00700
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-4-a Acquired: 11/14/2013 19:39:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.650**	**.12504**	**.11602**	**-.00024**	**.91574**
Stddev	.142	.00087	.00041	.00011	.00590
%RSD	.49558	.69630	.35062	46.113	.64463
#1	28.550	.12442	.11574	-.00031	.91157
#2	28.750	.12565	.11631	-.00016	.91991
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00925**	**-.00258**	**.9468**	**-.00189**	**-.00425**
Stddev	.00039	.00067	.0012	.00133	.00159
%RSD	4.2645	25.975	.1311	70.466	37.396
#1	.00953	-.00305	.9477	-.00095	-.00537
#2	.00897	-.00211	.9460	-.00283	-.00312
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.541**	**-.00016**	**.02448**	**.09676**	**-.00307**
Stddev	.067	.00083	.00002	.00390	.00031
%RSD	.43125	511.01	.06439	4.0317	10.188
#1	15.493	-.00075	.02449	.09952	-.00285
#2	15.588	.00042	.02447	.09400	-.00329
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-4-a Acquired: 11/14/2013 19:39:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01685	.03301
Stddev	.00015	.00033
%RSD	.87233	1.0140
#1	.01675	.03277
#2	.01696	.03325
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3273.8	4903.8	75295.	7014.0
Stddev	2.3	3.3	544.	1.6
%RSD	.07160	.06684	.72246	.02263
#1	3275.5	4906.1	75680.	7012.9
#2	3272.1	4901.5	74910.	7015.1

Sample Name: 480-48971-e-5-a Acquired: 11/14/2013 19:41:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00040**	**.02910**	**-.00123**	**.00326**	**.00014**
Stddev	.00050	.00015	.00044	.00052	.00000
%RSD	125.01	.50740	35.905	15.856	.67410
#1	.00005	.02921	-.00154	.00363	.00014
#2	.00076	.02900	-.00092	.00290	.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.06193**	**-.00010**	**-.00013**	**-.00030**
Stddev	.00005	.00341	.00003	.00001	.00005
%RSD	167.06	5.5036	31.623	8.3874	15.492
#1	.00006	.05952	-.00012	-.00014	-.00027
#2	-.00001	.06434	-.00008	-.00012	-.00033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**.00060**	**.02962**	**.00193**	**-.00077**
Stddev	.00032	.00095	.01352	.00041	.00079
%RSD	309.31	157.76	45.650	21.153	102.25
#1	-.00012	.00128	.02006	.00164	-.00021
#2	.00033	-.00007	.03918	.00222	-.00133
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-5-a Acquired: 11/14/2013 19:41:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00719**	**-.00005**	**.00032**	**-.00019**	**.08331**
Stddev	.00014	.00004	.00032	.00000	.00179
%RSD	1.9945	84.306	100.49	1.5351	2.1459
#1	.00709	-.00002	.00009	-.00019	.08205
#2	.00729	-.00008	.00055	-.00019	.08458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**-.00026**	**.0062**	**-.00250**	**-.00093**
Stddev	.00033	.00107	.0006	.00017	.00209
%RSD	379.70	404.19	9.202	6.7600	224.62
#1	.00015	.00049	.0058	-.00262	-.00241
#2	-.00033	-.00102	.0066	-.00238	.00055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00484**	**-.00007**	**.00014**	**.00029**	**-.00377**
Stddev	.00467	.00013	.00011	.00027	.00053
%RSD	96.655	172.77	81.908	92.207	14.058
#1	-.00153	-.00017	.00006	.00048	-.00339
#2	-.00814	.00002	.00021	.00010	-.00414
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-5-a Acquired: 11/14/2013 19:41:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00011**	**.00146**
Stddev	.00014	.00010
%RSD	132.22	6.6064
#1	-.00020	.00153
#2	-.00001	.00139
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3427.5**	**4984.2**	**78095.**	**7048.7**
Stddev	3.1	2.1	214.	7.2
%RSD	.09153	.04298	.27462	.10186
#1	3429.7	4985.7	78247.	7043.6
#2	3425.3	4982.6	77944.	7053.7

Sample Name: 480-48971-e-6-a Acquired: 11/14/2013 19:44:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**9.6149**	**.00056**	**.01509**	**.03040**
Stddev	.00083	.0242	.00017	.00045	.00001
%RSD	151.51	.25154	30.842	3.0021	.01752
#1	-.00113	9.6320	.00044	.01541	.03040
#2	.00004	9.5978	.00068	.01477	.03041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00071**	**47.391**	**.00022**	**.00291**	**.01214**
Stddev	.00004	.021	.00003	.00000	.00030
%RSD	4.9096	.04360	13.569	.13915	2.4470
#1	.00069	47.405	.00024	.00291	.01193
#2	.00074	47.376	.00020	.00292	.01235
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00848**	**7.0015**	**3.0945**	**3.4412**	**.00788**
Stddev	.00022	.0135	.0417	.0056	.00061
%RSD	2.6454	.19210	1.3478	.16354	7.7430
#1	.00864	6.9920	3.1240	3.4452	.00745
#2	.00832	7.0110	3.0650	3.4372	.00832
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-6-a Acquired: 11/14/2013 19:44:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.734**	**.14998**	**.13726**	**-.00009**	**.92231**
Stddev	.018	.00018	.00027	.00005	.00763
%RSD	.06159	.11820	.19666	57.793	.82739
#1	28.722	.14985	.13745	-.00013	.91692
#2	28.747	.15010	.13707	-.00005	.92771
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01108**	**-.00146**	**.9476**	**-.00383**	**-.00379**
Stddev	.00032	.00158	.0041	.00124	.00553
%RSD	2.8720	107.78	.4338	32.442	145.80
#1	.01086	-.00035	.9447	-.00295	-.00770
#2	.01131	-.00258	.9505	-.00471	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**19.194**	**.00001**	**.02481**	**.14049**	**-.00029**
Stddev	.002	.00041	.00007	.00088	.00009
%RSD	.00999	3389.3	.28711	.62437	31.001
#1	19.192	-.00028	.02476	.13987	-.00023
#2	19.195	.00030	.02486	.14111	-.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48971-e-6-a Acquired: 11/14/2013 19:44:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.02057**	**.02749**
Stddev	.00029	.00051
%RSD	1.4130	1.8621
#1	.02036	.02786
#2	.02078	.02713
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3259.0**	**4901.3**	**75641.**	**7035.7**
Stddev	.5	3.5	52.	18.5
%RSD	.01482	.07100	.06919	.26306
#1	3259.3	4903.7	75604.	7048.7
#2	3258.6	4898.8	75678.	7022.6

Sample Name: 480-48972-c-1-a Acquired: 11/14/2013 19:46:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00205**	**.08061**	**.00271**	**2.7176**	**.19003**
Stddev	.00012	.00248	.00133	.0018	.00060
%RSD	5.6342	3.0722	49.081	.06752	.31344
#1	.00197	.07886	.00177	2.7163	.18961
#2	.00213	.08236	.00365	2.7189	.19045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**40.712**	**.00001**	**.01234**	**.00207**
Stddev	.00004	.061	.00000	.00013	.00006
%RSD	48.583	.15056	14.842	1.0764	3.1086
#1	.00012	40.755	.00002	.01224	.00202
#2	.00006	40.668	.00001	.01243	.00211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**8.6539**	**7.1599**	**8.9404**	**.00019**
Stddev	.00000	.0094	.0600	.0785	.00055
%RSD	.42871	.10846	.83842	.87765	287.19
#1	.00073	8.6606	7.2024	8.8849	-.00020
#2	.00072	8.6473	7.1175	8.9959	.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-1-a Acquired: 11/14/2013 19:46:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**21.790**	**9.9696**	**9.7970**	**-.00081**	**55.071**
Stddev	.013	.0030	.0069	.00037	.327
%RSD	.05751	.03007	.07093	45.082	.59401
#1	21.798	9.9717	9.8019	-.00107	54.839
#2	21.781	9.9675	9.7921	-.00055	55.302
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00369**	**-.00075**	**8.794**	**-.00299**	**.00522**
Stddev	.00007	.00131	.017	.00203	.00310
%RSD	2.0257	175.68	.1923	68.048	59.428
#1	.00374	-.00168	8.782	-.00442	.00302
#2	.00364	.00018	8.806	-.00155	.00741
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.4447**	**-.00014**	**.22062**	**.00214**	**.00366**
Stddev	.0155	.00005	.00036	.00019	.00011
%RSD	.28433	31.879	.16150	9.0548	3.0898
#1	5.4338	-.00011	.22037	.00200	.00374
#2	5.4557	-.00017	.22087	.00228	.00358
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-1-a Acquired: 11/14/2013 19:46:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00037	.00530
Stddev	.00015	.00034
%RSD	39.565	6.4852
#1	.00048	.00554
#2	.00027	.00505
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3208.9	4814.6	73731.	7083.7
Stddev	7.9	9.3	150.	15.9
%RSD	.24560	.19256	.20356	.22453
#1	3214.5	4821.1	73837.	7095.0
#2	3203.4	4808.0	73624.	7072.5

Sample Name: CCV Acquired: 11/14/2013 19:48:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49683**	**25.375**	**.50154**	**.48821**	**.51474**	**.48687**	**24.799**
Stddev	.00025	.095	.00209	.00013	.00059	.00094	.099
%RSD	.04963	.37327	.41654	.02746	.11441	.19272	.39763
#1	.49665	25.308	.50302	.48812	.51432	.48621	24.729
#2	.49700	25.442	.50006	.48831	.51516	.48753	24.869
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48714**	**.48446**	**.51173**	**.51137**	**23.786**	**26.418**	F **27.907**
Stddev	.00013	.00111	.00063	.00170	.130	.093	.236
%RSD	.02706	.22962	.12262	.33159	.54551	.35377	.84591
#1	.48705	.48525	.51129	.51017	23.694	26.352	27.740
#2	.48724	.48367	.51217	.51257	23.878	26.484	28.074
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52584**	**23.914**	**.49813**	**.46643**	**.49112**	**26.223**	**.48654**
Stddev	.00109	.002	.00156	.00148	.00094	.082	.00259
%RSD	.20661	.00809	.31346	.31687	.19216	.31117	.53185
#1	.52660	23.915	.49702	.46538	.49179	26.165	.48837
#2	.52507	23.912	.49923	.46747	.49046	26.281	.48472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 19:48:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48763	24.82	.50462	.48922	24.705	.49288	.49042
Stddev	.00232	.09	.00005	.00288	.147	.00136	.00170
%RSD	.47529	.3810	.00912	.58816	.59559	.27670	.34597
#1	.48927	24.88	.50459	.49125	24.601	.49384	.48922
#2	.48599	24.75	.50466	.48718	24.809	.49191	.49162
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49637	.49048	.50329	.49297
Stddev	.00054	.00415	.00122	.00026
%RSD	.10843	.84532	.24259	.05341
#1	.49675	.49341	.50416	.49316
#2	.49599	.48755	.50243	.49279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3206.2	4868.2	73900.	6952.2
Stddev	5.7	4.8	69.	16.8
%RSD	.17742	.09873	.09318	.24127
#1	3202.2	4864.8	73948.	6964.0
#2	3210.2	4871.6	73851.	6940.3

Sample Name: CCB Acquired: 11/14/2013 19:51:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**.00619**	**-.00231**	**.00082**	**.00002**	**-.00007**	**-.00336**
Stddev	.00011	.01990	.00146	.00039	.00001	.00012	.00513
%RSD	78.619	321.71	63.270	47.959	42.532	158.38	152.84
#1	-.00006	.02026	-.00128	.00054	.00001	.00001	-.00698
#2	-.00021	-.00789	-.00335	.00110	.00002	-.00016	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**.00006**	**-.00031**	**.00011**	**.00009**	**.02371**	**.00170**
Stddev	.00002	.00011	.00007	.00003	.00189	.00492	.00044
%RSD	36.536	190.64	23.286	23.543	2123.1	20.737	26.112
#1	-.00009	.00014	-.00036	.00013	.00143	.02024	.00202
#2	-.00005	-.00002	-.00026	.00009	-.00125	.02719	.00139
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00180**	**-.00050**	**-.00003**	**.00038**	**-.00018**	**.01114**	**-.00073**
Stddev	.00007	.00099	.00001	.00031	.00019	.01064	.00042
%RSD	4.1591	199.31	41.664	81.874	109.00	95.546	56.875
#1	-.00175	.00020	-.00002	.00016	-.00004	.00361	-.00044
#2	-.00185	-.00120	-.00003	.00060	-.00031	.01867	-.00102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 19:51:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00050**	**-.0023**	**-.00117**	**-.00282**	**.02322**	**-.00032**	**-.00018**
Stddev	.00090	.0004	.00144	.00523	.00157	.00027	.00003
%RSD	179.14	18.91	123.88	185.43	6.7811	84.174	17.746
#1	-.00114	-.0020	-.00219	.00088	.02433	-.00051	-.00021
#2	.00013	-.0026	-.00014	-.00651	.02211	-.00013	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00010**	**-.00377**	**-.00007**	**-.00022**
Stddev	.00013	.00127	.00004	.00046
%RSD	137.08	33.565	53.778	208.25
#1	-.00000	-.00287	-.00004	-.00055
#2	-.00019	-.00466	-.00009	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3433.6**	**4992.4**	**77642.**	**7020.3**
Stddev	10.3	5.9	100.	11.2
%RSD	.29925	.11747	.12909	.15991
#1	3440.8	4996.6	77571.	7012.4
#2	3426.3	4988.3	77713.	7028.3

Sample Name: CCVL Acquired: 11/14/2013 19:53:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00241**	**.21596**	**.01189**	**.02040**	F **.00371**	**.00193**	**.50339**
Stddev	.00026	.00832	.00078	.00023	.00001	.00007	.00038
%RSD	10.812	3.8518	6.5983	1.1396	.25780	3.5040	.07577
#1	.00223	.21007	.01244	.02057	.00372	.00188	.50366
#2	.00259	.22184	.01134	.02024	.00370	.00198	.50312
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
Value					.00200		
Range					50.000%		

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00090**	**.00385**	**.00352**	**.01006**	**.04480**	**.48649**	**.45074**
Stddev	.00000	.00005	.00031	.00008	.00149	.00377	.00308
%RSD	.08097	1.3728	8.8275	.83983	3.3337	.77396	.68388
#1	.00090	.00389	.00330	.01000	.04375	.48383	.44856
#2	.00090	.00381	.00374	.01012	.04586	.48915	.45292
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02887**	**.20338**	**.00326**	**.00342**	**.00945**	**.97499**	**.00978**
Stddev	.00041	.00285	.00005	.00015	.00003	.00442	.00013
%RSD	1.4191	1.4034	1.6622	4.4136	.31348	.45315	1.3168
#1	.02916	.20540	.00330	.00331	.00947	.97187	.00988
#2	.02859	.20137	.00323	.00352	.00943	.97812	.00969
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/14/2013 19:53:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00366	.2072	.01951	.01086	.49047	.00939	.00498
Stddev	.00116	.0114	.00071	.00550	.01682	.00017	.00007
%RSD	31.854	5.488	3.6516	50.649	3.4302	1.7979	1.4926
#1	.00283	.2152	.02001	.01475	.47857	.00951	.00503
#2	.00448	.1992	.01900	.00697	.50236	.00927	.00493
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00492	.01826	.00476	.01096
Stddev	.00008	.00020	.00008	.00008
%RSD	1.6093	1.1148	1.6246	.69739
#1	.00486	.01840	.00471	.01101
#2	.00497	.01811	.00482	.01091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3450.0	5054.0	78751.	7172.5
Stddev	5.9	4.1	83.	21.6
%RSD	.17062	.08112	.10526	.30103
#1	3454.2	5056.9	78692.	7187.8
#2	3445.9	5051.1	78809.	7157.3

Sample Name: 480-48972-c-2-a Acquired: 11/14/2013 19:56:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**.01824**	**.00071**	**.02992**	**.01707**
Stddev	.00036	.01255	.00155	.00033	.00005
%RSD	141.70	68.802	218.07	1.0928	.26775
#1	-.00000	.00937	-.00038	.03015	.01710
#2	.00051	.02712	.00180	.02969	.01704
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**3.5185**	**.00001**	**.03606**	**.00012**
Stddev	.00006	.0215	.00001	.00004	.00021
%RSD	541.33	.60991	195.87	.11995	175.19
#1	.00003	3.5033	.00002	.03602	.00027
#2	-.00006	3.5337	-.00000	.03609	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00068**	**.18993**	**1.6731**	**1.6321**	**.00051**
Stddev	.00011	.00225	.0382	.0056	.00074
%RSD	16.541	1.1850	2.2846	.34474	144.79
#1	.00076	.19152	1.6461	1.6281	-.00001
#2	.00060	.18834	1.7002	1.6360	.00104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-2-a Acquired: 11/14/2013 19:56:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.8712**	**3.1755**	**2.8589**	**-.00044**	**3.0946**
Stddev	.0045	.0119	.0124	.00007	.0037
%RSD	.09281	.37362	.43208	16.023	.11933
#1	4.8744	3.1838	2.8677	-.00039	3.0919
#2	4.8680	3.1671	2.8502	-.00049	3.0972
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00324**	**-.00280**	**7.829**	**-.00154**	**.00095**
Stddev	.00032	.00172	.024	.00138	.00216
%RSD	9.9971	61.556	.3038	89.470	227.79
#1	.00347	-.00402	7.812	-.00252	.00248
#2	.00301	-.00158	7.845	-.00057	-.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.1156**	**-.00011**	**.01619**	**.00075**	**-.00190**
Stddev	.0006	.00004	.00024	.00005	.00317
%RSD	.01476	37.788	1.5007	6.8845	166.72
#1	4.1160	-.00014	.01636	.00078	.00034
#2	4.1151	-.00008	.01602	.00071	-.00415
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-2-a Acquired: 11/14/2013 19:56:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00004	.00592
Stddev	.00004	.00053
%RSD	117.91	8.8837
#1	.00001	.00629
#2	.00007	.00554
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3406.0	4957.7	77763.	7082.1
Stddev	9.9	5.4	302.	38.6
%RSD	.29054	.10956	.38851	.54471
#1	3413.0	4961.6	77549.	7109.4
#2	3399.0	4953.9	77977.	7054.8

Sample Name: 480-48972-c-3-a Acquired: 11/14/2013 19:58:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00503**	**.04573**	**.00172**	**1.4637**	**.21757**
Stddev	.00063	.02879	.00122	.0014	.00032
%RSD	12.520	62.958	71.047	.09830	.14723
#1	.00458	.02537	.00086	1.4627	.21780
#2	.00547	.06609	.00259	1.4648	.21735
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**87.641**	**.00019**	**.04003**	**.00545**
Stddev	.00006	.576	.00001	.00004	.00042
%RSD	88.865	.65719	5.1761	.10062	7.7545
#1	-.00012	88.048	.00019	.04006	.00575
#2	-.00003	87.234	.00018	.04000	.00515
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**.08588**	**8.5081**	**10.448**	**.00070**
Stddev	.00003	.00385	.0135	.068	.00121
%RSD	4.2016	4.4811	.15867	.65004	171.83
#1	.00075	.08861	8.5176	10.496	-.00015
#2	.00071	.08316	8.4985	10.400	.00156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-3-a Acquired: 11/14/2013 19:58:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.135**	F **22.618**	F **24.114**	**-.00114**	**28.769**
Stddev	.006	.034	.046	.00002	.020
%RSD	.02419	.15067	.19062	2.0163	.07059
#1	25.139	22.642	24.147	-.00112	28.754
#2	25.130	22.594	24.082	-.00116	28.783
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02396**	**-.00206**	F **22.05**	**-.00217**	**.00838**
Stddev	.00090	.00187	.05	.00075	.00019
%RSD	3.7514	90.575	.2098	34.543	2.2557
#1	.02332	-.00074	22.02	-.00164	.00825
#2	.02460	-.00338	22.08	-.00269	.00852
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.4586**	**-.00096**	**.58339**	**.00045**	**.00835**
Stddev	.0154	.00002	.00235	.00007	.00232
%RSD	.16235	2.2147	.40339	16.033	27.793
#1	9.4695	-.00095	.58506	.00051	.00671
#2	9.4478	-.00098	.58173	.00040	.00999
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-3-a Acquired: 11/14/2013 19:58:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00130	.01619
Stddev	.00031	.00007
%RSD	23.616	.43762
#1	.00108	.01614
#2	.00151	.01624
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3178.1	4766.8	73042.	6987.6
Stddev	2.4	1.8	71.	21.6
%RSD	.07691	.03818	.09658	.30932
#1	3179.8	4768.1	73092.	6972.3
#2	3176.4	4765.5	72993.	7002.9

Sample Name: 480-48972-c-4-a Acquired: 11/14/2013 20:01:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.11689**	**-.00107**	**.00891**	**.01976**
Stddev	.00022	.00673	.00039	.00046	.00005
%RSD	256.54	5.7561	36.500	5.2037	.26605
#1	-.00007	.11213	-.00134	.00924	.01972
#2	.00024	.12165	-.00079	.00859	.01979
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**4.2896**	**-.00012**	**.00006**	**-.00031**
Stddev	.00001	.0436	.00001	.00004	.00034
%RSD	30.803	1.0174	10.480	71.989	109.62
#1	.00006	4.3205	-.00013	.00003	-.00055
#2	.00004	4.2587	-.00011	.00009	-.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.16654**	**1.1788**	**1.1165**	**.00144**
Stddev	.00012	.00059	.0175	.0124	.00118
%RSD	14.527	.35563	1.4832	1.1139	81.587
#1	.00076	.16612	1.1912	1.1253	.00061
#2	.00093	.16696	1.1664	1.1077	.00227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-4-a Acquired: 11/14/2013 20:01:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6534**	**.00985**	**.00884**	**-.00033**	**2.2428**
Stddev	.0049	.00000	.00023	.00001	.0098
%RSD	.29811	.00326	2.5733	2.8118	.43620
#1	1.6569	.00985	.00868	-.00033	2.2497
#2	1.6500	.00985	.00900	-.00032	2.2359
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**-.00279**	**.4255**	**-.00257**	**-.00019**
Stddev	.00002	.00072	.0027	.00085	.00246
%RSD	7.1315	25.654	.6389	33.093	1290.1
#1	.00023	-.00330	.4236	-.00317	.00155
#2	.00021	-.00228	.4274	-.00197	-.00193
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.2699**	**.00017**	**.02218**	**.00607**	**-.00372**
Stddev	.0446	.00065	.00024	.00344	.00097
%RSD	.61370	389.80	1.0817	56.771	26.161
#1	7.3014	-.00029	.02235	.00850	-.00441
#2	7.2383	.00062	.02201	.00363	-.00303
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48972-c-4-a Acquired: 11/14/2013 20:01:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00046**	**.00261**
Stddev	.00018	.00049
%RSD	40.094	18.757
#1	.00059	.00226
#2	.00033	.00296
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3428.6**	**4970.7**	**76865.**	**7004.6**
Stddev	6.7	8.6	18.	39.1
%RSD	.19592	.17315	.02291	.55866
#1	3433.4	4976.8	76853.	6976.9
#2	3423.9	4964.6	76878.	7032.3

Sample Name: 480-48973-a-1-a Acquired: 11/14/2013 20:03:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.03782**	**.00060**	**.00448**	**.00021**
Stddev	.00022	.01606	.00131	.00008	.00002
%RSD	263.38	42.452	217.84	1.6731	9.0091
#1	-.00024	.04917	-.00033	.00443	.00019
#2	.00007	.02647	.00153	.00454	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**.05492**	**-.00003**	**.00000**	**-.00070**
Stddev	.00004	.00256	.00002	.00001	.00037
%RSD	58.921	4.6697	65.977	233.89	52.863
#1	-.00004	.05311	-.00005	-.00000	-.00044
#2	-.00009	.05674	-.00002	.00001	-.00096
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**-.00076**	**.00320**	**.00220**	**-.00079**
Stddev	.00007	.00193	.02899	.00002	.00010
%RSD	30.555	254.99	905.58	.85648	12.422
#1	.00029	.00061	.02370	.00221	-.00072
#2	.00019	-.00213	-.01730	.00219	-.00086
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-a-1-a Acquired: 11/14/2013 20:03:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**.00013**	**.00047**	**-.00044**	**.02559**
Stddev	.00310	.00001	.00015	.00012	.00060
%RSD	1422.9	6.6725	31.922	26.778	2.3582
#1	.00241	.00013	.00058	-.00035	.02516
#2	-.00197	.00012	.00037	-.00052	.02601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**-.00130**	**.0033**	**-.00319**	**-.00071**
Stddev	.00024	.00075	.0042	.00067	.00007
%RSD	3906.8	57.598	126.1	20.900	9.9519
#1	-.00016	-.00183	.0063	-.00272	-.00076
#2	.00017	-.00077	.0004	-.00366	-.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01011**	**-.00017**	**.00019**	**-.00003**	**-.00070**
Stddev	.00512	.00017	.00010	.00026	.00070
%RSD	50.679	102.00	51.055	814.69	101.21
#1	-.01373	-.00029	.00012	.00015	-.00119
#2	-.00649	-.00005	.00026	-.00022	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-a-1-a Acquired: 11/14/2013 20:03:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00003**	**.01842**
Stddev	.00005	.00024
%RSD	159.10	1.3127
#1	.00007	.01825
#2	-.00000	.01859
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3424.2**	**4981.5**	**78030.**	**7032.4**
Stddev	5.0	5.5	85.	22.7
%RSD	.14474	.10959	.10957	.32274
#1	3427.7	4985.3	77969.	7048.5
#2	3420.7	4977.6	78090.	7016.4

Sample Name: 480-48973-c-3-a Acquired: 11/14/2013 20:05:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00063**	**.09504**	**.00099**	**.00758**	**.03838**
Stddev	.00008	.00239	.00075	.00000	.00009
%RSD	13.556	2.5153	76.184	.02931	.22374
#1	-.00057	.09673	.00152	.00757	.03832
#2	-.00069	.09335	.00046	.00758	.03844
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**16.592**	**.00002**	**.00017**	**.00001**
Stddev	.00002	.034	.00011	.00014	.00030
%RSD	26.729	.20654	584.00	79.801	2215.6
#1	-.00006	16.568	-.00006	.00027	.00022
#2	-.00009	16.616	.00010	.00007	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**.05559**	**3.4395**	**3.6201**	**.01123**
Stddev	.00005	.00661	.0082	.0208	.00071
%RSD	7.7975	11.893	.23950	.57475	6.2851
#1	.00061	.05091	3.4337	3.6054	.01173
#2	.00068	.06026	3.4454	3.6348	.01073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-3-a Acquired: 11/14/2013 20:05:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.7562**	**.02740**	**.02513**	**-.00025**	**7.4561**
Stddev	.0071	.00009	.00032	.00022	.0246
%RSD	.18951	.31615	1.2876	89.419	.32986
#1	3.7512	.02746	.02536	-.00041	7.4387
#2	3.7613	.02734	.02491	-.00009	7.4735
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00322**	F **-.00549**	**1.074**	**-.00110**	**-.00043**
Stddev	.00032	.00058	.009	.00060	.00290
%RSD	9.9235	10.642	.8875	54.780	670.62
#1	.00299	-.00590	1.067	-.00067	.00162
#2	.00344	-.00508	1.081	-.00152	-.00248
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		120.00			
Low Limit		-.00500			

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.022**	**.00019**	**.11608**	**.00065**	**-.00118**
Stddev	.061	.00040	.00073	.00017	.00009
%RSD	.47188	212.65	.63140	25.782	7.7141
#1	12.979	.00047	.11556	.00077	-.00125
#2	13.065	-.00009	.11659	.00053	-.00112
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-3-a Acquired: 11/14/2013 20:05:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00007**	**.00286**
Stddev	.00030	.00049
%RSD	435.19	17.013
#1	-.00029	.00320
#2	.00015	.00252
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3380.0**	**4940.8**	**76786.**	**7068.6**
Stddev	2.2	5.1	109.	31.9
%RSD	.06400	.10267	.14171	.45195
#1	3381.5	4944.4	76863.	7091.2
#2	3378.4	4937.2	76709.	7046.0

Sample Name: 480-48973-c-4-a Acquired: 11/14/2013 20:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**.02169**	**.00113**	**.00804**	**.02462**
Stddev	.00044	.02519	.00049	.00001	.00005
%RSD	537.52	116.15	43.710	.18051	.20170
#1	-.00023	.00388	.00148	.00803	.02466
#2	.00040	.03951	.00078	.00805	.02459
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**19.573**	**-.00004**	**-.00014**	**-.00024**
Stddev	.00002	.007	.00002	.00006	.00034
%RSD	189.74	.03533	38.967	42.006	142.89
#1	.00000	19.578	-.00003	-.00019	.00000
#2	-.00002	19.568	-.00005	-.00010	-.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00041**	**.00390**	**3.1138**	**3.1960**	**.00755**
Stddev	.00008	.00097	.0267	.0061	.00090
%RSD	19.504	24.840	.85641	.18953	11.901
#1	.00035	.00458	3.1327	3.1917	.00818
#2	.00047	.00321	3.0950	3.2003	.00691
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-4-a Acquired: 11/14/2013 20:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.4548**	**.00063**	**.00066**	**.00006**	**5.5618**
Stddev	.0009	.00005	.00065	.00002	.0068
%RSD	.03657	7.7009	99.228	28.775	.12248
#1	2.4554	.00059	.00112	.00005	5.5666
#2	2.4541	.00066	.00020	.00008	5.5569
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**-.00486**	**3.095**	**-.00181**	**-.00343**
Stddev	.00033	.00061	.012	.00057	.00004
%RSD	71.115	12.459	.3811	31.693	1.2430
#1	.00023	-.00529	3.104	-.00221	-.00340
#2	.00069	-.00443	3.087	-.00140	-.00346
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.7256**	**-.00012**	**.10615**	**.00044**	**-.00356**
Stddev	.0295	.00050	.00045	.00015	.00221
%RSD	.30327	423.49	.41940	34.495	61.950
#1	9.7464	-.00047	.10647	.00054	-.00512
#2	9.7047	.00023	.10584	.00033	-.00200
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-4-a Acquired: 11/14/2013 20:08:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00024**	**.00103**
Stddev	.00002	.00012
%RSD	7.4784	12.092
#1	.00022	.00111
#2	.00025	.00094
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3384.1**	**4929.6**	**76854.**	**7095.0**
Stddev	7.0	9.9	28.	7.4
%RSD	.20539	.20165	.03625	.10399
#1	3389.0	4936.6	76874.	7100.2
#2	3379.2	4922.5	76834.	7089.8

Sample Name: 480-48973-c-5-a Acquired: 11/14/2013 20:10:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00156**	**.05564**	**.00017**	**2.2066**	**.08796**
Stddev	.00024	.00651	.00077	.0099	.00015
%RSD	15.276	11.701	441.94	.45067	.17034
#1	.00139	.06024	.00072	2.1995	.08807
#2	.00173	.05104	-.00037	2.2136	.08786
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**51.520**	**.00014**	**.00590**	**.00188**
Stddev	.00001	.168	.00006	.00004	.00046
%RSD	15.780	.32606	45.074	.65121	24.362
#1	-.00007	51.402	.00009	.00592	.00155
#2	-.00009	51.639	.00018	.00587	.00220
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00108**	**1.5569**	**6.9459**	**8.5222**	**.00085**
Stddev	.00012	.0014	.0235	.1260	.00054
%RSD	10.709	.08831	.33842	1.4781	63.757
#1	.00116	1.5559	6.9625	8.6112	.00047
#2	.00100	1.5578	6.9293	8.4331	.00123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-5-a Acquired: 11/14/2013 20:10:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.971**	**8.1990**	**8.0425**	**-.00017**	**43.762**
Stddev	.004	.0063	.0020	.00007	.154
%RSD	.02854	.07654	.02476	37.797	.35222
#1	14.968	8.2035	8.0411	-.00013	43.653
#2	14.974	8.1946	8.0439	-.00022	43.871
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00121**	**-.00161**	**2.631**	**-.00201**	**.00139**
Stddev	.00007	.00085	.010	.00009	.00025
%RSD	5.7842	53.167	.3921	4.7060	17.744
#1	.00126	-.00221	2.639	-.00208	.00157
#2	.00116	-.00100	2.624	-.00194	.00122
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9779**	**.00017**	**.32552**	**.00029**	**.00289**
Stddev	.0120	.00101	.00033	.00004	.00384
%RSD	.24156	610.70	.09986	12.901	133.05
#1	4.9864	-.00055	.32529	.00026	.00017
#2	4.9694	.00088	.32575	.00031	.00560
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-5-a Acquired: 11/14/2013 20:10:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00056**	**.00245**
Stddev	.00009	.00014
%RSD	15.451	5.5076
#1	.00062	.00236
#2	.00050	.00255
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3227.4**	**4802.5**	**73790.**	**7055.3**
Stddev	.8	5.7	104.	17.1
%RSD	.02416	.11769	.14136	.24267
#1	3226.9	4806.5	73717.	7067.4
#2	3228.0	4798.5	73864.	7043.2

Sample Name: 480-48973-c-6-a Acquired: 11/14/2013 20:13:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**.27544**	**-.00105**	**.01057**	**.00692**
Stddev	.00031	.01706	.00196	.00039	.00000
%RSD	123.77	6.1929	186.38	3.6744	.05545
#1	-.00003	.26338	-.00244	.01084	.00692
#2	-.00047	.28750	.00033	.01029	.00692
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**36.606**	**-.00006**	**-.00016**	**.00010**
Stddev	.00005	.100	.00005	.00006	.00011
%RSD	49.412	.27429	91.719	39.226	104.89
#1	-.00014	36.677	-.00002	-.00020	.00018
#2	-.00007	36.535	-.00009	-.00012	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00082**	**.01795**	**4.4963**	**4.7359**	**.00191**
Stddev	.00020	.00371	.0297	.0046	.00066
%RSD	24.043	20.682	.66054	.09638	34.721
#1	.00096	.02057	4.5173	4.7391	.00144
#2	.00068	.01532	4.4753	4.7327	.00238
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-6-a Acquired: 11/14/2013 20:13:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.5206**	**.00161**	**.00273**	**.00009**	**5.7885**
Stddev	.0021	.00004	.00029	.00013	.0151
%RSD	.05863	2.7631	10.665	144.93	.26151
#1	3.5221	.00158	.00294	.00018	5.7778
#2	3.5192	.00164	.00253	-.00000	5.7992
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00055**	F **-.00623**	**5.022**	**-.00152**	**.00084**
Stddev	.00006	.00065	.007	.00135	.00341
%RSD	10.987	10.483	.1361	88.835	407.11
#1	.00059	-.00577	5.027	-.00247	.00324
#2	.00050	-.00669	5.017	-.00056	-.00157
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		120.00			
Low Limit		-.00500			

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.518**	**-.00012**	**.19354**	**.00094**	**-.00286**
Stddev	.007	.00024	.00048	.00007	.00138
%RSD	.05803	198.91	.24697	7.5606	48.150
#1	12.513	.00005	.19388	.00099	-.00189
#2	12.523	-.00029	.19320	.00089	-.00384
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-6-a Acquired: 11/14/2013 20:13:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00053**	**.07002**
Stddev	.00005	.00017
%RSD	8.9376	.24889
#1	.00050	.07014
#2	.00057	.06990
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3344.7**	**4885.4**	**75604.**	**7046.3**
Stddev	7.2	8.7	1.	14.8
%RSD	.21595	.17884	.00090	.21019
#1	3349.8	4891.6	75605.	7035.8
#2	3339.6	4879.2	75604.	7056.8

Sample Name: 480-48973-c-7-a Acquired: 11/14/2013 20:15:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**.07690**	**-.00107**	**.00655**	**.02968**
Stddev	.00078	.00263	.00043	.00026	.00007
%RSD	218.86	3.4192	39.877	4.0403	.22937
#1	-.00091	.07504	-.00137	.00674	.02973
#2	.00020	.07876	-.00077	.00636	.02963
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**4.6371**	**.00006**	**-.00005**	**.00022**
Stddev	.00002	.0389	.00011	.00005	.00019
%RSD	54.191	.83938	165.74	97.737	87.736
#1	.00005	4.6646	-.00001	-.00001	.00008
#2	.00002	4.6095	.00014	-.00008	.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**.05026**	**.55554**	**.53809**	**.00002**
Stddev	.00006	.00277	.01396	.01005	.00018
%RSD	12.554	5.5084	2.5129	1.8673	1171.0
#1	.00056	.04831	.54567	.54520	.00015
#2	.00046	.05222	.56542	.53099	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-7-a Acquired: 11/14/2013 20:15:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.9103**	**.02701**	**.02359**	**-.00007**	**2.5201**
Stddev	.0048	.00008	.00038	.00014	.0192
%RSD	.25294	.28895	1.6277	199.38	.76134
#1	1.9137	.02706	.02386	.00003	2.5337
#2	1.9069	.02695	.02332	-.00017	2.5066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**-.00432**	**.0731**	**-.00222**	**-.00009**
Stddev	.00030	.00082	.0033	.00129	.00056
%RSD	117.58	19.045	4.573	58.397	628.92
#1	-.00004	-.00374	.0707	-.00313	-.00049
#2	-.00046	-.00490	.0754	-.00130	.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.718**	**-.00027**	**.02864**	**.00204**	**-.00338**
Stddev	.071	.00058	.00015	.00039	.00277
%RSD	.66628	212.79	.52119	19.090	82.082
#1	10.769	-.00068	.02874	.00232	-.00534
#2	10.668	.00014	.02853	.00176	-.00142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-7-a Acquired: 11/14/2013 20:15:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00136**	**.00220**
Stddev	.00020	.00031
%RSD	14.640	14.311
#1	.00150	.00242
#2	.00122	.00198
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3431.2**	**4984.3**	**77185.**	**7035.8**
Stddev	9.7	16.7	120.	43.8
%RSD	.28334	.33440	.15519	.62198
#1	3438.1	4996.1	77270.	7004.8
#2	3424.3	4972.5	77100.	7066.7

Sample Name: CCV Acquired: 11/14/2013 20:18:01 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49641**	**25.440**	**.50502**	**.48635**	**.51421**	**.48745**	**24.935**
Stddev	.00034	.169	.00053	.00015	.00356	.00088	.186
%RSD	.06867	.66506	.10412	.02996	.69278	.18095	.74656
#1	.49617	25.560	.50539	.48645	.51673	.48808	25.066
#2	.49665	25.320	.50465	.48625	.51169	.48683	24.803
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48768**	**.48467**	**.50845**	**.50662**	**23.787**	**26.388**	F **27.943**
Stddev	.00135	.00016	.00189	.00244	.115	.196	.288
%RSD	.27784	.03288	.37096	.48087	.48388	.74286	1.0322
#1	.48672	.48456	.50712	.50490	23.868	26.526	28.147
#2	.48864	.48478	.50978	.50834	23.706	26.249	27.740
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52563**	**24.019**	**.49985**	**.46207**	**.49287**	**26.247**	**.48883**
Stddev	.00140	.019	.00171	.00168	.00111	.185	.00078
%RSD	.26691	.07936	.34197	.36425	.22521	.70354	.15881
#1	.52662	24.005	.49864	.46088	.49209	26.378	.48938
#2	.52464	24.032	.50106	.46326	.49366	26.117	.48828
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 20:18:01 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48828	24.92	.50588	.49375	24.697	.49358	.49021
Stddev	.00151	.15	.00081	.00395	.076	.00156	.00119
%RSD	.31021	.6080	.15943	.80036	.30770	.31581	.24300
#1	.48721	24.81	.50531	.49654	24.751	.49248	.48937
#2	.48935	25.02	.50645	.49095	24.643	.49468	.49105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.49803	.49031	.50147	.49465
Stddev	.00143	.00097	.00073	.00128
%RSD	.28698	.19760	.14629	.25976
#1	.49904	.49100	.50199	.49556
#2	.49702	.48963	.50096	.49375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3210.9	4875.4	74205.	6935.5
Stddev	1.8	1.9	154.	49.0
%RSD	.05596	.03875	.20757	.70679
#1	3209.6	4876.7	74314.	6900.8
#2	3212.1	4874.1	74096.	6970.1

Sample Name: CCB Acquired: 11/14/2013 20:20:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	**.00719**	**.00067**	**.00085**	**.00002**	**-.00005**	**-.00290**
Stddev	.00034	.01084	.00323	.00027	.00000	.00001	.00422
%RSD	7055.3	150.67	479.45	31.925	3.6501	23.352	145.65
#1	-.00025	.01485	.00296	.00104	.00002	-.00004	-.00588
#2	.00024	-.00047	-.00161	.00066	.00002	-.00005	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00012**	**-.00036**	**-.00013**	**-.00133**	**.02969**	**.00118**
Stddev	.00007	.00007	.00004	.00000	.00021	.03571	.00019
%RSD	309.41	56.887	12.090	2.6204	15.842	120.31	16.197
#1	-.00007	-.00007	-.00039	-.00013	-.00148	.00443	.00132
#2	.00003	-.00016	-.00033	-.00013	-.00118	.05494	.00105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00070**	**-.00145**	**-.00004**	**.00028**	**-.00006**	**.01971**	**.00006**
Stddev	.00141	.00120	.00004	.00037	.00005	.00281	.00001
%RSD	200.81	82.832	104.73	132.35	84.596	14.234	13.575
#1	-.00170	-.00060	-.00001	.00055	-.00009	.02170	.00007
#2	.00030	-.00230	-.00007	.00002	-.00002	.01773	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 20:20:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00100	-.0031	-.00072	-.00058	.02392	-.00056	.00009
Stddev	.00097	.0014	.00167	.00400	.00199	.00040	.00003
%RSD	97.106	45.65	232.47	694.64	8.3155	72.374	32.908
#1	-.00168	-.0041	-.00190	.00225	.02532	-.00085	.00011
#2	-.00031	-.0021	.00046	-.00340	.02251	-.00027	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00016	-.00174	-.00019	.00007
Stddev	.00006	.00035	.00019	.00002
%RSD	39.392	20.269	98.764	26.605
#1	.00012	-.00149	-.00006	.00009
#2	.00021	-.00199	-.00033	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3431.8	4984.7	78100.	7094.3
Stddev	6.9	7.2	123.	48.3
%RSD	.19975	.14396	.15812	.68152
#1	3436.7	4989.8	78187.	7128.4
#2	3427.0	4979.6	78013.	7060.1

Sample Name: CCVL Acquired: 11/14/2013 20:22:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00218**	**.20677**	**.01163**	**.01967**	**.00212**	**.00196**	**.49979**
Stddev	.00045	.00001	.00080	.00030	.00000	.00002	.00347
%RSD	20.660	.00556	6.8572	1.5232	.19265	.85114	.69500
#1	.00186	.20678	.01219	.01946	.00211	.00197	.50224
#2	.00250	.20676	.01107	.01988	.00212	.00195	.49733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.00392**	**.00365**	**.00983**	**.04972**	**.51997**	**.45518**
Stddev	.00001	.00018	.00002	.00031	.00094	.00439	.00309
%RSD	1.5895	4.5426	.63890	3.1791	1.8943	.84513	.67988
#1	.00084	.00404	.00367	.00961	.05039	.51686	.45300
#2	.00085	.00379	.00363	.01005	.04906	.52307	.45737
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02864**	**.20500**	**.00327**	W **.00398**	**.00940**	**.98190**	**.00970**
Stddev	.00020	.00776	.00003	.00057	.00024	.00413	.00079
%RSD	.68619	3.7864	.82929	14.342	2.5489	.42027	8.1465
#1	.02878	.19951	.00325	.00358	.00957	.98482	.01026
#2	.02850	.21049	.00329	.00439	.00923	.97898	.00914
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass
Value				.00300			
Range				30.000%			

Sample Name: CCVL Acquired: 11/14/2013 20:22:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00282	.2029	.01919	.01597	.49071	.00949	.00464
Stddev	.00006	.0026	.00127	.00179	.01790	.00046	.00009
%RSD	2.0307	1.275	6.6046	11.239	3.6478	4.8436	1.8673
#1	.00278	.2011	.02009	.01470	.47805	.00981	.00458
#2	.00286	.2047	.01829	.01724	.50336	.00916	.00470
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00474	.01716	.00477	.01028
Stddev	.00021	.00303	.00005	.00021
%RSD	4.4046	17.645	1.0670	2.0615
#1	.00489	.01930	.00474	.01043
#2	.00459	.01502	.00481	.01013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3446.8	5052.8	78528.	7129.3
Stddev	14.9	19.3	172.	.1
%RSD	.43306	.38289	.21844	.00122
#1	3457.4	5066.5	78649.	7129.3
#2	3436.3	5039.1	78407.	7129.2

Sample Name: 480-48973-c-8-a Acquired: 11/14/2013 20:25:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00053**	**.11833**	**.00037**	**.00517**	**.04104**
Stddev	.00026	.00142	.00057	.00053	.00001
%RSD	48.945	1.2018	153.47	10.199	.02047
#1	-.00034	.11733	-.00003	.00554	.04105
#2	-.00071	.11934	.00078	.00480	.04104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**9.3769**	**-.00002**	**-.00005**	**.00091**
Stddev	.00008	.0129	.00004	.00009	.00011
%RSD	90.560	.13757	175.37	182.62	12.192
#1	-.00003	9.3677	-.00006	-.00012	.00083
#2	-.00014	9.3860	.00001	.00001	.00099
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00077**	**.09961**	**1.2795**	**1.2918**	**.00076**
Stddev	.00023	.00189	.0221	.0039	.00022
%RSD	29.847	1.9012	1.7263	.30256	28.669
#1	.00061	.09827	1.2639	1.2890	.00092
#2	.00093	.10095	1.2952	1.2945	.00061
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-8-a Acquired: 11/14/2013 20:25:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.4827**	**.00668**	**.00627**	**.00002**	**5.6125**
Stddev	.0046	.00007	.00019	.00002	.0402
%RSD	.13312	1.0120	3.0086	150.78	.71589
#1	3.4860	.00664	.00614	.00003	5.5841
#2	3.4795	.00673	.00641	-.00000	5.6409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00000**	F **-.00602**	**.2980**	**-.00241**	**-.00163**
Stddev	.00025	.00020	.0008	.00032	.00352
%RSD	232070.	3.2638	.2800	13.415	216.65
#1	.00018	-.00588	.2974	-.00264	-.00412
#2	-.00018	-.00616	.2986	-.00218	.00087
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		120.00			
Low Limit		-.00500			

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.974**	**.00005**	**.04888**	**.00295**	**-.00333**
Stddev	.015	.00026	.00004	.00005	.00172
%RSD	.11840	506.39	.08649	1.5239	51.622
#1	12.985	.00023	.04891	.00292	-.00211
#2	12.964	-.00013	.04885	.00299	-.00454
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-8-a Acquired: 11/14/2013 20:25:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00239	.00294
Stddev	.00021	.00008
%RSD	8.7154	2.6076
#1	.00224	.00299
#2	.00254	.00288
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3401.1	4950.9	76706.	7060.8
Stddev	9.7	6.1	74.	8.0
%RSD	.28443	.12280	.09611	.11269
#1	3394.3	4955.2	76759.	7066.4
#2	3408.0	4946.6	76654.	7055.2

Sample Name: 480-48973-c-9-a Acquired: 11/14/2013 20:27:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**.01723**	**-.00093**	**.16886**	**.10387**
Stddev	.00022	.00542	.00215	.00081	.00033
%RSD	59.748	31.461	231.10	.48196	.31854
#1	-.00021	.02106	-.00245	.16944	.10364
#2	-.00052	.01340	.00059	.16828	.10410
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**21.866**	**.00014**	**.00049**	**-.00015**
Stddev	.00010	.026	.00001	.00004	.00040
%RSD	533.83	.11995	7.8341	7.5668	261.83
#1	.00005	21.847	.00013	.00051	-.00044
#2	-.00009	21.884	.00014	.00046	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**.03197**	**3.3575**	**3.6526**	**.00618**
Stddev	.00015	.00229	.0317	.0137	.00009
%RSD	28.197	7.1669	.94344	.37360	1.4685
#1	.00042	.03035	3.3351	3.6429	.00611
#2	.00064	.03359	3.3799	3.6622	.00624
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-9-a Acquired: 11/14/2013 20:27:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.0468**	**.19598**	**.17851**	**-.00029**	**9.7497**
Stddev	.0025	.00013	.00026	.00006	.1279
%RSD	.03113	.06653	.14376	21.209	1.3117
#1	8.0450	.19589	.17833	-.00033	9.6593
#2	8.0485	.19608	.17870	-.00025	9.8401
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00154**	F **-.00584**	**1.519**	**-.00264**	**.00065**
Stddev	.00010	.00030	.001	.00044	.00313
%RSD	6.2632	5.0640	.0720	16.685	482.86
#1	.00147	-.00563	1.519	-.00233	-.00156
#2	.00161	-.00604	1.518	-.00295	.00286
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		120.00			
Low Limit		-.00500			

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.885**	**-.00050**	**.19295**	**.00084**	**.00092**
Stddev	.050	.00011	.00048	.00007	.00345
%RSD	.35823	22.946	.24847	8.6334	377.17
#1	13.850	-.00042	.19261	.00089	.00336
#2	13.921	-.00058	.19329	.00079	-.00153
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48973-c-9-a Acquired: 11/14/2013 20:27:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00017**	**.00270**
Stddev	.00004	.00032
%RSD	25.715	11.890
#1	.00020	.00248
#2	.00014	.00293
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3364.0**	**4914.7**	**75581.**	**7008.7**
Stddev	13.4	4.6	20.	7.9
%RSD	.39877	.09368	.02680	.11311
#1	3373.5	4918.0	75595.	7014.3
#2	3354.5	4911.5	75566.	7003.1

Sample Name: 480-48979-c-1-a Acquired: 11/14/2013 20:30:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00113**	**.11143**	**.01490**	F **85.175**	**.30873**
Stddev	.00065	.01750	.00004	.123	.00118
%RSD	57.434	15.707	.25376	.14444	.38204
#1	-.00159	.09905	.01487	85.088	.30957
#2	-.00067	.12380	.01493	85.262	.30790
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				20.000	
Low Limit				-.02000	

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**74.331**	**-.00052**	**.00307**	**.02310**
Stddev	.00002	.031	.00006	.00036	.00068
%RSD	4.7666	.04125	11.796	11.666	2.9342
#1	.00053	74.309	-.00056	.00282	.02358
#2	.00049	74.352	-.00048	.00333	.02262
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00251**	**.53683**	**275.52**	^ *****	**4.4303**
Stddev	.00005	.00240	.55	-----	.0216
%RSD	1.8735	.44733	.19910	-----	.48849
#1	.00248	.53853	275.14	^ -----	4.4150
#2	.00254	.53514	275.91	^ -----	4.4456
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48979-c-1-a Acquired: 11/14/2013 20:30:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**104.59**	**.15324**	**.17090**	**.05597**	**1957.3**
Stddev	.13	.00035	.00044	.00032	2.0
%RSD	.12428	.22548	.25652	.57336	.10012
#1	104.68	.15300	.17121	.05574	1955.9
#2	104.50	.15349	.17059	.05620	1958.7
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00716**	F **-.00689**	F **130.6**	**-.00495**	**.00065**
Stddev	.00039	.00266	.3	.00142	.00462
%RSD	5.5157	38.516	.2411	28.694	710.65
#1	.00688	-.00502	130.4	-.00395	.00391
#2	.00744	-.00877	130.8	-.00595	-.00261
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.613**	**.00215**	**2.7947**	**.02265**	**-.00041**
Stddev	.048	.00002	.0114	.00004	.00027
%RSD	.30869	1.1210	.40851	.17746	65.013
#1	15.578	.00217	2.8028	.02268	-.00022
#2	15.647	.00213	2.7866	.02262	-.00060
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48979-c-1-a Acquired: 11/14/2013 20:30:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.06069	.00777
Stddev	.00027	.00047
%RSD	.45301	6.0760
#1	.06088	.00810
#2	.06049	.00744
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2520.8	4197.5	61120.	7003.8
Stddev	3.9	9.7	173.	13.7
%RSD	.15317	.23075	.28253	.19619
#1	2523.6	4204.3	60998.	7013.5
#2	2518.1	4190.6	61242.	6994.1

Sample Name: 480-48979-c-2-a Acquired: 11/14/2013 20:32:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00026**	**.35995**	**.11597**	F **85.800**	**.04740**
Stddev	.00074	.01003	.00257	.064	.00021
%RSD	281.55	2.7868	2.2159	.07462	.44160
#1	.00079	.36704	.11779	85.754	.04725
#2	-.00026	.35286	.11415	85.845	.04755
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				20.000	
Low Limit				-.02000	

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00037**	**564.45**	**.00066**	F **-.00707**	**-.00030**
Stddev	.00008	1.11	.00001	.00003	.00054
%RSD	21.066	.19633	.87183	.48520	180.57
#1	-.00042	565.24	.00066	-.00705	.00008
#2	-.00031	563.67	.00065	-.00709	-.00068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				20.000	
Low Limit				-.00400	

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01517**	**.02331**	**284.70**	^ *****	**1.7318**
Stddev	.00037	.00066	.60	-----	.0024
%RSD	2.4417	2.8495	.21158	-----	.13707
#1	.01491	.02378	284.28	^ -----	1.7302
#2	.01543	.02284	285.13	^ -----	1.7335
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48979-c-2-a Acquired: 11/14/2013 20:32:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.451**	**.10542**	**.11156**	F **23.615**	**453.96**
Stddev	.015	.00018	.00109	.036	.91
%RSD	.13412	.16715	.97888	.15041	.20102
#1	11.440	.10555	.11079	23.640	453.32
#2	11.462	.10530	.11233	23.590	454.61
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit				10.000	
Low Limit				-.01000	

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00591**	F **-.01328**	F **751.2**	**-.01507**	**.02607**
Stddev	.00008	.00017	.5	.00084	.00451
%RSD	1.4355	1.2539	.0687	5.5633	17.313
#1	.00585	-.01340	751.5	-.01567	.02927
#2	.00597	-.01316	750.8	-.01448	.02288
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3268**	**.00041**	**1.5983**	**.02795**	**.00166**
Stddev	.0228	.00008	.0024	.00059	.00466
%RSD	.68489	20.257	.15125	2.1027	280.90
#1	3.3107	.00035	1.6000	.02837	.00496
#2	3.3429	.00047	1.5966	.02754	-.00164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48979-c-2-a Acquired: 11/14/2013 20:32:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.09043**	**.02781**
Stddev	.00104	.00083
%RSD	1.1448	3.0020
#1	.09116	.02722
#2	.08970	.02840
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2514.8**	**4293.1**	**64716.**	**6910.2**
Stddev	6.5	7.9	258.	24.7
%RSD	.26042	.18408	.39922	.35810
#1	2519.5	4298.7	64899.	6927.7
#2	2510.2	4287.5	64534.	6892.7

Sample Name: CCVL Acquired: 11/14/2013 20:35:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00296**	**.20396**	**.01091**	F **.13234**	**.00215**	**.00194**	**.49881**
Stddev	.00013	.00520	.00353	.00921	.00001	.00001	.00143
%RSD	4.3385	2.5511	32.337	6.9628	.23751	.31454	.28589
#1	.00305	.20764	.00842	.13885	.00215	.00195	.49981
#2	.00287	.20028	.01340	.12582	.00216	.00194	.49780
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
Value				.02000			
Range				50.000%			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00080**	**.00406**	**.00350**	**.01033**	**.04961**	**.64069**	**.44540**
Stddev	.00003	.00007	.00014	.00010	.00239	.01587	.00082
%RSD	3.3037	1.6159	3.9565	.97833	4.8098	2.4770	.18435
#1	.00078	.00401	.00360	.01040	.04792	.65191	.44482
#2	.00081	.00411	.00341	.01026	.05130	.62947	.44598
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02981**	**.20815**	**.00330**	**.00343**	W **.01375**	**1.0624**	**.00987**
Stddev	.00053	.00071	.00000	.00038	.00015	.0021	.00003
%RSD	1.7670	.34252	.00642	11.070	1.1032	.19260	.25733
#1	.03019	.20866	.00330	.00370	.01385	1.0638	.00985
#2	.02944	.20765	.00330	.00316	.01364	1.0609	.00989
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass
Value					.01000		
Range					30.000%		

Sample Name: CCVL Acquired: 11/14/2013 20:35:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00338	.2239	.02006	.01324	.49567	.00935	.00473
Stddev	.00020	.0045	.00015	.00216	.01007	.00065	.00000
%RSD	6.0167	2.000	.72988	16.339	2.0310	6.9518	.00976
#1	.00324	.2271	.02017	.01477	.50279	.00889	.00472
#2	.00353	.2207	.01996	.01171	.48855	.00981	.00473
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00454	.01887	.00464	.01015
Stddev	.00021	.00085	.00031	.00007
%RSD	4.6501	4.5133	6.7252	.68586
#1	.00469	.01827	.00486	.01020
#2	.00439	.01947	.00442	.01010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3446.1	5042.1	78065.	7109.7
Stddev	10.8	11.5	104.	1.0
%RSD	.31210	.22886	.13278	.01470
#1	3453.7	5050.3	78138.	7110.4
#2	3438.5	5033.9	77992.	7108.9

Sample Name: icsa-1716849 Acquired: 11/14/2013 20:37:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**546.73**	**.00145**	F **.07495**	**.00199**	**.00000**	**496.16**
Stddev	.00034	.07	.00083	.00309	.00001	.00006	1.38
%RSD	163.19	.01271	57.284	4.1198	.41883	1182.2	.27813
#1	.00045	546.78	.00204	.07714	.00200	-.00004	497.13
#2	-.00003	546.68	.00086	.07277	.00199	.00004	495.18
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				.04000			
Low Limit				-.04000			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**-.00115**	**-.00033**	**.00263**	**202.21**	**.13801**	**.01536**
Stddev	.00003	.00010	.00015	.00019	.70	.00943	.00108
%RSD	13.198	8.5527	47.365	7.3631	.34480	6.8352	7.0368
#1	.00023	-.00108	-.00022	.00249	202.71	.14468	.01612
#2	.00019	-.00122	-.00043	.00276	201.72	.13134	.01459
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00306**	**505.97**	**.00133**	**.00142**	**-.00049**	**.17033**	**.00061**
Stddev	.00106	1.79	.00000	.00018	.00047	.00575	.00049
%RSD	34.678	.35297	.23280	13.012	95.586	3.3749	80.830
#1	.00231	504.71	.00133	.00155	-.00016	.17439	.00026
#2	.00381	507.23	.00133	.00129	-.00082	.16626	.00096
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: icsa-1716849 Acquired: 11/14/2013 20:37:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00420**	**-.0998**	**-.02538**	**-.00151**	**.00596**	**.00064**	**.00483**
Stddev	.00322	.0011	.00249	.00320	.03504	.00055	.00007
%RSD	76.698	1.062	9.8209	212.52	587.46	86.387	1.4267
#1	-.00648	-.1005	-.02715	-.00377	-.01881	.00025	.00478
#2	-.00192	-.0990	-.02362	.00076	.03074	.00103	.00488
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00333**	**-.00646**	**-.00100**	**.00240**
Stddev	.00051	.00290	.00040	.00040
%RSD	15.207	44.970	39.408	16.658
#1	.00369	-.00851	-.00128	.00211
#2	.00297	-.00441	-.00072	.00268
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2602.8**	**4422.3**	**65299.**	**6514.0**
Stddev	1.1	9.3	61.	21.3
%RSD	.04418	.20947	.09304	.32746
#1	2601.9	4428.8	65256.	6499.0
#2	2603.6	4415.7	65342.	6529.1

Sample Name: icsab-1723354 Acquired: 11/14/2013 20:40:01 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22004	520.63	.09366	.06094	.53097	.50185	485.52
Stddev	.00048	.91	.00664	.00162	.00025	.00094	.02
%RSD	.21739	.17408	7.0942	2.6519	.04617	.18768	.00424
#1	.21970	519.99	.08896	.06208	.53079	.50252	485.50
#2	.22038	521.27	.09836	.05980	.53114	.50119	485.53
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0114	.49558	.47855	.54811	95.459	.08773	.02735
Stddev	.0025	.00047	.00211	.00455	.551	.02640	.00002
%RSD	.24563	.09402	.44156	.83001	.57768	30.094	.05516
#1	1.0132	.49525	.47705	.54490	95.070	.10640	.02736
#2	1.0097	.49591	.48004	.55133	95.849	.06906	.02734
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.59250	502.48	.46149	.47585	.00026	.13149	.95825
Stddev	.00274	2.35	.00135	.00105	.00037	.00183	.00182
%RSD	.46161	.46688	.29336	.22123	142.73	1.3902	.19014
#1	.59056	500.82	.46053	.47510	-.00000	.13019	.95697
#2	.59443	504.14	.46244	.47659	.00053	.13278	.95954
Check ?	None	Chk Pass	Chk Pass	Chk Pass	None	None	Chk Pass
Value							
Range							

Sample Name: icsab-1723354 Acquired: 11/14/2013 20:40:01 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.04266	F .3793	.58149	.04963	1.0637	.00079	.51764
Stddev	.00039	.0005	.00153	.00371	.0006	.00024	.00123
%RSD	.90428	.1321	.26332	7.4714	.06040	30.263	.23836
#1	.04238	.3797	.58041	.04701	1.0632	.00096	.51852
#2	.04293	.3790	.58258	.05225	1.0641	.00062	.51677
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value		.2000					
Range		20.00%					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00267	.09945	.48261	.92839
Stddev	.00008	.00014	.00208	.00728
%RSD	3.0715	.14132	.43042	.78450
#1	.00273	.09935	.48114	.92324
#2	.00261	.09955	.48408	.93354
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2628.7	4441.5	66230.	6533.0
Stddev	5.6	3.1	316.	15.0
%RSD	.21479	.07029	.47751	.22937
#1	2632.6	4443.7	66454.	6543.6
#2	2624.7	4439.3	66006.	6522.4

Sample Name: CCV Acquired: 11/14/2013 20:42:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49400**	**25.322**	**.50295**	**.53388**	**.51610**	**.48901**	**24.662**
Stddev	.00198	.076	.00404	.00055	.00157	.00079	.087
%RSD	.40181	.30000	.80343	.10269	.30400	.16200	.35471
#1	.49540	25.375	.50581	.53427	.51721	.48957	24.724
#2	.49260	25.268	.50009	.53349	.51499	.48845	24.600
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48766**	**.48521**	**.50874**	**.50657**	**23.861**	**26.490**	F **27.778**
Stddev	.00015	.00075	.00034	.00050	.088	.082	.103
%RSD	.03094	.15361	.06781	.09898	.36799	.30836	.37027
#1	.48755	.48468	.50898	.50621	23.923	26.548	27.850
#2	.48776	.48573	.50849	.50692	23.799	26.433	27.705
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52632**	**23.999**	**.50075**	**.46092**	**.49122**	**26.266**	**.48606**
Stddev	.00038	.019	.00061	.00205	.00026	.073	.00027
%RSD	.07135	.07769	.12264	.44388	.05299	.27787	.05657
#1	.52606	24.012	.50031	.45947	.49141	26.317	.48586
#2	.52659	23.986	.50118	.46236	.49104	26.214	.48625
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/14/2013 20:42:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48707**	**24.74**	**.50776**	**.49788**	**24.498**	**.49472**	**.49347**
Stddev	.00150	.00	.00417	.00032	.071	.00024	.00197
%RSD	.30859	.0118	.82185	.06330	.29175	.04757	.40001
#1	.48813	24.74	.51072	.49810	24.548	.49489	.49487
#2	.48601	24.74	.50481	.49766	24.447	.49456	.49208
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.49804**	**.49264**	**.50035**	**.49224**
Stddev	.00030	.00125	.00224	.00187
%RSD	.06085	.25451	.44675	.37899
#1	.49782	.49353	.50193	.49356
#2	.49825	.49176	.49877	.49092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3204.7**	**4860.9**	**74115.**	**6898.6**
Stddev	4.3	4.3	10.	43.3
%RSD	.13367	.08924	.01350	.62796
#1	3207.7	4857.8	74122.	6867.9
#2	3201.7	4864.0	74108.	6929.2

Sample Name: CCB Acquired: 11/14/2013 20:44:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.00321**	**-.00174**	F **.03572**	**.00001**	**-.00016**	**-.00267**
Stddev	.00010	.03239	.00154	.00092	.00001	.00009	.00026
%RSD	48.713	1009.6	88.816	2.5624	97.581	57.340	9.8556
#1	-.00013	.02611	-.00065	.03637	.00002	-.00009	-.00249
#2	-.00027	-.01970	-.00283	.03507	.00000	-.00022	-.00286
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit				.02000			
Low Limit				-.02000			

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**-.00017**	**-.00053**	**-.00003**	**.00000**	**.04109**	**.00316**
Stddev	.00005	.00003	.00044	.00001	.00398	.01217	.00059
%RSD	563.54	17.609	82.129	34.779	1071800.	29.604	18.544
#1	-.00005	-.00020	-.00084	-.00004	.00281	.03249	.00357
#2	.00003	-.00015	-.00022	-.00003	-.00281	.04970	.00275
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00129**	**-.00511**	**.00001**	**-.00013**	**.00007**	**.03541**	**-.00001**
Stddev	.00136	.00298	.00002	.00102	.00008	.00378	.00031
%RSD	105.79	58.372	125.97	802.28	113.23	10.666	5026.2
#1	-.00032	-.00722	.00000	-.00085	.00012	.03274	-.00023
#2	-.00225	-.00300	.00003	.00060	.00001	.03808	.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/14/2013 20:44:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00088	-.0011	-.00200	-.00165	-.00509	.00014	-.00002
Stddev	.00036	.0027	.00151	.00011	.02572	.00016	.00005
%RSD	41.260	241.3	75.571	6.5587	505.39	114.54	282.84
#1	-.00113	.0008	-.00306	-.00157	.01310	.00025	-.00005
#2	-.00062	-.0031	-.00093	-.00172	-.02328	.00003	.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	-.00030	-.00344	.00006	-.00050
Stddev	.00002	.00123	.00013	.00013
%RSD	7.5040	35.671	237.97	26.619
#1	-.00032	-.00431	-.00004	-.00059
#2	-.00029	-.00257	.00015	-.00041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3425.2	4985.2	77898.	6954.7
Stddev	.4	5.6	222.	5.5
%RSD	.01137	.11250	.28545	.07840
#1	3424.9	4989.2	77741.	6958.5
#2	3425.5	4981.2	78055.	6950.8

Run File: I1111513A Instrument: ICAP1

Analyst: JRK Data Review: UMB 11/17/13

Spikes IDs: 1653961(W1), 1311054 (W2), 1622883(Sn), 1684515(Ag), 1451136(Si), 1320125(TCLP), 1296944 (Sr TCLP)
Pipette IDs: 08-20-13-(1-7,8,10,13,14)
Internal Standard:1739112

Seq#	Run File ID	Sample ID	Date / Time	Type
1	I1111513A	IC-1749384	11/15/13 09:30 AM	Standard
2	I1111513A	IC-1757696	11/15/13 09:32 AM	Standard
3	I1111513A	IC-1757694	11/15/13 09:34 AM	Standard
4	I1111513A	IC-1757693	11/15/13 09:37 AM	Standard
5	I1111513A	ICV-1734477	11/15/13 09:39 AM	QC
6	I1111513A	ICB-1734412	11/15/13 09:41 AM	QC
7	I1111513A	CRI-1739110	11/15/13 09:44 AM	QC
8	I1111513A	ICVL-1723353	11/15/13 09:46 AM	QC
9	I1111513A	ICSA-1716849	11/15/13 09:49 AM	QC
10	I1111513A	ICSAB-1723354	11/15/13 09:51 AM	QC
11	I1111513A	CCV-1723352	11/15/13 09:54 AM	QC
12	I1111513A	CCB-1734412	11/15/13 09:56 AM	QC
13	I1111513A	CCVL	11/15/13 09:59 AM	QC
14	I1111513A	480-48428-a-8-b@5	11/15/13 10:01 AM	Unknown
15	I1111513A	CCV	11/15/13 10:03 AM	QC
16	I1111513A	CCB	11/15/13 10:06 AM	QC
17	I1111513A	CCVL	11/15/13 10:08 AM	QC
18	I1111513A	480-48428-a-8-b@10	11/15/13 10:11 AM	Unknown
19	I1111513A	480-48428-a-8-b@20	11/15/13 10:13 AM	Unknown
20	I1111513A	480-49393-b-4-c	11/15/13 10:15 AM	Unknown
21	I1111513A	lb 480-151502/1-b	11/15/13 10:18 AM	Unknown
22	I1111513A	mb 480-151777/2-a	11/15/13 10:20 AM	Unknown
23	I1111513A	lcs 480-151777/3-a	11/15/13 10:23 AM	Unknown
24	I1111513A	480-48828-f-1-g	11/15/13 10:25 AM	Unknown
25	I1111513A	480-48828-f-1-g SD@5	11/15/13 10:27 AM	Unknown
26	I1111513A	480-48828-f-1-g PDS	11/15/13 10:30 AM	Unknown
27	I1111513A	CCV	11/15/13 10:32 AM	QC
28	I1111513A	CCB	11/15/13 10:35 AM	QC
29	I1111513A	CCVL	11/15/13 10:37 AM	QC
30	I1111513A	480-48828-f-1-h ms	11/15/13 10:40 AM	Unknown
31	I1111513A	480-48828-f-1-i msd	11/15/13 10:42 AM	Unknown
32	I1111513A	480-48828-f-2-e	11/15/13 10:44 AM	Unknown
33	I1111513A	480-48828-f-3-d	11/15/13 10:47 AM	Unknown
34	I1111513A	480-48828-f-4-d	11/15/13 10:49 AM	Unknown
35	I1111513A	480-48828-h-5-d	11/15/13 10:51 AM	Unknown
36	I1111513A	480-48828-h-6-d	11/15/13 10:54 AM	Unknown
37	I1111513A	480-48828-i-7-b	11/15/13 10:56 AM	Unknown
38	I1111513A	480-48828-i-8-e	11/15/13 10:59 AM	Unknown
39	I1111513A	CCV	11/15/13 11:01 AM	QC
40	I1111513A	CCB	11/15/13 11:03 AM	QC

41	I1111513A	CCVL	11/15/13 11:06 AM QC
42	I1111513A	480-48828-f-9-e	11/15/13 11:08 AM Unknown
43	I1111513A	480-49305-f-1-d	11/15/13 11:11 AM Unknown
44	I1111513A	480-49305-f-2-d	11/15/13 11:13 AM Unknown
45	I1111513A	480-49305-g-3-d	11/15/13 11:16 AM Unknown
46	I1111513A	480-49305-g-4-d	11/15/13 11:18 AM Unknown
47	I1111513A	480-49305-g-5-d	11/15/13 11:20 AM Unknown
48	I1111513A	480-49305-h-6-d	11/15/13 11:23 AM Unknown
49	I1111513A	480-49305-f-7-c	11/15/13 11:25 AM Unknown
50	I1111513A	480-49305-g-8-d	11/15/13 11:28 AM Unknown
51	I1111513A	CCV	11/15/13 11:30 AM QC
52	I1111513A	CCB	11/15/13 11:32 AM QC
53	I1111513A	CCVL	11/15/13 11:35 AM QC
54	I1111513A	480-49305-f-9-d	11/15/13 11:37 AM Unknown
55	I1111513A	480-49303-a-1-f	11/15/13 11:40 AM Unknown
56	I1111513A	480-49303-a-2-d	11/15/13 11:42 AM Unknown
57	I1111513A	lcs 480-149467/18-b	11/15/13 11:44 AM Unknown
58	I1111513A	480-48473-b-15-a@100	11/15/13 11:47 AM Unknown
59	I1111513A	480-49577-a-1-e@50	11/15/13 11:49 AM Unknown
60	I1111513A	480-48453-e-5-a	11/15/13 11:52 AM Unknown
61	I1111513A	480-48472-b-3-a@500	11/15/13 11:54 AM Unknown
62	I1111513A	48472-b-3-a SD@2500	11/15/13 11:56 AM Unknown
63	I1111513A	CCV	11/15/13 11:59 AM QC
64	I1111513A	CCB	11/15/13 12:01 PM QC
65	I1111513A	CCVL	11/15/13 12:04 PM QC
66	I1111513A	48472-b-3-aPDS@500	11/15/13 12:06 PM Unknown
67	I1111513A	48472-b-3-b ms	11/15/13 12:08 PM Unknown
68	I1111513A	48472-b-3-c msd	11/15/13 12:11 PM Unknown
69	I1111513A	480-48472-a-4-a@500	11/15/13 12:13 PM Unknown
70	I1111513A	480-49623-c-1-c	11/15/13 12:16 PM Unknown
71	I1111513A	480-49725-a-1-c@5	11/15/13 12:18 PM Unknown
72	I1111513A	480-49725-a-1-c@10	11/15/13 12:21 PM Unknown
73	I1111513A	480-48969-c-1-a	11/15/13 12:23 PM Unknown
74	I1111513A	480-48966-p-1-a@50	11/15/13 12:26 PM Unknown
75	I1111513A	CCV	11/15/13 12:28 PM QC
76	I1111513A	CCB	11/15/13 12:31 PM QC
77	I1111513A	CCVL	11/15/13 12:33 PM QC
78	I1111513A	480-49854-a-1-b	11/15/13 12:36 PM Unknown
79	I1111513A	480-49854-a-2-b	11/15/13 12:38 PM Unknown
80	I1111513A	480-49854-a-2-c ms	11/15/13 12:40 PM Unknown
81	I1111513A	480-49854-a-2-d msd	11/15/13 12:43 PM Unknown
82	I1111513A	480-49854-a-3-b	11/15/13 12:45 PM Unknown
83	I1111513A	480-49854-a-3-b SD@5	11/15/13 12:47 PM Unknown
84	I1111513A	480-49854-a-3-b PDS	11/15/13 12:50 PM Unknown
85	I1111513A	480-49854-a-4-b	11/15/13 12:52 PM Unknown
86	I1111513A	480-49854-a-5-b	11/15/13 12:55 PM Unknown
87	I1111513A	CCV	11/15/13 12:57 PM QC
88	I1111513A	CCB	11/15/13 01:00 PM QC
89	I1111513A	CCVL	11/15/13 01:02 PM QC
90	I1111513A	480-49854-a-6-b	11/15/13 01:04 PM Unknown

91	I1111513A	480-49854-a-7-b	11/15/13 01:07 PM Unknown
92	I1111513A	480-49854-a-8-b	11/15/13 01:09 PM Unknown
93	I1111513A	480-49854-a-9-b	11/15/13 01:12 PM Unknown
94	I1111513A	480-49854-a-10-b	11/15/13 01:14 PM Unknown
95	I1111513A	480-49854-a-11-b	11/15/13 01:16 PM Unknown
96	I1111513A	480-49854-a-12-b	11/15/13 01:19 PM Unknown
97	I1111513A	480-49854-a-13-b	11/15/13 01:21 PM Unknown
98	I1111513A	480-49854-a-14-b	11/15/13 01:23 PM Unknown
99	I1111513A	CCV	11/15/13 01:26 PM QC
100	I1111513A	CCB	11/15/13 01:28 PM QC
101	I1111513A	CCVL	11/15/13 01:31 PM QC
102	I1111513A	480-49854-a-16-b	11/15/13 01:33 PM Unknown
103	I1111513A	480-49854-a-17-b	11/15/13 01:35 PM Unknown
104	I1111513A	480-49854-a-18-b	11/15/13 01:38 PM Unknown
105	I1111513A	480-49854-a-19-b	11/15/13 01:40 PM Unknown
106	I1111513A	480-49854-a-20-b	11/15/13 01:43 PM Unknown
107	I1111513A	480-49854-a-12-b@2	11/15/13 01:45 PM Unknown
108	I1111513A	480-49854-a-15-b	11/15/13 01:47 PM Unknown
109	I1111513A	480-49329-f-10-a	11/15/13 01:50 PM Unknown
110	I1111513A	480-49329-f-11-a	11/15/13 01:52 PM Unknown
111	I1111513A	CCV	11/15/13 01:54 PM QC
112	I1111513A	CCB	11/15/13 01:57 PM QC
113	I1111513A	CCVL	11/15/13 01:59 PM QC
114	I1111513A	480-49329-f-12-a	11/15/13 02:02 PM Unknown
115	I1111513A	480-49329-f-8-a	11/15/13 02:04 PM Unknown
116	I1111513A	480-49329-f-9-a	11/15/13 02:06 PM Unknown
117	I1111513A	480-49222-c-9-b	11/15/13 02:09 PM Unknown
118	I1111513A	480-49222-c-10-b	11/15/13 02:11 PM Unknown
119	I1111513A	480-49222-c-11-b	11/15/13 02:14 PM Unknown
120	I1111513A	480-49222-c-12-b	11/15/13 02:16 PM Unknown
121	I1111513A	480-49222-c-4-b	11/15/13 02:19 PM Unknown
122	I1111513A	480-49222-c-5-b	11/15/13 02:21 PM Unknown
123	I1111513A	CCV	11/15/13 02:24 PM QC
124	I1111513A	CCB	11/15/13 02:26 PM QC
125	I1111513A	CCVL	11/15/13 02:29 PM QC
126	I1111513A	mb 480-150654/1-a	11/15/13 02:31 PM Unknown
127	I1111513A	lcs 480-150654/2-a	11/15/13 02:33 PM Unknown
128	I1111513A	lcsd 480-150654/3-a	11/15/13 02:36 PM Unknown
129	I1111513A	480-49148-a-10-a	11/15/13 02:38 PM Unknown
130	I1111513A	480-49029-c-1-b	11/15/13 02:40 PM Unknown
131	I1111513A	480-49065-e-1-d	11/15/13 02:43 PM Unknown
132	I1111513A	480-49645-c-1-a	11/15/13 02:46 PM Unknown
133	I1111513A	480-49645-c-1-aSD@5	11/15/13 02:48 PM Unknown
134	I1111513A	480-49645-c-1-a PDS	11/15/13 02:51 PM Unknown
135	I1111513A	CCV	11/15/13 02:53 PM QC
136	I1111513A	CCB	11/15/13 02:55 PM QC
137	I1111513A	CCVL	11/15/13 02:58 PM QC
138	I1111513A	480-49645-c-1-b ms	11/15/13 03:00 PM Unknown
139	I1111513A	480-49645-c-1-c msd	11/15/13 03:03 PM Unknown
140	I1111513A	480-49645-c-2-a	11/15/13 03:05 PM Unknown

141	I1111513A	480-49645-c-3-a	11/15/13 03:08 PM Unknown
142	I1111513A	480-49645-c-4-a	11/15/13 03:10 PM Unknown
143	I1111513A	480-49645-c-5-a	11/15/13 03:13 PM Unknown
144	I1111513A	480-49645-c-6-a	11/15/13 03:15 PM Unknown
145	I1111513A	480-49645-c-7-a	11/15/13 03:18 PM Unknown
146	I1111513A	480-49691-b-1-a	11/15/13 03:20 PM Unknown
147	I1111513A	CCV	11/15/13 03:23 PM QC
148	I1111513A	CCB	11/15/13 03:25 PM QC
149	I1111513A	480-49691-B-2-A	11/15/13 03:27 PM QC
150	I1111513A	CCVL	11/15/13 03:30 PM Unknown
151	I1111513A	480-49691-b-3-a	11/15/13 03:32 PM Unknown
152	I1111513A	480-49691-b-4-a	11/15/13 03:35 PM Unknown
153	I1111513A	480-49691-b-5-a	11/15/13 03:37 PM Unknown
154	I1111513A	480-49691-b-6-a	11/15/13 03:39 PM Unknown
155	I1111513A	480-49691-b-7-a	11/15/13 03:42 PM Unknown
156	I1111513A	480-49691-b-8-a	11/15/13 03:44 PM Unknown
157	I1111513A	480-49691-b-9-a	11/15/13 03:46 PM Unknown
158	I1111513A	mb 480-148518/17-b	11/15/13 03:49 PM Unknown
159	I1111513A	CCV	11/15/13 03:51 PM QC
160	I1111513A	CCB	11/15/13 03:54 PM QC
161	I1111513A	CCVL	11/15/13 03:56 PM QC
162	I1111513A	lcs 480-148518/18-b	11/15/13 03:58 PM Unknown
163	I1111513A	480-49217-b-3-a	11/15/13 04:01 PM Unknown
164	I1111513A	480-49217-b-4-a	11/15/13 04:03 PM Unknown
165	I1111513A	480-49217-b-5-a	11/15/13 04:06 PM Unknown
166	I1111513A	480-49217-b-5-aSD@5	11/15/13 04:08 PM Unknown
167	I1111513A	480-49217-b-5-a PDS	11/15/13 04:11 PM Unknown
168	I1111513A	480-49217-b-5-b ms	11/15/13 04:13 PM Unknown
169	I1111513A	480-49217-b-5-c msd	11/15/13 04:15 PM Unknown
170	I1111513A	480-49217-b-6-a	11/15/13 04:18 PM Unknown
171	I1111513A	CCV	11/15/13 04:20 PM QC
172	I1111513A	CCB	11/15/13 04:23 PM QC
173	I1111513A	CCVL	11/15/13 04:25 PM QC
174	I1111513A	480-49217-b-7-a	11/15/13 04:27 PM Unknown
175	I1111513A	480-49217-b-8-a	11/15/13 04:30 PM Unknown
176	I1111513A	480-49217-b-9-a	11/15/13 04:32 PM Unknown
177	I1111513A	480-49217-b-10-a	11/15/13 04:35 PM Unknown
178	I1111513A	480-49217-b-11-a	11/15/13 04:37 PM Unknown
179	I1111513A	480-49217-b-12-a	11/15/13 04:40 PM Unknown
180	I1111513A	480-49217-b-13-a	11/15/13 04:42 PM Unknown
181	I1111513A	480-49217-b-14-a	11/15/13 04:44 PM Unknown
182	I1111513A	480-49217-b-16-a	11/15/13 04:47 PM Unknown
183	I1111513A	CCV	11/15/13 04:49 PM QC
184	I1111513A	CCB	11/15/13 04:52 PM QC
185	I1111513A	CCVL	11/15/13 04:54 PM QC
186	I1111513A	480-49217-b-17-a	11/15/13 04:56 PM Unknown
187	I1111513A	480-49217-b-18-a	11/15/13 04:59 PM Unknown
188	I1111513A	480-49217-b-19-a	11/15/13 05:01 PM Unknown
189	I1111513A	480-49217-b-20-a	11/15/13 05:04 PM Unknown
190	I1111513A	480-49217-b-21-a	11/15/13 05:06 PM Unknown

191	I1111513A	480-49217-b-1-a	11/15/13 05:08 PM Unknown
192	I1111513A	480-49217-b-15-a	11/15/13 05:11 PM Unknown
193	I1111513A	mb 480-149380/1-a	11/15/13 05:13 PM Unknown
194	I1111513A	lcs 480-149380/2-a	11/15/13 05:16 PM Unknown
195	I1111513A	CCV	11/15/13 05:18 PM QC
196	I1111513A	CCB	11/15/13 05:20 PM QC
197	I1111513A	CCVL	11/15/13 05:23 PM QC
198	I1111513A	480-49222-e-2-a	11/15/13 05:25 PM Unknown
199	I1111513A	480-49222-e-3-a	11/15/13 05:28 PM Unknown
200	I1111513A	480-49222-e-4-a	11/15/13 05:30 PM Unknown
201	I1111513A	480-49222-e-4-a SD@5	11/15/13 05:33 PM Unknown
202	I1111513A	480-49222-e-4-a PDS	11/15/13 05:35 PM Unknown
203	I1111513A	480-49222-e-4-b ms	11/15/13 05:37 PM Unknown
204	I1111513A	480-49222-e-4-c msd	11/15/13 05:40 PM Unknown
205	I1111513A	480-49222-e-5-a	11/15/13 05:42 PM Unknown
206	I1111513A	480-49222-e-6-a	11/15/13 05:45 PM Unknown
207	I1111513A	CCV	11/15/13 05:47 PM QC
208	I1111513A	CCB	11/15/13 05:49 PM QC
209	I1111513A	CCVL	11/15/13 05:52 PM QC
210	I1111513A	480-49222-e-7-a	11/15/13 05:54 PM Unknown
211	I1111513A	480-49222-e-9-a	11/15/13 05:57 PM Unknown
212	I1111513A	480-49222-e-10-a	11/15/13 05:59 PM Unknown
213	I1111513A	480-49222-e-11-a	11/15/13 06:02 PM Unknown
214	I1111513A	480-49222-e-12-a	11/15/13 06:04 PM Unknown
215	I1111513A	480-49219-c-1-a	11/15/13 06:06 PM Unknown
216	I1111513A	480-49219-c-2-a	11/15/13 06:09 PM Unknown
217	I1111513A	480-49219-c-3-a	11/15/13 06:11 PM Unknown
218	I1111513A	480-49219-c-4-a	11/15/13 06:14 PM Unknown
219	I1111513A	CCV	11/15/13 06:16 PM QC
220	I1111513A	CCB	11/15/13 06:18 PM QC
221	I1111513A	CCVL	11/15/13 06:21 PM QC
222	I1111513A	480-49219-a-5-a	11/15/13 06:23 PM Unknown
223	I1111513A	480-49219-c-6-a	11/15/13 06:26 PM Unknown
224	I1111513A	480-49223-e-1-a	11/15/13 06:28 PM Unknown
225	I1111513A	480-49223-e-2-a	11/15/13 06:31 PM Unknown
226	I1111513A	480-49223-e-3-a	11/15/13 06:33 PM Unknown
227	I1111513A	480-49223-e-4-a	11/15/13 06:35 PM Unknown
228	I1111513A	mb 480-147458/15-b	11/15/13 06:38 PM Unknown
229	I1111513A	lcs 480-147458/16-b	11/15/13 06:40 PM Unknown
230	I1111513A	480-48833-e-1-a	11/15/13 06:43 PM Unknown
231	I1111513A	CCV	11/15/13 06:45 PM QC
232	I1111513A	CCB	11/15/13 06:48 PM QC
233	I1111513A	CCVL	11/15/13 06:50 PM QC
234	I1111513A	480-48833-e-2-a	11/15/13 06:52 PM Unknown
235	I1111513A	480-48833-e-2-a SD@5	11/15/13 06:55 PM Unknown
236	I1111513A	480-48833-e-2-a PDS	11/15/13 06:57 PM Unknown
237	I1111513A	480-48833-e-2-b ms	11/15/13 07:00 PM Unknown
238	I1111513A	480-48833-e-2-c msd	11/15/13 07:02 PM Unknown
239	I1111513A	480-48833-e-3-a	11/15/13 07:05 PM Unknown
240	I1111513A	480-48833-e-4-a	11/15/13 07:07 PM Unknown

241	I1111513A	480-48833-e-5-a	11/15/13 07:10 PM Unknown
242	I1111513A	480-48826-h-1-b	11/15/13 07:12 PM Unknown
243	I1111513A	CCV	11/15/13 07:15 PM QC
244	I1111513A	CCB	11/15/13 07:17 PM QC
245	I1111513A	CCVL	11/15/13 07:19 PM QC
246	I1111513A	480-48826-h-2-b	11/15/13 07:22 PM Unknown
247	I1111513A	480-48826-h-3-b	11/15/13 07:24 PM Unknown
248	I1111513A	480-48826-h-4-b	11/15/13 07:27 PM Unknown
249	I1111513A	480-48826-h-5-b	11/15/13 07:29 PM Unknown
250	I1111513A	480-48826-h-6-b	11/15/13 07:31 PM Unknown
251	I1111513A	480-48826-h-7-b	11/15/13 07:34 PM Unknown
252	I1111513A	480-48826-h-8-b	11/15/13 07:36 PM Unknown
253	I1111513A	480-48826-h-9-b	11/15/13 07:38 PM Unknown
254	I1111513A	480-48826-h-10-b	11/15/13 07:41 PM Unknown
255	I1111513A	CCV	11/15/13 07:43 PM QC
256	I1111513A	CCB	11/15/13 07:46 PM QC
257	I1111513A	CCVL	11/15/13 07:48 PM QC
258	I1111513A	480-48826-h-11-b	11/15/13 07:50 PM Unknown
259	I1111513A	480-48826-h-12-b	11/15/13 07:53 PM Unknown
260	I1111513A	480-48826-h-13-b	11/15/13 07:55 PM Unknown
261	I1111513A	480-48826-h-14-b	11/15/13 07:58 PM Unknown
262	I1111513A	480-48826-h-15-b	11/15/13 08:00 PM Unknown
263	I1111513A	BLANK	11/15/13 08:02 PM Unknown
264	I1111513A	BLANK	11/15/13 08:05 PM Unknown
265	I1111513A	BLANK	11/15/13 08:07 PM Unknown
266	I1111513A	BLANK	11/15/13 08:09 PM Unknown
267	I1111513A	CCV	11/15/13 08:12 PM QC
268	I1111513A	CCB	11/15/13 08:14 PM QC
269	I1111513A	CCVL	11/15/13 08:17 PM QC
270	I1111513A	icsa-1716849	11/15/13 08:19 PM QC
271	I1111513A	icsab-1723354	11/15/13 08:22 PM QC
272	I1111513A	CCV	11/15/13 08:24 PM QC
273	I1111513A	CCB	11/15/13 08:27 PM QC

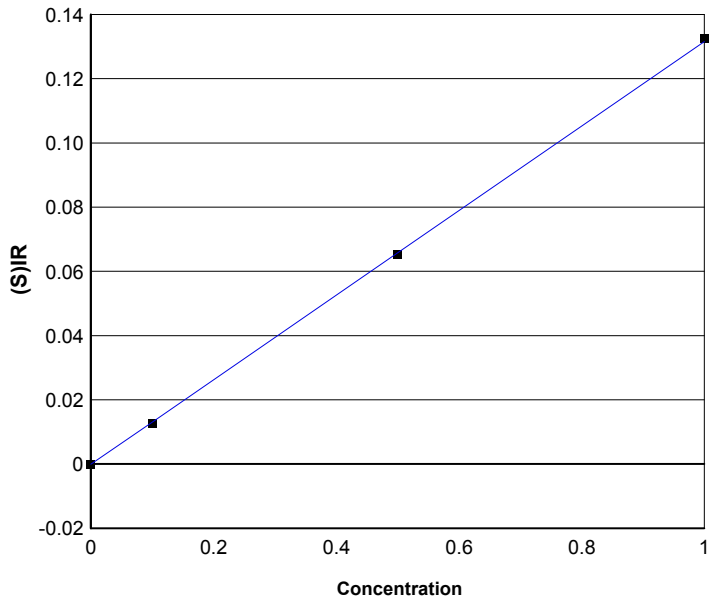
I1111513A

Author: JRK

Published: 11/17/2013 9:42:46AM

Instrument Name: iCAP1 Serial Number: 20094603

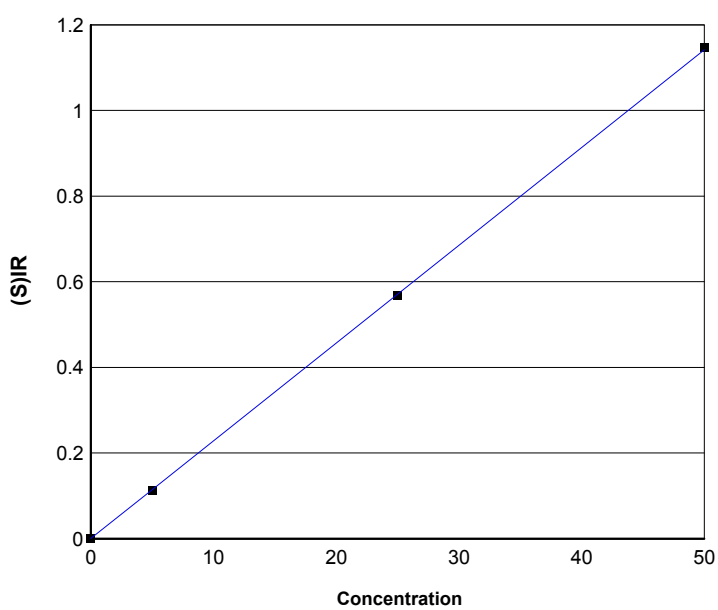
Method Name: ICAP1 (4)



Element Name:	Ag
Element Wavelength:	Ag 328.068 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99995
A0 (Offset):	-0.000057262
A1 (Gain):	0.13161
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

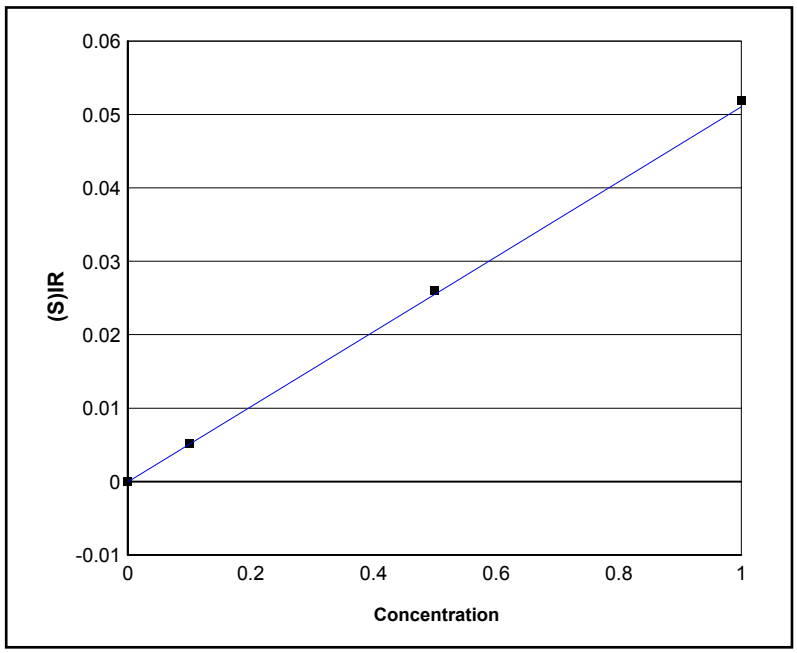
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000028343	0.0000028343	0.00000	-0.000056889	0.000013209	1
IC4	1.0000	1.0070	0.0070420	0.70420	0.13250	0.00018093	1
IC2	0.10000	0.097337	-0.0026627	-2.6627	0.012755	0.000091519	1
IC3	0.50000	0.49562	-0.0043794	-0.87588	0.065180	0.00027458	1



Element Name:	Al
Element Wavelength:	Al 308.215 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00061191
A1 (Gain):	0.022826
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

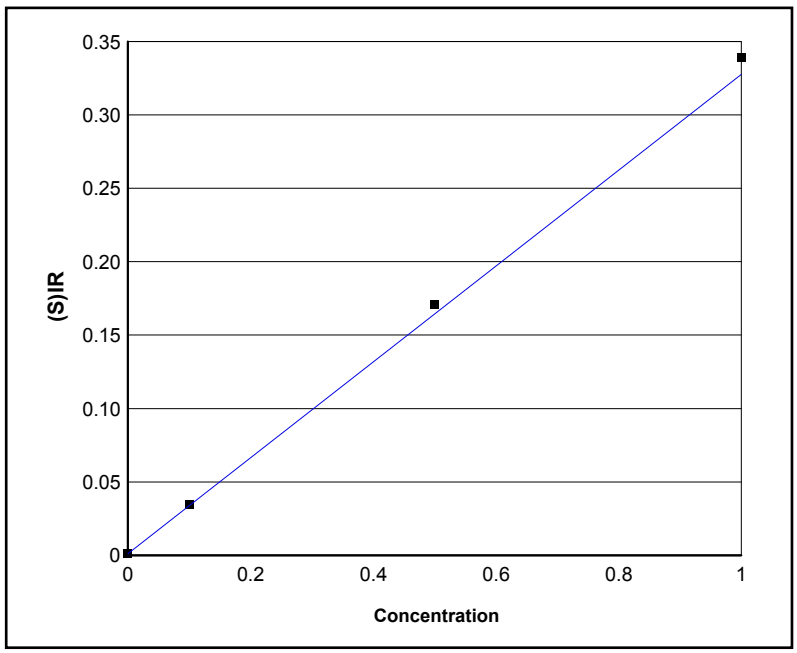
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000094982	0.000094982	0.00000	0.00061408	0.00025741	1
IC4	50.000	50.216	0.21609	0.43219	1.1468	0.0023624	1
IC2	5.0000	4.9083	-0.091716	-1.8343	0.11265	0.00066447	1
IC3	25.000	24.876	-0.12438	-0.49751	0.56843	0.0010331	1



Element Name:	As
Element Wavelength:	As 189.042 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.000054221
A1 (Gain):	0.051108
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

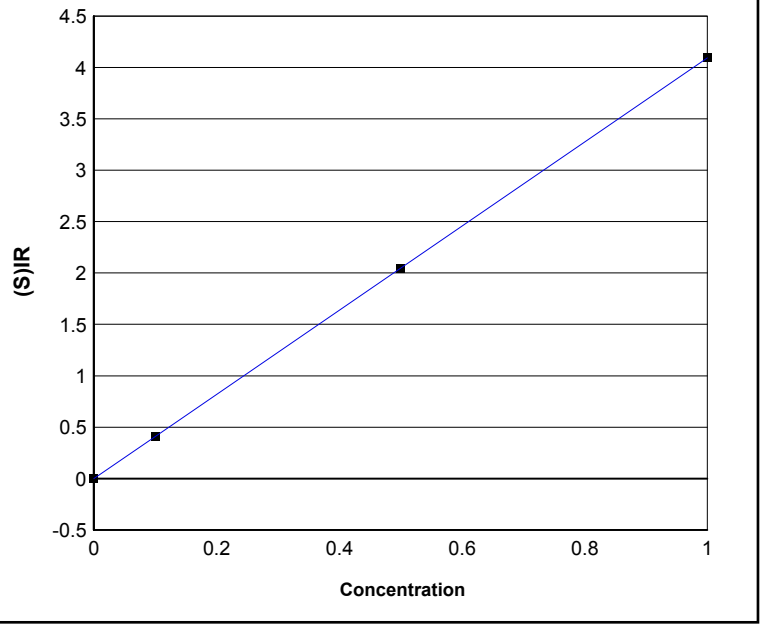
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000004463	0.0000004463	0.00000	-0.000054198	0.000079081	1
IC4	1.0000	0.99843	-0.0015654	-0.15654	0.051925	0.00011208	1
IC2	0.10000	0.099246	-0.00075359	-0.75359	0.0051132	0.000032663	1
IC3	0.50000	0.50232	0.0023190	0.46380	0.026094	0.000027853	1



Element Name:	B
Element Wavelength:	B 208.959 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0011345
A1 (Gain):	0.32653
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

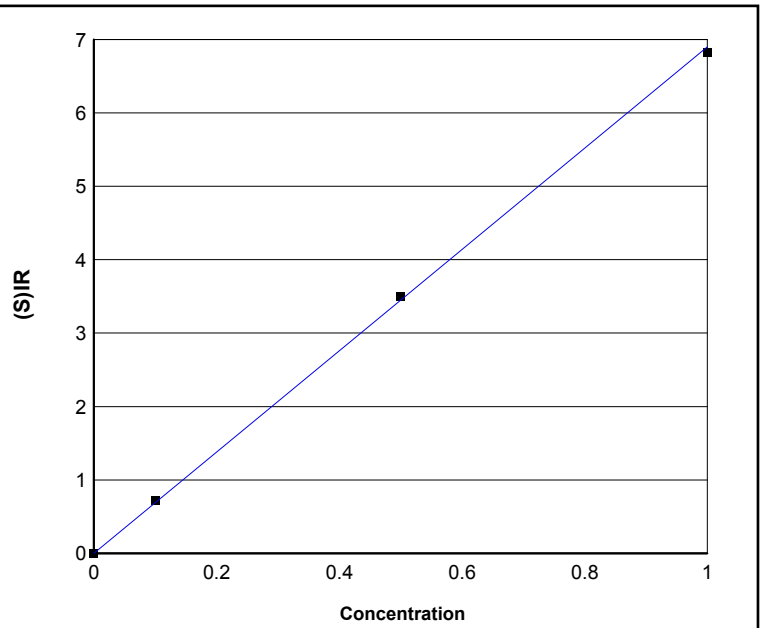
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000008036	0.0000008036	0.00000	0.0011347	0.00010156	1
IC4	1.0000	0.99941	-0.00058812	-0.058812	0.33909	0.0012575	1
IC2	0.10000	0.098922	-0.0010781	-1.0781	0.034597	0.000052961	1
IC3	0.50000	0.50167	0.0016662	0.33323	0.17075	0.00011884	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00019611
A1 (Gain):	4.0945
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

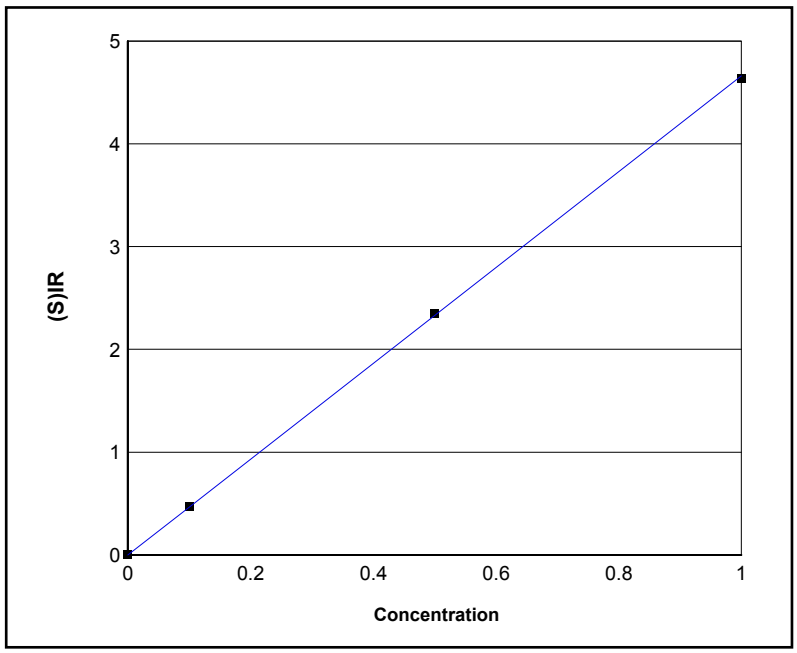
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000013814	0.0000013814	0.00000	-0.00019046	0.00036635	1
IC4	1.0000	1.0017	0.0016706	0.16706	4.1012	0.00051453	1
IC2	0.10000	0.098482	-0.0015179	-1.5179	0.40304	0.000021932	1
IC3	0.50000	0.49985	-0.00015264	-0.030529	2.0464	0.0019415	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99990
A0 (Offset):	0.00080292
A1 (Gain):	6.8974
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

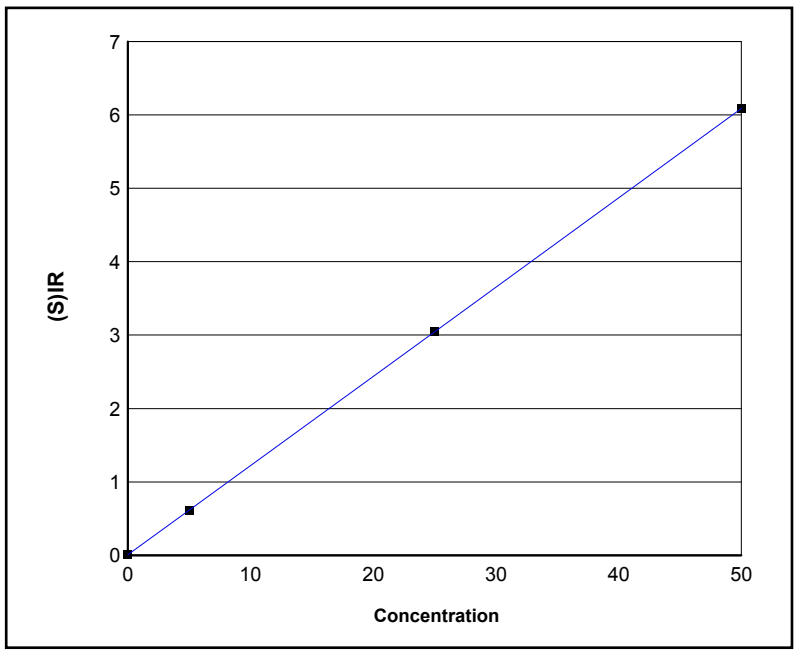
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000039544	-0.0000039544	0.00000	0.00077564	0.000055776	1
IC4	1.0000	0.98984	-0.010160	-1.0160	6.8281	0.0020162	1
IC2	0.10000	0.10367	0.0036730	3.6730	0.71587	0.0058750	1
IC3	0.50000	0.50649	0.0064870	1.2974	3.4942	0.016637	1



Element Name:	Be
Element Wavelength:	Be 313.042 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	0.00011717
A1 (Gain):	4.6625
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

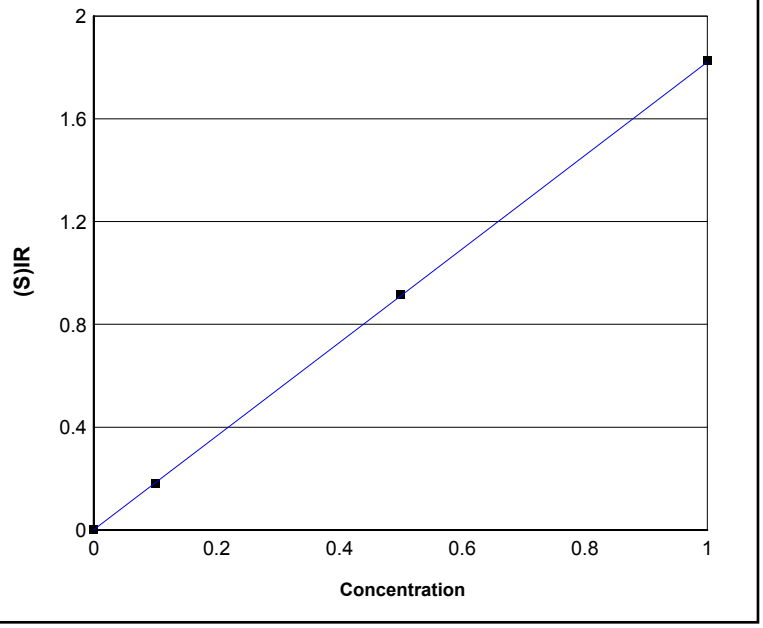
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000018299	-0.0000018299	0.00000	0.00010864	0.00014467	1
IC4	1.0000	0.99421	-0.0057870	-0.57870	4.6321	0.0050214	1
IC2	0.10000	0.10156	0.0015641	1.5641	0.47331	0.0019890	1
IC3	0.50000	0.50422	0.0042229	0.84458	2.3493	0.0082457	1



Element Name:	Ca
Element Wavelength:	Ca 317.933 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0074371
A1 (Gain):	0.12160
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

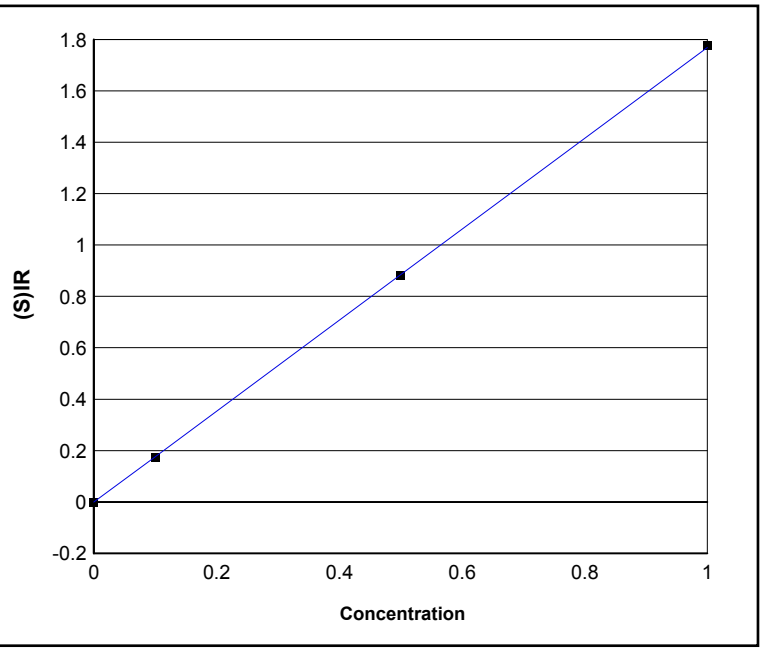
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000067481	0.000067481	0.00000	0.0074453	0.00025036	1
IC4	50.000	50.044	0.044348	0.088697	6.0929	0.00039921	1
IC2	5.0000	4.9212	-0.078808	-1.5762	0.60586	0.0023071	1
IC3	25.000	25.034	0.034459	0.13784	3.0516	0.0055682	1



Element Name:	Cd
Element Wavelength:	Cd 228.802 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0012265
A1 (Gain):	1.8204
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

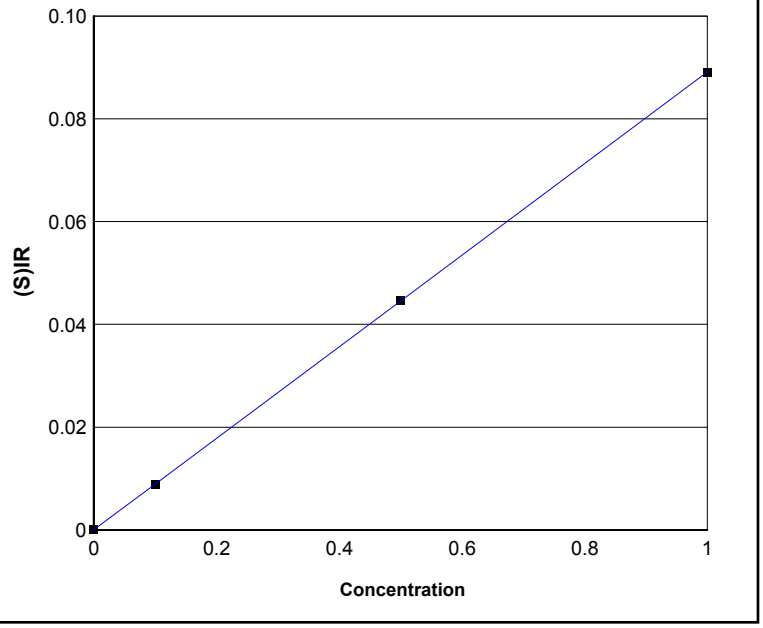
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000007480	0.0000007480	0.00000	0.0012279	0.000053872	1
IC4	1.0000	0.99920	-0.00079692	-0.079692	1.8260	0.0027710	1
IC2	0.10000	0.098965	-0.0010347	-1.0347	0.18197	0.00069006	1
IC3	0.50000	0.50183	0.0018316	0.36631	0.91767	0.0012979	1



Element Name:	Co
Element Wavelength:	Co 228.616 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.00073569
A1 (Gain):	1.7702
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

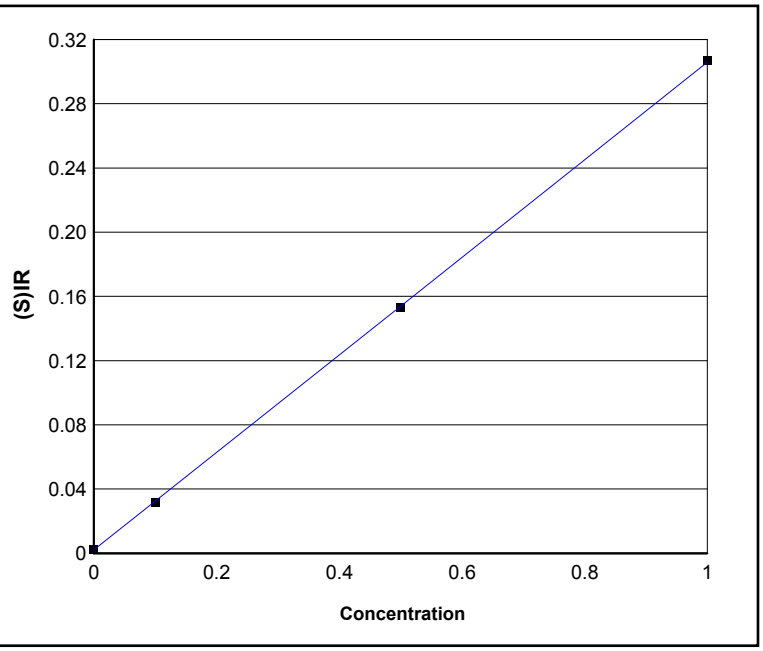
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000019163	0.0000019163	0.00000	-0.00073230	0.000069044	1
IC4	1.0000	1.0033	0.0032775	0.32775	1.7767	0.0011822	1
IC2	0.10000	0.098014	-0.0019857	-1.9857	0.17291	0.00010131	1
IC3	0.50000	0.49871	-0.0012918	-0.25836	0.88279	0.00021357	1



Element Name:	Cr
Element Wavelength:	Cr 267.716 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.000022485
A1 (Gain):	0.089100
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

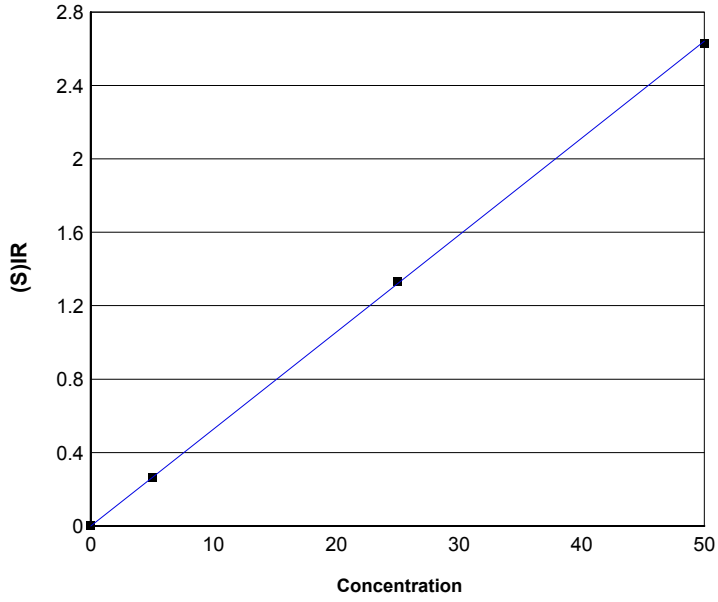
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000002318	0.0000002318	0.00000	0.000022506	0.000016380	1
IC4	1.0000	0.99902	-0.00098447	-0.098447	0.089035	0.00051477	1
IC2	0.10000	0.099587	-0.00041286	-0.41286	0.0088957	0.000033929	1
IC3	0.50000	0.50140	0.0013973	0.27947	0.044697	0.00012927	1



Element Name:	Cu
Element Wavelength:	Cu 324.754 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.0021507
A1 (Gain):	0.30367
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

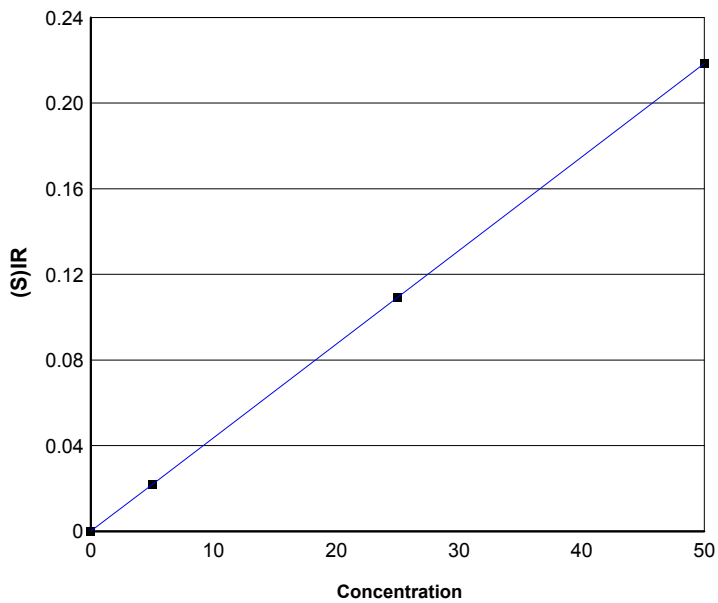
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000018960	0.0000018960	0.00000	0.0021513	0.000027312	1
IC4	1.0000	1.0045	0.0045188	0.45188	0.30686	0.00099781	1
IC2	0.10000	0.098195	-0.0018052	-1.8052	0.031936	0.00035111	1
IC3	0.50000	0.49729	-0.0027136	-0.54273	0.15299	0.00055803	1



Element Name:	Fe
Element Wavelength:	Fe 259.940 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00055489
A1 (Gain):	0.052834
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

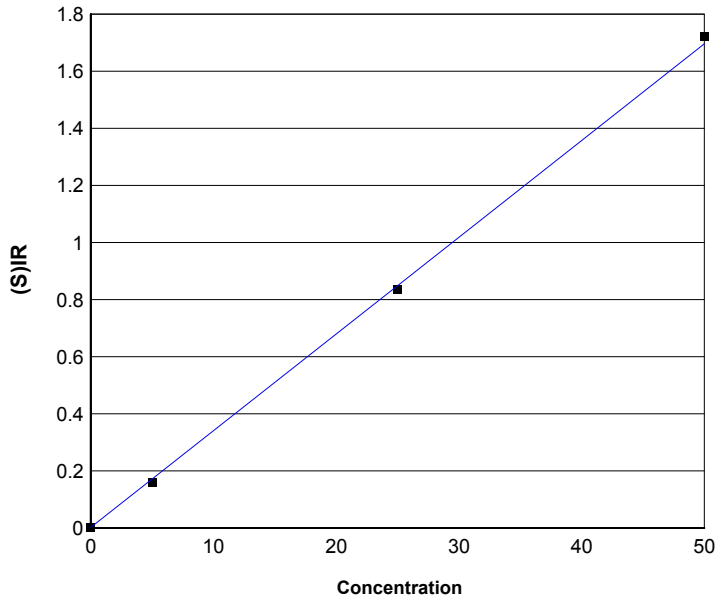
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000049700	-0.000049700	0.00000	0.00055227	0.00013551	1
IC4	50.000	49.783	-0.21670	-0.43340	2.6308	0.00081126	1
IC2	5.0000	5.0350	0.035037	0.70074	0.26658	0.00016686	1
IC3	25.000	25.182	0.18166	0.72665	1.3310	0.000069155	1



Element Name:	Fe
Element Wavelength:	Fe 271.441 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.000080489
A1 (Gain):	0.0043697
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

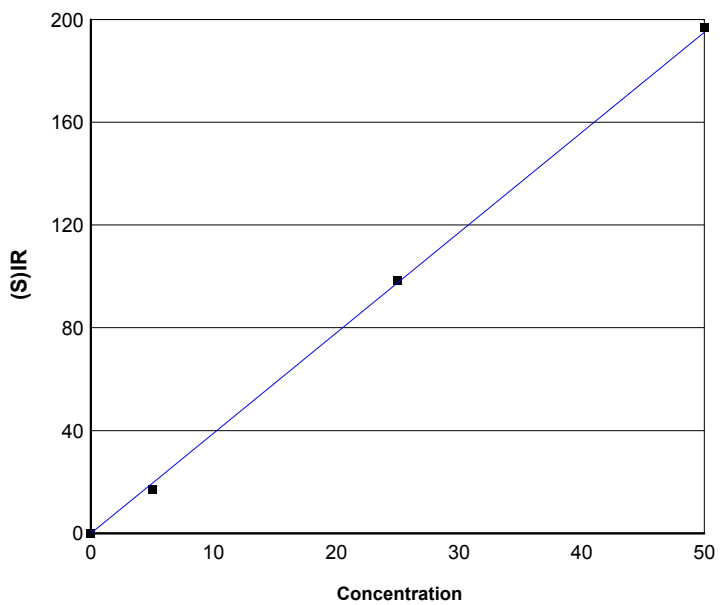
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000088504	-0.0000088504	0.00000	0.000080450	0.0000040793	1
IC4	50.000	49.974	-0.025970	-0.051941	0.21845	0.0019022	1
IC2	5.0000	5.0078	0.0078168	0.15634	0.021963	0.00053321	1
IC3	25.000	25.018	0.018154	0.072614	0.10940	0.00053737	1



Element Name:	K
Element Wavelength:	K 766.490 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99975
A0 (Offset):	0.0020807
A1 (Gain):	0.033869
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

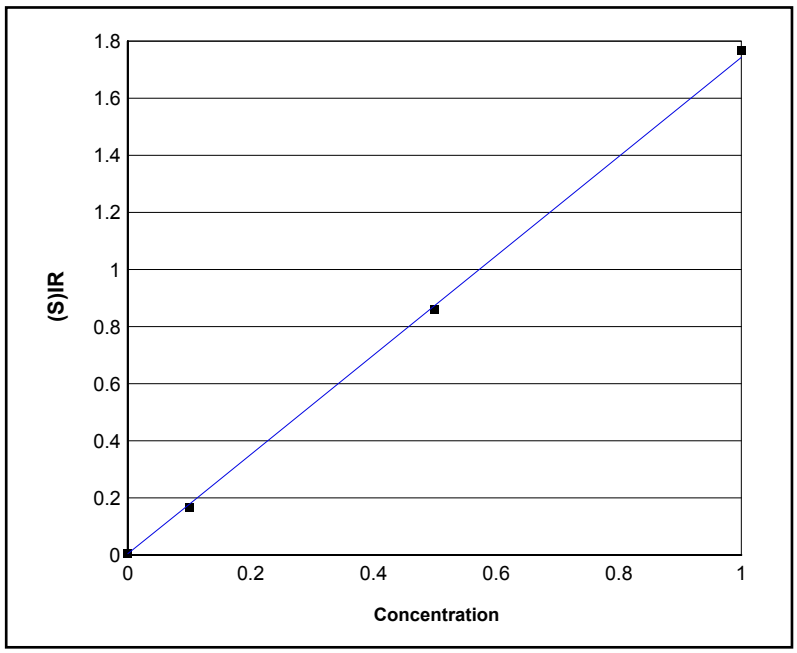
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00034512	0.00034512	0.00000	0.0020924	0.0014833	1
IC4	50.000	50.729	0.72938	1.4588	1.7202	0.0045552	1
IC2	5.0000	4.6598	-0.34023	-6.8046	0.15990	0.00060236	1
IC3	25.000	24.611	-0.38915	-1.5566	0.83562	0.00092145	1



Element Name:	K
Element Wavelength:	K 766.490 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99945
A0 (Offset):	0.0096643
A1 (Gain):	3.9006
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

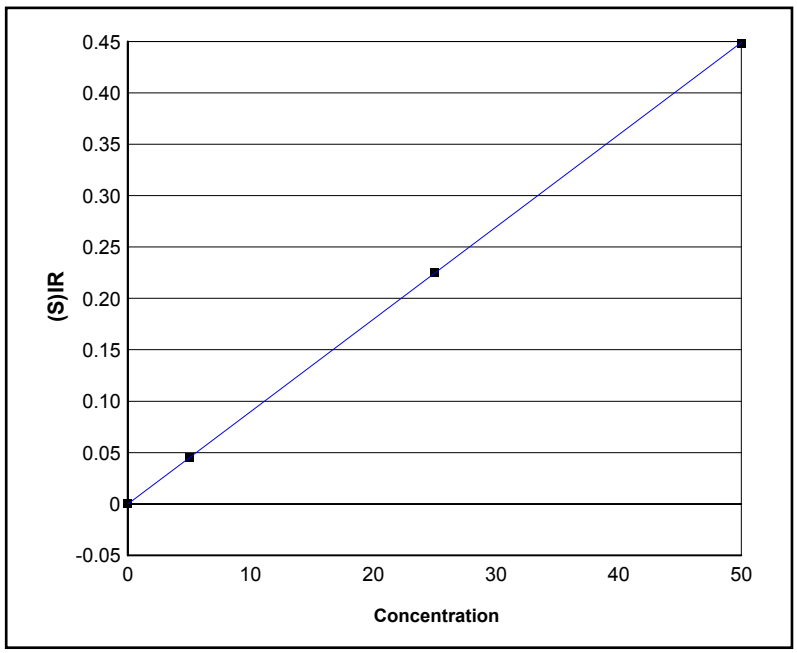
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00055824	0.00055824	0.00000	0.011842	0.0014909	1
IC4	50.000	50.465	0.46526	0.93053	196.85	1.0165	1
IC2	5.0000	4.3604	-0.63964	-12.793	17.018	0.16831	1
IC3	25.000	25.174	0.17437	0.69749	98.205	1.7325	1



Element Name:	Li
Element Wavelength:	Li 670.784 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99976
A0 (Offset):	0.0038696
A1 (Gain):	1.7389
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

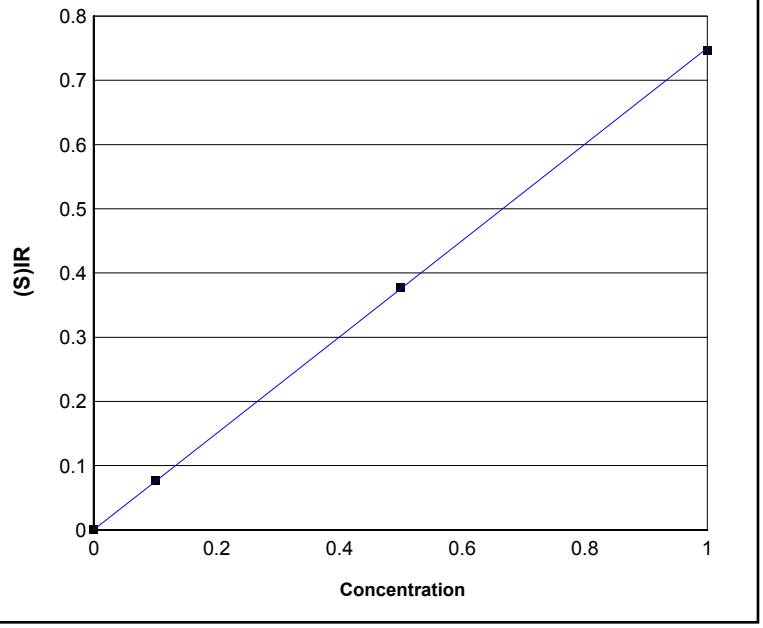
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000068823	0.0000068823	0.00000	0.0038816	0.0012639	1
IC2	0.10000	0.093154	-0.0068463	-6.8463	0.16586	0.0019842	1
IC3	0.50000	0.49279	-0.0072066	-1.4413	0.86080	0.00093333	1
IC4	1.0000	1.0141	0.014053	1.4053	1.7672	0.0034901	1



Element Name:	Mg
Element Wavelength:	Mg 279.079 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.000012137
A1 (Gain):	0.0089803
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

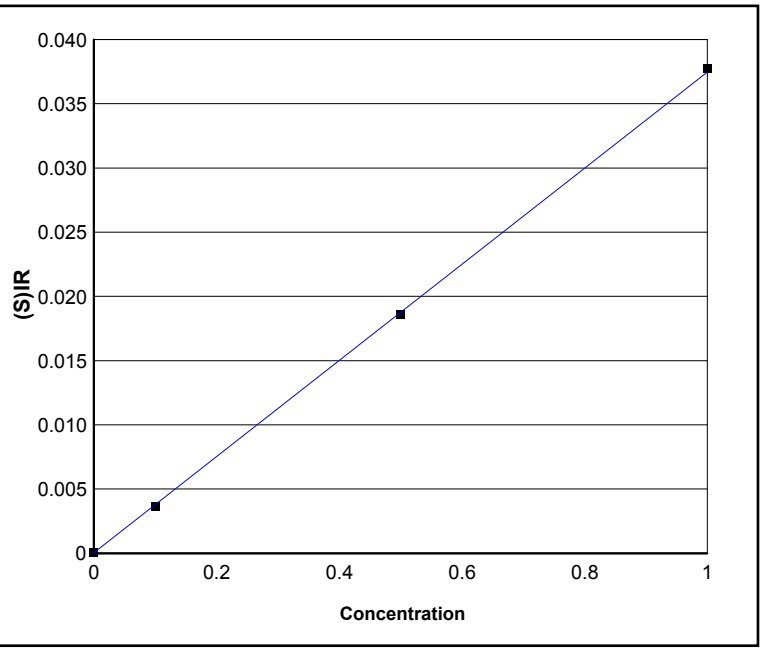
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000042728	-0.0000042728	0.00000	-0.000012176	0.000011557	1
IC4	50.000	49.922	-0.078328	-0.15666	0.44830	0.000028114	1
IC2	5.0000	4.9956	-0.0044500	-0.089000	0.044850	0.00033020	1
IC3	25.000	25.083	0.082778	0.33111	0.22524	0.000041296	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	0.00028609
A1 (Gain):	0.75001
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

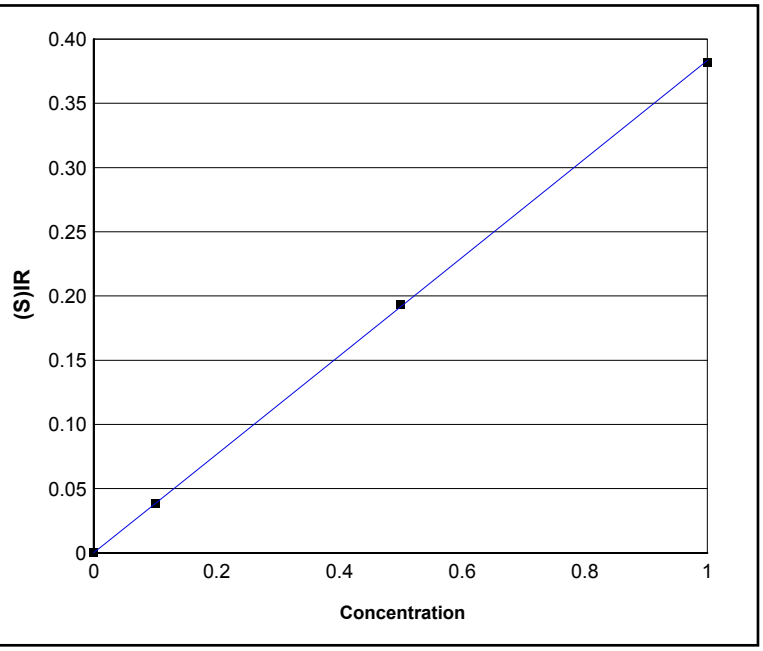
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000018429	-0.0000018429	0.00000	0.00028471	0.000049147	1
IC4	1.0000	0.99458	-0.0054162	-0.54162	0.74623	0.0012597	1
IC2	0.10000	0.10163	0.0016266	1.6266	0.076507	0.00062666	1
IC3	0.50000	0.50379	0.0037896	0.75793	0.37813	0.00022199	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99994
A0 (Offset):	0.000042145
A1 (Gain):	0.037432
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

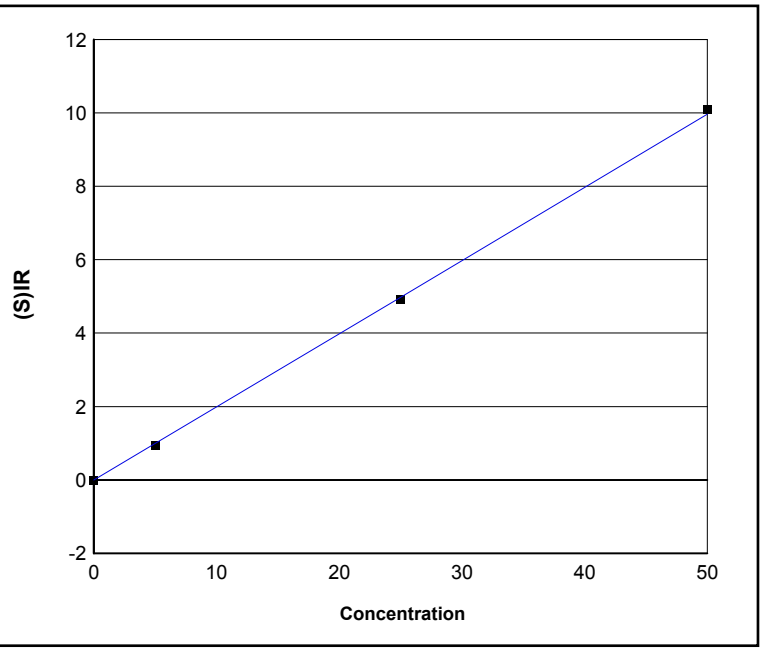
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000031868	0.0000031868	0.00000	0.000042264	0.0000033624	1
IC4	1.0000	1.0072	0.0071951	0.71951	0.037744	0.0000042552	1
IC2	0.10000	0.096916	-0.0030841	-3.0841	0.0036699	0.000031611	1
IC3	0.50000	0.49589	-0.0041110	-0.82220	0.018604	0.000057183	1



Element Name:	Mo
Element Wavelength:	Mo 202.030 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00017183
A1 (Gain):	0.38312
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

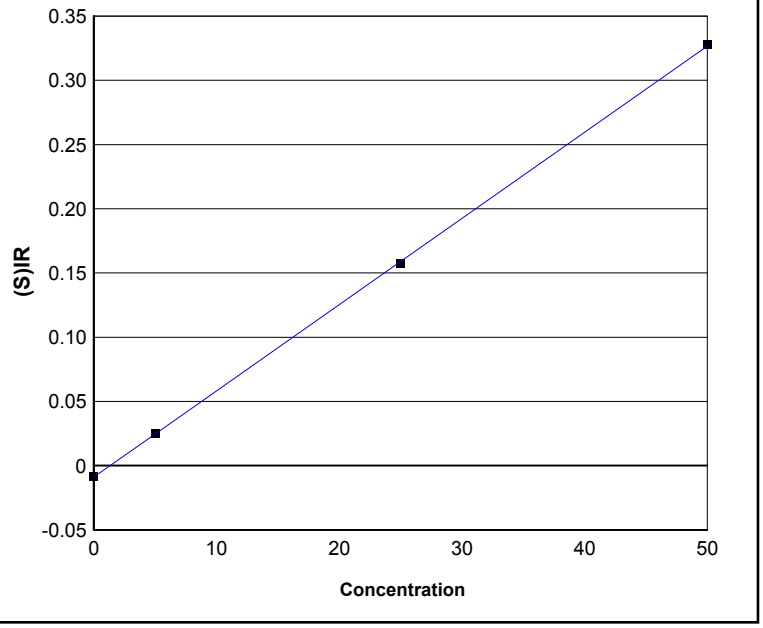
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000006832	-0.0000006832	0.00000	0.00017157	0.000032430	1
IC4	1.0000	0.99578	-0.0042190	-0.42190	0.38167	0.0010286	1
IC2	0.10000	0.10033	0.00032667	0.32667	0.038609	0.000074226	1
IC3	0.50000	0.50389	0.0038923	0.77846	0.19322	0.00056257	1



Element Name:	Na
Element Wavelength:	Na 589.592 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99977
A0 (Offset):	-0.0024847
A1 (Gain):	0.19930
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

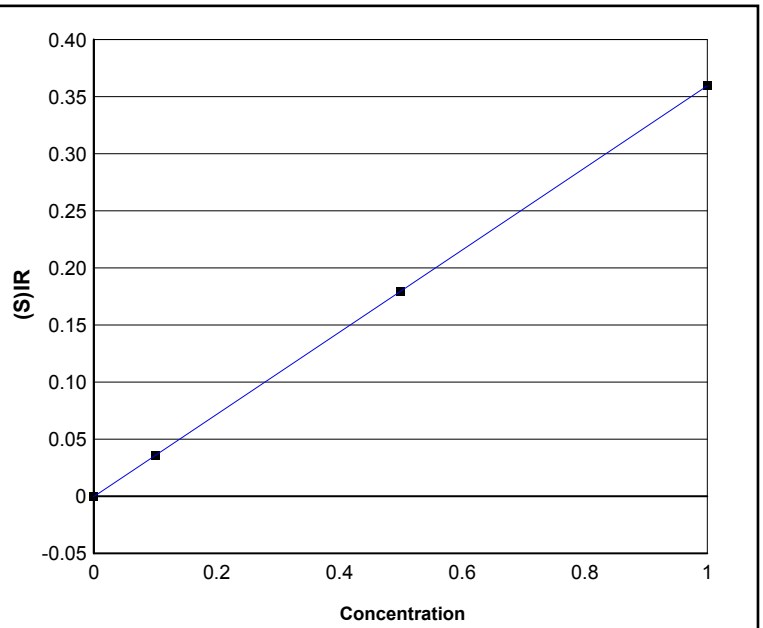
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00033534	0.00033534	0.00000	-0.0024179	0.0015555	1
IC4	50.000	50.676	0.67648	1.3530	10.097	0.021197	1
IC2	5.0000	4.6654	-0.33462	-6.6923	0.92733	0.0027442	1
IC3	25.000	24.658	-0.34186	-1.3674	4.9119	0.0094974	1



Element Name:	Na
Element Wavelength:	Na 818.326 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.0087517
A1 (Gain):	0.0067073
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

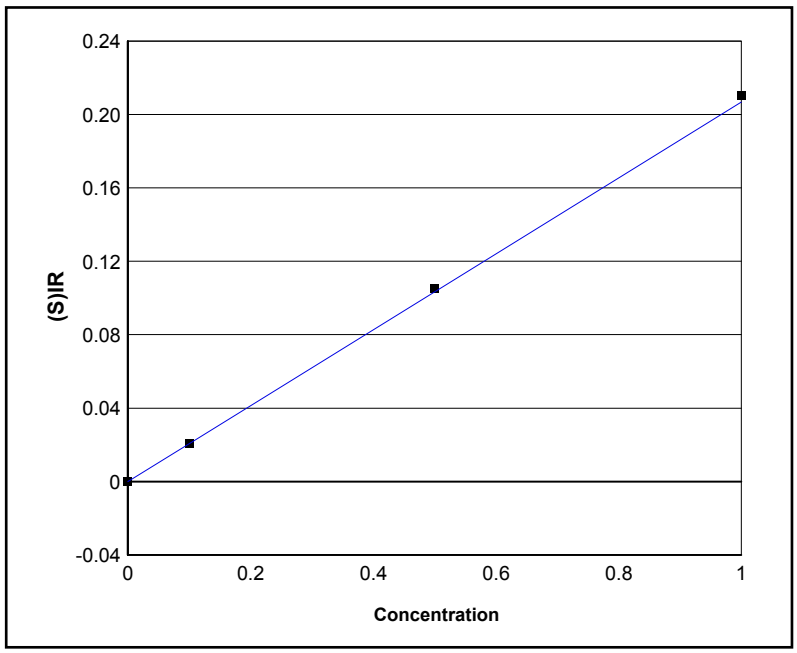
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000010305	-0.000010305	0.00000	-0.0087518	0.000053930	1
IC4	50.000	50.152	0.15220	0.30441	0.32763	0.00078901	1
IC2	5.0000	5.0319	0.031906	0.63812	0.024999	0.000070717	1
IC3	25.000	24.816	-0.18411	-0.73644	0.15769	0.00097993	1



Element Name:	Ni
Element Wavelength:	Ni 231.604 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00032465
A1 (Gain):	0.35967
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

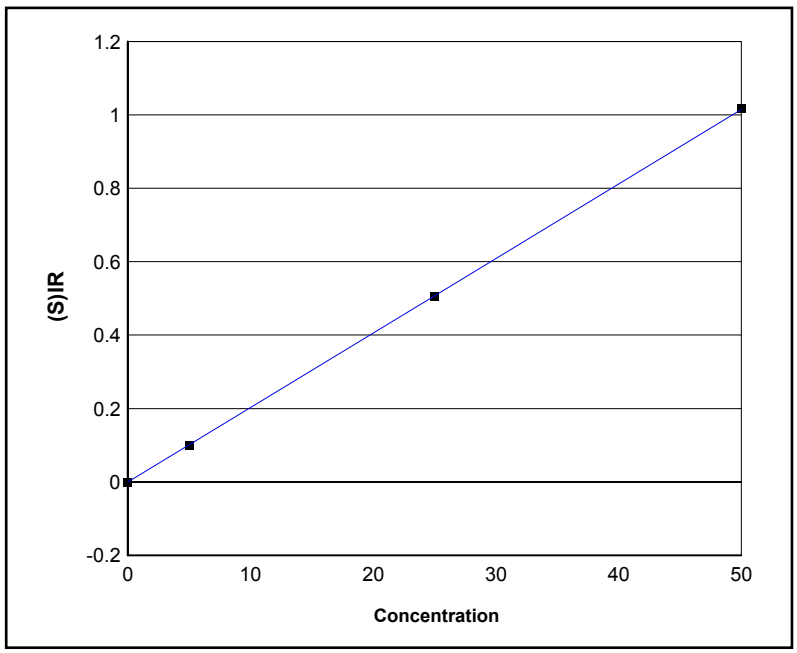
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000011324	0.0000011324	0.00000	-0.00032424	0.00013660	1
IC4	1.0000	1.0017	0.0016937	0.16937	0.35995	0.00037436	1
IC2	0.10000	0.098796	-0.0012038	-1.2038	0.035209	0.00017159	1
IC3	0.50000	0.49951	-0.00048991	-0.097982	0.17933	0.00035527	1



Element Name:	Pb
Element Wavelength:	Pb 220.353 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00012355
A1 (Gain):	0.20688
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

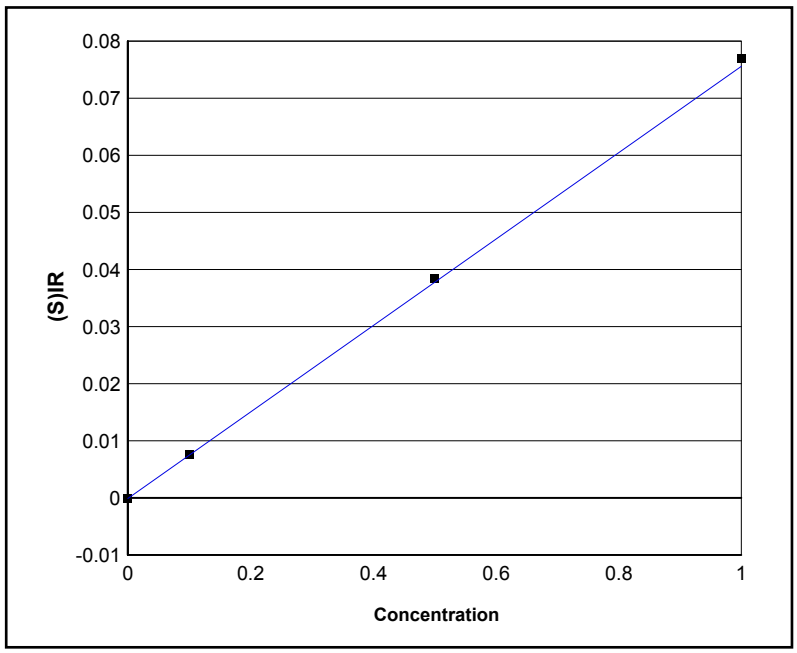
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000015185	0.0000015185	0.00000	-0.00012323	0.000030192	1
IC4	1.0000	1.0012	0.0012431	0.12431	0.21052	0.00060624	1
IC2	0.10000	0.098257	-0.0017428	-1.7428	0.020554	0.00030960	1
IC3	0.50000	0.50050	0.00049963	0.099927	0.10517	0.00019278	1



Element Name:	S
Element Wavelength:	S 182.034 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.0000
A0 (Offset):	-0.0002599
A1 (Gain):	0.02030
A2 (Curvature):	0.0000
n (Exponent):	1.000

Reslope		QC Normalize	
Slope:	1.000	**Slope factor:**	1.000
Y Int:	0.0000	**Offset:**	0.0000

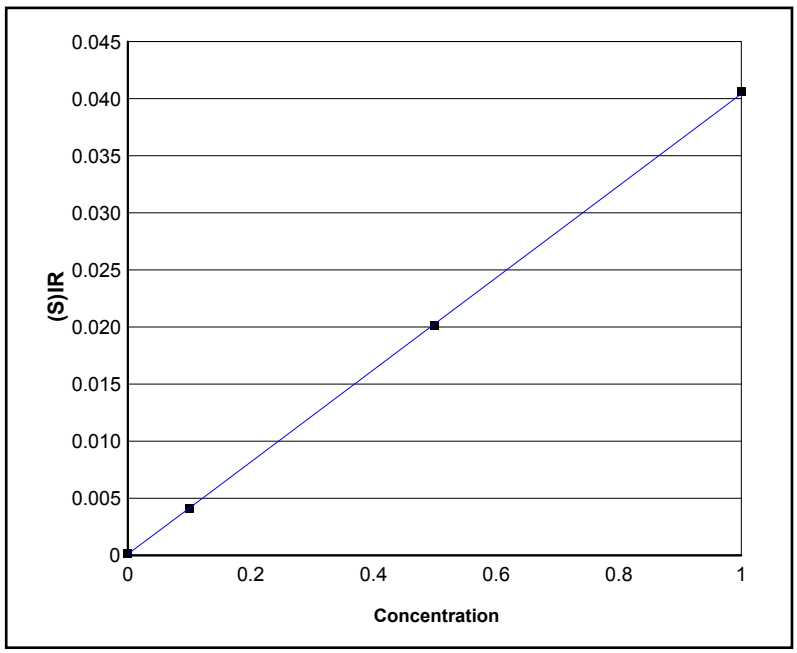
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.0000	0.0001128	0.0001128	0.0000	-0.0002576	0.00006884	1
IC2	5.000	4.881	-0.1193	-2.386	0.09884	0.0001754	1
IC3	25.00	24.95	-0.05383	-0.2153	0.5063	0.0003134	1
IC4	50.00	50.17	0.1731	0.3463	1.018	0.002242	1



Element Name:	Sb
Element Wavelength:	Sb 206.833 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00011041
A1 (Gain):	0.075692
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

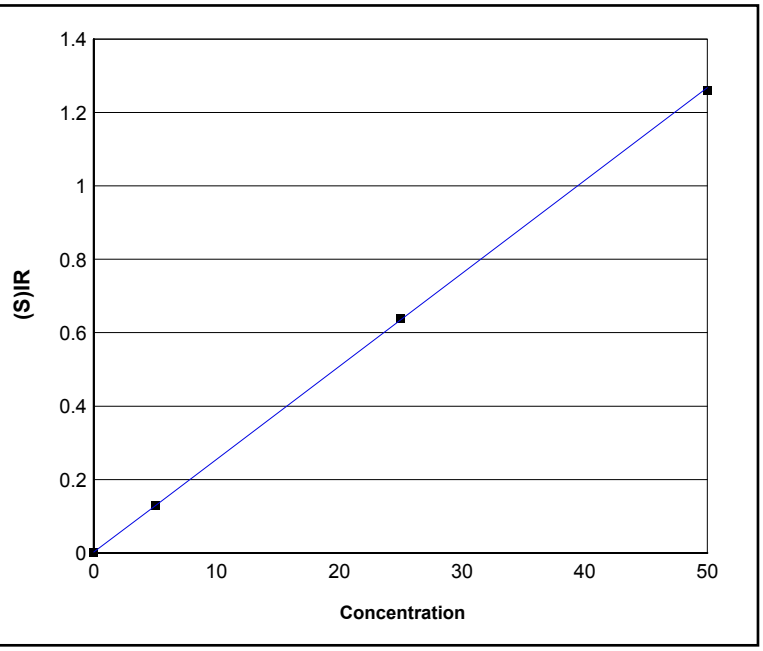
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000010064	0.0000010064	0.00000	-0.00011033	0.000099458	1
IC4	1.0000	1.0002	0.00024273	0.024273	0.076953	0.00049189	1
IC2	0.10000	0.098772	-0.0012277	-1.2277	0.0075012	0.000046978	1
IC3	0.50000	0.50098	0.00098498	0.19700	0.038487	0.000073760	1



Element Name:	Se
Element Wavelength:	Se 196.090 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00011157
A1 (Gain):	0.040317
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

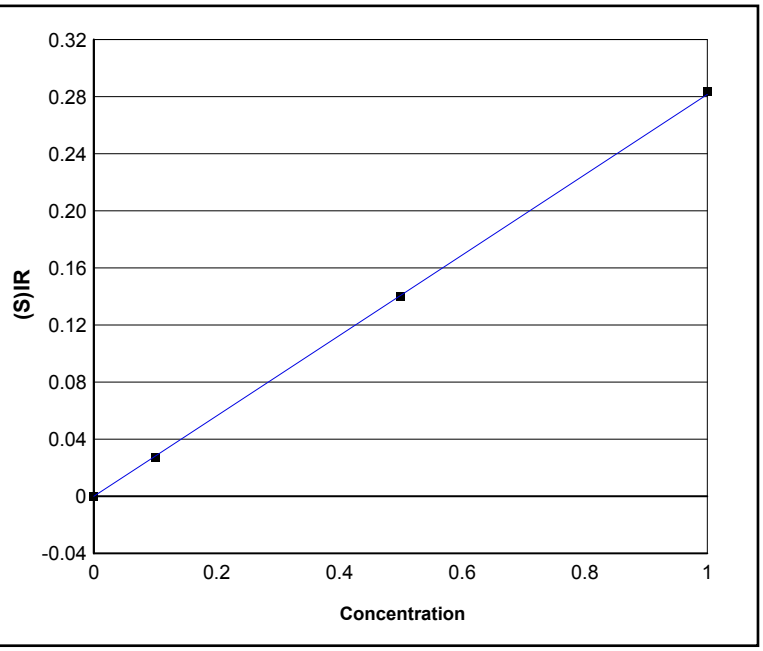
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000012384	0.0000012384	0.00000	0.00011162	0.000099458	1
IC4	1.0000	1.0046	0.0045615	0.45615	0.040601	0.00015958	1
IC2	0.10000	0.099022	-0.00097776	-0.97776	0.0041027	0.000070323	1
IC3	0.50000	0.49642	-0.0035837	-0.71675	0.020120	0.00018240	1



Element Name:	Si
Element Wavelength:	Si 288.158 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.0020478
A1 (Gain):	0.025311
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

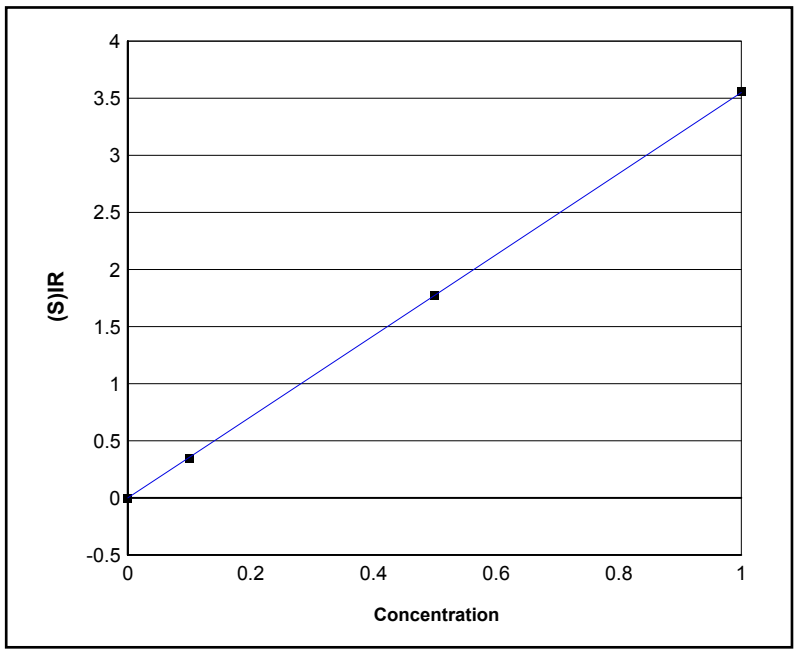
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	-0.000055330	-0.000055330	0.00000	0.0020464	0.000081810	1
IC2	5.0000	5.0382	0.038225	0.76450	0.12957	0.00054159	1
IC3	25.000	25.209	0.20928	0.83711	0.64013	0.00074338	1
IC4	50.000	49.752	-0.24750	-0.49500	1.2614	0.0054480	1



Element Name:	Sn
Element Wavelength:	Sn 189.989 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99996
A0 (Offset):	-0.0000060369
A1 (Gain):	0.28165
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

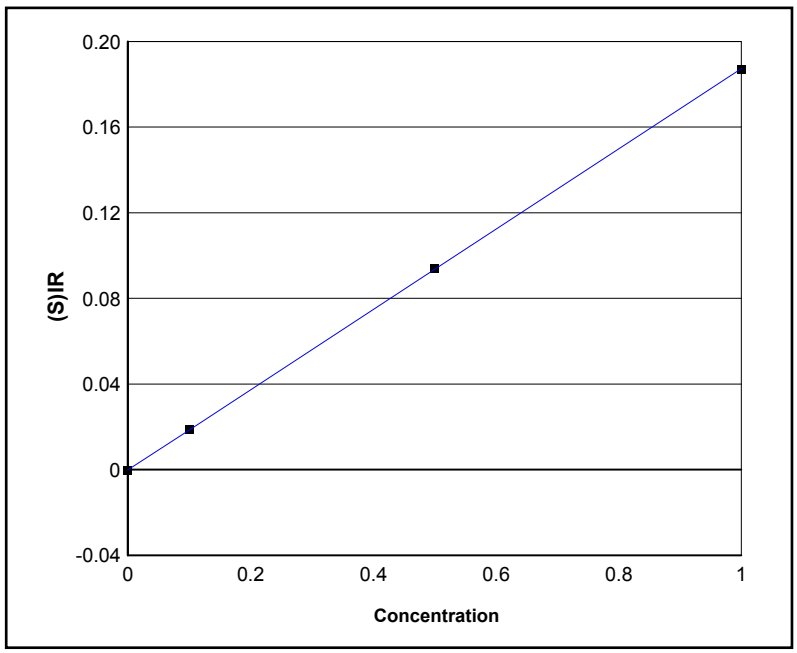
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000027519	0.0000027519	0.00000	-0.0000052619	0.0000014932	1
IC4	1.0000	1.0062	0.0061723	0.61723	0.28338	0.00066765	1
IC2	0.10000	0.097332	-0.0026684	-2.6684	0.027407	0.00011729	1
IC3	0.50000	0.49650	-0.0035039	-0.70078	0.13983	0.00054749	1



Element Name:	Sr
Element Wavelength:	Sr 407.771 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.0014949
A1 (Gain):	3.5523
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

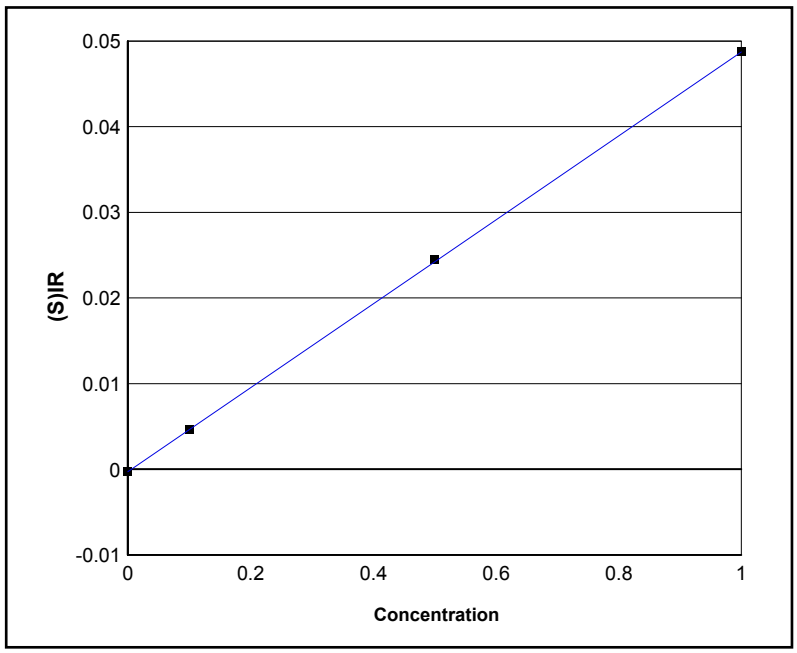
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000017861	0.0000017861	0.00000	-0.0014886	0.00067253	1
IC2	0.10000	0.098193	-0.0018070	-1.8070	0.34732	0.00012883	1
IC3	0.50000	0.49840	-0.0015977	-0.31955	1.7690	0.00024525	1
IC4	1.0000	1.0034	0.0034048	0.34048	3.5629	0.0053650	1



Element Name:	Ti
Element Wavelength:	Ti 334.904 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.00016513
A1 (Gain):	0.18747
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

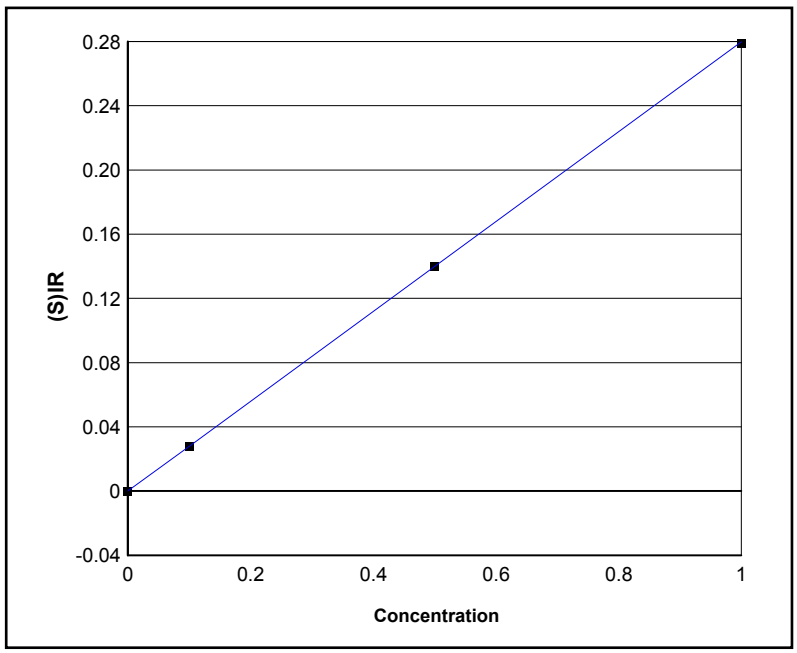
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000003702	-0.0000003702	0.00000	-0.00016520	0.000040799	1
IC4	1.0000	0.99830	-0.0017006	-0.17006	0.18702	0.00025544	1
IC2	0.10000	0.10025	0.00025023	0.25023	0.018632	0.000093966	1
IC3	0.50000	0.50145	0.0014503	0.29006	0.093857	0.00015306	1



Element Name:	Tl
Element Wavelength:	Tl 190.856 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00027803
A1 (Gain):	0.049015
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

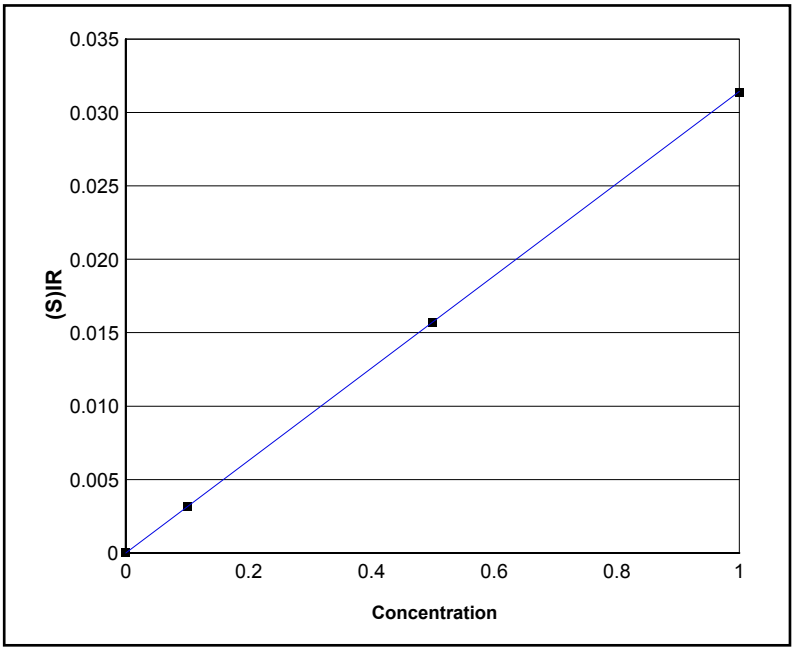
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000002399	0.0000002399	0.00000	-0.00027802	0.0000081604	1
IC4	1.0000	0.99677	-0.0032304	-0.32304	0.048758	0.00020675	1
IC2	0.10000	0.099296	-0.00070366	-0.70366	0.0046069	0.000079481	1
IC3	0.50000	0.50393	0.0039340	0.78680	0.024512	0.000089033	1



Element Name:	V
Element Wavelength:	V 292.402 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.0000028321
A1 (Gain):	0.27975
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000008397	0.0000008397	0.00000	-0.0000025972	0.0000036730	1
IC4	1.0000	1.0003	0.00031572	0.031572	0.27898	0.00074536	1
IC2	0.10000	0.098990	-0.0010101	-1.0101	0.027604	0.000065999	1
IC3	0.50000	0.50069	0.00069441	0.13888	0.13964	0.000014563	1



Element Name:	Zn
Element Wavelength:	Zn 206.200 nm
Concentration Units:	ppm
Date of Calibration:	11/15/2013 9:39:33AM
Date of Fit:	11/15/2013 9:39:33AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.0000063462
A1 (Gain):	0.031438
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000003438	0.0000003438	0.00000	0.0000063570	0.000010353	1
IC4	1.0000	1.0001	0.000069019	0.0069019	0.031390	0.000089276	1
IC2	0.10000	0.099579	-0.00042106	-0.42106	0.0031312	0.000028469	1
IC3	0.50000	0.50035	0.00035204	0.070408	0.015708	0.000017109	1

Sample Name: IC1 Acquired: 11/15/2013 9:30:11 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**-.00006**	**.00061**	**-.00005**	**.00113**	**-.00019**	**.00078**	**.00011**
Stddev	.00001	.00026	.00008	.00010	.00037	.00006	.00014
%RSD	23.218	41.919	145.91	8.9499	192.35	7.1909	133.17
#1	-.00005	.00043	.00000	.00106	.00007	.00082	.00021
#2	-.00007	.00080	-.00011	.00121	-.00045	.00074	.00001

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00745**	**.00123**	**-.00073**	**.00002**	**.00215**	**.00055**	**.00008**
Stddev	.00025	.00005	.00007	.00002	.00003	.00014	.00000
%RSD	3.3626	4.3875	9.4284	72.781	1.2696	24.537	5.0705
#1	.00762	.00127	-.00078	.00001	.00213	.00065	.00008
#2	.00727	.00119	-.00068	.00003	.00217	.00046	.00008

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00209**	**.01184**	**.00388**	**-.00001**	**.00028**	**.00004**	**.00017**
Stddev	.00148	.00149	.00126	.00001	.00005	.00000	.00003
%RSD	70.887	12.590	32.562	94.915	17.262	7.9558	18.902
#1	.00104	.01079	.00299	-.00002	.00025	.00004	.00015
#2	.00314	.01290	.00478	-.00000	.00032	.00004	.00019

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**-.00242**	**-.00875**	**-.00032**	**-.00012**	**-.0003**	**-.00011**	**.00011**
Stddev	.00156	.00005	.00014	.00003	.0001	.00010	.00010
%RSD	64.332	.61622	42.129	24.500	26.72	90.144	89.102
#1	-.00132	-.00871	-.00042	-.00010	-.0002	-.00004	.00004
#2	-.00352	-.00879	-.00023	-.00014	-.0003	-.00018	.00018

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00205**	**-.00001**	**-.00149**	**-.00017**	**-.00028**	**-.00000**	**.00001**
Stddev	.00008	.00000	.00067	.00004	.00001	.00000	.00001
%RSD	3.9979	28.378	45.178	24.696	2.9352	141.42	162.86
#1	.00199	-.00001	-.00101	-.00019	-.00027	.00000	-.00000
#2	.00210	-.00000	-.00196	-.00014	-.00028	-.00001	.00001

Sample Name: IC1 Acquired: 11/15/2013 9:30:11 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3454.4	5163.9	77270.	7123.9
Stddev	3.9	.9	396.	68.9
%RSD	.11196	.01703	.51294	.96712
#1	3451.6	5163.3	77550.	7075.2
#2	3457.1	5164.5	76990.	7172.6

Sample Name: IC2 Acquired: 11/15/2013 9:32:36 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.01276**	**.11265**	**.00511**	**.03460**	**.40304**	**.71587**	**.47331**
Stddev	.00009	.00066	.00003	.00005	.00002	.00588	.00199
%RSD	.71752	.58986	.63880	.15308	.00544	.82068	.42023
#1	.01269	.11312	.00509	.03463	.40306	.71172	.47472
#2	.01282	.11218	.00514	.03456	.40302	.72003	.47190

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.60586**	**.18197**	**.17291**	**.00890**	**.03194**	**.26658**	**.02196**
Stddev	.00231	.00069	.00010	.00003	.00035	.00017	.00053
%RSD	.38080	.37923	.05859	.38141	1.0994	.06259	2.4278
#1	.60749	.18148	.17298	.00887	.03169	.26670	.02159
#2	.60423	.18245	.17284	.00892	.03218	.26646	.02234

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.15990**	**17.018**	**.16586**	**.04485**	**.07651**	**.00367**	**.03861**
Stddev	.00060	.168	.00198	.00033	.00063	.00003	.00007
%RSD	.37671	.98905	1.1964	.73624	.81910	.86135	.19225
#1	.16033	17.137	.16445	.04462	.07606	.00365	.03866
#2	.15948	16.899	.16726	.04508	.07695	.00369	.03856

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.92733**	**.02500**	**.03521**	**.02055**	**.0988**	**.00750**	**.00410**
Stddev	.00274	.00007	.00017	.00031	.0002	.00005	.00007
%RSD	.29593	.28289	.48734	1.5063	.1775	.62627	1.7141
#1	.92538	.02505	.03533	.02077	.0987	.00747	.00405
#2	.92927	.02495	.03509	.02034	.0990	.00753	.00415

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.12957**	**.02741**	**.34732**	**.01863**	**.00461**	**.02760**	**.00313**
Stddev	.00054	.00012	.00013	.00009	.00008	.00007	.00003
%RSD	.41798	.42796	.03709	.50433	1.7253	.23909	.90918
#1	.12919	.02732	.34741	.01857	.00455	.02756	.00315
#2	.12996	.02749	.34723	.01870	.00466	.02765	.00311

Sample Name: IC2 Acquired: 11/15/2013 9:32:36 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3422.0	5176.5	76770.	7213.1
Stddev	4.6	2.9	478.	33.8
%RSD	.13332	.05535	.62325	.46870
#1	3425.2	5178.6	77108.	7189.2
#2	3418.8	5174.5	76431.	7237.0

Sample Name: IC3 Acquired: 11/15/2013 9:34:53 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.06518**	**.56843**	**.02609**	**.17075**	**2.0464**	**3.4942**	**2.3493**
Stddev	.00027	.00103	.00003	.00012	.0019	.0166	.0083
%RSD	.42127	.18175	.10674	.06960	.09487	.47614	.35099
#1	.06537	.56916	.02611	.17083	2.0451	3.4825	2.3435
#2	.06499	.56769	.02607	.17067	2.0478	3.5060	2.3551

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3.0516**	**.91767**	**.88279**	**.04470**	**.15299**	**1.3310**	**.10940**
Stddev	.0056	.00130	.00021	.00013	.00056	.0001	.00054
%RSD	.18247	.14144	.02419	.28921	.36474	.00520	.49119
#1	3.0556	.91859	.88294	.04461	.15260	1.3311	.10978
#2	3.0477	.91675	.88264	.04479	.15339	1.3310	.10902

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.83562**	**98.205**	**.86080**	**.22524**	**.37813**	**.01860**	**.19322**
Stddev	.00092	1.732	.00093	.00004	.00022	.00006	.00056
%RSD	.11027	1.7642	.10843	.01833	.05871	.30737	.29115
#1	.83497	96.980	.86146	.22521	.37797	.01856	.19362
#2	.83627	99.430	.86014	.22527	.37829	.01864	.19282

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**4.9119**	**.15769**	**.17933**	**.10517**	**.5063**	**.03849**	**.02012**
Stddev	.0095	.00098	.00036	.00019	.0003	.00007	.00018
%RSD	.19336	.62141	.19811	.18330	.0619	.19165	.90659
#1	4.9186	.15839	.17958	.10504	.5065	.03843	.02025
#2	4.9052	.15700	.17908	.10531	.5060	.03854	.01999

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.64013**	**.13983**	**1.7690**	**.09386**	**.02451**	**.13964**	**.01571**
Stddev	.00074	.00055	.0003	.00015	.00009	.00001	.00002
%RSD	.11613	.39153	.01386	.16308	.36322	.01043	.10892
#1	.63961	.13945	1.7688	.09375	.02458	.13965	.01570
#2	.64066	.14022	1.7692	.09396	.02445	.13963	.01572

Sample Name: IC3 Acquired: 11/15/2013 9:34:53 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3254.9	5056.6	74068.	7130.7
Stddev	1.3	9.1	176.	9.5
%RSD	.03944	.18014	.23720	.13338
#1	3254.0	5050.1	74192.	7123.9
#2	3255.8	5063.0	73944.	7137.4

Sample Name: IC4 Acquired: 11/15/2013 9:37:16 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.13250	1.1468	.05193	.33909	4.1012	6.8281	4.6321
Stddev	.00018	.0024	.00011	.00126	.0005	.0020	.0050
%RSD	.13656	.20599	.21584	.37086	.01255	.02953	.10840
#1	.13237	1.1452	.05185	.33820	4.1015	6.8267	4.6357
#2	.13262	1.1485	.05200	.33998	4.1008	6.8295	4.6286

Elem	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	Fe2714
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	6.0929	1.8260	1.7767	.08903	.30686	2.6308	.21845
Stddev	.0004	.0028	.0012	.00051	.00100	.0008	.00190
%RSD	.00655	.15175	.06654	.57817	.32517	.03084	.87079
#1	6.0931	1.8240	1.7775	.08867	.30615	2.6303	.21980
#2	6.0926	1.8280	1.7759	.08940	.30756	2.6314	.21710

Elem	K_7664	K_7664-2	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.7202	196.85	1.7672	.44830	.74623	.03774	.38167
Stddev	.0046	1.02	.0035	.00003	.00126	.00000	.00103
%RSD	.26480	.51639	.19749	.00627	.16881	.01127	.26949
#1	1.7170	197.57	1.7648	.44828	.74534	.03775	.38095
#2	1.7234	196.14	1.7697	.44832	.74712	.03774	.38240

Elem	Na5895	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	10.097	.32763	.35995	.21052	1.018	.07695	.04060
Stddev	.021	.00079	.00037	.00061	.002	.00049	.00016
%RSD	.20993	.24082	.10400	.28798	.2201	.63920	.39305
#1	10.082	.32707	.35969	.21095	1.017	.07661	.04049
#2	10.112	.32819	.36022	.21009	1.020	.07730	.04071

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.2614	.28338	3.5629	.18702	.04876	.27898	.03139
Stddev	.0055	.00067	.0054	.00026	.00021	.00075	.00009
%RSD	.43192	.23560	.15058	.13659	.42402	.26717	.28441
#1	1.2575	.28386	3.5591	.18720	.04861	.27845	.03133
#2	1.2652	.28291	3.5667	.18683	.04890	.27951	.03145

Sample Name: IC4 Acquired: 11/15/2013 9:37:16 Type: Cal
Method: ICAP1(v4) Mode: IR Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3131.7	4991.1	72197.	7098.6
Stddev	.0	10.2	121.	10.1
%RSD	.00021	.20480	.16782	.14163
#1	3131.7	4998.3	72283.	7091.5
#2	3131.7	4983.9	72111.	7105.7

Sample Name: ICV-1734477 Acquired: 11/15/2013 9:39:37 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37231	18.897	.38307	.37595	.38568	.37730	18.674
Stddev	.00161	.000	.00057	.00183	.00168	.00119	.024
%RSD	.43310	.00097	.14920	.48612	.43432	.31553	.12642
#1	.37117	18.897	.38347	.37724	.38449	.37646	18.690
#2	.37345	18.897	.38266	.37466	.38686	.37815	18.657
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37550	.37055	.37613	.37311	18.392	18.262	18.396
Stddev	.00081	.00010	.00262	.00094	.051	.059	.056
%RSD	.21679	.02818	.69658	.25096	.27516	.32517	.30640
#1	.37607	.37048	.37427	.37244	18.356	18.220	18.436
#2	.37492	.37063	.37798	.37377	18.428	18.304	18.356
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.36420	18.236	.38095	.37237	.38058	18.265	.37474
Stddev	.00204	.030	.00013	.00250	.00250	.082	.00144
%RSD	.55976	.16652	.03478	.67126	.65699	.44700	.38519
#1	.36276	18.214	.38086	.37060	.38235	18.207	.37577
#2	.36565	18.257	.38105	.37413	.37881	18.323	.37372
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ICV-1734477 Acquired: 11/15/2013 9:39:37 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37251	18.59	.38692	.37508	18.853	.37864	.37281
Stddev	.00085	.01	.00039	.00313	.022	.00126	.00128
%RSD	.22904	.0455	.10057	.83450	.11832	.33336	.34466
#1	.37311	18.59	.38720	.37729	18.837	.37775	.37190
#2	.37191	18.60	.38665	.37287	18.869	.37954	.37372
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.38188	.37584	.37442	.37388
Stddev	.00138	.00008	.00142	.00117
%RSD	.36143	.02198	.37848	.31324
#1	.38090	.37590	.37342	.37305
#2	.38285	.37578	.37543	.37470
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3309.9	5092.3	75118.	7194.1
Stddev	2.4	9.9	114.	16.4
%RSD	.07194	.19472	.15179	.22782
#1	3308.2	5085.3	75199.	7182.5
#2	3311.5	5099.3	75038.	7205.7

Sample Name: ICB-1734412 Acquired: 11/15/2013 9:41:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**.01936**	**.00274**	**.00032**	**-.00002**	**.00005**	**-.01854**
Stddev	.00003	.01854	.00173	.00024	.00000	.00001	.00417
%RSD	4.7710	95.770	63.052	76.676	5.6238	21.997	22.518
#1	-.00057	.03247	.00396	.00049	-.00002	.00005	-.02149
#2	-.00053	.00625	.00152	.00014	-.00002	.00004	-.01559
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.00005**	**-.00014**	**.00009**	**-.00678**	**.04846**	**.00251**
Stddev	.00003	.00016	.00010	.00008	.00469	.03913	.00089
%RSD	124.63	296.47	71.137	90.088	69.198	80.744	35.398
#1	.00005	-.00006	-.00021	.00003	-.01010	.07613	.00314
#2	.00000	.00017	-.00007	.00015	-.00346	.02079	.00189
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**-.00057**	**-.00001**	**.00035**	**.00009**	**-.00125**	**-.00002**
Stddev	.00063	.00120	.00004	.00024	.00009	.00127	.00021
%RSD	378.15	209.97	271.51	69.701	101.11	101.78	925.97
#1	.00028	-.00142	-.00004	.00018	.00003	-.00035	-.00017
#2	-.00061	.00028	.00001	.00052	.00015	-.00215	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: ICB-1734412 Acquired: 11/15/2013 9:41:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**.0017**	**-.00103**	**.00079**	**.01957**	**.00027**	**-.00004**
Stddev	.00017	.0013	.00021	.00158	.00098	.00000	.00010
%RSD	50.167	77.62	20.663	201.30	5.0057	1.2046	227.56
#1	.00045	.0026	-.00118	.00190	.01888	.00027	.00003
#2	.00022	.0008	-.00088	-.00033	.02027	.00027	-.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00030**	**.00107**	**-.00006**	**-.00012**
Stddev	.00027	.00205	.00024	.00031
%RSD	90.251	191.11	400.33	260.90
#1	.00011	.00252	.00011	-.00033
#2	.00049	-.00038	-.00023	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3460.0**	**5164.1**	**77785.**	**7222.9**
Stddev	3.4	7.0	54.	46.2
%RSD	.09875	.13460	.06927	.63909
#1	3462.4	5169.1	77823.	7190.2
#2	3457.6	5159.2	77747.	7255.5

Sample Name: CRI-1739110 Acquired: 11/15/2013 9:44:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00570**	**.44129**	**.02187**	**.03896**	**.00426**	**.00425**	**.98336**
Stddev	.00009	.00218	.00009	.00036	.00002	.00010	.00523
%RSD	1.6432	.49290	.41370	.93563	.51445	2.2432	.53224
#1	.00563	.43975	.02194	.03922	.00428	.00419	.97966
#2	.00576	.44282	.02181	.03871	.00425	.00432	.98706
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00212**	**.00801**	**.00758**	**.02011**	**.09614**	**.94029**	**.83560**
Stddev	.00005	.00000	.00060	.00017	.00025	.03745	.00481
%RSD	2.5353	.03581	7.9627	.84001	.25640	3.9830	.57567
#1	.00209	.00800	.00715	.02023	.09631	.91381	.83220
#2	.00216	.00801	.00800	.02000	.09596	.96677	.83900
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05469**	**.40222**	**.00645**	**.00599**	**.02049**	**1.8778**	**.01950**
Stddev	.00082	.00415	.00014	.00062	.00008	.0072	.00049
%RSD	1.5023	1.0314	2.1210	10.402	.37807	.38189	2.5206
#1	.05411	.40516	.00655	.00643	.02055	1.8728	.01984
#2	.05527	.39929	.00636	.00554	.02044	1.8829	.01915
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CRI-1739110 Acquired: 11/15/2013 9:44:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.01035	.4031	.04222	.03093	.99943	.01950	.00977
Stddev	.00168	.0001	.00149	.00429	.01913	.00031	.00012
%RSD	16.207	.0278	3.5387	13.866	1.9141	1.6019	1.1935
#1	.01153	.4030	.04116	.03396	.98591	.01928	.00968
#2	.00916	.4032	.04327	.02790	1.0130	.01972	.00985
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.01009	.04043	.01017	.02095
Stddev	.00044	.00232	.00002	.00163
%RSD	4.3883	5.7326	.16267	7.7984
#1	.00978	.04207	.01018	.02211
#2	.01041	.03879	.01016	.01980
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3458.2	5138.0	77463.	7151.4
Stddev	8.1	17.7	543.	19.4
%RSD	.23454	.34531	.70079	.27101
#1	3452.5	5125.5	77079.	7137.7
#2	3464.0	5150.6	77847.	7165.1

Sample Name: ICVL-1723353 Acquired: 11/15/2013 9:46:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00246**	**.22892**	**.01094**	**.01966**	**.00215**	**.00220**	**.49757**
Stddev	.00011	.00126	.00005	.00076	.00001	.00018	.00432
%RSD	4.5687	.55170	.42907	3.8658	.51319	8.3339	.86794
#1	.00238	.22981	.01098	.01913	.00215	.00233	.50062
#2	.00253	.22803	.01091	.02020	.00216	.00207	.49451
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00102**	**.00416**	**.00357**	**.01073**	**.04781**	**.52064**	**.42619**
Stddev	.00003	.00003	.00016	.00019	.00132	.02745	.00285
%RSD	3.0780	.79163	4.4548	1.7815	2.7578	5.2727	.66909
#1	.00104	.00419	.00346	.01059	.04688	.50123	.42820
#2	.00100	.00414	.00368	.01086	.04874	.54005	.42417
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02797**	**.21267**	**.00339**	**.00335**	**.00972**	**.93975**	**.01053**
Stddev	.00109	.00168	.00000	.00007	.00021	.00994	.00011
%RSD	3.8964	.78848	.13919	1.9953	2.1337	1.0572	1.0082
#1	.02720	.21149	.00340	.00340	.00986	.94678	.01061
#2	.02874	.21386	.00339	.00330	.00957	.93273	.01046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: ICVL-1723353 Acquired: 11/15/2013 9:46:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00451	.2068	.02031	.01517	.49504	.00952	.00497
Stddev	.00013	.0015	.00045	.00041	.00874	.00004	.00007
%RSD	2.9852	.7062	2.2285	2.6758	1.7651	.39839	1.5076
#1	.00460	.2058	.01999	.01488	.50122	.00954	.00492
#2	.00441	.2078	.02063	.01546	.48886	.00949	.00502
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00494	.02221	.00493	.01030
Stddev	.00023	.00036	.00000	.00063
%RSD	4.6592	1.6123	.09087	6.1038
#1	.00478	.02196	.00494	.01074
#2	.00511	.02247	.00493	.00985
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3473.9	5209.7	77654.	7245.2
Stddev	11.1	22.4	404.	7.2
%RSD	.32069	.43000	.51972	.09993
#1	3481.8	5225.6	77940.	7240.1
#2	3466.1	5193.9	77369.	7250.3

Sample Name: ICSA-1716849 Acquired: 11/15/2013 9:49:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00025	552.46	-.00452	-.00056	.00188	.00016	501.58
Stddev	.00058	.53	.00072	.00013	.00000	.00001	.47
%RSD	227.72	.09585	15.914	22.666	.18068	3.8061	.09375
#1	-.00066	552.84	-.00503	-.00047	.00188	.00016	501.91
#2	.00016	552.09	-.00402	-.00065	.00188	.00015	501.25
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00057	-.00114	-.00002	.00219	201.57	.02319	.00503
Stddev	.00024	.00014	.00048	.00007	.71	.00136	.00046
%RSD	41.931	12.679	3085.5	3.2096	.35377	5.8433	9.1117
#1	.00040	-.00124	-.00036	.00214	201.07	.02415	.00535
#2	.00074	-.00104	.00033	.00224	202.08	.02224	.00470
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00276	517.91	.00142	.00113	-.00183	.07848	.00017
Stddev	.00061	1.21	.00007	.00072	.00044	.00078	.00135
%RSD	22.154	.23326	5.1497	64.007	24.278	.99186	803.91
#1	.00233	517.05	.00137	.00164	-.00214	.07903	.00112
#2	.00319	518.76	.00147	.00062	-.00151	.07793	-.00079
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: ICSA-1716849 Acquired: 11/15/2013 9:49:13 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00460	-.1149	-.01373	-.00338	.00540	.00099	.00493
Stddev	.00152	.0041	.00174	.00180	.00395	.00054	.00001
%RSD	33.017	3.528	12.663	53.131	73.264	54.842	.12209
#1	.00568	-.1178	-.01250	-.00465	.00260	.00061	.00493
#2	.00353	-.1120	-.01496	-.00211	.00819	.00137	.00494
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00311	.00292	-.00080	.00382
Stddev	.00001	.00103	.00043	.00098
%RSD	.42371	35.205	54.572	25.745
#1	.00310	.00219	-.00110	.00451
#2	.00312	.00365	-.00049	.00312
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2667.2	4542.6	65950.	6697.8
Stddev	2.7	1.8	214.	15.9
%RSD	.10225	.04026	.32474	.23765
#1	2665.3	4541.3	66101.	6709.1
#2	2669.1	4543.9	65798.	6686.5

Sample Name: ICSAB-1723354 Acquired: 11/15/2013 9:51:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22381	532.37	.10006	.00431	.53088	.52449	496.34
Stddev	.00053	2.13	.00320	.00001	.00200	.00114	1.72
%RSD	.23529	.40034	3.1978	.32793	.37663	.21643	.34719
#1	.22343	530.86	.09780	.00432	.52946	.52529	497.56
#2	.22418	533.88	.10232	.00430	.53229	.52369	495.12
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0551	.51117	.48421	.54908	97.069	.02810	.01862
Stddev	.0004	.00012	.00150	.00062	.486	.04013	.00026
%RSD	.03750	.02255	.30899	.11250	.50051	142.83	1.4202
#1	1.0554	.51109	.48527	.54952	96.725	.05647	.01881
#2	1.0548	.51125	.48315	.54865	97.412	-.00028	.01843
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.57121	521.00	.47592	.52362	-.00047	.06408	.98760
Stddev	.00277	.46	.00077	.00195	.00030	.00228	.00125
%RSD	.48477	.08809	.16221	.37208	64.629	3.5612	.12674
#1	.56925	521.32	.47646	.52224	-.00025	.06247	.98848
#2	.57317	520.67	.47537	.52500	-.00068	.06570	.98671
Check ?	None	Chk Pass	Chk Pass	Chk Pass	None	None	Chk Pass
Value							
Range							

Sample Name: ICSAB-1723354 Acquired: 11/15/2013 9:51:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05705	F .3742	.61608	.04392	1.0872	.00069	.52371
Stddev	.00129	.0127	.00087	.00709	.0314	.00038	.00214
%RSD	2.2605	3.384	.14045	16.135	2.8924	54.591	.40868
#1	.05796	.3652	.61547	.04893	1.0650	.00043	.52220
#2	.05613	.3831	.61669	.03891	1.1094	.00096	.52522
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value		.2000					
Range		20.00%					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00288	.10355	.49362	.96199
Stddev	.00008	.00232	.00027	.00104
%RSD	2.8444	2.2377	.05508	.10839
#1	.00294	.10191	.49342	.96126
#2	.00283	.10519	.49381	.96273
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2676.7	4583.4	65709.	6662.1
Stddev	5.9	10.3	67.	6.3
%RSD	.22078	.22505	.10125	.09492
#1	2680.9	4590.7	65662.	6657.7
#2	2672.6	4576.1	65756.	6666.6

Sample Name: CCV-1723352 Acquired: 11/15/2013 9:54:19 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50940**	**25.839**	**.51418**	**.50144**	**.51648**	**.51098**	**25.292**
Stddev	.00138	.024	.00382	.00190	.00045	.00061	.084
%RSD	.27154	.09386	.74253	.37913	.08708	.11951	.33154
#1	.50842	25.822	.51688	.50009	.51616	.51055	25.233
#2	.51037	25.856	.51148	.50278	.51680	.51142	25.352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50883**	**.50253**	**.51389**	**.51149**	**24.959**	**25.534**	**25.999**
Stddev	.00021	.00140	.00566	.00312	.046	.037	.176
%RSD	.04194	.27912	1.1023	.60954	.18583	.14460	.67707
#1	.50898	.50352	.50988	.50928	24.927	25.560	25.875
#2	.50868	.50154	.51789	.51369	24.992	25.508	26.123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51013**	**24.650**	**.51432**	**.50675**	**.51593**	**25.446**	**.50705**
Stddev	.00005	.043	.00177	.00190	.00101	.061	.00004
%RSD	.01008	.17456	.34351	.37545	.19645	.23852	.00826
#1	.51017	24.619	.51307	.50540	.51521	25.403	.50702
#2	.51009	24.680	.51556	.50809	.51665	25.488	.50708
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV-1723352 Acquired: 11/15/2013 9:54:19 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50764	25.40	.52797	.51293	25.154	.51459	.51193
Stddev	.00405	.01	.00029	.00225	.169	.00265	.00044
%RSD	.79696	.0338	.05495	.43826	.67369	.51534	.08669
#1	.51051	25.40	.52817	.51134	25.034	.51646	.51162
#2	.50478	25.39	.52776	.51452	25.274	.51271	.51225
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51819	.51214	.51023	.50282
Stddev	.00086	.00248	.00518	.00811
%RSD	.16666	.48492	1.0151	1.6127
#1	.51758	.51038	.50657	.49709
#2	.51880	.51389	.51389	.50856
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3248.0	5022.2	73912.	7074.7
Stddev	.5	14.1	449.	10.4
%RSD	.01606	.28041	.60690	.14684
#1	3248.4	5032.2	74229.	7082.0
#2	3247.7	5012.2	73595.	7067.3

Sample Name: CCB-1734412 Acquired: 11/15/2013 9:56:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00047**	**.02755**	**-.00146**	**-.00087**	**-.00001**	**.00009**	**-.01844**
Stddev	.00000	.00740	.00177	.00007	.00001	.00002	.00234
%RSD	.12632	26.878	120.83	8.4205	151.04	28.052	12.682
#1	-.00047	.03279	-.00271	-.00092	.00000	.00007	-.01679
#2	-.00047	.02231	-.00021	-.00081	-.00002	.00011	-.02010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**.00007**	**-.00024**	**.00033**	**-.00416**	**.05751**	**.00067**
Stddev	.00002	.00007	.00004	.00003	.00134	.00448	.00047
%RSD	19.578	91.982	16.880	9.6426	32.284	7.7945	70.691
#1	.00009	.00003	-.00027	.00035	-.00511	.05434	.00033
#2	.00007	.00012	-.00021	.00030	-.00321	.06068	.00100
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**-.00250**	**-.00006**	**-.00010**	**-.00006**	**-.00091**	**.00020**
Stddev	.00023	.00153	.00008	.00020	.00007	.00069	.00002
%RSD	1193.7	61.020	139.40	204.81	111.74	75.131	11.319
#1	.00019	-.00358	-.00011	.00004	-.00001	-.00140	.00019
#2	-.00015	-.00142	-.00000	-.00023	-.00011	-.00043	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB-1734412 Acquired: 11/15/2013 9:56:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00071	F .0039	.00001	-.00199	-.00092	-.00002	.00009
Stddev	.00085	.0000	.00080	.00296	.00748	.00028	.00008
%RSD	120.49	.4460	10378.	149.10	813.14	1128.0	89.560
#1	-.00131	.0039	-.00056	.00011	-.00621	.00017	.00003
#2	-.00010	.0039	.00058	-.00408	.00437	-.00022	.00015
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00042	.00231	.00009	-.00013
Stddev	.00024	.00094	.00007	.00002
%RSD	56.831	40.667	78.031	17.080
#1	.00058	.00165	.00004	-.00012
#2	.00025	.00297	.00015	-.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3475.8	5168.6	77560.	7116.6
Stddev	2.9	2.4	15.	12.3
%RSD	.08449	.04592	.01988	.17215
#1	3477.9	5170.2	77549.	7125.2
#2	3473.7	5166.9	77570.	7107.9

Sample Name: CCVL Acquired: 11/15/2013 9:59:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00218**	**.20975**	**.01149**	**.01952**	**.00222**	**.00212**	**.49188**
Stddev	.00012	.00998	.00284	.00013	.00001	.00001	.00401
%RSD	5.5251	4.7580	24.718	.64656	.36238	.35183	.81426
#1	.00227	.20269	.01350	.01943	.00222	.00211	.49471
#2	.00210	.21680	.00948	.01961	.00223	.00212	.48905
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**.00414**	**.00374**	**.01048**	**.04228**	**.48916**	**.42545**
Stddev	.00005	.00005	.00016	.00006	.00416	.02382	.00087
%RSD	4.9381	1.1049	4.3350	.53905	9.8461	4.8701	.20541
#1	.00089	.00418	.00386	.01052	.03934	.50600	.42483
#2	.00096	.00411	.00363	.01044	.04522	.47231	.42607
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02797**	**.20936**	**.00330**	**.00304**	**.00997**	**.93337**	**.00990**
Stddev	.00086	.00079	.00004	.00066	.00001	.00912	.00016
%RSD	3.0587	.37667	1.2736	21.774	.12365	.97672	1.6129
#1	.02736	.20881	.00333	.00257	.00996	.92693	.01001
#2	.02857	.20992	.00327	.00351	.00998	.93982	.00978
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 9:59:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00356	.2120	.01992	.01654	.48119	.00946	.00483
Stddev	.00147	.0028	.00060	.00102	.01290	.00012	.00005
%RSD	41.201	1.316	3.0230	6.1961	2.6802	1.2569	1.0427
#1	.00253	.2140	.01950	.01726	.49031	.00954	.00486
#2	.00460	.2101	.02035	.01581	.47207	.00937	.00479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00497	.02283	.00532	.01048
Stddev	.00033	.00001	.00019	.00030
%RSD	6.6554	.03806	3.6231	2.8267
#1	.00473	.02284	.00546	.01027
#2	.00520	.02283	.00518	.01069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3452.0	5169.3	76666.	7163.6
Stddev	13.9	17.8	79.	29.9
%RSD	.40201	.34425	.10365	.41766
#1	3461.8	5181.9	76609.	7184.8
#2	3442.2	5156.7	76722.	7142.5

Sample Name: 480-48428-a-8-b@5 Acquired: 11/15/2013 10:01:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02219**	**1.9014**	F **-.03054**	**.08675**	**.03088**
Stddev	.00009	.0015	.00470	.00027	.00015
%RSD	.39723	.07881	15.374	.31654	.47910
#1	.02225	1.9003	-.02722	.08656	.03098
#2	.02212	1.9024	-.03386	.08695	.03077
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01923**	**13.866**	**.00961**	**.55676**	**1.1049**
Stddev	.00003	.103	.00016	.00048	.0015
%RSD	.16020	.73974	1.6545	.08534	.13256
#1	.01925	13.939	.00949	.55710	1.1059
#2	.01921	13.794	.00972	.55643	1.1039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.8295**	**11.766**	**.07024**	**.06930**	**.00332**
Stddev	.0159	.050	.00147	.00157	.00067
%RSD	.86662	.42348	2.0908	2.2683	20.238
#1	1.8407	11.801	.06920	.07041	.00380
#2	1.8183	11.730	.07128	.06819	.00285
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@5 Acquired: 11/15/2013 10:01:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.0174**	**.08488**	**.07896**	**.06754**	**.22575**
Stddev	.0126	.00018	.00020	.00035	.01127
%RSD	.41585	.21061	.24744	.51413	4.9910
#1	3.0263	.08501	.07883	.06779	.23372
#2	3.0085	.08476	.07910	.06729	.21778
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.59744**	**.00786**	**1.923**	**-.01497**	**.01898**
Stddev	.00119	.00287	.007	.00092	.00207
%RSD	.19837	36.448	.3803	6.1190	10.886
#1	.59828	.00989	1.928	-.01562	.01752
#2	.59660	.00584	1.918	-.01432	.02044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31303**	**.00746**	**.02550**	**.19858**	**.00156**
Stddev	.01925	.00003	.00040	.00094	.00071
%RSD	6.1509	.42284	1.5804	.47164	45.266
#1	.32665	.00743	.02578	.19792	.00106
#2	.29942	.00748	.02521	.19924	.00206
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@5 Acquired: 11/15/2013 10:01:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.02415	.56010
Stddev	.00018	.00492
%RSD	.73629	.87811
#1	.02403	.55662
#2	.02428	.56358
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3377.2	5036.0	75445.	6968.0
Stddev	1.5	2.5	184.	65.6
%RSD	.04427	.05018	.24350	.94184
#1	3376.1	5034.2	75315.	6921.6
#2	3378.2	5037.7	75575.	7014.4

Sample Name: CCV Acquired: 11/15/2013 10:03:52 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49457**	**25.241**	**.51084**	**.49297**	**.50353**	**.49849**	**24.831**
Stddev	.00452	.185	.00224	.00009	.00251	.00038	.195
%RSD	.91470	.73234	.43922	.01742	.49783	.07668	.78651
#1	.49137	25.372	.51242	.49290	.50530	.49876	24.969
#2	.49777	25.111	.50925	.49303	.50176	.49822	24.693
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49900**	**.49249**	**.49955**	**.49862**	**24.353**	**24.769**	**25.485**
Stddev	.00005	.00005	.00265	.00413	.048	.283	.195
%RSD	.01030	.00931	.52985	.82776	.19619	1.1437	.76450
#1	.49896	.49252	.49768	.49570	24.387	24.969	25.622
#2	.49904	.49246	.50142	.50153	24.320	24.569	25.347
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49423**	**24.158**	**.50178**	**.49213**	**.50406**	**24.851**	**.49605**
Stddev	.00520	.047	.00141	.00531	.00054	.224	.00114
%RSD	1.0516	.19525	.28015	1.0783	.10722	.90263	.22988
#1	.49791	24.125	.50078	.48838	.50368	25.010	.49525
#2	.49056	24.191	.50277	.49588	.50444	24.693	.49686
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 10:03:52 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49241	24.97	.51265	.49661	24.665	.50354	.49899
Stddev	.00012	.06	.00660	.00769	.126	.00098	.00341
%RSD	.02365	.2269	1.2882	1.5475	.50989	.19466	.68322
#1	.49250	25.01	.51732	.50204	24.753	.50423	.50140
#2	.49233	24.93	.50798	.49118	24.576	.50284	.49658
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50700	.50270	.49729	.49220
Stddev	.00021	.00435	.00513	.00462
%RSD	.04108	.86503	1.0318	.93800
#1	.50685	.49963	.49366	.48894
#2	.50714	.50578	.50091	.49547
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3231.1	5000.6	73865.	7022.2
Stddev	3.4	1.5	402.	27.2
%RSD	.10510	.02958	.54470	.38702
#1	3233.5	5001.7	74150.	7003.0
#2	3228.7	4999.6	73581.	7041.4

Sample Name: CCB Acquired: 11/15/2013 10:06:14 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**.12642**	**.00108**	**.00000**	**.00001**	**.00006**	**-.01831**
Stddev	.00008	.00734	.00056	.00015	.00002	.00003	.00090
%RSD	30.870	5.8028	52.009	3376.3	197.84	50.375	4.9207
#1	-.00030	.12124	.00068	.00011	.00002	.00004	-.01895
#2	-.00019	.13161	.00147	-.00010	-.00000	.00008	-.01768
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.00009**	**-.00032**	**.00039**	**-.00157**	**.00512**	**.00101**
Stddev	.00004	.00003	.00019	.00015	.00219	.02066	.00007
%RSD	66.715	29.790	59.634	38.742	139.74	403.44	7.3773
#1	.00003	.00011	-.00045	.00049	-.00311	-.00949	.00095
#2	.00009	.00007	-.00018	.00028	-.00002	.01973	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00106**	**-.00132**	**.00003**	**-.00001**	**.00006**	**.00139**	**.00003**
Stddev	.00102	.00139	.00003	.00072	.00001	.00249	.00004
%RSD	96.172	105.22	97.819	6529.6	23.447	178.86	147.19
#1	-.00178	-.00034	.00006	.00050	.00005	.00315	.00006
#2	-.00034	-.00230	.00001	-.00052	.00006	-.00037	-.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 10:06:14 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00112	F .0035	-.00073	.00388	-.00737	-.00034	-.00006
Stddev	.00228	.0014	.00056	.00024	.00791	.00041	.00005
%RSD	202.77	40.16	76.124	6.2995	107.40	118.38	96.162
#1	-.00049	.0045	-.00112	.00371	-.01296	-.00063	-.00009
#2	.00274	.0025	-.00034	.00405	-.00177	-.00006	-.00002
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00037	.00196	-.00012	.00019
Stddev	.00026	.00027	.00023	.00010
%RSD	69.267	13.743	191.10	55.742
#1	.00055	.00177	-.00029	.00011
#2	.00019	.00215	.00004	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3444.0	5132.3	77211.	7105.0
Stddev	.3	2.9	56.	24.4
%RSD	.00911	.05656	.07279	.34319
#1	3444.2	5130.3	77171.	7122.3
#2	3443.8	5134.4	77251.	7087.8

Sample Name: CCVL Acquired: 11/15/2013 10:08:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00295**	**.21433**	**.01056**	**.01957**	**.00222**	**.00212**	**.48986**
Stddev	.00047	.00237	.00238	.00014	.00002	.00007	.00142
%RSD	15.917	1.1041	22.495	.73071	.75351	3.0869	.28933
#1	.00328	.21266	.01225	.01967	.00223	.00217	.48885
#2	.00262	.21601	.00888	.01947	.00221	.00207	.49086
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00096**	**.00422**	**.00400**	**.01036**	**.04788**	**.49517**	**.42114**
Stddev	.00001	.00003	.00015	.00003	.00188	.02120	.00023
%RSD	.55913	.78517	3.8207	.28611	3.9289	4.2811	.05392
#1	.00097	.00424	.00410	.01034	.04655	.51016	.42098
#2	.00096	.00419	.00389	.01039	.04921	.48018	.42130
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02752**	**.21291**	**.00332**	**.00309**	**.00978**	**.95016**	**.01005**
Stddev	.00020	.00179	.00003	.00046	.00026	.00001	.00024
%RSD	.72688	.83944	.99303	14.817	2.6688	.00085	2.3409
#1	.02766	.21417	.00334	.00341	.00959	.95016	.00988
#2	.02738	.21165	.00329	.00276	.00996	.95017	.01022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 10:08:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00501	.2120	.02004	.01465	.48595	.01007	.00497
Stddev	.00041	.0010	.00236	.00239	.00570	.00030	.00005
%RSD	8.1748	.4493	11.771	16.339	1.1735	3.0145	.92104
#1	.00530	.2113	.02171	.01296	.48998	.00985	.00500
#2	.00472	.2127	.01837	.01634	.48191	.01028	.00494
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00515	.02371	.00503	.01078
Stddev	.00017	.00011	.00008	.00064
%RSD	3.2887	.44477	1.4916	5.9437
#1	.00503	.02363	.00509	.01033
#2	.00527	.02378	.00498	.01123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3455.2	5181.3	76615.	7173.3
Stddev	10.0	24.8	65.	2.3
%RSD	.28799	.47821	.08483	.03198
#1	3462.3	5198.8	76569.	7171.7
#2	3448.2	5163.8	76661.	7174.9

Sample Name: 480-48428-a-8-b@10 Acquired: 11/15/2013 10:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01101**	**.94106**	F **-.01395**	**.04250**	**.01580**
Stddev	.00025	.01328	.00163	.00031	.00006
%RSD	2.2574	1.4110	11.685	.72563	.35857
#1	.01119	.93167	-.01510	.04229	.01584
#2	.01084	.95045	-.01279	.04272	.01576
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00964**	**6.9057**	**.00479**	**.27832**	**.56083**
Stddev	.00008	.0437	.00004	.00035	.00524
%RSD	.83775	.63333	.88760	.12477	.93432
#1	.00969	6.8748	.00482	.27807	.56453
#2	.00958	6.9366	.00476	.27856	.55712
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.92052**	**5.8729**	**.07566**	**.03222**	**.00164**
Stddev	.00575	.0030	.00351	.00038	.00057
%RSD	.62442	.05171	4.6429	1.1640	35.102
#1	.92459	5.8707	.07814	.03196	.00204
#2	.91646	5.8750	.07318	.03249	.00123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@10 Acquired: 11/15/2013 10:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.5155**	**.04309**	**.04017**	**.03374**	**.11353**
Stddev	.0074	.00025	.00028	.00030	.00314
%RSD	.48619	.57778	.69579	.89906	2.7623
#1	1.5207	.04326	.04037	.03395	.11131
#2	1.5102	.04291	.03998	.03353	.11574
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.30074**	**.00314**	**.9562**	**-.00685**	**.01008**
Stddev	.00119	.00051	.0097	.00067	.00229
%RSD	.39446	16.160	1.018	9.7867	22.722
#1	.29991	.00278	.9493	-.00733	.01171
#2	.30158	.00350	.9631	-.00638	.00846
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13965**	**.00364**	**.01252**	**.10020**	**-.00003**
Stddev	.00457	.00025	.00000	.00035	.00011
%RSD	3.2728	6.9723	.00880	.34873	314.16
#1	.14288	.00382	.01252	.10045	.00004
#2	.13642	.00346	.01252	.09996	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@10 Acquired: 11/15/2013 10:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01209	.28390
Stddev	.00026	.00289
%RSD	2.1223	1.0168
#1	.01191	.28594
#2	.01227	.28186
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3399.6	5062.2	75320.	7037.1
Stddev	2.4	1.1	574.	27.3
%RSD	.07063	.02184	.76184	.38774
#1	3401.3	5063.0	74914.	7056.4
#2	3397.9	5061.5	75726.	7017.8

Sample Name: 480-48428-a-8-b@20 Acquired: 11/15/2013 10:13:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00590**	**.48200**	**-.00593**	**.02145**	**.00789**
Stddev	.00001	.00490	.00186	.00002	.00002
%RSD	.17546	1.0174	31.286	.07521	.25267
#1	.00590	.47854	-.00462	.02146	.00787
#2	.00591	.48547	-.00724	.02144	.00790
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00487**	**3.4590**	**.00257**	**.13961**	**.27780**
Stddev	.00010	.0119	.00001	.00012	.00175
%RSD	1.9759	.34379	.54083	.08626	.62920
#1	.00494	3.4506	.00258	.13970	.27657
#2	.00480	3.4675	.00256	.13953	.27904
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.45367**	**2.9708**	**.04195**	**.01567**	**.00043**
Stddev	.00179	.0121	.00738	.00004	.00064
%RSD	.39437	.40885	17.587	.25419	148.92
#1	.45241	2.9623	.03673	.01564	.00088
#2	.45494	2.9794	.04716	.01570	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@20 Acquired: 11/15/2013 10:13:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.76067**	**.02159**	**.02030**	**.01682**	**.05900**
Stddev	.00319	.00015	.00025	.00011	.00138
%RSD	.41891	.67688	1.2143	.65112	2.3403
#1	.76293	.02170	.02013	.01690	.05997
#2	.75842	.02149	.02048	.01675	.05802
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.15094**	**.00225**	**.4818**	**-.00396**	**.00556**
Stddev	.00110	.00029	.0058	.00143	.00351
%RSD	.73040	12.759	1.193	36.061	63.105
#1	.15016	.00246	.4859	-.00295	.00805
#2	.15171	.00205	.4778	-.00496	.00308
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05307**	**.00148**	**.00614**	**.04981**	**.00231**
Stddev	.01991	.00035	.00005	.00014	.00069
%RSD	37.509	23.685	.77413	.28485	29.832
#1	.03900	.00173	.00610	.04991	.00182
#2	.06715	.00123	.00617	.04971	.00280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48428-a-8-b@20 Acquired: 11/15/2013 10:13:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00638	.14185
Stddev	.00000	.00147
%RSD	.01166	1.0331
#1	.00638	.14081
#2	.00638	.14288
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3406.8	5082.7	76344.	7080.1
Stddev	.8	7.7	68.	6.7
%RSD	.02415	.15203	.08962	.09409
#1	3406.2	5077.2	76392.	7075.4
#2	3407.4	5088.1	76295.	7084.8

Sample Name: 480-49393-b-4-c Acquired: 11/15/2013 10:15:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**2.0672**	**.01399**	**.38218**	**.25935**
Stddev	.00022	.0276	.00161	.00117	.00192
%RSD	52.091	1.3353	11.518	.30702	.73928
#1	-.00026	2.0867	.01285	.38135	.25799
#2	-.00057	2.0477	.01513	.38301	.26070
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00181**	**248.83**	**.00145**	**.00701**	**.00632**
Stddev	.00010	.72	.00009	.00009	.00031
%RSD	5.5460	.29129	6.2133	1.2551	4.8891
#1	.00188	249.34	.00151	.00695	.00653
#2	.00174	248.32	.00138	.00707	.00610
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01040**	**1.4124**	**16.142**	**30.857**	**.03537**
Stddev	.00038	.0010	.000	.110	.00042
%RSD	3.6884	.06787	.00086	.35683	1.1888
#1	.01013	1.4117	16.142	30.779	.03567
#2	.01068	1.4130	16.142	30.935	.03507
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-b-4-c Acquired: 11/15/2013 10:15:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**74.047**	**1.6913**	**2.0336**	**.00765**	**2100.1**
Stddev	.346	.0123	.0094	.00029	1.1
%RSD	.46764	.72732	.46132	3.8077	.05176
#1	73.802	1.6826	2.0269	.00785	2099.3
#2	74.292	1.7000	2.0402	.00744	2100.8
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01210**	**.04014**	**9.646**	**-.00153**	**.00897**
Stddev	.00034	.00347	.003	.00146	.00085
%RSD	2.7880	8.6519	.0302	95.675	9.5059
#1	.01234	.03769	9.644	-.00256	.00957
#2	.01186	.04260	9.648	-.00049	.00836
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**41.675**	**.00181**	**.77088**	**.03881**	**-.00514**
Stddev	.402	.00014	.00257	.00144	.00265
%RSD	.96519	7.5329	.33360	3.6979	51.665
#1	41.959	.00171	.77270	.03780	-.00326
#2	41.390	.00190	.76906	.03983	-.00701
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49393-b-4-c Acquired: 11/15/2013 10:15:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01595	.08064
Stddev	.00015	.00100
%RSD	.96334	1.2361
#1	.01606	.07993
#2	.01584	.08134
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2491.5	4299.9	60042.	7044.7
Stddev	5.4	9.8	339.	7.0
%RSD	.21735	.22900	.56454	.09946
#1	2495.3	4306.9	60282.	7049.7
#2	2487.7	4292.9	59803.	7039.8

Sample Name: lb 480-151502/1-b Acquired: 11/15/2013 10:18:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.01676**	**.00260**	F **.02243**	F **.01323**
Stddev	.00046	.02971	.00323	.00014	.00006
%RSD	600.69	177.25	123.95	.64477	.47085
#1	.00025	-.00425	.00032	.02233	.01328
#2	-.00040	.03776	.00488	.02253	.01319
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail
High Limit				.02000	.00200
Low Limit				-.00800	-.00300

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	F **.51564**	**-.00010**	**.00021**	**-.00013**
Stddev	.00006	.00725	.00003	.00013	.00033
%RSD	55.362	1.4052	30.712	64.944	247.87
#1	.00015	.51052	-.00012	.00011	.00010
#2	.00007	.52077	-.00008	.00030	-.00036
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		.50000			
Low Limit		-.05000			

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00055**	**.00237**	**.06386**	**.04055**	**.00043**
Stddev	.00002	.00313	.05291	.00011	.00016
%RSD	3.7725	132.26	82.865	.27343	36.215
#1	.00053	.00015	.10127	.04047	.00032
#2	.00056	.00459	.02644	.04063	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lb 480-151502/1-b Acquired: 11/15/2013 10:18:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03127**	**.00041**	**-.00056**	**-.00026**	F **3.6732**
Stddev	.00132	.00001	.00036	.00015	.0050
%RSD	4.2217	2.4843	63.582	57.743	.13659
#1	.03220	.00041	-.00031	-.00036	3.6768
#2	.03033	.00042	-.00081	-.00015	3.6697
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit					1.0000
Low Limit					-.50000

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00049**	**.00045**	F **3.816**	**-.00156**	**.00046**
Stddev	.00048	.00033	.020	.00182	.00089
%RSD	98.837	72.659	.5105	116.50	192.55
#1	.00083	.00022	3.802	-.00027	.00109
#2	.00015	.00069	3.830	-.00284	-.00017
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			.2000		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04257**	**.00003**	**.00097**	**.00050**	**.00238**
Stddev	.00678	.00013	.00005	.00004	.00101
%RSD	15.935	430.50	4.8782	9.0265	42.237
#1	.03778	-.00006	.00100	.00046	.00167
#2	.04737	.00012	.00094	.00053	.00309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lb 480-151502/1-b Acquired: 11/15/2013 10:18:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00015**	**.00585**
Stddev	.00000	.00062
%RSD	2.7125	10.673
#1	-.00015	.00541
#2	-.00015	.00630
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3470.9**	**5168.3**	**76783.**	**7244.4**
Stddev	2.3	27.8	9.	58.9
%RSD	.06605	.53710	.01165	.81266
#1	3472.5	5187.9	76777.	7286.1
#2	3469.3	5148.6	76789.	7202.8

Sample Name: mb 480-151777/2-a Acquired: 11/15/2013 10:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**.00676**	**.00048**	**-.00074**	**.00012**
Stddev	.00041	.00101	.00017	.00028	.00001
%RSD	68.558	14.885	34.944	37.964	5.1169
#1	-.00031	.00747	.00036	-.00054	.00012
#2	-.00090	.00605	.00060	-.00094	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**-.01268**	**-.00020**	**.00033**	**-.00028**
Stddev	.00000	.00189	.00007	.00019	.00028
%RSD	1.0748	14.904	34.303	58.137	99.123
#1	.00013	-.01402	-.00025	.00047	-.00008
#2	.00013	-.01134	-.00016	.00020	-.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00026**	**-.00484**	**-.00650**	**.00075**	**-.00042**
Stddev	.00002	.00169	.01965	.00008	.00013
%RSD	6.1226	34.981	302.50	11.369	31.651
#1	.00027	-.00364	-.02039	.00081	-.00033
#2	.00025	-.00604	.00740	.00069	-.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-151777/2-a Acquired: 11/15/2013 10:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00360**	**.00009**	**-.00012**	**-.00009**	**.05130**
Stddev	.00313	.00002	.00017	.00003	.00631
%RSD	87.060	20.900	135.66	36.162	12.291
#1	-.00138	.00011	-.00001	-.00007	.05576
#2	-.00581	.00008	-.00024	-.00011	.04685
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**-.00115**	**.0093**	**-.00218**	**-.00212**
Stddev	.00005	.00039	.0006	.00098	.00602
%RSD	39.552	33.650	6.397	44.756	283.81
#1	-.00017	-.00088	.0089	-.00149	-.00638
#2	-.00010	-.00142	.0097	-.00287	.00214
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02951**	**.00003**	**-.00010**	**.00045**	**.00599**
Stddev	.00517	.00039	.00012	.00008	.00116
%RSD	17.524	1311.3	124.99	17.917	19.379
#1	-.03317	.00030	-.00018	.00039	.00681
#2	-.02586	-.00025	-.00001	.00051	.00517
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-151777/2-a Acquired: 11/15/2013 10:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00011	.00062
Stddev	.00010	.00052
%RSD	89.217	82.586
#1	.00019	.00099
#2	.00004	.00026
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3481.4	5203.0	76987.	7283.2
Stddev	10.7	15.8	428.	36.6
%RSD	.30833	.30393	.55627	.50257
#1	3489.0	5214.2	77290.	7309.1
#2	3473.8	5191.9	76684.	7257.3

Sample Name: lcs 480-151777/3-a Acquired: 11/15/2013 10:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **-.00028**	F **6.1584**	**.17163**	F **.14738**	F **.13920**
Stddev	.00018	.0219	.00026	.00020	.00037
%RSD	65.680	.35607	.14952	.13729	.26774
#1	-.00015	6.1429	.17181	.14723	.13894
#2	-.00041	6.1739	.17145	.14752	.13947
Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Fail	Chk Fail
High Limit	.05750	11.500		.23000	.23000
Low Limit	.04250	8.5000		.17000	.17000

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.16181**	**8.5227**	F **.16562**	F **.15945**	F **.16316**
Stddev	.00011	.0178	.00013	.00001	.00020
%RSD	.07025	.20890	.07889	.00685	.12044
#1	.16173	8.5353	.16571	.15944	.16303
#2	.16189	8.5101	.16553	.15945	.16330
Check ?	Chk Fail	Chk Pass	Chk Fail	Chk Fail	Chk Fail
High Limit	.23000		.23000	.23000	.23000
Low Limit	.17000		.17000	.17000	.17000

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.16121**	F **7.9323**	F **5.9723**	F **6.2800**	F **.11879**
Stddev	.00058	.0092	.0058	.0245	.00112
%RSD	.36084	.11618	.09715	.39063	.94647
#1	.16080	7.9258	5.9682	6.2627	.11799
#2	.16162	7.9388	5.9764	6.2974	.11958
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
High Limit	.23000	11.500	11.500	11.500	.23000
Low Limit	.17000	8.5000	8.5000	8.5000	.17000

Sample Name: lcs 480-151777/3-a Acquired: 11/15/2013 10:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.6792**	F **.16246**	F **.15785**	F **.16499**	**9.4641**
Stddev	.0055	.00021	.00210	.00010	.0373
%RSD	.06281	.12922	1.3327	.06025	.39405
#1	8.6831	.16261	.15934	.16492	9.4377
#2	8.6754	.16231	.15637	.16507	9.4905
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Fail	Chk Pass
High Limit		.23000	.23000	.23000	
Low Limit		.17000	.17000	.17000	

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.15976**	F **.16916**	F **3.875**	F **.16297**	**.17820**
Stddev	.00010	.00167	.010	.00124	.00078
%RSD	.06419	.98849	.2590	.75886	.43975
#1	.15968	.16798	3.882	.16210	.17765
#2	.15983	.17034	3.868	.16385	.17875
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Pass
High Limit	.23000	.23000	11.50	.23000	
Low Limit	.17000	.17000	8.500	.17000	

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.02529**	F **-.00025**	F **.61263**	F **.15568**	F **.16872**
Stddev	.01626	.00009	.00045	.00019	.00002
%RSD	64.282	34.905	.07293	.12439	.01060
#1	.03679	-.00031	.61232	.15582	.16871
#2	.01380	-.00019	.61295	.15555	.16873
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
High Limit	11.500	.23000	.23000	.23000	.23000
Low Limit	8.5000	.17000	.17000	.17000	.17000

Sample Name: lcs 480-151777/3-a Acquired: 11/15/2013 10:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	F .16431	.17434
Stddev	.00010	.00153
%RSD	.06388	.87809
#1	.16423	.17542
#2	.16438	.17326
Check ?	Chk Fail	Chk Pass
High Limit	.23000	
Low Limit	.17000	

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3398.5	5149.1	75353.	7216.4
Stddev	9.2	15.1	65.	38.3
%RSD	.27026	.29361	.08661	.53006
#1	3405.0	5159.7	75399.	7243.5
#2	3392.1	5138.4	75307.	7189.4

Sample Name: 480-48828-f-1-g Acquired: 11/15/2013 10:25:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**.11535**	**.00107**	**.01620**	**.04126**
Stddev	.00071	.01412	.00315	.00013	.00002
%RSD	118.01	12.245	295.23	.79979	.04667
#1	-.00110	.12534	.00329	.01611	.04127
#2	-.00010	.10536	-.00116	.01629	.04124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**3.2147**	**.00004**	**.00066**	**-.00024**
Stddev	.00010	.0281	.00007	.00000	.00036
%RSD	47.545	.87541	155.01	.68648	151.55
#1	.00027	3.2346	.00009	.00066	.00002
#2	.00014	3.1948	-.00000	.00066	-.00049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**.00566**	**.26205**	**.25261**	**.00051**
Stddev	.00028	.00161	.01721	.00080	.00007
%RSD	32.378	28.528	6.5674	.31803	12.965
#1	.00104	.00680	.24988	.25204	.00046
#2	.00066	.00451	.27422	.25318	.00056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g Acquired: 11/15/2013 10:25:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39787**	**.05084**	**.04741**	**-.00001**	**3.7986**
Stddev	.00386	.00022	.00101	.00015	.0094
%RSD	.96938	.44031	2.1276	1427.1	.24776
#1	.39515	.05099	.04812	.00010	3.8053
#2	.40060	.05068	.04670	-.00012	3.7920
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00079**	**-.00166**	**3.880**	**-.00037**	**-.00089**
Stddev	.00009	.00052	.013	.00057	.00215
%RSD	11.719	31.225	.3443	151.58	242.20
#1	.00073	-.00203	3.889	.00003	.00063
#2	.00086	-.00130	3.870	-.00077	-.00241
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.77980**	**-.00024**	**.02275**	**.00043**	**.00343**
Stddev	.00071	.00015	.00032	.00023	.00058
%RSD	.09152	62.135	1.4183	53.066	16.878
#1	.77929	-.00034	.02298	.00027	.00384
#2	.78030	-.00013	.02252	.00059	.00302
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g Acquired: 11/15/2013 10:25:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00008	.00623
Stddev	.00008	.00019
%RSD	94.552	3.0280
#1	.00014	.00609
#2	.00003	.00636
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3439.5	5104.2	75639.	7164.5
Stddev	5.8	.5	41.	4.7
%RSD	.16961	.00882	.05460	.06603
#1	3443.6	5103.9	75610.	7167.8
#2	3435.3	5104.5	75668.	7161.1

Sample Name: 480-48828-f-1-g SD@5 Acquired: 11/15/2013 10:27:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.03919**	**.00196**	**.00242**	**.00908**
Stddev	.00014	.02318	.00001	.00016	.00002
%RSD	31.876	59.157	.46889	6.6553	.25374
#1	-.00052	.05558	.00197	.00253	.00910
#2	-.00033	.02280	.00196	.00231	.00907
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**.67185**	**.00006**	**.00022**	**-.00035**
Stddev	.00010	.00821	.00002	.00005	.00017
%RSD	71.318	1.2225	28.392	24.656	48.386
#1	.00021	.67766	.00007	.00026	-.00023
#2	.00007	.66605	.00005	.00018	-.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00038**	**-.00011**	**.05101**	**.04857**	**.00005**
Stddev	.00009	.00018	.06202	.00037	.00159
%RSD	24.402	163.51	121.58	.75400	2965.6
#1	.00045	.00002	.00716	.04883	-.00107
#2	.00032	-.00023	.09487	.04831	.00118
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g SD@5 Acquired: 11/15/2013 10:27:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.08037**	**.01089**	**.01037**	**-.00007**	**.82159**
Stddev	.00597	.00015	.00005	.00001	.01462
%RSD	7.4259	1.4109	.49153	16.930	1.7792
#1	.07615	.01078	.01040	-.00006	.81125
#2	.08459	.01100	.01033	-.00008	.83193
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**.00080**	**.7970**	**-.00097**	**.00143**
Stddev	.00001	.00227	.0037	.00104	.00124
%RSD	14.856	283.47	.4687	107.88	87.101
#1	-.00010	-.00080	.7997	-.00171	.00231
#2	-.00008	.00240	.7944	-.00023	.00055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.16178**	**-.00007**	**.00477**	**.00039**	**.00319**
Stddev	.01176	.00067	.00010	.00038	.00196
%RSD	7.2701	939.33	2.0475	97.442	61.295
#1	.17010	-.00054	.00484	.00066	.00181
#2	.15347	.00040	.00470	.00012	.00457
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g SD@5 Acquired: 11/15/2013 10:27:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00003	.00102
Stddev	.00020	.00001
%RSD	664.85	1.2208
#1	.00017	.00103
#2	-.00011	.00101
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3421.1	5084.4	76296.	7094.9
Stddev	7.9	2.1	270.	3.5
%RSD	.23124	.04128	.35325	.04883
#1	3426.7	5082.9	76105.	7097.4
#2	3415.5	5085.9	76487.	7092.5

Sample Name: 480-48828-f-1-g PDS Acquired: 11/15/2013 10:30:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05237	10.884	.21389	.23388	.25941
Stddev	.00085	.029	.00013	.00025	.00079
%RSD	1.6295	.26730	.05999	.10618	.30559
#1	.05297	10.864	.21398	.23371	.25998
#2	.05177	10.905	.21380	.23406	.25885
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20742	13.636	.21033	.20766	.21464
Stddev	.00045	.031	.00069	.00028	.00090
%RSD	.21636	.22690	.32894	.13683	.42037
#1	.20710	13.615	.21082	.20786	.21528
#2	.20774	13.658	.20984	.20746	.21400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21173	10.237	10.613	11.276	.20902
Stddev	.00086	.036	.092	.046	.00120
%RSD	.40692	.34936	.86216	.40705	.57422
#1	.21234	10.211	10.549	11.244	.20817
#2	.21113	10.262	10.678	11.309	.20987
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g PDS Acquired: 11/15/2013 10:30:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.393**	**.25695**	**.24928**	**.21089**	**14.246**
Stddev	.011	.00059	.00229	.00087	.098
%RSD	.09265	.23145	.91912	.41385	.68465
#1	11.400	.25737	.25090	.21151	14.177
#2	11.385	.25653	.24766	.21027	14.315
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20506**	**.21290**	**3.761**	**.20632**	**.22094**
Stddev	.00009	.00234	.019	.00051	.00215
%RSD	.04432	1.0973	.4947	.24522	.97366
#1	.20513	.21455	3.774	.20668	.21942
#2	.20500	.21125	3.748	.20597	.22247
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.188**	**.20251**	**.23423**	**.20300**	**.21856**
Stddev	.025	.00002	.00104	.00005	.00067
%RSD	.22687	.00786	.44593	.02671	.30722
#1	11.170	.20252	.23349	.20304	.21809
#2	11.206	.20250	.23497	.20296	.21904
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-g PDS Acquired: 11/15/2013 10:30:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21565**	**.22390**
Stddev	.00109	.00071
%RSD	.50766	.31681
#1	.21642	.22340
#2	.21487	.22440
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3357.6**	**5141.3**	**74622.**	**7149.4**
Stddev	9.6	10.8	35.	59.5
%RSD	.28539	.21038	.04634	.83269
#1	3364.4	5149.0	74647.	7191.5
#2	3350.8	5133.7	74598.	7107.3

Sample Name: CCV Acquired: 11/15/2013 10:32:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49635**	**25.315**	**.50691**	**.49549**	**.50714**	**.49055**	**24.619**
Stddev	.00107	.276	.00118	.00156	.00311	.00082	.205
%RSD	.21502	1.0915	.23206	.31415	.61401	.16656	.83083
#1	.49560	25.120	.50775	.49439	.50493	.49112	24.474
#2	.49711	25.510	.50608	.49659	.50934	.48997	24.763
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49648**	**.48744**	**.50413**	**.50576**	**23.970**	**25.302**	**25.796**
Stddev	.00030	.00041	.00350	.00052	.121	.157	.164
%RSD	.06140	.08404	.69464	.10236	.50397	.61885	.63390
#1	.49626	.48773	.50661	.50613	23.885	25.191	25.912
#2	.49669	.48715	.50165	.50539	24.056	25.413	25.681
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50345**	**24.116**	**.49885**	**.49087**	**.50344**	**25.411**	**.48896**
Stddev	.00258	.041	.00078	.00042	.00135	.210	.00250
%RSD	.51335	.16887	.15637	.08603	.26727	.82487	.51222
#1	.50162	24.145	.49830	.49057	.50249	25.263	.49073
#2	.50528	24.087	.49940	.49117	.50439	25.559	.48719
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 10:32:47 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49152	25.04	.52050	.50278	24.715	.50272	.50700
Stddev	.00002	.05	.00077	.00329	.189	.00089	.00412
%RSD	.00346	.1876	.14794	.65358	.76401	.17677	.81248
#1	.49153	25.00	.52104	.50511	24.582	.50209	.50409
#2	.49150	25.07	.51996	.50046	24.849	.50335	.50992
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51018	.49400	.50606	.49618
Stddev	.00033	.00103	.00208	.00358
%RSD	.06538	.20750	.41058	.72165
#1	.50994	.49473	.50753	.49872
#2	.51041	.49328	.50459	.49365
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3179.7	4891.1	72407.	6980.4
Stddev	3.5	14.2	147.	35.2
%RSD	.10969	.29053	.20304	.50419
#1	3182.1	4901.1	72303.	7005.2
#2	3177.2	4881.0	72511.	6955.5

Sample Name: CCB Acquired: 11/15/2013 10:35:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**.13745**	**.00122**	**-.00008**	**-.00000**	**.00018**	**-.01668**
Stddev	.00028	.01590	.00099	.00021	.00002	.00005	.00123
%RSD	34.444	11.567	81.185	255.67	2367.7	26.130	7.3983
#1	-.00062	.12621	.00052	-.00023	.00001	.00014	-.01580
#2	-.00102	.14869	.00192	.00007	-.00001	.00021	-.01755
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**.00010**	**-.00016**	**.00042**	**-.00171**	**.04000**	**.00087**
Stddev	.00012	.00001	.00057	.00019	.00082	.02343	.00003
%RSD	66.452	5.2241	368.64	45.093	48.042	58.581	3.7510
#1	.00026	.00010	-.00056	.00056	-.00113	.05656	.00084
#2	.00009	.00010	.00025	.00029	-.00230	.02343	.00089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**-.00474**	**-.00000**	**.00003**	**.00005**	**.01123**	**.00008**
Stddev	.00025	.00077	.00001	.00020	.00025	.00038	.00000
%RSD	58.739	16.313	3095.9	620.11	466.07	3.4069	1.4394
#1	-.00060	-.00420	-.00001	.00017	.00023	.01095	.00008
#2	-.00025	-.00529	.00001	-.00011	-.00012	.01150	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 10:35:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00077	F .0057	-.00078	.00181	-.00957	.00003	-.00014
Stddev	.00076	.0001	.00060	.00205	.00825	.00030	.00023
%RSD	98.380	2.448	76.958	112.94	86.176	913.57	166.44
#1	-.00024	.0058	-.00120	.00326	-.01540	-.00018	.00002
#2	-.00131	.0056	-.00035	.00036	-.00374	.00024	-.00031
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00037	.00235	-.00012	-.00034
Stddev	.00030	.00000	.00008	.00023
%RSD	81.975	.10658	69.338	66.812
#1	.00058	.00235	-.00006	-.00050
#2	.00015	.00235	-.00018	-.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3396.7	5029.7	75897.	7053.3
Stddev	16.3	20.6	118.	14.4
%RSD	.47969	.41042	.15481	.20407
#1	3408.3	5044.3	75980.	7063.5
#2	3385.2	5015.1	75814.	7043.1

Sample Name: CCVL Acquired: 11/15/2013 10:37:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00255**	**.22146**	**.00923**	**.01951**	**.00228**	**.00219**	**.48973**
Stddev	.00044	.00793	.00281	.00003	.00000	.00007	.00842
%RSD	17.358	3.5805	30.465	.15318	.04423	3.1978	1.7194
#1	.00286	.21585	.01122	.01953	.00228	.00214	.48378
#2	.00224	.22707	.00724	.01949	.00228	.00224	.49568
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00098**	**.00404**	**.00367**	**.01070**	**.04632**	**.48383**	**.42704**
Stddev	.00017	.00011	.00006	.00013	.00204	.00010	.00123
%RSD	17.725	2.7877	1.6105	1.2452	4.4089	.02030	.28789
#1	.00110	.00412	.00372	.01061	.04776	.48390	.42617
#2	.00085	.00396	.00363	.01080	.04487	.48376	.42791
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02709**	**.20645**	**.00330**	**.00260**	**.01004**	**.96712**	**.00988**
Stddev	.00036	.00009	.00003	.00026	.00022	.00352	.00062
%RSD	1.3425	.04502	.93817	9.9563	2.2087	.36398	6.2809
#1	.02735	.20638	.00328	.00242	.00989	.96463	.00944
#2	.02684	.20651	.00332	.00278	.01020	.96960	.01032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 10:37:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00402	.2115	.01944	.01535	.49550	.00978	.00495
Stddev	.00112	.0027	.00061	.00156	.00035	.00008	.00002
%RSD	27.866	1.282	3.1467	10.187	.07163	.86498	.39270
#1	.00323	.2134	.01987	.01424	.49525	.00972	.00496
#2	.00481	.2095	.01901	.01646	.49575	.00984	.00493
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00499	.02093	.00496	.01039
Stddev	.00032	.00246	.00014	.00049
%RSD	6.4629	11.731	2.7814	4.7177
#1	.00476	.02267	.00506	.01004
#2	.00522	.01919	.00486	.01073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3447.2	5144.9	76241.	7136.4
Stddev	5.6	15.3	79.	39.5
%RSD	.16365	.29693	.10423	.55285
#1	3451.1	5155.7	76185.	7164.3
#2	3443.2	5134.1	76297.	7108.5

Sample Name: 480-48828-f-1-h ms Acquired: 11/15/2013 10:40:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00062**	**10.655**	**.20999**	**.22849**	**.25400**
Stddev	.00027	.040	.00227	.00056	.00085
%RSD	44.351	.37693	1.0799	.24325	.33565
#1	-.00042	10.684	.21159	.22888	.25340
#2	-.00081	10.627	.20838	.22809	.25461
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20130**	**13.170**	**.20484**	**.20002**	**.20379**
Stddev	.00076	.046	.00048	.00050	.00009
%RSD	.37799	.34854	.23424	.25018	.04181
#1	.20184	13.203	.20517	.20037	.20372
#2	.20076	13.138	.20450	.19967	.20385
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20265**	**9.8748**	**10.326**	**10.989**	**.20377**
Stddev	.00212	.0593	.003	.109	.00203
%RSD	1.0443	.60027	.02425	.99613	.99624
#1	.20115	9.9167	10.324	10.912	.20234
#2	.20414	9.8329	10.328	11.067	.20521
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-h ms Acquired: 11/15/2013 10:40:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.061**	**.24833**	**.24220**	**.20447**	**13.884**
Stddev	.030	.00112	.00077	.00063	.018
%RSD	.27296	.45131	.31676	.30682	.12625
#1	11.082	.24913	.24166	.20491	13.871
#2	11.039	.24754	.24274	.20403	13.896
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19934**	**.21060**	**3.826**	**.20192**	**.21563**
Stddev	.00108	.00034	.003	.00194	.00481
%RSD	.54070	.16039	.0728	.96114	2.2298
#1	.19858	.21084	3.824	.20330	.21903
#2	.20010	.21036	3.828	.20055	.21223
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.77277**	**-.00015**	**1.2735**	**.19460**	**.21154**
Stddev	.02581	.00013	.0007	.00047	.00015
%RSD	3.3401	89.012	.05550	.23907	.06960
#1	.79102	-.00025	1.2740	.19492	.21165
#2	.75452	-.00006	1.2730	.19427	.21144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-h ms Acquired: 11/15/2013 10:40:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20637**	**.21419**
Stddev	.00043	.00061
%RSD	.20901	.28466
#1	.20606	.21375
#2	.20667	.21462
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3367.4**	**5141.1**	**74932.**	**7239.0**
Stddev	6.0	10.0	391.	15.4
%RSD	.17765	.19410	.52243	.21211
#1	3371.7	5148.1	75209.	7249.8
#2	3363.2	5134.0	74655.	7228.1

Sample Name: 480-48828-f-1-i msd Acquired: 11/15/2013 10:42:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00085**	**10.570**	**.20951**	**.22713**	**.25191**
Stddev	.00022	.062	.00127	.00036	.00080
%RSD	26.076	.58276	.60427	.15852	.31882
#1	-.00069	10.614	.20862	.22739	.25135
#2	-.00100	10.527	.21041	.22688	.25248
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20038**	**13.059**	**.20348**	**.19833**	**.20177**
Stddev	.00027	.034	.00010	.00005	.00024
%RSD	.13611	.26146	.04867	.02731	.11748
#1	.20018	13.084	.20341	.19829	.20160
#2	.20057	13.035	.20355	.19837	.20194
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20082**	**9.8280**	**10.369**	**10.826**	**.20280**
Stddev	.00061	.0083	.008	.060	.00081
%RSD	.30485	.08460	.07579	.55028	.39841
#1	.20038	9.8221	10.375	10.868	.20222
#2	.20125	9.8339	10.364	10.784	.20337
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-i msd Acquired: 11/15/2013 10:42:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.990**	**.24680**	**.24338**	**.20389**	**13.803**
Stddev	.045	.00121	.00038	.00058	.024
%RSD	.40891	.48915	.15479	.28660	.17442
#1	10.958	.24594	.24364	.20431	13.820
#2	11.022	.24765	.24311	.20348	13.786
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19757**	**.20800**	**3.804**	**.20173**	**.21920**
Stddev	.00021	.00042	.004	.00140	.00068
%RSD	.10704	.20362	.1134	.69234	.30845
#1	.19772	.20830	3.801	.20271	.21873
#2	.19742	.20770	3.807	.20074	.21968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.75346**	**.00001**	**1.2687**	**.19421**	**.20809**
Stddev	.00602	.00002	.0008	.00055	.00045
%RSD	.79917	132.76	.05998	.28102	.21424
#1	.75772	.00003	1.2682	.19382	.20777
#2	.74920	.00000	1.2693	.19459	.20840
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-1-i msd Acquired: 11/15/2013 10:42:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20424**	**.21270**
Stddev	.00059	.00179
%RSD	.28791	.84017
#1	.20383	.21144
#2	.20466	.21396
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3348.1**	**5106.5**	**74421.**	**7207.2**
Stddev	6.7	12.2	321.	19.0
%RSD	.19903	.23943	.43093	.26358
#1	3352.8	5115.1	74647.	7220.6
#2	3343.4	5097.9	74194.	7193.8

Sample Name: 480-48828-f-2-e Acquired: 11/15/2013 10:44:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**.36380**	**.00404**	**.02302**	**.03969**
Stddev	.00035	.02198	.00016	.00018	.00010
%RSD	151.39	6.0412	3.9898	.78974	.26347
#1	-.00002	.37934	.00416	.02290	.03961
#2	.00049	.34826	.00393	.02315	.03976
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**3.0439**	**.00009**	**.00083**	**.00012**
Stddev	.00001	.0139	.00005	.00004	.00004
%RSD	4.2238	.45588	53.482	5.4135	36.090
#1	.00031	3.0341	.00012	.00080	.00009
#2	.00029	3.0537	.00006	.00086	.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00338**	**.14162**	**.35027**	**.32301**	**-.00141**
Stddev	.00000	.00297	.00729	.00396	.00032
%RSD	.07415	2.0984	2.0817	1.2273	23.072
#1	.00338	.14372	.34512	.32021	-.00164
#2	.00339	.13952	.35543	.32581	-.00118
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-2-e Acquired: 11/15/2013 10:44:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.44181**	**.05624**	**.05277**	**-.00015**	**.98295**
Stddev	.00364	.00027	.00017	.00027	.00396
%RSD	.82337	.48384	.32433	180.76	.40281
#1	.44438	.05605	.05265	.00004	.98015
#2	.43924	.05643	.05289	-.00034	.98575
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**-.00052**	**4.288**	**-.00186**	**-.00211**
Stddev	.00047	.00018	.013	.00010	.00021
%RSD	57.000	33.857	.3081	5.4034	9.7369
#1	.00050	-.00040	4.297	-.00194	-.00225
#2	.00117	-.00065	4.278	-.00179	-.00196
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0511**	**-.00017**	**.02432**	**.00441**	**.00366**
Stddev	.0011	.00001	.00028	.00004	.00054
%RSD	.10319	7.3488	1.1563	.97605	14.648
#1	1.0503	-.00018	.02412	.00444	.00328
#2	1.0518	-.00016	.02452	.00438	.00404
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-2-e Acquired: 11/15/2013 10:44:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00027	.00792
Stddev	.00015	.00021
%RSD	54.124	2.6984
#1	.00017	.00807
#2	.00038	.00777
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3443.2	5153.6	75766.	7195.7
Stddev	2.0	11.8	419.	72.0
%RSD	.05846	.22930	.55350	.99991
#1	3444.6	5161.9	76062.	7246.5
#2	3441.8	5145.2	75469.	7144.8

Sample Name: 480-48828-f-3-d Acquired: 11/15/2013 10:47:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.32856**	**.00279**	**.01604**	**.06064**
Stddev	.00064	.00718	.00009	.00033	.00001
%RSD	200.83	2.1843	3.2417	2.0478	.01473
#1	-.00077	.33363	.00285	.01627	.06064
#2	.00013	.32348	.00272	.01580	.06063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**3.6529**	**.00002**	**.00078**	**-.00037**
Stddev	.00004	.0048	.00001	.00017	.00005
%RSD	12.647	.13245	55.786	21.691	14.241
#1	.00033	3.6563	.00001	.00090	-.00041
#2	.00028	3.6495	.00003	.00066	-.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**.01075**	**.36896**	**.33898**	**-.00081**
Stddev	.00028	.00393	.05770	.00182	.00027
%RSD	32.442	36.540	15.639	.53747	32.994
#1	.00068	.01352	.32816	.34027	-.00099
#2	.00108	.00797	.40976	.33770	-.00062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-3-d Acquired: 11/15/2013 10:47:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.45033**	**.05254**	**.05008**	**-.00003**	**3.8494**
Stddev	.00015	.00020	.00129	.00010	.0154
%RSD	.03324	.38154	2.5666	393.87	.40018
#1	.45023	.05240	.04917	-.00010	3.8386
#2	.45044	.05268	.05099	.00005	3.8603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00054**	**-.00108**	**5.265**	**-.00128**	**-.00078**
Stddev	.00032	.00054	.012	.00265	.00118
%RSD	58.648	50.168	.2307	207.60	152.42
#1	.00032	-.00070	5.256	.00060	-.00161
#2	.00077	-.00146	5.273	-.00315	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.89127**	**.00003**	**.02714**	**.00090**	**.00469**
Stddev	.02270	.00012	.00018	.00012	.00341
%RSD	2.5470	376.88	.65487	13.355	72.714
#1	.90733	.00012	.02727	.00081	.00228
#2	.87522	-.00005	.02702	.00098	.00709
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-3-d Acquired: 11/15/2013 10:47:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00014**	**.00482**
Stddev	.00022	.00017
%RSD	155.63	3.6032
#1	.00030	.00494
#2	-.00001	.00470
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3449.9**	**5158.9**	**75632.**	**7241.5**
Stddev	8.8	15.0	180.	16.1
%RSD	.25561	.29105	.23771	.22227
#1	3456.1	5169.5	75760.	7252.9
#2	3443.7	5148.2	75505.	7230.1

Sample Name: 480-48828-f-4-d Acquired: 11/15/2013 10:49:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.09812**	**.00244**	**.01447**	**.04622**
Stddev	.00011	.01756	.00278	.00013	.00029
%RSD	33.593	17.897	113.86	.88349	.62645
#1	-.00025	.08570	.00441	.01456	.04642
#2	-.00040	.11053	.00048	.01438	.04601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**3.4358**	**.00002**	**.00062**	**-.00016**
Stddev	.00003	.0120	.00001	.00019	.00040
%RSD	12.550	.34864	45.668	31.385	244.69
#1	.00023	3.4443	.00002	.00048	.00012
#2	.00027	3.4273	.00003	.00075	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00116**	**.02856**	**.27766**	**.25393**	**.00074**
Stddev	.00033	.00052	.01797	.00202	.00048
%RSD	28.825	1.8100	6.4717	.79550	65.495
#1	.00139	.02819	.29037	.25536	.00040
#2	.00092	.02892	.26496	.25250	.00108
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-4-d Acquired: 11/15/2013 10:49:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.42266**	**.05646**	**.05352**	**.00008**	**3.9544**
Stddev	.00038	.00007	.00179	.00029	.0130
%RSD	.09017	.12721	3.3358	369.30	.32844
#1	.42239	.05651	.05478	-.00013	3.9452
#2	.42293	.05641	.05226	.00028	3.9636
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00110**	**-.00094**	**4.162**	**-.00214**	**-.00265**
Stddev	.00004	.00091	.008	.00061	.00112
%RSD	3.4907	96.573	.1946	28.651	42.034
#1	.00112	-.00158	4.168	-.00257	-.00187
#2	.00107	-.00030	4.157	-.00171	-.00344
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.72525**	**.00013**	**.02396**	**.00033**	**.00456**
Stddev	.01932	.00009	.00009	.00009	.00035
%RSD	2.6635	69.592	.38483	27.889	7.6337
#1	.71160	.00020	.02402	.00039	.00481
#2	.73891	.00007	.02389	.00026	.00432
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-4-d Acquired: 11/15/2013 10:49:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00015**	**.00639**
Stddev	.00001	.00028
%RSD	5.7772	4.4073
#1	.00016	.00619
#2	.00015	.00659
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3441.9**	**5132.0**	**75096.**	**7182.5**
Stddev	1.1	.8	264.	17.7
%RSD	.03179	.01577	.35164	.24604
#1	3442.7	5131.4	74909.	7195.0
#2	3441.1	5132.6	75283.	7170.0

Sample Name: 480-48828-h-5-d Acquired: 11/15/2013 10:51:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**.41390**	**.00445**	**.01832**	**.07038**
Stddev	.00000	.01129	.00055	.00003	.00037
%RSD	1.3867	2.7276	12.402	.14118	.52336
#1	-.00016	.40592	.00406	.01830	.07064
#2	-.00017	.42189	.00484	.01834	.07012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**1.3800**	**-.00008**	**.00038**	**-.00024**
Stddev	.00011	.0064	.00007	.00010	.00017
%RSD	33.122	.46588	85.722	26.216	73.494
#1	.00026	1.3845	-.00003	.00031	-.00036
#2	.00042	1.3754	-.00014	.00046	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00049**	**.02167**	**.19846**	**.19485**	**-.00007**
Stddev	.00002	.00122	.00248	.00084	.00039
%RSD	3.7456	5.6204	1.2500	.43083	580.40
#1	.00051	.02253	.20021	.19426	.00021
#2	.00048	.02080	.19671	.19545	-.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-h-5-d Acquired: 11/15/2013 10:51:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20072**	**.04036**	**.03862**	**-.00018**	**4.0759**
Stddev	.00171	.00018	.00033	.00018	.0161
%RSD	.85440	.43758	.85712	100.10	.39424
#1	.19950	.04048	.03839	-.00005	4.0873
#2	.20193	.04024	.03886	-.00031	4.0646
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00062**	**-.00133**	**2.722**	**-.00059**	**-.00126**
Stddev	.00008	.00222	.012	.00044	.00045
%RSD	12.710	166.94	.4213	75.484	35.711
#1	.00067	.00024	2.714	-.00027	-.00094
#2	.00056	-.00290	2.730	-.00090	-.00158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51517**	**-.00014**	**.01552**	**.00068**	**.00449**
Stddev	.01077	.00014	.00021	.00045	.00281
%RSD	2.0909	97.149	1.3235	65.927	62.489
#1	.50755	-.00005	.01566	.00100	.00648
#2	.52278	-.00024	.01537	.00036	.00251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-h-5-d Acquired: 11/15/2013 10:51:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00024**	**.00426**
Stddev	.00014	.00008
%RSD	58.642	1.9115
#1	.00034	.00432
#2	.00014	.00420
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3450.0**	**5158.3**	**76774.**	**7298.2**
Stddev	3.2	11.0	640.	10.2
%RSD	.09377	.21267	.83421	.13980
#1	3452.3	5166.1	76321.	7291.0
#2	3447.7	5150.5	77227.	7305.4

Sample Name: 480-48828-h-6-d Acquired: 11/15/2013 10:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**1.3550**	**.00096**	**.01611**	**.10719**
Stddev	.00084	.0212	.00264	.00018	.00038
%RSD	37067.	1.5661	274.36	1.1221	.35464
#1	.00060	1.3400	-.00090	.01624	.10692
#2	-.00059	1.3700	.00282	.01598	.10746
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**1.3769**	**-.00006**	**.00064**	**.00003**
Stddev	.00003	.0035	.00002	.00015	.00009
%RSD	5.1488	.25418	28.027	23.092	308.59
#1	.00052	1.3744	-.00005	.00075	.00010
#2	.00049	1.3793	-.00008	.00054	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00069**	**.00576**	**.29711**	**.23686**	**-.00104**
Stddev	.00019	.00298	.04561	.00204	.00112
%RSD	26.961	51.775	15.353	.85931	107.36
#1	.00056	.00787	.26485	.23542	-.00025
#2	.00083	.00365	.32936	.23830	-.00184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-h-6-d Acquired: 11/15/2013 10:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20674**	**.05992**	**.05712**	**-.00005**	**3.7459**
Stddev	.00308	.00001	.00052	.00010	.0344
%RSD	1.4903	.02398	.90942	199.20	.91730
#1	.20892	.05991	.05748	-.00012	3.7216
#2	.20456	.05993	.05675	.00002	3.7702
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**.00104**	**5.035**	**-.00199**	**-.00124**
Stddev	.00066	.00054	.004	.00168	.00305
%RSD	312.39	51.625	.0769	84.408	245.41
#1	-.00026	.00142	5.038	-.00318	-.00340
#2	.00068	.00066	5.032	-.00080	.00091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.72147**	**-.00012**	**.01744**	**.00033**	**.00390**
Stddev	.01320	.00001	.00002	.00031	.00255
%RSD	1.8290	9.2935	.09763	94.205	65.389
#1	.73080	-.00011	.01743	.00056	.00570
#2	.71214	-.00013	.01745	.00011	.00210
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-h-6-d Acquired: 11/15/2013 10:54:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00010**	**.00425**
Stddev	.00011	.00019
%RSD	108.03	4.5663
#1	.00018	.00411
#2	.00002	.00438
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3428.5**	**5177.0**	**76660.**	**7331.5**
Stddev	1.3	4.8	558.	80.7
%RSD	.03739	.09270	.72841	1.1002
#1	3427.6	5180.4	77055.	7388.5
#2	3429.4	5173.6	76265.	7274.5

Sample Name: 480-48828-i-7-b Acquired: 11/15/2013 10:56:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**1.4104**	**.00236**	**.01843**	**.11587**
Stddev	.00049	.0155	.00040	.00019	.00054
%RSD	96.273	1.0964	17.047	1.0110	.46177
#1	-.00016	1.4214	.00208	.01830	.11549
#2	-.00085	1.3995	.00265	.01856	.11625
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**1.4553**	**.00002**	**.00076**	**-.00020**
Stddev	.00004	.0089	.00010	.00004	.00028
%RSD	8.3973	.60983	436.84	5.1275	144.54
#1	.00050	1.4490	-.00005	.00078	-.00040
#2	.00056	1.4616	.00009	.00073	.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00214**	**.00661**	**.28995**	**.25137**	**-.00042**
Stddev	.00018	.00382	.02751	.00078	.00097
%RSD	8.3500	57.854	9.4874	.30940	232.67
#1	.00226	.00931	.30940	.25192	-.00111
#2	.00201	.00390	.27050	.25082	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-i-7-b Acquired: 11/15/2013 10:56:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21605**	**.06126**	**.05882**	**-.00029**	**4.0395**
Stddev	.00056	.00029	.00004	.00027	.0169
%RSD	.26085	.47946	.06627	92.776	.41752
#1	.21566	.06106	.05879	-.00049	4.0514
#2	.21645	.06147	.05885	-.00010	4.0275
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00075**	**.00500**	**5.187**	**-.00150**	**.00191**
Stddev	.00003	.00110	.001	.00082	.00085
%RSD	4.5709	21.959	.0131	54.554	44.403
#1	.00072	.00422	5.186	-.00092	.00131
#2	.00077	.00578	5.187	-.00209	.00251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.76447**	**-.00020**	**.01860**	**.00028**	**.00476**
Stddev	.01135	.00026	.00018	.00005	.00136
%RSD	1.4847	130.34	.97810	15.962	28.564
#1	.75644	-.00039	.01847	.00032	.00380
#2	.77249	-.00002	.01873	.00025	.00572
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-i-7-b Acquired: 11/15/2013 10:56:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00017	.00805
Stddev	.00011	.00086
%RSD	60.538	10.680
#1	.00025	.00744
#2	.00010	.00866
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3414.3	5149.7	75804.	7265.0
Stddev	.1	12.1	540.	19.5
%RSD	.00251	.23576	.71297	.26787
#1	3414.2	5158.3	76187.	7278.7
#2	3414.4	5141.1	75422.	7251.2

Sample Name: 480-48828-i-8-e Acquired: 11/15/2013 10:59:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00073**	**1.5248**	**.00149**	**.02675**	**.11494**
Stddev	.00010	.0145	.00095	.00022	.00050
%RSD	13.723	.95228	63.635	.83682	.43121
#1	-.00080	1.5351	.00082	.02691	.11458
#2	-.00066	1.5146	.00216	.02659	.11529
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**1.3532**	**.00001**	**.00071**	**-.00027**
Stddev	.00004	.0076	.00005	.00019	.00030
%RSD	6.9975	.56223	416.68	26.404	111.12
#1	.00061	1.3586	.00005	.00058	-.00048
#2	.00056	1.3479	-.00003	.00084	-.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00096**	**.01195**	**.26574**	**.25344**	**.00080**
Stddev	.00013	.00319	.00056	.00099	.00053
%RSD	13.963	26.677	.21108	.38908	66.593
#1	.00086	.01420	.26534	.25274	.00042
#2	.00105	.00969	.26614	.25413	.00118
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-i-8-e Acquired: 11/15/2013 10:59:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20912**	**.06474**	**.06142**	**-.00018**	**4.3281**
Stddev	.00231	.00010	.00027	.00004	.0103
%RSD	1.1051	.15074	.44145	23.855	.23711
#1	.20749	.06467	.06161	-.00015	4.3208
#2	.21075	.06481	.06123	-.00021	4.3353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00091**	**-.00060**	**5.465**	**-.00002**	**-.00002**
Stddev	.00064	.00060	.021	.00097	.00071
%RSD	70.295	100.74	.3941	4997.1	2954.9
#1	.00137	-.00102	5.480	.00067	-.00053
#2	.00046	-.00017	5.450	-.00071	.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.80860**	**.00037**	**.01672**	**.00068**	**.00657**
Stddev	.00575	.00055	.00000	.00020	.00052
%RSD	.71109	149.86	.02248	29.902	7.9911
#1	.81267	-.00002	.01672	.00054	.00694
#2	.80454	.00075	.01672	.00082	.00620
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-i-8-e Acquired: 11/15/2013 10:59:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00017	.00341
Stddev	.00013	.00035
%RSD	74.212	10.355
#1	.00008	.00366
#2	.00027	.00316
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3423.4	5170.9	76213.	7292.2
Stddev	10.5	16.4	442.	13.4
%RSD	.30649	.31641	.58046	.18360
#1	3430.8	5182.5	76526.	7282.7
#2	3416.0	5159.3	75901.	7301.7

Sample Name: CCV Acquired: 11/15/2013 11:01:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50417**	**25.694**	**.51499**	**.49962**	**.51379**	**.49414**	**24.746**
Stddev	.00060	.193	.00471	.00017	.00228	.00010	.067
%RSD	.11851	.75306	.91365	.03389	.44291	.02035	.26903
#1	.50460	25.831	.51166	.49950	.51540	.49421	24.793
#2	.50375	25.558	.51831	.49974	.51218	.49407	24.699
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49871**	**.49000**	**.51121**	**.51845**	**24.126**	**25.696**	**26.183**
Stddev	.00075	.00049	.00467	.00164	.028	.225	.131
%RSD	.15053	.10061	.91264	.31603	.11496	.87749	.50191
#1	.49818	.48966	.50792	.51729	24.146	25.855	26.090
#2	.49925	.49035	.51451	.51961	24.106	25.536	26.276
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51465**	**24.241**	**.50067**	**.49697**	**.50705**	**25.904**	**.49153**
Stddev	.00438	.057	.00206	.00263	.00029	.171	.00169
%RSD	.85118	.23394	.41208	.52864	.05704	.66056	.34446
#1	.51774	24.201	.49921	.49511	.50725	26.025	.49033
#2	.51155	24.282	.50213	.49883	.50684	25.783	.49273
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 11:01:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48990	25.28	.52388	.50725	24.977	.50472	.51633
Stddev	.00240	.00	.00340	.00535	.052	.00057	.00381
%RSD	.48984	.0133	.64994	1.0556	.20719	.11291	.73846
#1	.48820	25.28	.52628	.51104	25.014	.50432	.51903
#2	.49160	25.28	.52147	.50346	24.941	.50513	.51364
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51239	.49640	.51363	.49551
Stddev	.00177	.00332	.00205	.00528
%RSD	.34554	.66862	.39971	1.0663
#1	.51364	.49405	.51218	.49177
#2	.51113	.49874	.51508	.49925
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3169.5	4875.6	70937.	6886.4
Stddev	12.4	19.8	40.	31.2
%RSD	.38979	.40606	.05645	.45282
#1	3160.8	4861.6	70965.	6864.3
#2	3178.2	4889.6	70908.	6908.4

Sample Name: CCB Acquired: 11/15/2013 11:03:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.13684**	**.00061**	**-.00055**	**.00002**	**.00012**	**-.01834**
Stddev	.00033	.01600	.00007	.00045	.00000	.00001	.00071
%RSD	314.58	11.695	11.946	81.147	10.648	8.2480	3.8609
#1	.00013	.14816	.00055	-.00023	.00002	.00011	-.01884
#2	-.00034	.12553	.00066	-.00087	.00002	.00013	-.01784
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**-.00004**	**-.00056**	**.00045**	**-.00563**	**.01501**	**.00033**
Stddev	.00006	.00005	.00010	.00013	.00230	.03128	.00019
%RSD	89.964	123.85	18.547	29.320	40.774	208.43	57.215
#1	.00002	-.00000	-.00064	.00035	-.00401	-.00711	.00047
#2	.00010	-.00007	-.00049	.00054	-.00726	.03713	.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00145**	**.00178**	**-.00004**	**.00027**	**-.00020**	**.00087**	**-.00004**
Stddev	.00001	.00271	.00005	.00017	.00026	.01617	.00010
%RSD	.86279	152.23	119.95	64.716	127.32	1868.5	238.93
#1	-.00144	.00370	-.00001	.00039	-.00002	.01230	.00003
#2	-.00146	-.00014	-.00007	.00014	-.00038	-.01057	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 11:03:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00040	F .0041	-.00037	-.00004	.00540	.00022	-.00008
Stddev	.00090	.0005	.00084	.00107	.01549	.00003	.00015
%RSD	225.73	12.98	228.55	2705.8	286.77	11.939	202.07
#1	-.00024	.0045	-.00096	.00072	.01636	.00021	-.00019
#2	.00104	.0037	.00023	-.00080	-.00555	.00024	.00003
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00023	.00340	.00006	-.00011
Stddev	.00004	.00251	.00023	.00034
%RSD	16.962	73.644	372.78	303.57
#1	.00026	.00517	.00023	-.00035
#2	.00021	.00163	-.00010	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3398.7	5033.9	75526.	7073.1
Stddev	8.0	9.0	97.	12.6
%RSD	.23583	.17923	.12829	.17842
#1	3393.0	5027.5	75594.	7064.2
#2	3404.3	5040.3	75457.	7082.0

Sample Name: CCVL Acquired: 11/15/2013 11:06:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00296**	**.21310**	**.01239**	**.01953**	**.00225**	**.00207**	**.48580**
Stddev	.00023	.00575	.00100	.00018	.00004	.00000	.00645
%RSD	7.6366	2.6981	8.0523	.93038	1.7857	.11451	1.3283
#1	.00311	.20903	.01168	.01940	.00222	.00207	.48123
#2	.00280	.21716	.01309	.01966	.00227	.00207	.49036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00106**	**.00419**	**.00382**	**.01079**	**.04632**	**.51619**	**.42481**
Stddev	.00024	.00018	.00048	.00036	.00333	.00974	.00249
%RSD	22.756	4.3413	12.639	3.3573	7.1876	1.8875	.58580
#1	.00124	.00432	.00416	.01053	.04396	.50930	.42305
#2	.00089	.00406	.00348	.01105	.04867	.52308	.42657
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02884**	**.20566**	**.00323**	**.00317**	**.00986**	**.95708**	**.01008**
Stddev	.00032	.00024	.00005	.00048	.00039	.00764	.00008
%RSD	1.0995	.11493	1.6464	15.024	4.0027	.79876	.74671
#1	.02906	.20550	.00319	.00284	.00958	.95167	.01014
#2	.02861	.20583	.00326	.00351	.01014	.96248	.01003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 11:06:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00499	.2185	.02018	.01305	.49437	.00918	.00502
Stddev	.00055	.0023	.00057	.00245	.00189	.00015	.00011
%RSD	11.056	1.033	2.8403	18.773	.38270	1.6052	2.0934
#1	.00538	.2169	.02058	.01131	.49304	.00907	.00495
#2	.00460	.2201	.01977	.01478	.49571	.00928	.00510
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00507	.02280	.00495	.01014
Stddev	.00010	.00257	.00024	.00042
%RSD	1.8876	11.262	4.7581	4.1318
#1	.00501	.02098	.00478	.01044
#2	.00514	.02461	.00511	.00984
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3410.3	5075.2	75983.	7160.7
Stddev	15.6	21.9	286.	19.9
%RSD	.45714	.43200	.37605	.27836
#1	3421.4	5090.7	76185.	7174.8
#2	3399.3	5059.7	75781.	7146.6

Sample Name: 480-48828-f-9-e Acquired: 11/15/2013 11:08:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**.20442**	**.00202**	**.15962**	**.02580**
Stddev	.00047	.00525	.00267	.00022	.00002
%RSD	91.749	2.5660	132.00	.13520	.06372
#1	-.00084	.20813	.00013	.15947	.02579
#2	-.00018	.20071	.00391	.15977	.02581
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**2.6618**	**-.00006**	**.00061**	**.00059**
Stddev	.00002	.0100	.00009	.00009	.00041
%RSD	7.2664	.37575	141.33	14.477	69.656
#1	.00025	2.6689	-.00013	.00054	.00088
#2	.00022	2.6547	-.00000	.00067	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**.09741**	**.26149**	**.22694**	**-.00010**
Stddev	.00012	.00132	.01530	.00008	.00046
%RSD	11.257	1.3581	5.8496	.03480	442.81
#1	.00096	.09835	.27231	.22700	.00022
#2	.00112	.09648	.25067	.22689	-.00043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-9-e Acquired: 11/15/2013 11:08:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.40422**	**.02109**	**.02049**	**-.00011**	**7.8165**
Stddev	.00502	.00007	.00023	.00014	.0218
%RSD	1.2416	.35072	1.1110	128.24	.27867
#1	.40068	.02103	.02033	-.00001	7.8010
#2	.40777	.02114	.02065	-.00022	7.8319
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**-.00132**	**4.219**	**-.00055**	**-.00215**
Stddev	.00022	.00007	.000	.00190	.00266
%RSD	25.530	4.9914	.0002	347.43	123.82
#1	.00070	-.00137	4.219	.00079	-.00027
#2	.00100	-.00128	4.219	-.00189	-.00403
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.86754**	**-.00040**	**.02112**	**.00160**	**.00416**
Stddev	.02115	.00050	.00017	.00025	.00178
%RSD	2.4374	124.58	.80929	15.340	42.687
#1	.88249	-.00005	.02100	.00143	.00542
#2	.85259	-.00075	.02124	.00177	.00290
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48828-f-9-e Acquired: 11/15/2013 11:08:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00018**	**.00409**
Stddev	.00021	.00007
%RSD	111.98	1.7422
#1	.00033	.00414
#2	.00004	.00404
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3454.4**	**5133.8**	**75551.**	**7311.6**
Stddev	17.8	30.0	457.	25.7
%RSD	.51667	.58410	.60473	.35105
#1	3467.0	5155.0	75874.	7329.8
#2	3441.7	5112.6	75228.	7293.5

Sample Name: 480-49305-f-1-d Acquired: 11/15/2013 11:11:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00058**	**.40938**	**-.00009**	**.03905**	**.07352**
Stddev	.00076	.01066	.00057	.00029	.00045
%RSD	129.92	2.6029	635.01	.74208	.61727
#1	-.00005	.41691	.00032	.03884	.07384
#2	-.00112	.40184	-.00050	.03925	.07320
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00045**	**1.2354**	**.00003**	**.00067**	**-.00030**
Stddev	.00004	.0053	.00011	.00018	.00005
%RSD	9.7493	.43081	374.19	27.464	18.259
#1	.00042	1.2316	.00010	.00080	-.00026
#2	.00048	1.2391	-.00005	.00054	-.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00065**	**.00627**	**.21264**	**.17248**	**.00003**
Stddev	.00008	.00575	.00498	.00063	.00128
%RSD	11.694	91.692	2.3411	.36790	4241.8
#1	.00070	.01033	.21616	.17293	-.00087
#2	.00060	.00220	.20912	.17203	.00093
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-1-d Acquired: 11/15/2013 11:11:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23787**	**.06482**	**.06181**	**-.00027**	**4.4805**
Stddev	.00091	.00007	.00084	.00016	.0015
%RSD	.38187	.10424	1.3558	59.200	.03266
#1	.23722	.06486	.06122	-.00038	4.4795
#2	.23851	.06477	.06240	-.00016	4.4816
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00148**	**-.00134**	**2.846**	**-.00085**	**-.00378**
Stddev	.00012	.00108	.003	.00113	.00005
%RSD	8.0559	80.511	.1098	131.95	1.3338
#1	.00157	-.00210	2.848	-.00006	-.00375
#2	.00140	-.00058	2.844	-.00165	-.00382
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.53094**	**-.00002**	**.01314**	**.00037**	**.00395**
Stddev	.00614	.00039	.00004	.00007	.00065
%RSD	1.1555	2230.6	.28921	19.816	16.406
#1	.52660	-.00029	.01311	.00042	.00349
#2	.53528	.00025	.01316	.00032	.00440
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-1-d Acquired: 11/15/2013 11:11:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00017**	**.00554**
Stddev	.00010	.00011
%RSD	57.029	1.9449
#1	.00025	.00546
#2	.00010	.00561
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3468.8**	**5190.2**	**76580.**	**7293.7**
Stddev	21.0	24.2	195.	2.1
%RSD	.60661	.46693	.25425	.02871
#1	3483.7	5207.4	76442.	7295.2
#2	3453.9	5173.1	76718.	7292.2

Sample Name: 480-49305-f-2-d Acquired: 11/15/2013 11:13:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**.46159**	**-.00013**	**.01341**	**.09496**
Stddev	.00068	.01948	.00050	.00015	.00016
%RSD	83.164	4.2210	390.28	1.1520	.16344
#1	-.00130	.47536	-.00048	.01331	.09485
#2	-.00034	.44781	.00023	.01352	.09507
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**1.2833**	**-.00002**	**.00052**	**-.00018**
Stddev	.00006	.0101	.00003	.00001	.00017
%RSD	18.011	.78419	187.04	2.6034	94.051
#1	.00041	1.2904	-.00004	.00051	-.00006
#2	.00031	1.2762	.00001	.00053	-.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00061**	**.03194**	**.19488**	**.18156**	**.00039**
Stddev	.00006	.00263	.03250	.00011	.00051
%RSD	9.2230	8.2373	16.675	.05823	132.20
#1	.00065	.03380	.21786	.18163	.00003
#2	.00057	.03008	.17190	.18148	.00075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-2-d Acquired: 11/15/2013 11:13:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20999**	**.06327**	**.06040**	**-.00020**	**3.8965**
Stddev	.00127	.00009	.00041	.00002	.0151
%RSD	.60330	.14089	.68416	10.493	.38676
#1	.21088	.06321	.06069	-.00019	3.9071
#2	.20909	.06333	.06010	-.00022	3.8858
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**-.00024**	**2.840**	**-.00059**	**-.00182**
Stddev	.00002	.00033	.005	.00042	.00314
%RSD	6.5356	138.38	.1842	71.717	172.12
#1	.00033	-.00047	2.836	-.00089	.00040
#2	.00036	-.00001	2.843	-.00029	-.00404
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.54156**	**-.00021**	**.01306**	**.00019**	**.00416**
Stddev	.01116	.00041	.00021	.00031	.00265
%RSD	2.0599	189.13	1.5752	162.28	63.684
#1	.54945	.00007	.01320	-.00003	.00229
#2	.53368	-.00050	.01291	.00041	.00604
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-2-d Acquired: 11/15/2013 11:13:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00010**	**.00890**
Stddev	.00004	.00050
%RSD	36.614	5.5984
#1	-.00008	.00926
#2	-.00013	.00855
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3452.4**	**5171.5**	**76634.**	**7314.9**
Stddev	5.4	3.0	24.	13.7
%RSD	.15506	.05776	.03112	.18703
#1	3456.2	5173.6	76651.	7305.3
#2	3448.6	5169.3	76617.	7324.6

Sample Name: 480-49305-g-3-d Acquired: 11/15/2013 11:16:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00024**	**.52436**	**.00253**	**.01474**	**.08115**
Stddev	.00032	.00553	.00195	.00004	.00016
%RSD	135.77	1.0554	77.291	.28034	.19316
#1	-.00001	.52828	.00115	.01472	.08104
#2	-.00046	.52045	.00391	.01477	.08126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00041**	**1.2342**	**-.00004**	**.00069**	**-.00025**
Stddev	.00009	.0077	.00005	.00012	.00030
%RSD	21.565	.62832	146.21	17.662	117.45
#1	.00035	1.2397	-.00008	.00078	-.00004
#2	.00047	1.2287	.00000	.00060	-.00047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00067**	**.00152**	**.20144**	**.17287**	**-.00060**
Stddev	.00007	.00120	.02324	.00096	.00015
%RSD	10.600	79.067	11.534	.55470	24.773
#1	.00072	.00067	.21787	.17220	-.00049
#2	.00062	.00237	.18501	.17355	-.00070
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-3-d Acquired: 11/15/2013 11:16:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19308**	**.05889**	**.05604**	**-.00025**	**3.8946**
Stddev	.00167	.00015	.00067	.00015	.0152
%RSD	.86595	.25224	1.1918	60.256	.38979
#1	.19190	.05878	.05557	-.00036	3.8839
#2	.19426	.05899	.05651	-.00015	3.9054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00069**	**-.00094**	**2.808**	**-.00175**	**-.00160**
Stddev	.00013	.00045	.004	.00039	.00296
%RSD	19.165	48.508	.1362	22.445	185.48
#1	.00079	-.00126	2.810	-.00203	.00050
#2	.00060	-.00062	2.805	-.00148	-.00369
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.47050**	**.00032**	**.01293**	**.00025**	**.00638**
Stddev	.00630	.00024	.00020	.00006	.00043
%RSD	1.3392	74.945	1.5233	24.695	6.7748
#1	.47496	.00049	.01307	.00029	.00608
#2	.46605	.00015	.01279	.00021	.00669
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-3-d Acquired: 11/15/2013 11:16:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00006	.00655
Stddev	.00009	.00030
%RSD	155.80	4.5351
#1	-.00001	.00634
#2	.00012	.00676
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3450.8	5171.9	76628.	7295.9
Stddev	1.5	1.4	320.	5.0
%RSD	.04230	.02749	.41817	.06787
#1	3451.8	5170.9	76854.	7299.4
#2	3449.7	5172.9	76401.	7292.4

Sample Name: 480-49305-g-4-d Acquired: 11/15/2013 11:18:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00050**	**.40908**	**.00107**	**.01353**	**.07918**
Stddev	.00032	.01762	.00165	.00010	.00017
%RSD	64.033	4.3083	154.13	.73348	.21156
#1	-.00072	.42154	-.00010	.01360	.07929
#2	-.00027	.39662	.00224	.01346	.07906
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**1.3535**	**-.00000**	**.00064**	**-.00026**
Stddev	.00004	.0063	.00004	.00002	.00018
%RSD	10.124	.46827	1807.8	3.0350	66.518
#1	.00039	1.3579	-.00003	.00063	-.00014
#2	.00033	1.3490	.00003	.00065	-.00039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**.00249**	**.19528**	**.17934**	**.00014**
Stddev	.00016	.00443	.05450	.00124	.00082
%RSD	21.997	177.79	27.910	.69319	609.18
#1	.00084	.00563	.23382	.17846	.00072
#2	.00062	-.00064	.15674	.18022	-.00045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-4-d Acquired: 11/15/2013 11:18:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22895**	**.06893**	**.06543**	**-.00015**	**3.8866**
Stddev	.00040	.00025	.00073	.00011	.0269
%RSD	.17510	.35684	1.1089	72.674	.69182
#1	.22923	.06875	.06595	-.00023	3.8676
#2	.22867	.06910	.06492	-.00008	3.9057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00040**	**.00087**	**2.852**	**-.00282**	**-.00002**
Stddev	.00057	.00003	.007	.00068	.00307
%RSD	143.75	3.2977	.2518	24.252	17950.
#1	-.00001	.00085	2.847	-.00330	-.00219
#2	.00080	.00089	2.857	-.00234	.00216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.53259**	**-.00017**	**.01345**	**.00030**	**.00315**
Stddev	.00465	.00080	.00009	.00007	.00089
%RSD	.87319	481.74	.66384	22.634	28.294
#1	.52931	.00040	.01351	.00026	.00252
#2	.53588	-.00073	.01338	.00035	.00378
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-4-d Acquired: 11/15/2013 11:18:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00007**	**.00379**
Stddev	.00007	.00040
%RSD	88.671	10.654
#1	-.00012	.00408
#2	-.00003	.00351
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3451.0**	**5155.9**	**76764.**	**7302.2**
Stddev	8.0	22.5	264.	28.9
%RSD	.23110	.43571	.34441	.39530
#1	3456.6	5171.8	76951.	7322.6
#2	3445.3	5140.0	76577.	7281.8

Sample Name: 480-49305-g-5-d Acquired: 11/15/2013 11:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00037**	**.48698**	**.00241**	**.01478**	**.08924**
Stddev	.00023	.01042	.00026	.00013	.00001
%RSD	62.165	2.1387	10.947	.90784	.01055
#1	-.00021	.49435	.00222	.01468	.08923
#2	-.00053	.47962	.00260	.01487	.08924
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00045**	**1.2556**	**-.00003**	**.00075**	**-.00026**
Stddev	.00008	.0122	.00004	.00005	.00011
%RSD	17.836	.97046	115.08	6.9927	42.462
#1	.00051	1.2470	-.00006	.00072	-.00034
#2	.00040	1.2642	-.00001	.00079	-.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00077**	**.00350**	**.19349**	**.19372**	**-.00051**
Stddev	.00000	.00321	.03739	.00287	.00041
%RSD	.08872	91.818	19.325	1.4810	79.859
#1	.00077	.00123	.21992	.19169	-.00080
#2	.00077	.00577	.16705	.19575	-.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-5-d Acquired: 11/15/2013 11:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21707**	**.06632**	**.06362**	**-.00012**	**3.5534**
Stddev	.00081	.00022	.00051	.00002	.0106
%RSD	.37481	.32920	.79492	13.469	.29854
#1	.21765	.06647	.06398	-.00011	3.5459
#2	.21650	.06616	.06326	-.00013	3.5609
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**.00040**	**2.786**	**-.00089**	**-.00027**
Stddev	.00013	.00040	.009	.00169	.00078
%RSD	61.292	100.88	.3208	189.16	288.21
#1	.00030	.00011	2.780	-.00209	-.00082
#2	.00012	.00069	2.793	.00030	.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.55711**	**-.00030**	**.01343**	**.00066**	**.00504**
Stddev	.01903	.00007	.00010	.00038	.00120
%RSD	3.4166	22.445	.77345	56.945	23.883
#1	.57057	-.00035	.01336	.00040	.00589
#2	.54365	-.00025	.01351	.00093	.00419
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-5-d Acquired: 11/15/2013 11:20:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00004**	**.01144**
Stddev	.00006	.00045
%RSD	149.69	3.9210
#1	-.00000	.01113
#2	.00009	.01176
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3450.7**	**5167.1**	**75855.**	**7267.0**
Stddev	7.4	19.1	6.	44.5
%RSD	.21350	.36947	.00812	.61293
#1	3455.9	5180.6	75851.	7298.5
#2	3445.5	5153.6	75859.	7235.5

Sample Name: 480-49305-h-6-d Acquired: 11/15/2013 11:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00078**	**.17136**	**.00126**	**.01800**	**.06191**
Stddev	.00009	.01746	.00082	.00041	.00010
%RSD	11.958	10.189	65.400	2.2856	.15593
#1	-.00072	.18370	.00184	.01829	.06198
#2	-.00085	.15901	.00068	.01771	.06184
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**1.3186**	**.00002**	**.00058**	**-.00065**
Stddev	.00004	.0019	.00007	.00004	.00055
%RSD	18.002	.14597	372.89	6.5395	84.696
#1	.00021	1.3199	.00007	.00061	-.00104
#2	.00027	1.3172	-.00003	.00055	-.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00105**	**.01106**	**.17875**	**.15079**	**-.00041**
Stddev	.00021	.00593	.03656	.00029	.00080
%RSD	19.829	53.634	20.454	.19317	193.04
#1	.00090	.00686	.20460	.15100	.00015
#2	.00120	.01525	.15290	.15059	-.00097
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-h-6-d Acquired: 11/15/2013 11:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22510**	**.05710**	**.05484**	**-.00026**	**3.7841**
Stddev	.00327	.00012	.00068	.00015	.0008
%RSD	1.4530	.20872	1.2415	57.858	.02109
#1	.22741	.05718	.05436	-.00036	3.7836
#2	.22279	.05701	.05532	-.00015	3.7847
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00068**	**-.00080**	**1.954**	**.00008**	**.00072**
Stddev	.00012	.00225	.011	.00088	.00120
%RSD	17.654	282.21	.5389	1071.3	166.38
#1	.00076	-.00239	1.947	.00071	.00157
#2	.00059	.00079	1.962	-.00054	-.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.49059**	**-.00028**	**.01285**	**.00044**	**.00255**
Stddev	.00694	.00012	.00001	.00028	.00214
%RSD	1.4138	42.542	.05926	63.864	83.992
#1	.49550	-.00020	.01285	.00063	.00406
#2	.48569	-.00037	.01286	.00024	.00103
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-h-6-d Acquired: 11/15/2013 11:23:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.00986
Stddev	.00000	.00037
%RSD	70.785	3.7197
#1	.00000	.01012
#2	.00001	.00960
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3451.9	5140.9	75477.	7234.5
Stddev	8.3	7.0	109.	10.3
%RSD	.23984	.13608	.14422	.14217
#1	3457.7	5145.8	75554.	7241.8
#2	3446.0	5135.9	75400.	7227.2

Sample Name: 480-49305-f-7-c Acquired: 11/15/2013 11:25:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00064**	**.46648**	**.00256**	**.01645**	**.08176**
Stddev	.00022	.03711	.00008	.00029	.00024
%RSD	33.864	7.9561	3.2203	1.7415	.29649
#1	-.00049	.44024	.00262	.01625	.08193
#2	-.00079	.49273	.00250	.01666	.08159
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00043**	**1.3248**	**-.00004**	**.00057**	**-.00054**
Stddev	.00003	.0036	.00004	.00004	.00028
%RSD	7.8727	.27222	113.17	7.1001	51.487
#1	.00046	1.3223	-.00007	.00060	-.00074
#2	.00041	1.3274	-.00001	.00054	-.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00105**	**.02197**	**.20823**	**.18621**	**-.00049**
Stddev	.00003	.00126	.01481	.00115	.00034
%RSD	2.4330	5.7322	7.1146	.61733	68.737
#1	.00103	.02286	.19775	.18540	-.00073
#2	.00106	.02108	.21870	.18702	-.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-7-c Acquired: 11/15/2013 11:25:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21819**	**.06692**	**.06285**	**-.00008**	**3.7477**
Stddev	.00114	.00041	.00025	.00010	.0210
%RSD	.52359	.61789	.39585	134.48	.56145
#1	.21738	.06721	.06267	-.00015	3.7328
#2	.21899	.06662	.06302	-.00000	3.7626
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**-.00049**	**2.825**	**-.00043**	**.00007**
Stddev	.00033	.00240	.013	.00081	.00049
%RSD	63.091	493.52	.4529	189.71	696.33
#1	.00029	.00121	2.816	.00015	-.00027
#2	.00077	-.00218	2.834	-.00100	.00041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51564**	**-.00016**	**.01352**	**.00066**	**.00374**
Stddev	.00002	.00025	.00016	.00014	.00067
%RSD	.00302	149.70	1.1931	21.036	17.919
#1	.51565	.00001	.01341	.00056	.00326
#2	.51563	-.00034	.01363	.00076	.00421
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-7-c Acquired: 11/15/2013 11:25:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00007**	**.00945**
Stddev	.00013	.00000
%RSD	192.35	.02771
#1	.00002	.00945
#2	-.00016	.00945
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3443.0**	**5161.9**	**75666.**	**7259.9**
Stddev	13.5	20.8	171.	27.1
%RSD	.39245	.40390	.22599	.37396
#1	3452.6	5176.7	75545.	7279.1
#2	3433.5	5147.2	75787.	7240.7

Sample Name: 480-49305-g-8-d Acquired: 11/15/2013 11:28:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00134**	**.45381**	**.00223**	**.01849**	**.07780**
Stddev	.00004	.00840	.00014	.00007	.00018
%RSD	3.0944	1.8516	6.2318	.35343	.22673
#1	.00137	.45975	.00213	.01844	.07792
#2	.00131	.44787	.00232	.01853	.07767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00038**	**1.3184**	**.00003**	**.00064**	**-.00055**
Stddev	.00007	.0003	.00010	.00001	.00024
%RSD	18.454	.02016	374.46	1.8840	43.720
#1	.00043	1.3183	-.00004	.00063	-.00038
#2	.00033	1.3186	.00010	.00065	-.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**.00814**	**.22059**	**.18899**	**-.00032**
Stddev	.00014	.00183	.05577	.00124	.00005
%RSD	13.870	22.527	25.284	.65500	14.744
#1	.00115	.00684	.18115	.18812	-.00035
#2	.00094	.00944	.26002	.18987	-.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-8-d Acquired: 11/15/2013 11:28:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23099**	**.07312**	**.06964**	**-.00037**	**3.5689**
Stddev	.00146	.00018	.00096	.00004	.0272
%RSD	.63142	.24694	1.3738	10.195	.76337
#1	.22995	.07325	.07032	-.00035	3.5497
#2	.23202	.07299	.06897	-.00040	3.5882
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**-.00000**	**2.889**	**-.00147**	**-.00379**
Stddev	.00021	.00088	.001	.00132	.00104
%RSD	61.286	36755.	.0224	90.306	27.443
#1	.00020	.00062	2.888	-.00240	-.00452
#2	.00049	-.00062	2.889	-.00053	-.00305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.52343**	**-.00066**	**.01366**	**.00041**	**.00448**
Stddev	.00354	.00001	.00017	.00038	.00277
%RSD	.67695	.81171	1.2247	92.816	61.824
#1	.52593	-.00066	.01378	.00067	.00252
#2	.52092	-.00065	.01355	.00014	.00644
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-g-8-d Acquired: 11/15/2013 11:28:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00013**	**.01512**
Stddev	.00027	.00062
%RSD	214.26	4.0745
#1	.00032	.01468
#2	-.00006	.01555
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3450.0**	**5152.9**	**76473.**	**7293.6**
Stddev	8.3	13.3	12.	30.6
%RSD	.24069	.25826	.01584	.41936
#1	3455.9	5162.3	76481.	7315.2
#2	3444.1	5143.5	76464.	7271.9

Sample Name: CCV Acquired: 11/15/2013 11:30:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50004**	**25.594**	**.51416**	**.49763**	**.51339**	**.49355**	**24.601**
Stddev	.00253	.139	.00027	.00063	.00245	.00052	.065
%RSD	.50536	.54332	.05282	.12581	.47815	.10499	.26341
#1	.50183	25.692	.51397	.49807	.51513	.49391	24.647
#2	.49826	25.496	.51436	.49719	.51166	.49318	24.555
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49844**	**.49134**	**.50300**	**.51157**	**23.935**	**25.533**	**26.074**
Stddev	.00014	.00082	.00514	.00422	.013	.044	.369
%RSD	.02824	.16628	1.0213	.82406	.05616	.17371	1.4139
#1	.49854	.49077	.50663	.51455	23.944	25.565	26.335
#2	.49834	.49192	.49936	.50859	23.925	25.502	25.813
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51311**	**24.187**	**.49963**	**.49284**	**.50571**	**25.800**	**.49231**
Stddev	.00551	.087	.00119	.00166	.00085	.178	.00027
%RSD	1.0747	.35864	.23830	.33607	.16727	.69102	.05568
#1	.51701	24.249	.50047	.49401	.50511	25.926	.49250
#2	.50922	24.126	.49879	.49167	.50630	25.674	.49211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 11:30:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49510**	**25.22**	**.52344**	**.50760**	**24.850**	**.50540**	**.51341**
Stddev	.00183	.02	.00126	.01156	.007	.00183	.00193
%RSD	.37049	.0774	.24161	2.2782	.02904	.36274	.37670
#1	.49640	25.21	.52255	.51578	24.844	.50410	.51478
#2	.49381	25.24	.52434	.49943	24.855	.50669	.51204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.51117**	**.49573**	**.50542**	**.49449**
Stddev	.00320	.00093	.00334	.00164
%RSD	.62595	.18707	.66014	.33107
#1	.51344	.49639	.50778	.49565
#2	.50891	.49508	.50306	.49333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3192.5**	**4919.5**	**71972.**	**6964.4**
Stddev	2.8	13.9	424.	41.4
%RSD	.08653	.28220	.58936	.59454
#1	3190.6	4909.7	71672.	6935.1
#2	3194.5	4929.3	72271.	6993.7

Sample Name: CCB Acquired: 11/15/2013 11:32:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00047**	**.14496**	**.00384**	**-.00058**	**.00002**	**.00006**	**-.01493**
Stddev	.00031	.02060	.00219	.00010	.00002	.00007	.00008
%RSD	66.999	14.214	56.984	18.060	103.79	116.54	.55862
#1	-.00069	.15953	.00229	-.00066	.00000	.00011	-.01499
#2	-.00025	.13039	.00539	-.00051	.00003	.00001	-.01487
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**-.00002**	**-.00037**	**.00079**	**-.00190**	**.04065**	**.00056**
Stddev	.00007	.00004	.00043	.00004	.00083	.00231	.00039
%RSD	43.437	285.90	117.85	4.4809	43.764	5.6764	69.789
#1	.00012	.00002	-.00067	.00076	-.00131	.03902	.00028
#2	.00022	-.00005	-.00006	.00081	-.00249	.04229	.00084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00037**	**.00128**	**-.00001**	**-.00010**	**.00013**	**-.00218**	**.00011**
Stddev	.00073	.00199	.00004	.00027	.00032	.00866	.00040
%RSD	201.05	155.32	516.04	280.82	255.84	396.74	359.23
#1	-.00088	.00269	-.00003	.00010	-.00010	.00394	-.00017
#2	.00015	-.00013	.00002	-.00029	.00035	-.00831	.00039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 11:32:50 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00077	.0021	-.00080	-.00100	-.00006	.00029	-.00019
Stddev	.00019	.0009	.00186	.00004	.00033	.00030	.00008
%RSD	24.788	44.19	231.53	4.2905	551.92	103.11	39.862
#1	.00063	.0028	.00051	-.00097	.00017	.00008	-.00014
#2	.00090	.0014	-.00212	-.00103	-.00029	.00050	-.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00044	.00128	.00012	-.00024
Stddev	.00013	.00232	.00023	.00010
%RSD	29.120	180.98	198.59	40.968
#1	.00054	-.00036	-.00005	-.00017
#2	.00035	.00292	.00028	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3394.4	5043.4	75087.	7038.9
Stddev	.8	9.6	507.	2.1
%RSD	.02381	.19055	.67553	.02997
#1	3395.0	5050.2	75445.	7037.4
#2	3393.9	5036.6	74728.	7040.4

Sample Name: CCVL Acquired: 11/15/2013 11:35:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00262**	**.21363**	**.01227**	**.01960**	**.00224**	**.00213**	**.49624**
Stddev	.00013	.00377	.00205	.00058	.00002	.00011	.00179
%RSD	4.9600	1.7637	16.690	2.9385	.93102	5.1530	.36010
#1	.00253	.21630	.01372	.02001	.00226	.00221	.49750
#2	.00271	.21097	.01082	.01920	.00223	.00205	.49497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00110**	**.00400**	**.00391**	**.01078**	**.04443**	**.47721**	**.42862**
Stddev	.00003	.00005	.00037	.00027	.00444	.06422	.00279
%RSD	3.0372	1.1661	9.4367	2.5357	9.9830	13.457	.65096
#1	.00112	.00404	.00364	.01059	.04756	.52262	.42664
#2	.00107	.00397	.00417	.01097	.04129	.43181	.43059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02882**	**.20603**	**.00335**	**.00323**	**.00975**	**.96474**	**.00986**
Stddev	.00004	.00455	.00003	.00060	.00028	.00081	.00053
%RSD	.13472	2.2069	.91880	18.672	2.8775	.08423	5.4005
#1	.02884	.20281	.00337	.00366	.00995	.96531	.01024
#2	.02879	.20924	.00333	.00281	.00955	.96416	.00949
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 11:35:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00587	.2153	.02114	.01406	.49571	.01029	.00498
Stddev	.00104	.0038	.00080	.00050	.01111	.00031	.00002
%RSD	17.766	1.774	3.7857	3.5732	2.2419	3.0445	.37169
#1	.00661	.2180	.02057	.01441	.48785	.01007	.00500
#2	.00513	.2126	.02171	.01370	.50357	.01052	.00497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00488	.02231	.00511	.01060
Stddev	.00001	.00241	.00024	.00017
%RSD	.14864	10.818	4.7751	1.5875
#1	.00489	.02060	.00528	.01072
#2	.00488	.02402	.00494	.01048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3410.8	5092.7	75370.	7108.5
Stddev	3.0	4.5	136.	28.6
%RSD	.08807	.08870	.18010	.40263
#1	3408.7	5089.5	75466.	7128.7
#2	3412.9	5095.9	75274.	7088.2

Sample Name: 480-49305-f-9-d Acquired: 11/15/2013 11:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.41272**	**.00276**	**.03847**	**.07524**
Stddev	.00074	.00654	.00056	.00001	.00037
%RSD	207.32	1.5848	20.205	.02886	.49171
#1	-.00088	.40810	.00237	.03848	.07498
#2	.00017	.41735	.00316	.03846	.07550
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00027**	**1.2517**	**-.00006**	**.00067**	**-.00004**
Stddev	.00000	.0003	.00005	.00014	.00005
%RSD	1.4752	.02588	94.090	20.144	113.06
#1	.00027	1.2515	-.00002	.00058	-.00001
#2	.00028	1.2520	-.00009	.00077	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**.01140**	**.21203**	**.18653**	**-.00031**
Stddev	.00025	.00373	.03188	.00053	.00080
%RSD	26.664	32.722	15.035	.28296	259.68
#1	.00076	.01403	.23457	.18616	.00026
#2	.00111	.00876	.18949	.18691	-.00087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-9-d Acquired: 11/15/2013 11:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22522**	**.06507**	**.06252**	**-.00014**	**4.0505**
Stddev	.00044	.00001	.00120	.00021	.0004
%RSD	.19359	.02026	1.9226	148.51	.00919
#1	.22553	.06506	.06337	-.00030	4.0502
#2	.22491	.06508	.06167	.00001	4.0508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00049**	**-.00130**	**2.828**	**-.00075**	**-.00263**
Stddev	.00059	.00098	.006	.00100	.00283
%RSD	119.53	74.961	.2240	132.84	107.50
#1	.00090	-.00200	2.824	-.00146	-.00063
#2	.00008	-.00061	2.833	-.00005	-.00463
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.59215**	**-.00004**	**.01320**	**.00091**	**.00301**
Stddev	.03490	.00021	.00011	.00004	.00065
%RSD	5.8938	478.72	.79620	4.1369	21.559
#1	.61682	-.00020	.01312	.00088	.00255
#2	.56747	.00011	.01327	.00094	.00347
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49305-f-9-d Acquired: 11/15/2013 11:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00006	.00562
Stddev	.00010	.00042
%RSD	170.59	7.3839
#1	.00013	.00533
#2	-.00001	.00592
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3446.0	5165.2	75438.	7273.4
Stddev	12.9	32.2	649.	19.0
%RSD	.37479	.62404	.85995	.26149
#1	3455.2	5188.0	75897.	7286.9
#2	3436.9	5142.4	74980.	7260.0

Sample Name: 480-49303-a-1-f Acquired: 11/15/2013 11:40:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**.51398**	**.00196**	**.08266**	**.00953**
Stddev	.00043	.02029	.00003	.00038	.00003
%RSD	379.68	3.9466	1.5182	.45888	.29556
#1	.00019	.49964	.00194	.08239	.00955
#2	-.00042	.52833	.00198	.08293	.00951
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**5.7618**	**.00009**	**.00103**	**.00439**
Stddev	.00002	.0037	.00004	.00002	.00029
%RSD	13.988	.06441	48.306	1.6611	6.4905
#1	.00016	5.7644	.00006	.00102	.00459
#2	.00019	5.7592	.00012	.00104	.00419
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00234**	**.94866**	**.32535**	**.31554**	**.00328**
Stddev	.00023	.00511	.04453	.00083	.00029
%RSD	9.9331	.53893	13.686	.26149	8.7928
#1	.00250	.94505	.35684	.31496	.00348
#2	.00218	.95228	.29387	.31612	.00307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49303-a-1-f Acquired: 11/15/2013 11:40:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.0843**	**.04873**	**.04729**	**.00297**	**18.749**
Stddev	.0070	.00011	.00032	.00013	.026
%RSD	.33645	.22977	.68632	4.4014	.14115
#1	2.0793	.04865	.04706	.00306	18.730
#2	2.0892	.04881	.04752	.00288	18.767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00164**	**.00148**	**2.640**	**-.00192**	**-.00156**
Stddev	.00034	.00072	.008	.00073	.00005
%RSD	20.487	48.520	.3064	38.107	2.9518
#1	.00187	.00097	2.646	-.00243	-.00152
#2	.00140	.00199	2.634	-.00140	-.00159
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4907**	**-.00015**	**.00869**	**.01377**	**.00366**
Stddev	.0195	.00010	.00001	.00015	.00134
%RSD	1.3110	67.957	.07660	1.0880	36.577
#1	1.4768	-.00008	.00870	.01388	.00272
#2	1.5045	-.00022	.00869	.01367	.00461
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49303-a-1-f Acquired: 11/15/2013 11:40:07 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00250	.01029
Stddev	.00016	.00024
%RSD	6.3827	2.3588
#1	.00261	.01012
#2	.00239	.01046
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3384.3	5059.5	73667.	7206.1
Stddev	3.5	.0	168.	15.1
%RSD	.10222	.00084	.22815	.20946
#1	3386.7	5059.5	73786.	7216.7
#2	3381.8	5059.5	73548.	7195.4

Sample Name: 480-49303-a-2-d Acquired: 11/15/2013 11:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**.52302**	**.00623**	**.05243**	**.01406**
Stddev	.00037	.01195	.00122	.00036	.00002
%RSD	115.54	2.2839	19.556	.67971	.11327
#1	.00057	.51457	.00537	.05218	.01405
#2	.00006	.53147	.00709	.05268	.01407
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**6.7673**	**.00017**	**.00088**	**.00073**
Stddev	.00004	.0242	.00012	.00014	.00038
%RSD	19.984	.35710	73.976	15.309	51.332
#1	.00019	6.7843	.00025	.00079	.00100
#2	.00025	6.7502	.00008	.00098	.00047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00192**	**.94681**	**.20223**	**.19999**	**.00285**
Stddev	.00013	.00163	.01592	.00149	.00004
%RSD	6.7120	.17166	7.8726	.74658	1.3118
#1	.00201	.94796	.21349	.20105	.00282
#2	.00183	.94566	.19098	.19893	.00287
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49303-a-2-d Acquired: 11/15/2013 11:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.7458**	**.06280**	**.05992**	**.00280**	**5.8133**
Stddev	.0045	.00017	.00031	.00002	.0181
%RSD	.25717	.27678	.52244	.67540	.31043
#1	1.7426	.06268	.06014	.00282	5.8261
#2	1.7489	.06293	.05970	.00279	5.8006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00229**	**.00128**	**3.537**	**-.00156**	**-.00293**
Stddev	.00008	.00076	.015	.00018	.00188
%RSD	3.3925	59.484	.4327	11.383	64.044
#1	.00234	.00074	3.526	-.00169	-.00160
#2	.00223	.00182	3.548	-.00144	-.00426
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4754**	**.00070**	**.00935**	**.01232**	**.00424**
Stddev	.0164	.00009	.00008	.00009	.00125
%RSD	1.1133	12.491	.81271	.71516	29.396
#1	1.4870	.00076	.00940	.01239	.00336
#2	1.4638	.00064	.00930	.01226	.00512
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49303-a-2-d Acquired: 11/15/2013 11:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00379	.01638
Stddev	.00015	.00011
%RSD	3.8580	.64350
#1	.00369	.01646
#2	.00389	.01631
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3422.1	5107.7	73937.	7218.1
Stddev	6.3	21.8	227.	17.3
%RSD	.18389	.42602	.30745	.23916
#1	3426.5	5123.1	74097.	7205.9
#2	3417.6	5092.3	73776.	7230.3

Sample Name: lcs 480-149467/18-b Acquired: 11/15/2013 11:44:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05194**	**10.838**	**.21269**	**.21155**	**.22488**
Stddev	.00065	.009	.00439	.00015	.00205
%RSD	1.2568	.08194	2.0627	.07071	.91068
#1	.05148	10.844	.21579	.21165	.22343
#2	.05240	10.832	.20959	.21144	.22633
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20779**	**10.296**	**.20538**	**.20495**	**.21491**
Stddev	.00054	.035	.00082	.00055	.00324
%RSD	.26039	.34343	.39926	.26758	1.5054
#1	.20817	10.271	.20596	.20534	.21262
#2	.20741	10.321	.20480	.20456	.21719
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21747**	**10.167**	**10.463**	**10.579**	**.21545**
Stddev	.00201	.007	.043	.110	.00046
%RSD	.92540	.06847	.40649	1.0360	.21126
#1	.21604	10.172	10.494	10.501	.21513
#2	.21889	10.162	10.433	10.656	.21578
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149467/18-b Acquired: 11/15/2013 11:44:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.645**	**.20671**	**.20031**	**.21542**	**10.644**
Stddev	.019	.00020	.00131	.00115	.039
%RSD	.17866	.09737	.65610	.53315	.36935
#1	10.631	.20657	.19938	.21623	10.672
#2	10.658	.20686	.20124	.21460	10.617
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20148**	**.20831**	**10.24**	**.20878**	**.20888**
Stddev	.00079	.00135	.01	.00149	.00121
%RSD	.39058	.64583	.1334	.71366	.57752
#1	.20204	.20736	10.25	.20983	.20974
#2	.20092	.20927	10.23	.20773	.20803
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.242**	**.20340**	**.21702**	**.20655**	**.20703**
Stddev	.047	.00056	.00056	.00111	.00179
%RSD	.46127	.27380	.26011	.53721	.86564
#1	10.209	.20379	.21742	.20576	.20576
#2	10.276	.20300	.21662	.20733	.20829
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149467/18-b Acquired: 11/15/2013 11:44:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.22030	.20677
Stddev	.00300	.00136
%RSD	1.3635	.65988
#1	.21818	.20580
#2	.22242	.20773
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3305.0	4991.8	72657.	6970.0
Stddev	4.9	1.7	635.	33.4
%RSD	.14886	.03475	.87440	.47927
#1	3301.5	4990.5	73106.	6993.6
#2	3308.5	4993.0	72207.	6946.3

Sample Name: 480-48473-b-15-a@100 Acquired: 11/15/2013 11:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**.64965**	F **-.01631**	**.00358**	**.00914**
Stddev	.00047	.02188	.00294	.00059	.00003
%RSD	118.90	3.3680	18.032	16.416	.35609
#1	-.00073	.66513	-.01423	.00399	.00912
#2	-.00006	.63418	-.01839	.00316	.00916
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**5.6788**	**.00061**	**.58411**	**.53878**
Stddev	.00006	.0599	.00004	.00050	.00098
%RSD	45.993	1.0541	6.9199	.08538	.18195
#1	.00018	5.7212	.00058	.58376	.53808
#2	.00009	5.6365	.00064	.58446	.53947
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03321**	**4.2949**	**.01516**	**.03053**	**.00097**
Stddev	.00015	.0175	.01862	.00028	.00028
%RSD	.45988	.40805	122.89	.92133	29.418
#1	.03310	4.3073	.00199	.03073	.00077
#2	.03332	4.2826	.02832	.03033	.00117
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-b-15-a@100 Acquired: 11/15/2013 11:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.44049**	**.04249**	**.03978**	**.16926**	**.01843**
Stddev	.00503	.00009	.00040	.00135	.01754
%RSD	1.1427	.20759	.99548	.79813	95.201
#1	.44405	.04243	.03950	.16830	.03083
#2	.43693	.04256	.04006	.17021	.00602
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.1793**	**.02042**	**.0556**	**-.00832**	**-.00254**
Stddev	.0010	.00172	.0015	.00135	.00079
%RSD	.03198	8.4185	2.621	16.236	31.030
#1	3.1786	.02164	.0545	-.00927	-.00198
#2	3.1800	.01920	.0566	-.00736	-.00309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22371**	**.00243**	**.00898**	**.16087**	**.00106**
Stddev	.00752	.00011	.00002	.00070	.00161
%RSD	3.3608	4.5108	.16814	.43259	152.09
#1	.21840	.00251	.00897	.16037	.00220
#2	.22903	.00235	.00899	.16136	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48473-b-15-a@100 Acquired: 11/15/2013 11:47:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.01481	.05227
Stddev	.00010	.00031
%RSD	.70800	.59137
#1	.01474	.05249
#2	.01489	.05205
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3363.8	5048.5	74726.	6965.9
Stddev	5.1	12.2	74.	53.0
%RSD	.15132	.24230	.09903	.76148
#1	3367.4	5057.2	74779.	6928.4
#2	3360.2	5039.9	74674.	7003.4

Sample Name: 480-49577-a-1-e@50 Acquired: 11/15/2013 11:49:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00050**	**-.01581**	**-.00193**	**.04435**	**.01257**
Stddev	.00005	.02528	.00072	.00023	.00010
%RSD	9.6972	159.86	37.329	.51636	.79604
#1	-.00053	.00206	-.00243	.04419	.01264
#2	-.00046	-.03369	-.00142	.04451	.01250
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**21.669**	**.00038**	**.00213**	**.10322**
Stddev	.00000	.065	.00004	.00002	.00059
%RSD	2.0485	.30181	9.4041	.80383	.57297
#1	.00005	21.716	.00035	.00215	.10363
#2	.00005	21.623	.00041	.00212	.10280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00159**	**-.00568**	**1.8650**	**2.0161**	**.00113**
Stddev	.00004	.00501	.0023	.0210	.00092
%RSD	2.3077	88.279	.12522	1.0410	81.261
#1	.00156	-.00213	1.8666	2.0309	.00178
#2	.00161	-.00923	1.8633	2.0013	.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-a-1-e@50 Acquired: 11/15/2013 11:49:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67762**	**.01267**	**.01233**	**.00376**	**41.007**
Stddev	.00038	.00007	.00018	.00010	.054
%RSD	.05647	.58809	1.4274	2.6365	.13133
#1	.67735	.01272	.01245	.00383	41.045
#2	.67789	.01262	.01220	.00369	40.968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00065**	**.00016**	**.3773**	**-.00127**	**.00169**
Stddev	.00041	.00133	.0005	.00069	.00094
%RSD	63.091	823.45	.1274	53.953	55.570
#1	.00094	.00110	.3776	-.00079	.00235
#2	.00036	-.00078	.3769	-.00176	.00102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.75681**	**-.00006**	**.04613**	**.00087**	**.00154**
Stddev	.01507	.00045	.00003	.00009	.00010
%RSD	1.9912	765.23	.07149	10.587	6.2984
#1	.76747	-.00038	.04611	.00094	.00161
#2	.74616	.00026	.04615	.00081	.00148
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49577-a-1-e@50 Acquired: 11/15/2013 11:49:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00052	.05381
Stddev	.00011	.00001
%RSD	22.239	.01229
#1	.00043	.05380
#2	.00060	.05381
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3259.4	4931.8	71438.	6968.6
Stddev	2.8	8.2	225.	16.4
%RSD	.08729	.16597	.31445	.23499
#1	3257.4	4937.6	71279.	6957.0
#2	3261.4	4926.1	71596.	6980.2

Sample Name: 480-48453-e-5-a Acquired: 11/15/2013 11:52:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00011	.03610	.01879	.32880	.51640
Stddev	.00038	.01836	.00001	.00024	.00110
%RSD	337.70	50.866	.05593	.07272	.21237
#1	.00038	.04908	.01880	.32863	.51562
#2	-.00016	.02311	.01879	.32897	.51718
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00014	133.69	.00014	.00232	.00085
Stddev	.00009	.10	.00022	.00023	.00045
%RSD	60.852	.07424	150.89	10.089	52.769
#1	.00008	133.76	-.00001	.00248	.00053
#2	.00020	133.62	.00029	.00215	.00116
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.00236	37.486	7.2542	9.1564	.02228
Stddev	.00006	.025	.0273	.0458	.00033
%RSD	2.6542	.06583	.37656	.49974	1.4639
#1	.00240	37.504	7.2349	9.1241	.02251
#2	.00232	37.469	7.2735	9.1888	.02205
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-e-5-a Acquired: 11/15/2013 11:52:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.115**	**4.1491**	**4.3236**	**.00225**	**65.642**
Stddev	.049	.0089	.0095	.00007	.311
%RSD	.13675	.21520	.22074	3.1211	.47366
#1	36.080	4.1428	4.3303	.00220	65.422
#2	36.150	4.1554	4.3169	.00230	65.862
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00820**	F **-.00557**	F **12.18**	**-.00150**	**.00074**
Stddev	.00066	.00046	.00	.00151	.00059
%RSD	8.0583	8.3230	.0088	100.88	79.137
#1	.00866	-.00589	12.18	-.00257	.00033
#2	.00773	-.00524	12.18	-.00043	.00116
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.652**	**.00047**	**1.1258**	**.00101**	**.00157**
Stddev	.059	.00021	.0006	.00000	.00152
%RSD	.17513	43.700	.05538	.26148	96.573
#1	33.693	.00061	1.1253	.00102	.00050
#2	33.610	.00032	1.1262	.00101	.00265
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48453-e-5-a Acquired: 11/15/2013 11:52:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00046**	**.00496**
Stddev	.00025	.00057
%RSD	55.049	11.467
#1	.00064	.00456
#2	.00028	.00536
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3050.7**	**4759.1**	**69390.**	**7004.3**
Stddev	1.0	2.5	70.	22.2
%RSD	.03253	.05218	.10059	.31654
#1	3050.0	4757.4	69439.	7019.9
#2	3051.4	4760.9	69341.	6988.6

Sample Name: 480-48472-b-3-a@500 Acquired: 11/15/2013 11:54:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**.15055**	**-.00302**	**-.00027**	**.00284**
Stddev	.00014	.00157	.00171	.00044	.00002
%RSD	112.71	1.0450	56.500	163.04	.82492
#1	-.00003	.15166	-.00423	.00004	.00282
#2	-.00022	.14943	-.00181	-.00058	.00286
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**1.0584**	**.00031**	**.01613**	**.16159**
Stddev	.00005	.0026	.00001	.00008	.00032
%RSD	41.024	.24364	3.6250	.49654	.19507
#1	.00016	1.0566	.00032	.01619	.16137
#2	.00009	1.0602	.00031	.01607	.16181
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02193**	**3.0880**	**.02389**	**.00893**	**-.00001**
Stddev	.00008	.0033	.05501	.00004	.00002
%RSD	.34384	.10735	230.25	.40571	359.74
#1	.02198	3.0903	.06278	.00891	.00001
#2	.02188	3.0856	-.01501	.00896	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-b-3-a@500 Acquired: 11/15/2013 11:54:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09304**	**.02239**	**.02090**	**.01415**	**.00699**
Stddev	.00011	.00007	.00041	.00014	.00734
%RSD	.11656	.29670	1.9655	.95616	105.01
#1	.09311	.02244	.02119	.01425	.01218
#2	.09296	.02234	.02060	.01406	.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19001**	**.00923**	**.0149**	**-.00210**	**.00288**
Stddev	.00007	.00162	.0024	.00073	.00278
%RSD	.03613	17.572	15.87	34.478	96.405
#1	.19006	.01037	.0165	-.00262	.00092
#2	.18996	.00808	.0132	-.00159	.00484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04075**	**.00151**	**.00198**	**.01033**	**.00300**
Stddev	.00310	.00027	.00011	.00018	.00028
%RSD	7.6077	17.708	5.5311	1.7046	9.3440
#1	.04295	.00132	.00206	.01046	.00280
#2	.03856	.00170	.00190	.01021	.00320
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-b-3-a@500 Acquired: 11/15/2013 11:54:32 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00257	.02432
Stddev	.00021	.00111
%RSD	8.3196	4.5725
#1	.00272	.02354
#2	.00242	.02511
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3358.4	5031.5	74586.	6982.5
Stddev	.1	8.0	162.	28.4
%RSD	.00249	.15897	.21739	.40695
#1	3358.5	5025.9	74701.	6962.4
#2	3358.3	5037.2	74472.	7002.6

Sample Name: 48472-b-3-a SD@2500 Acquired: 11/15/2013 11:56:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**.03150**	**.00154**	**-.00086**	**.00065**
Stddev	.00031	.03294	.00005	.00045	.00001
%RSD	61.359	104.59	3.2239	51.974	1.9819
#1	-.00073	.05479	.00158	-.00118	.00064
#2	-.00029	.00820	.00150	-.00055	.00065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**.20369**	**.00012**	**.00319**	**.03202**
Stddev	.00013	.00494	.00008	.00007	.00062
%RSD	107.93	2.4254	66.638	2.2694	1.9393
#1	.00003	.20019	.00018	.00314	.03158
#2	.00021	.20718	.00006	.00324	.03245
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00496**	**.60656**	**.00486**	**.00114**	**.00020**
Stddev	.00021	.00721	.02412	.00011	.00051
%RSD	4.3219	1.1895	496.07	9.2641	249.76
#1	.00481	.61166	-.01219	.00121	.00057
#2	.00511	.60146	.02191	.00107	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-a SD@2500 Acquired: 11/15/2013 11:56:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01749**	**.00444**	**.00420**	**.00255**	**.00075**
Stddev	.00210	.00011	.00038	.00010	.00065
%RSD	11.998	2.4777	9.1581	3.7434	86.782
#1	.01897	.00452	.00392	.00262	.00122
#2	.01600	.00437	.00447	.00249	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03739**	**.00204**	**.0035**	**-.00129**	**.00235**
Stddev	.00008	.00050	.0024	.00282	.00200
%RSD	.22131	24.265	69.32	218.49	85.302
#1	.03745	.00239	.0052	.00070	.00093
#2	.03733	.00169	.0018	-.00328	.00377
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01449**	**.00072**	**.00034**	**.00251**	**.00217**
Stddev	.00048	.00009	.00009	.00018	.00133
%RSD	3.2871	12.061	28.236	7.1017	61.104
#1	-.01416	.00066	.00040	.00263	.00311
#2	-.01483	.00079	.00027	.00238	.00123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-a SD@2500 Acquired: 11/15/2013 11:56:57 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00067	.00506
Stddev	.00012	.00001
%RSD	18.233	.29321
#1	.00075	.00505
#2	.00058	.00507
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3368.8	5050.8	74640.	6961.0
Stddev	.5	8.3	234.	14.2
%RSD	.01472	.16354	.31410	.20426
#1	3369.1	5044.9	74806.	6951.0
#2	3368.4	5056.6	74474.	6971.1

Sample Name: CCV Acquired: 11/15/2013 11:59:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50524**	**25.622**	**.50742**	**.49255**	**.51050**	**.49095**	**24.879**
Stddev	.00213	.075	.00144	.00122	.00045	.00038	.108
%RSD	.42118	.29227	.28293	.24756	.08836	.07678	.43567
#1	.50373	25.675	.50844	.49169	.51082	.49121	24.802
#2	.50674	25.569	.50641	.49342	.51018	.49068	24.956
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49320**	**.49148**	**.51911**	**.51843**	**23.986**	**25.466**	**25.603**
Stddev	.00027	.00059	.00233	.00548	.064	.009	.336
%RSD	.05397	.11997	.44889	1.0572	.26607	.03571	1.3122
#1	.49339	.49107	.51747	.51455	23.941	25.459	25.366
#2	.49302	.49190	.52076	.52230	24.031	25.472	25.841
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50641**	**24.368**	**.50126**	**.50229**	**.50013**	**25.730**	**.48924**
Stddev	.00171	.110	.00047	.00126	.00055	.034	.00138
%RSD	.33758	.44945	.09421	.25064	.10995	.13238	.28157
#1	.50762	24.291	.50092	.50140	.49975	25.754	.49022
#2	.50520	24.446	.50159	.50318	.50052	25.706	.48827
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 11:59:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49265	25.27	.52192	.49552	24.988	.51134	.51600
Stddev	.00254	.01	.00182	.00148	.087	.00184	.00076
%RSD	.51628	.0383	.34898	.29844	.34924	.36026	.14764
#1	.49085	25.28	.52321	.49447	24.927	.51264	.51546
#2	.49444	25.26	.52064	.49656	25.050	.51004	.51654
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51694	.49642	.52038	.50482
Stddev	.00171	.00232	.00455	.00056
%RSD	.33144	.46828	.87511	.11101
#1	.51572	.49807	.51716	.50442
#2	.51815	.49478	.52360	.50521
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3188.7	4954.2	71106.	6981.7
Stddev	.4	3.2	357.	23.3
%RSD	.01219	.06512	.50174	.33380
#1	3188.4	4956.5	71358.	6998.2
#2	3189.0	4951.9	70853.	6965.2

Sample Name: CCB Acquired: 11/15/2013 12:01:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**.15578**	**.00100**	**-.00031**	**-.00001**	**.00010**	**-.01458**
Stddev	.00058	.04174	.00146	.00000	.00000	.00002	.00612
%RSD	299.34	26.791	146.62	1.1711	17.132	20.155	41.990
#1	-.00022	.18529	-.00004	-.00032	-.00001	.00009	-.01025
#2	.00060	.12627	.00203	-.00031	-.00001	.00012	-.01890
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**.00008**	**-.00011**	**.00079**	**-.00375**	**.04156**	**.00070**
Stddev	.00000	.00010	.00061	.00013	.00371	.01067	.00052
%RSD	1.3487	125.17	566.37	16.340	98.990	25.668	73.818
#1	.00012	.00001	.00032	.00070	-.00112	.03402	.00033
#2	.00012	.00016	-.00054	.00088	-.00637	.04911	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**-.00232**	**.00004**	**-.00084**	**.00009**	**-.00309**	**.00011**
Stddev	.00029	.00447	.00004	.00071	.00012	.00285	.00008
%RSD	72.151	192.99	104.42	83.954	139.73	92.105	70.742
#1	-.00020	-.00548	.00007	-.00034	.00000	-.00108	.00005
#2	-.00061	.00084	.00001	-.00134	.00018	-.00510	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 12:01:46 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00040	F .0038	.00077	-.00065	.00088	.00022	.00002
Stddev	.00127	.0020	.00140	.00077	.01037	.00025	.00023
%RSD	317.13	52.19	181.24	118.29	1175.9	113.28	1407.4
#1	.00129	.0024	.00176	-.00011	.00822	.00004	-.00015
#2	-.00050	.0052	-.00022	-.00120	-.00645	.00040	.00018
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00019	.00116	-.00007	.00016
Stddev	.00022	.00003	.00013	.00024
%RSD	118.06	2.4639	177.64	150.58
#1	.00035	.00114	-.00016	.00032
#2	.00003	.00118	.00002	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3388.6	5079.1	74959.	7024.7
Stddev	12.2	19.0	62.	.6
%RSD	.35979	.37409	.08265	.00883
#1	3397.2	5092.5	74916.	7025.2
#2	3380.0	5065.6	75003.	7024.3

Sample Name: CCVL Acquired: 11/15/2013 12:04:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00234**	**.22584**	**.00963**	**.01909**	**.00227**	**.00212**	**.49221**
Stddev	.00042	.01547	.00009	.00016	.00001	.00003	.00093
%RSD	17.989	6.8514	.94338	.84049	.43431	1.3966	.18872
#1	.00264	.21490	.00957	.01921	.00228	.00214	.49286
#2	.00204	.23678	.00970	.01898	.00226	.00210	.49155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00099**	**.00409**	**.00371**	**.01115**	**.04298**	**.47905**	**.41811**
Stddev	.00004	.00011	.00031	.00023	.00714	.03006	.00207
%RSD	4.0719	2.6721	8.3826	2.0306	16.616	6.2757	.49599
#1	.00097	.00402	.00393	.01131	.03793	.45779	.41958
#2	.00102	.00417	.00349	.01099	.04803	.50031	.41665
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02879**	**.21060**	**.00332**	**.00338**	**.00991**	**.97320**	**.00997**
Stddev	.00050	.00287	.00002	.00081	.00006	.02003	.00034
%RSD	1.7502	1.3629	.61425	23.829	.61498	2.0584	3.3780
#1	.02915	.20857	.00333	.00281	.00995	.95903	.01020
#2	.02843	.21263	.00331	.00395	.00987	.98736	.00973
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 12:04:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00295	.2153	.02000	.01725	.49930	.00978	.00499
Stddev	.00061	.0035	.00072	.00168	.01899	.00042	.00002
%RSD	20.606	1.623	3.5981	9.7384	3.8031	4.2475	.39157
#1	.00338	.2128	.02051	.01607	.48587	.00949	.00498
#2	.00252	.2178	.01949	.01844	.51273	.01008	.00501
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00500						
Range	-30.000%						

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00519	.02261	.00495	.01085
Stddev	.00031	.00079	.00015	.00041
%RSD	6.0311	3.4940	3.1235	3.7906
#1	.00541	.02317	.00484	.01056
#2	.00497	.02205	.00506	.01114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3395.9	5113.5	75055.	7100.2
Stddev	5.2	16.5	111.	11.9
%RSD	.15236	.32237	.14723	.16791
#1	3399.5	5125.2	74977.	7108.6
#2	3392.2	5101.9	75133.	7091.8

Sample Name: 48472-b-3-aPDS@500 Acquired: 11/15/2013 12:06:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00862**	**7.4169**	**.11627**	**.12950**	**.15111**
Stddev	.00009	.0602	.00145	.00043	.00016
%RSD	1.0964	.81130	1.2508	.33581	.10325
#1	.00869	7.4595	.11729	.12981	.15100
#2	.00856	7.3744	.11524	.12919	.15122
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13142**	**7.5870**	**.12212**	**.14062**	**.30063**
Stddev	.00086	.0007	.00059	.00121	.00242
%RSD	.65129	.00931	.48386	.86201	.80413
#1	.13202	7.5865	.12254	.14148	.29892
#2	.13081	7.5875	.12170	.13977	.30234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.15446**	**9.5774**	**6.5908**	**6.1954**	**.13616**
Stddev	.00048	.0164	.0096	.0162	.00020
%RSD	.31300	.17088	.14617	.26175	.14441
#1	.15411	9.5890	6.5976	6.2069	.13602
#2	.15480	9.5658	6.5840	6.1840	.13630
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-aPDS@500 Acquired: 11/15/2013 12:06:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.6610**	**.15155**	**.14860**	**.14492**	**6.7604**
Stddev	.0186	.00010	.00040	.00101	.0127
%RSD	.27855	.06400	.27047	.69691	.18819
#1	6.6742	.15162	.14831	.14563	6.7694
#2	6.6479	.15148	.14888	.14421	6.7514
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.31192**	**.13124**	**.0101**	**.12026**	**.11971**
Stddev	.00010	.00070	.0027	.00093	.00097
%RSD	.03281	.53567	26.38	.76939	.80914
#1	.31185	.13174	.0120	.12091	.12040
#2	.31199	.13074	.0082	.11960	.11903
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.5347**	**.08357**	**.14619**	**.14116**	**.11561**
Stddev	.0264	.00051	.00026	.00051	.00007
%RSD	.74709	.61034	.18062	.36445	.05989
#1	3.5534	.08321	.14601	.14153	.11566
#2	3.5160	.08393	.14638	.14080	.11556
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-aPDS@500 Acquired: 11/15/2013 12:06:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.14169**	**.15475**
Stddev	.00020	.00013
%RSD	.13823	.08710
#1	.14183	.15466
#2	.14155	.15485
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3302.7**	**5022.0**	**72285.**	**6962.3**
Stddev	2.3	1.5	336.	29.0
%RSD	.06961	.03026	.46487	.41672
#1	3304.3	5020.9	72523.	6982.8
#2	3301.1	5023.0	72047.	6941.8

Sample Name: 48472-b-3-b ms Acquired: 11/15/2013 12:08:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**.24941**	**.00078**	**.00030**	**.00474**
Stddev	.00001	.00727	.00131	.00013	.00004
%RSD	5.5050	2.9138	167.78	43.841	.83327
#1	.00026	.24427	-.00015	.00021	.00477
#2	.00024	.25455	.00171	.00039	.00471
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00097**	**.66174**	**.00107**	**.00570**	**.02931**
Stddev	.00009	.00166	.00006	.00020	.00061
%RSD	9.1542	.25127	6.0440	3.5874	2.0980
#1	.00091	.66057	.00103	.00584	.02974
#2	.00103	.66292	.00112	.00555	.02887
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04413**	**4.9973**	**.09718**	**.04765**	**.00122**
Stddev	.00017	.0083	.03683	.00012	.00040
%RSD	.38738	.16688	37.901	.24746	32.318
#1	.04425	4.9914	.07114	.04774	.00094
#2	.04401	5.0032	.12323	.04757	.00150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-b ms Acquired: 11/15/2013 12:08:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11639**	**.04215**	**.03887**	**.01046**	**.05048**
Stddev	.00030	.00011	.00102	.00018	.00181
%RSD	.25557	.26159	2.6247	1.6952	3.5775
#1	.11617	.04207	.03815	.01058	.05176
#2	.11660	.04222	.03960	.01033	.04920
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04829**	**.01130**	**.0515**	**.00141**	**.00132**
Stddev	.00007	.00091	.0055	.00074	.00189
%RSD	.14507	8.0277	10.69	52.328	143.75
#1	.04834	.01194	.0476	.00194	-.00002
#2	.04824	.01066	.0554	.00089	.00265
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03561**	**.00383**	**.00286**	**.01513**	**.00206**
Stddev	.02784	.00019	.00002	.00009	.00074
%RSD	78.201	5.0411	.53516	.56294	36.183
#1	.05529	.00369	.00287	.01507	.00153
#2	.01592	.00396	.00285	.01519	.00258
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-b ms Acquired: 11/15/2013 12:08:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00353	.03003
Stddev	.00023	.00006
%RSD	6.4017	.19175
#1	.00369	.02999
#2	.00337	.03007
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3362.3	5059.7	73854.	6960.4
Stddev	5.8	6.1	174.	4.9
%RSD	.17246	.12110	.23515	.07080
#1	3358.2	5055.4	73731.	6963.9
#2	3366.4	5064.0	73977.	6956.9

Sample Name: 48472-b-3-c msd Acquired: 11/15/2013 12:11:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**.74837**	**.00034**	**.01961**	**.04805**
Stddev	.00037	.01383	.00048	.00029	.00014
%RSD	209.31	1.8486	141.88	1.4565	.28669
#1	-.00008	.73859	-.00000	.01981	.04795
#2	.00043	.75815	.00067	.01941	.04815
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00084**	**1.1940**	**.00109**	**.01772**	**.03759**
Stddev	.00008	.0152	.00008	.00001	.00006
%RSD	10.037	1.2715	7.6650	.03774	.16794
#1	.00078	1.1833	.00115	.01771	.03764
#2	.00090	1.2048	.00103	.01772	.03755
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04174**	**3.0384**	**.09206**	**.05265**	**.00111**
Stddev	.00053	.0086	.01533	.00087	.00129
%RSD	1.2805	.28288	16.648	1.6449	116.09
#1	.04137	3.0323	.08123	.05204	.00202
#2	.04212	3.0445	.10290	.05326	.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-c msd Acquired: 11/15/2013 12:11:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.19765**	**.03695**	**.03429**	**.00997**	**.06958**
Stddev	.00169	.00022	.00016	.00005	.01115
%RSD	.85362	.60071	.48012	.48164	16.027
#1	.19884	.03711	.03441	.01000	.06169
#2	.19646	.03680	.03418	.00993	.07746
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13606**	**.01695**	**.0499**	**-.00091**	**-.00060**
Stddev	.00019	.00124	.0020	.00009	.00106
%RSD	.14300	7.3118	3.976	9.6228	176.59
#1	.13592	.01608	.0513	-.00097	.00015
#2	.13620	.01783	.0485	-.00085	-.00136
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03064**	**.00173**	**.00343**	**.01235**	**.00399**
Stddev	.00152	.00014	.00008	.00007	.00224
%RSD	4.9638	8.2285	2.2792	.58179	56.037
#1	.03172	.00163	.00338	.01240	.00241
#2	.02957	.00183	.00349	.01230	.00557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 48472-b-3-c msd Acquired: 11/15/2013 12:11:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00321	.08486
Stddev	.00004	.00010
%RSD	1.2359	.11700
#1	.00318	.08479
#2	.00324	.08493
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3350.0	5049.3	73637.	6959.6
Stddev	2.0	.4	26.	52.0
%RSD	.05860	.00778	.03467	.74777
#1	3351.4	5049.5	73656.	6996.4
#2	3348.6	5049.0	73619.	6922.8

Sample Name: 480-48472-a-4-a@500 Acquired: 11/15/2013 12:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00093**	**.10144**	F **-.03095**	**-.00088**	**.00565**
Stddev	.00048	.01246	.00227	.00002	.00000
%RSD	52.074	12.285	7.3280	2.3094	.04827
#1	-.00059	.09263	-.02934	-.00086	.00565
#2	-.00127	.11026	-.03255	-.00089	.00564
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			30.000		
Low Limit			-.01000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**1.3809**	**.00037**	**.00547**	**.94562**
Stddev	.00003	.0052	.00012	.00005	.00126
%RSD	20.999	.37635	31.299	.98251	.13316
#1	.00017	1.3846	.00045	.00551	.94473
#2	.00013	1.3773	.00029	.00543	.94651
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03068**	**4.3692**	**-.01149**	**.00895**	**-.00020**
Stddev	.00003	.0193	.00519	.00017	.00028
%RSD	.11397	.44176	45.146	1.8437	138.95
#1	.03070	4.3556	-.01516	.00907	-.00040
#2	.03065	4.3828	-.00783	.00884	-.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-a-4-a@500 Acquired: 11/15/2013 12:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14360**	**.09618**	**.08924**	**.02181**	**.00285**
Stddev	.00238	.00002	.00007	.00047	.00987
%RSD	1.6607	.01846	.07815	2.1725	346.90
#1	.14529	.09619	.08919	.02215	.00983
#2	.14191	.09617	.08929	.02148	-.00414
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.46660**	**.01194**	**.0138**	**-.01285**	**.00010**
Stddev	.00057	.00069	.0035	.00112	.00080
%RSD	.12214	5.7777	25.39	8.7435	773.10
#1	.46620	.01243	.0113	-.01365	-.00046
#2	.46701	.01145	.0163	-.01206	.00067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02644**	**.00260**	**.00221**	**.00257**	**.00269**
Stddev	.00478	.00025	.00001	.00006	.00134
%RSD	18.090	9.6531	.58725	2.2923	49.854
#1	.02306	.00242	.00222	.00261	.00174
#2	.02982	.00278	.00220	.00253	.00364
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48472-a-4-a@500 Acquired: 11/15/2013 12:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00653	.02248
Stddev	.00008	.00015
%RSD	1.2585	.64576
#1	.00647	.02258
#2	.00658	.02238
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3377.9	5093.7	74040.	6959.8
Stddev	4.4	4.5	182.	18.6
%RSD	.13036	.08886	.24605	.26702
#1	3374.7	5090.5	74169.	6972.9
#2	3381.0	5096.9	73911.	6946.6

Sample Name: 480-49623-c-1-c Acquired: 11/15/2013 12:16:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00892**	**.06101**	**.82301**	**.78618**	**.66295**
Stddev	.00022	.01684	.01143	.00088	.00052
%RSD	2.5018	27.592	1.3884	.11233	.07866
#1	.00876	.07292	.81493	.78556	.66332
#2	.00908	.04911	.83109	.78681	.66258
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**59.079**	**-.00008**	**.01163**	**.01030**
Stddev	.00009	.026	.00006	.00013	.00017
%RSD	46.911	.04332	81.084	1.1495	1.6730
#1	.00013	59.061	-.00003	.01172	.01017
#2	.00025	59.097	-.00012	.01153	.01042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00689**	**444.59**	**9.5590**	**18.033**	**.21797**
Stddev	.00014	.56	.0318	.048	.00080
%RSD	2.0247	.12572	.33216	.26626	.36819
#1	.00679	444.98	9.5814	17.999	.21854
#2	.00699	444.19	9.5365	18.066	.21741
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49623-c-1-c Acquired: 11/15/2013 12:16:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.6818**	F **22.112**	F **28.376**	**-.00391**	**1635.2**
Stddev	.0142	.023	.048	.00012	2.1
%RSD	.30317	.10202	.16976	3.0313	.12814
#1	4.6918	22.128	28.410	-.00399	1633.7
#2	4.6718	22.096	28.342	-.00383	1636.7
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		15.000	15.000		
Low Limit		-.00300	-.00300		

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04212**	**.03606**	F **38.90**	**.00461**	**.01446**
Stddev	.00037	.00053	.01	.00060	.00429
%RSD	.87294	1.4699	.0253	12.992	29.685
#1	.04186	.03644	38.90	.00419	.01750
#2	.04238	.03569	38.91	.00503	.01143
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2963**	**.00954**	**4.8903**	**.00010**	**-.00201**
Stddev	.0025	.00085	.0032	.00017	.00386
%RSD	.10980	8.8924	.06447	166.07	192.21
#1	2.2981	.01014	4.8925	-.00002	-.00473
#2	2.2945	.00894	4.8881	.00023	.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49623-c-1-c Acquired: 11/15/2013 12:16:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00160	.76755
Stddev	.00017	.00096
%RSD	10.798	.12565
#1	.00148	.76687
#2	.00173	.76823
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2604.9	4291.9	59358.	6938.9
Stddev	4.0	8.7	2.	19.0
%RSD	.15369	.20313	.00394	.27431
#1	2607.8	4298.1	59359.	6952.4
#2	2602.1	4285.7	59356.	6925.5

Sample Name: 480-49725-a-1-c@5 Acquired: 11/15/2013 12:18:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.36956**	**.00487**	**.12768**	**.05144**
Stddev	.00048	.00922	.00136	.00017	.00019
%RSD	482.72	2.4937	27.939	.13194	.36380
#1	-.00044	.36305	.00583	.12780	.05130
#2	.00024	.37608	.00391	.12756	.05157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**88.633**	**.00033**	**.00177**	**.00158**
Stddev	.00000	.100	.00017	.00003	.00043
%RSD	1.2842	.11263	51.967	1.7266	27.282
#1	.00031	88.562	.00045	.00179	.00127
#2	.00030	88.703	.00021	.00175	.00188
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00215**	**.31441**	**4.8020**	**7.1463**	**.01070**
Stddev	.00011	.00330	.0142	.0525	.00049
%RSD	5.1065	1.0483	.29589	.73401	4.5347
#1	.00223	.31208	4.8121	7.1092	.01036
#2	.00207	.31674	4.7920	7.1834	.01105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49725-a-1-c@5 Acquired: 11/15/2013 12:18:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.532**	**.25223**	**.26451**	**.00538**	**325.08**
Stddev	.017	.00019	.00211	.00019	.09
%RSD	.16527	.07362	.79661	3.5439	.02837
#1	10.520	.25210	.26600	.00525	325.15
#2	10.545	.25236	.26303	.00552	325.02
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00804**	**-.00183**	F **10.61**	**-.00134**	**.00214**
Stddev	.00027	.00025	.02	.00084	.00272
%RSD	3.3368	13.872	.1910	62.731	127.01
#1	.00785	-.00165	10.62	-.00075	.00407
#2	.00823	-.00201	10.59	-.00194	.00022
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.2342**	**.00109**	**.24332**	**.01381**	**.00238**
Stddev	.2605	.00049	.00050	.00039	.00090
%RSD	2.8204	44.781	.20702	2.8163	37.897
#1	9.4184	.00143	.24367	.01409	.00174
#2	9.0501	.00074	.24296	.01354	.00302
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49725-a-1-c@5 Acquired: 11/15/2013 12:18:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00515**	**.03107**
Stddev	.00013	.00070
%RSD	2.5655	2.2481
#1	.00505	.03058
#2	.00524	.03157
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2958.9**	**4710.7**	**65740.**	**6924.6**
Stddev	4.5	6.7	77.	30.8
%RSD	.15040	.14213	.11747	.44466
#1	2962.0	4715.4	65795.	6946.4
#2	2955.7	4705.9	65686.	6902.9

Sample Name: 480-49725-a-1-c@10 Acquired: 11/15/2013 12:21:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.18578**	**.00230**	**.06352**	**.02620**
Stddev	.00070	.03206	.00104	.00039	.00011
%RSD	1115.5	17.255	45.071	.60845	.42062
#1	-.00043	.20845	.00156	.06380	.02613
#2	.00056	.16312	.00303	.06325	.02628
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**44.693**	**.00023**	**.00086**	**.00111**
Stddev	.00004	.052	.00009	.00013	.00012
%RSD	23.287	.11583	39.876	14.843	10.508
#1	.00015	44.729	.00017	.00095	.00102
#2	.00022	44.656	.00030	.00077	.00119
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00175**	**.15996**	**2.3337**	**3.0744**	**.00432**
Stddev	.00000	.00467	.0403	.0083	.00022
%RSD	.24438	2.9205	1.7246	.26959	5.1275
#1	.00175	.16327	2.3053	3.0686	.00416
#2	.00176	.15666	2.3622	3.0803	.00448
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49725-a-1-c@10 Acquired: 11/15/2013 12:21:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.3318**	**.12768**	**.12992**	**.00267**	**162.31**
Stddev	.0009	.00033	.00089	.00006	.99
%RSD	.01613	.26104	.68820	2.0772	.60980
#1	5.3324	.12791	.12928	.00271	163.01
#2	5.3312	.12744	.13055	.00264	161.61
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00389**	**-.00109**	**5.224**	**-.00025**	**.00175**
Stddev	.00001	.00014	.023	.00151	.00280
%RSD	.21579	13.176	.4416	613.50	159.94
#1	.00389	-.00099	5.208	.00082	-.00023
#2	.00388	-.00119	5.240	-.00131	.00373
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.6914**	**.00028**	**.12240**	**.00711**	**.00114**
Stddev	.0667	.00014	.00026	.00003	.00005
%RSD	1.4222	48.336	.21346	.37773	4.0321
#1	4.7386	.00038	.12259	.00713	.00110
#2	4.6442	.00019	.12222	.00709	.00117
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49725-a-1-c@10 Acquired: 11/15/2013 12:21:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00271	.01546
Stddev	.00009	.00056
%RSD	3.2740	3.6402
#1	.00265	.01506
#2	.00278	.01585
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3100.7	4815.1	68229.	6932.8
Stddev	3.4	10.9	22.	7.9
%RSD	.10855	.22701	.03197	.11327
#1	3103.1	4822.8	68244.	6927.3
#2	3098.3	4807.3	68213.	6938.4

Sample Name: 480-48969-c-1-a Acquired: 11/15/2013 12:23:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00070**	**.00771**	**.00342**	**1.8954**	**.00749**
Stddev	.00062	.01004	.00037	.0043	.00004
%RSD	88.784	130.13	10.758	.22829	.57813
#1	-.00113	.01481	.00368	1.8923	.00746
#2	-.00026	.00062	.00316	1.8984	.00752
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**218.65**	**.00052**	**-.00003**	**.00101**
Stddev	.00009	.30	.00009	.00013	.00004
%RSD	55.002	.13532	16.632	457.95	4.2432
#1	.00023	218.86	.00046	-.00012	.00104
#2	.00010	218.44	.00058	.00006	.00098
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00218**	**.02897**	**2.1832**	**3.2424**	**.04562**
Stddev	.00006	.00267	.0096	.0003	.00114
%RSD	2.9672	9.2032	.44072	.00824	2.5093
#1	.00223	.03085	2.1764	3.2423	.04482
#2	.00213	.02708	2.1900	3.2426	.04643
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48969-c-1-a Acquired: 11/15/2013 12:23:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**129.26**	**.01007**	**.01040**	**-.00034**	**125.10**
Stddev	.31	.00014	.00059	.00014	.39
%RSD	.24090	1.3597	5.7109	40.535	.31522
#1	129.48	.00998	.01082	-.00024	125.38
#2	129.04	.01017	.00998	-.00043	124.82
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00188**	**-.00333**	F **325.0**	**-.00157**	**-.00015**
Stddev	.00004	.00121	.1	.00034	.00116
%RSD	2.1761	36.291	.0284	21.879	768.17
#1	.00186	-.00419	325.0	-.00133	.00067
#2	.00191	-.00248	325.1	-.00181	-.00097
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.495**	**.00006**	**.48467**	**.00111**	**.00353**
Stddev	.039	.00004	.00029	.00008	.00038
%RSD	.22226	69.431	.05959	7.2274	10.889
#1	17.523	.00009	.48488	.00105	.00380
#2	17.468	.00003	.48447	.00116	.00325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48969-c-1-a Acquired: 11/15/2013 12:23:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00031**	**.00182**
Stddev	.00006	.00030
%RSD	18.220	16.270
#1	-.00027	.00161
#2	-.00035	.00203
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2945.1**	**4609.4**	**65989.**	**6906.2**
Stddev	9.5	12.1	50.	29.7
%RSD	.32150	.26176	.07646	.42938
#1	2951.8	4617.9	66025.	6885.2
#2	2938.4	4600.8	65953.	6927.1

Sample Name: 480-48966-p-1-a@50 Acquired: 11/15/2013 12:26:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.00088**	**.00219**	**.01120**	F **20.223**
Stddev	.00031	.01564	.00144	.00013	.171
%RSD	90.445	1769.5	65.616	1.1426	.84423
#1	-.00013	-.01018	.00320	.01129	20.102
#2	-.00057	.01195	.00117	.01111	20.343
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit					10.000
Low Limit					-.00200

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**29.060**	**-.00075**	**-.00378**	**-.00013**
Stddev	.00005	.105	.00009	.00014	.00026
%RSD	74.077	.36281	11.290	3.5746	196.80
#1	.00009	28.985	-.00069	-.00387	.00005
#2	.00003	29.134	-.00081	-.00368	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00155**	**.19749**	**.39580**	**.48540**	**.27984**
Stddev	.00011	.00006	.02324	.00273	.00215
%RSD	7.3449	.03148	5.8725	.56190	.76919
#1	.00163	.19753	.41224	.48348	.27832
#2	.00147	.19744	.37936	.48733	.28136
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-p-1-a@50 Acquired: 11/15/2013 12:26:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.0597**	**.01232**	**.01282**	**-.00031**	**90.725**
Stddev	.0029	.00006	.00027	.00040	.270
%RSD	.14344	.45274	2.0738	127.33	.29713
#1	2.0576	.01228	.01263	-.00059	90.534
#2	2.0618	.01236	.01301	-.00003	90.915
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**-.00103**	**.0052**	**-.00142**	**-.00097**
Stddev	.00074	.00226	.0011	.00164	.00360
%RSD	140.27	218.36	20.13	115.54	372.82
#1	.00000	.00056	.0045	-.00258	.00158
#2	.00106	-.00263	.0060	-.00026	-.00351
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01763**	**-.00032**	**9.9554**	**.00026**	**.00431**
Stddev	.04659	.00044	.1742	.00023	.00045
%RSD	264.30	135.90	1.7497	89.485	10.518
#1	-.01532	-.00001	9.8322	.00010	.00463
#2	.05057	-.00063	10.079	.00043	.00399
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48966-p-1-a@50 Acquired: 11/15/2013 12:26:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00014**	**-.00027**
Stddev	.00006	.00016
%RSD	43.626	59.308
#1	-.00018	-.00039
#2	-.00009	-.00016
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3169.0**	**4902.2**	**68671.**	**6922.6**
Stddev	.9	4.0	138.	12.1
%RSD	.02849	.08124	.20156	.17457
#1	3168.3	4905.0	68573.	6931.2
#2	3169.6	4899.4	68769.	6914.1

Sample Name: CCV Acquired: 11/15/2013 12:28:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50578**	**25.844**	**.50685**	**.49275**	**.51437**	**.49233**	**25.218**
Stddev	.00040	.117	.00078	.00032	.00028	.00048	.106
%RSD	.07870	.45281	.15403	.06508	.05530	.09682	.42179
#1	.50550	25.927	.50740	.49297	.51457	.49199	25.293
#2	.50606	25.762	.50630	.49252	.51417	.49266	25.142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49292**	**.49205**	**.51851**	**.51575**	**24.051**	**25.925**	**25.962**
Stddev	.00030	.00105	.00008	.00068	.001	.137	.131
%RSD	.06179	.21368	.01478	.13228	.00601	.52655	.50448
#1	.49270	.49280	.51856	.51623	24.052	26.022	26.055
#2	.49313	.49131	.51845	.51527	24.050	25.829	25.870
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51305**	**24.420**	**.50311**	**.49607**	**.49858**	**26.119**	**.49257**
Stddev	.00298	.036	.00057	.00001	.00039	.112	.00018
%RSD	.58080	.14592	.11332	.00251	.07777	.43015	.03629
#1	.51516	24.395	.50352	.49608	.49885	26.199	.49269
#2	.51094	24.445	.50271	.49606	.49830	26.040	.49244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 12:28:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49455	25.21	.51661	.50141	25.270	.51348	.52135
Stddev	.00115	.01	.00099	.00004	.051	.00001	.00164
%RSD	.23303	.0253	.19255	.00782	.20142	.00265	.31367
#1	.49374	25.22	.51591	.50144	25.306	.51349	.52251
#2	.49537	25.21	.51731	.50138	25.234	.51347	.52019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51667	.49990	.51961	.51267
Stddev	.00174	.00039	.00079	.00274
%RSD	.33694	.07886	.15263	.53486
#1	.51544	.49963	.51904	.51461
#2	.51790	.50018	.52017	.51073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3207.0	4991.3	71456.	6914.9
Stddev	2.0	4.5	64.	22.2
%RSD	.06295	.08969	.09003	.32160
#1	3205.5	4994.5	71411.	6899.1
#2	3208.4	4988.2	71502.	6930.6

Sample Name: CCB Acquired: 11/15/2013 12:31:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.14935**	**.00017**	**.00046**	**-.00000**	**.00010**	**-.01611**
Stddev	.00018	.01482	.00071	.00009	.00000	.00002	.00123
%RSD	52.485	9.9203	411.16	18.546	6.7948	23.023	7.6063
#1	-.00022	.13887	.00068	.00052	-.00000	.00008	-.01525
#2	-.00048	.15982	-.00033	.00040	-.00000	.00012	-.01698
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.00017**	**-.00031**	**.00073**	**-.00308**	**-.00229**	**.00053**
Stddev	.00009	.00001	.00036	.00001	.00113	.03932	.00052
%RSD	173.13	7.5360	113.82	.83516	36.640	1713.3	97.824
#1	.00011	.00018	-.00057	.00072	-.00228	-.03010	.00090
#2	-.00001	.00016	-.00006	.00073	-.00388	.02551	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00056**	**-.00524**	**-.00003**	**.00005**	**.00007**	**.01277**	**.00014**
Stddev	.00134	.00210	.00006	.00034	.00006	.00504	.00007
%RSD	238.50	40.066	163.33	661.29	86.797	39.447	47.557
#1	-.00151	-.00376	.00001	-.00019	.00012	.01634	.00009
#2	.00039	-.00673	-.00008	.00029	.00003	.00921	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 12:31:09 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00100	F .0055	-.00061	.00072	.00428	.00051	-.00012
Stddev	.00038	.0009	.00034	.00072	.00680	.00030	.00012
%RSD	38.406	15.64	55.871	100.47	158.74	58.995	96.197
#1	-.00127	.0061	-.00085	.00122	-.00052	.00073	-.00021
#2	-.00073	.0049	-.00037	.00021	.00909	.00030	-.00004
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00066	-.00001	.00014	.00038
Stddev	.00024	.00236	.00012	.00017
%RSD	36.188	18363.	83.254	43.857
#1	.00049	.00165	.00006	.00050
#2	.00083	-.00168	.00023	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3379.0	5054.4	74680.	6994.9
Stddev	1.8	1.5	687.	23.5
%RSD	.05460	.02887	.92027	.33545
#1	3377.7	5053.4	74194.	6978.3
#2	3380.3	5055.4	75166.	7011.5

Sample Name: CCVL Acquired: 11/15/2013 12:33:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00268**	**.22439**	W **.01495**	**.02051**	**.00226**	**.00212**	**.49569**
Stddev	.00016	.01408	.00034	.00042	.00001	.00001	.01198
%RSD	5.8652	6.2726	2.2584	2.0657	.64280	.46838	2.4175
#1	.00279	.23434	.01472	.02021	.00227	.00212	.50416
#2	.00257	.21444	.01519	.02081	.00225	.00211	.48721
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.01000				
Range			30.000%				

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00094**	**.00415**	**.00371**	**.01123**	**.04602**	**.49954**	**.41680**
Stddev	.00006	.00001	.00058	.00020	.00385	.01738	.00434
%RSD	6.4471	.28784	15.598	1.7472	8.3695	3.4790	1.0407
#1	.00098	.00416	.00412	.01110	.04330	.51183	.41987
#2	.00090	.00414	.00330	.01137	.04874	.48725	.41373
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02818**	**.20938**	**.00331**	**.00336**	**.00979**	**.97435**	**.00985**
Stddev	.00048	.00352	.00005	.00048	.00022	.02075	.00000
%RSD	1.7071	1.6833	1.5708	14.273	2.2056	2.1297	.01921
#1	.02852	.21187	.00327	.00302	.00994	.98902	.00985
#2	.02784	.20689	.00335	.00370	.00964	.95968	.00985
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 12:33:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00407	.2179	.02042	.01456	.49727	.01000	.00493
Stddev	.00037	.0076	.00023	.00205	.01185	.00074	.00003
%RSD	9.0148	3.469	1.1106	14.048	2.3833	7.3607	.54833
#1	.00433	.2232	.02058	.01601	.50565	.01052	.00495
#2	.00381	.2125	.02026	.01312	.48889	.00948	.00492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00529	.02267	.00510	.01026
Stddev	.00021	.00063	.00043	.00010
%RSD	3.9191	2.7775	8.3452	.99347
#1	.00543	.02311	.00540	.01034
#2	.00514	.02222	.00480	.01019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3394.1	5098.8	74722.	7094.1
Stddev	10.8	17.5	299.	29.0
%RSD	.31753	.34307	.40030	.40918
#1	3401.8	5111.1	74934.	7073.6
#2	3386.5	5086.4	74511.	7114.7

Sample Name: 480-49854-a-1-b Acquired: 11/15/2013 12:36:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00065**	**8.1685**	**.00808**	**.01215**	**.24710**
Stddev	.00017	.0548	.00137	.00011	.00102
%RSD	26.847	.67139	17.027	.86679	.41439
#1	-.00053	8.2072	.00905	.01208	.24638
#2	-.00077	8.1297	.00710	.01223	.24783
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00067**	**11.071**	**.00084**	**.04583**	**.09908**
Stddev	.00002	.091	.00008	.00000	.00147
%RSD	2.2928	.82583	8.9672	.00541	1.4857
#1	.00068	11.007	.00089	.04583	.09803
#2	.00066	11.136	.00079	.04583	.10012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24030**	**32.925**	**.80811**	**.75867**	**.00686**
Stddev	.00203	.100	.02717	.00200	.00078
%RSD	.84278	.30440	3.3628	.26381	11.341
#1	.23887	32.854	.78889	.76008	.00741
#2	.24173	32.995	.82732	.75725	.00631
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-1-b Acquired: 11/15/2013 12:36:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.0720**	**.83723**	**.79546**	**.00098**	**.57728**
Stddev	.0273	.00459	.00780	.00038	.00477
%RSD	.33762	.54785	.98074	38.451	.82676
#1	8.0527	.83399	.78994	.00125	.58065
#2	8.0912	.84047	.80097	.00071	.57390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18003**	**.03128**	**9.855**	**-.00122**	**.00628**
Stddev	.00011	.00029	.020	.00056	.00157
%RSD	.06351	.93519	.1996	45.801	24.911
#1	.18011	.03149	9.841	-.00083	.00739
#2	.17995	.03107	9.869	-.00162	.00518
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.1273**	**.02953**	**.06321**	**.49629**	**.00142**
Stddev	.0143	.00073	.00036	.00033	.00115
%RSD	.17625	2.4813	.57245	.06662	80.910
#1	8.1375	.02902	.06347	.49652	.00223
#2	8.1172	.03005	.06296	.49605	.00061
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-1-b Acquired: 11/15/2013 12:36:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.05966	.20060
Stddev	.00089	.00231
%RSD	1.4851	1.1514
#1	.05904	.19897
#2	.06029	.20224
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3297.2	4986.0	72184.	6834.1
Stddev	5.0	19.6	117.	19.3
%RSD	.15305	.39261	.16246	.28273
#1	3293.6	4972.2	72267.	6820.4
#2	3300.7	4999.9	72101.	6847.8

Sample Name: 480-49854-a-2-b Acquired: 11/15/2013 12:38:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00070**	**37.483**	**.00946**	**.00690**	**.47235**
Stddev	.00029	.260	.00008	.00022	.00202
%RSD	41.119	.69481	.81427	3.2435	.42669
#1	-.00049	37.667	.00940	.00706	.47377
#2	-.00090	37.299	.00951	.00674	.47092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00190**	**15.511**	**.00064**	**.09765**	**.14708**
Stddev	.00006	.076	.00002	.00008	.00068
%RSD	3.2306	.48854	3.0761	.07766	.46572
#1	.00186	15.564	.00065	.09760	.14660
#2	.00194	15.457	.00062	.09770	.14757
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18403**	**107.53**	**5.7721**	**5.8483**	**.04166**
Stddev	.00023	.55	.0444	.0296	.00029
%RSD	.12760	.51379	.76863	.50633	.70730
#1	.18386	107.92	5.8035	5.8692	.04186
#2	.18419	107.14	5.7407	5.8273	.04145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-b Acquired: 11/15/2013 12:38:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.903**	**1.1073**	**1.0798**	**-.00013**	**.58078**
Stddev	.184	.0035	.0036	.00018	.01836
%RSD	.49902	.31922	.33697	139.74	3.1619
#1	36.773	1.1048	1.0773	-.00026	.59376
#2	37.033	1.1098	1.0824	-.00000	.56779
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24668**	**.06144**	**1.996**	**-.00249**	**-.00179**
Stddev	.00006	.00012	.005	.00238	.00261
%RSD	.02535	.19620	.2777	95.633	146.14
#1	.24663	.06152	1.992	-.00417	-.00363
#2	.24672	.06135	2.000	-.00081	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.6202**	**.02540**	**.06271**	**2.9175**	**-.00243**
Stddev	.0668	.00047	.00002	.0045	.00276
%RSD	.77544	1.8399	.03020	.15342	113.68
#1	8.6675	.02507	.06273	2.9144	-.00048
#2	8.5729	.02573	.06270	2.9207	-.00438
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-b Acquired: 11/15/2013 12:38:22 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.14692	.66483
Stddev	.00064	.00643
%RSD	.43565	.96766
#1	.14647	.66028
#2	.14737	.66938
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3189.2	4978.5	72029.	6908.2
Stddev	18.8	34.1	22.	37.9
%RSD	.58949	.68581	.02994	.54828
#1	3202.5	5002.7	72044.	6881.4
#2	3175.9	4954.4	72014.	6935.0

Sample Name: 480-49854-a-2-c ms Acquired: 11/15/2013 12:40:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09763**	**76.613**	**.40722**	**.40230**	**.94450**
Stddev	.00149	.557	.00240	.00124	.00511
%RSD	1.5282	.72661	.58930	.30865	.54124
#1	.09868	76.219	.40892	.40318	.94088
#2	.09657	77.007	.40553	.40142	.94811
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39767**	**46.824**	**.39172**	**.50590**	**.61993**
Stddev	.00149	.127	.00071	.00004	.00024
%RSD	.37422	.27139	.18125	.00769	.03829
#1	.39872	46.734	.39122	.50592	.61976
#2	.39661	46.914	.39222	.50587	.62010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.63224**	**135.53**	**28.700**	**29.740**	**.49054**
Stddev	.00326	.95	.269	.086	.00719
%RSD	.51556	.69891	.93615	.28766	1.4654
#1	.63454	134.86	28.510	29.680	.48545
#2	.62993	136.20	28.890	29.801	.49562
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-c ms Acquired: 11/15/2013 12:40:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**65.275**	**1.4215**	**1.4375**	**.40834**	**23.320**
Stddev	.131	.0022	.0097	.00058	.354
%RSD	.20067	.15710	.67310	.14183	1.5201
#1	65.182	1.4199	1.4443	.40793	23.069
#2	65.367	1.4231	1.4307	.40875	23.571
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.68382**	**.46695**	F **21.46**	**.34235**	**.40255**
Stddev	.00080	.00199	.05	.00166	.00314
%RSD	.11771	.42710	.2293	.48578	.77990
#1	.68325	.46836	21.50	.34117	.40477
#2	.68439	.46554	21.43	.34353	.40033
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.125**	**.42735**	**.53547**	**5.3195**	**.39652**
Stddev	.234	.00081	.00418	.0097	.00052
%RSD	.86083	.18952	.77974	.18196	.13104
#1	26.960	.42792	.53252	5.3126	.39615
#2	27.290	.42677	.53843	5.3263	.39688
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-c ms Acquired: 11/15/2013 12:40:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.62772	1.1516
Stddev	.00227	.0076
%RSD	.36106	.66119
#1	.62932	1.1462
#2	.62611	1.1570
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3035.3	4907.9	70252.	6866.2
Stddev	6.7	15.1	563.	5.9
%RSD	.22043	.30716	.80111	.08660
#1	3030.6	4897.2	69854.	6862.0
#2	3040.0	4918.6	70650.	6870.4

Sample Name: 480-49854-a-2-d msd Acquired: 11/15/2013 12:43:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09775**	**76.266**	**.40880**	**.40511**	**.96429**
Stddev	.00046	.039	.00373	.00110	.00093
%RSD	.47238	.05147	.91328	.27236	.09635
#1	.09742	76.294	.40616	.40589	.96495
#2	.09808	76.238	.41144	.40433	.96363
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.39936**	**47.499**	**.39001**	**.51154**	**.61212**
Stddev	.00020	.167	.00008	.00012	.00418
%RSD	.05034	.35168	.01995	.02361	.68208
#1	.39950	47.381	.39006	.51162	.60917
#2	.39922	47.617	.38995	.51145	.61507
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.62376**	**143.47**	**28.527**	**29.230**	**.48795**
Stddev	.00493	.45	.140	.211	.00260
%RSD	.79110	.31695	.48998	.72170	.53376
#1	.62027	143.15	28.626	29.081	.48979
#2	.62725	143.79	28.428	29.379	.48611
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-d msd Acquired: 11/15/2013 12:43:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**64.551**	**1.7564**	**1.7772**	**.40720**	**23.178**
Stddev	.045	.0049	.0072	.00064	.123
%RSD	.06940	.27771	.40331	.15712	.52862
#1	64.520	1.7530	1.7722	.40765	23.264
#2	64.583	1.7599	1.7823	.40675	23.091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.67975**	**.46517**	F **21.84**	**.33028**	**.39399**
Stddev	.00195	.00219	.02	.00173	.00771
%RSD	.28707	.47172	.0726	.52374	1.9568
#1	.68113	.46362	21.85	.32905	.39944
#2	.67837	.46673	21.83	.33150	.38853
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**30.774**	**.43861**	**.53423**	**5.3074**	**.38578**
Stddev	.000	.00057	.00074	.0020	.00184
%RSD	.00109	.13043	.13803	.03699	.47604
#1	30.774	.43821	.53475	5.3088	.38448
#2	30.774	.43902	.53371	5.3060	.38707
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-2-d msd Acquired: 11/15/2013 12:43:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.62053	1.1563
Stddev	.00558	.0027
%RSD	.89852	.23569
#1	.61658	1.1544
#2	.62447	1.1583
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3044.3	4927.8	71212.	6931.7
Stddev	2.7	6.6	20.	6.3
%RSD	.08923	.13342	.02808	.09071
#1	3042.4	4923.2	71227.	6936.2
#2	3046.3	4932.5	71198.	6927.3

Sample Name: 480-49854-a-3-b Acquired: 11/15/2013 12:45:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00078**	**29.748**	**.01640**	**.01074**	**.50045**
Stddev	.00006	.151	.00132	.00006	.00157
%RSD	7.3803	.50608	8.0528	.59217	.31438
#1	-.00074	29.855	.01734	.01079	.50157
#2	-.00082	29.642	.01547	.01070	.49934
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00160**	**13.543**	**.00124**	**.09363**	**.20003**
Stddev	.00000	.103	.00001	.00024	.00200
%RSD	.10153	.75736	1.1277	.25336	.99919
#1	.00160	13.616	.00123	.09346	.19862
#2	.00160	13.471	.00125	.09379	.20144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23711**	**108.01**	**3.9909**	**3.9384**	**.02824**
Stddev	.00106	1.08	.0527	.0303	.00056
%RSD	.44804	1.0011	1.3195	.76835	1.9719
#1	.23636	108.78	4.0281	3.9598	.02785
#2	.23786	107.25	3.9536	3.9170	.02863
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b Acquired: 11/15/2013 12:45:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.377**	**3.7895**	**3.7411**	**.00070**	**.40088**
Stddev	.097	.0144	.0371	.00004	.00959
%RSD	.41291	.37993	.99122	6.1049	2.3912
#1	23.309	3.7794	3.7148	.00073	.39410
#2	23.445	3.7997	3.7673	.00067	.40765
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.28245**	**.06571**	**1.974**	**-.00366**	**.00340**
Stddev	.00068	.00028	.001	.00150	.00307
%RSD	.24022	.43162	.0533	40.860	90.095
#1	.28197	.06551	1.975	-.00472	.00557
#2	.28293	.06591	1.973	-.00260	.00124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.774**	**.03257**	**.07051**	**2.1315**	**-.00040**
Stddev	.036	.00068	.00036	.0091	.00061
%RSD	.33452	2.1008	.50536	.42483	154.65
#1	10.799	.03208	.07077	2.1251	.00004
#2	10.748	.03305	.07026	2.1379	-.00083
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b Acquired: 11/15/2013 12:45:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.15121	.28578
Stddev	.00115	.00378
%RSD	.75873	1.3225
#1	.15040	.28311
#2	.15202	.28845
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3208.4	4965.0	71391.	6876.3
Stddev	4.2	3.6	286.	59.6
%RSD	.13213	.07276	.40014	.86704
#1	3205.4	4962.4	71593.	6834.2
#2	3211.4	4967.5	71189.	6918.5

Sample Name: 480-49854-a-3-b SD@5 Acquired: 11/15/2013 12:47:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00044**	**6.0095**	**.00372**	**.00189**	**.10922**
Stddev	.00027	.0383	.00229	.00018	.00005
%RSD	61.574	.63754	61.457	9.6269	.04192
#1	-.00025	5.9824	.00210	.00202	.10919
#2	-.00063	6.0366	.00534	.00176	.10925
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**2.8168**	**.00024**	**.01901**	**.04133**
Stddev	.00001	.0141	.00006	.00000	.00001
%RSD	2.1458	.49868	23.286	.02175	.03232
#1	.00035	2.8069	.00020	.01901	.04134
#2	.00036	2.8268	.00028	.01901	.04132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04863**	**21.311**	**.81570**	**.70091**	**.00510**
Stddev	.00017	.023	.03486	.00008	.00038
%RSD	.34197	.10773	4.2735	.01170	7.4218
#1	.04851	21.294	.79105	.70086	.00537
#2	.04874	21.327	.84035	.70097	.00483
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b SD@5 Acquired: 11/15/2013 12:47:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9440**	**.80113**	**.75943**	**-.00002**	**.07829**
Stddev	.0072	.00020	.00015	.00013	.00510
%RSD	.14614	.02493	.02017	689.30	6.5094
#1	4.9389	.80099	.75932	-.00011	.08190
#2	4.9491	.80127	.75954	.00007	.07469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05788**	**.01491**	**.4082**	**.00003**	**-.00008**
Stddev	.00068	.00183	.0037	.00026	.00226
%RSD	1.1724	12.264	.8944	819.36	2747.1
#1	.05740	.01361	.4056	-.00015	-.00168
#2	.05836	.01620	.4108	.00022	.00152
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2075**	**.00675**	**.01447**	**.44042**	**.00179**
Stddev	.0037	.00029	.00013	.00200	.00106
%RSD	.16548	4.2894	.87641	.45518	59.221
#1	2.2101	.00696	.01438	.43900	.00104
#2	2.2049	.00655	.01456	.44184	.00254
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b SD@5 Acquired: 11/15/2013 12:47:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.03124	.06020
Stddev	.00017	.00004
%RSD	.53559	.06032
#1	.03113	.06023
#2	.03136	.06018
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3347.3	5066.0	73502.	6981.9
Stddev	20.0	45.5	131.	11.3
%RSD	.59874	.89800	.17756	.16185
#1	3333.1	5033.9	73594.	6989.9
#2	3361.4	5098.2	73410.	6973.9

Sample Name: 480-49854-a-3-b PDS Acquired: 11/15/2013 12:50:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.08805**	**84.432**	**.37001**	**.35408**	**.99982**
Stddev	.00009	.030	.00119	.00034	.00285
%RSD	.10188	.03562	.32066	.09598	.28468
#1	.08799	84.411	.36917	.35384	1.0018
#2	.08812	84.453	.37084	.35432	.99781
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.35842**	**33.212**	**.34821**	**.52572**	**.96303**
Stddev	.00094	.050	.00023	.00098	.00190
%RSD	.26235	.15092	.06699	.18573	.19713
#1	.35775	33.177	.34804	.52641	.96168
#2	.35908	33.247	.34837	.52503	.96437
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.60126**	**187.94**	**21.585**	**22.138**	**.43596**
Stddev	.00115	.21	.142	.196	.00078
%RSD	.19063	.11043	.65646	.88742	.17960
#1	.60207	187.79	21.686	21.999	.43652
#2	.60045	188.09	21.485	22.277	.43541
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b PDS Acquired: 11/15/2013 12:50:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**35.710**	**4.4555**	**4.5309**	**.36816**	**18.840**
Stddev	.065	.0245	.0097	.00009	.066
%RSD	.18185	.55093	.21376	.02400	.34827
#1	35.664	4.4382	4.5241	.36810	18.887
#2	35.755	4.4729	4.5378	.36822	18.794
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.79828**	**.66398**	**2.306**	**.33694**	**.36427**
Stddev	.00153	.00117	.002	.00373	.00252
%RSD	.19218	.17574	.0831	1.1084	.69193
#1	.79719	.66315	2.308	.33958	.36605
#2	.79936	.66480	2.305	.33430	.36249
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**31.266**	**.36233**	**.44884**	**4.3487**	**.34489**
Stddev	.044	.00409	.00077	.0150	.00070
%RSD	.14007	1.1282	.17047	.34427	.20387
#1	31.235	.36522	.44938	4.3381	.34539
#2	31.297	.35944	.44829	4.3593	.34440
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-3-b PDS Acquired: 11/15/2013 12:50:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.61284	.78400
Stddev	.00214	.01186
%RSD	.34999	1.5133
#1	.61133	.77561
#2	.61436	.79239
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3102.6	4996.9	71558.	6912.7
Stddev	7.7	3.8	14.	16.4
%RSD	.24964	.07686	.01989	.23659
#1	3097.1	4994.2	71568.	6901.1
#2	3108.1	4999.6	71548.	6924.2

Sample Name: 480-49854-a-4-b Acquired: 11/15/2013 12:52:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00039**	**54.684**	**.01385**	**.01298**	**.60740**
Stddev	.00027	.078	.00160	.00009	.00130
%RSD	68.610	.14288	11.584	.73207	.21329
#1	-.00058	54.629	.01498	.01304	.60832
#2	-.00020	54.740	.01271	.01291	.60649
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00295**	**15.367**	**.00191**	**.14430**	**.48286**
Stddev	.00001	.035	.00004	.00083	.00005
%RSD	.21653	.22777	2.1614	.57647	.01135
#1	.00295	15.342	.00194	.14371	.48282
#2	.00296	15.392	.00188	.14489	.48290
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23804**	**153.09**	**3.6390**	**3.6804**	**.05019**
Stddev	.00100	.42	.0164	.0067	.00053
%RSD	.42003	.27512	.45109	.18347	1.0544
#1	.23875	152.79	3.6274	3.6852	.05057
#2	.23733	153.39	3.6506	3.6757	.04982
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-4-b Acquired: 11/15/2013 12:52:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**20.428**	**4.1964**	**4.1493**	**.00246**	**.42659**
Stddev	.050	.0094	.0252	.00012	.00705
%RSD	.24487	.22291	.60638	5.0046	1.6526
#1	20.464	4.2030	4.1671	.00254	.42160
#2	20.393	4.1898	4.1315	.00237	.43157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.40162**	**.23587**	**2.250**	**-.00502**	**.00474**
Stddev	.00028	.00106	.003	.00142	.00081
%RSD	.06961	.45049	.1178	28.241	17.192
#1	.40142	.23512	2.251	-.00402	.00416
#2	.40182	.23662	2.248	-.00603	.00531
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.641**	**.03246**	**.08233**	**3.5165**	**.00124**
Stddev	.007	.00008	.00002	.0088	.00115
%RSD	.05817	.24971	.01953	.25143	92.873
#1	12.646	.03240	.08232	3.5227	.00205
#2	12.636	.03251	.08235	3.5102	.00042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-4-b Acquired: 11/15/2013 12:52:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21558**	**.40199**
Stddev	.00019	.00124
%RSD	.08809	.30730
#1	.21544	.40112
#2	.21571	.40287
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3207.1**	**5065.3**	**72816.**	**6955.7**
Stddev	6.5	15.0	353.	10.5
%RSD	.20347	.29649	.48534	.15087
#1	3202.4	5054.7	72566.	6948.3
#2	3211.7	5076.0	73066.	6963.1

Sample Name: 480-49854-a-5-b Acquired: 11/15/2013 12:55:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**59.068**	**.01453**	**.02262**	**1.0055**
Stddev	.00068	.262	.00160	.00022	.0044
%RSD	194.05	.44340	10.995	.97215	.43553
#1	.00083	58.883	.01566	.02278	1.0024
#2	-.00013	59.253	.01340	.02246	1.0086
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00271**	**31.689**	**.00336**	**.31857**	**.67636**
Stddev	.00001	.163	.00011	.00007	.00054
%RSD	.31467	.51302	3.3669	.02295	.08024
#1	.00271	31.574	.00328	.31852	.67675
#2	.00272	31.803	.00344	.31862	.67598
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.3775**	**229.50**	**4.6122**	**5.2710**	**.05154**
Stddev	.0063	1.44	.0367	.0186	.00103
%RSD	.18690	.62808	.79598	.35350	1.9983
#1	3.3730	228.48	4.5863	5.2578	.05081
#2	3.3820	230.52	4.6382	5.2842	.05227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-5-b Acquired: 11/15/2013 12:55:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**135.17**	**6.2758**	**6.4901**	**.00055**	**.56762**
Stddev	.46	.0295	.0252	.00032	.00193
%RSD	.33991	.46939	.38834	59.318	.34040
#1	134.84	6.2550	6.4723	.00077	.56625
#2	135.49	6.2967	6.5079	.00032	.56898
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4467**	**.23108**	**4.468**	**-.00799**	**.02359**
Stddev	.0012	.00080	.029	.00171	.00399
%RSD	.08474	.34603	.6469	21.411	16.896
#1	1.4459	.23052	4.447	-.00920	.02077
#2	1.4476	.23165	4.488	-.00678	.02640
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.264**	**.12857**	**.17477**	**3.2233**	**.00047**
Stddev	.019	.00099	.00087	.0134	.00184
%RSD	.13439	.77024	.49963	.41434	394.70
#1	14.250	.12786	.17415	3.2138	.00177
#2	14.277	.12927	.17538	3.2327	-.00084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-5-b Acquired: 11/15/2013 12:55:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.19317	.86687
Stddev	.00015	.00033
%RSD	.07736	.03792
#1	.19328	.86664
#2	.19306	.86711
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3078.0	4972.0	71890.	6921.9
Stddev	2.2	1.8	19.	7.1
%RSD	.07243	.03649	.02577	.10278
#1	3076.4	4970.7	71903.	6916.9
#2	3079.6	4973.2	71877.	6927.0

Sample Name: CCV Acquired: 11/15/2013 12:57:38 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50668	25.637	.50844	.49151	.50937	.49427	25.305
Stddev	.00113	.077	.00217	.00076	.00140	.00359	.066
%RSD	.22263	.30215	.42582	.15369	.27457	.72643	.25991
#1	.50588	25.582	.50997	.49204	.51035	.49681	25.259
#2	.50747	25.692	.50691	.49098	.50838	.49174	25.352
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49467	.49691	.51815	.51440	24.182	25.529	25.715
Stddev	.00039	.00010	.00070	.00195	.106	.014	.031
%RSD	.07817	.02042	.13457	.37828	.43945	.05600	.12226
#1	.49494	.49698	.51765	.51302	24.257	25.519	25.693
#2	.49439	.49683	.51864	.51577	24.107	25.539	25.737
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50461	24.603	.50645	.49509	.50107	25.696	.49688
Stddev	.00063	.064	.00008	.00156	.00051	.018	.00076
%RSD	.12448	.26160	.01598	.31462	.10167	.06954	.15317
#1	.50506	24.557	.50650	.49619	.50143	25.684	.49634
#2	.50417	24.648	.50639	.49399	.50071	25.709	.49742
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 12:57:38 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49729	25.19	.51580	.49509	25.519	.51536	.51506
Stddev	.00252	.10	.00153	.00589	.086	.00285	.00096
%RSD	.50725	.4037	.29614	1.1902	.33820	.55268	.18684
#1	.49907	25.26	.51688	.49926	25.458	.51737	.51438
#2	.49550	25.12	.51472	.49092	25.580	.51334	.51574
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.52233	.50242	.51952	.51365
Stddev	.00151	.00106	.00257	.00546
%RSD	.28875	.21166	.49560	1.0626
#1	.52126	.50317	.51770	.50979
#2	.52340	.50167	.52135	.51751
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3237.3	5055.9	72577.	6998.8
Stddev	3.1	.7	186.	15.2
%RSD	.09532	.01389	.25640	.21783
#1	3239.5	5056.4	72709.	7009.6
#2	3235.1	5055.4	72446.	6988.0

Sample Name: CCB Acquired: 11/15/2013 13:00:00 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00047**	**.15599**	**.00015**	**-.00052**	**.00001**	**.00016**	**-.01263**
Stddev	.00022	.00773	.00057	.00001	.00001	.00003	.00088
%RSD	46.144	4.9547	384.11	1.0232	108.04	17.677	6.9602
#1	-.00062	.15053	-.00025	-.00053	.00000	.00014	-.01201
#2	-.00032	.16146	.00055	-.00052	.00001	.00018	-.01325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**.00007**	**-.00024**	**.00110**	**-.00128**	**.07603**	**.00088**
Stddev	.00000	.00002	.00060	.00017	.00166	.04857	.00017
%RSD	4.4052	26.476	248.13	15.207	130.14	63.887	19.753
#1	.00006	.00008	-.00066	.00098	-.00245	.11038	.00076
#2	.00007	.00006	.00018	.00122	-.00010	.04168	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00027**	**.00023**	**-.00004**	**-.00009**	**-.00010**	**-.00287**	**-.00015**
Stddev	.00079	.00141	.00005	.00094	.00025	.00494	.00018
%RSD	293.15	602.11	141.17	1059.1	256.73	171.95	119.76
#1	-.00029	-.00076	-.00007	-.00075	.00008	.00062	-.00002
#2	.00083	.00123	-.00000	.00058	-.00028	-.00637	-.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 13:00:00 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00064	F .0039	-.00013	-.00073	.02304	.00044	-.00018
Stddev	.00031	.0004	.00108	.00033	.00427	.00031	.00005
%RSD	49.096	10.92	828.55	45.346	18.514	70.895	25.179
#1	.00041	.0042	-.00090	-.00050	.02606	.00022	-.00015
#2	.00086	.0036	.00063	-.00097	.02003	.00066	-.00022
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00036	-.00103	.00005	.00003
Stddev	.00007	.00159	.00026	.00024
%RSD	20.630	154.30	502.96	683.06
#1	.00031	.00009	-.00013	-.00013
#2	.00042	-.00216	.00023	.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3423.3	5157.6	74668.	6925.4
Stddev	7.5	15.8	519.	5.0
%RSD	.22024	.30616	.69539	.07149
#1	3428.7	5168.7	75036.	6928.9
#2	3418.0	5146.4	74301.	6921.9

Sample Name: CCVL Acquired: 11/15/2013 13:02:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00269**	**.22102**	W **.01340**	**.01964**	**.00230**	**.00211**	**.50700**
Stddev	.00022	.02462	.00111	.00015	.00001	.00002	.00784
%RSD	8.3359	11.138	8.2663	.78800	.56354	.80613	1.5467
#1	.00285	.23843	.01418	.01953	.00231	.00210	.50146
#2	.00253	.20361	.01261	.01975	.00229	.00212	.51255
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.01000				
Range			30.000%				

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00099**	**.00406**	**.00389**	**.01136**	**.04322**	**.50579**	**.42981**
Stddev	.00001	.00008	.00040	.00040	.00471	.01811	.00042
%RSD	.68956	1.8826	10.388	3.4809	10.901	3.5813	.09870
#1	.00099	.00412	.00417	.01164	.04655	.49298	.43011
#2	.00099	.00401	.00360	.01108	.03989	.51859	.42951
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02834**	**.21156**	**.00340**	W **.00393**	**.00996**	**.98685**	**.01011**
Stddev	.00019	.00038	.00006	.00011	.00001	.00716	.00026
%RSD	.67284	.17855	1.6527	2.9171	.09687	.72559	2.6024
#1	.02847	.21182	.00343	.00401	.00995	.98179	.00993
#2	.02820	.21129	.00336	.00385	.00996	.99191	.01030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass
Value				.00300			
Range				30.000%			

Sample Name: CCVL Acquired: 11/15/2013 13:02:27 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00496	.2089	.02025	.01308	.50627	.00937	.00512
Stddev	.00026	.0031	.00169	.00280	.02956	.00034	.00004
%RSD	5.2343	1.471	8.3294	21.409	5.8385	3.6384	.78465
#1	.00478	.2067	.02144	.01110	.48537	.00913	.00509
#2	.00515	.2110	.01906	.01506	.52717	.00961	.00515
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00523	.02125	.00554	.01072
Stddev	.00004	.00067	.00009	.00011
%RSD	.80288	3.1419	1.5653	.99892
#1	.00526	.02172	.00548	.01065
#2	.00520	.02078	.00560	.01080
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3443.4	5196.2	75355.	7019.3
Stddev	4.9	17.2	27.	31.7
%RSD	.14145	.33171	.03612	.45144
#1	3446.8	5208.4	75335.	7041.7
#2	3439.9	5184.0	75374.	6996.9

Sample Name: 480-49854-a-6-b Acquired: 11/15/2013 13:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**18.326**	**.00768**	**.00091**	**.26264**
Stddev	.00062	.017	.00128	.00005	.00017
%RSD	183.02	.09496	16.704	5.2765	.06655
#1	.00010	18.339	.00677	.00094	.26276
#2	-.00078	18.314	.00859	.00088	.26252
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00095**	**5.9826**	**.00021**	**.03600**	**.07058**
Stddev	.00004	.0305	.00006	.00029	.00029
%RSD	4.3260	.50912	28.715	.80456	.40533
#1	.00097	5.9610	.00016	.03620	.07078
#2	.00092	6.0041	.00025	.03579	.07038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05917**	**67.163**	**2.7075**	**2.4976**	**.02710**
Stddev	.00044	.528	.0242	.0041	.00022
%RSD	.73868	.78600	.89224	.16430	.79719
#1	.05948	66.790	2.6904	2.5005	.02725
#2	.05886	67.536	2.7246	2.4947	.02695
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-6-b Acquired: 11/15/2013 13:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.575**	**2.7536**	**2.6232**	**-.00000**	**.30338**
Stddev	.028	.0013	.0010	.00008	.00982
%RSD	.26414	.04712	.03861	4556.4	3.2359
#1	10.556	2.7545	2.6239	-.00006	.31032
#2	10.595	2.7527	2.6224	.00006	.29644
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.09722**	**.02888**	**.3553**	**-.00101**	**.00003**
Stddev	.00040	.00044	.0047	.00036	.00045
%RSD	.40748	1.5260	1.321	35.917	1567.3
#1	.09694	.02857	.3519	-.00076	.00035
#2	.09750	.02919	.3586	-.00127	-.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9387**	**.04966**	**.03037**	**.86235**	**.00191**
Stddev	.0037	.00065	.00006	.00716	.00038
%RSD	.07525	1.3055	.20174	.83051	19.948
#1	4.9414	.05012	.03033	.85728	.00218
#2	4.9361	.04920	.03042	.86741	.00164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-6-b Acquired: 11/15/2013 13:04:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.08869	.28975
Stddev	.00004	.00005
%RSD	.03962	.01761
#1	.08867	.28978
#2	.08872	.28971
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3281.9	5012.8	72243.	6820.2
Stddev	4.0	14.2	143.	28.1
%RSD	.12227	.28265	.19728	.41243
#1	3279.0	5002.8	72142.	6800.3
#2	3284.7	5022.9	72344.	6840.1

Sample Name: 480-49854-a-7-b Acquired: 11/15/2013 13:07:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**80.090**	**.02046**	**.02025**	**.56401**
Stddev	.00019	.176	.00035	.00072	.00314
%RSD	44.705	.21981	1.7002	3.5475	.55748
#1	-.00055	79.966	.02021	.02076	.56179
#2	-.00028	80.215	.02070	.01975	.56624
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00321**	**18.769**	**.00188**	**.06821**	**.20195**
Stddev	.00011	.063	.00000	.00007	.00089
%RSD	3.4498	.33718	.15053	.09839	.44054
#1	.00329	18.724	.00188	.06817	.20258
#2	.00313	18.813	.00187	.06826	.20132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21813**	**113.30**	**3.3985**	**3.5409**	**.06034**
Stddev	.00072	.70	.0419	.0070	.00117
%RSD	.33035	.61694	1.2331	.19705	1.9396
#1	.21864	112.81	3.4281	3.5458	.05951
#2	.21762	113.80	3.3688	3.5359	.06116
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-7-b Acquired: 11/15/2013 13:07:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**19.970**	**1.5477**	**1.5194**	**.00326**	**.55093**
Stddev	.076	.0024	.0038	.00025	.00488
%RSD	.38243	.15626	.25084	7.7297	.88606
#1	20.024	1.5494	1.5221	.00344	.54748
#2	19.916	1.5459	1.5167	.00308	.55438
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.23677**	**.32532**	**4.804**	**-.00154**	**.00411**
Stddev	.00150	.00197	.001	.00283	.00120
%RSD	.63384	.60680	.0096	182.96	29.057
#1	.23571	.32392	4.804	-.00354	.00496
#2	.23783	.32671	4.804	.00045	.00327
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.333**	**.03242**	**.10878**	**5.2428**	**.00295**
Stddev	.073	.00030	.00099	.0146	.00388
%RSD	.47647	.91697	.90868	.27757	131.28
#1	15.281	.03263	.10808	5.2531	.00570
#2	15.385	.03221	.10948	5.2325	.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-7-b Acquired: 11/15/2013 13:07:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21769	.38908
Stddev	.00149	.00333
%RSD	.68288	.85673
#1	.21874	.39143
#2	.21664	.38672
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3218.1	5045.9	72935.	6892.5
Stddev	5.0	14.1	291.	2.9
%RSD	.15556	.28004	.39865	.04177
#1	3214.6	5035.9	72729.	6894.6
#2	3221.6	5055.9	73141.	6890.5

Sample Name: 480-49854-a-8-b Acquired: 11/15/2013 13:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**32.764**	**.08635**	**-.00029**	**.62310**
Stddev	.00018	.070	.00413	.00015	.00175
%RSD	144.76	.21223	4.7773	50.437	.28022
#1	-.00026	32.814	.08343	-.00019	.62433
#2	.00000	32.715	.08926	-.00040	.62186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00202**	**13.007**	**-.00008**	**.16055**	**.34315**
Stddev	.00001	.003	.00000	.00030	.00013
%RSD	.44398	.02613	.84667	.18499	.03786
#1	.00202	13.004	-.00008	.16076	.34306
#2	.00201	13.009	-.00008	.16034	.34325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.26644**	**401.19**	**2.6345**	**2.8905**	**.04292**
Stddev	.00019	.33	.0423	.0132	.00037
%RSD	.07132	.08221	1.6076	.45752	.85712
#1	.26630	400.96	2.6645	2.8999	.04266
#2	.26657	401.43	2.6046	2.8812	.04318
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-8-b Acquired: 11/15/2013 13:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**99.696**	**5.1412**	**5.2321**	**-.00096**	**.70160**
Stddev	.063	.0089	.0115	.00029	.00217
%RSD	.06279	.17309	.21883	29.721	.30910
#1	99.651	5.1349	5.2240	-.00076	.70007
#2	99.740	5.1475	5.2402	-.00116	.70314
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.58466**	**.07210**	**.9901**	**-.00322**	**.00447**
Stddev	.00017	.00281	.0099	.00214	.00035
%RSD	.02987	3.8926	1.000	66.436	7.8055
#1	.58478	.07408	.9971	-.00171	.00472
#2	.58453	.07011	.9831	-.00473	.00423
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.390**	**.05391**	**.06351**	**1.3558**	**-.00194**
Stddev	.019	.00102	.00001	.0041	.00230
%RSD	.17893	1.8884	.01235	.30489	118.67
#1	10.377	.05463	.06352	1.3529	-.00357
#2	10.403	.05319	.06351	1.3587	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-8-b Acquired: 11/15/2013 13:09:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.40717**	**.77656**
Stddev	.00018	.00160
%RSD	.04364	.20543
#1	.40705	.77543
#2	.40730	.77769
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3112.4**	**4902.6**	**69932.**	**6774.9**
Stddev	4.8	13.8	27.	13.0
%RSD	.15355	.28101	.03866	.19135
#1	3109.0	4892.9	69951.	6765.7
#2	3115.8	4912.4	69913.	6784.1

Sample Name: 480-49854-a-9-b Acquired: 11/15/2013 13:12:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00070**	**65.478**	**.02420**	**.02574**	**1.1855**
Stddev	.00012	.091	.00062	.00004	.0028
%RSD	16.918	.13839	2.5598	.15468	.23404
#1	.00062	65.542	.02376	.02576	1.1874
#2	.00079	65.414	.02464	.02571	1.1835
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00308**	**36.619**	**.00409**	**.34289**	**.70636**
Stddev	.00010	.049	.00009	.00013	.00271
%RSD	3.4019	.13445	2.2573	.03701	.38411
#1	.00300	36.584	.00402	.34280	.70828
#2	.00315	36.654	.00415	.34298	.70444
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2540**	**246.39**	**5.3865**	**6.0481**	**.05514**
Stddev	.0335	.35	.0139	.0213	.00011
%RSD	.63666	.14012	.25787	.35255	.19643
#1	5.2776	246.63	5.3963	6.0632	.05506
#2	5.2303	246.15	5.3766	6.0331	.05522
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-9-b Acquired: 11/15/2013 13:12:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**88.055**	**8.6791**	**9.0145**	**.00117**	**.58332**
Stddev	.043	.0084	.0050	.00018	.00063
%RSD	.04915	.09672	.05493	15.391	.10805
#1	88.025	8.6731	9.0180	.00104	.58376
#2	88.086	8.6850	9.0110	.00130	.58287
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.6224**	**.24952**	**5.032**	**-.01040**	**.03431**
Stddev	.0022	.00066	.004	.00252	.00586
%RSD	.13806	.26465	.0841	24.216	17.069
#1	1.6208	.24905	5.029	-.01218	.03845
#2	1.6239	.24999	5.035	-.00862	.03017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.822**	**.18588**	**.21617**	**3.0449**	**.00103**
Stddev	.034	.00028	.00077	.0029	.00179
%RSD	.23183	.14861	.35832	.09617	173.84
#1	14.846	.18607	.21671	3.0428	.00229
#2	14.797	.18568	.21562	3.0469	-.00024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-9-b Acquired: 11/15/2013 13:12:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.22496	1.0747
Stddev	.00220	.0034
%RSD	.97582	.31730
#1	.22651	1.0771
#2	.22341	1.0722
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3101.0	5010.9	71357.	6863.4
Stddev	.3	2.6	380.	13.0
%RSD	.00824	.05282	.53296	.19012
#1	3101.2	5012.8	71088.	6854.1
#2	3100.9	5009.0	71626.	6872.6

Sample Name: 480-49854-a-10-b Acquired: 11/15/2013 13:14:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00046**	**26.171**	**.00509**	**.00304**	**.38925**
Stddev	.00006	.105	.00193	.00010	.00061
%RSD	13.271	.40189	37.932	3.4068	.15692
#1	-.00041	26.245	.00646	.00311	.38968
#2	-.00050	26.097	.00373	.00296	.38882
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00140**	**13.965**	**.00025**	**.09956**	**.21895**
Stddev	.00013	.001	.00005	.00001	.00021
%RSD	9.4934	.00417	21.713	.01353	.09718
#1	.00131	13.965	.00021	.09955	.21880
#2	.00150	13.966	.00029	.09957	.21911
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21162**	**119.10**	**3.6410**	**3.7951**	**.02722**
Stddev	.00063	.25	.0408	.0154	.00042
%RSD	.29838	.20870	1.1215	.40496	1.5299
#1	.21117	119.28	3.6698	3.8060	.02751
#2	.21207	118.92	3.6121	3.7842	.02693
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-10-b Acquired: 11/15/2013 13:14:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**75.176**	**1.5350**	**1.5030**	**-.00042**	**.77296**
Stddev	.034	.0004	.0052	.00011	.00796
%RSD	.04476	.02502	.34491	26.971	1.0303
#1	75.200	1.5353	1.4994	-.00034	.77860
#2	75.152	1.5348	1.5067	-.00050	.76733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.50018**	**.02942**	**.6609**	**-.00301**	**.00689**
Stddev	.00091	.00067	.0001	.00153	.00271
%RSD	.18211	2.2704	.0175	50.871	39.390
#1	.49953	.02894	.6610	-.00409	.00497
#2	.50082	.02989	.6608	-.00193	.00881
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.843**	**.04839**	**.06586**	**2.1256**	**.00228**
Stddev	.060	.00060	.00011	.0046	.00033
%RSD	.50653	1.2330	.16069	.21669	14.483
#1	11.885	.04882	.06578	2.1288	.00252
#2	11.800	.04797	.06593	2.1223	.00205
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-10-b Acquired: 11/15/2013 13:14:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.08913**	**.46252**
Stddev	.00016	.00437
%RSD	.18185	.94573
#1	.08902	.46561
#2	.08925	.45943
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3172.8**	**4951.9**	**71780.**	**6852.6**
Stddev	4.6	10.7	228.	21.5
%RSD	.14404	.21704	.31769	.31332
#1	3169.6	4944.3	71618.	6837.4
#2	3176.1	4959.5	71941.	6867.8

Sample Name: 480-49854-a-11-b Acquired: 11/15/2013 13:16:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00089**	**24.439**	**.00605**	**.00858**	**.40905**
Stddev	.00030	.095	.00272	.00006	.00106
%RSD	33.299	.39040	45.046	.67522	.25981
#1	-.00109	24.372	.00797	.00863	.40830
#2	-.00068	24.507	.00412	.00854	.40980
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00134**	**16.414**	**.00062**	**.11773**	**.19842**
Stddev	.00001	.097	.00004	.00004	.00179
%RSD	.93208	.59269	7.0071	.03158	.90396
#1	.00135	16.345	.00065	.11775	.19715
#2	.00133	16.483	.00059	.11770	.19969
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.29041**	**102.71**	**3.6384**	**3.7227**	**.02833**
Stddev	.00030	.69	.0133	.0232	.00093
%RSD	.10365	.67523	.36593	.62246	3.2773
#1	.29020	102.22	3.6478	3.7390	.02899
#2	.29063	103.20	3.6290	3.7063	.02767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-11-b Acquired: 11/15/2013 13:16:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**64.169**	**1.6772**	**1.6302**	**-.00022**	**.71438**
Stddev	.114	.0040	.0088	.00002	.00333
%RSD	.17710	.24020	.53861	7.7338	.46546
#1	64.088	1.6744	1.6240	-.00020	.71673
#2	64.249	1.6801	1.6364	-.00023	.71203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.50046**	**.03469**	**9.911**	**-.00496**	**-.00148**
Stddev	.00056	.00187	.000	.00087	.00454
%RSD	.11226	5.4038	.0023	17.482	307.21
#1	.50085	.03336	9.911	-.00435	-.00468
#2	.50006	.03602	9.911	-.00558	.00173
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.969**	**.04816**	**.06668**	**2.2068**	**.00345**
Stddev	.032	.00020	.00040	.0038	.00336
%RSD	.22809	.40533	.60234	.17026	97.386
#1	13.947	.04802	.06639	2.2041	.00583
#2	13.992	.04830	.06696	2.2094	.00108
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-11-b Acquired: 11/15/2013 13:16:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.10002	.49258
Stddev	.00072	.00257
%RSD	.72226	.52151
#1	.09951	.49076
#2	.10053	.49439
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3195.0	4971.6	72120.	6895.8
Stddev	4.6	5.5	52.	6.5
%RSD	.14367	.11004	.07213	.09404
#1	3191.8	4967.7	72157.	6891.2
#2	3198.3	4975.5	72083.	6900.3

Sample Name: 480-49854-a-12-b Acquired: 11/15/2013 13:19:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00121**	**53.053**	**.02469**	**.00288**	**.60834**
Stddev	.00107	.095	.00147	.00033	.00069
%RSD	88.857	.17857	5.9625	11.565	.11420
#1	-.00045	52.986	.02574	.00311	.60883
#2	-.00197	53.120	.02365	.00264	.60785
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00222**	**66.096**	**.00015**	**.12458**	**.35812**
Stddev	.00007	.152	.00009	.00017	.00215
%RSD	3.1458	.22964	58.611	.13776	.60043
#1	.00217	65.988	.00021	.12446	.35964
#2	.00227	66.203	.00009	.12470	.35660
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22421**	**237.21**	**4.8117**	**5.2918**	**.09765**
Stddev	.00233	.87	.0147	.0010	.00184
%RSD	1.0374	.36635	.30526	.01934	1.8831
#1	.22585	236.59	4.8221	5.2925	.09635
#2	.22256	237.82	4.8013	5.2911	.09895
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-12-b Acquired: 11/15/2013 13:19:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**77.843**	**3.8539**	**3.8328**	**.00048**	**.78380**
Stddev	.352	.0114	.0363	.00000	.00737
%RSD	.45265	.29634	.94768	.29140	.94065
#1	78.092	3.8620	3.8585	.00049	.78901
#2	77.594	3.8458	3.8071	.00048	.77859
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.37874**	**.05007**	**2.519**	**-.00535**	**.00209**
Stddev	.00112	.00069	.005	.00020	.00076
%RSD	.29570	1.3834	.1990	3.8047	36.427
#1	.37954	.04958	2.515	-.00520	.00155
#2	.37795	.05056	2.522	-.00549	.00263
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.5845**	**.05061**	**.10700**	**1.9676**	**.00129**
Stddev	.0214	.00040	.00021	.0121	.00031
%RSD	.28145	.79937	.19314	.61740	24.284
#1	7.5694	.05033	.10714	1.9762	.00106
#2	7.5996	.05090	.10685	1.9590	.00151
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-12-b Acquired: 11/15/2013 13:19:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.22022**	**.64051**
Stddev	.00181	.00737
%RSD	.82092	1.1513
#1	.22150	.64573
#2	.21895	.63530
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3078.9**	**4877.5**	**71071.**	**6855.5**
Stddev	2.3	8.9	565.	13.3
%RSD	.07391	.18322	.79450	.19469
#1	3077.2	4871.2	70672.	6865.0
#2	3080.5	4883.8	71471.	6846.1

Sample Name: 480-49854-a-13-b Acquired: 11/15/2013 13:21:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**21.062**	**.00267**	**.01227**	**.56653**
Stddev	.00033	.055	.00035	.00014	.00106
%RSD	69.253	.26031	13.223	1.1187	.18752
#1	.00071	21.023	.00292	.01237	.56578
#2	.00024	21.101	.00242	.01218	.56728
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00113**	**12.897**	**.00069**	**.07041**	**.26726**
Stddev	.00002	.095	.00007	.00051	.00014
%RSD	1.5742	.73275	10.202	.72467	.05174
#1	.00111	12.830	.00064	.07004	.26736
#2	.00114	12.963	.00074	.07077	.26716
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20197**	**80.859**	**2.4139**	**2.3903**	**.02175**
Stddev	.00017	.539	.0367	.0012	.00015
%RSD	.08398	.66684	1.5200	.04942	.70913
#1	.20185	80.478	2.3880	2.3894	.02186
#2	.20209	81.240	2.4399	2.3911	.02164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-13-b Acquired: 11/15/2013 13:21:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**30.842**	**4.4032**	**4.2812**	**-.00045**	**.66277**
Stddev	.067	.0087	.0063	.00011	.00649
%RSD	.21880	.19789	.14666	23.589	.97987
#1	30.794	4.3971	4.2767	-.00052	.65818
#2	30.889	4.4094	4.2856	-.00037	.66736
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.30147**	**.03909**	**3.766**	**-.00446**	**.00485**
Stddev	.00191	.00008	.006	.00141	.00051
%RSD	.63246	.19708	.1650	31.705	10.499
#1	.30012	.03904	3.762	-.00545	.00449
#2	.30281	.03915	3.771	-.00346	.00521
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.8232**	**.04096**	**.06290**	**1.3576**	**.00187**
Stddev	.0671	.00080	.00012	.0027	.00161
%RSD	.68326	1.9457	.19648	.19623	86.082
#1	9.7757	.04152	.06281	1.3557	.00073
#2	9.8706	.04040	.06299	1.3594	.00301
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-13-b Acquired: 11/15/2013 13:21:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.08361	.46248
Stddev	.00030	.00365
%RSD	.35634	.78976
#1	.08382	.45990
#2	.08340	.46506
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3267.8	5032.0	73042.	6808.5
Stddev	1.4	.0	8.	25.6
%RSD	.04411	.00097	.01156	.37660
#1	3266.8	5032.0	73036.	6826.6
#2	3268.8	5032.0	73048.	6790.4

Sample Name: 480-49854-a-14-b Acquired: 11/15/2013 13:23:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00094**	**29.130**	**.00752**	**.00171**	**.30420**
Stddev	.00035	.127	.00228	.00048	.00160
%RSD	37.662	.43726	30.378	28.081	.52503
#1	-.00069	29.040	.00590	.00205	.30532
#2	-.00119	29.220	.00913	.00137	.30307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00152**	**8.0225**	**.00018**	**.07363**	**.12222**
Stddev	.00005	.0152	.00001	.00025	.00125
%RSD	3.3405	.18924	4.0548	.34133	1.0256
#1	.00156	8.0332	.00018	.07381	.12311
#2	.00148	8.0118	.00017	.07346	.12133
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.18892**	**112.43**	**4.2757**	**4.3334**	**.04181**
Stddev	.00090	.18	.0265	.0170	.00043
%RSD	.47689	.16108	.61979	.39141	1.0359
#1	.18955	112.31	4.2945	4.3453	.04151
#2	.18828	112.56	4.2570	4.3214	.04212
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-14-b Acquired: 11/15/2013 13:23:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**58.019**	**1.3895**	**1.3295**	**-.00067**	**.44139**
Stddev	.133	.0021	.0010	.00003	.00332
%RSD	.22867	.15239	.07498	4.1367	.75326
#1	58.113	1.3910	1.3288	-.00069	.43904
#2	57.925	1.3880	1.3302	-.00065	.44374
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.62728**	**.03450**	**.7773**	**-.00155**	**.00158**
Stddev	.00097	.00101	.0021	.00027	.00196
%RSD	.15526	2.9311	.2756	17.144	124.39
#1	.62659	.03521	.7757	-.00136	.00296
#2	.62797	.03378	.7788	-.00173	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.2063**	**.05036**	**.03464**	**2.0479**	**-.00002**
Stddev	.0478	.00014	.00000	.0055	.00182
%RSD	.58236	.27183	.00218	.26862	9707.7
#1	8.2401	.05027	.03464	2.0518	.00127
#2	8.1725	.05046	.03464	2.0440	-.00131
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-14-b Acquired: 11/15/2013 13:23:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.08567	.31099
Stddev	.00097	.00191
%RSD	1.1318	.61416
#1	.08635	.31234
#2	.08498	.30964
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3210.9	4991.6	73359.	6830.6
Stddev	.2	6.4	459.	31.2
%RSD	.00585	.12920	.62542	.45707
#1	3211.1	4996.2	73035.	6808.6
#2	3210.8	4987.1	73683.	6852.7

Sample Name: CCV Acquired: 11/15/2013 13:26:14 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49828**	**25.367**	**.50740**	**.49196**	**.50742**	**.49513**	**25.118**
Stddev	.00215	.112	.00066	.00068	.00094	.00143	.082
%RSD	.43060	.44186	.13018	.13778	.18532	.28921	.32830
#1	.49676	25.287	.50693	.49148	.50675	.49614	25.176
#2	.49979	25.446	.50787	.49244	.50808	.49412	25.059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49588**	**.49263**	**.50953**	**.50611**	**24.210**	**25.460**	**25.484**
Stddev	.00062	.00029	.00039	.00060	.099	.114	.217
%RSD	.12489	.05907	.07751	.11841	.41012	.44768	.85335
#1	.49544	.49242	.50981	.50569	24.280	25.380	25.330
#2	.49632	.49283	.50925	.50654	24.139	25.541	25.638
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50277**	**24.202**	**.50175**	**.48781**	**.50132**	**25.355**	**.49564**
Stddev	.00329	.005	.00053	.00046	.00199	.090	.00076
%RSD	.65388	.02122	.10610	.09402	.39774	.35377	.15373
#1	.50044	24.198	.50213	.48749	.49991	25.292	.49618
#2	.50509	24.205	.50138	.48814	.50273	25.419	.49510
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 13:26:14 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49556	25.01	.51337	.49840	25.025	.50882	.50848
Stddev	.00189	.06	.00069	.00115	.073	.00253	.00158
%RSD	.38093	.2500	.13448	.22997	.28988	.49637	.31023
#1	.49689	24.97	.51386	.49759	24.974	.50703	.50737
#2	.49422	25.06	.51288	.49921	25.077	.51061	.50960
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50879	.49872	.50727	.50230
Stddev	.00095	.00102	.00135	.00163
%RSD	.18678	.20502	.26571	.32533
#1	.50947	.49800	.50822	.50345
#2	.50812	.49944	.50632	.50114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3252.5	5050.2	73857.	6996.9
Stddev	6.1	13.4	63.	17.5
%RSD	.18870	.26576	.08500	.25056
#1	3256.9	5059.6	73812.	6984.5
#2	3248.2	5040.7	73901.	7009.3

Sample Name: CCB Acquired: 11/15/2013 13:28:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00070**	**.13895**	**.00128**	**-.00029**	**.00002**	**.00009**	**-.01657**
Stddev	.00031	.01491	.00020	.00010	.00001	.00006	.00283
%RSD	44.662	10.729	15.339	34.618	41.596	71.778	17.076
#1	-.00092	.12841	.00114	-.00036	.00001	.00004	-.01457
#2	-.00048	.14950	.00142	-.00022	.00003	.00013	-.01857
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.00000**	**-.00047**	**.00034**	**-.00412**	**.07160**	**.00050**
Stddev	.00015	.00015	.00040	.00015	.00464	.01542	.00031
%RSD	119.74	25266.	83.677	44.846	112.71	21.533	62.223
#1	.00002	.00010	-.00075	.00023	-.00084	.08250	.00072
#2	.00023	-.00011	-.00019	.00045	-.00740	.06070	.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00076**	**-.00107**	**.00005**	**-.00066**	**.00032**	**-.00949**	**-.00025**
Stddev	.00011	.00533	.00003	.00061	.00047	.00683	.00040
%RSD	14.600	498.05	63.861	91.849	149.88	71.999	158.63
#1	-.00084	-.00484	.00003	-.00023	.00065	-.01432	-.00054
#2	-.00068	.00270	.00007	-.00109	-.00002	-.00466	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 13:28:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00016	F .0059	-.00058	.00015	.00751	.00034	-.00011
Stddev	.00004	.0042	.00028	.00134	.01477	.00028	.00002
%RSD	27.079	70.34	49.013	893.69	196.65	81.070	19.857
#1	.00013	.0089	-.00078	.00110	-.00293	.00015	-.00013
#2	.00019	.0030	-.00038	-.00080	.01795	.00054	-.00010
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00025	-.00028	.00013	.00039
Stddev	.00004	.00106	.00001	.00031
%RSD	17.021	372.94	4.5650	80.969
#1	.00028	-.00103	.00012	.00061
#2	.00022	.00046	.00013	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3426.2	5125.6	76224.	6927.3
Stddev	5.3	1.8	273.	.9
%RSD	.15581	.03584	.35874	.01348
#1	3429.9	5126.9	76031.	6926.6
#2	3422.4	5124.3	76417.	6927.9

Sample Name: CCVL Acquired: 11/15/2013 13:31:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00252**	**.22733**	**.01258**	**.01914**	**.00222**	**.00211**	**.49548**
Stddev	.00080	.00203	.00016	.00007	.00000	.00005	.00130
%RSD	31.850	.89411	1.2772	.36472	.13431	2.3954	.26294
#1	.00308	.22589	.01270	.01919	.00223	.00207	.49456
#2	.00195	.22877	.01247	.01909	.00222	.00215	.49640
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00101**	**.00416**	**.00378**	**.01040**	**.04637**	**.51134**	**.42593**
Stddev	.00022	.00011	.00003	.00003	.00264	.00990	.00232
%RSD	21.505	2.5783	.71104	.33231	5.6955	1.9365	.54415
#1	.00117	.00408	.00380	.01042	.04450	.51834	.42757
#2	.00086	.00423	.00376	.01038	.04823	.50434	.42429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02834**	**.21108**	**.00334**	**.00309**	**.00984**	**.95827**	**.00996**
Stddev	.00029	.00339	.00009	.00019	.00016	.00570	.00012
%RSD	1.0086	1.6056	2.7949	6.1314	1.6160	.59528	1.2483
#1	.02854	.21347	.00327	.00322	.00973	.95424	.00988
#2	.02814	.20868	.00341	.00295	.00995	.96231	.01005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 13:31:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00517	.2106	.02056	.01323	.48660	.00978	.00499
Stddev	.00053	.0006	.00115	.00309	.00094	.00014	.00009
%RSD	10.323	.2972	5.5949	23.377	.19335	1.4175	1.7788
#1	.00479	.2102	.02137	.01541	.48594	.00969	.00492
#2	.00555	.2111	.01974	.01104	.48727	.00988	.00505
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00493	.02098	.00515	.01056
Stddev	.00012	.00228	.00022	.00051
%RSD	2.3864	10.873	4.1765	4.8433
#1	.00485	.01937	.00500	.01019
#2	.00501	.02259	.00530	.01092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3447.9	5177.8	76680.	7032.9
Stddev	7.3	8.8	227.	17.2
%RSD	.21049	.16906	.29614	.24385
#1	3453.0	5184.0	76841.	7045.1
#2	3442.8	5171.6	76520.	7020.8

Sample Name: 480-49854-a-16-b Acquired: 11/15/2013 13:33:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**28.258**	**.00714**	**.00437**	**.33079**
Stddev	.00020	.148	.00645	.00018	.00177
%RSD	28.285	.52538	90.344	4.1924	.53585
#1	-.00085	28.153	.01170	.00450	.32954
#2	-.00056	28.363	.00258	.00424	.33204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00142**	**15.814**	**.00033**	**.07968**	**.12665**
Stddev	.00004	.145	.00022	.00033	.00237
%RSD	2.5587	.91957	68.117	.40893	1.8734
#1	.00144	15.712	.00049	.07945	.12498
#2	.00139	15.917	.00017	.07991	.12833
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11027**	**91.817**	**2.7833**	**2.9101**	**.02334**
Stddev	.00073	1.058	.0332	.0027	.00110
%RSD	.66616	1.1523	1.1921	.09104	4.7204
#1	.10975	91.069	2.7599	2.9082	.02256
#2	.11079	92.565	2.8068	2.9120	.02412
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-16-b Acquired: 11/15/2013 13:33:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**52.812**	**1.4774**	**1.4200**	**-.00020**	**1.7313**
Stddev	.242	.0053	.0037	.00011	.0004
%RSD	.45783	.35665	.26147	55.017	.02541
#1	52.641	1.4736	1.4174	-.00012	1.7316
#2	52.983	1.4811	1.4227	-.00028	1.7310
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.40946**	**.06762**	**.6537**	**-.00373**	**-.00099**
Stddev	.00020	.00126	.0035	.00275	.00490
%RSD	.04813	1.8606	.5364	73.650	494.11
#1	.40960	.06851	.6512	-.00179	.00247
#2	.40932	.06673	.6562	-.00567	-.00445
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.758**	**.05092**	**.07216**	**2.0184**	**.00023**
Stddev	.046	.00065	.00042	.0072	.00186
%RSD	.33551	1.2813	.57751	.35480	803.86
#1	13.726	.05046	.07187	2.0133	-.00108
#2	13.791	.05138	.07246	2.0235	.00155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-16-b Acquired: 11/15/2013 13:33:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.06782	.39092
Stddev	.00009	.00469
%RSD	.13306	1.2010
#1	.06788	.38760
#2	.06776	.39424
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3203.8	4968.1	73373.	6863.9
Stddev	7.3	23.7	183.	.9
%RSD	.22629	.47763	.24944	.01315
#1	3198.7	4951.3	73503.	6864.6
#2	3208.9	4984.9	73244.	6863.3

Sample Name: 480-49854-a-17-b Acquired: 11/15/2013 13:35:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**39.692**	**.00758**	**.02074**	**.82226**
Stddev	.00007	.041	.00350	.00028	.00357
%RSD	9.3303	.10337	46.246	1.3733	.43438
#1	.00068	39.721	.00510	.02054	.82479
#2	.00078	39.662	.01005	.02094	.81974
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00190**	**18.851**	**.00117**	**.13876**	**.27790**
Stddev	.00003	.034	.00002	.00008	.00271
%RSD	1.3556	.18250	1.3661	.05668	.97421
#1	.00192	18.875	.00116	.13882	.27982
#2	.00188	18.827	.00118	.13871	.27599
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0485**	**125.38**	**3.5685**	**3.7517**	**.03613**
Stddev	.0071	.74	.0063	.0124	.00018
%RSD	.67500	.59120	.17717	.32928	.48683
#1	1.0535	125.91	3.5640	3.7605	.03626
#2	1.0435	124.86	3.5729	3.7430	.03601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-17-b Acquired: 11/15/2013 13:35:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**41.363**	**5.0047**	**4.9424**	**.00016**	**.90829**
Stddev	.090	.0118	.0079	.00036	.00076
%RSD	.21698	.23670	.15977	226.67	.08409
#1	41.427	5.0131	4.9479	.00041	.90775
#2	41.300	4.9964	4.9368	-.00010	.90883
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.61174**	**.08950**	F **10.56**	**-.00430**	**.01312**
Stddev	.00112	.00136	.01	.00099	.00024
%RSD	.18254	1.5184	.0675	23.087	1.8303
#1	.61253	.09046	10.55	-.00360	.01295
#2	.61095	.08854	10.56	-.00500	.01329
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.721**	**.05643**	**.10870**	**2.2384**	**.00321**
Stddev	.049	.00085	.00074	.0011	.00048
%RSD	.45860	1.5132	.68188	.04872	14.886
#1	10.756	.05704	.10922	2.2376	.00287
#2	10.686	.05583	.10818	2.2392	.00355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-17-b Acquired: 11/15/2013 13:35:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.13261	.86190
Stddev	.00112	.00279
%RSD	.84244	.32316
#1	.13340	.86387
#2	.13182	.85993
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3215.4	5028.0	73809.	6869.2
Stddev	2.7	1.1	507.	21.3
%RSD	.08471	.02223	.68677	.31025
#1	3213.5	5028.8	73450.	6854.1
#2	3217.4	5027.3	74167.	6884.3

Sample Name: 480-49854-a-18-b Acquired: 11/15/2013 13:38:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00047**	**31.463**	**.01369**	**.02145**	**.51092**
Stddev	.00045	.108	.00101	.00072	.00290
%RSD	95.384	.34251	7.3774	3.3744	.56797
#1	-.00015	31.387	.01297	.02094	.50887
#2	-.00079	31.540	.01440	.02196	.51297
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00164**	**33.669**	**.00253**	**.06915**	**.23478**
Stddev	.00008	.031	.00005	.00013	.00201
%RSD	4.8215	.09265	2.0866	.19466	.85718
#1	.00159	33.691	.00257	.06905	.23620
#2	.00170	33.647	.00249	.06924	.23336
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.46542**	**77.510**	**2.3056**	**2.3726**	**.02672**
Stddev	.00161	.205	.0277	.0039	.00071
%RSD	.34494	.26395	1.2015	.16251	2.6696
#1	.46656	77.365	2.3252	2.3699	.02621
#2	.46429	77.655	2.2860	2.3753	.02722
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-18-b Acquired: 11/15/2013 13:38:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**23.905**	**2.5330**	**2.4295**	**.00197**	**1.1915**
Stddev	.050	.0054	.0040	.00029	.0029
%RSD	.20814	.21226	.16543	14.677	.24016
#1	23.940	2.5368	2.4323	.00217	1.1935
#2	23.870	2.5291	2.4266	.00176	1.1894
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.32757**	**.20993**	F **10.93**	**-.00349**	**.01047**
Stddev	.00045	.00148	.03	.00258	.00229
%RSD	.13744	.70268	.2428	73.798	21.834
#1	.32725	.21097	10.91	-.00167	.01208
#2	.32789	.20889	10.95	-.00532	.00885
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.279**	**.04272**	**.11830**	**1.6648**	**.00015**
Stddev	.076	.00060	.00073	.0066	.00242
%RSD	.66992	1.3976	.61935	.39713	1589.3
#1	11.332	.04314	.11779	1.6695	-.00156
#2	11.225	.04230	.11882	1.6602	.00186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-18-b Acquired: 11/15/2013 13:38:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.23150**	**.35855**
Stddev	.00105	.00072
%RSD	.45278	.19968
#1	.23224	.35906
#2	.23076	.35805
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3230.4**	**5000.8**	**74343.**	**6887.8**
Stddev	.9	6.9	419.	6.1
%RSD	.02713	.13889	.56347	.08851
#1	3229.8	4995.9	74046.	6883.5
#2	3231.0	5005.7	74639.	6892.1

Sample Name: 480-49854-a-19-b Acquired: 11/15/2013 13:40:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00068**	**37.232**	**.00921**	**.01805**	**.96868**
Stddev	.00001	.019	.00147	.00061	.00022
%RSD	1.7840	.05023	16.011	3.3875	.02301
#1	.00067	37.218	.01025	.01848	.96884
#2	.00068	37.245	.00817	.01762	.96852
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00196**	**23.206**	**.00163**	**.11307**	**.30718**
Stddev	.00004	.008	.00015	.00027	.00095
%RSD	1.8718	.03568	9.4128	.24075	.30926
#1	.00198	23.200	.00174	.11288	.30650
#2	.00193	23.212	.00152	.11327	.30785
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.52529**	**114.69**	**3.1499**	**3.2697**	**.03216**
Stddev	.00073	.11	.0404	.0099	.00003
%RSD	.13836	.09903	1.2827	.30366	.10793
#1	.52478	114.61	3.1213	3.2767	.03213
#2	.52581	114.77	3.1785	3.2627	.03218
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-19-b Acquired: 11/15/2013 13:40:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**24.632**	**7.7975**	**7.7142**	**-.00045**	**.83236**
Stddev	.010	.0083	.0254	.00009	.00196
%RSD	.04198	.10633	.32874	19.439	.23546
#1	24.624	7.7916	7.6962	-.00051	.83097
#2	24.639	7.8034	7.7321	-.00039	.83375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.52169**	**.11320**	**5.752**	**-.00307**	**.00907**
Stddev	.00155	.00013	.019	.00103	.00285
%RSD	.29753	.11325	.3345	33.628	31.463
#1	.52060	.11329	5.766	-.00234	.01109
#2	.52279	.11311	5.739	-.00380	.00705
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.272**	**.04206**	**.13231**	**1.9169**	**.00052**
Stddev	.037	.00032	.00034	.0026	.00293
%RSD	.35755	.76984	.25567	.13571	567.23
#1	10.298	.04229	.13207	1.9151	.00258
#2	10.246	.04183	.13255	1.9188	-.00155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-19-b Acquired: 11/15/2013 13:40:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.12783	.73838
Stddev	.00036	.00089
%RSD	.28510	.12003
#1	.12758	.73775
#2	.12809	.73901
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3231.6	5037.0	74429.	6904.3
Stddev	4.6	12.8	21.	19.2
%RSD	.14216	.25384	.02765	.27795
#1	3228.3	5028.0	74443.	6890.8
#2	3234.8	5046.0	74414.	6917.9

Sample Name: 480-49854-a-20-b Acquired: 11/15/2013 13:43:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00156**	**33.638**	**.01175**	**.02039**	**1.0504**
Stddev	.00079	.048	.00008	.00047	.0005
%RSD	50.896	.14152	.71126	2.3251	.04486
#1	.00212	33.671	.01181	.02073	1.0501
#2	.00100	33.604	.01169	.02006	1.0508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00177**	**23.076**	**.00131**	**.10552**	**.28631**
Stddev	.00004	.047	.00009	.00036	.00030
%RSD	2.4944	.20197	6.9339	.34322	.10423
#1	.00180	23.043	.00125	.10578	.28610
#2	.00174	23.109	.00138	.10527	.28652
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.54310**	**117.64**	**3.1044**	**3.2412**	**.02929**
Stddev	.00088	.30	.0076	.0147	.00066
%RSD	.16221	.25139	.24613	.45394	2.2423
#1	.54248	117.43	3.1098	3.2308	.02976
#2	.54372	117.85	3.0990	3.2516	.02883
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-20-b Acquired: 11/15/2013 13:43:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.481**	**9.9925**	**10.031**	**-.00058**	**.83153**
Stddev	.111	.0362	.004	.00018	.00083
%RSD	.43455	.36222	.04377	30.873	.09952
#1	25.560	10.018	10.034	-.00046	.83094
#2	25.403	9.9669	10.028	-.00071	.83211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.47856**	**.09684**	**9.357**	**-.00356**	**.01145**
Stddev	.00135	.00174	.004	.00321	.00200
%RSD	.28297	1.7986	.0376	90.152	17.430
#1	.47761	.09560	9.354	-.00583	.01286
#2	.47952	.09807	9.359	-.00129	.01004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.967**	**.04460**	**.12838**	**1.7436**	**.00327**
Stddev	.014	.00031	.00073	.0018	.00365
%RSD	.12807	.70238	.56839	.10064	111.52
#1	10.957	.04482	.12787	1.7449	.00069
#2	10.977	.04438	.12890	1.7424	.00586
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-20-b Acquired: 11/15/2013 13:43:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.11110**	**.76374**
Stddev	.00019	.00188
%RSD	.16932	.24617
#1	.11097	.76507
#2	.11124	.76241
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3243.0**	**5051.3**	**73844.**	**6835.5**
Stddev	.3	5.6	319.	.1
%RSD	.00835	.11114	.43261	.00078
#1	3243.2	5055.3	73618.	6835.5
#2	3242.8	5047.3	74070.	6835.5

Sample Name: 480-49854-a-12-b@2 Acquired: 11/15/2013 13:45:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00097**	**28.220**	**.01696**	**.00135**	**.32834**
Stddev	.00016	.088	.00227	.00021	.00146
%RSD	16.372	.31166	13.394	15.382	.44431
#1	-.00085	28.158	.01535	.00150	.32731
#2	-.00108	28.283	.01857	.00121	.32937
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00121**	**35.725**	**.00012**	**.06558**	**.19246**
Stddev	.00014	.017	.00009	.00024	.00075
%RSD	11.613	.04730	76.025	.36140	.38915
#1	.00111	35.713	.00019	.06542	.19193
#2	.00131	35.737	.00006	.06575	.19299
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.11731**	**126.48**	**2.4951**	**2.6678**	**.04998**
Stddev	.00019	.32	.0248	.0144	.00045
%RSD	.16307	.25583	.99399	.54180	.90800
#1	.11718	126.71	2.4776	2.6576	.04966
#2	.11745	126.25	2.5127	2.6780	.05030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-12-b@2 Acquired: 11/15/2013 13:45:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**41.509**	**2.0913**	**2.0225**	**-.00006**	**.40304**
Stddev	.041	.0004	.0050	.00013	.00335
%RSD	.09759	.01749	.24653	214.63	.83236
#1	41.537	2.0910	2.0189	-.00015	.40067
#2	41.480	2.0915	2.0260	.00003	.40542
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20155**	**.02760**	**1.303**	**-.00240**	**.00164**
Stddev	.00010	.00162	.003	.00132	.00917
%RSD	.04822	5.8820	.2533	55.162	559.09
#1	.20148	.02875	1.305	-.00146	-.00485
#2	.20162	.02645	1.301	-.00333	.00813
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.0739**	**.02630**	**.05649**	**1.0294**	**.00085**
Stddev	.0300	.00035	.00007	.0011	.00481
%RSD	.73619	1.3147	.12726	.10265	564.86
#1	4.0527	.02654	.05644	1.0301	.00425
#2	4.0951	.02606	.05654	1.0286	-.00255
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-12-b@2 Acquired: 11/15/2013 13:45:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.11586**	**.34319**
Stddev	.00029	.00095
%RSD	.24630	.27693
#1	.11566	.34252
#2	.11607	.34386
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3226.4**	**4998.1**	**73211.**	**6878.8**
Stddev	.7	6.5	75.	1.1
%RSD	.02062	.13034	.10192	.01640
#1	3226.8	5002.7	73158.	6879.6
#2	3225.9	4993.5	73264.	6878.0

Sample Name: 480-49854-a-15-b Acquired: 11/15/2013 13:47:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00066**	**25.946**	**.00639**	**.00439**	**.36721**
Stddev	.00057	.007	.00010	.00053	.00086
%RSD	85.381	.02623	1.5253	12.016	.23382
#1	-.00026	25.941	.00646	.00402	.36782
#2	-.00107	25.951	.00632	.00477	.36660
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00135**	**19.072**	**.00040**	**.09728**	**.18198**
Stddev	.00001	.051	.00003	.00028	.00059
%RSD	.88611	.26493	8.0005	.28925	.32478
#1	.00134	19.107	.00038	.09748	.18240
#2	.00135	19.036	.00042	.09708	.18156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2714	K_7664	K_7664-2	Li6707
Line	324.754 {104}	271.441 {124}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20704**	**120.01**	**2.9922**	**3.1518**	**.03227**
Stddev	.00104	.48	.0167	.0116	.00066
%RSD	.50288	.39630	.55800	.36929	2.0410
#1	.20778	120.35	3.0040	3.1600	.03181
#2	.20630	119.67	2.9803	3.1435	.03274
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-15-b Acquired: 11/15/2013 13:47:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**70.611**	**2.7656**	**2.6712**	**-.00013**	**.61379**
Stddev	.092	.0004	.0029	.00011	.01099
%RSD	.13080	.01357	.10855	80.798	1.7907
#1	70.677	2.7659	2.6733	-.00006	.62156
#2	70.546	2.7653	2.6692	-.00021	.60601
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.51689**	**.03748**	**1.652**	**-.00166**	**.00308**
Stddev	.00032	.00029	.009	.00253	.00302
%RSD	.06147	.76294	.5384	151.86	98.056
#1	.51712	.03769	1.658	-.00345	.00095
#2	.51667	.03728	1.646	.00012	.00522
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.394**	**.05061**	**.05913**	**1.9321**	**.00147**
Stddev	.018	.00023	.00017	.0027	.00067
%RSD	.12744	.45322	.29188	.14058	45.770
#1	14.407	.05077	.05925	1.9341	.00099
#2	14.382	.05045	.05901	1.9302	.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49854-a-15-b Acquired: 11/15/2013 13:47:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.08752**	**.44708**
Stddev	.00054	.00180
%RSD	.61512	.40194
#1	.08790	.44835
#2	.08714	.44581
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3187.8**	**4973.4**	**72512.**	**6781.4**
Stddev	1.4	3.4	372.	36.4
%RSD	.04525	.06846	.51276	.53726
#1	3186.8	4971.0	72249.	6755.6
#2	3188.8	4975.8	72774.	6807.1

Sample Name: 480-49329-f-10-a Acquired: 11/15/2013 13:50:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00029**	**.08364**	**.00023**	**.01980**	**.02920**
Stddev	.00010	.00200	.00045	.00014	.00014
%RSD	35.041	2.3923	198.84	.69521	.48521
#1	-.00036	.08223	.00055	.01989	.02910
#2	-.00022	.08506	-.00009	.01970	.02930
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**247.75**	**.00039**	**.00013**	**.00040**
Stddev	.00003	.29	.00007	.00011	.00020
%RSD	41.934	.11833	18.497	85.083	49.769
#1	.00006	247.95	.00044	.00021	.00026
#2	.00010	247.54	.00034	.00005	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00128**	**.30634**	**1.5454**	**2.1008**	**.01614**
Stddev	.00039	.00152	.0404	.0018	.00017
%RSD	30.057	.49767	2.6118	.08758	1.0478
#1	.00101	.30742	1.5169	2.1021	.01602
#2	.00155	.30526	1.5740	2.0995	.01626
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-10-a Acquired: 11/15/2013 13:50:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**31.165**	**.19235**	**.19060**	**.00039**	**11.520**
Stddev	.138	.00105	.00277	.00017	.016
%RSD	.44284	.54430	1.4508	42.635	.13515
#1	31.068	.19161	.18865	.00027	11.531
#2	31.263	.19309	.19256	.00050	11.509
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00085**	**-.00043**	F **166.5**	**-.00106**	**-.00149**
Stddev	.00057	.00079	.3	.00080	.00117
%RSD	66.748	183.54	.1534	74.988	78.651
#1	.00045	-.00099	166.3	-.00163	-.00232
#2	.00125	.00013	166.7	-.00050	-.00066
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.2851**	**-.00022**	**.50766**	**.00189**	**.00141**
Stddev	.0312	.00073	.00006	.00024	.00179
%RSD	.49606	340.70	.01136	12.838	126.65
#1	6.2631	.00030	.50770	.00206	.00268
#2	6.3071	-.00073	.50762	.00172	.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-10-a Acquired: 11/15/2013 13:50:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00026**	**.00138**
Stddev	.00020	.00007
%RSD	76.449	4.8139
#1	-.00012	.00133
#2	-.00041	.00142
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3135.7**	**4792.4**	**70349.**	**6892.7**
Stddev	7.1	9.7	568.	19.0
%RSD	.22659	.20303	.80673	.27614
#1	3140.8	4799.3	70751.	6906.2
#2	3130.7	4785.5	69948.	6879.3

Sample Name: 480-49329-f-11-a Acquired: 11/15/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00063**	**.19882**	**.00552**	**.27623**	**.02365**
Stddev	.00014	.00182	.00040	.00101	.00019
%RSD	22.647	.91426	7.2843	.36452	.81857
#1	-.00073	.20010	.00523	.27695	.02378
#2	-.00053	.19753	.00580	.27552	.02351
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**1.0165**	**.00009**	**.00016**	**-.00032**
Stddev	.00004	.0017	.00016	.00002	.00040
%RSD	32.371	.16565	182.61	11.804	124.82
#1	.00009	1.0153	-.00002	.00015	-.00061
#2	.00014	1.0177	.00019	.00018	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00244**	**.14407**	**2.4385**	**3.4517**	**.24138**
Stddev	.00006	.00382	.0020	.0271	.00062
%RSD	2.4155	2.6523	.08135	.78513	.25690
#1	.00240	.14677	2.4371	3.4709	.24094
#2	.00248	.14137	2.4399	3.4325	.24182
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-11-a Acquired: 11/15/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.15965	.00477	.00466	.00993	183.62
Stddev	.00260	.00004	.00018	.00004	.18
%RSD	1.6316	.89521	3.8308	.38604	.09882
#1	.16149	.00480	.00454	.00990	183.74
#2	.15781	.00474	.00479	.00996	183.49
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	-.00005	-.00036	2.885	-.00028	.00064
Stddev	.00002	.00128	.001	.00199	.00396
%RSD	38.967	353.20	.0314	721.85	622.53
#1	-.00003	.00054	2.884	.00113	.00343
#2	-.00006	-.00127	2.886	-.00168	-.00216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	3.4425	.00026	.05494	.00231	.00302
Stddev	.0157	.00076	.00061	.00027	.00026
%RSD	.45705	291.59	1.1147	11.762	8.7612
#1	3.4536	.00080	.05451	.00250	.00283
#2	3.4314	-.00028	.05538	.00211	.00321
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-11-a Acquired: 11/15/2013 13:52:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00047	.00718
Stddev	.00009	.00037
%RSD	19.561	5.2038
#1	.00040	.00692
#2	.00053	.00745
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3194.5	4932.6	70693.	6958.4
Stddev	5.7	2.5	257.	.5
%RSD	.17698	.05072	.36371	.00759
#1	3198.5	4930.8	70511.	6958.8
#2	3190.5	4934.3	70874.	6958.0

Sample Name: CCV Acquired: 11/15/2013 13:54:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51344**	**26.176**	**.52428**	**.50709**	**.52643**	**.51229**	**25.693**
Stddev	.00553	.207	.00655	.00118	.00297	.00022	.001
%RSD	1.0779	.79179	1.2487	.23215	.56415	.04313	.00495
#1	.50953	26.323	.52891	.50626	.52853	.51245	25.692
#2	.51736	26.030	.51965	.50792	.52433	.51213	25.694
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51074**	**.50720**	**.52357**	**.52224**	**25.046**	**26.303**	**26.679**
Stddev	.00011	.00006	.00482	.00566	.034	.065	.092
%RSD	.02104	.01230	.92046	1.0835	.13718	.24745	.34568
#1	.51067	.50716	.52017	.51824	25.022	26.349	26.614
#2	.51082	.50725	.52698	.52624	25.070	26.257	26.744
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52384**	**24.909**	**.51917**	**.50000**	**.51749**	**26.201**	**.50921**
Stddev	.00448	.171	.00390	.00210	.00149	.207	.00100
%RSD	.85593	.68834	.75047	.42031	.28796	.79074	.19634
#1	.52701	24.787	.51641	.49852	.51854	26.348	.50851
#2	.52067	25.030	.52192	.50149	.51643	26.055	.50992
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 13:54:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50871	25.50	.52508	.51294	25.592	.52058	.52510
Stddev	.00325	.01	.00012	.00250	.022	.00116	.00366
%RSD	.63874	.0200	.02291	.48830	.08416	.22217	.69789
#1	.51101	25.51	.52499	.51117	25.608	.51976	.52769
#2	.50642	25.50	.52516	.51471	25.577	.52140	.52251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.52085	.51710	.51863	.51418
Stddev	.00306	.00034	.00555	.00481
%RSD	.58705	.06604	1.0704	.93505
#1	.51869	.51734	.51471	.51078
#2	.52302	.51685	.52256	.51758
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3234.6	5011.5	73033.	6875.5
Stddev	2.6	7.5	457.	7.3
%RSD	.08191	.14942	.62533	.10679
#1	3232.8	5006.2	73356.	6870.4
#2	3236.5	5016.8	72710.	6880.7

Sample Name: CCB Acquired: 11/15/2013 13:57:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.03675**	**-.00017**	**-.00019**	**-.00001**	**.00011**	**-.01864**
Stddev	.00008	.02459	.00088	.00021	.00000	.00001	.00091
%RSD	26.689	66.906	523.62	106.18	85.616	5.4176	4.8922
#1	-.00038	.01937	.00046	-.00034	-.00000	.00011	-.01928
#2	-.00026	.05414	-.00079	-.00005	-.00001	.00012	-.01799
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.00009**	**.00006**	**.00050**	**.00049**	**.02352**	**.00065**
Stddev	.00004	.00009	.00024	.00034	.00317	.01775	.00019
%RSD	45.688	108.99	385.20	69.437	642.63	75.470	28.613
#1	.00011	-.00002	-.00011	.00074	-.00175	.01097	.00052
#2	.00005	-.00015	.00023	.00025	.00273	.03607	.00078
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00056**	**-.00232**	**-.00001**	**-.00018**	**-.00004**	**-.00268**	**-.00034**
Stddev	.00101	.00584	.00002	.00081	.00011	.00553	.00037
%RSD	181.82	251.87	183.68	440.62	273.74	206.15	109.30
#1	-.00128	.00181	-.00002	.00039	.00004	-.00659	-.00060
#2	.00016	-.00645	.00000	-.00076	-.00012	.00123	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 13:57:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00065	F .0050	.00108	-.00201	-.00817	-.00001	-.00023
Stddev	.00029	.0057	.00237	.00116	.02776	.00022	.00010
%RSD	44.395	114.9	218.32	57.891	339.76	4160.5	43.799
#1	.00045	.0009	.00276	-.00283	-.02780	.00015	-.00016
#2	.00086	.0090	-.00059	-.00119	.01146	-.00016	-.00030
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00041	.00418	-.00006	-.00009
Stddev	.00004	.00031	.00007	.00043
%RSD	10.800	7.4093	106.30	471.90
#1	.00038	.00440	-.00002	.00021
#2	.00044	.00397	-.00011	-.00040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3442.9	5135.8	76506.	6929.1
Stddev	3.8	15.2	72.	17.0
%RSD	.11046	.29561	.09434	.24463
#1	3445.5	5146.6	76455.	6941.1
#2	3440.2	5125.1	76557.	6917.2

Sample Name: CCVL Acquired: 11/15/2013 13:59:44 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00236**	**.24257**	**.01137**	**.01922**	**.00220**	**.00215**	**.50057**
Stddev	.00026	.02337	.00136	.00020	.00002	.00007	.00750
%RSD	11.002	9.6330	11.927	1.0369	.75901	3.4893	1.4991
#1	.00255	.25910	.01233	.01908	.00219	.00209	.50588
#2	.00218	.22605	.01042	.01936	.00222	.00220	.49527
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**.00424**	**.00379**	**.01048**	**.05027**	**.49668**	**.42973**
Stddev	.00001	.00031	.00027	.00007	.00128	.01679	.00241
%RSD	.88493	7.2479	7.2290	.63931	2.5489	3.3804	.56151
#1	.00103	.00446	.00398	.01053	.04937	.50855	.43144
#2	.00102	.00402	.00359	.01043	.05118	.48481	.42803
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02854**	**.20654**	**.00332**	**.00302**	**.00984**	**.95718**	**.01012**
Stddev	.00057	.00063	.00006	.00033	.00031	.00225	.00025
%RSD	2.0101	.30523	1.7711	11.043	3.1502	.23507	2.4867
#1	.02813	.20699	.00336	.00325	.00962	.95559	.00995
#2	.02894	.20610	.00327	.00278	.01005	.95877	.01030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 13:59:44 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00445	.2089	.01980	.01373	.48103	.00975	.00503
Stddev	.00022	.0002	.00156	.00030	.01920	.00000	.00002
%RSD	4.9116	.0888	7.8603	2.2075	3.9921	.03389	.33850
#1	.00429	.2088	.01870	.01395	.46745	.00976	.00502
#2	.00460	.2090	.02090	.01352	.49461	.00975	.00505
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00491	.02198	.00473	.01018
Stddev	.00029	.00460	.00023	.00075
%RSD	5.8263	20.938	4.9373	7.3410
#1	.00471	.02524	.00490	.00965
#2	.00511	.01873	.00457	.01071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3447.9	5187.6	76984.	7014.7
Stddev	10.5	22.2	183.	3.2
%RSD	.30441	.42762	.23825	.04508
#1	3455.3	5203.2	76854.	7012.4
#2	3440.4	5171.9	77114.	7016.9

Sample Name: 480-49329-f-12-a Acquired: 11/15/2013 14:02:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**.04445**	**.00333**	**.08935**	**.03620**
Stddev	.00009	.00725	.00168	.00051	.00004
%RSD	17.298	16.311	50.405	.57007	.11657
#1	-.00045	.03933	.00452	.08899	.03623
#2	-.00057	.04958	.00215	.08971	.03617
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**307.82**	**.00032**	**-.00001**	**.00106**
Stddev	.00004	2.10	.00010	.00006	.00046
%RSD	33.163	.68276	30.039	913.42	43.485
#1	.00016	306.34	.00025	.00004	.00138
#2	.00010	309.31	.00039	-.00005	.00073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00759**	**.01254**	**23.438**	**28.326**	**.02984**
Stddev	.00019	.00404	.101	.181	.00053
%RSD	2.4721	32.237	.43144	.63846	1.7707
#1	.00773	.01539	23.366	28.454	.02946
#2	.00746	.00968	23.509	28.198	.03021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-12-a Acquired: 11/15/2013 14:02:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**58.949**	**.00052**	**.00022**	**.00120**	**10.953**
Stddev	.099	.00003	.00002	.00025	.095
%RSD	.16746	4.8499	11.199	21.010	.86749
#1	59.019	.00054	.00020	.00137	10.886
#2	58.879	.00050	.00024	.00102	11.020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00944**	**.00297**	F **238.3**	**.00034**	**.00405**
Stddev	.00048	.00062	.9	.00015	.00048
%RSD	5.1104	20.888	.3576	44.731	11.915
#1	.00910	.00340	237.7	.00023	.00439
#2	.00978	.00253	238.9	.00045	.00371
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.2673**	**.00682**	**1.0561**	**.00146**	**.00116**
Stddev	.0210	.00070	.0049	.00025	.00061
%RSD	.49224	10.219	.45961	17.194	52.024
#1	4.2525	.00731	1.0526	.00128	.00159
#2	4.2822	.00632	1.0595	.00164	.00074
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-12-a Acquired: 11/15/2013 14:02:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00004**	**.04151**
Stddev	.00002	.00011
%RSD	52.466	.25333
#1	-.00005	.04158
#2	-.00003	.04144
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3034.7**	**4676.4**	**68414.**	**6819.8**
Stddev	4.7	11.7	154.	41.0
%RSD	.15428	.24941	.22526	.60082
#1	3038.0	4684.7	68305.	6848.8
#2	3031.4	4668.2	68523.	6790.8

Sample Name: 480-49329-f-8-a Acquired: 11/15/2013 14:04:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00057**	**.09242**	**.00167**	**.02653**	**.20098**
Stddev	.00072	.00330	.00364	.00001	.00083
%RSD	126.69	3.5730	217.58	.03275	.41186
#1	.00006	.09008	.00425	.02653	.20039
#2	.00108	.09475	-.00090	.02652	.20157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**145.87**	**.00021**	**.00022**	**.00103**
Stddev	.00002	.27	.00005	.00003	.00003
%RSD	42.336	.18247	24.247	12.769	2.8644
#1	.00008	145.69	.00025	.00024	.00105
#2	.00004	146.06	.00017	.00020	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00098**	**.13443**	**1.5299**	**1.7942**	**.01865**
Stddev	.00008	.00492	.0190	.0166	.00061
%RSD	8.0934	3.6608	1.2391	.92431	3.2940
#1	.00092	.13791	1.5433	1.7825	.01821
#2	.00103	.13095	1.5165	1.8060	.01908
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-8-a Acquired: 11/15/2013 14:04:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.805**	**.81150**	**.79668**	**.00010**	**6.4862**
Stddev	.018	.00041	.00320	.00006	.0401
%RSD	.06699	.05002	.40112	65.724	.61758
#1	26.818	.81179	.79894	.00005	6.4579
#2	26.792	.81122	.79442	.00014	6.5145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00084**	**.00060**	F **23.18**	**-.00267**	**.00144**
Stddev	.00074	.00224	.07	.00068	.00160
%RSD	87.786	372.51	.2897	25.505	110.86
#1	.00136	.00219	23.23	-.00219	.00257
#2	.00032	-.00098	23.13	-.00315	.00031
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.2120**	**.00034**	**.42160**	**.00100**	**.00281**
Stddev	.0454	.00028	.00269	.00014	.00199
%RSD	.55316	81.220	.63832	13.562	70.765
#1	8.1799	.00015	.41970	.00110	.00422
#2	8.2441	.00054	.42351	.00091	.00141
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-8-a Acquired: 11/15/2013 14:04:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00010**	**.00300**
Stddev	.00009	.00027
%RSD	87.178	9.1308
#1	.00016	.00319
#2	.00004	.00280
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3190.9**	**4829.9**	**71839.**	**6949.9**
Stddev	7.4	.2	41.	17.7
%RSD	.23111	.00368	.05685	.25436
#1	3196.1	4829.8	71867.	6962.4
#2	3185.6	4830.0	71810.	6937.4

Sample Name: 480-49329-f-9-a Acquired: 11/15/2013 14:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**.04562**	**.00043**	**.08463**	**.43540**
Stddev	.00013	.01134	.00170	.00050	.00072
%RSD	23.635	24.866	392.21	.58874	.16594
#1	-.00064	.03760	.00164	.08498	.43489
#2	-.00046	.05364	-.00077	.08427	.43591
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**65.304**	**.00018**	**-.00004**	**.00011**
Stddev	.00007	.148	.00009	.00001	.00026
%RSD	34.374	.22728	49.151	13.753	251.97
#1	.00015	65.199	.00012	-.00003	.00029
#2	.00024	65.409	.00025	-.00004	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00203**	**.02799**	**3.5915**	**4.0949**	**.02763**
Stddev	.00022	.00389	.0623	.0102	.00048
%RSD	10.785	13.911	1.7344	.24925	1.7393
#1	.00218	.03074	3.5475	4.0877	.02797
#2	.00187	.02523	3.6355	4.1022	.02729
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-9-a Acquired: 11/15/2013 14:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.680**	**.15218**	**.14690**	**-.00007**	**19.863**
Stddev	.012	.00001	.00001	.00002	.073
%RSD	.10347	.00558	.00669	29.826	.36679
#1	11.688	.15218	.14689	-.00008	19.811
#2	11.671	.15219	.14690	-.00005	19.914
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00041**	**-.00260**	F **13.38**	**-.00020**	**-.00283**
Stddev	.00004	.00030	.00	.00029	.00081
%RSD	9.6595	11.610	.0280	139.26	28.451
#1	.00038	-.00238	13.37	-.00041	-.00341
#2	.00043	-.00281	13.38	-.00000	-.00226
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.3159**	**.00054**	**.63262**	**.00064**	**.00339**
Stddev	.0146	.00008	.00319	.00025	.00232
%RSD	.23099	13.914	.50459	39.929	68.430
#1	6.3262	.00049	.63036	.00046	.00503
#2	6.3056	.00060	.63488	.00081	.00175
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49329-f-9-a Acquired: 11/15/2013 14:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00009**	**.00189**
Stddev	.00010	.00025
%RSD	119.59	13.345
#1	-.00001	.00171
#2	-.00016	.00207
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3278.1**	**4925.6**	**72574.**	**6932.1**
Stddev	4.7	6.9	76.	25.4
%RSD	.14187	.14009	.10515	.36650
#1	3274.8	4920.7	72628.	6950.1
#2	3281.4	4930.5	72520.	6914.2

Sample Name: 480-49222-c-9-b Acquired: 11/15/2013 14:09:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00044**	**.18891**	**.00681**	**.13016**	**.09673**
Stddev	.00005	.00170	.00077	.00036	.00007
%RSD	11.048	.89734	11.231	.27837	.06943
#1	-.00048	.19011	.00735	.12990	.09678
#2	-.00041	.18772	.00627	.13041	.09669
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**64.911**	**.00027**	**.00007**	**.00117**
Stddev	.00004	.399	.00003	.00015	.00023
%RSD	28.253	.61405	11.060	215.49	19.409
#1	.00010	65.193	.00025	-.00004	.00133
#2	.00015	64.629	.00029	.00017	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00267**	**.12899**	**7.7385**	**9.7514**	**.05073**
Stddev	.00015	.00154	.0355	.0327	.00034
%RSD	5.4231	1.1931	.45826	.33496	.66514
#1	.00257	.12790	7.7636	9.7745	.05097
#2	.00278	.13008	7.7134	9.7283	.05049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-9-b Acquired: 11/15/2013 14:09:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.657**	**.01566**	**.01488**	**.00390**	**79.014**
Stddev	.018	.00001	.00086	.00016	.153
%RSD	.07007	.08297	5.7661	4.0151	.19311
#1	25.669	.01567	.01427	.00401	78.906
#2	25.644	.01565	.01549	.00379	79.122
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00213**	**-.00191**	F **72.99**	**-.00188**	**.00382**
Stddev	.00012	.00087	.08	.00095	.00122
%RSD	5.5732	45.614	.1121	50.591	32.048
#1	.00205	-.00130	73.05	-.00255	.00469
#2	.00221	-.00253	72.93	-.00121	.00295
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.2136**	**.00009**	**.56989**	**.00413**	**.00265**
Stddev	.0474	.00011	.00291	.00003	.00142
%RSD	.76266	130.50	.51027	.69532	53.638
#1	6.2471	.00017	.57195	.00415	.00164
#2	6.1801	.00001	.56784	.00411	.00365
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-9-b Acquired: 11/15/2013 14:09:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00374**	**.00239**
Stddev	.00037	.00021
%RSD	10.018	8.7698
#1	.00347	.00224
#2	.00400	.00254
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3190.8**	**4852.0**	**71462.**	**6917.0**
Stddev	3.6	2.4	62.	41.3
%RSD	.11365	.04932	.08704	.59750
#1	3188.2	4853.7	71506.	6887.8
#2	3193.3	4850.3	71418.	6946.2

Sample Name: 480-49222-c-10-b Acquired: 11/15/2013 14:11:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**.02929**	**.00607**	**.12713**	**.08926**
Stddev	.00012	.01770	.00075	.00051	.00053
%RSD	14.494	60.433	12.332	.40507	.59612
#1	-.00090	.01678	.00554	.12676	.08888
#2	-.00074	.04181	.00660	.12749	.08963
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**63.870**	**.00014**	**.00006**	**.00220**
Stddev	.00004	.322	.00000	.00004	.00004
%RSD	4935.8	.50417	.71004	73.974	1.6444
#1	-.00003	63.643	.00014	.00009	.00222
#2	.00003	64.098	.00014	.00003	.00217
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00263**	**.00634**	**7.5935**	**9.5026**	**.05090**
Stddev	.00029	.00091	.0242	.1489	.00002
%RSD	10.882	14.352	.31920	1.5671	.04723
#1	.00243	.00570	7.5764	9.3973	.05089
#2	.00283	.00698	7.6107	9.6079	.05092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-10-b Acquired: 11/15/2013 14:11:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.251**	**.00040**	**.00062**	**.00383**	**78.084**
Stddev	.225	.00005	.00079	.00003	.360
%RSD	.89239	13.216	127.03	.76133	.46130
#1	25.091	.00037	.00006	.00381	77.829
#2	25.410	.00044	.00118	.00385	78.339
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00235**	**-.00154**	F **71.72**	**-.00241**	**.00226**
Stddev	.00019	.00127	.08	.00188	.00342
%RSD	8.1119	82.710	.1049	78.113	150.81
#1	.00248	-.00064	71.66	-.00108	-.00015
#2	.00222	-.00244	71.77	-.00374	.00468
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.7408**	**-.00043**	**.55803**	**.00077**	**.00180**
Stddev	.0444	.00036	.00046	.00009	.00058
%RSD	.77385	82.945	.08287	11.113	32.105
#1	5.7094	-.00069	.55770	.00071	.00139
#2	5.7722	-.00018	.55835	.00084	.00221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-10-b Acquired: 11/15/2013 14:11:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00304**	**.00239**
Stddev	.00014	.00033
%RSD	4.6129	13.971
#1	.00294	.00262
#2	.00314	.00215
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3193.7**	**4861.7**	**71465.**	**6929.1**
Stddev	3.9	2.0	480.	42.9
%RSD	.12288	.04201	.67191	.61906
#1	3196.5	4863.1	71804.	6959.4
#2	3190.9	4860.3	71125.	6898.8

Sample Name: 480-49222-c-11-b Acquired: 11/15/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00061**	**.03960**	**.00652**	**.13129**	**.09285**
Stddev	.00005	.00269	.00148	.00077	.00003
%RSD	8.2631	6.7858	22.747	.58867	.03703
#1	-.00058	.04150	.00547	.13183	.09288
#2	-.00065	.03770	.00757	.13074	.09283
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**64.872**	**.00024**	**.00027**	**.00132**
Stddev	.00004	.046	.00003	.00000	.00040
%RSD	58.172	.07049	11.614	1.7476	30.482
#1	.00004	64.904	.00022	.00028	.00160
#2	.00010	64.839	.00025	.00027	.00104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00235**	**.00143**	**7.6830**	**9.7479**	**.05008**
Stddev	.00016	.00001	.0497	.1087	.00038
%RSD	6.9840	.36894	.64681	1.1156	.76725
#1	.00224	.00143	7.7182	9.8248	.05035
#2	.00247	.00142	7.6479	9.6710	.04980
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-11-b Acquired: 11/15/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.075**	**.00039**	**.00077**	**.00405**	**80.465**
Stddev	.065	.00006	.00037	.00020	.096
%RSD	.24958	15.816	48.483	4.9572	.11870
#1	26.029	.00043	.00051	.00420	80.397
#2	26.121	.00034	.00103	.00391	80.533
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00283**	**-.00124**	F **74.14**	**-.00049**	**.00292**
Stddev	.00060	.00141	.05	.00070	.00160
%RSD	21.366	113.06	.0714	143.16	54.624
#1	.00240	-.00025	74.18	-.00098	.00179
#2	.00326	-.00224	74.11	.00001	.00405
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.8435**	**-.00013**	**.56284**	**.00073**	**.00035**
Stddev	.0443	.00031	.00059	.00014	.00168
%RSD	.75828	235.27	.10451	18.685	479.47
#1	5.8122	.00009	.56326	.00083	-.00084
#2	5.8748	-.00035	.56243	.00064	.00154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-11-b Acquired: 11/15/2013 14:14:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00340**	**.00583**
Stddev	.00001	.00053
%RSD	.27962	9.0364
#1	.00340	.00545
#2	.00339	.00620
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3191.1**	**4851.6**	**71752.**	**6985.3**
Stddev	2.6	3.1	128.	1.2
%RSD	.08148	.06311	.17837	.01692
#1	3192.9	4853.7	71842.	6986.1
#2	3189.2	4849.4	71661.	6984.5

Sample Name: 480-49222-c-12-b Acquired: 11/15/2013 14:16:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**.00732**	**.00705**	**.12737**	**.08851**
Stddev	.00014	.00597	.00392	.00012	.00008
%RSD	42.023	81.549	55.510	.09782	.08539
#1	-.00044	.00310	.00429	.12728	.08846
#2	-.00024	.01154	.00982	.12745	.08857
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**63.668**	**.00018**	**-.00002**	**.00190**
Stddev	.00006	.013	.00011	.00001	.00041
%RSD	133.24	.02016	62.286	65.145	21.620
#1	.00000	63.659	.00010	-.00001	.00219
#2	.00008	63.678	.00025	-.00003	.00161
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00239**	**.00337**	**7.6628**	**9.5535**	**.05047**
Stddev	.00034	.00136	.0456	.1556	.00018
%RSD	14.297	40.335	.59524	1.6284	.34817
#1	.00263	.00241	7.6306	9.6635	.05059
#2	.00215	.00433	7.6951	9.4435	.05034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-12-b Acquired: 11/15/2013 14:16:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.269**	**.00029**	**-.00057**	**.00386**	**78.687**
Stddev	.033	.00011	.00024	.00014	.131
%RSD	.13041	37.086	41.407	3.5901	.16659
#1	25.293	.00021	-.00074	.00396	78.594
#2	25.246	.00036	-.00040	.00376	78.780
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00205**	**-.00017**	F **72.18**	**-.00045**	**.00099**
Stddev	.00042	.00008	.08	.00204	.00150
%RSD	20.619	45.125	.1061	456.32	152.50
#1	.00235	-.00012	72.13	-.00189	.00205
#2	.00175	-.00022	72.23	.00099	-.00008
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.7707**	**.00021**	**.55982**	**.00081**	**.00312**
Stddev	.0328	.00040	.00321	.00015	.00346
%RSD	.56865	192.42	.57408	18.111	110.93
#1	5.7475	.00049	.55755	.00071	.00556
#2	5.7939	-.00008	.56210	.00091	.00067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-12-b Acquired: 11/15/2013 14:16:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00288	.00161
Stddev	.00014	.00029
%RSD	4.7788	18.200
#1	.00298	.00182
#2	.00278	.00140
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3200.8	4859.3	71846.	6962.1
Stddev	.7	12.2	97.	.7
%RSD	.02050	.25147	.13463	.01058
#1	3201.3	4867.9	71778.	6962.6
#2	3200.3	4850.6	71915.	6961.6

Sample Name: 480-49222-c-4-b Acquired: 11/15/2013 14:19:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00066**	**.03540**	**.00747**	**.13226**	**.09409**
Stddev	.00038	.01271	.00308	.00044	.00008
%RSD	58.137	35.891	41.227	.33318	.08476
#1	-.00093	.02642	.00530	.13195	.09404
#2	-.00039	.04439	.00965	.13258	.09415
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**65.421**	**.00021**	**-.00003**	**.00147**
Stddev	.00005	.224	.00006	.00019	.00010
%RSD	57.634	.34246	28.635	534.78	6.9008
#1	.00005	65.262	.00017	-.00017	.00140
#2	.00013	65.579	.00025	.00010	.00155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00258**	**.00550**	**7.8356**	**9.8397**	**.05119**
Stddev	.00022	.00187	.0177	.0668	.00041
%RSD	8.4919	33.926	.22614	.67860	.79991
#1	.00243	.00418	7.8230	9.7925	.05090
#2	.00274	.00682	7.8481	9.8869	.05148
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-4-b Acquired: 11/15/2013 14:19:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.132**	**.00097**	**.00115**	**.00421**	**80.918**
Stddev	.088	.00001	.00025	.00023	.219
%RSD	.33617	1.3178	21.369	5.5035	.27022
#1	26.070	.00096	.00133	.00437	80.764
#2	26.194	.00098	.00098	.00404	81.073
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00196**	**-.00198**	F **74.11**	**.00110**	**.00525**
Stddev	.00019	.00063	.06	.00001	.00022
%RSD	9.9115	31.818	.0794	.93424	4.2400
#1	.00182	-.00243	74.07	.00109	.00540
#2	.00209	-.00154	74.16	.00110	.00509
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.9458**	**-.00007**	**.57256**	**.00069**	**.00263**
Stddev	.0578	.00028	.00193	.00003	.00181
%RSD	.97183	401.13	.33726	4.1573	68.962
#1	5.9050	-.00027	.57120	.00067	.00135
#2	5.9867	.00013	.57393	.00071	.00391
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-4-b Acquired: 11/15/2013 14:19:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00348**	**.00123**
Stddev	.00004	.00012
%RSD	1.2480	9.7000
#1	.00345	.00131
#2	.00351	.00114
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3187.9**	**4845.7**	**71517.**	**6962.2**
Stddev	2.5	9.0	150.	16.4
%RSD	.07690	.18532	.21012	.23566
#1	3189.6	4852.0	71623.	6973.9
#2	3186.2	4839.3	71411.	6950.6

Sample Name: 480-49222-c-5-b Acquired: 11/15/2013 14:21:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00063**	**.04554**	**.00484**	**.12996**	**.09004**
Stddev	.00034	.00208	.00087	.00015	.00008
%RSD	53.439	4.5704	17.897	.11530	.09217
#1	-.00039	.04701	.00545	.13007	.08999
#2	-.00087	.04407	.00423	.12986	.09010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**63.989**	**.00028**	**.00008**	**.00144**
Stddev	.00006	.100	.00011	.00023	.00043
%RSD	32.639	.15608	41.142	287.59	29.536
#1	.00013	64.060	.00020	-.00008	.00175
#2	.00022	63.918	.00036	.00024	.00114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00210**	**.01470**	**7.5880**	**9.4716**	**.05015**
Stddev	.00008	.00428	.0034	.0603	.00052
%RSD	4.0213	29.122	.04451	.63622	1.0387
#1	.00204	.01773	7.5856	9.4290	.04978
#2	.00216	.01168	7.5903	9.5142	.05052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-5-b Acquired: 11/15/2013 14:21:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.681**	**.00073**	**.00029**	**.00403**	**79.628**
Stddev	.081	.00001	.00033	.00003	.456
%RSD	.31690	1.5868	115.09	.85032	.57248
#1	25.738	.00072	.00052	.00405	79.950
#2	25.623	.00074	.00005	.00400	79.306
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00186**	**-.00050**	F **73.25**	**-.00124**	**-.00084**
Stddev	.00059	.00186	.24	.00015	.00402
%RSD	31.985	369.56	.3251	11.983	477.03
#1	.00144	.00081	73.08	-.00135	-.00369
#2	.00227	-.00182	73.41	-.00114	.00200
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.7929**	**-.00010**	**.55732**	**.00089**	**.00048**
Stddev	.0469	.00036	.00229	.00017	.00066
%RSD	.80990	345.19	.41020	18.702	137.09
#1	5.8261	.00015	.55894	.00101	.00095
#2	5.7597	-.00036	.55571	.00077	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-c-5-b Acquired: 11/15/2013 14:21:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00308	.00118
Stddev	.00014	.00051
%RSD	4.4384	43.692
#1	.00317	.00154
#2	.00298	.00081
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3189.6	4851.4	72185.	7004.7
Stddev	3.5	1.9	31.	11.0
%RSD	.11011	.03901	.04289	.15769
#1	3192.0	4852.7	72163.	6996.9
#2	3187.1	4850.0	72207.	7012.6

Sample Name: CCV Acquired: 11/15/2013 14:24:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51145	26.145	.52217	.50694	.52645	.51227	25.549
Stddev	.00021	.092	.00022	.00044	.00138	.00313	.038
%RSD	.04015	.35355	.04190	.08741	.26204	.61034	.14689
#1	.51131	26.079	.52201	.50726	.52547	.51006	25.523
#2	.51160	26.210	.52232	.50663	.52743	.51448	25.576
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50895	.50506	.52151	.51958	25.040	26.329	26.635
Stddev	.00032	.00015	.00361	.00164	.180	.007	.056
%RSD	.06214	.03027	.69182	.31645	.71723	.02554	.20903
#1	.50917	.50517	.52406	.52074	24.913	26.324	26.675
#2	.50872	.50495	.51896	.51842	25.167	26.333	26.596
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52539	24.716	.51699	.49797	.51415	26.197	.50838
Stddev	.00093	.084	.00140	.00001	.00002	.006	.00056
%RSD	.17742	.34030	.27117	.00186	.00465	.02357	.10949
#1	.52474	24.775	.51798	.49797	.51417	26.193	.50878
#2	.52605	24.656	.51600	.49798	.51413	26.201	.50799
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 14:24:12 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50833	25.30	.52212	.51399	25.528	.51669	.52444
Stddev	.00521	.00	.00005	.00281	.191	.00101	.00017
%RSD	1.0255	.0066	.00919	.54604	.74820	.19530	.03228
#1	.51202	25.30	.52215	.51598	25.393	.51740	.52432
#2	.50465	25.30	.52208	.51201	25.663	.51597	.52456
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51244	.51059	.51378	.50638
Stddev	.00175	.00517	.00114	.00153
%RSD	.34125	1.0126	.22134	.30132
#1	.51367	.51425	.51297	.50746
#2	.51120	.50694	.51458	.50530
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3238.6	5017.7	73473.	6889.0
Stddev	6.4	10.9	301.	9.5
%RSD	.19904	.21754	.41019	.13837
#1	3234.0	5010.0	73260.	6895.8
#2	3243.2	5025.4	73686.	6882.3

Sample Name: CCB Acquired: 11/15/2013 14:26:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**.01683**	**.00229**	**-.00044**	**-.00000**	**.00003**	**-.01691**
Stddev	.00059	.02049	.00164	.00021	.00001	.00002	.00125
%RSD	107.18	121.77	71.656	49.064	292.48	60.268	7.3894
#1	-.00013	.00234	.00113	-.00028	.00000	.00004	-.01779
#2	-.00097	.03132	.00346	-.00059	-.00001	.00002	-.01603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**.00000**	**-.00029**	**-.00010**	**.00062**	**.05601**	**.00109**
Stddev	.00009	.00001	.00018	.00001	.00009	.02818	.00077
%RSD	96.291	262.39	61.310	12.946	13.758	50.311	70.935
#1	.00003	.00001	-.00017	-.00009	.00056	.07593	.00164
#2	.00017	-.00000	-.00042	-.00010	.00068	.03608	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00066**	**-.00054**	**-.00001**	**-.00046**	**.00007**	**-.00152**	**-.00034**
Stddev	.00101	.00429	.00002	.00031	.00012	.01361	.00001
%RSD	153.85	793.83	175.26	66.299	172.16	897.36	2.8551
#1	.00138	.00249	.00000	-.00024	-.00002	-.01114	-.00033
#2	-.00006	-.00357	-.00002	-.00068	.00016	.00811	-.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 14:26:36 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00019	F .0062	-.00040	.00136	.00295	.00059	-.00016
Stddev	.00103	.0047	.00042	.00059	.00314	.00028	.00001
%RSD	556.38	76.26	104.30	43.494	106.58	47.778	6.3132
#1	-.00091	.0028	-.00070	.00094	.00073	.00039	-.00016
#2	.00054	.0095	-.00011	.00177	.00517	.00078	-.00015
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00019	.00071	-.00014	.00006
Stddev	.00006	.00144	.00020	.00004
%RSD	29.171	201.86	147.72	73.212
#1	.00023	.00173	-.00028	.00009
#2	.00015	-.00030	.00001	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3431.4	5112.0	77206.	6912.2
Stddev	5.3	21.9	146.	10.6
%RSD	.15304	.42891	.18957	.15340
#1	3435.1	5127.5	77310.	6919.7
#2	3427.7	5096.5	77103.	6904.7

Sample Name: CCVL Acquired: 11/15/2013 14:29:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00250**	**.20601**	**.01125**	**.01924**	**.00218**	**.00211**	**.48963**
Stddev	.00080	.00784	.00214	.00044	.00000	.00014	.00139
%RSD	31.955	3.8051	18.983	2.2837	.09501	6.6520	.28471
#1	.00193	.20047	.01276	.01955	.00218	.00201	.48865
#2	.00306	.21156	.00974	.01893	.00218	.00221	.49062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00101**	**.00411**	**.00353**	**.00987**	**.04399**	**.47377**	**.42696**
Stddev	.00012	.00006	.00040	.00026	.00010	.08407	.00157
%RSD	11.543	1.4889	11.299	2.6842	.23804	17.744	.36882
#1	.00109	.00407	.00381	.00968	.04406	.53321	.42585
#2	.00092	.00415	.00325	.01006	.04391	.41432	.42808
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02868**	**.20777**	**.00329**	**.00236**	**.00986**	**.93805**	**.01013**
Stddev	.00053	.00609	.00009	.00011	.00016	.00216	.00004
%RSD	1.8583	2.9297	2.8626	4.6992	1.6378	.23024	.38164
#1	.02830	.20347	.00323	.00243	.00974	.93652	.01010
#2	.02905	.21208	.00336	.00228	.00997	.93958	.01016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 14:29:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00551	.2103	.01997	.01248	.47553	.00977	.00490
Stddev	.00150	.0039	.00000	.00062	.01701	.00063	.00026
%RSD	27.127	1.852	.02166	4.9675	3.5781	6.4436	5.2245
#1	.00446	.2130	.01997	.01204	.46350	.01021	.00508
#2	.00657	.2075	.01997	.01292	.48756	.00932	.00472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00499	.02308	.00483	.01060
Stddev	.00021	.00139	.00025	.00092
%RSD	4.2183	6.0222	5.1858	8.6802
#1	.00514	.02210	.00465	.00995
#2	.00484	.02407	.00500	.01125
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3455.3	5176.6	77832.	7059.5
Stddev	3.7	4.7	588.	11.1
%RSD	.10628	.09141	.75582	.15715
#1	3457.9	5179.9	78248.	7067.4
#2	3452.7	5173.2	77416.	7051.7

Sample Name: mb 480-150654/1-a Acquired: 11/15/2013 14:31:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00082**	**.05274**	**.00350**	**.00189**	**.00002**
Stddev	.00014	.02044	.00245	.00018	.00000
%RSD	16.927	38.746	70.158	9.4902	3.1775
#1	-.00072	.03829	.00523	.00176	.00002
#2	-.00091	.06719	.00176	.00202	.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.01801**	**.00006**	**.00006**	**-.00029**
Stddev	.00004	.00299	.00004	.00009	.00012
%RSD	183.26	16.588	67.517	167.84	40.683
#1	.00005	.01589	.00009	.00012	-.00038
#2	-.00001	.02012	.00003	-.00001	-.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00027**	**.00164**	**.04428**	**.00079**	**-.00045**
Stddev	.00014	.00217	.03429	.00015	.00100
%RSD	51.352	132.16	77.435	19.070	220.81
#1	.00017	.00011	.06853	.00090	-.00116
#2	.00037	.00318	.02003	.00068	.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-150654/1-a Acquired: 11/15/2013 14:31:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00227**	**-.00008**	**-.00034**	**-.00025**	**-.00819**
Stddev	.00155	.00002	.00018	.00003	.00235
%RSD	68.231	18.872	53.619	10.694	28.703
#1	-.00117	-.00007	-.00021	-.00023	-.00652
#2	-.00336	-.00009	-.00047	-.00027	-.00985
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**.00053**	**.0071**	**.00021**	**-.00075**
Stddev	.00010	.00060	.0087	.00049	.00107
%RSD	1487.4	112.95	122.4	238.01	141.87
#1	-.00006	.00095	.0133	.00056	.00000
#2	.00008	.00011	.0010	-.00014	-.00150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01792**	**-.00002**	**.00007**	**.00036**	**.00064**
Stddev	.00885	.00004	.00006	.00019	.00304
%RSD	49.388	207.69	87.363	52.881	476.09
#1	-.02418	-.00005	.00011	.00023	-.00151
#2	-.01166	.00001	.00003	.00050	.00279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-150654/1-a Acquired: 11/15/2013 14:31:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00012	.00020
Stddev	.00009	.00038
%RSD	71.409	194.61
#1	.00018	.00046
#2	.00006	-.00007
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3441.7	5116.7	77369.	6952.1
Stddev	11.3	16.6	97.	3.1
%RSD	.32825	.32489	.12504	.04503
#1	3449.7	5128.5	77300.	6949.9
#2	3433.7	5105.0	77437.	6954.4

Sample Name: lcs 480-150654/2-a Acquired: 11/15/2013 14:33:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05168**	**10.704**	**.21687**	**.21191**	**.21891**
Stddev	.00044	.034	.00068	.00025	.00038
%RSD	.86080	.31597	.31126	.11797	.17279
#1	.05136	10.680	.21734	.21173	.21864
#2	.05199	10.728	.21639	.21208	.21918
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21176**	**10.442**	**.20813**	**.20758**	**.21425**
Stddev	.00045	.052	.00011	.00041	.00053
%RSD	.21115	.50225	.05317	.19615	.24516
#1	.21144	10.405	.20821	.20786	.21462
#2	.21207	10.479	.20805	.20729	.21388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21229**	**10.411**	**10.417**	**10.593**	**.21309**
Stddev	.00038	.042	.021	.063	.00004
%RSD	.18036	.40357	.20215	.59763	.02100
#1	.21201	10.381	10.402	10.548	.21313
#2	.21256	10.440	10.432	10.638	.21306
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-150654/2-a Acquired: 11/15/2013 14:33:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.658**	**.21076**	**.19842**	**.21790**	**10.444**
Stddev	.004	.00022	.00103	.00023	.005
%RSD	.03413	.10613	.51759	.10329	.04801
#1	10.655	.21060	.19770	.21806	10.440
#2	10.660	.21091	.19915	.21774	10.447
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20671**	**.21128**	**10.01**	**.20623**	**.21419**
Stddev	.00016	.00254	.04	.00181	.00128
%RSD	.07978	1.2031	.4253	.87686	.59800
#1	.20659	.21308	10.04	.20751	.21510
#2	.20682	.20948	9.978	.20495	.21329
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.218**	**.20090**	**.21395**	**.20232**	**.21100**
Stddev	.033	.00020	.00040	.00171	.00046
%RSD	.32630	.09758	.18741	.84399	.21864
#1	10.194	.20076	.21423	.20111	.21133
#2	10.241	.20104	.21367	.20353	.21068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-150654/2-a Acquired: 11/15/2013 14:33:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21196	.20691
Stddev	.00060	.00175
%RSD	.28294	.84731
#1	.21238	.20815
#2	.21153	.20567
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3345.3	5052.9	74934.	6911.8
Stddev	1.0	1.8	91.	50.8
%RSD	.03007	.03501	.12173	.73521
#1	3346.0	5051.7	74999.	6947.7
#2	3344.6	5054.2	74870.	6875.9

Sample Name: lcsd 480-150654/3-a Acquired: 11/15/2013 14:36:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04991**	**10.488**	**.21305**	**.20820**	**.21339**
Stddev	.00020	.063	.00090	.00071	.00050
%RSD	.39816	.59954	.42116	.33993	.23601
#1	.04977	10.444	.21241	.20770	.21375
#2	.05006	10.533	.21368	.20870	.21303
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20820**	**10.219**	**.20554**	**.20398**	**.20889**
Stddev	.00019	.016	.00018	.00053	.00057
%RSD	.09091	.15398	.08979	.25752	.27526
#1	.20833	10.208	.20541	.20435	.20929
#2	.20807	10.230	.20567	.20361	.20848
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20713**	**10.235**	**10.174**	**10.342**	**.20778**
Stddev	.00083	.004	.035	.174	.00282
%RSD	.40228	.03927	.34272	1.6815	1.3567
#1	.20772	10.232	10.149	10.465	.20579
#2	.20654	10.238	10.198	10.219	.20977
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcsd 480-150654/3-a Acquired: 11/15/2013 14:36:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.441**	**.20595**	**.19472**	**.21476**	**10.162**
Stddev	.027	.00047	.00092	.00001	.057
%RSD	.25951	.23025	.47199	.00308	.55943
#1	10.460	.20628	.19537	.21476	10.122
#2	10.422	.20561	.19407	.21475	10.203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20297**	**.20692**	**9.836**	**.20422**	**.21044**
Stddev	.00017	.00096	.009	.00105	.00072
%RSD	.08277	.46234	.0898	.51171	.34106
#1	.20285	.20625	9.830	.20348	.21094
#2	.20309	.20760	9.843	.20496	.20993
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.008**	**.19726**	**.20743**	**.19751**	**.20307**
Stddev	.019	.00182	.00096	.00105	.00428
%RSD	.19402	.92418	.46127	.53216	2.1086
#1	9.9944	.19854	.20675	.19825	.20610
#2	10.022	.19597	.20810	.19676	.20005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcsd 480-150654/3-a Acquired: 11/15/2013 14:36:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.20678**	**.20110**
Stddev	.00014	.00119
%RSD	.06685	.58971
#1	.20688	.20194
#2	.20668	.20026
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3357.6**	**5057.8**	**75715.**	**6985.3**
Stddev	2.4	1.1	207.	13.9
%RSD	.07121	.02139	.27299	.19903
#1	3355.9	5058.6	75569.	6995.1
#2	3359.2	5057.1	75862.	6975.5

Sample Name: 480-49148-a-10-a Acquired: 11/15/2013 14:38:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.03643**	**.00236**	**.01514**	**.00993**
Stddev	.00036	.00845	.00168	.00021	.00000
%RSD	365.91	23.182	71.436	1.4172	.04749
#1	-.00035	.03046	.00117	.01529	.00993
#2	.00015	.04241	.00354	.01499	.00994
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**18.084**	**.00019**	**.00003**	**-.00004**
Stddev	.00016	.051	.00013	.00011	.00000
%RSD	281.45	.28322	68.575	337.73	3.0714
#1	.00017	18.120	.00028	.00011	-.00004
#2	-.00006	18.047	.00010	-.00005	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00579**	**.26141**	**1.7577**	**1.8654**	**.00219**
Stddev	.00011	.00541	.0132	.0076	.00092
%RSD	1.8225	2.0704	.74952	.40813	42.241
#1	.00571	.25758	1.7484	1.8600	.00284
#2	.00586	.26523	1.7670	1.8708	.00153
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49148-a-10-a Acquired: 11/15/2013 14:38:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.5740**	**.29803**	**.28168**	**.00007**	**19.973**
Stddev	.0101	.00137	.00068	.00004	.104
%RSD	.28310	.46133	.23965	52.246	.51954
#1	3.5811	.29900	.28120	.00004	20.046
#2	3.5668	.29705	.28216	.00010	19.900
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**-.00338**	**5.153**	**-.00211**	**-.00014**
Stddev	.00025	.00048	.008	.00068	.00377
%RSD	102.47	14.241	.1524	32.275	2782.8
#1	.00042	-.00372	5.147	-.00162	.00253
#2	.00007	-.00304	5.158	-.00259	-.00280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.7633**	**.00011**	**.11368**	**.00080**	**.00330**
Stddev	.0030	.00005	.00039	.00003	.00049
%RSD	.03065	42.552	.34695	4.0661	14.950
#1	9.7654	.00008	.11396	.00082	.00295
#2	9.7612	.00015	.11340	.00078	.00365
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49148-a-10-a Acquired: 11/15/2013 14:38:37 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00011	.00857
Stddev	.00007	.00010
%RSD	62.517	1.1204
#1	.00016	.00864
#2	.00006	.00850
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3372.2	5013.3	74845.	6993.4
Stddev	3.1	12.4	230.	3.2
%RSD	.09289	.24669	.30748	.04643
#1	3374.4	5022.0	74682.	6991.1
#2	3369.9	5004.5	75008.	6995.7

Sample Name: 480-49029-c-1-b Acquired: 11/15/2013 14:40:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00061**	**1.7316**	**.02379**	**.91166**	**.71076**
Stddev	.00070	.0022	.00247	.00121	.00177
%RSD	114.15	.12424	10.394	.13273	.24864
#1	-.00111	1.7332	.02553	.91081	.71201
#2	-.00012	1.7301	.02204	.91252	.70951
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**172.47**	**.00011**	**.00466**	**.00181**
Stddev	.00021	.09	.00005	.00001	.00025
%RSD	211.28	.05288	40.153	.21753	13.837
#1	-.00005	172.41	.00015	.00466	.00198
#2	.00024	172.54	.00008	.00467	.00163
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00347**	**27.648**	**57.416**	**65.308**	**.03845**
Stddev	.00008	.027	.201	.257	.00039
%RSD	2.1881	.09799	.34942	.39376	1.0144
#1	.00352	27.629	57.558	65.490	.03873
#2	.00341	27.667	57.274	65.127	.03818
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49029-c-1-b Acquired: 11/15/2013 14:40:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**63.816**	**.31922**	**.33180**	**.00079**	**253.63**
Stddev	.106	.00083	.00306	.00012	.91
%RSD	.16628	.26125	.92186	15.798	.35942
#1	63.741	.31863	.33396	.00070	254.28
#2	63.891	.31981	.32964	.00088	252.99
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.02059**	**-.00092**	**5.632**	**-.00094**	**.00453**
Stddev	.00091	.00201	.008	.00030	.00040
%RSD	4.4291	219.13	.1458	31.746	8.9288
#1	.01995	-.00234	5.626	-.00115	.00424
#2	.02123	.00050	5.637	-.00073	.00481
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.615**	**.00269**	**.68496**	**.00310**	**.00461**
Stddev	.002	.00001	.00268	.00026	.00110
%RSD	.01382	.28298	.39091	8.5325	23.856
#1	14.614	.00268	.68685	.00329	.00538
#2	14.616	.00269	.68306	.00291	.00383
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49029-c-1-b Acquired: 11/15/2013 14:40:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00124	.00729
Stddev	.00000	.00049
%RSD	.15956	6.7380
#1	.00124	.00694
#2	.00124	.00763
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2920.2	4651.0	67511.	6864.0
Stddev	.0	3.6	9.	11.8
%RSD	.00044	.07751	.01399	.17157
#1	2920.2	4653.5	67518.	6872.4
#2	2920.2	4648.4	67505.	6855.7

Sample Name: 480-49065-e-1-d Acquired: 11/15/2013 14:43:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**14.358**	**.08715**	**6.2024**	**.11405**
Stddev	.00010	.032	.00263	.0217	.00002
%RSD	161.64	.21984	3.0228	.35047	.02049
#1	.00001	14.381	.08901	6.1870	.11403
#2	-.00013	14.336	.08529	6.2178	.11407
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00040**	**83.425**	**.00035**	**.00680**	**.09694**
Stddev	.00007	.184	.00000	.00021	.00041
%RSD	17.295	.21999	.84474	3.1319	.42792
#1	.00035	83.555	.00035	.00665	.09724
#2	.00045	83.295	.00035	.00695	.09665
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00770**	**.69012**	**211.93**	**^ *****	**.03247**
Stddev	.00001	.00820	.05	-----	.00090
%RSD	.16245	1.1886	.02506	-----	2.7742
#1	.00769	.69592	211.89	^ -----	.03183
#2	.00771	.68432	211.97	^ -----	.03310
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49065-e-1-d Acquired: 11/15/2013 14:43:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.455**	**.16124**	**.18145**	**.00624**	**1583.6**
Stddev	.064	.00053	.00161	.00040	.5
%RSD	.23439	.32981	.88472	6.3501	.03324
#1	27.409	.16086	.18032	.00596	1583.2
#2	27.501	.16161	.18259	.00652	1583.9
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.06921**	**-.00209**	F **157.9**	**.02338**	**.01957**
Stddev	.00032	.00012	.2	.00154	.00369
%RSD	.46950	5.9453	.1460	6.5712	18.850
#1	.06944	-.00217	157.7	.02229	.02218
#2	.06898	-.00200	158.0	.02446	.01696
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.6770**	**.01014**	**.49722**	**.19837**	**.00116**
Stddev	.0659	.00112	.00058	.00033	.00394
%RSD	1.1605	11.055	.11617	.16560	339.58
#1	5.6304	.01094	.49763	.19814	-.00162
#2	5.7236	.00935	.49681	.19860	.00394
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49065-e-1-d Acquired: 11/15/2013 14:43:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.13243**	**.02950**
Stddev	.00041	.00043
%RSD	.31022	1.4511
#1	.13214	.02919
#2	.13272	.02980
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2605.9**	**4470.5**	**62301.**	**6922.8**
Stddev	.4	13.6	83.	12.8
%RSD	.01632	.30348	.13377	.18491
#1	2605.6	4480.1	62360.	6913.7
#2	2606.2	4460.9	62242.	6931.8

Sample Name: 480-49645-c-1-a Acquired: 11/15/2013 14:46:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**.25853**	**.00330**	**2.9528**	**.02597**
Stddev	.00019	.02609	.00039	.0050	.00014
%RSD	58.224	10.091	11.746	.16764	.52267
#1	-.00047	.24009	.00357	2.9493	.02607
#2	-.00020	.27698	.00303	2.9563	.02588
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**47.039**	**.00041**	**.00046**	**.00675**
Stddev	.00011	.145	.00005	.00016	.00001
%RSD	101.33	.30836	12.638	34.487	.15280
#1	.00003	46.936	.00044	.00035	.00674
#2	.00019	47.141	.00037	.00057	.00676
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00781**	**.37643**	**33.710**	**38.922**	**.01045**
Stddev	.00011	.00024	.004	.575	.00112
%RSD	1.4541	.06295	.01042	1.4781	10.680
#1	.00789	.37660	33.712	38.516	.00966
#2	.00773	.37626	33.708	39.329	.01124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-a Acquired: 11/15/2013 14:46:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.281**	**.01987**	**.01959**	**.00867**	**177.36**
Stddev	.055	.00007	.00131	.00011	.54
%RSD	.31848	.34981	6.6731	1.3184	.30245
#1	17.320	.01992	.02051	.00859	177.74
#2	17.242	.01982	.01866	.00875	176.98
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03585**	**-.00034**	F **40.69**	**.00398**	**.00192**
Stddev	.00086	.00204	.10	.00203	.00243
%RSD	2.4021	593.00	.2414	50.989	126.52
#1	.03646	.00110	40.63	.00541	.00020
#2	.03524	-.00178	40.76	.00254	.00364
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.5735**	**.00251**	**.07907**	**.12108**	**.00105**
Stddev	.0009	.00074	.00014	.00089	.00115
%RSD	.01635	29.670	.17222	.73133	109.67
#1	5.5741	.00198	.07898	.12171	.00186
#2	5.5728	.00303	.07917	.12046	.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-a Acquired: 11/15/2013 14:46:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00031	.29751
Stddev	.00031	.00207
%RSD	99.530	.69537
#1	.00053	.29897
#2	.00009	.29604
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3100.1	4834.0	70266.	6911.5
Stddev	5.5	12.1	292.	20.1
%RSD	.17679	.24989	.41592	.29072
#1	3104.0	4842.6	70059.	6925.7
#2	3096.2	4825.5	70473.	6897.3

Sample Name: 480-49645-c-1-aSD@5 Acquired: 11/15/2013 14:48:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00083**	**.06775**	**.00225**	**.58181**	**.00542**
Stddev	.00043	.01818	.00007	.00040	.00003
%RSD	51.656	26.838	2.9907	.06957	.52591
#1	-.00053	.08060	.00220	.58153	.00544
#2	-.00113	.05489	.00229	.58210	.00540
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**9.5259**	**.00014**	**.00017**	**.00085**
Stddev	.00002	.0034	.00003	.00006	.00035
%RSD	22.312	.03590	24.794	33.934	41.562
#1	.00012	9.5234	.00012	.00020	.00060
#2	.00009	9.5283	.00017	.00013	.00110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00193**	**.06908**	**6.2455**	**6.6327**	**.00300**
Stddev	.00014	.00167	.0351	.0536	.00072
%RSD	7.0757	2.4138	.56169	.80737	24.070
#1	.00203	.06790	6.2703	6.6706	.00351
#2	.00184	.07025	6.2207	6.5948	.00249
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-aSD@5 Acquired: 11/15/2013 14:48:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.4641**	**.00405**	**.00361**	**.00147**	**34.979**
Stddev	.0072	.00004	.00060	.00016	.011
%RSD	.20708	1.0910	16.729	10.577	.03058
#1	3.4692	.00402	.00318	.00158	34.986
#2	3.4590	.00408	.00404	.00136	34.971
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00742**	**.00053**	**7.800**	**-.00060**	**.00013**
Stddev	.00029	.00001	.021	.00124	.00498
%RSD	3.9396	2.4138	.2625	206.27	3873.2
#1	.00721	.00054	7.785	-.00148	.00365
#2	.00762	.00053	7.814	.00028	-.00340
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.0975**	**.00080**	**.01583**	**.02419**	**-.00063**
Stddev	.0122	.00020	.00034	.00007	.00022
%RSD	1.1154	25.454	2.1258	.27641	34.722
#1	1.0889	.00095	.01607	.02414	-.00048
#2	1.1062	.00066	.01559	.02423	-.00079
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-aSD@5 Acquired: 11/15/2013 14:48:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00019	.05936
Stddev	.00013	.00001
%RSD	68.503	.01157
#1	.00028	.05935
#2	.00010	.05936
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3329.5	4991.8	73572.	6824.5
Stddev	1.8	2.0	276.	9.8
%RSD	.05377	.03970	.37559	.14344
#1	3328.2	4990.4	73377.	6831.4
#2	3330.7	4993.2	73768.	6817.6

Sample Name: 480-49645-c-1-a PDS Acquired: 11/15/2013 14:51:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05226**	**11.032**	**.22181**	**3.0778**	**.23615**
Stddev	.00005	.094	.00243	.0040	.00027
%RSD	.09334	.84815	1.0937	.12969	.11322
#1	.05223	10.965	.22352	3.0750	.23634
#2	.05229	11.098	.22009	3.0806	.23596
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20933**	**56.611**	**.21126**	**.21172**	**.21761**
Stddev	.00037	.128	.00009	.00007	.00050
%RSD	.17758	.22578	.04099	.03344	.22957
#1	.20959	56.521	.21133	.21167	.21796
#2	.20906	56.701	.21120	.21177	.21725
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22403**	**10.645**	**44.339**	**51.311**	**.23999**
Stddev	.00017	.009	.241	.136	.00419
%RSD	.07713	.08367	.54352	.26419	1.7463
#1	.22391	10.639	44.168	51.216	.23702
#2	.22415	10.651	44.509	51.407	.24295
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-a PDS Acquired: 11/15/2013 14:51:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.274**	**.22496**	**.22714**	**.22390**	**184.14**
Stddev	.053	.00026	.00052	.00011	.52
%RSD	.19436	.11538	.22866	.04811	.28046
#1	27.312	.22477	.22751	.22398	183.77
#2	27.237	.22514	.22678	.22382	184.50
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24320**	**.21090**	F **39.63**	**.20889**	**.22033**
Stddev	.00069	.00210	.14	.00258	.00411
%RSD	.28198	.99757	.3432	1.2353	1.8659
#1	.24369	.20941	39.72	.21071	.22323
#2	.24272	.21239	39.53	.20706	.21742
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.668**	**.20614**	**.28902**	**.32041**	**.20723**
Stddev	.149	.00068	.00188	.00133	.00377
%RSD	.95107	.33149	.65047	.41579	1.8214
#1	15.563	.20662	.28769	.31947	.20990
#2	15.773	.20566	.29035	.32135	.20456
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-a PDS Acquired: 11/15/2013 14:51:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21494**	**.49571**
Stddev	.00055	.00210
%RSD	.25756	.42264
#1	.21455	.49720
#2	.21533	.49423
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3074.5**	**4847.6**	**70295.**	**6904.8**
Stddev	3.5	8.7	90.	24.2
%RSD	.11545	.18020	.12780	.35113
#1	3077.0	4853.8	70232.	6921.9
#2	3072.0	4841.5	70359.	6887.7

Sample Name: CCV Acquired: 11/15/2013 14:53:32 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51298**	**26.146**	**.52619**	**.51502**	**.52564**	**.51256**	**25.754**
Stddev	.00185	.017	.00251	.00050	.00052	.00061	.074
%RSD	.36065	.06312	.47627	.09753	.09800	.11817	.28696
#1	.51167	26.157	.52797	.51466	.52600	.51214	25.702
#2	.51429	26.134	.52442	.51538	.52527	.51299	25.806
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51123**	**.50834**	**.52237**	**.51800**	**25.053**	**26.327**	**26.549**
Stddev	.00157	.00071	.00523	.00402	.027	.001	.322
%RSD	.30679	.13914	1.0013	.77540	.10825	.00452	1.2120
#1	.51234	.50884	.51867	.51516	25.034	26.328	26.321
#2	.51012	.50784	.52607	.52085	25.073	26.326	26.776
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52379**	**24.991**	**.52008**	**.49733**	**.51725**	**26.225**	**.51223**
Stddev	.00309	.113	.00210	.00468	.00147	.061	.00068
%RSD	.58938	.45229	.40318	.94183	.28458	.23325	.13339
#1	.52598	24.911	.51860	.49402	.51829	26.268	.51271
#2	.52161	25.071	.52156	.50065	.51621	26.182	.51174
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 14:53:32 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51162	25.51	.52657	.51742	25.581	.52213	.52361
Stddev	.00244	.01	.00321	.00142	.162	.00085	.00099
%RSD	.47692	.0539	.61002	.27509	.63391	.16363	.18879
#1	.51335	25.52	.52884	.51642	25.467	.52153	.52291
#2	.50990	25.50	.52430	.51843	25.696	.52274	.52431
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51939	.51324	.51750	.51652
Stddev	.00017	.00333	.00416	.00303
%RSD	.03205	.64870	.80460	.58729
#1	.51928	.51089	.51456	.51438
#2	.51951	.51560	.52045	.51867
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3216.3	4989.7	72939.	6809.9
Stddev	4.3	4.5	314.	7.3
%RSD	.13268	.09078	.43068	.10774
#1	3213.3	4986.5	73161.	6815.1
#2	3219.3	4992.9	72717.	6804.7

Sample Name: CCB Acquired: 11/15/2013 14:55:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00062**	**.02196**	**.00290**	**.00469**	**.00000**	**.00002**	**-.01483**
Stddev	.00037	.01798	.00197	.00058	.00000	.00003	.00031
%RSD	59.866	81.879	67.893	12.363	698.68	124.32	2.0845
#1	-.00036	.03467	.00429	.00510	-.00000	.00000	-.01461
#2	-.00089	.00925	.00151	.00428	.00000	.00004	-.01505
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**.00007**	**-.00050**	**.00026**	**-.00275**	**.02463**	**.00293**
Stddev	.00001	.00010	.00005	.00008	.00107	.00870	.00000
%RSD	14.008	150.68	10.836	30.179	38.847	35.334	.09507
#1	.00007	.00014	-.00054	.00032	-.00200	.01848	.00292
#2	.00006	-.00000	-.00046	.00020	-.00351	.03078	.00293
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**-.00068**	**-.00002**	**-.00024**	**.00011**	**.01911**	**.00015**
Stddev	.00138	.00030	.00001	.00006	.00021	.00308	.00006
%RSD	528.49	44.923	52.406	26.364	201.38	16.126	44.191
#1	.00071	-.00046	-.00003	-.00020	-.00005	.01693	.00019
#2	-.00123	-.00089	-.00002	-.00029	.00026	.02129	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 14:55:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00054	F .0036	-.00013	.00236	.00056	.00038	-.00010
Stddev	.00012	.0007	.00005	.00287	.02153	.00030	.00001
%RSD	22.415	18.73	41.966	121.68	3845.2	78.114	15.553
#1	.00045	.0032	-.00016	.00033	-.01466	.00059	-.00009
#2	.00062	.0041	-.00009	.00439	.01578	.00017	-.00011
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00035	.00229	.00007	.00005
Stddev	.00011	.00113	.00018	.00036
%RSD	31.756	49.429	265.99	728.81
#1	.00027	.00149	-.00006	-.00020
#2	.00042	.00309	.00020	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3437.8	5136.1	76280.	6899.7
Stddev	2.9	14.2	246.	6.5
%RSD	.08307	.27663	.32306	.09403
#1	3435.7	5126.0	76106.	6895.1
#2	3439.8	5146.1	76455.	6904.2

Sample Name: CCVL Acquired: 11/15/2013 14:58:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00253**	**.22429**	W **.01306**	**.02317**	**.00223**	**.00213**	**.50128**
Stddev	.00017	.01405	.00200	.00010	.00002	.00003	.00223
%RSD	6.5772	6.2634	15.298	.42111	.78081	1.4812	.44543
#1	.00241	.23422	.01164	.02310	.00224	.00210	.49970
#2	.00265	.21435	.01447	.02324	.00222	.00215	.50286
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.01000				
Range			30.000%				

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00095**	**.00417**	**.00350**	**.01035**	**.04971**	**.52584**	**.43498**
Stddev	.00007	.00020	.00030	.00015	.00305	.00685	.00312
%RSD	7.6199	4.8022	8.5847	1.4820	6.1400	1.3030	.71765
#1	.00090	.00403	.00329	.01046	.04756	.53069	.43277
#2	.00100	.00432	.00371	.01025	.05187	.52100	.43718
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02921**	**.20540**	**.00333**	**.00311**	**.00983**	**.97538**	**.01041**
Stddev	.00046	.00162	.00005	.00036	.00022	.00857	.00020
%RSD	1.5639	.78630	1.6224	11.712	2.2194	.87887	1.9253
#1	.02888	.20654	.00329	.00337	.00999	.96931	.01055
#2	.02953	.20426	.00337	.00286	.00968	.98144	.01027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 14:58:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00532	.2122	.02090	.01487	.48813	.00955	.00491
Stddev	.00082	.0011	.00039	.00500	.00753	.00010	.00014
%RSD	15.415	.5414	1.8693	33.648	1.5426	1.0590	2.7920
#1	.00474	.2130	.02117	.01133	.48280	.00962	.00481
#2	.00590	.2114	.02062	.01840	.49345	.00948	.00500
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00476	.01993	.00527	.01035
Stddev	.00006	.00061	.00019	.00033
%RSD	1.3410	3.0704	3.5374	3.2200
#1	.00481	.01950	.00514	.01058
#2	.00472	.02036	.00540	.01011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3470.0	5203.3	76706.	6939.7
Stddev	8.5	20.2	49.	26.2
%RSD	.24561	.38791	.06360	.37717
#1	3476.0	5217.6	76740.	6958.2
#2	3463.9	5189.0	76671.	6921.2

Sample Name: 480-49645-c-1-b ms Acquired: 11/15/2013 15:00:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05263**	**11.092**	**.22441**	**3.1877**	**.23953**
Stddev	.00058	.067	.00182	.0004	.00055
%RSD	1.0999	.60656	.81022	.01316	.22880
#1	.05304	11.045	.22312	3.1880	.23914
#2	.05222	11.140	.22570	3.1874	.23992
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21244**	**58.423**	**.21456**	**.21461**	**.22076**
Stddev	.00063	.229	.00013	.00030	.00172
%RSD	.29779	.39167	.06138	.14135	.77800
#1	.21199	58.261	.21447	.21482	.21954
#2	.21289	58.585	.21465	.21439	.22197
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22659**	**10.780**	**45.840**	**53.251**	**.24532**
Stddev	.00059	.008	.421	.122	.00351
%RSD	.26164	.07270	.91808	.22884	1.4305
#1	.22617	10.774	45.542	53.165	.24284
#2	.22701	10.785	46.137	53.337	.24781
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-b ms Acquired: 11/15/2013 15:00:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**28.017**	**.22888**	**.22997**	**.22762**	**191.58**
Stddev	.049	.00003	.00063	.00041	1.07
%RSD	.17529	.01175	.27357	.18135	.55722
#1	27.982	.22886	.22952	.22733	190.83
#2	28.052	.22890	.23041	.22792	192.34
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24750**	**.21635**	F **51.61**	**.21617**	**.22483**
Stddev	.00033	.00092	.04	.00019	.00227
%RSD	.13512	.42373	.0715	.08827	1.0092
#1	.24726	.21700	51.64	.21603	.22322
#2	.24774	.21570	51.58	.21630	.22643
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.842**	**.21256**	**.29410**	**.32866**	**.20898**
Stddev	.076	.00026	.00255	.00133	.00063
%RSD	.47711	.12069	.86631	.40490	.30053
#1	15.789	.21274	.29230	.32772	.20854
#2	15.895	.21238	.29590	.32960	.20943
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-b ms Acquired: 11/15/2013 15:00:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21742	.50627
Stddev	.00095	.00222
%RSD	.43765	.43887
#1	.21674	.50470
#2	.21809	.50785
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3054.6	4827.2	69831.	6854.4
Stddev	5.0	4.3	245.	31.7
%RSD	.16494	.08985	.35116	.46280
#1	3051.0	4824.1	70004.	6876.8
#2	3058.1	4830.2	69657.	6832.0

Sample Name: 480-49645-c-1-c msd Acquired: 11/15/2013 15:03:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05327	11.046	.22347	3.1722	.23887
Stddev	.00033	.010	.00032	.0074	.00072
%RSD	.61450	.09450	.14537	.23244	.29950
#1	.05303	11.054	.22324	3.1670	.23837
#2	.05350	11.039	.22370	3.1774	.23938
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21164	57.690	.21370	.21390	.22066
Stddev	.00025	.020	.00031	.00009	.00095
%RSD	.11634	.03521	.14357	.04211	.43161
#1	.21181	57.676	.21348	.21383	.21999
#2	.21146	57.705	.21392	.21396	.22134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.22691	10.746	45.373	51.870	.24168
Stddev	.00180	.026	.122	.021	.00137
%RSD	.79215	.23788	.26779	.04143	.56509
#1	.22564	10.728	45.287	51.885	.24071
#2	.22818	10.764	45.459	51.854	.24264
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-c msd Acquired: 11/15/2013 15:03:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**27.925**	**.22830**	**.23079**	**.22593**	**190.20**
Stddev	.114	.00168	.00028	.00008	.54
%RSD	.40875	.73722	.12282	.03693	.28602
#1	27.845	.22711	.23099	.22587	189.81
#2	28.006	.22949	.23059	.22599	190.58
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.24535**	**.21284**	F **51.33**	**.21473**	**.21684**
Stddev	.00128	.00115	.06	.00353	.00153
%RSD	.52015	.54175	.1089	1.6462	.70785
#1	.24625	.21202	51.29	.21223	.21792
#2	.24445	.21365	51.37	.21723	.21575
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.721**	**.21187**	**.29067**	**.32890**	**.21065**
Stddev	.035	.00006	.00109	.00098	.00173
%RSD	.22530	.02855	.37611	.29927	.81926
#1	15.696	.21183	.28990	.32821	.21187
#2	15.746	.21192	.29144	.32960	.20943
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-1-c msd Acquired: 11/15/2013 15:03:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21728**	**.50410**
Stddev	.00098	.00577
%RSD	.44883	1.1445
#1	.21659	.50002
#2	.21797	.50818
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3062.5**	**4837.0**	**69849.**	**6894.9**
Stddev	2.4	2.5	389.	8.2
%RSD	.07945	.05072	.55651	.11887
#1	3060.8	4838.8	70124.	6900.7
#2	3064.3	4835.3	69574.	6889.1

Sample Name: 480-49645-c-2-a Acquired: 11/15/2013 15:05:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00072**	**.02046**	**.00367**	**2.9679**	**.00544**
Stddev	.00068	.00169	.00425	.0019	.00003
%RSD	94.366	8.2579	115.55	.06343	.62447
#1	-.00024	.02166	.00668	2.9692	.00547
#2	-.00121	.01927	.00067	2.9666	.00542
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**46.449**	**.00024**	**.00046**	**.00123**
Stddev	.00003	.244	.00005	.00002	.00051
%RSD	18.490	.52547	21.787	4.9672	41.482
#1	.00019	46.276	.00028	.00048	.00087
#2	.00014	46.622	.00021	.00044	.00160
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00317**	**.04596**	**33.722**	**40.836**	**.01096**
Stddev	.00002	.00041	.034	.143	.00081
%RSD	.76396	.88679	.10080	.35020	7.3518
#1	.00318	.04567	33.698	40.937	.01039
#2	.00315	.04625	33.746	40.735	.01153
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-2-a Acquired: 11/15/2013 15:05:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.267**	**.01279**	**.01258**	**.00869**	**178.14**
Stddev	.031	.00003	.00016	.00035	.03
%RSD	.18167	.20701	1.2473	4.0804	.01640
#1	17.289	.01277	.01269	.00894	178.12
#2	17.244	.01281	.01247	.00844	178.16
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03585**	**-.00183**	F **40.97**	**.00436**	**-.00147**
Stddev	.00028	.00084	.02	.00074	.00101
%RSD	.78981	45.740	.0502	16.905	68.826
#1	.03565	-.00124	40.96	.00384	-.00076
#2	.03605	-.00242	40.98	.00488	-.00219
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2539**	**.00258**	**.07451**	**.00324**	**.00362**
Stddev	.0092	.00030	.00026	.00007	.00070
%RSD	.17534	11.531	.34523	2.0151	19.344
#1	5.2474	.00237	.07432	.00329	.00313
#2	5.2604	.00280	.07469	.00319	.00412
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-2-a Acquired: 11/15/2013 15:05:39 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00010**	**.12873**
Stddev	.00024	.00050
%RSD	254.71	.38519
#1	-.00008	.12908
#2	.00027	.12838
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3106.9**	**4846.2**	**70749.**	**6899.6**
Stddev	1.7	2.7	122.	50.9
%RSD	.05363	.05657	.17226	.73744
#1	3105.7	4848.1	70663.	6935.6
#2	3108.0	4844.2	70836.	6863.6

Sample Name: 480-49645-c-3-a Acquired: 11/15/2013 15:08:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00049**	**.04121**	**.00331**	**2.9534**	**.00525**
Stddev	.00055	.00187	.00066	.0012	.00001
%RSD	112.14	4.5409	19.938	.04197	.15139
#1	-.00010	.04253	.00377	2.9525	.00524
#2	-.00087	.03988	.00284	2.9543	.00525
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**47.293**	**.00032**	**.00045**	**.00180**
Stddev	.00002	.079	.00005	.00020	.00015
%RSD	14.078	.16751	14.398	43.730	8.2897
#1	.00015	47.237	.00029	.00059	.00169
#2	.00012	47.349	.00036	.00031	.00191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00391**	**.04397**	**33.503**	**40.150**	**.00943**
Stddev	.00008	.00257	.249	.841	.00008
%RSD	2.1131	5.8372	.74454	2.0942	.87079
#1	.00397	.04579	33.326	40.745	.00937
#2	.00385	.04216	33.679	39.555	.00949
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-3-a Acquired: 11/15/2013 15:08:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.260**	**.01236**	**.01205**	**.00868**	**177.55**
Stddev	.027	.00007	.00110	.00004	.07
%RSD	.15887	.57390	9.1273	.42600	.03668
#1	17.279	.01241	.01128	.00871	177.60
#2	17.241	.01231	.01283	.00866	177.50
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03562**	**-.00044**	F **41.76**	**.00271**	**.00228**
Stddev	.00002	.00084	.01	.00063	.00020
%RSD	.06544	193.10	.0160	23.289	8.7957
#1	.03564	.00016	41.75	.00315	.00214
#2	.03560	-.00103	41.76	.00226	.00243
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2359**	**.00252**	**.07624**	**.00258**	**.00076**
Stddev	.0350	.00030	.00011	.00008	.00327
%RSD	.66910	11.948	.14580	3.2280	429.35
#1	5.2112	.00231	.07616	.00264	-.00155
#2	5.2607	.00273	.07632	.00252	.00307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-3-a Acquired: 11/15/2013 15:08:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00028**	**.13045**
Stddev	.00019	.00185
%RSD	68.555	1.4208
#1	.00015	.13176
#2	.00042	.12914
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3105.0**	**4841.6**	**69978.**	**6869.7**
Stddev	3.7	5.7	121.	2.4
%RSD	.11944	.11857	.17266	.03549
#1	3107.6	4845.7	69893.	6867.9
#2	3102.3	4837.6	70064.	6871.4

Sample Name: 480-49645-c-4-a Acquired: 11/15/2013 15:10:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**.02893**	**.00360**	**2.9864**	**.00561**
Stddev	.00021	.00827	.00148	.0055	.00001
%RSD	29.174	28.598	41.053	.18358	.17030
#1	-.00056	.02308	.00256	2.9826	.00562
#2	-.00085	.03478	.00465	2.9903	.00560
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**47.659**	**.00025**	**.00049**	**.00174**
Stddev	.00005	.158	.00010	.00026	.00007
%RSD	51.233	.33076	39.467	53.361	4.0841
#1	.00006	47.771	.00032	.00068	.00169
#2	.00013	47.548	.00018	.00031	.00179
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00327**	**.05073**	**33.695**	**40.425**	**.01139**
Stddev	.00012	.00156	.031	.973	.00008
%RSD	3.6963	3.0801	.09317	2.4058	.67038
#1	.00318	.04963	33.717	41.113	.01145
#2	.00335	.05184	33.673	39.737	.01134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-4-a Acquired: 11/15/2013 15:10:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.431**	**.01250**	**.01273**	**.00877**	**179.86**
Stddev	.011	.00007	.00125	.00009	.59
%RSD	.06349	.58105	9.8455	1.0376	.33036
#1	17.439	.01245	.01361	.00884	180.28
#2	17.423	.01255	.01184	.00871	179.44
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03559**	**-.00105**	F **41.04**	**.00312**	**.00361**
Stddev	.00024	.00113	.06	.00229	.00021
%RSD	.68050	107.15	.1536	73.444	5.6895
#1	.03542	-.00026	41.08	.00150	.00375
#2	.03576	-.00185	40.99	.00475	.00346
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.1857**	**.00239**	**.07710**	**.00584**	**.00253**
Stddev	.0443	.00044	.00021	.00006	.00014
%RSD	.85428	18.191	.27723	1.0122	5.6513
#1	5.1543	.00270	.07725	.00580	.00263
#2	5.2170	.00209	.07695	.00588	.00243
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-4-a Acquired: 11/15/2013 15:10:45 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00016	.12938
Stddev	.00006	.00151
%RSD	39.823	1.1651
#1	.00020	.13045
#2	.00011	.12832
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3101.6	4834.7	70362.	6933.6
Stddev	1.0	12.0	112.	31.0
%RSD	.03193	.24828	.15879	.44763
#1	3102.3	4843.2	70283.	6911.6
#2	3100.9	4826.2	70441.	6955.5

Sample Name: 480-49645-c-5-a Acquired: 11/15/2013 15:13:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**.01196**	**.00637**	**2.4826**	**.00114**
Stddev	.00011	.00432	.00061	.0062	.00000
%RSD	89.771	36.083	9.6513	.25139	.05458
#1	.00005	.01501	.00680	2.4870	.00114
#2	.00020	.00891	.00593	2.4781	.00114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**9.2305**	**.00014**	**.00047**	**.00132**
Stddev	.00010	.0449	.00006	.00006	.00021
%RSD	423.93	.48675	43.675	12.663	16.015
#1	-.00005	9.1987	.00010	.00043	.00117
#2	.00010	9.2623	.00018	.00052	.00147
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00367**	**.04777**	**102.75**	**89.993**	**.00957**
Stddev	.00001	.00172	.03	.474	.00056
%RSD	.29095	3.6017	.02832	.52643	5.8875
#1	.00366	.04898	102.73	90.328	.00917
#2	.00368	.04655	102.77	89.658	.00997
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-5-a Acquired: 11/15/2013 15:13:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.3181**	**.00619**	**.00619**	**.00784**	**128.97**
Stddev	.0207	.00004	.00050	.00002	.20
%RSD	.38902	.62667	8.0283	.20646	.15422
#1	5.3327	.00616	.00584	.00785	128.83
#2	5.3035	.00622	.00654	.00783	129.11
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03102**	**-.00055**	F **33.43**	**.00446**	**.00267**
Stddev	.00018	.00116	.03	.00003	.00219
%RSD	.57115	211.41	.0759	.75075	81.977
#1	.03090	.00027	33.45	.00448	.00112
#2	.03115	-.00137	33.41	.00444	.00422
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.0503**	**.00118**	**.01616**	**.00218**	**.00132**
Stddev	.0437	.00047	.00019	.00018	.00306
%RSD	.86593	39.629	1.1624	8.3715	231.29
#1	5.0194	.00151	.01629	.00205	.00349
#2	5.0813	.00085	.01603	.00231	-.00084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-5-a Acquired: 11/15/2013 15:13:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00005	.12613
Stddev	.00025	.00039
%RSD	487.77	.31267
#1	.00023	.12641
#2	-.00013	.12585
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3152.7	4889.7	70558.	6921.7
Stddev	4.8	4.1	59.	25.5
%RSD	.15157	.08358	.08348	.36902
#1	3149.3	4886.8	70599.	6939.8
#2	3156.0	4892.5	70516.	6903.6

Sample Name: 480-49645-c-6-a Acquired: 11/15/2013 15:15:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00091**	**.05142**	**.00266**	**2.6007**	**.00108**
Stddev	.00028	.01482	.00021	.0025	.00002
%RSD	30.707	28.823	7.7837	.09708	2.0384
#1	-.00071	.06191	.00251	2.5990	.00109
#2	-.00111	.04094	.00281	2.6025	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**9.5716**	**.00013**	**.00052**	**.00119**
Stddev	.00006	.0093	.00000	.00003	.00020
%RSD	45.153	.09719	.20769	5.6583	16.612
#1	.00018	9.5651	.00013	.00054	.00132
#2	.00009	9.5782	.00013	.00050	.00105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00405**	**.05617**	**67.284**	**66.961**	**.00865**
Stddev	.00020	.00467	.152	.109	.00016
%RSD	5.0397	8.3108	.22628	.16297	1.9050
#1	.00390	.05947	67.392	67.039	.00876
#2	.00419	.05287	67.176	66.884	.00853
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-6-a Acquired: 11/15/2013 15:15:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.8035**	**.00610**	**.00584**	**.00818**	**154.79**
Stddev	.0157	.00005	.00032	.00009	.36
%RSD	.27057	.83295	5.5407	1.0566	.23248
#1	5.8146	.00613	.00607	.00824	155.04
#2	5.7924	.00606	.00561	.00812	154.53
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03163**	**-.00225**	F **35.20**	**.00374**	**.00042**
Stddev	.00025	.00034	.02	.00035	.00330
%RSD	.78556	15.096	.0460	9.3790	795.32
#1	.03180	-.00201	35.22	.00349	.00275
#2	.03145	-.00249	35.19	.00399	-.00192
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9898**	**.00087**	**.01578**	**.00201**	**.00473**
Stddev	.0095	.00001	.00021	.00007	.00128
%RSD	.19054	1.3028	1.3073	3.3443	27.088
#1	4.9966	.00087	.01592	.00196	.00383
#2	4.9831	.00088	.01563	.00205	.00564
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-6-a Acquired: 11/15/2013 15:15:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00023**	**.12702**
Stddev	.00001	.00004
%RSD	2.6010	.03430
#1	.00024	.12705
#2	.00023	.12699
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3153.4**	**4879.0**	**70921.**	**6934.6**
Stddev	5.3	3.7	20.	36.9
%RSD	.16653	.07582	.02885	.53211
#1	3157.1	4881.6	70907.	6960.7
#2	3149.7	4876.3	70936.	6908.5

Sample Name: 480-49645-c-7-a Acquired: 11/15/2013 15:18:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**.04710**	**.00720**	**2.5967**	**.00228**
Stddev	.00027	.00029	.00395	.0059	.00001
%RSD	48.968	.62076	54.849	.22631	.55005
#1	-.00036	.04730	.00440	2.5925	.00229
#2	-.00074	.04689	.00999	2.6008	.00227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**11.945**	**.00026**	**.00050**	**.00139**
Stddev	.00005	.077	.00001	.00005	.00058
%RSD	26.376	.64470	3.9416	9.8887	41.751
#1	.00021	11.890	.00027	.00053	.00098
#2	.00014	11.999	.00026	.00046	.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00349**	**.07639**	**50.502**	**53.901**	**.00946**
Stddev	.00027	.00087	.016	.190	.00032
%RSD	7.7356	1.1453	.03199	.35339	3.3739
#1	.00368	.07701	50.513	53.767	.00969
#2	.00330	.07577	50.491	54.036	.00924
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-7-a Acquired: 11/15/2013 15:18:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.7603**	**.00721**	**.00716**	**.00827**	**162.61**
Stddev	.0095	.00001	.00071	.00029	.48
%RSD	.13978	.14402	9.9233	3.5576	.29668
#1	6.7536	.00720	.00766	.00848	162.26
#2	6.7670	.00721	.00666	.00806	162.95
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.03095**	**-.00027**	F **35.46**	**.00234**	**.00064**
Stddev	.00002	.00165	.02	.00160	.00045
%RSD	.06235	614.56	.0468	68.415	70.201
#1	.03097	-.00144	35.45	.00121	.00095
#2	.03094	.00090	35.47	.00347	.00032
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.9092**	**.00061**	**.01894**	**.01125**	**.00320**
Stddev	.0430	.00028	.00008	.00012	.00004
%RSD	.87595	46.507	.43407	1.0985	1.2085
#1	4.8788	.00041	.01888	.01133	.00317
#2	4.9396	.00081	.01900	.01116	.00323
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49645-c-7-a Acquired: 11/15/2013 15:18:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00027**	**.13066**
Stddev	.00011	.00098
%RSD	39.786	.75367
#1	.00035	.13135
#2	.00020	.12996
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3148.5**	**4879.5**	**70480.**	**6931.3**
Stddev	3.1	11.5	195.	48.8
%RSD	.09881	.23597	.27645	.70443
#1	3150.7	4887.7	70343.	6965.8
#2	3146.3	4871.4	70618.	6896.8

Sample Name: 480-49691-b-1-a Acquired: 11/15/2013 15:20:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**.02141**	**.00392**	**.06801**	**.15850**
Stddev	.00084	.01227	.00005	.00093	.00084
%RSD	436.64	57.291	1.4014	1.3740	.52875
#1	-.00079	.01274	.00388	.06867	.15910
#2	.00040	.03009	.00396	.06735	.15791
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**101.91**	**.00014**	**-.00006**	**.00031**
Stddev	.00010	.27	.00001	.00000	.00047
%RSD	127.01	.26072	8.5553	5.6832	149.38
#1	.00015	102.10	.00014	-.00006	-.00002
#2	.00001	101.72	.00015	-.00005	.00065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**6.2933**	**7.1642**	**8.3458**	**.00753**
Stddev	.00018	.0415	.0037	.0048	.00073
%RSD	19.980	.65895	.05177	.05699	9.7570
#1	.00104	6.3226	7.1616	8.3424	.00701
#2	.00079	6.2640	7.1669	8.3491	.00805
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-1-a Acquired: 11/15/2013 15:20:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.279**	**.41097**	**.39978**	**.00067**	**47.277**
Stddev	.055	.00032	.00373	.00032	.072
%RSD	.31923	.07871	.93259	48.590	.15230
#1	17.318	.41074	.40242	.00044	47.328
#2	17.240	.41119	.39715	.00090	47.226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**-.00202**	**8.141**	**-.00265**	**.00030**
Stddev	.00011	.00034	.002	.00313	.00012
%RSD	226.60	16.644	.0277	118.03	39.354
#1	-.00012	-.00226	8.139	-.00044	.00039
#2	.00003	-.00179	8.142	-.00486	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.3258**	**.00087**	**.41071**	**.00069**	**.00247**
Stddev	.0291	.00011	.00020	.00029	.00019
%RSD	.39732	13.142	.04781	42.545	7.7318
#1	7.3464	.00079	.41057	.00048	.00261
#2	7.3052	.00095	.41085	.00089	.00234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-1-a Acquired: 11/15/2013 15:20:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00009**	**.00051**
Stddev	.00005	.00020
%RSD	51.463	38.809
#1	-.00013	.00037
#2	-.00006	.00065
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3191.1**	**4871.3**	**71715.**	**6874.8**
Stddev	5.3	4.4	286.	21.5
%RSD	.16738	.09094	.39935	.31252
#1	3194.9	4874.4	71513.	6859.6
#2	3187.4	4868.2	71918.	6889.9

Sample Name: CCV Acquired: 11/15/2013 15:23:10 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51079**	**26.192**	**.52635**	**.51704**	**.52642**	**.51228**	**25.679**
Stddev	.00336	.143	.00460	.00103	.00210	.00132	.054
%RSD	.65693	.54477	.87322	.19904	.39980	.25849	.21045
#1	.51317	26.292	.52310	.51632	.52791	.51321	25.717
#2	.50842	26.091	.52960	.51777	.52493	.51134	25.641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51221**	**.50655**	**.52031**	**.51813**	**25.064**	**26.412**	**26.640**
Stddev	.00018	.00130	.00408	.00462	.022	.175	.382
%RSD	.03599	.25595	.78469	.89230	.08809	.66378	1.4339
#1	.51234	.50564	.52319	.52140	25.048	26.536	26.910
#2	.51208	.50747	.51742	.51486	25.080	26.289	26.370
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52503**	**24.890**	**.51843**	**.49313**	**.51821**	**26.273**	**.51143**
Stddev	.00275	.141	.00205	.00064	.00114	.187	.00043
%RSD	.52350	.56711	.39473	.12899	.22038	.71190	.08360
#1	.52698	24.990	.51988	.49358	.51740	26.406	.51174
#2	.52309	24.790	.51698	.49268	.51901	26.141	.51113
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 15:23:10 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51272	25.44	.52764	.52321	25.433	.51598	.52494
Stddev	.00080	.07	.00067	.00461	.113	.00117	.00133
%RSD	.15544	.2567	.12736	.88122	.44518	.22750	.25259
#1	.51216	25.49	.52812	.51995	25.513	.51681	.52588
#2	.51329	25.40	.52717	.52647	25.353	.51515	.52401
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51885	.51576	.51344	.50915
Stddev	.00257	.00209	.00496	.00791
%RSD	.49459	.40532	.96568	1.5529
#1	.52067	.51428	.51694	.51475
#2	.51704	.51724	.50993	.50356
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3225.7	4988.4	73351.	6807.7
Stddev	3.5	1.2	488.	43.9
%RSD	.10708	.02433	.66517	.64554
#1	3228.2	4987.5	73006.	6776.6
#2	3223.3	4989.3	73696.	6838.8

Sample Name: CCB Acquired: 11/15/2013 15:25:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**.02838**	**.00375**	**.00593**	**-.00001**	**.00007**	**-.01603**
Stddev	.00001	.02782	.00133	.00052	.00000	.00001	.00304
%RSD	4.8567	98.023	35.329	8.7152	41.002	18.416	18.982
#1	-.00019	.00871	.00282	.00629	-.00001	.00006	-.01819
#2	-.00018	.04806	.00469	.00556	-.00000	.00007	-.01388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**.00009**	**-.00038**	**.00040**	**-.00016**	**.00516**	**.00377**
Stddev	.00001	.00005	.00003	.00005	.00176	.00897	.00020
%RSD	23.252	62.275	7.6984	13.048	1097.8	173.70	5.2581
#1	-.00003	.00012	-.00036	.00036	-.00141	-.00118	.00363
#2	-.00002	.00005	-.00040	.00044	.00109	.01151	.00391
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**-.00319**	**-.00001**	**.00039**	**.00012**	**.01224**	**-.00015**
Stddev	.00102	.00610	.00000	.00001	.00001	.00807	.00019
%RSD	714.96	191.24	3.6331	2.6502	6.5734	65.926	121.88
#1	-.00087	.00112	-.00001	.00038	.00013	.01795	-.00029
#2	.00058	-.00750	-.00001	.00040	.00012	.00654	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 15:25:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00014	F .0044	-.00027	.00090	-.01899	.00059	.00003
Stddev	.00101	.0000	.00061	.00099	.00559	.00083	.00002
%RSD	715.10	.7449	223.65	109.75	29.429	140.81	61.896
#1	-.00086	.0044	.00016	.00020	-.01504	.00118	.00004
#2	.00058	.0044	-.00070	.00160	-.02294	.00000	.00002
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00027	.00293	.00005	.00014
Stddev	.00008	.00021	.00004	.00007
%RSD	29.533	7.2347	86.730	52.909
#1	.00033	.00278	.00002	.00008
#2	.00022	.00308	.00007	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3426.9	5114.0	76973.	6886.4
Stddev	12.3	8.8	9.	27.8
%RSD	.35912	.17205	.01197	.40389
#1	3435.6	5120.2	76967.	6866.7
#2	3418.2	5107.8	76980.	6906.1

Sample Name: 480-49691-B-2-A Acquired: 11/15/2013 15:27:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .00009	F .06914	F .00280	F .10169	F .03846	F .00006	F 115.29
Stddev	.00015	.00127	.00020	.00046	.00009	.00000	.02
%RSD	167.88	1.8418	7.1105	.45397	.24420	.49299	.01360
#1	.00019	.07004	.00266	.10137	.03853	.00006	115.30
#2	-.00002	.06824	.00294	.10202	.03839	.00006	115.27
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
Value	.00300	.20000	.01000	.02000	.00200	.00200	.50000
Range	-50.000%	-50.000%	-50.000%	50.000%	50.000%	-50.000%	50.000%

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .00021	F .00076	F .00104	F .00115	F 2.9679	F .77122	F .89929
Stddev	.00002	.00014	.00031	.00006	.0160	.03902	.00405
%RSD	8.8707	18.218	29.714	5.4176	.53897	5.0591	.45014
#1	.00020	.00066	.00082	.00119	2.9792	.79881	.90216
#2	.00022	.00085	.00126	.00111	2.9566	.74363	.89643
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
Value	.00100	.00400	.00400	.01000	.05000	.50000	.50000
Range	-50.000%	-50.000%	-50.000%	-50.000%	50.000%	50.000%	50.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F .00624	F 14.955	F 1.7674	F 1.7421	F .00100	F 55.998	F .00072
Stddev	.00022	.037	.0062	.0116	.00022	.071	.00036
%RSD	3.4555	.24667	.35113	.66752	22.106	.12749	50.360
#1	.00609	14.981	1.7718	1.7503	.00084	55.947	.00097
#2	.00639	14.929	1.7630	1.7339	.00115	56.048	.00046
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
Value	.03000	.20000	.00300	.00300	.01000	1.0000	.01000
Range	-50.000%	50.000%	50.000%	50.000%	-50.000%	50.000%	-50.000%

Sample Name: 480-49691-B-2-A Acquired: 11/15/2013 15:27:59 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F -.00151	F 8.187	F -.00177	F .00363	F 7.2258	F .00035	F .47410
Stddev	.00108	.023	.00134	.00086	.0133	.00026	.00084
%RSD	71.716	.2809	75.833	23.650	.18438	74.978	.17751
#1	-.00074	8.203	-.00082	.00424	7.2352	.00016	.47350
#2	-.00227	8.170	-.00272	.00303	7.2163	.00053	.47469
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
Value	.00500	.2000	.02000	.01500	.50000	.01000	.00500
Range	-50.000%	50.00%	-50.000%	-50.000%	50.000%	-50.000%	50.000%

Elem	Ti3349	TI1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	F .00160	F .00404	F .00030	F .00069
Stddev	.00015	.00148	.00020	.00038
%RSD	9.4927	36.654	69.382	54.235
#1	.00171	.00508	.00044	.00096
#2	.00150	.00299	.00015	.00043
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail
Value	.00500	.02000	.00500	.01000
Range	-50.000%	-50.000%	-50.000%	-50.000%

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3180.4	4855.1	71902.	6945.9
Stddev	5.3	6.7	266.	13.8
%RSD	.16794	.13829	.37007	.19873
#1	3184.2	4859.8	71714.	6955.7
#2	3176.7	4850.3	72091.	6936.1

Sample Name: CCVL Acquired: 11/15/2013 15:30:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00260**	**.22431**	**.01383**	**.02351**	**.00222**
Stddev	.00017	.01092	.00346	.00064	.00001
%RSD	6.4151	4.8691	25.005	2.7031	.54298
#1	.00248	.21659	.01627	.02306	.00223
#2	.00272	.23203	.01138	.02396	.00221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00210**	**.48337**	**.00104**	**.00409**	**.00370**
Stddev	.00012	.00165	.00007	.00010	.00023
%RSD	5.5186	.34210	6.7796	2.3770	6.1752
#1	.00218	.48220	.00099	.00402	.00354
#2	.00201	.48454	.00109	.00416	.00386
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01016**	**.04632**	**.52624**	**.42810**	**.02875**
Stddev	.00005	.00300	.04538	.00200	.00033
%RSD	.48651	6.4758	8.6230	.46616	1.1542
#1	.01012	.04420	.49416	.42669	.02898
#2	.01019	.04844	.55833	.42951	.02851
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: CCVL Acquired: 11/15/2013 15:30:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20468**	**.00334**	**.00330**	**.00991**	**.96349**
Stddev	.00073	.00000	.00040	.00003	.00612
%RSD	.35821	.14283	12.079	.29468	.63488
#1	.20416	.00334	.00358	.00989	.96781
#2	.20520	.00334	.00302	.00993	.95916
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00987**	**.00485**	**.2099**	**.02009**	**.01551**
Stddev	.00006	.00178	.0019	.00010	.00239
%RSD	.58907	36.791	.9008	.51743	15.387
#1	.00982	.00611	.2113	.02016	.01719
#2	.00991	.00359	.2086	.02001	.01382
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.46135**	**.01000**	**.00508**	**.00469**	**.02286**
Stddev	.00070	.00028	.00009	.00032	.00133
%RSD	.15124	2.8212	1.7189	6.8511	5.8250
#1	.46085	.01020	.00514	.00446	.02380
#2	.46184	.00980	.00501	.00492	.02192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: CCVL Acquired: 11/15/2013 15:30:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00501	.01062
Stddev	.00004	.00009
%RSD	.75065	.81374
#1	.00498	.01056
#2	.00504	.01068
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3442.2	5166.5	77086.	7003.9
Stddev	2.7	19.2	187.	50.4
%RSD	.07778	.37107	.24267	.71935
#1	3444.1	5180.1	77219.	7039.6
#2	3440.3	5152.9	76954.	6968.3

Sample Name: 480-49691-b-3-a Acquired: 11/15/2013 15:32:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**.03649**	**.00367**	**.03801**	**.08314**
Stddev	.00014	.00778	.00047	.00025	.00000
%RSD	63.001	21.310	12.746	.66339	.00584
#1	-.00012	.03099	.00334	.03819	.08313
#2	-.00032	.04199	.00400	.03783	.08314
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**108.54**	**.00024**	**.00003**	**.00032**
Stddev	.00008	.72	.00005	.00010	.00044
%RSD	43.256	.66549	19.899	319.20	138.46
#1	.00012	108.03	.00028	.00010	.00063
#2	.00023	109.05	.00021	-.00004	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00102**	**2.4500**	**2.5834**	**3.3462**	**.00480**
Stddev	.00012	.0128	.0574	.0315	.00013
%RSD	11.656	.52108	2.2232	.94271	2.8073
#1	.00110	2.4410	2.5428	3.3239	.00471
#2	.00094	2.4591	2.6240	3.3685	.00490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-3-a Acquired: 11/15/2013 15:32:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.123**	**.28151**	**.27616**	**.01358**	**67.899**
Stddev	.047	.00046	.00180	.00006	.137
%RSD	.33222	.16420	.65263	.41752	.20246
#1	14.157	.28184	.27743	.01354	67.802
#2	14.090	.28119	.27488	.01362	67.996
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00072**	**.00044**	**6.004**	**-.00065**	**.00179**
Stddev	.00059	.00053	.019	.00152	.00153
%RSD	81.874	119.41	.3167	232.94	85.407
#1	.00113	.00007	5.991	-.00173	.00071
#2	.00030	.00081	6.017	.00042	.00286
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.9405**	**-.00012**	**.43699**	**.00107**	**.00248**
Stddev	.0279	.00016	.00301	.00032	.00174
%RSD	.40168	139.49	.68926	29.880	70.067
#1	6.9208	-.00000	.43486	.00084	.00125
#2	6.9602	-.00023	.43912	.00129	.00371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-3-a Acquired: 11/15/2013 15:32:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00017	.00021
Stddev	.00011	.00016
%RSD	61.756	75.870
#1	.00010	.00010
#2	.00025	.00032
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3173.1	4845.9	71092.	6882.9
Stddev	2.8	6.1	179.	42.4
%RSD	.08951	.12515	.25109	.61545
#1	3175.1	4850.2	70966.	6912.9
#2	3171.1	4841.6	71218.	6853.0

Sample Name: 480-49691-b-4-a Acquired: 11/15/2013 15:35:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**.17901**	**.00425**	**.06168**	**.04471**
Stddev	.00098	.03204	.00423	.00037	.00011
%RSD	732.35	17.900	99.684	.60598	.23745
#1	-.00083	.15635	.00125	.06141	.04464
#2	.00056	.20167	.00724	.06194	.04479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**111.53**	**.00087**	**.00147**	**.00098**
Stddev	.00001	.74	.00003	.00018	.00038
%RSD	7.4837	.66418	3.3539	12.549	38.743
#1	.00012	112.06	.00089	.00161	.00124
#2	.00011	111.01	.00085	.00134	.00071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00204**	**1.9841**	**.75192**	**.91773**	**.00541**
Stddev	.00008	.0151	.00355	.00310	.00074
%RSD	3.8471	.76011	.47177	.33798	13.675
#1	.00209	1.9948	.74941	.91553	.00489
#2	.00198	1.9734	.75442	.91992	.00594
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-4-a Acquired: 11/15/2013 15:35:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.656**	**2.4883**	**2.4576**	**.00099**	**58.577**
Stddev	.010	.0055	.0033	.00010	.140
%RSD	.07013	.22025	.13478	10.321	.23907
#1	14.664	2.4921	2.4600	.00091	58.676
#2	14.649	2.4844	2.4553	.00106	58.478
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00252**	**-.00238**	**8.426**	**-.00144**	**.00092**
Stddev	.00027	.00065	.008	.00004	.00073
%RSD	10.857	27.171	.0897	3.0530	79.090
#1	.00233	-.00284	8.431	-.00147	.00040
#2	.00271	-.00193	8.420	-.00141	.00143
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.8497**	**-.00017**	**.46457**	**.00339**	**.00596**
Stddev	.0670	.00035	.00085	.00046	.00195
%RSD	.85419	204.31	.18391	13.522	32.661
#1	7.8971	.00008	.46517	.00371	.00458
#2	7.8023	-.00041	.46396	.00306	.00733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-4-a Acquired: 11/15/2013 15:35:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00070**	**.00536**
Stddev	.00012	.00007
%RSD	17.122	1.3929
#1	.00078	.00531
#2	.00061	.00542
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3181.1**	**4845.6**	**71739.**	**6921.8**
Stddev	2.5	1.2	206.	41.1
%RSD	.07876	.02472	.28662	.59372
#1	3182.9	4846.5	71593.	6892.7
#2	3179.3	4844.8	71884.	6950.8

Sample Name: 480-49691-b-5-a Acquired: 11/15/2013 15:37:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.04854**	**.00439**	**.01938**	**.09070**
Stddev	.00028	.02115	.00321	.00037	.00020
%RSD	67.519	43.578	73.017	1.8995	.22214
#1	-.00022	.03359	.00666	.01964	.09085
#2	-.00062	.06350	.00212	.01912	.09056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**93.934**	**.00020**	**-.00003**	**-.00016**
Stddev	.00004	.325	.00012	.00012	.00005
%RSD	105.02	.34579	60.726	404.84	28.260
#1	.00006	93.705	.00028	-.00011	-.00013
#2	.00001	94.164	.00011	.00006	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**1.0153**	**2.3182**	**2.9390**	**.00365**
Stddev	.00036	.0100	.0051	.0031	.00110
%RSD	38.212	.98234	.21830	.10569	30.249
#1	.00118	1.0083	2.3218	2.9368	.00287
#2	.00068	1.0224	2.3147	2.9412	.00443
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-5-a Acquired: 11/15/2013 15:37:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.927**	**.13206**	**.12900**	**.00819**	**65.786**
Stddev	.011	.00039	.00053	.00015	.156
%RSD	.07394	.29223	.40833	1.8907	.23727
#1	14.935	.13233	.12863	.00830	65.676
#2	14.919	.13179	.12937	.00808	65.897
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00075**	**-.00153**	**7.545**	**-.00127**	**.00012**
Stddev	.00044	.00163	.007	.00022	.00263
%RSD	58.304	106.87	.0917	17.000	2277.6
#1	.00107	-.00037	7.550	-.00143	.00197
#2	.00044	-.00268	7.540	-.00112	-.00174
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.0551**	**.00017**	**.34223**	**.00088**	**.00377**
Stddev	.0228	.00011	.00065	.00021	.00162
%RSD	.37730	66.876	.19053	24.285	42.807
#1	6.0390	.00009	.34177	.00103	.00263
#2	6.0713	.00025	.34269	.00073	.00492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-5-a Acquired: 11/15/2013 15:37:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00004**	**.00021**
Stddev	.00025	.00024
%RSD	649.91	109.88
#1	.00014	.00005
#2	-.00021	.00038
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3183.4**	**4844.1**	**72188.**	**6953.8**
Stddev	4.7	6.0	198.	17.7
%RSD	.14843	.12360	.27478	.25522
#1	3186.8	4848.4	72048.	6966.3
#2	3180.1	4839.9	72329.	6941.2

Sample Name: 480-49691-b-6-a Acquired: 11/15/2013 15:39:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.09170**	**.00055**	**.17776**	**.05122**
Stddev	.00025	.01869	.00077	.00040	.00001
%RSD	303.82	20.376	139.80	.22719	.01853
#1	-.00026	.10492	.00110	.17747	.05122
#2	.00010	.07849	.00001	.17804	.05121
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**97.907**	**.00029**	**-.00000**	**-.00009**
Stddev	.00001	.178	.00001	.00004	.00016
%RSD	21.810	.18146	1.9483	1044.2	174.18
#1	.00005	97.782	.00030	.00003	-.00021
#2	.00007	98.033	.00029	-.00003	.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00101**	**4.8126**	**.53577**	**.60445**	**.03010**
Stddev	.00010	.0141	.01890	.00507	.00075
%RSD	10.306	.29376	3.5277	.83925	2.4847
#1	.00094	4.8226	.52240	.60086	.02958
#2	.00109	4.8026	.54913	.60804	.03063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-6-a Acquired: 11/15/2013 15:39:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.112**	**.09672**	**.09261**	**.01536**	**34.126**
Stddev	.050	.00013	.00044	.00021	.330
%RSD	.41301	.13794	.47902	1.3960	.96660
#1	12.147	.09682	.09230	.01521	33.892
#2	12.077	.09663	.09293	.01551	34.359
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	**-.00042**	F **51.29**	**-.00076**	**-.00077**
Stddev	.00046	.00028	.05	.00125	.00120
%RSD	109.26	66.609	.1060	163.56	156.07
#1	.00010	-.00062	51.25	-.00164	.00008
#2	.00075	-.00022	51.33	.00012	-.00161
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.5928**	**.00040**	**.41383**	**.00205**	**.00262**
Stddev	.0706	.00067	.00163	.00011	.00065
%RSD	.82189	166.19	.39480	5.5731	24.907
#1	8.5428	-.00007	.41268	.00197	.00216
#2	8.6427	.00088	.41499	.00214	.00309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-6-a Acquired: 11/15/2013 15:39:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00041	.00306
Stddev	.00013	.00004
%RSD	32.289	1.4433
#1	.00050	.00303
#2	.00031	.00309
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3226.9	4871.4	72093.	6898.7
Stddev	2.4	9.3	149.	5.5
%RSD	.07398	.19078	.20736	.08034
#1	3228.5	4878.0	71988.	6902.6
#2	3225.2	4864.9	72199.	6894.8

Sample Name: 480-49691-b-7-a Acquired: 11/15/2013 15:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00066**	**.06179**	**.00148**	**.11128**	**.15827**
Stddev	.00037	.02125	.00286	.00116	.00026
%RSD	55.558	34.392	193.17	1.0434	.16549
#1	-.00040	.04676	.00350	.11211	.15809
#2	-.00092	.07682	-.00054	.11046	.15846
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**97.199**	**.00020**	**-.00009**	**.00037**
Stddev	.00008	.414	.00002	.00020	.00016
%RSD	80.207	.42574	9.4809	228.44	42.523
#1	.00005	97.492	.00021	-.00022	.00026
#2	.00016	96.907	.00018	.00005	.00049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00088**	**17.478**	**1.0241**	**1.1934**	**.01160**
Stddev	.00007	.062	.0016	.0001	.00041
%RSD	7.8053	.35537	.15348	.00845	3.5622
#1	.00083	17.434	1.0252	1.1933	.01131
#2	.00093	17.522	1.0230	1.1934	.01189
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-7-a Acquired: 11/15/2013 15:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.389**	**1.3240**	**1.2913**	**-.00001**	**31.238**
Stddev	.010	.0002	.0118	.00017	.142
%RSD	.06200	.01193	.91363	1988.6	.45570
#1	15.383	1.3241	1.2830	-.00012	31.339
#2	15.396	1.3239	1.2997	.00011	31.138
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00078**	**-.00007**	**7.024**	**-.00062**	**.00192**
Stddev	.00105	.00082	.010	.00077	.00157
%RSD	133.44	1099.7	.1427	124.89	81.850
#1	.00004	.00051	7.031	-.00007	.00081
#2	.00152	-.00066	7.017	-.00117	.00302
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.209**	**.00075**	**.35844**	**.00103**	**.00185**
Stddev	.018	.00031	.00272	.00011	.00218
%RSD	.17175	41.800	.75764	11.003	117.93
#1	10.222	.00053	.36036	.00111	.00031
#2	10.197	.00097	.35652	.00095	.00340
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-7-a Acquired: 11/15/2013 15:42:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00027	.00067
Stddev	.00015	.00022
%RSD	55.108	33.177
#1	.00016	.00051
#2	.00037	.00083
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3211.6	4905.5	72846.	6948.5
Stddev	4.4	3.1	242.	7.4
%RSD	.13585	.06372	.33256	.10620
#1	3214.7	4903.3	73017.	6943.3
#2	3208.5	4907.7	72675.	6953.8

Sample Name: 480-49691-b-8-a Acquired: 11/15/2013 15:44:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**.02704**	**.01261**	**.56228**	**.01867**
Stddev	.00027	.01198	.00013	.00193	.00001
%RSD	84.178	44.310	1.0037	.34286	.04778
#1	.00051	.03552	.01252	.56091	.01866
#2	.00013	.01857	.01269	.56364	.01867
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**244.23**	**.00027**	**-.00004**	**.00016**
Stddev	.00004	1.66	.00010	.00008	.00012
%RSD	37.534	.67900	37.377	210.05	74.532
#1	.00008	245.40	.00020	.00002	.00008
#2	.00013	243.06	.00034	-.00009	.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00114**	**14.116**	**2.1666**	**2.9500**	**.10072**
Stddev	.00017	.080	.0177	.0029	.00057
%RSD	14.987	.57005	.81511	.09763	.56626
#1	.00102	14.173	2.1791	2.9480	.10112
#2	.00126	14.059	2.1542	2.9520	.10031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-8-a Acquired: 11/15/2013 15:44:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**67.480**	**.30302**	**.30006**	**.00256**	**43.405**
Stddev	.199	.00139	.00026	.00000	.426
%RSD	.29519	.45842	.08664	.10809	.98174
#1	67.621	.30400	.29988	.00256	43.706
#2	67.339	.30203	.30025	.00256	43.104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00028**	**-.00168**	F **221.5**	**-.00089**	**.00001**
Stddev	.00043	.00238	.7	.00079	.00531
%RSD	152.95	141.74	.3096	88.560	93377.
#1	-.00002	.00000	221.1	-.00144	-.00375
#2	.00058	-.00337	222.0	-.00033	.00376
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.432**	**-.00006**	**1.5743**	**.00145**	**.00339**
Stddev	.082	.00014	.0091	.00047	.00176
%RSD	.65665	233.20	.57476	32.474	51.966
#1	12.489	-.00016	1.5806	.00178	.00215
#2	12.374	.00004	1.5679	.00111	.00464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-8-a Acquired: 11/15/2013 15:44:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00028**	**.00223**
Stddev	.00022	.00074
%RSD	78.973	33.001
#1	-.00044	.00275
#2	-.00013	.00171
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3047.5**	**4694.4**	**69317.**	**6831.1**
Stddev	7.6	14.6	191.	20.9
%RSD	.24841	.31200	.27617	.30620
#1	3052.9	4704.7	69182.	6816.3
#2	3042.1	4684.0	69452.	6845.9

Sample Name: 480-49691-b-9-a Acquired: 11/15/2013 15:46:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00029**	**.03879**	**.00226**	**.23254**	**.05058**
Stddev	.00034	.01236	.00053	.00033	.00002
%RSD	118.88	31.871	23.602	.14170	.03771
#1	-.00053	.03005	.00188	.23230	.05060
#2	-.00005	.04754	.00264	.23277	.05057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**80.674**	**.00021**	**.00008**	**.00022**
Stddev	.00004	.098	.00009	.00003	.00026
%RSD	32.049	.12110	44.855	37.439	122.09
#1	.00008	80.605	.00028	.00006	.00040
#2	.00013	80.743	.00014	.00010	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00111**	**.92212**	**1.3069**	**1.5767**	**.00790**
Stddev	.00030	.00257	.0116	.0037	.00032
%RSD	27.215	.27915	.88552	.23559	3.9977
#1	.00090	.92030	1.2987	1.5794	.00812
#2	.00133	.92394	1.3150	1.5741	.00767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-9-a Acquired: 11/15/2013 15:46:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.949**	**.16353**	**.15784**	**.00610**	**39.179**
Stddev	.021	.00037	.00021	.00030	.043
%RSD	.17660	.22917	.13109	4.9708	.11002
#1	11.964	.16379	.15769	.00589	39.209
#2	11.934	.16326	.15798	.00632	39.148
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**-.00216**	F **26.96**	**-.00012**	**.00016**
Stddev	.00014	.00031	.05	.00110	.00186
%RSD	521.33	14.234	.1806	955.50	1139.6
#1	-.00007	-.00238	26.99	.00066	-.00115
#2	.00012	-.00194	26.92	-.00089	.00148
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.4049**	**-.00008**	**.34004**	**.00117**	**.00103**
Stddev	.0210	.00093	.00024	.00002	.00021
%RSD	.22336	1166.1	.07191	1.3487	20.723
#1	9.3900	-.00074	.33986	.00116	.00088
#2	9.4198	.00058	.34021	.00119	.00118
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49691-b-9-a Acquired: 11/15/2013 15:46:54 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00021	.00164
Stddev	.00024	.00032
%RSD	110.29	19.750
#1	.00038	.00141
#2	.00005	.00187
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3242.5	4909.7	71657.	6886.2
Stddev	3.0	10.2	14.	13.7
%RSD	.09151	.20849	.01907	.19840
#1	3240.4	4917.0	71667.	6895.9
#2	3244.6	4902.5	71648.	6876.5

Sample Name: mb 480-148518/17-b Acquired: 11/15/2013 15:49:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**.03283**	**.00256**	**.00422**	**.00006**
Stddev	.00045	.01335	.00192	.00042	.00002
%RSD	1042.9	40.671	74.975	10.027	34.397
#1	-.00036	.04227	.00392	.00392	.00004
#2	.00027	.02339	.00120	.00452	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.03645**	**.00007**	**-.00001**	**-.00036**
Stddev	.00002	.00211	.00004	.00013	.00002
%RSD	22.117	5.8010	60.659	1466.7	5.4313
#1	.00008	.03496	.00004	.00009	-.00038
#2	.00010	.03795	.00010	-.00010	-.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00037**	**-.00069**	**.02242**	**.00097**	**-.00063**
Stddev	.00000	.00622	.00028	.00002	.00057
%RSD	1.3293	904.68	1.2392	2.4712	89.322
#1	.00037	.00371	.02261	.00095	-.00104
#2	.00036	-.00508	.02222	.00098	-.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-148518/17-b Acquired: 11/15/2013 15:49:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00106**	**-.00007**	**-.00041**	**-.00027**	**.00788**
Stddev	.00202	.00000	.00035	.00003	.00039
%RSD	191.01	.56178	86.412	9.4102	4.9542
#1	-.00037	-.00007	-.00066	-.00026	.00761
#2	.00248	-.00007	-.00016	-.00029	.00816
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**.00035**	**.0130**	**-.00144**	**-.00157**
Stddev	.00019	.00138	.0004	.00081	.00073
%RSD	187.48	395.22	3.168	55.913	46.389
#1	-.00003	-.00063	.0133	-.00087	-.00106
#2	.00023	.00133	.0127	-.00201	-.00209
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01825**	**.00007**	**.00015**	**.00035**	**.00176**
Stddev	.01734	.00047	.00004	.00005	.00212
%RSD	95.001	673.79	26.887	15.204	120.28
#1	-.00599	.00041	.00012	.00039	.00326
#2	-.03051	-.00026	.00018	.00031	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-148518/17-b Acquired: 11/15/2013 15:49:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00009	.00107
Stddev	.00002	.00032
%RSD	27.812	29.380
#1	.00007	.00085
#2	.00011	.00129
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3435.2	5114.0	77041.	6927.1
Stddev	2.9	5.3	115.	15.4
%RSD	.08396	.10438	.14972	.22186
#1	3437.2	5117.8	76960.	6938.0
#2	3433.1	5110.2	77123.	6916.2

Sample Name: CCV Acquired: 11/15/2013 15:51:42 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51267**	**26.254**	**.52650**	**.51107**	**.52692**	**.51515**	**25.735**
Stddev	.00273	.133	.00076	.00017	.00164	.00148	.048
%RSD	.53218	.50788	.14398	.03267	.31146	.28817	.18585
#1	.51460	26.159	.52596	.51119	.52576	.51410	25.701
#2	.51074	26.348	.52704	.51096	.52808	.51620	25.769
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51133**	**.50694**	**.52262**	**.51901**	**25.181**	**26.444**	**26.793**
Stddev	.00016	.00074	.00558	.00280	.031	.126	.034
%RSD	.03217	.14689	1.0680	.53936	.12398	.47813	.12759
#1	.51145	.50747	.52657	.52099	25.204	26.354	26.817
#2	.51121	.50642	.51867	.51703	25.159	26.533	26.769
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52726**	**24.905**	**.51873**	**.49699**	**.51649**	**26.280**	**.51047**
Stddev	.00519	.119	.00240	.00332	.00101	.146	.00039
%RSD	.98522	.47759	.46285	.66883	.19466	.55655	.07724
#1	.52358	24.989	.52043	.49934	.51720	26.176	.51074
#2	.53093	24.821	.51703	.49463	.51578	26.383	.51019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 15:51:42 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51010	25.51	.52529	.51991	25.519	.51816	.52493
Stddev	.00031	.05	.00089	.00423	.123	.00010	.00302
%RSD	.06152	.1885	.17020	.81296	.48029	.01920	.57588
#1	.51033	25.47	.52466	.52290	25.432	.51823	.52279
#2	.50988	25.54	.52592	.51693	25.606	.51809	.52706
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51775	.51497	.51735	.51152
Stddev	.00048	.00003	.00421	.00453
%RSD	.09314	.00660	.81429	.88574
#1	.51741	.51494	.52033	.51473
#2	.51810	.51499	.51437	.50832
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3235.4	5009.6	73208.	6802.1
Stddev	6.7	10.8	471.	15.3
%RSD	.20560	.21460	.64291	.22470
#1	3230.7	5002.0	72875.	6812.9
#2	3240.1	5017.2	73541.	6791.3

Sample Name: CCB Acquired: 11/15/2013 15:54:04 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00081**	**.03684**	**.00223**	**.00106**	**-.00000**	**.00010**	**-.01776**
Stddev	.00057	.00059	.00139	.00023	.00000	.00008	.00553
%RSD	70.288	1.5898	62.076	21.944	275.97	77.368	31.136
#1	-.00122	.03643	.00321	.00090	-.00000	.00016	-.02167
#2	-.00041	.03725	.00125	.00123	.00000	.00005	-.01385
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**-.00010**	**-.00032**	**.00024**	**-.00404**	**-.00068**	**.00097**
Stddev	.00008	.00000	.00000	.00004	.00172	.01682	.00001
%RSD	74.225	2.0263	.03081	15.711	42.461	2464.0	.82400
#1	.00005	-.00010	-.00032	.00021	-.00283	.01121	.00097
#2	.00017	-.00010	-.00032	.00026	-.00526	-.01257	.00098
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00115**	**-.00258**	**-.00001**	**.00045**	**-.00003**	**.00537**	**-.00037**
Stddev	.00121	.00226	.00003	.00040	.00020	.01200	.00026
%RSD	105.06	87.748	513.11	90.213	697.68	223.24	71.861
#1	-.00029	-.00418	-.00003	.00073	.00011	.01386	-.00018
#2	-.00200	-.00098	.00002	.00016	-.00017	-.00311	-.00055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 15:54:04 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00043	F .0062	.00020	-.00018	.00178	.00034	-.00017
Stddev	.00091	.0014	.00046	.00175	.00241	.00011	.00004
%RSD	213.22	22.36	234.40	990.54	135.67	33.398	24.049
#1	-.00022	.0072	-.00013	.00106	.00348	.00042	-.00014
#2	.00107	.0052	.00052	-.00141	.00007	.00026	-.00019
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00028	.00157	-.00019	-.00015
Stddev	.00032	.00066	.00017	.00052
%RSD	112.23	42.034	93.003	346.02
#1	.00051	.00110	-.00006	-.00052
#2	.00006	.00204	-.00031	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3434.7	5130.8	76782.	6900.8
Stddev	.8	6.8	150.	5.5
%RSD	.02442	.13223	.19565	.07966
#1	3435.3	5135.6	76888.	6904.7
#2	3434.1	5126.1	76675.	6897.0

Sample Name: CCVL Acquired: 11/15/2013 15:56:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00256**	**.21146**	**.01169**	**.02072**	**.00221**	**.00206**	**.48735**
Stddev	.00049	.03899	.00178	.00016	.00000	.00017	.00171
%RSD	19.270	18.438	15.193	.77022	.21272	8.1430	.35117
#1	.00291	.18389	.01294	.02061	.00221	.00194	.48856
#2	.00221	.23903	.01043	.02084	.00222	.00217	.48614
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00087**	**.00400**	**.00376**	**.00989**	**.04299**	**.45389**	**.42515**
Stddev	.00007	.00017	.00009	.00033	.00133	.01017	.00320
%RSD	8.5850	4.1671	2.4377	3.3758	3.0873	2.2401	.75359
#1	.00082	.00389	.00382	.01013	.04205	.46108	.42288
#2	.00092	.00412	.00369	.00966	.04392	.44670	.42741
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02859**	**.21012**	F **.00468**	**.00362**	**.00950**	**.95016**	**.01031**
Stddev	.00064	.00060	.00002	.00016	.00008	.01728	.00007
%RSD	2.2453	.28420	.34753	4.3172	.87651	1.8185	.63261
#1	.02814	.20970	.00467	.00351	.00956	.93794	.01026
#2	.02904	.21054	.00469	.00373	.00944	.96238	.01035
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.00300				
Range			50.000%				

Sample Name: CCVL Acquired: 11/15/2013 15:56:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00424	.2076	.02008	.01467	.46701	.00980	.00503
Stddev	.00018	.0005	.00074	.00303	.02244	.00063	.00004
%RSD	4.1954	.2291	3.6955	20.620	4.8050	6.4625	.86779
#1	.00437	.2072	.01955	.01681	.45114	.00935	.00500
#2	.00412	.2079	.02060	.01253	.48287	.01024	.00506
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00519	.02216	.00484	.01041
Stddev	.00013	.00016	.00028	.00058
%RSD	2.5317	.73484	5.7090	5.5718
#1	.00509	.02228	.00504	.01082
#2	.00528	.02205	.00465	.01000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3453.9	5182.9	77419.	7029.3
Stddev	9.6	11.9	54.	33.5
%RSD	.27799	.22904	.06999	.47673
#1	3460.7	5191.3	77458.	7053.0
#2	3447.1	5174.5	77381.	7005.6

Sample Name: lcs 480-148518/18-b Acquired: 11/15/2013 15:58:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04997**	**10.626**	F **.00426**	**.21145**	**.21852**
Stddev	.00084	.074	.00005	.00045	.00050
%RSD	1.6749	.70073	1.1098	.21366	.23030
#1	.05056	10.573	.00423	.21113	.21816
#2	.04938	10.678	.00430	.21176	.21887
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			.23000		
Low Limit			.17000		

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.00007**	F **.03065**	F **.00009**	F **-.00011**	F **-.00009**
Stddev	.00001	.00197	.00004	.00003	.00010
%RSD	17.519	6.4358	45.428	28.867	102.11
#1	.00008	.03205	.00006	-.00009	-.00003
#2	.00007	.02926	.00012	-.00013	-.00016
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Fail
High Limit	.23000	11.500	.23000	.23000	.23000
Low Limit	.17000	8.5000	.17000	.17000	.17000

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **.00062**	F **-.00158**	**10.321**	**9.9965**	**.21078**
Stddev	.00024	.00775	.034	.1263	.00056
%RSD	37.977	489.29	.33159	1.2630	.26388
#1	.00046	-.00706	10.296	9.9073	.21038
#2	.00079	.00390	10.345	10.086	.21117
Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit	.23000	11.500			
Low Limit	.17000	8.5000			

Sample Name: lcs 480-148518/18-b Acquired: 11/15/2013 15:58:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **-.00241**	F **-.00006**	F **.00002**	F **-.00024**	**10.362**
Stddev	.00301	.00001	.00020	.00007	.026
%RSD	124.96	17.607	829.47	28.291	.24934
#1	-.00454	-.00005	-.00012	-.00019	10.344
#2	-.00028	-.00007	.00017	-.00029	10.381
Check ?	Chk Fail	Chk Fail	Chk Fail	Chk Fail	Chk Pass
High Limit	11.500	.23000	.23000	.23000	
Low Limit	8.5000	.17000	.17000	.17000	

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	F **-.00029**	F **-.00502**	**9.814**	F **-.00046**	F **-.00313**
Stddev	.00018	.00031	.031	.00188	.00266
%RSD	59.592	6.1803	.3142	412.24	85.089
#1	-.00042	-.00524	9.793	-.00178	-.00125
#2	-.00017	-.00480	9.836	.00087	-.00501
Check ?	Chk Fail	Chk Fail	Chk Pass	Chk Fail	Chk Fail
High Limit	.23000	.23000		.23000	.23000
Low Limit	.17000	.17000		.17000	.17000

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.203**	**.19868**	**.21263**	F **.00029**	F **.00475**
Stddev	.004	.00004	.00005	.00011	.00128
%RSD	.03833	.02010	.02222	37.746	26.824
#1	10.206	.19871	.21266	.00021	.00566
#2	10.200	.19865	.21260	.00037	.00385
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Fail
High Limit				.23000	.23000
Low Limit				.17000	.17000

Sample Name: lcs 480-148518/18-b Acquired: 11/15/2013 15:58:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	F .00001	F .00031
Stddev	.00016	.00012
%RSD	2152.5	37.526
#1	-.00011	.00039
#2	.00012	.00023
Check ?	Chk Fail	Chk Fail
High Limit	.23000	.23000
Low Limit	.17000	.17000

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3387.5	5092.3	75385.	6883.4
Stddev	3.3	14.1	84.	3.5
%RSD	.09615	.27648	.11171	.05129
#1	3389.8	5102.3	75445.	6885.9
#2	3385.2	5082.3	75326.	6880.9

Sample Name: 480-49217-b-3-a Acquired: 11/15/2013 16:01:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00027**	**.06632**	**.01708**	**.08071**	**.17184**
Stddev	.00016	.00765	.00271	.00003	.00039
%RSD	60.980	11.537	15.893	.03645	.22554
#1	-.00015	.06091	.01900	.08069	.17211
#2	-.00038	.07173	.01516	.08073	.17156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**96.768**	**.00017**	**.00050**	**.00030**
Stddev	.00011	.182	.00003	.00004	.00044
%RSD	125.99	.18825	19.440	8.8984	146.59
#1	.00017	96.897	.00020	.00047	-.00001
#2	.00001	96.639	.00015	.00053	.00061
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00133**	**2.4827**	**8.0795**	**9.3101**	**.00421**
Stddev	.00025	.0156	.0283	.0136	.00007
%RSD	18.725	.62804	.34998	.14608	1.6884
#1	.00151	2.4937	8.0995	9.3197	.00416
#2	.00115	2.4717	8.0595	9.3005	.00426
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-3-a Acquired: 11/15/2013 16:01:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**39.546**	**.25820**	**.25057**	**.00095**	**21.594**
Stddev	.023	.00015	.00177	.00038	.099
%RSD	.05779	.05790	.70440	40.055	.46022
#1	39.530	.25830	.24933	.00122	21.664
#2	39.563	.25809	.25182	.00068	21.524
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00194**	**-.00279**	**3.914**	**-.00082**	**-.00037**
Stddev	.00024	.00043	.003	.00015	.00031
%RSD	12.151	15.493	.0654	18.145	84.524
#1	.00211	-.00249	3.916	-.00071	-.00059
#2	.00178	-.00310	3.912	-.00092	-.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.654**	**-.00054**	**.10372**	**.00038**	**.00224**
Stddev	.005	.00046	.00057	.00023	.00056
%RSD	.04324	84.610	.54548	59.567	24.970
#1	11.658	-.00086	.10412	.00054	.00185
#2	11.651	-.00022	.10332	.00022	.00264
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-3-a Acquired: 11/15/2013 16:01:24 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00022**	**.00407**
Stddev	.00038	.00031
%RSD	171.95	7.6264
#1	.00005	.00429
#2	-.00049	.00385
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3180.3**	**4859.4**	**72435.**	**6879.2**
Stddev	2.0	3.0	107.	10.1
%RSD	.06336	.06123	.14774	.14639
#1	3178.9	4857.3	72360.	6872.1
#2	3181.7	4861.5	72511.	6886.3

Sample Name: 480-49217-b-4-a Acquired: 11/15/2013 16:03:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00050**	**.10233**	**.00744**	**.09219**	**.16260**
Stddev	.00040	.00359	.00128	.00041	.00017
%RSD	79.848	3.5057	17.236	.44790	.10502
#1	-.00022	.09979	.00834	.09249	.16272
#2	-.00078	.10487	.00653	.09190	.16247
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**106.08**	**.00024**	**.00051**	**.00060**
Stddev	.00000	.20	.00007	.00016	.00010
%RSD	7.8062	.19181	28.180	30.187	16.549
#1	.00004	105.94	.00029	.00062	.00053
#2	.00004	106.22	.00019	.00040	.00068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00216**	**.55964**	**7.9495**	**9.2913**	**.00499**
Stddev	.00031	.00091	.0135	.0393	.00091
%RSD	14.253	.16262	.16959	.42332	18.155
#1	.00194	.56028	7.9590	9.3191	.00563
#2	.00238	.55900	7.9400	9.2634	.00435
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-4-a Acquired: 11/15/2013 16:03:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.792**	**.22152**	**.21606**	**.00030**	**24.482**
Stddev	.011	.00042	.00177	.00005	.079
%RSD	.02453	.18991	.81917	15.393	.32318
#1	43.800	.22122	.21731	.00027	24.426
#2	43.785	.22181	.21481	.00033	24.538
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00236**	**-.00261**	**2.450**	**-.00088**	**.00279**
Stddev	.00007	.00001	.009	.00014	.00251
%RSD	2.7894	.41318	.3567	15.787	89.936
#1	.00231	-.00261	2.456	-.00098	.00456
#2	.00241	-.00262	2.444	-.00079	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.198**	**.00061**	**.11115**	**.00065**	**.00280**
Stddev	.059	.00050	.00062	.00045	.00182
%RSD	.52239	81.666	.56024	70.497	65.162
#1	11.157	.00096	.11071	.00097	.00151
#2	11.239	.00026	.11159	.00032	.00409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-4-a Acquired: 11/15/2013 16:03:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00013**	**.00810**
Stddev	.00000	.00047
%RSD	3.3651	5.7623
#1	-.00013	.00843
#2	-.00013	.00777
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3165.7**	**4850.5**	**71533.**	**6866.2**
Stddev	4.4	1.3	41.	13.1
%RSD	.13856	.02585	.05684	.19121
#1	3168.8	4851.4	71505.	6875.5
#2	3162.6	4849.7	71562.	6856.9

Sample Name: 480-49217-b-5-a Acquired: 11/15/2013 16:06:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00093**	**.02285**	**.00420**	**.01484**	**.05982**
Stddev	.00009	.01898	.00149	.00031	.00007
%RSD	9.7928	83.077	35.372	2.1112	.11221
#1	-.00087	.00943	.00526	.01462	.05977
#2	-.00100	.03627	.00315	.01507	.05987
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**77.008**	**.00026**	**.00023**	**.00059**
Stddev	.00000	.521	.00005	.00002	.00007
%RSD	4.9666	.67635	17.912	8.5963	11.848
#1	.00009	77.376	.00023	.00025	.00064
#2	.00010	76.640	.00029	.00022	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00207**	**.00794**	**1.4637**	**1.6449**	**.00361**
Stddev	.00003	.00284	.0530	.0011	.00012
%RSD	1.2419	35.701	3.6240	.06866	3.2996
#1	.00209	.00995	1.5012	1.6457	.00370
#2	.00205	.00594	1.4262	1.6441	.00353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-a Acquired: 11/15/2013 16:06:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**38.063**	**.11031**	**.10648**	**.00014**	**9.9047**
Stddev	.066	.00025	.00073	.00047	.0218
%RSD	.17319	.22673	.68827	334.31	.21982
#1	38.110	.11048	.10596	-.00019	9.9201
#2	38.016	.11013	.10699	.00047	9.8893
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00141**	**-.00214**	**5.448**	**-.00074**	**.00054**
Stddev	.00000	.00050	.001	.00120	.00159
%RSD	.27630	23.280	.0193	161.84	293.90
#1	.00142	-.00250	5.448	-.00160	.00167
#2	.00141	-.00179	5.447	.00011	-.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.3230**	**.00012**	**.06055**	**.00053**	**.00044**
Stddev	.0253	.00021	.00031	.00036	.00030
%RSD	.34512	172.28	.50381	68.871	67.311
#1	7.3408	.00027	.06033	.00027	.00023
#2	7.3051	-.00003	.06076	.00079	.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-a Acquired: 11/15/2013 16:06:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00033**	**.00573**
Stddev	.00007	.00009
%RSD	20.580	1.5911
#1	.00028	.00579
#2	.00038	.00566
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3240.6**	**4918.4**	**72888.**	**6888.7**
Stddev	1.8	3.1	28.	30.8
%RSD	.05494	.06236	.03831	.44742
#1	3239.3	4916.3	72869.	6866.9
#2	3241.8	4920.6	72908.	6910.5

Sample Name: 480-49217-b-5-aSD@5 Acquired: 11/15/2013 16:08:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.00435**	**-.00002**	**.00282**	**.01223**
Stddev	.00031	.01189	.00049	.00020	.00003
%RSD	97.247	273.38	2860.8	7.0012	.27181
#1	-.00054	-.00406	.00033	.00296	.01220
#2	-.00010	.01276	-.00036	.00268	.01225
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**15.558**	**.00019**	**.00004**	**-.00018**
Stddev	.00005	.089	.00014	.00005	.00023
%RSD	33.410	.57507	76.288	112.57	125.66
#1	.00017	15.621	.00009	.00008	-.00034
#2	.00010	15.495	.00029	.00001	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00070**	**.00047**	**.29368**	**.25700**	**.00088**
Stddev	.00009	.00262	.04220	.00049	.00093
%RSD	13.359	564.24	14.370	.19140	105.75
#1	.00063	-.00139	.32352	.25665	.00022
#2	.00076	.00232	.26384	.25735	.00154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-aSD@5 Acquired: 11/15/2013 16:08:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.4928**	**.02241**	**.02061**	**-.00019**	**1.9062**
Stddev	.0065	.00013	.00114	.00046	.0063
%RSD	.08618	.58852	5.5439	242.60	.32798
#1	7.4973	.02250	.02142	.00014	1.9106
#2	7.4882	.02231	.01980	-.00052	1.9018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**-.00072**	**1.046**	**-.00015**	**-.00052**
Stddev	.00000	.00041	.004	.00200	.00194
%RSD	1.1788	57.485	.3925	1287.8	376.10
#1	.00031	-.00043	1.049	.00126	.00086
#2	.00031	-.00101	1.043	-.00157	-.00189
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4784**	**.00048**	**.01205**	**.00019**	**.00398**
Stddev	.0075	.00018	.00012	.00007	.00004
%RSD	.50822	37.569	.99352	38.127	.89795
#1	1.4731	.00060	.01213	.00014	.00401
#2	1.4837	.00035	.01196	.00024	.00396
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-aSD@5 Acquired: 11/15/2013 16:08:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.00060
Stddev	.00011	.00014
%RSD	1090.3	22.966
#1	.00009	.00050
#2	-.00007	.00070
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3385.1	5060.8	75038.	6855.8
Stddev	2.8	.3	17.	39.7
%RSD	.08407	.00638	.02283	.57975
#1	3387.1	5060.5	75050.	6827.7
#2	3383.1	5061.0	75026.	6883.9

Sample Name: 480-49217-b-5-a PDS Acquired: 11/15/2013 16:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05131	10.768	.21667	.22539	.27014
Stddev	.00043	.013	.00193	.00081	.00046
%RSD	.84091	.11793	.89255	.35910	.17021
#1	.05100	10.777	.21804	.22481	.26981
#2	.05161	10.759	.21530	.22596	.27046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21208	85.869	.20915	.20778	.20909
Stddev	.00095	.765	.00029	.00016	.00004
%RSD	.44906	.89053	.13687	.07786	.01698
#1	.21275	86.409	.20895	.20767	.20911
#2	.21141	85.328	.20935	.20789	.20906
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21178	10.350	12.278	13.793	.22326
Stddev	.00062	.065	.079	.135	.00121
%RSD	.29207	.62713	.63995	.97800	.54324
#1	.21134	10.396	12.222	13.888	.22240
#2	.21222	10.304	12.334	13.697	.22412
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-a PDS Acquired: 11/15/2013 16:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**47.264**	**.31020**	**.30024**	**.21641**	**20.553**
Stddev	.027	.00011	.00001	.00009	.140
%RSD	.05626	.03406	.00248	.03955	.68170
#1	47.283	.31013	.30023	.21647	20.454
#2	47.245	.31028	.30024	.21635	20.653
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20546**	**.21056**	**5.310**	**.20673**	**.21178**
Stddev	.00146	.00097	.011	.00087	.00326
%RSD	.71136	.46155	.2025	.42112	1.5383
#1	.20442	.20987	5.318	.20612	.20948
#2	.20649	.21124	5.302	.20735	.21408
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.452**	**.20236**	**.27072**	**.20107**	**.20807**
Stddev	.020	.00145	.00004	.00023	.00294
%RSD	.11399	.71650	.01312	.11476	1.4126
#1	17.438	.20133	.27069	.20124	.20599
#2	17.466	.20338	.27074	.20091	.21015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-a PDS Acquired: 11/15/2013 16:11:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21181	.20439
Stddev	.00011	.00012
%RSD	.05031	.05766
#1	.21189	.20431
#2	.21174	.20447
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3175.0	4935.5	73090.	6861.8
Stddev	.5	2.9	198.	48.9
%RSD	.01729	.05800	.27052	.71299
#1	3174.6	4937.5	73230.	6827.2
#2	3175.4	4933.5	72950.	6896.4

Sample Name: 480-49217-b-5-b ms Acquired: 11/15/2013 16:13:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05136**	**10.809**	**.00058**	**.22837**	**.27278**
Stddev	.00058	.003	.00116	.00028	.00070
%RSD	1.1302	.02336	202.03	.12178	.25649
#1	.05095	10.811	-.00025	.22857	.27327
#2	.05177	10.807	.00140	.22818	.27228
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**78.065**	**.00014**	**.00017**	**.00051**
Stddev	.00001	.418	.00005	.00001	.00034
%RSD	4.2981	.53503	37.323	5.2590	65.271
#1	.00015	78.360	.00018	.00016	.00028
#2	.00015	77.769	.00010	.00017	.00075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00183**	**.01167**	**12.283**	**13.802**	**.22542**
Stddev	.00022	.00342	.009	.129	.00023
%RSD	11.890	29.307	.07636	.93806	.10270
#1	.00198	.01409	12.277	13.710	.22525
#2	.00167	.00925	12.290	13.893	.22558
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-b ms Acquired: 11/15/2013 16:13:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**37.616**	**.10967**	**.10427**	**.00032**	**20.936**
Stddev	.019	.00009	.00057	.00007	.021
%RSD	.05104	.07785	.54820	23.130	.09869
#1	37.630	.10973	.10468	.00037	20.951
#2	37.603	.10961	.10387	.00027	20.921
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00089**	F **-.00596**	F **15.63**	**-.00234**	**-.00180**
Stddev	.00076	.00028	.00	.00017	.00213
%RSD	84.588	4.7062	.0065	7.3887	118.43
#1	.00036	-.00576	15.63	-.00222	-.00029
#2	.00143	-.00615	15.63	-.00246	-.00331
Check ?	Chk Pass	Chk Fail	Chk Fail	Chk Pass	Chk Pass
High Limit		120.00	10.00		
Low Limit		-.00500	-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.533**	**.20314**	**.27435**	**.00070**	**.00357**
Stddev	.010	.00055	.00111	.00051	.00071
%RSD	.05611	.27133	.40487	73.200	19.800
#1	17.540	.20275	.27513	.00034	.00307
#2	17.526	.20353	.27356	.00105	.00407
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-b ms Acquired: 11/15/2013 16:13:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00024**	**.00556**
Stddev	.00005	.00017
%RSD	18.861	3.0488
#1	.00021	.00568
#2	.00027	.00544
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3186.9**	**4935.8**	**73388.**	**6863.6**
Stddev	7.3	3.9	68.	28.0
%RSD	.22976	.07965	.09208	.40822
#1	3192.1	4938.6	73340.	6843.8
#2	3181.8	4933.1	73436.	6883.4

Sample Name: 480-49217-b-5-c msd Acquired: 11/15/2013 16:15:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04949**	**10.716**	**.00280**	**.22657**	**.27068**
Stddev	.00037	.028	.00127	.00043	.00039
%RSD	.74252	.25731	45.362	.18975	.14318
#1	.04923	10.696	.00370	.22627	.27040
#2	.04975	10.735	.00190	.22687	.27095
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**76.895**	**.00025**	**.00005**	**.00047**
Stddev	.00003	.069	.00002	.00017	.00044
%RSD	30.963	.08982	6.8653	341.51	93.422
#1	.00012	76.944	.00023	-.00007	.00079
#2	.00008	76.846	.00026	.00017	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00168**	**.00923**	**12.149**	**13.730**	**.22124**
Stddev	.00000	.00273	.000	.140	.00131
%RSD	.15603	29.558	.00267	1.0187	.59024
#1	.00167	.00730	12.150	13.829	.22032
#2	.00168	.01116	12.149	13.631	.22217
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-c msd Acquired: 11/15/2013 16:15:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**37.113**	**.10787**	**.10357**	**.00006**	**20.520**
Stddev	.037	.00056	.00136	.00026	.045
%RSD	.09864	.51688	1.3095	434.25	.21850
#1	37.087	.10826	.10453	.00024	20.551
#2	37.139	.10747	.10261	-.00012	20.488
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00190**	**-.00447**	F **15.50**	**-.00244**	**.00091**
Stddev	.00016	.00009	.02	.00063	.00308
%RSD	8.2051	2.0860	.1315	25.977	337.21
#1	.00202	-.00454	15.52	-.00288	-.00127
#2	.00179	-.00440	15.49	-.00199	.00309
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.374**	**.20174**	**.27047**	**.00053**	**.00418**
Stddev	.035	.00129	.00008	.00018	.00163
%RSD	.20079	.63731	.02796	33.741	38.969
#1	17.349	.20265	.27042	.00040	.00303
#2	17.398	.20083	.27052	.00066	.00533
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-5-c msd Acquired: 11/15/2013 16:15:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00017	.00529
Stddev	.00002	.00014
%RSD	14.278	2.6346
#1	.00018	.00519
#2	.00015	.00538
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3186.1	4938.7	73708.	6848.0
Stddev	6.9	6.7	34.	6.7
%RSD	.21658	.13603	.04635	.09853
#1	3191.0	4943.5	73732.	6852.8
#2	3181.2	4934.0	73684.	6843.3

Sample Name: 480-49217-b-6-a Acquired: 11/15/2013 16:18:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00043**	**.01947**	**.00239**	**.02320**	**.07392**
Stddev	.00008	.03963	.00057	.00045	.00005
%RSD	18.992	203.49	23.714	1.9275	.07439
#1	-.00037	-.00855	.00199	.02352	.07396
#2	-.00049	.04749	.00279	.02288	.07388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**77.795**	**.00039**	**.00032**	**.00062**
Stddev	.00011	.022	.00009	.00009	.00003
%RSD	148.88	.02767	23.116	27.412	4.4020
#1	-.00000	77.780	.00045	.00039	.00060
#2	.00015	77.810	.00033	.00026	.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00155**	**.03622**	**2.8237**	**3.3369**	**.00515**
Stddev	.00021	.00248	.0220	.0069	.00082
%RSD	13.739	6.8479	.77815	.20744	15.869
#1	.00140	.03446	2.8081	3.3320	.00457
#2	.00170	.03797	2.8392	3.3418	.00573
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-6-a Acquired: 11/15/2013 16:18:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.761**	**.07324**	**.06910**	**.00104**	**23.353**
Stddev	.051	.00051	.00263	.00003	.064
%RSD	.11704	.69814	3.8084	3.2355	.27564
#1	43.725	.07288	.07096	.00107	23.308
#2	43.797	.07360	.06724	.00102	23.399
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00206**	**-.00179**	**9.507**	**-.00041**	**.00110**
Stddev	.00036	.00120	.016	.00196	.00408
%RSD	17.256	66.621	.1676	480.29	370.67
#1	.00181	-.00095	9.496	.00098	.00399
#2	.00231	-.00264	9.518	-.00180	-.00179
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.3133**	**.00029**	**.09436**	**.00061**	**.00327**
Stddev	.0090	.00016	.00045	.00015	.00068
%RSD	.10859	53.901	.48123	25.354	20.923
#1	8.3070	.00018	.09404	.00050	.00279
#2	8.3197	.00040	.09468	.00072	.00375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-6-a Acquired: 11/15/2013 16:18:19 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00037**	**.00544**
Stddev	.00006	.00033
%RSD	15.753	5.9775
#1	.00041	.00521
#2	.00033	.00567
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3210.7**	**4887.4**	**72063.**	**6838.6**
Stddev	4.8	6.0	19.	13.9
%RSD	.14952	.12338	.02647	.20322
#1	3214.1	4891.7	72076.	6848.4
#2	3207.4	4883.1	72049.	6828.7

Sample Name: CCV Acquired: 11/15/2013 16:20:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51955**	**26.671**	**.53722**	**.51694**	**.53726**	**.52176**	**26.045**
Stddev	.00352	.178	.00377	.00077	.00411	.00110	.015
%RSD	.67758	.66685	.70236	.14958	.76431	.20988	.05749
#1	.52204	26.797	.53989	.51640	.54017	.52253	26.034
#2	.51706	26.546	.53455	.51749	.53436	.52099	26.055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52164**	**.51649**	**.52700**	**.52541**	**25.509**	**26.942**	F **27.514**
Stddev	.00129	.00049	.00472	.00233	.061	.369	.173
%RSD	.24674	.09447	.89524	.44352	.23722	1.3689	.62962
#1	.52073	.51683	.53034	.52706	25.552	27.202	27.391
#2	.52255	.51614	.52366	.52376	25.466	26.681	27.636
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.53587**	**25.193**	**.52582**	**.50158**	**.52696**	**26.784**	**.52121**
Stddev	.00691	.026	.00080	.00420	.00092	.299	.00140
%RSD	1.2887	.10431	.15135	.83692	.17459	1.1166	.26779
#1	.54075	25.211	.52525	.50455	.52631	26.995	.52022
#2	.53099	25.174	.52638	.49861	.52761	26.572	.52219
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 16:20:43 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51857	25.88	.53658	.52843	25.933	.52620	.53605
Stddev	.00137	.05	.00001	.00418	.024	.00040	.00350
%RSD	.26326	.1741	.00165	.79160	.09396	.07577	.65360
#1	.51953	25.85	.53659	.53139	25.951	.52592	.53853
#2	.51760	25.91	.53658	.52547	25.916	.52648	.53357
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.52310	.52308	.52103	.51731
Stddev	.00030	.00170	.00408	.00131
%RSD	.05651	.32517	.78385	.25235
#1	.52289	.52188	.52392	.51824
#2	.52331	.52428	.51814	.51639
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3223.1	4985.5	73494.	6806.1
Stddev	.5	4.7	340.	5.2
%RSD	.01600	.09446	.46313	.07708
#1	3222.8	4988.8	73253.	6809.8
#2	3223.5	4982.2	73735.	6802.4

Sample Name: CCB Acquired: 11/15/2013 16:23:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**.00129**	**.00056**	**.00004**	**.00003**	**.00003**	**-.01567**
Stddev	.00048	.00837	.00126	.00009	.00001	.00004	.00079
%RSD	124.85	647.66	224.95	216.03	23.120	108.22	5.0376
#1	-.00004	.00721	.00145	-.00002	.00003	.00001	-.01511
#2	-.00072	-.00463	-.00033	.00010	.00004	.00006	-.01622
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**.00011**	**-.00042**	**.00008**	**.00111**	**.03722**	**.00124**
Stddev	.00000	.00013	.00035	.00007	.00480	.00724	.00027
%RSD	2.5598	117.18	83.195	84.381	431.67	19.440	21.792
#1	.00009	.00002	-.00066	.00013	-.00228	.04234	.00143
#2	.00008	.00020	-.00017	.00003	.00450	.03210	.00105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**.00234**	**.00002**	**-.00034**	**.00008**	**-.00013**	**-.00027**
Stddev	.00027	.00013	.00000	.00023	.00009	.00271	.00002
%RSD	45.272	5.5359	1.8919	67.397	104.07	2075.7	6.2647
#1	-.00041	.00243	.00002	-.00018	.00015	-.00205	-.00026
#2	-.00079	.00225	.00002	-.00050	.00002	.00179	-.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 16:23:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00002	F .0038	-.00020	-.00294	-.02057	.00053	-.00003
Stddev	.00076	.0001	.00111	.00217	.01799	.00001	.00020
%RSD	3647.0	1.971	557.85	73.843	87.468	2.1148	630.89
#1	-.00052	.0037	-.00098	-.00141	-.00785	.00053	.00011
#2	.00056	.0038	.00058	-.00448	-.03328	.00054	-.00017
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00007	.00163	.00004	.00012
Stddev	.00017	.00284	.00007	.00033
%RSD	226.80	173.91	161.77	284.59
#1	-.00004	.00364	.00009	-.00012
#2	.00019	-.00038	-.00001	.00035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3429.4	5107.7	76977.	6885.2
Stddev	3.2	5.3	453.	.2
%RSD	.09454	.10346	.58912	.00312
#1	3427.1	5103.9	77298.	6885.4
#2	3431.7	5111.4	76656.	6885.1

Sample Name: CCVL Acquired: 11/15/2013 16:25:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00280**	**.22202**	**.01231**	**.01993**	**.00222**	**.00217**	**.50027**
Stddev	.00018	.00769	.00174	.00054	.00002	.00001	.00488
%RSD	6.4091	3.4625	14.107	2.7242	.96295	.46508	.97540
#1	.00267	.21659	.01108	.02032	.00220	.00218	.49682
#2	.00293	.22746	.01354	.01955	.00223	.00216	.50372
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**.00419**	**.00390**	**.01038**	**.04714**	**.51022**	**.43721**
Stddev	.00011	.00011	.00022	.00015	.00540	.01294	.00433
%RSD	10.450	2.6367	5.5779	1.4315	11.456	2.5352	.99018
#1	.00097	.00427	.00406	.01028	.05095	.50108	.43415
#2	.00112	.00412	.00375	.01049	.04332	.51937	.44027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02916**	**.20738**	**.00335**	**.00279**	**.01002**	**.96929**	**.00979**
Stddev	.00092	.00257	.00002	.00042	.00036	.00725	.00022
%RSD	3.1714	1.2402	.63024	15.211	3.5704	.74794	2.2638
#1	.02981	.20920	.00337	.00309	.00977	.97442	.00994
#2	.02851	.20556	.00334	.00249	.01028	.96417	.00963
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 16:25:33 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00399	.2083	.01991	.01454	.47913	.00983	.00509
Stddev	.00145	.0018	.00048	.00168	.02141	.00041	.00002
%RSD	36.314	.8848	2.4143	11.565	4.4693	4.2128	.46599
#1	.00297	.2096	.02025	.01335	.46399	.01012	.00508
#2	.00502	.2070	.01957	.01573	.49427	.00954	.00511
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00506	.02087	.00513	.01087
Stddev	.00012	.00065	.00009	.00006
%RSD	2.4058	3.0932	1.7320	.55262
#1	.00497	.02133	.00519	.01091
#2	.00514	.02041	.00507	.01082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3459.8	5195.2	76924.	6952.6
Stddev	11.9	18.0	40.	24.6
%RSD	.34355	.34560	.05231	.35428
#1	3468.2	5207.9	76952.	6970.1
#2	3451.4	5182.5	76895.	6935.2

Sample Name: 480-49217-b-7-a Acquired: 11/15/2013 16:27:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00045**	**.04458**	**.00384**	**.01514**	**.19245**
Stddev	.00030	.00698	.00229	.00046	.00068
%RSD	65.978	15.665	59.583	3.0622	.35086
#1	-.00066	.03964	.00222	.01481	.19293
#2	-.00024	.04951	.00546	.01547	.19197
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**204.49**	**.00035**	**.00378**	**.00084**
Stddev	.00004	.39	.00001	.00007	.00050
%RSD	31.639	.19307	1.4184	1.7300	59.117
#1	.00014	204.21	.00035	.00383	.00049
#2	.00009	204.77	.00036	.00373	.00119
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00222**	**.01732**	**3.0370**	**3.8224**	**.00356**
Stddev	.00009	.00448	.0397	.0341	.00190
%RSD	4.0519	25.841	1.3079	.89240	53.213
#1	.00228	.01416	3.0089	3.8465	.00491
#2	.00216	.02049	3.0651	3.7983	.00222
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-7-a Acquired: 11/15/2013 16:27:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**77.562**	**1.4500**	**1.4334**	**.00013**	**6.7668**
Stddev	.254	.0010	.0040	.00001	.0612
%RSD	.32786	.07103	.28153	6.1999	.90361
#1	77.382	1.4493	1.4363	.00013	6.7236
#2	77.742	1.4508	1.4306	.00012	6.8101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01462**	**-.00079**	F **15.93**	**-.00111**	**.00279**
Stddev	.00025	.00238	.05	.00168	.00186
%RSD	1.7260	303.27	.2836	151.52	66.596
#1	.01480	.00090	15.90	.00008	.00148
#2	.01444	-.00247	15.96	-.00230	.00410
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.9069**	**.00009**	**.15079**	**.00087**	**.00251**
Stddev	.0415	.00048	.00046	.00034	.00214
%RSD	.52543	518.45	.30329	38.674	85.055
#1	7.8775	.00043	.15046	.00063	.00402
#2	7.9363	-.00025	.15111	.00110	.00100
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-7-a Acquired: 11/15/2013 16:27:58 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00030**	**.00511**
Stddev	.00033	.00029
%RSD	106.93	5.6623
#1	-.00054	.00490
#2	-.00007	.00531
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3085.0**	**4747.2**	**70139.**	**6814.2**
Stddev	.4	8.5	46.	.9
%RSD	.01345	.17980	.06501	.01259
#1	3084.7	4753.2	70106.	6814.8
#2	3085.3	4741.1	70171.	6813.6

Sample Name: 480-49217-b-8-a Acquired: 11/15/2013 16:30:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**.03264**	**.00623**	**.14167**	**.33360**
Stddev	.00060	.00186	.00053	.00012	.00001
%RSD	201.26	5.6922	8.5491	.08285	.00203
#1	.00013	.03395	.00661	.14158	.33359
#2	-.00072	.03132	.00586	.14175	.33360
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**97.691**	**.00023**	**.00002**	**.00052**
Stddev	.00013	.179	.00008	.00001	.00015
%RSD	299.31	.18358	33.214	34.639	29.440
#1	.00013	97.818	.00017	.00002	.00041
#2	-.00005	97.565	.00028	.00001	.00063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00113**	**.01663**	**11.265**	**13.881**	**.01093**
Stddev	.00002	.00035	.006	.042	.00046
%RSD	1.7665	2.1204	.05531	.30076	4.2391
#1	.00114	.01688	11.269	13.910	.01060
#2	.00112	.01638	11.261	13.851	.01126
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-8-a Acquired: 11/15/2013 16:30:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**72.798**	**.02734**	**.02709**	**.00009**	**56.512**
Stddev	.161	.00003	.00023	.00013	.262
%RSD	.22120	.10999	.84560	149.82	.46353
#1	72.912	.02736	.02693	.00018	56.326
#2	72.684	.02732	.02726	-.00001	56.697
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00287**	F **-.00561**	**1.117**	**-.00107**	**-.00287**
Stddev	.00021	.00116	.009	.00099	.00102
%RSD	7.3487	20.774	.7920	92.432	35.662
#1	.00273	-.00478	1.111	-.00178	-.00359
#2	.00302	-.00643	1.124	-.00037	-.00215
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass
High Limit		120.00			
Low Limit		-.00500			

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.857**	**-.00013**	**.19632**	**.00080**	**.00293**
Stddev	.025	.00001	.00075	.00012	.00020
%RSD	.13884	7.2099	.37992	14.888	6.8972
#1	17.874	-.00012	.19579	.00088	.00279
#2	17.839	-.00014	.19685	.00072	.00307
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-8-a Acquired: 11/15/2013 16:30:20 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00012**	**.00402**
Stddev	.00009	.00017
%RSD	77.765	4.1713
#1	.00018	.00390
#2	.00005	.00414
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3113.6**	**4795.5**	**71059.**	**6878.5**
Stddev	.3	6.9	101.	.9
%RSD	.00982	.14300	.14192	.01342
#1	3113.4	4800.4	70987.	6877.9
#2	3113.9	4790.7	71130.	6879.2

Sample Name: 480-49217-b-9-a Acquired: 11/15/2013 16:32:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00073**	**.03363**	**.01732**	**.35148**	**.15074**
Stddev	.00004	.01774	.00229	.00051	.00129
%RSD	5.5420	52.753	13.232	.14642	.85888
#1	-.00076	.04618	.01894	.35184	.15166
#2	-.00070	.02109	.01570	.35112	.14983
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**116.03**	**.00030**	**.00127**	**.00123**
Stddev	.00012	.39	.00010	.00001	.00003
%RSD	140.48	.33671	34.801	.48835	2.1862
#1	.00017	116.31	.00023	.00127	.00125
#2	.00000	115.76	.00038	.00127	.00121
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00140**	**1.6960**	**23.794**	**27.598**	**.01029**
Stddev	.00012	.0172	.030	.222	.00028
%RSD	8.6392	1.0135	.12690	.80447	2.6970
#1	.00131	1.7082	23.816	27.755	.01048
#2	.00149	1.6839	23.773	27.441	.01009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-9-a Acquired: 11/15/2013 16:32:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**78.049**	**.09236**	**.09149**	**.00019**	**64.815**
Stddev	.146	.00012	.00180	.00003	.262
%RSD	.18721	.13407	1.9683	16.265	.40481
#1	78.153	.09245	.09276	.00021	64.629
#2	77.946	.09227	.09021	.00017	65.000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00486**	**-.00385**	**3.443**	**-.00172**	**.00165**
Stddev	.00007	.00005	.004	.00090	.00222
%RSD	1.5156	1.4205	.1051	52.306	134.35
#1	.00491	-.00381	3.445	-.00108	.00322
#2	.00481	-.00389	3.440	-.00236	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.242**	**.00052**	**.18637**	**.00045**	**.00384**
Stddev	.003	.00014	.00014	.00009	.00154
%RSD	.01663	27.467	.07724	21.074	40.026
#1	17.244	.00042	.18647	.00052	.00275
#2	17.240	.00062	.18626	.00038	.00492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-9-a Acquired: 11/15/2013 16:32:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00004	.00298
Stddev	.00041	.00011
%RSD	1018.9	3.6162
#1	.00033	.00290
#2	-.00025	.00305
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3076.8	4749.7	71276.	6923.7
Stddev	2.5	5.0	378.	14.3
%RSD	.08265	.10581	.53059	.20630
#1	3075.0	4746.2	71008.	6913.6
#2	3078.6	4753.3	71543.	6933.8

Sample Name: 480-49217-b-10-a Acquired: 11/15/2013 16:35:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00068**	**.04494**	**.00869**	**.13136**	**.21241**
Stddev	.00054	.00786	.00016	.00016	.00056
%RSD	78.844	17.495	1.8961	.11935	.26476
#1	-.00107	.05050	.00880	.13147	.21281
#2	-.00030	.03938	.00857	.13125	.21202
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**156.52**	**.00031**	**.00209**	**.00045**
Stddev	.00000	.14	.00003	.00012	.00027
%RSD	.30462	.08884	11.008	5.9373	59.574
#1	.00015	156.62	.00028	.00200	.00026
#2	.00015	156.43	.00033	.00218	.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00156**	**8.6531**	**12.930**	**15.778**	**.00517**
Stddev	.00012	.0253	.005	.069	.00017
%RSD	7.8929	.29271	.04038	.43826	3.3018
#1	.00147	8.6710	12.934	15.827	.00504
#2	.00164	8.6352	12.927	15.729	.00529
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-10-a Acquired: 11/15/2013 16:35:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**73.434**	**.09415**	**.09196**	**.00020**	**35.899**
Stddev	.314	.00052	.00068	.00045	.072
%RSD	.42698	.55672	.73822	226.67	.20076
#1	73.656	.09452	.09244	.00052	35.950
#2	73.213	.09378	.09148	-.00012	35.848
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00527**	**-.00182**	F **11.20**	**-.00118**	**.00088**
Stddev	.00079	.00268	.01	.00004	.00344
%RSD	15.062	147.17	.0917	3.7903	389.89
#1	.00471	-.00372	11.20	-.00121	.00331
#2	.00583	.00007	11.21	-.00115	-.00155
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**17.406**	**.00019**	**.20473**	**.00099**	**.00466**
Stddev	.011	.00059	.00003	.00019	.00087
%RSD	.06218	314.64	.01331	19.172	18.730
#1	17.414	-.00023	.20475	.00113	.00528
#2	17.399	.00061	.20471	.00086	.00405
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-10-a Acquired: 11/15/2013 16:35:15 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00002**	**.00490**
Stddev	.00027	.00069
%RSD	1756.3	14.086
#1	-.00018	.00539
#2	.00021	.00441
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3074.0**	**4753.1**	**70463.**	**6833.8**
Stddev	2.7	4.1	251.	10.4
%RSD	.08928	.08623	.35576	.15176
#1	3072.1	4756.0	70286.	6841.2
#2	3076.0	4750.2	70640.	6826.5

Sample Name: 480-49217-b-11-a Acquired: 11/15/2013 16:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00048**	**.03327**	**.00802**	**.13860**	**.10809**
Stddev	.00014	.00037	.00188	.00039	.00048
%RSD	29.070	1.0988	23.432	.27808	.44274
#1	-.00058	.03353	.00669	.13833	.10776
#2	-.00038	.03301	.00934	.13887	.10843
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**134.05**	**.00028**	**.00285**	**.00085**
Stddev	.00004	.14	.00000	.00008	.00067
%RSD	43.436	.10158	.86750	2.8797	78.413
#1	.00013	133.95	.00028	.00291	.00038
#2	.00007	134.14	.00028	.00280	.00132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00252**	**5.8225**	**10.079**	**12.404**	**.00450**
Stddev	.00004	.0320	.037	.094	.00186
%RSD	1.6794	.55015	.36964	.75786	41.254
#1	.00249	5.7998	10.105	12.337	.00319
#2	.00255	5.8451	10.052	12.470	.00581
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-11-a Acquired: 11/15/2013 16:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**62.726**	**.08542**	**.08395**	**-.00005**	**36.644**
Stddev	.062	.00004	.00095	.00014	.146
%RSD	.09931	.04556	1.1266	294.46	.39884
#1	62.682	.08545	.08328	.00005	36.748
#2	62.770	.08539	.08462	-.00015	36.541
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00571**	**-.00370**	F **10.45**	**-.00215**	**.00163**
Stddev	.00007	.00165	.01	.00240	.00217
%RSD	1.2346	44.755	.1293	111.40	133.45
#1	.00566	-.00487	10.44	-.00385	.00009
#2	.00576	-.00253	10.46	-.00046	.00317
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**14.487**	**.00046**	**.14523**	**.00088**	**.00394**
Stddev	.014	.00011	.00072	.00031	.00120
%RSD	.09502	23.245	.49789	34.966	30.519
#1	14.477	.00053	.14574	.00109	.00309
#2	14.496	.00038	.14472	.00066	.00479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-11-a Acquired: 11/15/2013 16:37:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00038**	**.00566**
Stddev	.00006	.00034
%RSD	16.114	6.0778
#1	-.00043	.00542
#2	-.00034	.00590
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3108.2**	**4793.0**	**71209.**	**6819.2**
Stddev	.3	5.6	231.	17.8
%RSD	.00899	.11654	.32396	.26116
#1	3108.4	4797.0	71372.	6831.8
#2	3108.0	4789.1	71046.	6806.6

Sample Name: 480-49217-b-12-a Acquired: 11/15/2013 16:40:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00104**	**.04184**	**.00164**	**.03261**	**.11915**
Stddev	.00054	.00248	.00115	.00009	.00004
%RSD	51.758	5.9370	70.282	.29093	.03319
#1	-.00142	.04008	.00083	.03254	.11912
#2	-.00066	.04360	.00246	.03267	.11918
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**124.68**	**.00043**	**.00351**	**.00070**
Stddev	.00011	.33	.00001	.00003	.00042
%RSD	89.047	.26440	2.1077	.76809	60.657
#1	.00005	124.45	.00044	.00349	.00100
#2	.00020	124.91	.00042	.00353	.00040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00386**	**.01759**	**3.5327**	**4.2626**	**.00540**
Stddev	.00003	.00011	.0063	.0207	.00092
%RSD	.90120	.63752	.17695	.48646	16.950
#1	.00384	.01767	3.5283	4.2480	.00475
#2	.00389	.01751	3.5372	4.2773	.00605
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-12-a Acquired: 11/15/2013 16:40:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**58.622**	**.06418**	**.06139**	**.00022**	**7.4606**
Stddev	.001	.00018	.00063	.00016	.0088
%RSD	.00142	.27624	1.0260	71.546	.11845
#1	58.621	.06431	.06184	.00034	7.4669
#2	58.622	.06406	.06095	.00011	7.4544
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00377**	**-.00027**	F **14.71**	**-.00092**	**-.00153**
Stddev	.00004	.00069	.03	.00066	.00077
%RSD	1.1690	255.36	.2347	72.515	50.476
#1	.00374	.00022	14.69	-.00139	-.00099
#2	.00380	-.00075	14.74	-.00045	-.00208
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.9520**	**-.00014**	**.15721**	**.00067**	**.00356**
Stddev	.0625	.00021	.00033	.00011	.00008
%RSD	.78552	150.20	.21127	16.450	2.1980
#1	7.9078	.00001	.15744	.00059	.00362
#2	7.9961	-.00028	.15697	.00075	.00351
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-12-a Acquired: 11/15/2013 16:40:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00036**	**.00699**
Stddev	.00006	.00011
%RSD	17.001	1.6255
#1	.00032	.00707
#2	.00040	.00691
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3166.4**	**4825.0**	**71460.**	**6807.1**
Stddev	6.4	5.6	44.	32.2
%RSD	.20297	.11609	.06226	.47284
#1	3171.0	4829.0	71491.	6829.9
#2	3161.9	4821.0	71428.	6784.4

Sample Name: 480-49217-b-13-a Acquired: 11/15/2013 16:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00100**	**.04832**	**.00204**	**.06286**	**.04620**
Stddev	.00013	.02321	.00027	.00007	.00009
%RSD	13.406	48.032	13.095	.11086	.19828
#1	-.00091	.06473	.00185	.06281	.04614
#2	-.00110	.03191	.00223	.06291	.04627
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**89.174**	**.00023**	**-.00016**	**.00075**
Stddev	.00004	.311	.00006	.00004	.00044
%RSD	37.708	.34917	28.000	24.409	57.986
#1	.00008	88.954	.00028	-.00013	.00044
#2	.00013	89.394	.00018	-.00019	.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00193**	**.01547**	**1.9535**	**2.2283**	**.00345**
Stddev	.00037	.00002	.0267	.0042	.00009
%RSD	19.358	.15871	1.3646	.18854	2.5880
#1	.00166	.01549	1.9723	2.2253	.00338
#2	.00219	.01545	1.9346	2.2313	.00351
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-13-a Acquired: 11/15/2013 16:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**40.225**	**.00201**	**.00148**	**.00021**	**8.5290**
Stddev	.079	.00001	.00102	.00003	.0314
%RSD	.19534	.39905	68.802	14.933	.36789
#1	40.169	.00201	.00220	.00019	8.5511
#2	40.280	.00200	.00076	.00023	8.5068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00090**	**-.00031**	**5.876**	**-.00045**	**.00163**
Stddev	.00051	.00083	.003	.00273	.00106
%RSD	56.702	264.65	.0437	613.88	64.841
#1	.00127	.00027	5.874	.00149	.00238
#2	.00054	-.00090	5.878	-.00238	.00088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.2588**	**.00015**	**.08459**	**.00077**	**.00362**
Stddev	.0024	.00017	.00050	.00010	.00042
%RSD	.03327	115.43	.58958	12.397	11.642
#1	7.2571	.00003	.08424	.00084	.00332
#2	7.2605	.00026	.08494	.00071	.00392
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-13-a Acquired: 11/15/2013 16:42:30 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00015**	**.00476**
Stddev	.00001	.00056
%RSD	9.3634	11.780
#1	.00014	.00436
#2	.00016	.00516
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3223.4**	**4886.2**	**72850.**	**6857.0**
Stddev	5.1	3.6	173.	21.7
%RSD	.15812	.07372	.23719	.31639
#1	3219.8	4883.6	72972.	6872.3
#2	3227.0	4888.7	72727.	6841.6

Sample Name: 480-49217-b-14-a Acquired: 11/15/2013 16:44:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00039**	**.04261**	**.00621**	**.09220**	**.17838**
Stddev	.00066	.03647	.00013	.00092	.00030
%RSD	167.64	85.602	2.1520	1.0016	.16910
#1	.00007	.06840	.00612	.09155	.17859
#2	-.00086	.01682	.00631	.09286	.17817
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**98.005**	**.00032**	**.00180**	**.00084**
Stddev	.00008	.756	.00011	.00002	.00029
%RSD	315.03	.77156	34.458	.83683	33.863
#1	-.00003	98.540	.00024	.00178	.00104
#2	.00009	97.470	.00040	.00181	.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00159**	**.28420**	**11.566**	**13.339**	**.00554**
Stddev	.00006	.00468	.127	.146	.00002
%RSD	3.8841	1.6460	1.1003	1.0969	.41432
#1	.00154	.28750	11.656	13.442	.00552
#2	.00163	.28089	11.476	13.236	.00555
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-14-a Acquired: 11/15/2013 16:44:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.449**	**.26352**	**.25178**	**.00084**	**22.726**
Stddev	.195	.00064	.00018	.00001	.238
%RSD	.45887	.24269	.07058	1.6646	1.0490
#1	42.586	.26398	.25166	.00085	22.894
#2	42.311	.26307	.25191	.00083	22.557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00385**	**-.00420**	**3.940**	**-.00154**	**-.00144**
Stddev	.00085	.00026	.004	.00204	.00597
%RSD	22.046	6.2472	.1048	132.93	416.00
#1	.00325	-.00439	3.937	-.00298	.00279
#2	.00445	-.00402	3.943	-.00009	-.00566
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.445**	**.00025**	**.11174**	**.00095**	**.00435**
Stddev	.069	.00033	.00112	.00037	.00014
%RSD	.59939	133.88	1.0031	38.346	3.3208
#1	11.494	.00049	.11253	.00070	.00445
#2	11.397	.00001	.11095	.00121	.00425
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-14-a Acquired: 11/15/2013 16:44:52 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00038**	**.00745**
Stddev	.00001	.00003
%RSD	3.5012	.40687
#1	-.00037	.00743
#2	-.00039	.00748
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3184.0**	**4869.3**	**72015.**	**6801.1**
Stddev	5.9	15.6	25.	24.2
%RSD	.18596	.31945	.03524	.35593
#1	3188.2	4880.3	71997.	6784.0
#2	3179.8	4858.3	72033.	6818.3

Sample Name: 480-49217-b-16-a Acquired: 11/15/2013 16:47:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**.03473**	**.00320**	**.01525**	**.06904**
Stddev	.00001	.00165	.00288	.00029	.00033
%RSD	3.6666	4.7588	89.899	1.9063	.47309
#1	-.00015	.03356	.00117	.01504	.06881
#2	-.00016	.03590	.00524	.01545	.06927
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**75.725**	**.00017**	**.00016**	**.00075**
Stddev	.00002	.215	.00002	.00003	.00029
%RSD	38.302	.28370	11.951	20.142	38.198
#1	.00003	75.573	.00019	.00018	.00095
#2	.00005	75.876	.00016	.00014	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00176**	**.05136**	**1.7217**	**1.9214**	**.00357**
Stddev	.00005	.00194	.0440	.0013	.00037
%RSD	2.6892	3.7769	2.5578	.06536	10.298
#1	.00179	.04999	1.7529	1.9205	.00331
#2	.00173	.05273	1.6906	1.9222	.00383
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-16-a Acquired: 11/15/2013 16:47:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.274**	**.01977**	**.01907**	**.00058**	**8.0164**
Stddev	.161	.00006	.00070	.00001	.0113
%RSD	.37218	.30326	3.6793	2.2028	.14050
#1	43.160	.01972	.01957	.00059	8.0243
#2	43.388	.01981	.01858	.00057	8.0084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00043**	**-.00188**	F **10.85**	**-.00193**	**.00292**
Stddev	.00005	.00017	.03	.00038	.00060
%RSD	12.179	8.8459	.2608	19.748	20.717
#1	.00047	-.00176	10.83	-.00220	.00249
#2	.00040	-.00199	10.87	-.00166	.00334
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.7114**	**-.00020**	**.09368**	**.00054**	**.00477**
Stddev	.0137	.00089	.00039	.00021	.00174
%RSD	.15735	440.18	.42102	38.591	36.418
#1	8.7211	.00043	.09340	.00039	.00600
#2	8.7017	-.00083	.09396	.00069	.00354
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-16-a Acquired: 11/15/2013 16:47:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00030**	**.00333**
Stddev	.00007	.00008
%RSD	23.581	2.3109
#1	-.00025	.00328
#2	-.00035	.00338
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3237.1**	**4900.1**	**73312.**	**6871.9**
Stddev	3.2	10.3	386.	19.0
%RSD	.10018	.21018	.52710	.27584
#1	3239.4	4907.4	73585.	6885.3
#2	3234.8	4892.9	73039.	6858.5

Sample Name: CCV Acquired: 11/15/2013 16:49:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51607	26.580	.54015	.51967	.53565	.52474	25.936
Stddev	.00204	.001	.00258	.00023	.00017	.00033	.058
%RSD	.39486	.00531	.47767	.04516	.03159	.06258	.22327
#1	.51463	26.581	.54197	.51983	.53553	.52450	25.895
#2	.51751	26.579	.53832	.51950	.53577	.52497	25.977
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52271	.51561	.52389	.52363	25.646	26.766	27.299
Stddev	.00031	.00045	.00274	.00025	.029	.041	.365
%RSD	.05971	.08773	.52242	.04757	.11365	.15273	1.3372
#1	.52294	.51593	.52195	.52346	25.666	26.737	27.557
#2	.52249	.51529	.52582	.52381	25.625	26.794	27.041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.53651	25.183	.52678	.50492	.52858	26.566	.52239
Stddev	.00041	.079	.00236	.00207	.00194	.071	.00177
%RSD	.07696	.31352	.44830	.41051	.36786	.26585	.33887
#1	.53680	25.127	.52511	.50346	.52996	26.516	.52364
#2	.53622	25.239	.52845	.50639	.52721	26.616	.52113
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 16:49:45 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.52134	25.86	.53509	.52770	25.782	.52508	.52990
Stddev	.00236	.01	.00246	.00098	.133	.00106	.00030
%RSD	.45331	.0343	.46047	.18514	.51659	.20241	.05632
#1	.52301	25.86	.53683	.52839	25.688	.52433	.53011
#2	.51967	25.87	.53335	.52701	25.877	.52584	.52969
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.52071	.52245	.51638	.51524
Stddev	.00179	.00201	.00067	.00549
%RSD	.34416	.38509	.12962	1.0648
#1	.51945	.52387	.51591	.51136
#2	.52198	.52102	.51686	.51912
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3218.1	4972.9	73689.	6818.4
Stddev	6.2	5.3	131.	.7
%RSD	.19393	.10670	.17778	.01044
#1	3213.7	4969.2	73781.	6818.9
#2	3222.5	4976.7	73596.	6817.9

Sample Name: CCB Acquired: 11/15/2013 16:52:07 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00056**	**.01136**	**.00120**	**-.00035**	**.00002**	**.00015**	**-.01332**
Stddev	.00066	.00275	.00420	.00005	.00001	.00005	.00206
%RSD	117.29	24.226	350.90	14.253	30.531	32.430	15.492
#1	-.00103	.00941	.00417	-.00038	.00001	.00012	-.01478
#2	-.00010	.01330	-.00177	-.00031	.00002	.00019	-.01186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.00004**	**-.00030**	**.00023**	**-.00256**	**.01917**	**.00143**
Stddev	.00009	.00021	.00044	.00003	.00430	.01212	.00053
%RSD	96.305	487.86	145.28	12.394	167.82	63.239	37.396
#1	.00003	-.00010	.00001	.00021	.00048	.01060	.00181
#2	.00015	.00019	-.00061	.00025	-.00560	.02774	.00105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00028**	**-.00029**	**.00002**	**.00048**	**-.00004**	**.00928**	**-.00045**
Stddev	.00020	.00035	.00003	.00029	.00005	.00833	.00017
%RSD	73.733	122.39	119.02	59.654	132.02	89.738	38.896
#1	-.00013	-.00054	.00000	.00069	-.00007	.01517	-.00057
#2	-.00042	-.00004	.00005	.00028	-.00000	.00339	-.00032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 16:52:07 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00023	F .0048	.00014	.00100	-.01332	.00033	-.00021
Stddev	.00025	.0001	.00093	.00193	.00356	.00039	.00005
%RSD	107.66	2.371	652.29	193.89	26.737	117.95	24.204
#1	.00006	.0049	-.00051	.00236	-.01584	.00005	-.00017
#2	.00041	.0047	.00080	-.00037	-.01080	.00060	-.00025
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00030	.00290	.00014	.00000
Stddev	.00024	.00029	.00002	.00002
%RSD	77.458	9.9019	16.686	900.97
#1	.00014	.00270	.00013	-.00001
#2	.00047	.00310	.00016	.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3428.0	5094.6	76988.	6817.8
Stddev	1.7	5.1	366.	45.2
%RSD	.04882	.09934	.47559	.66230
#1	3426.8	5091.0	77247.	6785.9
#2	3429.2	5098.2	76729.	6849.8

Sample Name: CCVL Acquired: 11/15/2013 16:54:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00261**	**.22707**	**.01275**	**.01959**	**.00223**	**.00214**	**.49315**
Stddev	.00016	.00042	.00193	.00040	.00001	.00008	.01124
%RSD	5.9517	.18343	15.139	2.0465	.58170	3.7288	2.2799
#1	.00250	.22736	.01139	.01988	.00222	.00220	.50110
#2	.00272	.22677	.01412	.01931	.00224	.00209	.48520
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00100**	**.00415**	**.00363**	**.00992**	**.04386**	**.54898**	**.43455**
Stddev	.00005	.00001	.00035	.00010	.00290	.00089	.00181
%RSD	5.3385	.23141	9.6980	1.0428	6.6214	.16238	.41758
#1	.00103	.00414	.00388	.00999	.04591	.54961	.43326
#2	.00096	.00416	.00338	.00985	.04180	.54835	.43583
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02870**	**.20526**	**.00330**	**.00328**	**.00976**	**.94607**	**.00962**
Stddev	.00040	.00031	.00002	.00055	.00015	.01046	.00046
%RSD	1.3911	.14896	.75348	16.736	1.5838	1.1053	4.7469
#1	.02898	.20504	.00331	.00367	.00987	.93868	.00930
#2	.02842	.20547	.00328	.00289	.00965	.95347	.00995
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 16:54:34 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00463	.2090	.01939	.01370	.48011	.00989	.00486
Stddev	.00042	.0031	.00151	.00157	.00007	.00015	.00007
%RSD	9.1433	1.498	7.7759	11.429	.01484	1.5125	1.4868
#1	.00493	.2068	.01832	.01481	.48006	.00999	.00481
#2	.00433	.2112	.02045	.01260	.48016	.00978	.00491
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00495	.02251	.00484	.01060
Stddev	.00035	.00279	.00013	.00004
%RSD	7.1263	12.395	2.6310	.33141
#1	.00520	.02449	.00475	.01063
#2	.00470	.02054	.00493	.01058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3458.1	5185.4	78098.	6994.8
Stddev	14.4	19.3	116.	18.6
%RSD	.41549	.37239	.14824	.26612
#1	3468.2	5199.1	78017.	6981.6
#2	3447.9	5171.8	78180.	7007.9

Sample Name: 480-49217-b-17-a Acquired: 11/15/2013 16:56:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00063**	**.03834**	**.00232**	**.02302**	**.05040**
Stddev	.00025	.01591	.00101	.00003	.00000
%RSD	38.906	41.494	43.471	.12081	.00960
#1	-.00081	.02709	.00304	.02300	.05041
#2	-.00046	.04959	.00161	.02304	.05040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**93.648**	**.00028**	**-.00000**	**.00133**
Stddev	.00004	.152	.00002	.00030	.00015
%RSD	42.205	.16248	6.9472	11539.	11.356
#1	.00006	93.755	.00027	-.00022	.00144
#2	.00011	93.540	.00030	.00021	.00123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00184**	**.01720**	**1.4493**	**1.7285**	**.00256**
Stddev	.00003	.00106	.0026	.0128	.00091
%RSD	1.4424	6.1842	.17596	.74282	35.611
#1	.00182	.01795	1.4511	1.7375	.00191
#2	.00186	.01645	1.4475	1.7194	.00320
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-17-a Acquired: 11/15/2013 16:56:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**45.562**	**.00149**	**.00103**	**.00015**	**22.960**
Stddev	.044	.00001	.00005	.00006	.094
%RSD	.09683	.40249	4.8301	41.801	.40728
#1	45.593	.00149	.00100	.00020	22.894
#2	45.531	.00149	.00107	.00011	23.026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00074**	**-.00007**	**5.202**	**-.00052**	**.00442**
Stddev	.00088	.00027	.001	.00003	.00103
%RSD	120.04	395.25	.0138	5.8752	23.178
#1	.00136	-.00026	5.203	-.00054	.00370
#2	.00011	.00012	5.202	-.00050	.00515
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.7000**	**.00019**	**.06395**	**.00070**	**.00190**
Stddev	.0028	.00022	.00040	.00051	.00037
%RSD	.03579	113.87	.62309	71.837	19.674
#1	7.7019	.00035	.06367	.00035	.00163
#2	7.6980	.00004	.06423	.00106	.00216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-17-a Acquired: 11/15/2013 16:56:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00058	.00305
Stddev	.00036	.00023
%RSD	62.156	7.3866
#1	.00084	.00321
#2	.00033	.00289
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3191.2	4861.7	72188.	6813.4
Stddev	1.2	6.2	27.	7.3
%RSD	.03823	.12777	.03716	.10675
#1	3190.3	4857.3	72169.	6808.3
#2	3192.0	4866.1	72207.	6818.6

Sample Name: 480-49217-b-18-a Acquired: 11/15/2013 16:59:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00045**	**.02877**	**.00094**	**.02354**	**.07101**
Stddev	.00036	.03008	.00225	.00021	.00026
%RSD	78.424	104.55	239.67	.89015	.37067
#1	-.00071	.00750	-.00065	.02339	.07120
#2	-.00020	.05004	.00253	.02369	.07082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**109.39**	**.00019**	**-.00001**	**.00140**
Stddev	.00003	.21	.00005	.00016	.00005
%RSD	37.696	.18832	26.634	1126.8	3.9024
#1	.00007	109.24	.00016	.00010	.00136
#2	.00011	109.53	.00023	-.00012	.00144
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00427**	**.01463**	**2.4784**	**3.0529**	**.00203**
Stddev	.00039	.00055	.0618	.0002	.00008
%RSD	9.2029	3.7454	2.4917	.00620	3.8418
#1	.00400	.01425	2.5221	3.0527	.00197
#2	.00455	.01502	2.4347	3.0530	.00208
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-18-a Acquired: 11/15/2013 16:59:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**53.648**	**.00180**	**.00164**	**-.00003**	**23.387**
Stddev	.091	.00004	.00019	.00018	.241
%RSD	.17007	2.1811	11.400	697.30	1.0317
#1	53.713	.00183	.00178	-.00015	23.557
#2	53.584	.00177	.00151	.00010	23.216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00220**	**-.00071**	**5.354**	**-.00175**	**.00217**
Stddev	.00095	.00048	.038	.00034	.00168
%RSD	42.992	68.115	.7082	19.483	77.170
#1	.00153	-.00037	5.328	-.00151	.00099
#2	.00287	-.00105	5.381	-.00199	.00336
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.4528**	**.00013**	**.08767**	**.00082**	**.00184**
Stddev	.0265	.00075	.00040	.00039	.00097
%RSD	.35525	586.02	.45492	48.176	52.356
#1	7.4715	-.00040	.08795	.00110	.00116
#2	7.4341	.00066	.08739	.00054	.00253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-18-a Acquired: 11/15/2013 16:59:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00038	.01322
Stddev	.00016	.00028
%RSD	42.980	2.1212
#1	.00026	.01342
#2	.00049	.01302
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3162.8	4838.1	71630.	6837.5
Stddev	1.8	8.3	107.	14.5
%RSD	.05649	.17097	.14972	.21221
#1	3164.0	4843.9	71554.	6847.8
#2	3161.5	4832.2	71706.	6827.2

Sample Name: 480-49217-b-19-a Acquired: 11/15/2013 17:01:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**.03860**	**.00143**	**.03977**	**.04963**
Stddev	.00019	.03121	.00182	.00027	.00003
%RSD	114.55	80.867	127.42	.67941	.06861
#1	.00003	.01653	.00014	.03996	.04961
#2	.00031	.06067	.00272	.03958	.04965
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**86.306**	**.00014**	**.00011**	**.00084**
Stddev	.00004	.385	.00004	.00019	.00004
%RSD	22.110	.44616	27.397	175.89	5.0145
#1	.00014	86.033	.00011	.00025	.00081
#2	.00019	86.578	.00017	-.00003	.00087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00302**	**.01023**	**1.8550**	**2.1371**	**.00296**
Stddev	.00014	.00453	.0042	.0118	.00001
%RSD	4.5752	44.253	.22857	.55077	.24964
#1	.00312	.00703	1.8580	2.1288	.00296
#2	.00292	.01343	1.8520	2.1455	.00297
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-19-a Acquired: 11/15/2013 17:01:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.425**	**.00130**	**.00110**	**-.00005**	**8.5442**
Stddev	.014	.00002	.00108	.00009	.0074
%RSD	.03184	1.8094	97.818	172.84	.08617
#1	43.415	.00128	.00034	.00001	8.5494
#2	43.435	.00131	.00186	-.00011	8.5390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00065**	**-.00169**	**5.078**	**-.00428**	**-.00166**
Stddev	.00017	.00033	.004	.00082	.00258
%RSD	27.036	19.678	.0889	19.106	155.56
#1	.00077	-.00145	5.082	-.00486	.00017
#2	.00052	-.00192	5.075	-.00370	-.00348
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.0455**	**.00055**	**.07402**	**.00093**	**.00287**
Stddev	.0215	.00045	.00020	.00025	.00350
%RSD	.26698	82.481	.27629	26.450	122.00
#1	8.0303	.00023	.07388	.00110	.00039
#2	8.0606	.00087	.07417	.00076	.00534
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-19-a Acquired: 11/15/2013 17:01:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00023**	**.00447**
Stddev	.00001	.00035
%RSD	5.1769	7.8224
#1	.00024	.00472
#2	.00022	.00422
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3221.1**	**4889.6**	**72683.**	**6839.5**
Stddev	6.1	15.8	228.	41.6
%RSD	.19059	.32248	.31391	.60886
#1	3225.4	4900.8	72844.	6868.9
#2	3216.7	4878.5	72521.	6810.0

Sample Name: 480-49217-b-20-a Acquired: 11/15/2013 17:04:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**.04163**	**.00512**	**.05088**	**.06465**
Stddev	.00032	.00192	.00060	.00001	.00012
%RSD	92.027	4.6124	11.800	.02869	.17899
#1	-.00012	.04027	.00555	.05089	.06457
#2	-.00057	.04298	.00470	.05087	.06473
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**87.450**	**.00011**	**.00007**	**.00056**
Stddev	.00008	.586	.00002	.00002	.00018
%RSD	107.89	.66982	14.687	30.196	31.979
#1	.00002	87.036	.00012	.00009	.00044
#2	.00014	87.864	.00010	.00006	.00069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00577**	**.00602**	**3.8764**	**4.5858**	**.00532**
Stddev	.00023	.00208	.0115	.0477	.00004
%RSD	3.9180	34.471	.29773	1.0393	.66224
#1	.00561	.00749	3.8683	4.5521	.00535
#2	.00593	.00455	3.8846	4.6195	.00530
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-20-a Acquired: 11/15/2013 17:04:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**40.899**	**.00627**	**.00588**	**.00032**	**13.343**
Stddev	.066	.00005	.00057	.00016	.220
%RSD	.16148	.86050	9.6783	49.808	1.6456
#1	40.945	.00631	.00548	.00043	13.188
#2	40.852	.00624	.00628	.00021	13.498
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00115**	**-.00268**	**5.212**	**.00034**	**.00193**
Stddev	.00056	.00176	.010	.00192	.00617
%RSD	49.082	65.654	.1864	562.04	319.29
#1	.00075	-.00144	5.219	-.00102	.00629
#2	.00155	-.00392	5.205	.00170	-.00243
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.1751**	**-.00012**	**.09152**	**.00090**	**.00231**
Stddev	.0754	.00015	.00121	.00007	.00198
%RSD	.92211	118.79	1.3182	8.3532	85.737
#1	8.1218	-.00002	.09067	.00084	.00091
#2	8.2285	-.00023	.09238	.00095	.00371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-20-a Acquired: 11/15/2013 17:04:06 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00026	.00656
Stddev	.00000	.00050
%RSD	.95368	7.5952
#1	.00026	.00691
#2	.00026	.00621
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3223.6	4889.5	72748.	6826.8
Stddev	2.6	2.5	4.	34.2
%RSD	.08046	.05112	.00523	.50148
#1	3225.4	4891.3	72751.	6851.0
#2	3221.8	4887.7	72745.	6802.6

Sample Name: 480-49217-b-21-a Acquired: 11/15/2013 17:06:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00037**	**.04734**	**.00102**	**.04486**	**.04427**
Stddev	.00101	.00577	.00345	.00016	.00025
%RSD	275.99	12.183	338.83	.35533	.55638
#1	-.00035	.04326	-.00142	.04497	.04444
#2	.00109	.05142	.00346	.04474	.04409
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**83.811**	**.00028**	**.00018**	**.00085**
Stddev	.00003	.095	.00000	.00014	.00025
%RSD	107.85	.11375	.59318	79.827	29.310
#1	.00005	83.879	.00028	.00008	.00103
#2	.00001	83.744	.00028	.00028	.00067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00074**	**.43933**	**1.8237**	**2.2271**	**.00309**
Stddev	.00013	.00367	.0472	.0057	.00065
%RSD	17.254	.83507	2.5882	.25468	20.873
#1	.00065	.44192	1.7904	2.2311	.00264
#2	.00083	.43673	1.8571	2.2231	.00355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-21-a Acquired: 11/15/2013 17:06:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.848**	**.05015**	**.04756**	**.00009**	**17.082**
Stddev	.179	.00025	.00125	.00010	.082
%RSD	.41747	.50656	2.6207	117.96	.47757
#1	42.975	.05033	.04844	.00001	17.024
#2	42.722	.04997	.04668	.00016	17.140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00070**	**-.00136**	F **907.1**	**-.00159**	**-.00007**
Stddev	.00092	.00090	2.2	.00122	.00108
%RSD	131.51	65.914	.2381	76.707	1534.4
#1	.00005	-.00073	905.6	-.00073	.00069
#2	.00136	-.00200	908.6	-.00245	-.00083
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.6062**	**-.00045**	**.06454**	**.00076**	**.00024**
Stddev	.0476	.00019	.00011	.00014	.00176
%RSD	.62629	42.885	.17532	18.980	720.80
#1	7.5725	-.00031	.06446	.00066	.00149
#2	7.6398	-.00059	.06462	.00087	-.00100
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-21-a Acquired: 11/15/2013 17:06:29 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00012**	**.00205**
Stddev	.00035	.00040
%RSD	289.80	19.604
#1	.00013	.00234
#2	-.00037	.00177
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3241.3**	**4871.3**	**73173.**	**6866.6**
Stddev	.7	4.2	371.	8.0
%RSD	.02309	.08532	.50759	.11692
#1	3240.7	4868.3	72910.	6860.9
#2	3241.8	4874.2	73435.	6872.3

Sample Name: 480-49217-b-1-a Acquired: 11/15/2013 17:08:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**.04937**	**.00145**	**.00451**	**.00095**
Stddev	.00043	.02363	.00075	.00015	.00001
%RSD	921.88	47.859	51.608	3.3333	.98923
#1	.00026	.03266	.00092	.00462	.00096
#2	-.00035	.06608	.00198	.00441	.00094
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.27258**	**.00005**	**.00007**	**.00012**
Stddev	.00015	.00365	.00004	.00004	.00018
%RSD	532.76	1.3374	89.796	54.708	149.19
#1	-.00008	.27516	.00008	.00010	.00025
#2	.00013	.27001	.00002	.00004	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00087**	**.01179**	**.06179**	**.00974**	**-.00075**
Stddev	.00005	.00880	.00880	.00005	.00014
%RSD	5.2676	74.687	14.250	.53001	19.121
#1	.00084	.00556	.05556	.00970	-.00085
#2	.00090	.01801	.06802	.00977	-.00065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-1-a Acquired: 11/15/2013 17:08:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.14487**	**.00005**	**.00015**	**-.00000**	**.08769**
Stddev	.00008	.00006	.00006	.00006	.00411
%RSD	.05487	120.18	36.982	2632.8	4.6826
#1	.14482	.00010	.00019	.00004	.08479
#2	.14493	.00001	.00011	-.00004	.09059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**.00075**	**.0976**	**-.00086**	**.00263**
Stddev	.00004	.00010	.0128	.00014	.00370
%RSD	32.283	13.451	13.13	16.173	140.93
#1	.00017	.00068	.1067	-.00096	.00525
#2	.00010	.00082	.0885	-.00076	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01731**	**.00050**	**.00435**	**.00032**	**.00393**
Stddev	.01456	.00025	.00001	.00006	.00305
%RSD	84.093	50.747	.21584	17.792	77.574
#1	.00702	.00032	.00435	.00028	.00609
#2	.02760	.00068	.00434	.00036	.00177
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-1-a Acquired: 11/15/2013 17:08:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00001**	**.00339**
Stddev	.00000	.00005
%RSD	4.6232	1.5015
#1	-.00001	.00336
#2	-.00001	.00343
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3447.9**	**5118.2**	**77694.**	**6912.4**
Stddev	3.6	1.5	242.	42.1
%RSD	.10419	.02981	.31157	.60870
#1	3450.5	5117.1	77865.	6882.7
#2	3445.4	5119.3	77523.	6942.2

Sample Name: 480-49217-b-15-a Acquired: 11/15/2013 17:11:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**.04656**	**.03717**	**.08256**	**.26914**
Stddev	.00043	.01692	.00133	.00021	.00085
%RSD	616.45	36.342	3.5889	.25756	.31705
#1	.00024	.03460	.03811	.08271	.26853
#2	-.00038	.05853	.03623	.08241	.26974
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**96.994**	**.00021**	**.00198**	**.00025**
Stddev	.00013	.133	.00005	.00010	.00064
%RSD	81.111	.13712	23.156	5.0639	253.66
#1	.00007	97.088	.00018	.00205	-.00020
#2	.00024	96.900	.00025	.00191	.00071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00186**	**.01928**	**8.6898**	**10.232**	**.00534**
Stddev	.00011	.00239	.0392	.062	.00125
%RSD	5.9126	12.408	.45061	.60922	23.398
#1	.00178	.01759	8.6621	10.277	.00623
#2	.00194	.02097	8.7175	10.188	.00446
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-15-a Acquired: 11/15/2013 17:11:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**47.006**	**.04450**	**.04233**	**.00081**	**24.619**
Stddev	.084	.00012	.00131	.00000	.099
%RSD	.17885	.27434	3.0971	.24619	.40237
#1	46.946	.04459	.04140	.00081	24.549
#2	47.065	.04442	.04326	.00081	24.689
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00315**	**-.00424**	**5.336**	**.00041**	**.00113**
Stddev	.00021	.00047	.019	.00025	.00213
%RSD	6.7906	11.168	.3557	61.361	189.64
#1	.00300	-.00457	5.323	.00059	-.00038
#2	.00330	-.00390	5.350	.00023	.00263
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.211**	**-.00066**	**.13530**	**.00053**	**.00699**
Stddev	.061	.00072	.00020	.00004	.00008
%RSD	.40428	110.24	.14639	7.0689	1.0795
#1	15.168	-.00014	.13544	.00056	.00693
#2	15.255	-.00117	.13516	.00050	.00704
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49217-b-15-a Acquired: 11/15/2013 17:11:16 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00043**	**.00324**
Stddev	.00056	.00030
%RSD	131.17	9.3946
#1	-.00083	.00346
#2	-.00003	.00302
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3176.1**	**4859.5**	**72387.**	**6855.1**
Stddev	1.7	5.9	315.	10.2
%RSD	.05486	.12090	.43572	.14871
#1	3177.4	4855.4	72610.	6862.3
#2	3174.9	4863.7	72164.	6847.9

Sample Name: mb 480-149380/1-a Acquired: 11/15/2013 17:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.04780**	**.00296**	**.00224**	**.00007**
Stddev	.00026	.01071	.00507	.00034	.00001
%RSD	128.25	22.408	171.17	15.265	21.117
#1	.00002	.04023	-.00062	.00200	.00008
#2	.00039	.05537	.00655	.00248	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**.02493**	**.00014**	**.00010**	**-.00030**
Stddev	.00001	.00044	.00010	.00009	.00029
%RSD	15.140	1.7693	74.518	84.378	95.910
#1	.00008	.02525	.00021	.00016	-.00051
#2	.00007	.02462	.00006	.00004	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**-.00310**	**.00805**	**.00148**	**-.00067**
Stddev	.00017	.00032	.02704	.00018	.00101
%RSD	49.447	10.356	335.69	12.388	151.77
#1	.00022	-.00287	-.01106	.00135	-.00138
#2	.00045	-.00333	.02717	.00161	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-149380/1-a Acquired: 11/15/2013 17:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.00011**	**-.00012**	**.00002**	**-.00013**
Stddev	.00247	.00006	.00092	.00011	.00919
%RSD	3058.8	52.679	798.99	512.24	7097.1
#1	.00183	-.00007	.00054	-.00006	-.00663
#2	-.00167	-.00015	-.00077	.00010	.00637
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.00056**	**.0243**	**-.00142**	**-.00181**
Stddev	.00015	.00000	.0049	.00060	.00381
%RSD	983.83	.40773	20.29	41.965	210.27
#1	.00012	.00057	.0278	-.00184	-.00451
#2	-.00009	.00056	.0208	-.00100	.00088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02061**	**.00035**	**.00019**	**.00053**	**.00012**
Stddev	.01145	.00007	.00010	.00035	.00057
%RSD	55.546	19.470	53.869	66.885	467.91
#1	-.01251	.00039	.00027	.00028	-.00028
#2	-.02870	.00030	.00012	.00078	.00053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-149380/1-a Acquired: 11/15/2013 17:13:44 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00010**	**.00052**
Stddev	.00007	.00019
%RSD	70.752	36.308
#1	.00015	.00039
#2	.00005	.00065
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3451.4**	**5122.0**	**77949.**	**6979.1**
Stddev	5.9	9.5	191.	1.5
%RSD	.17220	.18510	.24558	.02177
#1	3455.6	5128.7	77814.	6980.2
#2	3447.2	5115.3	78085.	6978.0

Sample Name: lcs 480-149380/2-a Acquired: 11/15/2013 17:16:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.04999**	**10.662**	**.21194**	**.21068**	**.21645**
Stddev	.00010	.020	.00048	.00036	.00001
%RSD	.19630	.18398	.22504	.17131	.00668
#1	.04992	10.648	.21160	.21042	.21644
#2	.05006	10.676	.21228	.21093	.21646
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21083**	**10.334**	**.20637**	**.20614**	**.21209**
Stddev	.00099	.024	.00031	.00041	.00035
%RSD	.46883	.23401	.15058	.19822	.16296
#1	.21013	10.317	.20659	.20643	.21234
#2	.21152	10.351	.20615	.20585	.21185
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20924**	**10.399**	**10.347**	**10.550**	**.21191**
Stddev	.00016	.049	.065	.011	.00060
%RSD	.07744	.46987	.62367	.10513	.28258
#1	.20935	10.364	10.302	10.543	.21149
#2	.20912	10.434	10.393	10.558	.21234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149380/2-a Acquired: 11/15/2013 17:16:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.571**	**.20865**	**.19357**	**.21616**	**10.357**
Stddev	.019	.00019	.00142	.00003	.006
%RSD	.18423	.09108	.73402	.01174	.05824
#1	10.585	.20878	.19256	.21614	10.361
#2	10.557	.20851	.19457	.21618	10.353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20371**	**.21011**	**9.987**	**.20476**	**.21147**
Stddev	.00136	.00039	.020	.00011	.00015
%RSD	.66969	.18653	.1970	.05615	.07256
#1	.20467	.21039	9.973	.20484	.21158
#2	.20274	.20984	10.00	.20468	.21136
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.162**	**.20042**	**.21094**	**.19958**	**.20911**
Stddev	.005	.00003	.00065	.00049	.00017
%RSD	.04939	.01561	.30671	.24473	.08037
#1	10.166	.20044	.21049	.19993	.20899
#2	10.159	.20040	.21140	.19924	.20923
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-149380/2-a Acquired: 11/15/2013 17:16:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21010	.20508
Stddev	.00076	.00180
%RSD	.36247	.87545
#1	.21064	.20635
#2	.20956	.20381
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3359.3	5076.7	75388.	6868.3
Stddev	3.8	6.2	104.	14.0
%RSD	.11446	.12243	.13757	.20394
#1	3362.0	5081.1	75314.	6878.2
#2	3356.6	5072.3	75461.	6858.4

Sample Name: CCV Acquired: 11/15/2013 17:18:32 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52005**	**26.643**	**.53529**	**.51842**	**.53572**	**.52443**	**26.147**
Stddev	.00151	.088	.00061	.00002	.00310	.00174	.097
%RSD	.29005	.32893	.11427	.00347	.57894	.33200	.36979
#1	.52112	26.581	.53486	.51843	.53352	.52320	26.079
#2	.51899	26.705	.53573	.51840	.53791	.52566	26.216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51975**	**.51610**	**.53178**	**.52911**	**25.589**	**26.945**	F **27.587**
Stddev	.00030	.00068	.00272	.00439	.126	.173	.183
%RSD	.05712	.13245	.51132	.83005	.49081	.64232	.66187
#1	.51954	.51562	.53371	.53222	25.500	26.823	27.458
#2	.51996	.51658	.52986	.52600	25.678	27.068	27.716
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.53602**	**25.302**	**.52833**	**.50074**	**.52488**	**26.727**	**.51906**
Stddev	.00045	.004	.00017	.00092	.00091	.028	.00081
%RSD	.08406	.01682	.03276	.18295	.17322	.10551	.15605
#1	.53570	25.299	.52845	.50009	.52552	26.707	.51963
#2	.53634	25.305	.52820	.50138	.52423	26.747	.51849
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 17:18:32 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51990	25.76	.53110	.52417	25.886	.52575	.53423
Stddev	.00137	.06	.00295	.00151	.087	.00006	.00182
%RSD	.26372	.2500	.55468	.28758	.33732	.01130	.34114
#1	.52087	25.80	.53318	.52310	25.824	.52571	.53294
#2	.51893	25.71	.52901	.52523	25.948	.52579	.53552
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.52488	.52204	.52377	.52081
Stddev	.00156	.00307	.00128	.00152
%RSD	.29700	.58742	.24510	.29270
#1	.52378	.51987	.52467	.52188
#2	.52598	.52421	.52286	.51973
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3231.2	5004.7	73255.	6759.7
Stddev	2.5	.5	221.	23.2
%RSD	.07826	.00900	.30144	.34252
#1	3233.0	5005.0	73099.	6776.0
#2	3229.4	5004.4	73411.	6743.3

Sample Name: CCB Acquired: 11/15/2013 17:20:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.02764**	**-.00003**	**-.00043**	**.00001**	**.00011**	**-.02001**
Stddev	.00039	.02246	.00246	.00058	.00001	.00002	.00315
%RSD	196.91	81.262	7622.9	134.28	52.044	18.746	15.724
#1	-.00008	.04353	-.00177	-.00002	.00002	.00013	-.02223
#2	.00047	.01176	.00171	-.00084	.00001	.00010	-.01779
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**.00004**	**-.00026**	**-.00003**	**-.00345**	**.01993**	**.00136**
Stddev	.00003	.00021	.00037	.00002	.00021	.01182	.00045
%RSD	20.262	591.11	142.00	81.585	5.9912	59.308	33.135
#1	.00013	-.00011	-.00052	-.00001	-.00330	.01157	.00168
#2	.00017	.00019	.00000	-.00004	-.00359	.02828	.00104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**-.00123**	**.00003**	**-.00029**	**.00026**	**-.00034**	**-.00021**
Stddev	.00006	.00204	.00003	.00013	.00014	.00238	.00003
%RSD	19.257	165.40	88.333	46.358	56.339	693.06	14.018
#1	-.00037	-.00267	.00005	-.00019	.00036	.00134	-.00018
#2	-.00028	.00021	.00001	-.00038	.00015	-.00202	-.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 17:20:54 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00114	F .0112	.00001	.00087	-.00500	.00120	-.00023
Stddev	.00082	.0014	.00052	.00080	.01176	.00030	.00016
%RSD	71.533	12.49	6542.8	92.423	235.24	25.211	68.846
#1	.00172	.0102	-.00036	.00144	-.01332	.00141	-.00035
#2	.00057	.0121	.00037	.00030	.00332	.00099	-.00012
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00049	.00236	-.00013	.00031
Stddev	.00011	.00093	.00001	.00050
%RSD	22.117	39.457	11.475	161.64
#1	.00041	.00170	-.00012	-.00004
#2	.00057	.00302	-.00014	.00067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3439.5	5112.4	77267.	6856.8
Stddev	.1	5.9	211.	14.7
%RSD	.00185	.11457	.27321	.21400
#1	3439.5	5108.2	77416.	6867.2
#2	3439.6	5116.5	77118.	6846.4

Sample Name: CCVL Acquired: 11/15/2013 17:23:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00236**	**.24074**	**.00998**	**.01908**	**.00222**	**.00214**	**.49470**
Stddev	.00041	.01784	.00110	.00008	.00003	.00011	.00558
%RSD	17.436	7.4105	11.025	.42649	1.3493	5.2627	1.1286
#1	.00207	.22813	.00920	.01914	.00224	.00222	.49075
#2	.00265	.25336	.01075	.01902	.00220	.00206	.49865
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00097**	**.00419**	**.00377**	**.01007**	**.04662**	**.51142**	**.43770**
Stddev	.00002	.00013	.00024	.00001	.00043	.00887	.00227
%RSD	1.6689	3.1885	6.4754	.12561	.92226	1.7344	.51873
#1	.00099	.00410	.00394	.01006	.04693	.50515	.43609
#2	.00096	.00429	.00359	.01008	.04632	.51770	.43930
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02920**	**.20911**	**.00334**	**.00292**	**.00996**	**.95608**	**.01020**
Stddev	.00003	.00018	.00008	.00017	.00005	.00605	.00035
%RSD	.09498	.08694	2.4326	5.9321	.54124	.63242	3.4649
#1	.02922	.20898	.00340	.00280	.00992	.95181	.01045
#2	.02918	.20924	.00329	.00305	.00999	.96036	.00995
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 17:23:21 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00447	.2131	.02157	.01605	.48026	.00957	.00515
Stddev	.00144	.0017	.00172	.00139	.00050	.00053	.00009
%RSD	32.245	.8048	7.9875	8.6601	.10452	5.4918	1.7506
#1	.00345	.2119	.02278	.01507	.48062	.00920	.00521
#2	.00549	.2143	.02035	.01703	.47991	.00995	.00508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00511	.02322	.00509	.01071
Stddev	.00012	.00132	.00007	.00005
%RSD	2.3632	5.6984	1.3288	.46141
#1	.00503	.02228	.00504	.01074
#2	.00520	.02415	.00513	.01067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3470.4	5198.3	77605.	6941.9
Stddev	9.0	13.2	84.	36.4
%RSD	.25986	.25334	.10839	.52506
#1	3476.8	5207.6	77545.	6967.7
#2	3464.0	5189.0	77664.	6916.1

Sample Name: 480-49222-e-2-a Acquired: 11/15/2013 17:25:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00057**	**1.1704**	**.00742**	**.13280**	**.10409**
Stddev	.00029	.0003	.00017	.00049	.00003
%RSD	50.599	.02743	2.2711	.37042	.02842
#1	-.00037	1.1707	.00730	.13245	.10407
#2	-.00078	1.1702	.00754	.13314	.10411
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**66.214**	**.00032**	**.00046**	**.00186**
Stddev	.00011	.096	.00010	.00010	.00036
%RSD	58.467	.14435	29.909	21.242	19.280
#1	.00011	66.282	.00026	.00039	.00161
#2	.00027	66.146	.00039	.00053	.00212
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00354**	**1.0256**	**8.1892**	**10.501**	**.05195**
Stddev	.00013	.0063	.0267	.038	.00005
%RSD	3.6118	.61522	.32539	.35833	.09567
#1	.00363	1.0301	8.2080	10.527	.05199
#2	.00345	1.0211	8.1704	10.474	.05192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-2-a Acquired: 11/15/2013 17:25:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.176**	**.10339**	**.09911**	**.00386**	**80.560**
Stddev	.038	.00032	.00072	.00021	.187
%RSD	.14426	.31160	.72701	5.5429	.23171
#1	26.150	.10316	.09860	.00370	80.428
#2	26.203	.10362	.09962	.00401	80.692
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00404**	**-.00039**	F **73.32**	**-.00071**	**.00173**
Stddev	.00037	.00162	.14	.00062	.00386
%RSD	9.0852	410.67	.1853	86.893	223.24
#1	.00378	-.00154	73.41	-.00115	.00445
#2	.00430	.00075	73.22	-.00027	-.00100
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.7021**	**-.00035**	**.57315**	**.02228**	**.00357**
Stddev	.0075	.00005	.00146	.00014	.00140
%RSD	.08571	15.430	.25556	.63484	39.178
#1	8.7074	-.00038	.57419	.02238	.00455
#2	8.6969	-.00031	.57211	.02218	.00258
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-2-a Acquired: 11/15/2013 17:25:46 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00621	.00418
Stddev	.00008	.00059
%RSD	1.3360	14.211
#1	.00615	.00460
#2	.00627	.00376
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3200.0	4878.5	71777.	6850.9
Stddev	3.0	1.4	79.	9.4
%RSD	.09395	.02960	.11043	.13713
#1	3197.9	4879.5	71834.	6844.3
#2	3202.1	4877.4	71721.	6857.6

Sample Name: 480-49222-e-3-a Acquired: 11/15/2013 17:28:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00094**	**2.0660**	**.00857**	**.13648**	**.11616**
Stddev	.00114	.0015	.00506	.00081	.00009
%RSD	120.62	.07083	59.069	.59037	.08093
#1	-.00014	2.0670	.01214	.13591	.11609
#2	-.00175	2.0650	.00499	.13705	.11622
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**68.439**	**.00032**	**.00098**	**.00246**
Stddev	.00002	.701	.00008	.00001	.00020
%RSD	13.761	1.0242	25.608	.90481	8.0573
#1	.00016	68.935	.00026	.00098	.00232
#2	.00020	67.944	.00038	.00097	.00260
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00393**	**1.8298**	**8.4180**	**10.754**	**.05272**
Stddev	.00004	.0062	.0674	.122	.00048
%RSD	1.0035	.33663	.80130	1.1323	.91353
#1	.00390	1.8341	8.4657	10.840	.05306
#2	.00396	1.8254	8.3703	10.668	.05238
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-3-a Acquired: 11/15/2013 17:28:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.921**	**.18221**	**.17650**	**.00386**	**82.099**
Stddev	.043	.00070	.00033	.00014	.139
%RSD	.15938	.38322	.18803	3.4995	.16900
#1	26.891	.18172	.17626	.00377	82.197
#2	26.952	.18271	.17673	.00396	82.001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00383**	**-.00223**	F **75.00**	**-.00114**	**.00213**
Stddev	.00034	.00094	.27	.00135	.00046
%RSD	8.9915	42.131	.3624	118.66	21.552
#1	.00359	-.00290	74.81	-.00210	.00246
#2	.00408	-.00157	75.19	-.00018	.00181
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.884**	**.00006**	**.58122**	**.03862**	**.00410**
Stddev	.132	.00020	.00276	.00025	.00047
%RSD	1.2125	345.16	.47550	.63658	11.390
#1	10.977	-.00008	.58318	.03844	.00377
#2	10.791	.00020	.57927	.03879	.00444
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-3-a Acquired: 11/15/2013 17:28:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00872	.00872
Stddev	.00008	.00018
%RSD	.86962	2.1072
#1	.00866	.00885
#2	.00877	.00859
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3184.7	4868.7	72346.	6888.0
Stddev	1.9	20.4	75.	43.5
%RSD	.05841	.41956	.10337	.63100
#1	3186.0	4883.2	72399.	6857.3
#2	3183.4	4854.3	72293.	6918.7

Sample Name: 480-49222-e-4-a Acquired: 11/15/2013 17:30:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00109**	**1.1469**	**.00350**	**.13271**	**.10422**
Stddev	.00045	.0326	.00191	.00004	.00010
%RSD	40.976	2.8420	54.678	.02914	.09125
#1	-.00141	1.1700	.00214	.13274	.10416
#2	-.00078	1.1239	.00485	.13269	.10429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**66.146**	**.00021**	**.00058**	**.00172**
Stddev	.00004	.192	.00001	.00012	.00044
%RSD	37.347	.29075	4.8610	21.428	25.362
#1	.00015	66.282	.00022	.00049	.00203
#2	.00009	66.010	.00020	.00067	.00141
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00307**	**.94336**	**8.0176**	**10.293**	**.05155**
Stddev	.00021	.00969	.0667	.014	.00036
%RSD	6.8061	1.0268	.83243	.13305	.68953
#1	.00293	.95020	8.0647	10.302	.05130
#2	.00322	.93651	7.9704	10.283	.05180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a Acquired: 11/15/2013 17:30:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.221**	**.10248**	**.09909**	**.00387**	**80.488**
Stddev	.039	.00015	.00019	.00004	.489
%RSD	.14942	.14428	.19303	1.1469	.60813
#1	26.194	.10237	.09896	.00391	80.834
#2	26.249	.10258	.09923	.00384	80.142
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00335**	**-.00060**	F **73.49**	**-.00131**	**.00086**
Stddev	.00012	.00001	.04	.00008	.00101
%RSD	3.5398	1.4912	.0589	6.4003	116.68
#1	.00326	-.00060	73.46	-.00125	.00015
#2	.00343	-.00061	73.52	-.00136	.00158
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.4512**	**.00014**	**.56786**	**.02070**	**.00262**
Stddev	.0033	.00007	.00304	.00035	.00330
%RSD	.03859	51.867	.53592	1.6937	126.08
#1	8.4535	.00019	.57001	.02045	.00028
#2	8.4489	.00009	.56571	.02094	.00495
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a Acquired: 11/15/2013 17:30:41 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00632	.00477
Stddev	.00000	.00079
%RSD	.00344	16.472
#1	.00632	.00422
#2	.00632	.00533
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3197.0	4877.7	71905.	6890.9
Stddev	3.9	5.9	189.	5.7
%RSD	.12264	.12171	.26310	.08330
#1	3199.8	4881.9	72039.	6894.9
#2	3194.3	4873.5	71771.	6886.8

Sample Name: 480-49222-e-4-a SD@5 Acquired: 11/15/2013 17:33:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.26392**	**.00061**	**.02485**	**.02151**
Stddev	.00036	.01735	.00138	.00017	.00006
%RSD	110.39	6.5753	224.70	.67316	.29488
#1	-.00007	.25165	.00159	.02497	.02146
#2	-.00057	.27619	-.00036	.02473	.02155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**13.293**	**.00016**	**.00011**	**-.00043**
Stddev	.00009	.026	.00002	.00013	.00012
%RSD	67.467	.19275	10.897	117.82	27.501
#1	.00021	13.275	.00015	.00020	-.00035
#2	.00007	13.312	.00018	.00002	-.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00089**	**.19132**	**1.5461**	**1.5643**	**.01087**
Stddev	.00019	.00310	.0085	.0169	.00009
%RSD	21.617	1.6209	.55010	1.0790	.79639
#1	.00102	.18913	1.5521	1.5524	.01093
#2	.00075	.19351	1.5401	1.5762	.01081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a SD@5 Acquired: 11/15/2013 17:33:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.2092**	**.02074**	**.01865**	**.00070**	**15.274**
Stddev	.0147	.00006	.00097	.00011	.021
%RSD	.28126	.31270	5.1908	15.943	.13726
#1	5.1988	.02079	.01934	.00077	15.289
#2	5.2195	.02070	.01797	.00062	15.259
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**-.00018**	F **14.23**	**-.00151**	**.00078**
Stddev	.00013	.00076	.02	.00231	.00190
%RSD	82.533	410.38	.1368	152.95	244.89
#1	.00025	.00035	14.22	-.00315	-.00057
#2	.00006	-.00072	14.25	.00012	.00212
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.7849**	**-.00020**	**.11365**	**.00670**	**-.00059**
Stddev	.0225	.00051	.00065	.00034	.00124
%RSD	1.2595	254.86	.57177	5.0197	211.29
#1	1.7690	-.00056	.11411	.00693	.00029
#2	1.8007	.00016	.11319	.00646	-.00146
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a SD@5 Acquired: 11/15/2013 17:33:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00143**	**.00094**
Stddev	.00007	.00005
%RSD	4.9612	4.8563
#1	.00148	.00090
#2	.00138	.00097
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3382.0**	**5038.9**	**75419.**	**6871.5**
Stddev	3.7	1.0	35.	2.6
%RSD	.11018	.01890	.04705	.03774
#1	3384.6	5039.5	75444.	6873.4
#2	3379.3	5038.2	75394.	6869.7

Sample Name: 480-49222-e-4-a PDS Acquired: 11/15/2013 17:35:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05235**	**12.058**	**.22854**	**.34498**	**.31435**
Stddev	.00039	.106	.00252	.00042	.00123
%RSD	.74909	.87712	1.1014	.12201	.39166
#1	.05207	12.133	.22676	.34468	.31522
#2	.05262	11.983	.23032	.34527	.31348
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21223**	**75.545**	**.21327**	**.21089**	**.21222**
Stddev	.00055	.419	.00100	.00019	.00010
%RSD	.26022	.55513	.46680	.09067	.04734
#1	.21262	75.842	.21398	.21102	.21229
#2	.21184	75.249	.21257	.21075	.21215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21606**	**11.353**	**19.197**	**23.424**	**.27612**
Stddev	.00041	.061	.123	.240	.00134
%RSD	.18938	.54143	.63811	1.0240	.48555
#1	.21635	11.397	19.284	23.594	.27707
#2	.21577	11.310	19.111	23.254	.27518
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a PDS Acquired: 11/15/2013 17:35:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.129**	**.30743**	**.29979**	**.22252**	**89.438**
Stddev	.063	.00008	.00021	.00031	.219
%RSD	.17497	.02699	.07040	.13834	.24458
#1	36.174	.30749	.29994	.22274	89.593
#2	36.085	.30737	.29965	.22231	89.284
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21023**	**.21365**	F **71.44**	**.20931**	**.22434**
Stddev	.00046	.00221	.15	.00260	.00451
%RSD	.22059	1.0351	.2098	1.2433	2.0090
#1	.21056	.21209	71.55	.21115	.22752
#2	.20990	.21521	71.33	.20747	.22115
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**18.993**	**.20297**	**.77106**	**.23318**	**.21269**
Stddev	.085	.00026	.00473	.00171	.00391
%RSD	.44909	.12875	.61323	.73293	1.8376
#1	19.054	.20316	.77440	.23439	.21545
#2	18.933	.20279	.76771	.23198	.20992
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-a PDS Acquired: 11/15/2013 17:35:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21961	.21197
Stddev	.00087	.00007
%RSD	.39729	.03176
#1	.22022	.21202
#2	.21899	.21192
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3149.7	4882.9	71899.	6859.3
Stddev	.5	7.1	104.	20.5
%RSD	.01631	.14554	.14444	.29898
#1	3150.1	4877.9	71826.	6844.8
#2	3149.3	4887.9	71973.	6873.8

Sample Name: 480-49222-e-4-b ms Acquired: 11/15/2013 17:37:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05165	12.387	.22544	.34668	.31773
Stddev	.00033	.069	.00535	.00025	.00077
%RSD	.63064	.55909	2.3717	.07275	.24262
#1	.05188	12.436	.22922	.34685	.31719
#2	.05142	12.338	.22166	.34650	.31828
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.20994	76.686	.21258	.20970	.21469
Stddev	.00150	.226	.00054	.00034	.00049
%RSD	.71459	.29527	.25618	.16452	.22944
#1	.21100	76.846	.21220	.20945	.21434
#2	.20888	76.526	.21297	.20994	.21504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21523	11.303	19.510	23.764	.27904
Stddev	.00103	.051	.066	.324	.00080
%RSD	.47972	.45495	.33827	1.3617	.28589
#1	.21450	11.339	19.464	23.993	.27848
#2	.21596	11.267	19.557	23.535	.27961
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-b ms Acquired: 11/15/2013 17:37:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.470**	**.30828**	**.29919**	**.22220**	**90.663**
Stddev	.019	.00092	.00037	.00074	.085
%RSD	.05100	.29949	.12384	.33267	.09376
#1	36.457	.30763	.29893	.22167	90.723
#2	36.483	.30893	.29946	.22272	90.603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20901**	**.21038**	F **82.89**	**.21072**	**.22411**
Stddev	.00114	.00051	.22	.00106	.00284
%RSD	.54709	.24351	.2707	.50377	1.2672
#1	.20820	.21001	82.73	.20997	.22210
#2	.20982	.21074	83.05	.21147	.22612
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**19.664**	**.20738**	**.78644**	**.22566**	**.21090**
Stddev	.050	.00005	.00115	.00061	.00215
%RSD	.25651	.02428	.14598	.27240	1.0215
#1	19.700	.20735	.78725	.22522	.20938
#2	19.628	.20742	.78563	.22609	.21243
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-b ms Acquired: 11/15/2013 17:37:53 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21876**	**.21028**
Stddev	.00064	.00058
%RSD	.29276	.27480
#1	.21831	.21069
#2	.21922	.20987
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3140.3**	**4863.0**	**71538.**	**6803.8**
Stddev	5.7	1.9	106.	35.1
%RSD	.18065	.03896	.14838	.51546
#1	3144.3	4864.4	71614.	6779.0
#2	3136.3	4861.7	71463.	6828.6

Sample Name: 480-49222-e-4-c msd Acquired: 11/15/2013 17:40:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.05162	12.447	.22702	.34808	.32048
Stddev	.00024	.026	.00426	.00132	.00083
%RSD	.47288	.20917	1.8785	.37841	.25814
#1	.05180	12.465	.22400	.34901	.31990
#2	.05145	12.429	.23003	.34715	.32107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21070	76.111	.21199	.20970	.21341
Stddev	.00016	.205	.00034	.00008	.00046
%RSD	.07497	.26976	.15868	.03688	.21393
#1	.21059	75.966	.21175	.20976	.21309
#2	.21081	76.256	.21222	.20965	.21373
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	.21581	11.291	19.350	23.559	.28021
Stddev	.00058	.028	.117	.004	.00200
%RSD	.26750	.25163	.60474	.01853	.71457
#1	.21541	11.271	19.267	23.562	.27880
#2	.21622	11.311	19.433	23.556	.28163
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-c msd Acquired: 11/15/2013 17:40:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.499**	**.30829**	**.30087**	**.22231**	**90.922**
Stddev	.068	.00160	.00237	.00017	.299
%RSD	.18540	.51901	.78778	.07739	.32864
#1	36.452	.30715	.29919	.22243	90.711
#2	36.547	.30942	.30255	.22219	91.133
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20861**	**.20981**	F **82.57**	**.20845**	**.22014**
Stddev	.00034	.00152	.02	.00093	.00010
%RSD	.16161	.72411	.0287	.44601	.04515
#1	.20837	.20874	82.55	.20779	.22007
#2	.20885	.21088	82.59	.20911	.22021
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**19.702**	**.20880**	**.77876**	**.22783**	**.21002**
Stddev	.155	.00103	.00369	.00055	.00346
%RSD	.78838	.49508	.47431	.24108	1.6486
#1	19.593	.20807	.77615	.22822	.20757
#2	19.812	.20953	.78137	.22745	.21247
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-4-c msd Acquired: 11/15/2013 17:40:13 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21977**	**.20968**
Stddev	.00021	.00049
%RSD	.09637	.23165
#1	.21962	.21002
#2	.21992	.20933
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3135.6**	**4860.8**	**71219.**	**6814.0**
Stddev	5.1	4.8	119.	7.7
%RSD	.16268	.09862	.16709	.11337
#1	3139.2	4864.2	71303.	6819.4
#2	3132.0	4857.4	71134.	6808.5

Sample Name: 480-49222-e-5-a Acquired: 11/15/2013 17:42:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00059**	**1.9775**	**.00733**	**.13256**	**.11366**
Stddev	.00045	.0291	.00509	.00088	.00032
%RSD	76.053	1.4720	69.472	.66250	.28585
#1	-.00091	1.9569	.01093	.13194	.11389
#2	-.00027	1.9981	.00373	.13318	.11343
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00029**	**67.454**	**.00029**	**.00071**	**.00234**
Stddev	.00013	.675	.00004	.00005	.00022
%RSD	46.814	1.0006	12.164	6.8933	9.2359
#1	.00019	66.977	.00032	.00068	.00218
#2	.00038	67.931	.00027	.00075	.00249
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00374**	**1.6976**	**8.2835**	**10.636**	**.05117**
Stddev	.00046	.0094	.0441	.079	.00082
%RSD	12.234	.55190	.53286	.74721	1.5977
#1	.00406	1.6910	8.2523	10.692	.05059
#2	.00342	1.7043	8.3147	10.580	.05175
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-5-a Acquired: 11/15/2013 17:42:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.228**	**.16981**	**.16301**	**.00404**	**80.213**
Stddev	.088	.00008	.00025	.00029	.121
%RSD	.33524	.04847	.15292	7.1509	.15100
#1	26.290	.16976	.16319	.00384	80.127
#2	26.166	.16987	.16284	.00425	80.299
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00342**	**-.00224**	F **73.20**	**-.00210**	**.00341**
Stddev	.00007	.00243	.05	.00060	.00030
%RSD	1.9621	108.57	.0726	28.531	8.9008
#1	.00347	-.00052	73.17	-.00253	.00320
#2	.00337	-.00396	73.24	-.00168	.00363
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.532**	**.00021**	**.57334**	**.03828**	**.00187**
Stddev	.085	.00000	.00291	.00015	.00071
%RSD	.81174	.96229	.50823	.39192	38.105
#1	10.472	.00021	.57128	.03817	.00137
#2	10.593	.00021	.57540	.03838	.00237
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-5-a Acquired: 11/15/2013 17:42:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00862	.00680
Stddev	.00010	.00014
%RSD	1.1987	2.0656
#1	.00855	.00670
#2	.00869	.00690
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3190.1	4876.5	72223.	6847.2
Stddev	.3	14.9	153.	47.2
%RSD	.00786	.30601	.21249	.68977
#1	3190.0	4887.1	72114.	6880.6
#2	3190.3	4866.0	72332.	6813.8

Sample Name: 480-49222-e-6-a Acquired: 11/15/2013 17:45:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**2.2913**	**.00794**	**.13467**	**.11831**
Stddev	.00018	.0313	.00079	.00037	.00031
%RSD	25.054	1.3649	9.9053	.27465	.26287
#1	-.00059	2.3135	.00850	.13494	.11853
#2	-.00084	2.2692	.00739	.13441	.11809
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00026**	**67.232**	**.00027**	**.00079**	**.00253**
Stddev	.00000	.211	.00012	.00015	.00014
%RSD	1.6900	.31344	46.164	19.216	5.4748
#1	.00026	67.381	.00018	.00090	.00243
#2	.00026	67.083	.00035	.00068	.00262
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00451**	**2.0630**	**8.3795**	**10.774**	**.05242**
Stddev	.00010	.0158	.0187	.066	.00195
%RSD	2.1171	.76583	.22294	.61105	3.7138
#1	.00444	2.0741	8.3927	10.728	.05105
#2	.00458	2.0518	8.3663	10.821	.05380
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-6-a Acquired: 11/15/2013 17:45:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.568**	**.15430**	**.14800**	**.00394**	**80.869**
Stddev	.033	.00004	.00084	.00021	.546
%RSD	.12448	.02578	.56885	5.3591	.67472
#1	26.592	.15427	.14740	.00379	81.255
#2	26.545	.15432	.14859	.00409	80.484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00438**	**-.00011**	F **73.75**	**-.00162**	**-.00015**
Stddev	.00095	.00019	.06	.00023	.00062
%RSD	21.693	179.32	.0803	14.136	427.72
#1	.00505	-.00024	73.79	-.00178	.00030
#2	.00371	.00003	73.71	-.00146	-.00059
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.184**	**.00024**	**.57600**	**.04057**	**.00323**
Stddev	.032	.00054	.00310	.00016	.00112
%RSD	.28338	221.78	.53791	.38866	34.738
#1	11.206	.00062	.57819	.04068	.00403
#2	11.161	-.00014	.57381	.04045	.00244
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-6-a Acquired: 11/15/2013 17:45:01 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00910	.00767
Stddev	.00011	.00009
%RSD	1.1792	1.2246
#1	.00918	.00760
#2	.00903	.00773
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3193.7	4877.3	72310.	6864.5
Stddev	2.1	2.3	67.	15.2
%RSD	.06513	.04788	.09231	.22206
#1	3192.3	4875.7	72263.	6853.7
#2	3195.2	4879.0	72357.	6875.3

Sample Name: CCV Acquired: 11/15/2013 17:47:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49728**	**25.534**	**.51763**	**.50080**	**.51434**	**.50960**	**25.047**
Stddev	.00161	.030	.00395	.00067	.00008	.00184	.055
%RSD	.32314	.11785	.76245	.13360	.01524	.36165	.21926
#1	.49842	25.555	.51484	.50033	.51440	.50830	25.009
#2	.49615	25.513	.52043	.50128	.51428	.51091	25.086
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50768**	**.49999**	**.50165**	**.49933**	**24.926**	**25.544**	**26.315**
Stddev	.00025	.00073	.00183	.00155	.150	.027	.175
%RSD	.04884	.14579	.36579	.31062	.60139	.10668	.66502
#1	.50751	.49948	.50295	.50043	24.820	25.524	26.192
#2	.50786	.50051	.50036	.49823	25.032	25.563	26.439
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50996**	**24.341**	**.50945**	**.48501**	**.51188**	**25.372**	**.50728**
Stddev	.00305	.001	.00074	.00385	.00126	.100	.00070
%RSD	.59717	.00271	.14436	.79288	.24666	.39281	.13881
#1	.51211	24.341	.50997	.48773	.51098	25.442	.50778
#2	.50780	24.341	.50893	.48229	.51277	25.301	.50678
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 17:47:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50262	25.00	.51863	.51038	24.864	.50725	.50703
Stddev	.00057	.06	.00077	.00226	.038	.00133	.00002
%RSD	.11274	.2330	.14777	.44296	.15410	.26183	.00457
#1	.50222	25.04	.51809	.50878	24.891	.50819	.50704
#2	.50302	24.96	.51918	.51198	24.837	.50631	.50701
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50303	.50487	.49375	.49740
Stddev	.00081	.00556	.00029	.00239
%RSD	.16151	1.1003	.05926	.47965
#1	.50361	.50880	.49354	.49909
#2	.50246	.50094	.49395	.49571
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3237.7	5001.9	74541.	6815.9
Stddev	.5	3.7	210.	8.5
%RSD	.01603	.07341	.28218	.12417
#1	3238.1	4999.3	74393.	6821.9
#2	3237.4	5004.5	74690.	6809.9

Sample Name: CCB Acquired: 11/15/2013 17:49:51 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00048**	**.01059**	**.00039**	**-.00002**	**-.00000**	**.00010**	**-.01670**
Stddev	.00000	.00266	.00270	.00014	.00001	.00001	.00137
%RSD	.96637	25.150	683.71	714.42	749.29	6.4237	8.1971
#1	-.00049	.01247	-.00151	.00008	.00000	.00011	-.01573
#2	-.00048	.00870	.00230	-.00012	-.00001	.00010	-.01767
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.00002**	**-.00037**	**-.00011**	**-.00271**	**.01893**	**.00154**
Stddev	.00008	.00008	.00024	.00010	.00124	.04341	.00003
%RSD	91.270	345.15	65.127	91.747	45.632	229.29	2.2182
#1	.00015	.00008	-.00020	-.00004	-.00359	.04963	.00152
#2	.00003	-.00003	-.00053	-.00019	-.00184	-.01176	.00156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**-.00040**	**-.00002**	**.00005**	**-.00009**	**.00196**	**-.00018**
Stddev	.00031	.00222	.00004	.00040	.00017	.00100	.00006
%RSD	118.20	547.54	182.29	783.54	197.57	51.169	31.721
#1	-.00004	-.00197	.00001	-.00023	-.00020	.00267	-.00021
#2	-.00048	.00116	-.00006	.00034	.00003	.00125	-.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 17:49:51 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00040	F .0066	.00053	.00089	-.01042	.00030	-.00017
Stddev	.00007	.0039	.00104	.00005	.01725	.00044	.00007
%RSD	18.112	59.01	197.91	5.5611	165.48	147.81	43.421
#1	.00046	.0094	-.00021	.00085	.00177	-.00001	-.00011
#2	.00035	.0039	.00126	.00092	-.02262	.00061	-.00022
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00011	.00123	.00006	.00001
Stddev	.00014	.00140	.00044	.00019
%RSD	131.77	114.45	746.63	3371.6
#1	.00021	.00222	.00037	-.00013
#2	.00001	.00023	-.00025	.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3458.8	5154.2	78040.	6879.0
Stddev	5.3	9.6	569.	15.6
%RSD	.15252	.18633	.72874	.22610
#1	3462.5	5161.0	77638.	6890.0
#2	3455.1	5147.5	78442.	6868.0

Sample Name: CCVL Acquired: 11/15/2013 17:52:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00245**	**.19935**	**.01148**	**.01935**	**.00220**	**.00210**	**.49075**
Stddev	.00048	.00069	.00035	.00018	.00001	.00007	.00651
%RSD	19.428	.34806	3.0451	.93644	.49944	3.3010	1.3257
#1	.00279	.19886	.01123	.01948	.00219	.00205	.49535
#2	.00211	.19984	.01173	.01922	.00221	.00215	.48615
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**.00406**	**.00341**	**.01018**	**.04586**	**.50076**	**.43762**
Stddev	.00004	.00011	.00026	.00004	.00150	.00631	.00093
%RSD	3.6005	2.8183	7.6450	.35074	3.2732	1.2591	.21184
#1	.00101	.00414	.00360	.01021	.04480	.49630	.43697
#2	.00107	.00397	.00323	.01016	.04692	.50521	.43828
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02834**	**.20789**	**.00333**	**.00306**	**.00997**	**.94668**	**.01034**
Stddev	.00025	.00381	.00009	.00055	.00008	.00596	.00006
%RSD	.87084	1.8338	2.6617	17.848	.80778	.62995	.55538
#1	.02817	.21059	.00327	.00344	.01003	.95090	.01030
#2	.02852	.20520	.00339	.00267	.00992	.94247	.01039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 17:52:17 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00451	.2120	.01961	.01387	.48252	.01007	.00508
Stddev	.00031	.0009	.00177	.00044	.00108	.00038	.00005
%RSD	6.8052	.4405	9.0167	3.1374	.22421	3.8224	.93101
#1	.00473	.2113	.02086	.01418	.48328	.01034	.00505
#2	.00430	.2126	.01836	.01357	.48175	.00979	.00511
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00538	.02360	.00487	.01004
Stddev	.00004	.00191	.00020	.00021
%RSD	.75657	8.1068	4.1375	2.1143
#1	.00535	.02495	.00501	.01019
#2	.00541	.02225	.00473	.00989
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3454.1	5176.2	77569.	6919.4
Stddev	2.6	11.3	5.	46.6
%RSD	.07613	.21745	.00619	.67371
#1	3455.9	5184.2	77566.	6952.4
#2	3452.2	5168.2	77572.	6886.4

Sample Name: 480-49222-e-7-a Acquired: 11/15/2013 17:54:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**1.7606**	**.00729**	**.13134**	**.11605**
Stddev	.00116	.0354	.00073	.00033	.00063
%RSD	2968.4	2.0100	10.038	.24982	.54453
#1	-.00086	1.7356	.00781	.13111	.11649
#2	.00078	1.7856	.00677	.13157	.11560
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**66.150**	**.00033**	**.00063**	**.00228**
Stddev	.00007	.396	.00003	.00005	.00018
%RSD	42.497	.59808	9.7030	8.4730	8.0207
#1	.00021	65.870	.00031	.00059	.00215
#2	.00011	66.430	.00036	.00067	.00241
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00434**	**1.5807**	**8.1975**	**10.467**	**.05164**
Stddev	.00005	.0083	.0493	.006	.00094
%RSD	1.1371	.52621	.60130	.06051	1.8178
#1	.00438	1.5748	8.1626	10.463	.05098
#2	.00431	1.5866	8.2323	10.472	.05230
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-7-a Acquired: 11/15/2013 17:54:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**25.821**	**.12237**	**.11638**	**.00387**	**79.522**
Stddev	.050	.00013	.00170	.00009	.308
%RSD	.19306	.10224	1.4578	2.4001	.38695
#1	25.857	.12246	.11758	.00380	79.305
#2	25.786	.12228	.11519	.00393	79.740
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00336**	**-.00066**	F **72.16**	**-.00020**	**.00280**
Stddev	.00009	.00090	.17	.00076	.00154
%RSD	2.6286	135.75	.2359	383.57	54.848
#1	.00329	-.00130	72.04	.00034	.00171
#2	.00342	-.00003	72.28	-.00073	.00389
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.8953**	**-.00011**	**.57107**	**.03031**	**.00429**
Stddev	.0023	.00082	.00281	.00019	.00123
%RSD	.02352	750.32	.49264	.63524	28.583
#1	9.8936	.00047	.56908	.03045	.00516
#2	9.8969	-.00069	.57306	.03018	.00342
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-7-a Acquired: 11/15/2013 17:54:42 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00812	.00621
Stddev	.00015	.00033
%RSD	1.8491	5.2885
#1	.00822	.00598
#2	.00801	.00644
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3193.1	4876.9	71886.	6794.6
Stddev	1.8	4.2	361.	35.4
%RSD	.05689	.08520	.50171	.52169
#1	3194.4	4879.9	71631.	6819.6
#2	3191.8	4874.0	72141.	6769.5

Sample Name: 480-49222-e-9-a Acquired: 11/15/2013 17:57:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**1.4590**	**.00609**	**.13488**	**.11013**
Stddev	.00059	.0098	.00011	.00034	.00003
%RSD	138.84	.66928	1.7879	.25352	.02876
#1	-.00001	1.4521	.00601	.13464	.11011
#2	-.00084	1.4659	.00616	.13512	.11016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**67.078**	**.00022**	**.00057**	**.00195**
Stddev	.00007	.087	.00003	.00003	.00012
%RSD	42.353	.12909	11.798	5.0164	6.3343
#1	.00011	67.016	.00024	.00055	.00186
#2	.00021	67.139	.00020	.00059	.00204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00348**	**1.3246**	**8.2246**	**10.489**	**.05322**
Stddev	.00006	.0160	.0567	.031	.00044
%RSD	1.8358	1.2063	.68887	.29968	.82144
#1	.00352	1.3359	8.2647	10.467	.05352
#2	.00343	1.3133	8.1846	10.511	.05291
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-9-a Acquired: 11/15/2013 17:57:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.532**	**.12616**	**.12176**	**.00417**	**81.529**
Stddev	.088	.00054	.00079	.00035	.030
%RSD	.32996	.42780	.65073	8.4100	.03667
#1	26.470	.12578	.12120	.00441	81.550
#2	26.594	.12655	.12232	.00392	81.508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00284**	**.00040**	F **74.23**	**-.00160**	**.00322**
Stddev	.00010	.00095	.23	.00024	.00105
%RSD	3.4816	235.10	.3075	15.181	32.753
#1	.00291	-.00027	74.07	-.00143	.00247
#2	.00277	.00108	74.39	-.00178	.00396
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.3337**	**-.00007**	**.57690**	**.02519**	**.00178**
Stddev	.0244	.00057	.00062	.00015	.00088
%RSD	.26175	827.93	.10746	.57875	49.530
#1	9.3165	.00033	.57647	.02530	.00241
#2	9.3510	-.00047	.57734	.02509	.00116
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-9-a Acquired: 11/15/2013 17:57:09 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00715	.00545
Stddev	.00011	.00005
%RSD	1.5404	.85477
#1	.00723	.00542
#2	.00708	.00548
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3188.8	4867.0	71953.	6884.9
Stddev	.4	.1	227.	11.3
%RSD	.01110	.00248	.31583	.16393
#1	3188.5	4866.9	72113.	6892.9
#2	3189.0	4867.1	71792.	6876.9

Sample Name: 480-49222-e-10-a Acquired: 11/15/2013 17:59:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00084**	**1.5693**	**.00521**	**.13058**	**.10990**
Stddev	.00038	.0118	.00298	.00082	.00009
%RSD	45.832	.75351	57.145	.62560	.08226
#1	-.00111	1.5777	.00732	.13000	.10997
#2	-.00057	1.5609	.00311	.13116	.10984
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**66.576**	**.00022**	**.00088**	**.00195**
Stddev	.00008	.168	.00000	.00001	.00023
%RSD	45.367	.25184	2.0720	1.3449	11.688
#1	.00012	66.694	.00022	.00087	.00211
#2	.00024	66.457	.00022	.00089	.00179
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00365**	**1.4625**	**8.1367**	**10.412**	**.05132**
Stddev	.00004	.0079	.0192	.132	.00036
%RSD	.99317	.54267	.23587	1.2687	.69873
#1	.00362	1.4569	8.1503	10.318	.05107
#2	.00367	1.4681	8.1231	10.505	.05158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-10-a Acquired: 11/15/2013 17:59:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.128**	**.16015**	**.15499**	**.00356**	**79.306**
Stddev	.033	.00056	.00241	.00007	.084
%RSD	.12637	.35053	1.5530	1.9791	.10588
#1	26.105	.16054	.15669	.00351	79.366
#2	26.152	.15975	.15329	.00361	79.247
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00424**	**-.00030**	F **72.44**	**-.00169**	**.00166**
Stddev	.00023	.00066	.06	.00126	.00435
%RSD	5.4712	216.90	.0861	74.335	261.18
#1	.00408	-.00077	72.40	-.00258	-.00141
#2	.00441	.00016	72.49	-.00080	.00474
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.5569**	**-.00033**	**.56900**	**.02795**	**.00194**
Stddev	.0619	.00020	.00163	.00020	.00041
%RSD	.64820	61.996	.28582	.72617	21.166
#1	9.6007	-.00019	.57015	.02781	.00165
#2	9.5130	-.00048	.56785	.02810	.00224
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-10-a Acquired: 11/15/2013 17:59:36 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00779**	**.00594**
Stddev	.00013	.00024
%RSD	1.7063	4.0710
#1	.00789	.00611
#2	.00770	.00577
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3198.1**	**4898.6**	**71574.**	**6840.1**
Stddev	.2	5.0	44.	13.6
%RSD	.00661	.10208	.06172	.19926
#1	3198.2	4902.1	71543.	6849.7
#2	3197.9	4895.0	71605.	6830.5

Sample Name: 480-49222-e-11-a Acquired: 11/15/2013 18:02:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**1.4069**	**.00876**	**.13493**	**.10942**
Stddev	.00094	.0160	.00068	.00002	.00035
%RSD	155.06	1.1379	7.7958	.01399	.32357
#1	.00006	1.3956	.00828	.13492	.10917
#2	-.00127	1.4182	.00924	.13494	.10967
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**68.240**	**.00034**	**.00054**	**.00177**
Stddev	.00002	.300	.00006	.00013	.00004
%RSD	19.341	.44001	16.393	24.259	2.3524
#1	.00013	68.453	.00038	.00063	.00174
#2	.00010	68.028	.00030	.00044	.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00388**	**1.1654**	**8.3135**	**10.645**	**.05236**
Stddev	.00019	.0061	.0354	.047	.00027
%RSD	4.8562	.52659	.42575	.43851	.51247
#1	.00375	1.1697	8.3386	10.678	.05254
#2	.00401	1.1611	8.2885	10.612	.05217
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-11-a Acquired: 11/15/2013 18:02:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.744**	**.12254**	**.11741**	**.00394**	**82.164**
Stddev	.038	.00003	.00027	.00001	.181
%RSD	.14281	.02459	.22756	.34390	.21986
#1	26.717	.12252	.11722	.00395	82.291
#2	26.772	.12257	.11760	.00393	82.036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00334**	**-.00119**	F **74.75**	**-.00137**	**.00119**
Stddev	.00009	.00007	.02	.00093	.00281
%RSD	2.6879	6.0770	.0258	67.419	235.65
#1	.00327	-.00114	74.76	-.00072	-.00080
#2	.00340	-.00124	74.73	-.00203	.00318
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.3782**	**.00401**	**.58753**	**.02613**	**.00325**
Stddev	.0488	.00005	.00208	.00023	.00060
%RSD	.52043	1.1239	.35385	.86376	18.295
#1	9.4127	.00404	.58900	.02629	.00283
#2	9.3437	.00398	.58606	.02597	.00367
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-11-a Acquired: 11/15/2013 18:02:04 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00699	.00529
Stddev	.00009	.00101
%RSD	1.3493	19.156
#1	.00705	.00600
#2	.00692	.00457
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3192.4	4874.9	71678.	6814.5
Stddev	5.1	9.7	238.	17.4
%RSD	.15923	.19809	.33230	.25607
#1	3196.0	4881.7	71846.	6802.1
#2	3188.8	4868.1	71509.	6826.8

Sample Name: 480-49222-e-12-a Acquired: 11/15/2013 18:04:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00073**	**1.6901**	**.00737**	**.13302**	**.11106**
Stddev	.00049	.0039	.00022	.00013	.00009
%RSD	67.854	.22909	3.0500	.10104	.08010
#1	-.00108	1.6929	.00721	.13312	.11100
#2	-.00038	1.6874	.00753	.13293	.11113
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**67.538**	**.00017**	**.00077**	**.00195**
Stddev	.00001	.032	.00003	.00002	.00004
%RSD	5.6418	.04664	18.651	3.2080	2.0278
#1	.00016	67.560	.00015	.00075	.00197
#2	.00015	67.516	.00020	.00079	.00192
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00382**	**1.4168**	**8.3462**	**10.697**	**.05220**
Stddev	.00003	.0065	.0499	.039	.00004
%RSD	.73913	.45662	.59755	.36445	.07385
#1	.00380	1.4214	8.3815	10.725	.05223
#2	.00384	1.4123	8.3109	10.670	.05218
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-12-a Acquired: 11/15/2013 18:04:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**26.508**	**.15140**	**.14550**	**.00399**	**80.724**
Stddev	.016	.00019	.00009	.00011	.410
%RSD	.05848	.12872	.06382	2.7815	.50745
#1	26.497	.15126	.14557	.00407	81.014
#2	26.519	.15154	.14544	.00391	80.435
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00395**	**-.00074**	F **73.89**	**-.00118**	**.00165**
Stddev	.00000	.00220	.03	.00218	.00074
%RSD	.01204	296.11	.0377	184.80	44.903
#1	.00395	-.00230	73.87	.00036	.00218
#2	.00395	.00081	73.91	-.00271	.00113
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.013**	**.00032**	**.58176**	**.03635**	**.00418**
Stddev	.015	.00008	.00185	.00105	.00039
%RSD	.14798	24.719	.31813	2.8903	9.2691
#1	10.003	.00038	.58045	.03561	.00446
#2	10.024	.00027	.58307	.03709	.00391
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49222-e-12-a Acquired: 11/15/2013 18:04:31 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.00798**	**.00604**
Stddev	.00022	.00019
%RSD	2.8161	3.1465
#1	.00814	.00617
#2	.00782	.00590
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3198.7**	**4890.5**	**71349.**	**6835.6**
Stddev	1.3	1.7	41.	5.5
%RSD	.04005	.03431	.05793	.08110
#1	3199.6	4889.3	71378.	6831.6
#2	3197.8	4891.7	71319.	6839.5

Sample Name: 480-49219-c-1-a Acquired: 11/15/2013 18:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**.04443**	**.00126**	**.00545**	**.00571**
Stddev	.00030	.02502	.00006	.00023	.00000
%RSD	58.058	56.308	4.4013	4.1790	.02579
#1	-.00073	.06212	.00122	.00529	.00571
#2	-.00030	.02674	.00130	.00562	.00571
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**5.1623**	**.00014**	**.00009**	**-.00022**
Stddev	.00001	.0142	.00003	.00014	.00025
%RSD	5.3125	.27560	23.712	146.67	116.65
#1	.00017	5.1523	.00011	-.00000	-.00040
#2	.00016	5.1724	.00016	.00019	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00105**	**.01452**	**.95012**	**.82324**	**.00036**
Stddev	.00010	.00007	.11326	.00005	.00031
%RSD	9.7877	.47024	11.921	.00567	85.887
#1	.00098	.01447	.87003	.82321	.00058
#2	.00113	.01456	1.0302	.82327	.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-1-a Acquired: 11/15/2013 18:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.80561**	**.00161**	**.00163**	**.00011**	**2.4239**
Stddev	.00622	.00003	.00076	.00019	.0201
%RSD	.77264	1.5576	46.942	178.73	.82898
#1	.80121	.00163	.00217	.00024	2.4097
#2	.81001	.00159	.00109	-.00003	2.4381
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00115**	**-.00184**	**.2494**	**.00021**	**-.00286**
Stddev	.00039	.00159	.0005	.00025	.00105
%RSD	33.850	86.131	.2106	120.87	36.704
#1	.00087	-.00296	.2497	.00038	-.00361
#2	.00142	-.00072	.2490	.00003	-.00212
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**7.2143**	**.00020**	**.03293**	**.00097**	**-.00047**
Stddev	.0236	.00002	.00024	.00009	.00097
%RSD	.32760	10.500	.74240	9.4431	205.57
#1	7.1976	.00021	.03276	.00103	.00021
#2	7.2310	.00018	.03311	.00090	-.00115
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-1-a Acquired: 11/15/2013 18:06:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00011	.00257
Stddev	.00017	.00015
%RSD	157.33	5.6544
#1	.00023	.00268
#2	-.00001	.00247
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3450.3	5113.6	76417.	6872.0
Stddev	1.0	1.7	173.	33.3
%RSD	.02831	.03415	.22695	.48482
#1	3449.6	5114.9	76294.	6895.6
#2	3451.0	5112.4	76539.	6848.5

Sample Name: 480-49219-c-2-a Acquired: 11/15/2013 18:09:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00028**	**.15059**	**.00112**	**.00575**	**.05427**
Stddev	.00085	.00075	.00338	.00001	.00013
%RSD	305.63	.50020	300.86	.13288	.24499
#1	.00032	.15112	.00352	.00575	.05417
#2	-.00088	.15005	-.00127	.00574	.05436
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**2.6732**	**.00012**	**.00045**	**.00014**
Stddev	.00004	.0109	.00003	.00005	.00006
%RSD	12.557	.40572	24.628	11.105	40.651
#1	.00032	2.6809	.00010	.00042	.00018
#2	.00039	2.6655	.00014	.00049	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00100**	**.14688**	**1.5848**	**1.4702**	**.00065**
Stddev	.00024	.00521	.0109	.0012	.00006
%RSD	23.948	3.5486	.69025	.08217	10.017
#1	.00117	.15057	1.5771	1.4693	.00069
#2	.00083	.14319	1.5926	1.4710	.00060
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-2-a Acquired: 11/15/2013 18:09:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.2466**	**.00844**	**.00779**	**-.00026**	**2.1306**
Stddev	.0026	.00009	.00001	.00006	.0129
%RSD	.11643	1.0323	.11470	24.798	.60599
#1	2.2485	.00850	.00779	-.00021	2.1214
#2	2.2448	.00838	.00780	-.00030	2.1397
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**-.00086**	**.0889**	**-.00078**	**-.00007**
Stddev	.00010	.00012	.0007	.00249	.00089
%RSD	63.381	14.522	.7763	317.24	1204.5
#1	.00008	-.00077	.0894	-.00254	.00055
#2	.00022	-.00094	.0884	.00098	-.00070
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.5116**	**-.00029**	**.03515**	**.00606**	**.00084**
Stddev	.0182	.00023	.00025	.00020	.00170
%RSD	.40357	79.745	.70545	3.3525	201.86
#1	4.4988	-.00013	.03497	.00591	-.00036
#2	4.5245	-.00045	.03532	.00620	.00204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-2-a Acquired: 11/15/2013 18:09:23 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00033	.00397
Stddev	.00004	.00004
%RSD	12.764	.88744
#1	.00036	.00394
#2	.00030	.00399
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3440.8	5122.3	76837.	6854.3
Stddev	7.0	3.4	118.	.6
%RSD	.20378	.06549	.15388	.00824
#1	3445.8	5124.6	76753.	6853.9
#2	3435.9	5119.9	76920.	6854.7

Sample Name: 480-49219-c-3-a Acquired: 11/15/2013 18:11:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**.03425**	**.00037**	**.00637**	**.02672**
Stddev	.00091	.02174	.00166	.00037	.00012
%RSD	420.28	63.471	451.25	5.7803	.44185
#1	.00043	.01888	.00155	.00663	.02664
#2	-.00086	.04962	-.00081	.00611	.02680
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**2.5357**	**.00013**	**.00083**	**.00149**
Stddev	.00006	.0104	.00001	.00005	.00033
%RSD	33.913	.40882	6.0729	5.5914	22.239
#1	.00020	2.5430	.00014	.00087	.00126
#2	.00012	2.5283	.00013	.00080	.00172
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00299**	**.06098**	**1.4104**	**1.2799**	**.00049**
Stddev	.00041	.00482	.0449	.0107	.00059
%RSD	13.837	7.9045	3.1826	.83784	119.42
#1	.00270	.06439	1.4421	1.2723	.00090
#2	.00328	.05757	1.3786	1.2875	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-3-a Acquired: 11/15/2013 18:11:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.3996**	**.04306**	**.03813**	**-.00006**	**3.1807**
Stddev	.0022	.00009	.00007	.00019	.0226
%RSD	.09017	.20959	.18214	312.98	.71040
#1	2.3981	.04300	.03817	-.00019	3.1967
#2	2.4012	.04313	.03808	.00007	3.1648
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**-.00222**	**.1818**	**-.00136**	**-.00094**
Stddev	.00032	.00004	.0026	.00153	.00080
%RSD	69.976	1.7764	1.404	112.57	84.294
#1	.00069	-.00225	.1800	-.00245	-.00038
#2	.00023	-.00220	.1837	-.00028	-.00151
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.7538**	**.00049**	**.01954**	**.00030**	**.00141**
Stddev	.0111	.00026	.00009	.00030	.00277
%RSD	.16423	52.096	.47124	100.42	196.51
#1	6.7460	.00031	.01961	.00051	.00337
#2	6.7617	.00068	.01948	.00009	-.00055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-3-a Acquired: 11/15/2013 18:11:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00013	.00320
Stddev	.00007	.00037
%RSD	55.648	11.610
#1	.00018	.00294
#2	.00008	.00347
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3441.7	5114.4	76906.	6865.0
Stddev	5.6	10.4	294.	8.7
%RSD	.16350	.20394	.38267	.12739
#1	3445.7	5121.8	77114.	6871.2
#2	3437.8	5107.0	76698.	6858.8

Sample Name: 480-49219-c-4-a Acquired: 11/15/2013 18:14:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**.44876**	**.00419**	**.00669**	**.01799**
Stddev	.00038	.01317	.00146	.00016	.00003
%RSD	338.96	2.9340	34.873	2.4429	.17216
#1	.00016	.45807	.00523	.00657	.01797
#2	-.00038	.43945	.00316	.00680	.01802
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**19.238**	**.00017**	**.00008**	**.00383**
Stddev	.00005	.050	.00016	.00009	.00007
%RSD	39.813	.25853	91.569	109.83	1.7762
#1	.00016	19.203	.00029	.00002	.00378
#2	.00009	19.273	.00006	.00014	.00388
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00137**	**.33889**	**1.0563**	**1.0932**	**-.00004**
Stddev	.00009	.00383	.0248	.0013	.00017
%RSD	6.7352	1.1315	2.3425	.12149	465.82
#1	.00131	.33618	1.0738	1.0941	-.00015
#2	.00144	.34160	1.0388	1.0923	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-4-a Acquired: 11/15/2013 18:14:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.540**	**.01590**	**.01443**	**-.00022**	**5.3963**
Stddev	.000	.00004	.00034	.00004	.0518
%RSD	.00407	.27028	2.3451	19.911	.95958
#1	11.541	.01593	.01419	-.00025	5.4329
#2	11.540	.01587	.01466	-.00019	5.3597
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00347**	**-.00430**	**.9571**	**-.00184**	**-.00265**
Stddev	.00048	.00052	.0032	.00021	.00476
%RSD	13.848	12.110	.3300	11.442	179.40
#1	.00313	-.00393	.9594	-.00169	.00071
#2	.00381	-.00466	.9549	-.00199	-.00602
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**15.379**	**.00035**	**.04633**	**.00820**	**.00314**
Stddev	.073	.00007	.00002	.00005	.00172
%RSD	.47569	21.386	.04116	.66506	54.816
#1	15.431	.00040	.04634	.00824	.00436
#2	15.328	.00030	.04632	.00816	.00193
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-4-a Acquired: 11/15/2013 18:14:10 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00177	.00497
Stddev	.00005	.00067
%RSD	2.9779	13.453
#1	.00173	.00450
#2	.00180	.00545
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3380.6	5082.2	75522.	6871.1
Stddev	1.7	.9	114.	9.5
%RSD	.05032	.01777	.15125	.13768
#1	3379.4	5082.8	75603.	6864.4
#2	3381.8	5081.5	75441.	6877.7

Sample Name: CCV Acquired: 11/15/2013 18:16:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50451**	**25.974**	**.51659**	**.50033**	**.52149**	**.50723**	**25.456**
Stddev	.00180	.005	.00397	.00093	.00119	.00114	.048
%RSD	.35621	.01883	.76945	.18603	.22755	.22483	.19017
#1	.50578	25.970	.51377	.49967	.52065	.50642	25.422
#2	.50324	25.977	.51940	.50099	.52233	.50803	25.490
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50347**	**.50041**	**.51465**	**.50984**	**24.801**	**26.274**	**26.850**
Stddev	.00059	.00092	.00084	.00190	.115	.015	.314
%RSD	.11763	.18395	.16291	.37235	.46526	.05797	1.1691
#1	.50305	.49976	.51405	.51118	24.719	26.285	26.628
#2	.50389	.50106	.51524	.50850	24.882	26.263	27.072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52405**	**24.569**	**.51230**	**.48237**	**.50877**	**26.157**	**.50480**
Stddev	.00102	.017	.00150	.00079	.00102	.030	.00124
%RSD	.19520	.06936	.29229	.16290	.19998	.11354	.24613
#1	.52477	24.557	.51124	.48292	.50805	26.178	.50568
#2	.52332	24.581	.51336	.48181	.50949	26.136	.50392
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 18:16:35 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50501	25.12	.51890	.50851	25.323	.51154	.52143
Stddev	.00017	.02	.00215	.00144	.076	.00140	.00095
%RSD	.03440	.0795	.41401	.28307	.30159	.27306	.18275
#1	.50514	25.10	.52042	.50749	25.269	.51055	.52210
#2	.50489	25.13	.51738	.50953	25.377	.51253	.52076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51030	.50816	.50661	.50443
Stddev	.00054	.00276	.00032	.00084
%RSD	.10593	.54316	.06261	.16690
#1	.50992	.50621	.50684	.50383
#2	.51069	.51012	.50639	.50502
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3234.0	5017.4	73504.	6763.1
Stddev	.8	.7	121.	10.1
%RSD	.02416	.01417	.16422	.14991
#1	3234.5	5016.9	73418.	6770.3
#2	3233.4	5017.9	73589.	6756.0

Sample Name: CCB Acquired: 11/15/2013 18:18:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00015**	**.00794**	**.00368**	**-.00067**	**-.00003**	**.00003**	**-.01887**
Stddev	.00045	.00990	.00137	.00042	.00001	.00011	.00084
%RSD	311.43	124.71	37.157	62.958	49.799	319.29	4.4646
#1	-.00047	.01494	.00465	-.00037	-.00002	-.00004	-.01828
#2	.00017	.00094	.00272	-.00097	-.00004	.00011	-.01947
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**.00017**	**-.00044**	**.00046**	**-.00684**	**.00408**	**.00067**
Stddev	.00005	.00020	.00006	.00004	.00128	.01730	.00056
%RSD	209.02	117.77	13.192	9.3429	18.742	424.09	84.081
#1	-.00006	.00031	-.00040	.00043	-.00775	.01631	.00107
#2	.00001	.00003	-.00048	.00049	-.00594	-.00815	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00092**	**-.00202**	**-.00002**	**.00015**	**-.00010**	**-.00475**	**-.00040**
Stddev	.00065	.00112	.00002	.00034	.00002	.01495	.00019
%RSD	69.989	55.333	111.48	221.87	20.891	314.90	48.166
#1	-.00138	-.00281	-.00000	-.00009	-.00011	-.01532	-.00053
#2	-.00047	-.00123	-.00004	.00040	-.00008	.00582	-.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 18:18:57 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00043	F .0051	-.00014	-.00183	-.01754	.00068	-.00010
Stddev	.00060	.0013	.00216	.00233	.00347	.00004	.00007
%RSD	138.80	26.09	1503.3	127.44	19.753	5.3083	70.938
#1	-.00001	.0042	-.00167	-.00347	-.01509	.00065	-.00005
#2	-.00085	.0061	.00138	-.00018	-.02000	.00070	-.00015
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00049	-.00114	-.00003	.00042
Stddev	.00013	.00093	.00005	.00019
%RSD	25.640	81.129	162.51	46.038
#1	.00040	-.00180	-.00007	.00029
#2	.00058	-.00049	.00000	.00056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3453.5	5171.1	77040.	6861.2
Stddev	1.4	6.6	229.	16.2
%RSD	.04092	.12719	.29770	.23571
#1	3454.5	5166.5	77202.	6872.6
#2	3452.5	5175.8	76878.	6849.7

Sample Name: CCVL Acquired: 11/15/2013 18:21:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00255**	**.20611**	**.01206**	**.01942**	**.00221**	**.00212**	**.49992**
Stddev	.00006	.01600	.00094	.00034	.00001	.00011	.00060
%RSD	2.5013	7.7607	7.8244	1.7733	.43048	5.0579	.11970
#1	.00259	.19480	.01272	.01918	.00221	.00220	.49949
#2	.00250	.21742	.01139	.01967	.00220	.00204	.50034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**.00410**	**.00374**	**.01076**	**.05001**	**.49897**	**.43937**
Stddev	.00002	.00004	.00009	.00027	.00083	.03653	.00142
%RSD	1.5883	1.0880	2.4270	2.5325	1.6514	7.3217	.32258
#1	.00104	.00413	.00381	.01095	.05060	.52480	.43837
#2	.00102	.00407	.00368	.01056	.04943	.47313	.44037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02814**	**.20911**	**.00331**	**.00259**	**.00984**	**.97211**	**.01007**
Stddev	.00011	.00127	.00003	.00018	.00015	.01115	.00008
%RSD	.38448	.60683	.96947	7.0625	1.5267	1.1469	.83206
#1	.02806	.20821	.00334	.00246	.00973	.97999	.01013
#2	.02822	.21000	.00329	.00272	.00994	.96423	.01001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 18:21:23 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00416	.2068	.01945	.01512	.49894	.01015	.00513
Stddev	.00008	.0088	.00244	.00147	.00577	.00060	.00011
%RSD	1.8495	4.277	12.551	9.7262	1.1572	5.8817	2.0875
#1	.00421	.2006	.02118	.01615	.49486	.00973	.00506
#2	.00410	.2131	.01772	.01408	.50303	.01058	.00521
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00491	.02274	.00500	.01058
Stddev	.00051	.00205	.00024	.00024
%RSD	10.334	9.0043	4.7069	2.2216
#1	.00455	.02129	.00483	.01042
#2	.00527	.02419	.00516	.01075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3448.6	5204.3	76594.	6872.9
Stddev	.7	17.9	50.	7.9
%RSD	.01986	.34309	.06519	.11458
#1	3448.2	5216.9	76629.	6867.3
#2	3449.1	5191.7	76559.	6878.4

Sample Name: 480-49219-a-5-a Acquired: 11/15/2013 18:23:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00041**	**.01947**	**.00003**	**.00173**	**.00018**
Stddev	.00012	.02229	.00184	.00037	.00001
%RSD	29.070	114.46	5638.5	21.229	8.0397
#1	-.00033	.00371	.00133	.00199	.00019
#2	-.00050	.03523	-.00127	.00147	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**.02125**	**-.00001**	**.00019**	**-.00034**
Stddev	.00006	.00283	.00003	.00005	.00039
%RSD	72.570	13.322	361.98	27.341	113.20
#1	.00012	.02325	-.00003	.00023	-.00007
#2	.00004	.01925	.00001	.00015	-.00062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00055**	**-.00319**	**.02704**	**.00062**	**.00065**
Stddev	.00006	.00542	.00666	.00004	.00054
%RSD	11.664	170.03	24.633	7.0801	82.987
#1	.00050	-.00702	.02233	.00065	.00104
#2	.00059	.00064	.03175	.00059	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-a-5-a Acquired: 11/15/2013 18:23:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00141**	**.00005**	**-.00020**	**-.00035**	**.00096**
Stddev	.00345	.00001	.00030	.00003	.00028
%RSD	244.80	11.462	150.44	7.4261	29.331
#1	-.00103	.00005	.00001	-.00033	.00116
#2	.00385	.00006	-.00041	-.00036	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**-.00012**	**.0100**	**.00032**	**-.00056**
Stddev	.00003	.00116	.0028	.00003	.00107
%RSD	64.856	979.30	28.34	9.7440	189.41
#1	.00007	.00070	.0120	.00035	.00019
#2	.00002	-.00094	.0080	.00030	-.00132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00648**	**-.00010**	**.00016**	**.00050**	**.00201**
Stddev	.01282	.00025	.00004	.00003	.00080
%RSD	197.91	265.78	27.680	6.5167	40.097
#1	.00259	.00008	.00019	.00052	.00144
#2	-.01554	-.00027	.00013	.00048	.00257
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-a-5-a Acquired: 11/15/2013 18:23:49 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00010	.00112
Stddev	.00023	.00020
%RSD	224.01	18.025
#1	.00026	.00097
#2	-.00006	.00126
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3440.5	5131.6	76527.	6827.3
Stddev	1.4	11.4	416.	13.0
%RSD	.04150	.22306	.54314	.19011
#1	3441.6	5139.7	76233.	6836.5
#2	3439.5	5123.5	76821.	6818.1

Sample Name: 480-49219-c-6-a Acquired: 11/15/2013 18:26:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**.27661**	**.00160**	**.00477**	**.05190**
Stddev	.00033	.02444	.00340	.00025	.00018
%RSD	3277.4	8.8343	212.57	5.2880	.34316
#1	.00022	.29389	.00401	.00495	.05177
#2	-.00024	.25933	-.00081	.00459	.05203
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00029**	**.64487**	**.00017**	**.00115**	**.00023**
Stddev	.00008	.00419	.00016	.00007	.00008
%RSD	27.288	.64964	92.675	6.0839	35.892
#1	.00035	.64191	.00029	.00110	.00017
#2	.00024	.64783	.00006	.00120	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00115**	**.17312**	**.62276**	**.53646**	**.00105**
Stddev	.00009	.00518	.00379	.00059	.00080
%RSD	7.4457	2.9914	.60784	.11064	76.051
#1	.00109	.17678	.62544	.53688	.00161
#2	.00121	.16945	.62008	.53604	.00048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-6-a Acquired: 11/15/2013 18:26:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**1.4773**	**.01133**	**.01025**	**-.00008**	**1.3796**
Stddev	.0027	.00001	.00063	.00011	.0046
%RSD	.18080	.06584	6.1094	137.05	.33020
#1	1.4792	.01134	.00981	-.00016	1.3828
#2	1.4754	.01133	.01070	-.00000	1.3764
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**-.00072**	**.0526**	**.00017**	**.00054**
Stddev	.00003	.00075	.0013	.00082	.00134
%RSD	10.525	104.68	2.466	489.88	249.99
#1	.00033	-.00125	.0517	.00075	-.00041
#2	.00029	-.00019	.0535	-.00041	.00148
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.1921**	**-.00010**	**.00657**	**.00508**	**.00018**
Stddev	.0283	.00025	.00007	.00009	.00164
%RSD	.67449	236.80	1.0659	1.6964	915.67
#1	4.2121	.00007	.00652	.00514	-.00098
#2	4.1721	-.00028	.00662	.00502	.00134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49219-c-6-a Acquired: 11/15/2013 18:26:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00047	.01026
Stddev	.00018	.00022
%RSD	39.261	2.1829
#1	.00034	.01042
#2	.00060	.01010
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3439.6	5128.8	76597.	6884.7
Stddev	7.7	7.6	26.	25.9
%RSD	.22515	.14871	.03380	.37606
#1	3434.2	5123.4	76615.	6866.4
#2	3445.1	5134.2	76579.	6903.0

Sample Name: 480-49223-e-1-a Acquired: 11/15/2013 18:28:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00047**	**.10130**	**.00282**	**.00496**	**.04645**
Stddev	.00005	.00835	.00165	.00002	.00004
%RSD	10.561	8.2473	58.558	.44692	.08616
#1	.00043	.09540	.00399	.00495	.04648
#2	.00050	.10721	.00165	.00498	.04643
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**.14639**	**.00092**	**.07311**	**.00070**
Stddev	.00008	.00429	.00001	.00033	.00047
%RSD	52.244	2.9290	1.3216	.45135	67.663
#1	.00010	.14942	.00092	.07288	.00037
#2	.00022	.14336	.00091	.07334	.00104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00098**	**11.309**	**.28154**	**.22921**	**.00701**
Stddev	.00003	.040	.01071	.00093	.00045
%RSD	3.5482	.35284	3.8027	.40627	6.4021
#1	.00096	11.338	.28911	.22987	.00669
#2	.00101	11.281	.27397	.22855	.00732
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-1-a Acquired: 11/15/2013 18:28:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.13046**	**2.5911**	**2.3759**	**-.00037**	**6.5375**
Stddev	.00366	.0069	.0072	.00010	.0325
%RSD	2.8042	.26641	.30351	26.725	.49770
#1	.13305	2.5960	2.3708	-.00030	6.5605
#2	.12788	2.5862	2.3810	-.00044	6.5145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.01878**	**.00058**	**.2665**	**-.00096**	**.00004**
Stddev	.00027	.00071	.0013	.00029	.00182
%RSD	1.4146	124.12	.4983	30.600	4098.9
#1	.01896	.00007	.2674	-.00116	.00133
#2	.01859	.00108	.2655	-.00075	-.00125
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**2.9547**	**.00011**	**.00283**	**.00060**	**.00162**
Stddev	.0257	.00007	.00003	.00002	.00109
%RSD	.87108	68.048	1.0598	2.9143	67.393
#1	2.9729	.00016	.00285	.00061	.00085
#2	2.9365	.00005	.00281	.00058	.00240
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-1-a Acquired: 11/15/2013 18:28:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00047	.00621
Stddev	.00011	.00029
%RSD	22.762	4.6813
#1	.00039	.00642
#2	.00054	.00601
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3428.6	5109.2	76212.	6903.2
Stddev	3.2	6.6	24.	35.3
%RSD	.09234	.12941	.03108	.51188
#1	3430.8	5113.9	76195.	6878.2
#2	3426.3	5104.5	76229.	6928.1

Sample Name: 480-49223-e-2-a Acquired: 11/15/2013 18:31:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**1.5576**	**.00083**	**.00644**	**.00964**
Stddev	.00059	.0183	.00035	.00005	.00001
%RSD	107.61	1.1772	42.693	.83760	.07319
#1	-.00013	1.5446	.00058	.00640	.00965
#2	-.00097	1.5705	.00108	.00648	.00964
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**35.798**	**.00030**	**.00223**	**.00368**
Stddev	.00001	.000	.00003	.00003	.00003
%RSD	1.3160	.00022	9.9383	1.3110	.85064
#1	.00060	35.798	.00032	.00221	.00370
#2	.00059	35.798	.00028	.00225	.00365
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00323**	**1.2823**	**.88877**	**.85380**	**.00326**
Stddev	.00000	.0042	.02274	.00045	.00062
%RSD	.11291	.32855	2.5582	.05325	19.008
#1	.00323	1.2853	.87269	.85412	.00282
#2	.00322	1.2793	.90485	.85348	.00369
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-2-a Acquired: 11/15/2013 18:31:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**21.746**	**.06198**	**.05704**	**.00008**	**1.3005**
Stddev	.094	.00016	.00025	.00013	.0086
%RSD	.43095	.25143	.43623	175.25	.66295
#1	21.812	.06209	.05686	-.00002	1.2944
#2	21.680	.06187	.05721	.00017	1.3066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00357**	**-.00177**	**.6718**	**-.00199**	**.00114**
Stddev	.00044	.00138	.0044	.00116	.00171
%RSD	12.372	78.031	.6592	58.002	149.73
#1	.00326	-.00079	.6687	-.00281	.00235
#2	.00388	-.00274	.6750	-.00118	-.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**6.5676**	**.00009**	**.02218**	**.02067**	**.00167**
Stddev	.0562	.00011	.00002	.00131	.00125
%RSD	.85538	128.44	.09004	6.3258	74.768
#1	6.5279	.00016	.02216	.02159	.00079
#2	6.6074	.00001	.02219	.01974	.00255
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-2-a Acquired: 11/15/2013 18:31:02 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00531	.01084
Stddev	.00017	.00034
%RSD	3.1652	3.1688
#1	.00543	.01060
#2	.00519	.01109
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3325.0	5041.7	74241.	6841.4
Stddev	1.8	6.3	167.	25.4
%RSD	.05347	.12580	.22471	.37087
#1	3326.2	5046.2	74123.	6859.4
#2	3323.7	5037.2	74359.	6823.5

Sample Name: 480-49223-e-3-a Acquired: 11/15/2013 18:33:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00150**	**.87768**	**.00668**	**.01738**	**.27691**
Stddev	.00046	.04757	.00042	.00047	.00027
%RSD	30.654	5.4197	6.2471	2.7044	.09628
#1	.00117	.84404	.00697	.01705	.27709
#2	.00182	.91131	.00638	.01771	.27672
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00063**	**37.261**	**.00023**	**.02214**	**.05707**
Stddev	.00002	.251	.00002	.00011	.00054
%RSD	2.5777	.67332	9.8344	.51869	.94236
#1	.00062	37.083	.00021	.02222	.05669
#2	.00065	37.438	.00024	.02206	.05745
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00464**	**7.3768**	**6.7910**	**6.9954**	**.11803**
Stddev	.00031	.0564	.0426	.0452	.00149
%RSD	6.5730	.76402	.62781	.64620	1.2651
#1	.00486	7.3369	6.7608	7.0274	.11698
#2	.00442	7.4167	6.8211	6.9635	.11909
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-3-a Acquired: 11/15/2013 18:33:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.2606**	**8.1881**	**7.9812**	**.00271**	**1.0499**
Stddev	.0293	.0296	.0313	.00002	.0251
%RSD	.35429	.36216	.39157	.89837	2.3898
#1	8.2813	8.2091	8.0033	.00269	1.0322
#2	8.2399	8.1671	7.9592	.00272	1.0677
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.07000**	**.00045**	**.1941**	**-.00115**	**-.00084**
Stddev	.00009	.00040	.0001	.00095	.00067
%RSD	.12313	88.489	.0637	82.730	79.491
#1	.07006	.00073	.1941	-.00182	-.00037
#2	.06994	.00017	.1940	-.00048	-.00132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.7543**	**.00033**	**.52562**	**.01259**	**.00476**
Stddev	.0075	.00012	.00573	.00018	.00312
%RSD	.19919	36.311	1.0902	1.4414	65.692
#1	3.7490	.00024	.52157	.01247	.00696
#2	3.7595	.00041	.52967	.01272	.00255
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-3-a Acquired: 11/15/2013 18:33:26 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00411	.01433
Stddev	.00018	.00024
%RSD	4.3014	1.6582
#1	.00398	.01416
#2	.00423	.01450
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3329.7	5036.1	74567.	6854.4
Stddev	2.0	7.5	154.	41.8
%RSD	.05986	.14963	.20640	.61050
#1	3331.1	5041.4	74458.	6884.0
#2	3328.3	5030.8	74675.	6824.8

Sample Name: 480-49223-e-4-a Acquired: 11/15/2013 18:35:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.10804**	**.00330**	**.00471**	**.00788**
Stddev	.00062	.00679	.00241	.00002	.00000
%RSD	648.98	6.2839	72.901	.44867	.00197
#1	-.00053	.11284	.00500	.00473	.00788
#2	.00034	.10324	.00160	.00470	.00788
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.67162**	**.00011**	**.00041**	**.00040**
Stddev	.00008	.00293	.00008	.00013	.00020
%RSD	92.731	.43682	72.292	31.039	49.773
#1	.00003	.66955	.00017	.00050	.00054
#2	.00015	.67370	.00005	.00032	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00091**	**.04422**	**.18174**	**.13509**	**.00065**
Stddev	.00009	.00294	.02614	.00048	.00091
%RSD	10.409	6.6580	14.385	.35724	140.06
#1	.00084	.04630	.20023	.13475	.00001
#2	.00097	.04214	.16325	.13543	.00130
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-4-a Acquired: 11/15/2013 18:35:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.41030**	**.01989**	**.01778**	**-.00016**	**2.7231**
Stddev	.00803	.00007	.00023	.00005	.0036
%RSD	1.9582	.33839	1.2744	30.167	.13094
#1	.40462	.01984	.01794	-.00013	2.7206
#2	.41598	.01994	.01762	-.00019	2.7256
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**-.00088**	**.1110**	**.00056**	**.00201**
Stddev	.00038	.00224	.0007	.00027	.00168
%RSD	45.629	255.12	.6496	48.465	83.724
#1	.00110	-.00246	.1104	.00037	.00320
#2	.00056	.00071	.1115	.00075	.00082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.8752**	**.00013**	**.00424**	**.00046**	**.00351**
Stddev	.0343	.00026	.00007	.00024	.00295
%RSD	.88409	205.69	1.6783	51.045	83.911
#1	3.8994	.00031	.00419	.00063	.00560
#2	3.8510	-.00006	.00429	.00029	.00143
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-49223-e-4-a Acquired: 11/15/2013 18:35:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00005**	**.00221**
Stddev	.00002	.00042
%RSD	38.504	19.122
#1	-.00006	.00191
#2	-.00003	.00250
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3440.1**	**5115.9**	**76850.**	**6880.7**
Stddev	.9	7.2	217.	5.9
%RSD	.02640	.14055	.28291	.08502
#1	3440.8	5121.0	77004.	6876.6
#2	3439.5	5110.8	76696.	6884.9

Sample Name: mb 480-147458/15-b Acquired: 11/15/2013 18:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00054**	**.06172**	**.00047**	**.00194**	**.00009**
Stddev	.00006	.02436	.00069	.00044	.00000
%RSD	10.757	39.472	145.93	22.711	5.1066
#1	.00050	.07895	.00096	.00163	.00009
#2	.00058	.04449	-.00001	.00225	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**.02476**	**.00005**	**.00006**	**-.00051**
Stddev	.00002	.00322	.00010	.00006	.00036
%RSD	17.826	13.001	197.84	110.26	70.289
#1	.00009	.02248	.00013	.00010	-.00077
#2	.00011	.02703	-.00002	.00001	-.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**-.00135**	**.03416**	**.00190**	**.00017**
Stddev	.00012	.00520	.02198	.00012	.00063
%RSD	40.062	386.24	64.349	6.0432	367.87
#1	.00021	-.00502	.04970	.00182	.00062
#2	.00038	.00233	.01862	.00198	-.00028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-147458/15-b Acquired: 11/15/2013 18:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00081**	**-.00004**	**.00009**	**-.00015**	**-.00258**
Stddev	.00469	.00003	.00038	.00010	.00279
%RSD	579.40	76.378	412.19	63.738	108.37
#1	.00250	-.00002	.00036	-.00008	-.00060
#2	-.00412	-.00006	-.00018	-.00022	-.00455
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.00135**	**.0057**	**-.00029**	**.00051**
Stddev	.00042	.00062	.0036	.00054	.00427
%RSD	213.71	46.153	62.17	182.36	839.78
#1	-.00049	.00179	.0032	.00009	-.00251
#2	.00010	.00091	.0082	-.00067	.00353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.01720**	**.00050**	**-.00003**	**.00040**	**.00110**
Stddev	.00439	.00037	.00009	.00010	.00348
%RSD	25.528	74.268	344.50	26.274	315.63
#1	-.01410	.00024	.00004	.00033	-.00136
#2	-.02031	.00077	-.00009	.00047	.00357
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: mb 480-147458/15-b Acquired: 11/15/2013 18:38:25 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00013**	**.00226**
Stddev	.00012	.00058
%RSD	87.722	25.725
#1	-.00005	.00185
#2	-.00022	.00267
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3436.9**	**5144.3**	**77161.**	**6870.6**
Stddev	5.7	5.5	22.	25.2
%RSD	.16657	.10678	.02829	.36712
#1	3432.8	5140.4	77176.	6888.4
#2	3440.9	5148.2	77145.	6852.8

Sample Name: lcs 480-147458/16-b Acquired: 11/15/2013 18:40:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05145**	**10.817**	**.21203**	**.21112**	**.22120**
Stddev	.00017	.003	.00139	.00050	.00005
%RSD	.32973	.03057	.65488	.23530	.02216
#1	.05157	10.814	.21301	.21147	.22116
#2	.05133	10.819	.21105	.21077	.22123
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20956**	**10.462**	**.20629**	**.20727**	**.21451**
Stddev	.00069	.023	.00011	.00070	.00016
%RSD	.33103	.22221	.05394	.33823	.07668
#1	.21005	10.478	.20621	.20777	.21462
#2	.20907	10.445	.20636	.20678	.21439
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21241**	**10.332**	**10.490**	**10.685**	**.21283**
Stddev	.00058	.007	.013	.033	.00085
%RSD	.27191	.06907	.12128	.30866	.40033
#1	.21201	10.327	10.481	10.708	.21223
#2	.21282	10.337	10.499	10.661	.21344
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-147458/16-b Acquired: 11/15/2013 18:40:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.654**	**.20982**	**.19579**	**.21529**	**10.526**
Stddev	.001	.00005	.00174	.00029	.044
%RSD	.01123	.02536	.88811	.13686	.41526
#1	10.655	.20986	.19456	.21550	10.495
#2	10.654	.20978	.19702	.21508	10.557
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20500**	**.21065**	**10.28**	**.20450**	**.20915**
Stddev	.00009	.00132	.00	.00014	.00008
%RSD	.04598	.62828	.0441	.06818	.03896
#1	.20506	.21158	10.28	.20460	.20909
#2	.20493	.20971	10.27	.20440	.20921
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.298**	**.20333**	**.21438**	**.20177**	**.20772**
Stddev	.016	.00042	.00122	.00110	.00048
%RSD	.15944	.20501	.56953	.54551	.22970
#1	10.287	.20303	.21351	.20255	.20806
#2	10.310	.20362	.21524	.20099	.20738
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: lcs 480-147458/16-b Acquired: 11/15/2013 18:40:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21257	.20947
Stddev	.00017	.00093
%RSD	.07901	.44446
#1	.21245	.21013
#2	.21269	.20881
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3352.3	5095.2	74666.	6840.4
Stddev	2.9	.7	120.	11.7
%RSD	.08536	.01467	.16039	.17092
#1	3350.3	5094.7	74751.	6832.1
#2	3354.3	5095.8	74582.	6848.7

Sample Name: 480-48833-e-1-a Acquired: 11/15/2013 18:43:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00053**	**.01913**	**.00740**	**1.8085**	**.01064**
Stddev	.00025	.02824	.00073	.0009	.00002
%RSD	47.673	147.61	9.9323	.05024	.19655
#1	-.00035	.03910	.00688	1.8092	.01063
#2	-.00070	-.00084	.00792	1.8079	.01066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**267.65**	**.00040**	**.00021**	**.00044**
Stddev	.00001	1.79	.00005	.00006	.00026
%RSD	8.4957	.66789	11.343	27.956	58.322
#1	.00013	266.38	.00043	.00017	.00063
#2	.00015	268.91	.00037	.00025	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00194**	**1.0615**	**5.2584**	**7.9278**	**.04487**
Stddev	.00013	.0075	.0270	.0408	.00063
%RSD	6.8083	.70143	.51381	.51452	1.3954
#1	.00204	1.0563	5.2393	7.8990	.04442
#2	.00185	1.0668	5.2775	7.9567	.04531
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-1-a Acquired: 11/15/2013 18:43:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**104.92**	**.19793**	**.20059**	**.04069**	**142.49**
Stddev	.14	.00002	.00114	.00003	.04
%RSD	.13273	.00758	.56994	.07911	.02708
#1	104.82	.19794	.19978	.04072	142.46
#2	105.01	.19792	.20139	.04067	142.52
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00078**	**.00394**	F **429.3**	**.00033**	**-.00120**
Stddev	.00006	.00066	1.0	.00037	.00377
%RSD	7.8469	16.835	.2241	111.16	313.62
#1	.00082	.00441	430.0	.00060	-.00387
#2	.00073	.00347	428.6	.00007	.00146
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**3.7464**	**-.00114**	**3.4958**	**.00099**	**.00418**
Stddev	.0007	.00034	.0263	.00019	.00010
%RSD	.01961	29.570	.75255	18.819	2.3855
#1	3.7459	-.00138	3.4772	.00086	.00411
#2	3.7469	-.00090	3.5144	.00113	.00425
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-1-a Acquired: 11/15/2013 18:43:12 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00019**	**.00177**
Stddev	.00025	.00022
%RSD	132.54	12.165
#1	-.00001	.00192
#2	-.00036	.00162
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2958.3**	**4647.9**	**67658.**	**6747.9**
Stddev	5.3	2.7	169.	36.4
%RSD	.17831	.05800	.24906	.53955
#1	2962.0	4649.8	67777.	6773.6
#2	2954.6	4646.0	67539.	6722.1

Sample Name: CCV Acquired: 11/15/2013 18:45:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50814**	**25.853**	**.51909**	**.50239**	**.51937**	**.50561**	**25.382**
Stddev	.00052	.180	.00040	.00029	.00077	.00034	.079
%RSD	.10275	.69698	.07715	.05731	.14857	.06661	.31200
#1	.50851	25.726	.51937	.50219	.51882	.50537	25.326
#2	.50777	25.980	.51881	.50260	.51991	.50585	25.438
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50279**	**.50016**	**.52064**	**.51553**	**24.664**	**26.116**	**27.025**
Stddev	.00058	.00005	.00637	.00280	.007	.100	.135
%RSD	.11543	.00927	1.2225	.54369	.02658	.38219	.49976
#1	.50238	.50013	.51614	.51354	24.659	26.045	27.121
#2	.50320	.50019	.52514	.51751	24.668	26.186	26.929
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51887**	**24.718**	**.51236**	**.48481**	**.50956**	**26.039**	**.50340**
Stddev	.00170	.077	.00136	.00089	.00103	.050	.00021
%RSD	.32790	.31214	.26602	.18434	.20148	.19375	.04113
#1	.51767	24.663	.51140	.48544	.51028	26.003	.50354
#2	.52007	24.772	.51332	.48418	.50883	26.074	.50325
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 18:45:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50481	25.17	.52097	.50804	25.194	.51333	.51927
Stddev	.00244	.04	.00002	.00725	.131	.00008	.00093
%RSD	.48327	.1485	.00358	1.4267	.52139	.01469	.17926
#1	.50653	25.15	.52098	.50291	25.101	.51338	.51861
#2	.50308	25.20	.52095	.51316	25.287	.51327	.51993
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51606	.50564	.51527	.51328
Stddev	.00231	.00046	.00240	.00041
%RSD	.44738	.09061	.46582	.07928
#1	.51769	.50596	.51357	.51299
#2	.51443	.50531	.51696	.51357
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3233.1	5015.6	72700.	6740.3
Stddev	4.3	6.9	261.	3.0
%RSD	.13158	.13692	.35861	.04518
#1	3230.1	5010.8	72885.	6742.5
#2	3236.1	5020.5	72516.	6738.2

Sample Name: CCB Acquired: 11/15/2013 18:48:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00069**	**.01049**	**.00043**	**-.00014**	**-.00000**	**.00005**	**-.01866**
Stddev	.00022	.00960	.00402	.00017	.00001	.00002	.00422
%RSD	31.705	91.526	929.60	119.75	1266.8	30.941	22.636
#1	-.00053	.01728	-.00241	-.00002	.00001	.00006	-.02165
#2	-.00084	.00370	.00328	-.00026	-.00001	.00004	-.01568
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**.00007**	**-.00039**	**.00048**	**-.00079**	**.01650**	**.00058**
Stddev	.00006	.00002	.00003	.00009	.00336	.00981	.00027
%RSD	3257.6	21.844	7.2269	18.807	427.82	59.460	47.609
#1	.00004	.00006	-.00037	.00054	.00159	.00956	.00077
#2	-.00004	.00008	-.00041	.00041	-.00316	.02343	.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00068**	**-.00238**	**-.00005**	**-.00053**	**-.00022**	**-.00160**	**.00014**
Stddev	.00042	.00166	.00006	.00021	.00023	.00649	.00002
%RSD	61.075	69.757	108.46	39.811	103.92	405.12	14.272
#1	-.00098	-.00356	-.00001	-.00067	-.00006	-.00620	.00015
#2	-.00039	-.00121	-.00009	-.00038	-.00039	.00299	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 18:48:03 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	-.00037	F .0087	-.00029	.00042	-.02032	.00035	-.00006
Stddev	.00124	.0006	.00179	.00161	.01299	.00016	.00010
%RSD	331.32	6.621	611.90	385.19	63.954	45.847	169.25
#1	-.00125	.0083	.00097	-.00072	-.02950	.00024	.00001
#2	.00050	.0091	-.00156	.00156	-.01113	.00047	-.00013
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00017	.00273	.00020	-.00007
Stddev	.00021	.00042	.00009	.00010
%RSD	124.18	15.244	41.886	135.83
#1	.00031	.00302	.00026	-.00014
#2	.00002	.00243	.00014	-.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3445.4	5160.9	76627.	6868.4
Stddev	9.1	9.8	68.	6.1
%RSD	.26310	.18929	.08824	.08866
#1	3451.8	5167.8	76579.	6864.1
#2	3439.0	5154.0	76674.	6872.8

Sample Name: CCVL Acquired: 11/15/2013 18:50:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00205	.19203	.01057	.02003	.00225	.00212	.49929
Stddev	.00048	.04103	.00021	.00035	.00001	.00022	.01287
%RSD	23.274	21.368	1.9885	1.7635	.62065	10.224	2.5770
#1	.00238	.22105	.01042	.01978	.00224	.00197	.50839
#2	.00171	.16302	.01072	.02028	.00226	.00227	.49019
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00300						
Range	-30.000%						

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00100	.00411	.00342	.01055	.04370	.56651	.43857
Stddev	.00002	.00006	.00012	.00000	.00112	.03627	.00064
%RSD	2.0518	1.3982	3.6535	.01652	2.5574	6.4032	.14520
#1	.00102	.00407	.00351	.01055	.04291	.54086	.43902
#2	.00099	.00415	.00333	.01055	.04449	.59216	.43812
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02856	.21223	.00334	.00366	.00987	.96285	.01024
Stddev	.00122	.00459	.00002	.00060	.00003	.00491	.00013
%RSD	4.2891	2.1649	.64021	16.444	.28425	.50977	1.2459
#1	.02943	.20898	.00335	.00409	.00985	.96632	.01033
#2	.02769	.21548	.00332	.00324	.00989	.95938	.01015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 18:50:31 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00562	.2172	.02076	.01492	.47626	.00971	.00515
Stddev	.00188	.0037	.00185	.00383	.00085	.00031	.00007
%RSD	33.369	1.685	8.9057	25.709	.17817	3.2111	1.4252
#1	.00695	.2198	.01946	.01220	.47566	.00993	.00510
#2	.00430	.2146	.02207	.01763	.47686	.00949	.00521
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00502	.02373	.00499	.01057
Stddev	.00045	.00064	.00032	.00034
%RSD	8.8712	2.7168	6.3766	3.2317
#1	.00470	.02419	.00476	.01081
#2	.00533	.02328	.00521	.01033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3448.4	5193.3	76952.	6881.9
Stddev	16.0	19.7	129.	11.8
%RSD	.46488	.37957	.16815	.17139
#1	3459.7	5207.2	76861.	6873.6
#2	3437.0	5179.3	77044.	6890.3

Sample Name: 480-48833-e-2-a Acquired: 11/15/2013 18:52:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00072**	**.02864**	**.00255**	**.80573**	**.02449**
Stddev	.00002	.01784	.00396	.00050	.00000
%RSD	3.1151	62.295	155.15	.06173	.00342
#1	-.00073	.01603	.00535	.80538	.02449
#2	-.00070	.04126	-.00025	.80608	.02449
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**378.77**	**.00043**	**.00008**	**.00070**
Stddev	.00008	.37	.00003	.00007	.00005
%RSD	60.044	.09765	6.7213	79.555	7.4403
#1	.00008	378.51	.00045	.00004	.00074
#2	.00019	379.03	.00041	.00013	.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00167**	**-.00157**	**21.363**	**30.221**	**.23814**
Stddev	.00015	.00397	.037	.289	.00206
%RSD	8.7855	252.57	.17522	.95614	.86440
#1	.00157	-.00438	21.389	30.016	.23959
#2	.00178	.00123	21.337	30.425	.23668
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a Acquired: 11/15/2013 18:52:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**68.728**	**.00241**	**.00178**	**.03988**	**188.58**
Stddev	.035	.00002	.00061	.00006	.73
%RSD	.05105	.68148	34.433	.15866	.38707
#1	68.704	.00242	.00135	.03983	188.07
#2	68.753	.00240	.00221	.03992	189.10
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00172**	**.00187**	F **524.5**	**-.00069**	**.00134**
Stddev	.00012	.00081	1.1	.00098	.00202
%RSD	6.8163	43.441	.2176	141.60	150.85
#1	.00180	.00244	523.7	-.00139	-.00009
#2	.00164	.00129	525.4	.00000	.00277
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05180**	**-.00050**	**5.2180**	**.00155**	**.00326**
Stddev	.00544	.00024	.0180	.00006	.00612
%RSD	10.501	48.021	.34398	4.1336	187.53
#1	.05564	-.00033	5.2306	.00151	-.00106
#2	.04795	-.00067	5.2053	.00160	.00759
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a Acquired: 11/15/2013 18:52:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00023**	**.00048**
Stddev	.00021	.00081
%RSD	89.912	169.24
#1	-.00038	.00106
#2	-.00008	-.00009
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2904.7**	**4627.4**	**67004.**	**6702.6**
Stddev	2.3	2.9	57.	29.0
%RSD	.08084	.06279	.08511	.43243
#1	2906.3	4629.5	66964.	6723.1
#2	2903.0	4625.4	67044.	6682.1

Sample Name: 480-48833-e-2-a SD@5 Acquired: 11/15/2013 18:55:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00023**	**.01429**	**.00138**	**.15753**	**.00514**
Stddev	.00089	.00509	.00345	.00050	.00001
%RSD	386.78	35.624	250.80	.32027	.25255
#1	-.00086	.01069	-.00106	.15718	.00513
#2	.00040	.01790	.00382	.15789	.00514
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**78.053**	**.00030**	**.00011**	**-.00010**
Stddev	.00007	.480	.00010	.00011	.00031
%RSD	67.831	.61535	32.967	98.783	320.96
#1	.00006	78.392	.00037	.00003	-.00031
#2	.00016	77.713	.00023	.00019	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00119**	**-.00401**	**3.9637**	**4.6883**	**.04488**
Stddev	.00003	.00026	.0121	.0188	.00170
%RSD	2.8799	6.3894	.30394	.40080	3.7809
#1	.00116	-.00419	3.9722	4.7016	.04368
#2	.00121	-.00383	3.9551	4.6750	.04608
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a SD@5 Acquired: 11/15/2013 18:55:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**13.939**	**.00052**	**.00085**	**.00770**	**37.640**
Stddev	.006	.00001	.00004	.00018	.050
%RSD	.04416	2.8503	5.1977	2.4023	.13365
#1	13.934	.00053	.00081	.00757	37.604
#2	13.943	.00051	.00088	.00783	37.676
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.00108**	F **104.1**	**-.00191**	**.00206**
Stddev	.00010	.00173	.1	.00152	.00110
%RSD	52.173	160.78	.0952	79.591	53.405
#1	.00027	-.00015	104.2	-.00084	.00128
#2	.00013	.00230	104.1	-.00299	.00284
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00381**	**.00041**	**1.0673**	**.00022**	**.00511**
Stddev	.00658	.00008	.0014	.00014	.00251
%RSD	172.90	20.195	.12626	62.122	49.067
#1	-.00846	.00035	1.0683	.00013	.00334
#2	.00085	.00047	1.0664	.00032	.00688
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a SD@5 Acquired: 11/15/2013 18:55:28 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00012**	**-.00039**
Stddev	.00009	.00057
%RSD	70.379	147.29
#1	-.00018	.00002
#2	-.00006	-.00080
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3243.7**	**4940.4**	**70767.**	**6681.6**
Stddev	.5	7.0	101.	49.0
%RSD	.01549	.14110	.14265	.73405
#1	3244.0	4935.5	70838.	6646.9
#2	3243.3	4945.4	70696.	6716.2

Sample Name: 480-48833-e-2-a PDS Acquired: 11/15/2013 18:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05434**	**11.255**	**.22879**	**.99984**	**.23664**
Stddev	.00094	.005	.00110	.00000	.00161
%RSD	1.7375	.04454	.48079	.00030	.68173
#1	.05500	11.258	.22957	.99984	.23778
#2	.05367	11.251	.22801	.99984	.23550
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20740**	**386.96**	**.21587**	**.21245**	**.21170**
Stddev	.00101	1.01	.00008	.00043	.00268
%RSD	.48885	.25988	.03522	.20306	1.2680
#1	.20811	387.68	.21581	.21215	.21360
#2	.20668	386.25	.21592	.21276	.20981
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22262**	**10.256**	**33.467**	**45.163**	**.47835**
Stddev	.00215	.029	.181	.230	.00099
%RSD	.96520	.28514	.54021	.50944	.20773
#1	.22414	10.276	33.595	45.325	.47906
#2	.22110	10.235	33.340	45.000	.47765
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a PDS Acquired: 11/15/2013 18:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**77.328**	**.20679**	**.21153**	**.25395**	**195.03**
Stddev	.292	.00048	.00048	.00003	.33
%RSD	.37702	.23346	.22587	.01094	.17166
#1	77.534	.20713	.21187	.25393	195.27
#2	77.121	.20645	.21119	.25397	194.80
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20910**	**.21831**	F **505.8**	**.21520**	**.23343**
Stddev	.00006	.00097	1.2	.00001	.00406
%RSD	.02964	.44291	.2350	.00370	1.7378
#1	.20915	.21899	505.0	.21519	.23630
#2	.20906	.21763	506.6	.21520	.23056
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.599**	**.21147**	**5.4071**	**.20543**	**.20586**
Stddev	.005	.00087	.0188	.00034	.00033
%RSD	.04875	.41256	.34863	.16511	.15805
#1	10.603	.21209	5.4204	.20567	.20563
#2	10.595	.21086	5.3938	.20519	.20609
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-a PDS Acquired: 11/15/2013 18:57:51 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**.21760**	**.20633**
Stddev	.00233	.00329
%RSD	1.0688	1.5923
#1	.21924	.20865
#2	.21595	.20401
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2884.6**	**4654.4**	**66939.**	**6601.1**
Stddev	1.2	1.2	415.	20.9
%RSD	.04004	.02525	.62031	.31682
#1	2883.7	4655.2	66645.	6586.3
#2	2885.4	4653.5	67232.	6615.9

Sample Name: 480-48833-e-2-b ms Acquired: 11/15/2013 19:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05440**	**11.159**	**.23039**	**1.0470**	**.23669**
Stddev	.00020	.041	.00043	.0011	.00118
%RSD	.36347	.36938	.18755	.10414	.49795
#1	.05426	11.188	.23009	1.0477	.23586
#2	.05454	11.129	.23070	1.0462	.23753
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20848**	**399.07**	**.21781**	**.21409**	**.20973**
Stddev	.00048	1.93	.00026	.00014	.00150
%RSD	.22971	.48397	.11840	.06320	.71725
#1	.20882	397.70	.21763	.21400	.20866
#2	.20814	400.43	.21800	.21419	.21079
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22207**	**10.269**	**34.369**	**45.773**	**.48882**
Stddev	.00220	.021	.070	.121	.00255
%RSD	.99008	.20496	.20301	.26511	.52258
#1	.22051	10.284	34.319	45.688	.48701
#2	.22362	10.254	34.418	45.859	.49063
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-b ms Acquired: 11/15/2013 19:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**80.742**	**.20640**	**.21155**	**.25690**	**205.59**
Stddev	.045	.00003	.00031	.00020	.10
%RSD	.05523	.01283	.14550	.07771	.04865
#1	80.773	.20638	.21133	.25676	205.66
#2	80.710	.20642	.21177	.25704	205.52
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.21118**	**.21960**	F **541.8**	**.21739**	**.23881**
Stddev	.00000	.00053	.4	.00117	.00762
%RSD	.00020	.24360	.0780	.53645	3.1926
#1	.21118	.21998	541.5	.21821	.24420
#2	.21118	.21922	542.1	.21656	.23342
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.657**	**.21334**	**5.6139**	**.20759**	**.20694**
Stddev	.001	.00161	.0007	.00016	.00073
%RSD	.00576	.75676	.01289	.07657	.35288
#1	10.657	.21220	5.6144	.20771	.20642
#2	10.656	.21448	5.6134	.20748	.20746
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-b ms Acquired: 11/15/2013 19:00:18 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21566	.20346
Stddev	.00104	.00259
%RSD	.48423	1.2742
#1	.21492	.20529
#2	.21640	.20163
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2866.9	4630.4	67054.	6667.2
Stddev	.6	5.0	199.	.1
%RSD	.02111	.10776	.29742	.00185
#1	2867.4	4634.0	67195.	6667.1
#2	2866.5	4626.9	66913.	6667.2

Sample Name: 480-48833-e-2-c msd Acquired: 11/15/2013 19:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.05359**	**11.075**	**.22339**	**1.0109**	**.23503**
Stddev	.00023	.071	.00021	.0008	.00037
%RSD	.42979	.63773	.09460	.07731	.15785
#1	.05375	11.125	.22354	1.0115	.23477
#2	.05342	11.025	.22324	1.0104	.23529
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20527**	**388.24**	**.21439**	**.21043**	**.20896**
Stddev	.00073	3.03	.00063	.00050	.00095
%RSD	.35758	.78064	.29560	.23553	.45258
#1	.20578	390.39	.21484	.21078	.20963
#2	.20475	386.10	.21394	.21008	.20829
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.22034**	**10.143**	**33.686**	**44.138**	**.48029**
Stddev	.00003	.064	.248	.330	.00029
%RSD	.01240	.62875	.73635	.74768	.05945
#1	.22032	10.188	33.862	44.372	.48049
#2	.22036	10.098	33.511	43.905	.48009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-c msd Acquired: 11/15/2013 19:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**78.032**	**.20401**	**.21009**	**.25241**	**198.78**
Stddev	.103	.00048	.00189	.00008	.97
%RSD	.13231	.23392	.89769	.03066	.48709
#1	77.959	.20435	.20876	.25247	199.47
#2	78.105	.20367	.21142	.25236	198.10
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.20787**	**.21653**	F **522.7**	**.21278**	**.23651**
Stddev	.00048	.00088	1.0	.00254	.00508
%RSD	.23108	.40648	.1930	1.1950	2.1500
#1	.20821	.21591	523.4	.21457	.23291
#2	.20753	.21715	522.0	.21098	.24011
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.509**	**.21099**	**5.4592**	**.20423**	**.20238**
Stddev	.001	.00051	.0272	.00100	.00004
%RSD	.01047	.24037	.49863	.49199	.01943
#1	10.509	.21135	5.4784	.20352	.20240
#2	10.510	.21063	5.4399	.20494	.20235
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-2-c msd Acquired: 11/15/2013 19:02:48 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.21288	.20179
Stddev	.00073	.00110
%RSD	.34511	.54737
#1	.21236	.20257
#2	.21339	.20100
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2882.7	4647.4	66856.	6642.0
Stddev	5.9	5.0	74.	48.9
%RSD	.20343	.10818	.11032	.73625
#1	2878.5	4643.8	66908.	6607.5
#2	2886.8	4650.9	66804.	6676.6

Sample Name: 480-48833-e-3-a Acquired: 11/15/2013 19:05:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00066**	**.03062**	**.00513**	**1.3760**	**.01811**
Stddev	.00023	.01201	.00028	.0036	.00012
%RSD	34.637	39.235	5.4678	.25811	.65198
#1	-.00050	.03912	.00533	1.3785	.01819
#2	-.00083	.02213	.00493	1.3735	.01803
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**411.20**	**.00038**	**.00202**	**.00090**
Stddev	.00008	2.24	.00003	.00027	.00009
%RSD	645.45	.54505	7.8501	13.501	10.122
#1	-.00005	412.78	.00036	.00221	.00084
#2	.00007	409.61	.00040	.00182	.00097
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00184**	**.07269**	**7.2414**	**10.789**	**.07007**
Stddev	.00018	.00339	.0537	.210	.00120
%RSD	9.6041	4.6646	.74093	1.9450	1.7155
#1	.00197	.07508	7.2035	10.937	.06922
#2	.00172	.07029	7.2794	10.641	.07092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-3-a Acquired: 11/15/2013 19:05:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**78.209**	**.41083**	**.42205**	**.02442**	**129.59**
Stddev	.001	.00052	.00004	.00009	.10
%RSD	.00142	.12558	.00835	.34946	.07787
#1	78.208	.41119	.42203	.02448	129.52
#2	78.210	.41046	.42207	.02436	129.66
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00525**	**.00104**	F **487.4**	**-.00083**	**.00406**
Stddev	.00073	.00058	1.5	.00025	.00177
%RSD	13.841	55.793	.3062	30.501	43.580
#1	.00576	.00145	488.5	-.00101	.00281
#2	.00474	.00063	486.4	-.00065	.00531
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**4.7674**	**.00000**	**3.3455**	**.00159**	**.00258**
Stddev	.0111	.00023	.0004	.00017	.00174
%RSD	.23276	8547.3	.01271	10.829	67.386
#1	4.7753	.00017	3.3452	.00172	.00135
#2	4.7596	-.00016	3.3458	.00147	.00381
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-3-a Acquired: 11/15/2013 19:05:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00025**	**.00175**
Stddev	.00036	.00065
%RSD	141.68	37.460
#1	.00000	.00221
#2	-.00051	.00128
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2924.7**	**4620.9**	**67063.**	**6707.3**
Stddev	2.2	1.7	127.	17.9
%RSD	.07627	.03737	.18928	.26713
#1	2923.1	4619.7	66973.	6694.6
#2	2926.2	4622.1	67153.	6720.0

Sample Name: 480-48833-e-4-a Acquired: 11/15/2013 19:07:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00044**	**.02628**	**.00256**	**2.0226**	**.01299**
Stddev	.00062	.02780	.00131	.0080	.00006
%RSD	140.01	105.81	51.251	.39421	.47235
#1	-.00000	.04594	.00349	2.0169	.01295
#2	-.00088	.00662	.00163	2.0282	.01303
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**323.06**	**.00038**	**.00276**	**.00094**
Stddev	.00005	2.92	.00002	.00007	.00023
%RSD	40.239	.90484	6.4809	2.5234	24.403
#1	.00016	320.99	.00036	.00271	.00110
#2	.00009	325.12	.00040	.00281	.00077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00230**	**.33669**	**11.155**	**16.550**	**.06584**
Stddev	.00027	.00924	.042	.229	.00153
%RSD	11.580	2.7441	.37217	1.3812	2.3183
#1	.00211	.33015	11.126	16.389	.06477
#2	.00249	.34322	11.184	16.712	.06692
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-4-a Acquired: 11/15/2013 19:07:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**124.79**	**.69018**	**.70217**	**.01601**	**159.97**
Stddev	.00	.00049	.00013	.00031	1.51
%RSD	.00071	.07091	.01874	1.9403	.94151
#1	124.79	.69052	.70208	.01623	158.91
#2	124.79	.68983	.70227	.01579	161.04
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00637**	**.00047**	F **472.7**	**-.00256**	**.00007**
Stddev	.00010	.00166	.1	.00188	.00630
%RSD	1.5530	351.43	.0112	73.558	8577.0
#1	.00644	-.00070	472.6	-.00389	.00453
#2	.00630	.00165	472.7	-.00123	-.00438
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.6824**	**-.00070**	**3.6083**	**.00143**	**.00396**
Stddev	.0187	.00038	.0270	.00017	.00093
%RSD	.32993	53.534	.74865	12.129	23.562
#1	5.6691	-.00044	3.5892	.00131	.00462
#2	5.6956	-.00097	3.6274	.00155	.00330
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-4-a Acquired: 11/15/2013 19:07:47 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00063**	**.00701**
Stddev	.00019	.00021
%RSD	30.777	2.9758
#1	-.00049	.00687
#2	-.00077	.00716
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2920.5**	**4615.1**	**66559.**	**6680.2**
Stddev	1.7	11.7	132.	68.6
%RSD	.05987	.25434	.19822	1.0276
#1	2921.8	4623.4	66652.	6728.7
#2	2919.3	4606.8	66465.	6631.6

Sample Name: 480-48833-e-5-a Acquired: 11/15/2013 19:10:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00036**	**.02855**	**.00167**	**1.7346**	**.01530**
Stddev	.00090	.01237	.00009	.0033	.00003
%RSD	251.57	43.333	5.1410	.18956	.20481
#1	.00028	.03730	.00173	1.7323	.01528
#2	-.00100	.01980	.00161	1.7369	.01533
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**155.44**	**.00032**	**.00126**	**.00056**
Stddev	.00003	.08	.00004	.00014	.00048
%RSD	32.506	.05200	12.818	11.112	86.960
#1	.00006	155.38	.00029	.00116	.00021
#2	.00010	155.50	.00034	.00136	.00090
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00208**	**.22248**	**4.2718**	**5.9876**	**.04287**
Stddev	.00013	.00214	.0714	.0357	.00042
%RSD	6.1322	.96000	1.6723	.59583	.98329
#1	.00217	.22399	4.2213	5.9623	.04258
#2	.00199	.22097	4.3224	6.0128	.04317
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-5-a Acquired: 11/15/2013 19:10:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na8183
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**76.535**	**.49889**	**.49354**	**.05391**	**102.24**
Stddev	.024	.00036	.00298	.00018	.07
%RSD	.03158	.07309	.60385	.33741	.06971
#1	76.553	.49914	.49565	.05404	102.19
#2	76.518	.49863	.49143	.05378	102.29
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00507**	**-.00202**	F **216.8**	**-.00207**	**.00107**
Stddev	.00015	.00257	.7	.00108	.00171
%RSD	2.9721	127.11	.3028	52.358	159.94
#1	.00496	-.00020	217.2	-.00283	-.00014
#2	.00518	-.00384	216.3	-.00130	.00228
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**5.5744**	**-.00058**	**2.5479**	**.00100**	**.00515**
Stddev	.0449	.00008	.0108	.00016	.00206
%RSD	.80499	14.155	.42391	15.991	40.071
#1	5.5427	-.00052	2.5403	.00088	.00661
#2	5.6061	-.00064	2.5556	.00111	.00369
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48833-e-5-a Acquired: 11/15/2013 19:10:14 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00019**	**.00419**
Stddev	.00011	.00010
%RSD	56.657	2.4144
#1	-.00026	.00412
#2	-.00011	.00426
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3080.1**	**4781.1**	**68307.**	**6672.3**
Stddev	1.3	3.3	33.	26.1
%RSD	.04324	.06984	.04773	.39180
#1	3081.0	4783.4	68330.	6690.8
#2	3079.1	4778.7	68284.	6653.8

Sample Name: 480-48826-h-1-b Acquired: 11/15/2013 19:12:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00049**	**.03303**	**.03560**	**.02746**	**.45092**
Stddev	.00050	.00956	.00002	.00009	.00038
%RSD	101.62	28.951	.05167	.32109	.08517
#1	-.00085	.02627	.03559	.02753	.45064
#2	-.00014	.03979	.03561	.02740	.45119
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**67.405**	**.00009**	**-.00007**	**.00043**
Stddev	.00001	.141	.00007	.00017	.00005
%RSD	27.095	.20862	78.143	238.19	12.330
#1	.00003	67.505	.00004	-.00019	.00039
#2	.00004	67.306	.00014	.00005	.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00113**	**2.8479**	**.88928**	**.99114**	**.00178**
Stddev	.00008	.0009	.03767	.00637	.00026
%RSD	6.8437	.03073	4.2359	.64258	14.495
#1	.00118	2.8485	.91592	.99564	.00197
#2	.00107	2.8473	.86265	.98664	.00160
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-1-b Acquired: 11/15/2013 19:12:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**42.694**	**.01303**	**.01128**	**.00151**	**6.4680**
Stddev	.116	.00007	.00022	.00032	.0480
%RSD	.27062	.53401	1.9847	21.544	.74185
#1	42.776	.01307	.01112	.00128	6.5019
#2	42.613	.01298	.01144	.00173	6.4341
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00089**	**-.00232**	**.0695**	**-.00115**	**-.00139**
Stddev	.00005	.00261	.0045	.00080	.00014
%RSD	5.6657	112.39	6.490	69.824	10.126
#1	.00092	-.00417	.0727	-.00172	-.00129
#2	.00085	-.00048	.0663	-.00058	-.00149
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.9478**	**.00012**	**.13768**	**.00048**	**.00032**
Stddev	.0665	.00006	.00091	.00069	.00052
%RSD	.66811	49.195	.66349	141.84	162.57
#1	9.9948	.00008	.13833	-.00000	-.00005
#2	9.9008	.00016	.13704	.00097	.00069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-1-b Acquired: 11/15/2013 19:12:35 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00004**	**.00103**
Stddev	.00029	.00034
%RSD	668.29	32.444
#1	.00016	.00080
#2	-.00025	.00127
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3241.3**	**4935.2**	**72896.**	**6732.0**
Stddev	2.9	4.4	383.	.2
%RSD	.08841	.08906	.52517	.00335
#1	3243.4	4938.3	72626.	6732.1
#2	3239.3	4932.1	73167.	6731.8

Sample Name: CCV Acquired: 11/15/2013 19:15:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50640**	**25.911**	**.51807**	**.50375**	**.51951**	**.50535**	**25.440**
Stddev	.00208	.096	.00189	.00080	.00174	.00231	.067
%RSD	.41073	.37128	.36501	.15845	.33566	.45790	.26265
#1	.50787	25.979	.51673	.50318	.52075	.50372	25.488
#2	.50493	25.843	.51941	.50431	.51828	.50699	25.393
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50426**	**.50175**	**.51521**	**.51254**	**24.776**	**26.266**	**27.071**
Stddev	.00052	.00003	.00239	.00097	.091	.177	.344
%RSD	.10396	.00690	.46335	.18867	.36629	.67542	1.2704
#1	.50388	.50173	.51690	.51322	24.712	26.392	27.315
#2	.50463	.50178	.51352	.51186	24.840	26.141	26.828
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52144**	**24.590**	**.51146**	**.48140**	**.50971**	**26.090**	**.50258**
Stddev	.00273	.103	.00096	.00169	.00065	.207	.00029
%RSD	.52293	.41748	.18747	.35152	.12763	.79231	.05854
#1	.52337	24.662	.51213	.48020	.50925	26.237	.50238
#2	.51951	24.517	.51078	.48259	.51017	25.944	.50279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 19:15:06 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50474	25.24	.51887	.50806	25.083	.51392	.51944
Stddev	.00240	.02	.00116	.00731	.063	.00023	.00306
%RSD	.47531	.0808	.22313	1.4380	.25226	.04538	.58911
#1	.50304	25.22	.51805	.51322	25.128	.51375	.52161
#2	.50644	25.25	.51969	.50289	25.038	.51408	.51728
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51271	.51262	.51044	.50810
Stddev	.00054	.00224	.00230	.00400
%RSD	.10449	.43717	.44968	.78775
#1	.51309	.51420	.51207	.51093
#2	.51233	.51103	.50882	.50527
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3230.8	5016.7	73170.	6704.5
Stddev	1.6	.6	307.	18.6
%RSD	.05096	.01202	.41960	.27719
#1	3232.0	5016.2	72953.	6691.3
#2	3229.6	5017.1	73387.	6717.6

Sample Name: CCB Acquired: 11/15/2013 19:17:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00043**	**-.00501**	**.00121**	**.00169**	**-.00001**	**.00002**	**-.01404**
Stddev	.00021	.00615	.00028	.00049	.00001	.00002	.00420
%RSD	49.131	122.68	22.957	28.929	54.789	124.48	29.940
#1	-.00057	-.00066	.00141	.00135	-.00001	.00004	-.01701
#2	-.00028	-.00936	.00102	.00204	-.00001	.00000	-.01107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.00019**	**-.00045**	**.00031**	**-.00234**	**.01871**	**.00131**
Stddev	.00007	.00012	.00023	.00012	.00176	.00433	.00043
%RSD	115.54	65.691	51.866	39.870	75.089	23.159	32.813
#1	.00001	.00028	-.00061	.00040	-.00359	.02178	.00101
#2	.00010	.00010	-.00028	.00022	-.00110	.01565	.00161
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**.00052**	**-.00001**	**-.00042**	**.00009**	**-.00039**	**.00003**
Stddev	.00025	.00271	.00001	.00038	.00021	.00364	.00016
%RSD	103.90	525.75	77.640	88.978	230.35	940.95	493.59
#1	.00006	-.00140	-.00000	-.00069	-.00006	-.00296	.00014
#2	.00042	.00244	-.00002	-.00016	.00023	.00219	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 19:17:28 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00032	F .0152	.00009	-.00096	-.01510	.00002	-.00009
Stddev	.00017	.0019	.00014	.00220	.01284	.00033	.00015
%RSD	51.669	12.45	152.89	229.25	85.048	1689.7	163.97
#1	.00044	.0166	.00019	.00059	-.02418	.00025	.00001
#2	.00020	.0139	-.00001	-.00251	-.00602	-.00021	-.00020
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00014	.00226	.00012	-.00010
Stddev	.00007	.00076	.00011	.00016
%RSD	47.076	33.408	92.627	157.70
#1	.00010	.00279	.00020	-.00022
#2	.00019	.00173	.00004	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3443.1	5151.7	76811.	6761.1
Stddev	5.5	12.0	360.	8.8
%RSD	.16092	.23239	.46920	.13050
#1	3447.1	5160.2	76556.	6754.9
#2	3439.2	5143.2	77065.	6767.4

Sample Name: CCVL Acquired: 11/15/2013 19:19:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00251**	**.23994**	**.01162**	**.02132**	**.00221**	**.00218**	**.49905**
Stddev	.00073	.00067	.00121	.00030	.00001	.00008	.00078
%RSD	28.884	.28127	10.454	1.4142	.27384	3.6546	.15684
#1	.00200	.23946	.01076	.02111	.00221	.00212	.49850
#2	.00303	.24042	.01247	.02153	.00220	.00223	.49961
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00115**	**.00424**	**.00385**	**.01045**	**.04773**	**.51917**	**.44288**
Stddev	.00009	.00004	.00055	.00010	.00045	.01473	.00097
%RSD	7.7616	1.0044	14.397	.93068	.93433	2.8379	.21997
#1	.00121	.00427	.00424	.01052	.04742	.50875	.44219
#2	.00108	.00421	.00346	.01038	.04805	.52958	.44356
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02840**	**.21161**	**.00335**	**.00332**	**.00991**	**.96860**	**.00984**
Stddev	.00042	.00092	.00009	.00085	.00004	.00215	.00031
%RSD	1.4883	.43502	2.5854	25.620	.37089	.22208	3.1330
#1	.02810	.21226	.00341	.00393	.00994	.96708	.00962
#2	.02870	.21096	.00328	.00272	.00988	.97013	.01005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 19:19:56 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00521	.2242	.02007	.01633	.48398	.01000	.00527
Stddev	.00024	.0039	.00091	.00274	.01439	.00022	.00017
%RSD	4.5553	1.726	4.5313	16.765	2.9723	2.2038	3.1942
#1	.00538	.2214	.01942	.01439	.49415	.01016	.00515
#2	.00504	.2269	.02071	.01826	.47381	.00984	.00539
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00517	.02345	.00496	.01042
Stddev	.00028	.00169	.00025	.00023
%RSD	5.4916	7.2258	5.1228	2.1866
#1	.00497	.02465	.00478	.01058
#2	.00537	.02226	.00514	.01026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3448.6	5194.0	76763.	6826.3
Stddev	3.6	8.9	5.	36.0
%RSD	.10575	.17222	.00646	.52771
#1	3451.2	5200.4	76760.	6851.8
#2	3446.0	5187.7	76767.	6800.8

Sample Name: 480-48826-h-2-b Acquired: 11/15/2013 19:22:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**.04286**	**.00865**	**.02211**	**.14786**
Stddev	.00083	.01971	.00186	.00031	.00044
%RSD	254.02	45.984	21.462	1.3876	.29564
#1	.00026	.02893	.00996	.02232	.14755
#2	-.00092	.05680	.00734	.02189	.14816
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00010**	**76.557**	**.00014**	**-.00006**	**-.00015**
Stddev	.00001	.019	.00005	.00014	.00008
%RSD	11.411	.02534	34.792	212.76	52.275
#1	.00010	76.543	.00017	-.00016	-.00020
#2	.00009	76.570	.00010	.00003	-.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00106**	**7.3872**	**.72723**	**.81955**	**.00236**
Stddev	.00016	.0135	.03156	.00578	.00066
%RSD	15.227	.18335	4.3396	.70564	28.105
#1	.00094	7.3967	.74954	.81546	.00189
#2	.00117	7.3776	.70491	.82364	.00283
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-2-b Acquired: 11/15/2013 19:22:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**34.313**	**.10743**	**.10087**	**.00073**	**6.3771**
Stddev	.155	.00059	.00014	.00002	.0132
%RSD	.45101	.55358	.13793	2.2189	.20687
#1	34.204	.10701	.10077	.00074	6.3678
#2	34.423	.10785	.10097	.00072	6.3864
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**-.00277**	**.1022**	**-.00234**	**.00019**
Stddev	.00047	.00185	.0025	.00019	.00551
%RSD	190.65	66.997	2.469	8.0701	2857.2
#1	.00058	-.00408	.1040	-.00221	.00409
#2	-.00009	-.00146	.1004	-.00247	-.00370
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.226**	**-.00035**	**.09858**	**.00066**	**.00342**
Stddev	.021	.00006	.00003	.00006	.00023
%RSD	.19052	16.144	.03124	9.5536	6.8500
#1	11.211	-.00031	.09856	.00070	.00326
#2	11.241	-.00039	.09861	.00061	.00359
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-2-b Acquired: 11/15/2013 19:22:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00052	.00230
Stddev	.00007	.00037
%RSD	13.820	16.102
#1	.00046	.00204
#2	.00057	.00257
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3237.8	4941.8	72486.	6730.8
Stddev	.5	.1	279.	15.4
%RSD	.01454	.00251	.38501	.22922
#1	3237.4	4941.7	72683.	6741.7
#2	3238.1	4941.9	72289.	6719.9

Sample Name: 480-48826-h-3-b Acquired: 11/15/2013 19:24:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**.00395**	**.01490**	**.01909**	**.27376**
Stddev	.00038	.00859	.00078	.00052	.00007
%RSD	193.83	217.26	5.2348	2.7143	.02565
#1	-.00046	-.00212	.01435	.01946	.27381
#2	.00007	.01003	.01545	.01873	.27371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**66.965**	**.00016**	**-.00003**	**.00030**
Stddev	.00003	.486	.00008	.00003	.00001
%RSD	25.153	.72587	50.687	93.194	2.9072
#1	.00015	67.308	.00011	-.00006	.00030
#2	.00011	66.621	.00022	-.00001	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00044**	**5.4829**	**.65238**	**.75370**	**.00153**
Stddev	.00034	.0114	.05022	.00280	.00046
%RSD	76.862	.20804	7.6984	.37147	30.176
#1	.00020	5.4910	.68789	.75568	.00120
#2	.00068	5.4748	.61687	.75172	.00185
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-3-b Acquired: 11/15/2013 19:24:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.530**	**.04094**	**.03716**	**.00075**	**5.9111**
Stddev	.097	.00012	.00088	.00030	.0700
%RSD	.29039	.28465	2.3726	40.471	1.1849
#1	33.599	.04102	.03653	.00096	5.9607
#2	33.461	.04086	.03778	.00053	5.8616
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**-.00144**	**.0664**	**-.00120**	**-.00374**
Stddev	.00000	.00068	.0040	.00148	.00128
%RSD	.84523	46.922	5.994	123.59	34.191
#1	.00020	-.00192	.0692	-.00224	-.00283
#2	.00020	-.00096	.0635	-.00015	-.00464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.456**	**.00024**	**.09293**	**.00046**	**.00176**
Stddev	.037	.00019	.00121	.00024	.00051
%RSD	.35273	76.989	1.3010	51.584	28.966
#1	10.482	.00011	.09378	.00063	.00140
#2	10.430	.00038	.09207	.00029	.00212
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-3-b Acquired: 11/15/2013 19:24:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.00277
Stddev	.00022	.00003
%RSD	1779.7	1.2472
#1	-.00015	.00279
#2	.00017	.00275
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3246.8	4946.0	73719.	6798.8
Stddev	7.3	13.9	35.	27.1
%RSD	.22472	.28198	.04741	.39871
#1	3251.9	4955.8	73694.	6779.6
#2	3241.6	4936.1	73744.	6818.0

Sample Name: 480-48826-h-4-b Acquired: 11/15/2013 19:27:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**.00705**	**.00846**	**.01524**	**.10729**
Stddev	.00007	.00028	.00287	.00008	.00063
%RSD	17.601	4.0326	33.959	.50747	.58443
#1	-.00043	.00685	.01049	.01529	.10685
#2	-.00033	.00725	.00643	.01518	.10774
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00003**	**73.774**	**.00025**	**-.00005**	**.00019**
Stddev	.00003	.218	.00007	.00023	.00038
%RSD	87.330	.29575	29.040	432.99	197.45
#1	-.00005	73.620	.00020	.00011	-.00008
#2	-.00001	73.928	.00030	-.00021	.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00100**	**3.5020**	**.47162**	**.48831**	**.00142**
Stddev	.00002	.0295	.01395	.00261	.00085
%RSD	2.2001	.84348	2.9585	.53397	60.077
#1	.00099	3.4811	.48149	.48647	.00203
#2	.00102	3.5229	.46175	.49016	.00082
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-4-b Acquired: 11/15/2013 19:27:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**33.816**	**.04648**	**.04362**	**-.00007**	**5.3102**
Stddev	.011	.00015	.00001	.00021	.0526
%RSD	.03345	.31556	.02802	288.66	.98995
#1	33.808	.04658	.04361	.00007	5.2730
#2	33.824	.04637	.04362	-.00022	5.3474
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**-.00156**	**3.298**	**-.00219**	**.00073**
Stddev	.00005	.00109	.021	.00005	.00127
%RSD	41.809	70.179	.6463	2.4340	174.59
#1	-.00009	-.00233	3.283	-.00222	.00162
#2	-.00016	-.00078	3.313	-.00215	-.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.497**	**.00008**	**.07960**	**.00058**	**.00262**
Stddev	.050	.00066	.00085	.00005	.00030
%RSD	.47411	817.74	1.0666	8.3221	11.472
#1	10.462	.00055	.07900	.00055	.00241
#2	10.532	-.00039	.08020	.00061	.00283
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-4-b Acquired: 11/15/2013 19:27:05 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00024**	**.00676**
Stddev	.00014	.00020
%RSD	59.797	2.9522
#1	-.00014	.00662
#2	-.00034	.00690
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3255.7**	**4965.2**	**72918.**	**6744.9**
Stddev	.8	.6	201.	23.2
%RSD	.02569	.01158	.27568	.34357
#1	3256.3	4965.6	73060.	6761.3
#2	3255.1	4964.8	72776.	6728.5

Sample Name: 480-48826-h-5-b Acquired: 11/15/2013 19:29:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**.01817**	**.00514**	**.02053**	**.08942**
Stddev	.00020	.03403	.00041	.00031	.00014
%RSD	105.61	187.33	7.9289	1.4858	.15691
#1	-.00005	-.00590	.00485	.02075	.08952
#2	-.00033	.04223	.00543	.02032	.08933
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**81.864**	**.00021**	**-.00012**	**.00035**
Stddev	.00003	.410	.00004	.00016	.00052
%RSD	56.407	.50118	17.788	128.64	147.82
#1	.00007	82.155	.00023	-.00023	-.00002
#2	.00003	81.574	.00018	-.00001	.00072
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00158**	**2.7837**	**.66352**	**.72963**	**.00146**
Stddev	.00000	.0070	.00574	.00382	.00114
%RSD	.18216	.25274	.86557	.52320	77.785
#1	.00158	2.7787	.65946	.73233	.00066
#2	.00158	2.7887	.66758	.72693	.00226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-5-b Acquired: 11/15/2013 19:29:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**36.291**	**.05739**	**.05380**	**.00059**	**6.8504**
Stddev	.078	.00019	.00080	.00008	.0065
%RSD	.21436	.33054	1.4819	13.753	.09410
#1	36.346	.05752	.05436	.00053	6.8550
#2	36.236	.05725	.05323	.00065	6.8458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00037**	**-.00198**	**.8167**	**-.00172**	**-.00034**
Stddev	.00025	.00112	.0062	.00102	.00130
%RSD	67.782	56.545	.7619	59.545	378.33
#1	.00054	-.00119	.8123	-.00099	-.00127
#2	.00019	-.00277	.8211	-.00244	.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.251**	**.00017**	**.09938**	**.00064**	**.00185**
Stddev	.049	.00030	.00050	.00025	.00192
%RSD	.43543	181.12	.49811	39.733	104.13
#1	11.286	-.00005	.09973	.00046	.00049
#2	11.217	.00038	.09903	.00081	.00321
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-5-b Acquired: 11/15/2013 19:29:27 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00000**	**.00252**
Stddev	.00037	.00014
%RSD	13911.	5.6705
#1	.00026	.00242
#2	-.00026	.00262
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3238.3**	**4945.2**	**72349.**	**6686.1**
Stddev	.3	8.1	134.	22.0
%RSD	.00946	.16436	.18479	.32870
#1	3238.5	4950.9	72255.	6670.6
#2	3238.0	4939.5	72444.	6701.6

Sample Name: 480-48826-h-6-b Acquired: 11/15/2013 19:31:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00059**	**.02551**	**.00466**	**.01382**	**.18672**
Stddev	.00096	.01435	.00331	.00057	.00109
%RSD	162.99	56.275	71.031	4.1106	.58314
#1	-.00127	.01536	.00232	.01423	.18749
#2	.00009	.03566	.00699	.01342	.18595
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**113.79**	**.00020**	**-.00005**	**.00071**
Stddev	.00003	.54	.00016	.00007	.00009
%RSD	40.502	.47362	78.477	150.05	13.284
#1	.00006	113.41	.00032	.00000	.00065
#2	.00010	114.17	.00009	-.00010	.00078
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00128**	**3.6644**	**.39429**	**.44885**	**.00163**
Stddev	.00016	.0152	.00849	.00477	.00039
%RSD	12.445	.41445	2.1521	1.0621	24.155
#1	.00139	3.6537	.40029	.44548	.00135
#2	.00117	3.6752	.38829	.45222	.00191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-6-b Acquired: 11/15/2013 19:31:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**53.344**	**.18140**	**.17284**	**.00158**	**11.182**
Stddev	.174	.00099	.00113	.00011	.011
%RSD	.32597	.54412	.65344	6.9321	.09529
#1	53.467	.18209	.17363	.00166	11.190
#2	53.221	.18070	.17204	.00150	11.175
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**-.00225**	F **22.43**	**-.00154**	**.00007**
Stddev	.00034	.00166	.02	.00079	.00199
%RSD	32.933	73.708	.0887	51.619	2896.5
#1	.00127	-.00108	22.42	-.00098	.00148
#2	.00079	-.00343	22.44	-.00210	-.00134
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.167**	**-.00020**	**.12945**	**.00111**	**.00283**
Stddev	.005	.00080	.00010	.00006	.00206
%RSD	.05331	392.42	.07690	5.5955	72.710
#1	10.170	-.00077	.12938	.00116	.00138
#2	10.163	.00036	.12952	.00107	.00429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-6-b Acquired: 11/15/2013 19:31:50 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00003**	**.00250**
Stddev	.00013	.00026
%RSD	398.02	10.435
#1	-.00013	.00269
#2	.00006	.00232
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3179.0**	**4865.8**	**71347.**	**6727.9**
Stddev	1.9	3.4	359.	30.6
%RSD	.05821	.06977	.50286	.45536
#1	3177.7	4863.4	71094.	6749.6
#2	3180.4	4868.2	71601.	6706.2

Sample Name: 480-48826-h-7-b Acquired: 11/15/2013 19:34:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00076**	**.01323**	**.00280**	**.01879**	**.12393**
Stddev	.00055	.03989	.00016	.00003	.00035
%RSD	72.610	301.47	5.6259	.15834	.28144
#1	-.00037	.04144	.00291	.01877	.12369
#2	-.00114	-.01498	.00269	.01881	.12418
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**54.356**	**.00026**	**.00003**	**.00040**
Stddev	.00004	.132	.00013	.00010	.00010
%RSD	48.341	.24349	51.415	370.69	24.565
#1	.00005	54.450	.00016	.00009	.00047
#2	.00010	54.263	.00035	-.00004	.00033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00103**	**.10011**	**.66101**	**.79750**	**.00369**
Stddev	.00013	.00191	.00122	.00165	.00047
%RSD	12.819	1.9062	.18439	.20747	12.816
#1	.00094	.09877	.66014	.79633	.00403
#2	.00113	.10146	.66187	.79867	.00336
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-7-b Acquired: 11/15/2013 19:34:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**46.919**	**.02575**	**.02400**	**.00031**	**12.501**
Stddev	.124	.00002	.00030	.00010	.033
%RSD	.26395	.06418	1.2540	30.701	.26401
#1	46.832	.02574	.02379	.00024	12.524
#2	47.007	.02576	.02421	.00038	12.477
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00487**	**-.00065**	**3.287**	**.00027**	**.00262**
Stddev	.00061	.00085	.007	.00134	.00177
%RSD	12.566	131.14	.2249	495.37	67.752
#1	.00530	-.00005	3.292	-.00068	.00136
#2	.00444	-.00125	3.281	.00122	.00387
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**9.5452**	**-.00008**	**.20355**	**.00053**	**.00246**
Stddev	.0148	.00048	.00048	.00001	.00056
%RSD	.15471	634.73	.23770	1.9046	22.902
#1	9.5556	-.00042	.20390	.00053	.00286
#2	9.5347	.00026	.20321	.00054	.00206
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-7-b Acquired: 11/15/2013 19:34:11 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00018**	**.00020**
Stddev	.00013	.00057
%RSD	72.114	291.06
#1	-.00009	-.00021
#2	-.00027	.00060
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3247.7**	**4954.0**	**72683.**	**6733.5**
Stddev	2.6	4.8	410.	3.4
%RSD	.07889	.09767	.56401	.05088
#1	3249.5	4957.4	72973.	6731.1
#2	3245.9	4950.6	72394.	6735.9

Sample Name: 480-48826-h-8-b Acquired: 11/15/2013 19:36:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**.02265**	**.00642**	**.02108**	**.13384**
Stddev	.00049	.00255	.00122	.00018	.00008
%RSD	318.94	11.268	19.055	.86299	.06088
#1	.00019	.02084	.00729	.02121	.13390
#2	-.00050	.02445	.00556	.02095	.13378
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**89.609**	**.00023**	**-.00015**	**.00016**
Stddev	.00006	.182	.00001	.00002	.00063
%RSD	96.394	.20348	6.0142	13.285	397.40
#1	.00002	89.738	.00024	-.00014	-.00029
#2	.00010	89.480	.00022	-.00017	.00060
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00091**	**3.9129**	**.65779**	**.70208**	**.00411**
Stddev	.00021	.0029	.08451	.00299	.00053
%RSD	23.182	.07464	12.847	.42631	12.898
#1	.00076	3.9149	.59803	.70419	.00449
#2	.00106	3.9108	.71754	.69996	.00374
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-8-b Acquired: 11/15/2013 19:36:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**40.058**	**.09976**	**.09290**	**.00068**	**7.1349**
Stddev	.074	.00020	.00072	.00022	.0244
%RSD	.18441	.19893	.77197	32.378	.34200
#1	40.006	.09962	.09341	.00084	7.1177
#2	40.111	.09990	.09240	.00052	7.1522
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**-.00289**	**.4673**	**-.00272**	**.00129**
Stddev	.00046	.00131	.0011	.00126	.00039
%RSD	142.12	45.218	.2423	46.273	30.005
#1	-.00000	-.00381	.4681	-.00360	.00102
#2	.00064	-.00196	.4665	-.00183	.00157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.918**	**-.00020**	**.10908**	**.00031**	**.00360**
Stddev	.005	.00048	.00003	.00025	.00190
%RSD	.03898	238.79	.03040	81.056	52.844
#1	11.914	-.00054	.10910	.00013	.00495
#2	11.921	.00014	.10905	.00049	.00226
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-8-b Acquired: 11/15/2013 19:36:34 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00006**	**.00303**
Stddev	.00008	.00037
%RSD	143.88	12.318
#1	.00000	.00330
#2	-.00012	.00277
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3214.9**	**4925.1**	**72439.**	**6739.3**
Stddev	2.1	7.0	58.	12.4
%RSD	.06540	.14191	.07976	.18466
#1	3216.4	4930.0	72480.	6730.5
#2	3213.4	4920.1	72399.	6748.1

Sample Name: 480-48826-h-9-b Acquired: 11/15/2013 19:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00095**	**.01001**	**.01554**	**.02005**	**.24258**
Stddev	.00052	.00799	.00279	.00036	.00009
%RSD	55.058	79.782	17.937	1.7752	.03765
#1	-.00058	.00436	.01751	.02030	.24264
#2	-.00132	.01566	.01357	.01980	.24251
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**139.36**	**.00037**	**-.00019**	**.00024**
Stddev	.00007	.32	.00002	.00010	.00004
%RSD	66.440	.22786	6.5814	51.384	17.199
#1	.00006	139.58	.00036	-.00012	.00021
#2	.00017	139.13	.00039	-.00025	.00027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00111**	**9.5663**	**.90539**	**1.0823**	**.00472**
Stddev	.00003	.0362	.00315	.0018	.00031
%RSD	2.6245	.37848	.34748	.16448	6.5385
#1	.00113	9.5919	.90761	1.0810	.00494
#2	.00109	9.5407	.90316	1.0835	.00450
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-9-b Acquired: 11/15/2013 19:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**61.863**	**.11513**	**.10892**	**.00023**	**12.020**
Stddev	.130	.00004	.00091	.00014	.000
%RSD	.21072	.03705	.83140	58.145	.00318
#1	61.956	.11510	.10956	.00014	12.020
#2	61.771	.11516	.10828	.00033	12.020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00262**	**-.00162**	**5.721**	**-.00093**	**-.00183**
Stddev	.00066	.00066	.018	.00540	.00157
%RSD	25.009	40.519	.3078	579.59	85.564
#1	.00216	-.00116	5.733	-.00475	-.00072
#2	.00309	-.00208	5.709	.00289	-.00294
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**12.811**	**.00045**	**.17241**	**.00086**	**.00146**
Stddev	.033	.00036	.00078	.00003	.00028
%RSD	.25401	80.864	.45011	3.4022	19.183
#1	12.834	.00071	.17296	.00084	.00126
#2	12.788	.00019	.17187	.00088	.00166
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-9-b Acquired: 11/15/2013 19:38:56 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00009**	**.00138**
Stddev	.00025	.00049
%RSD	293.34	35.251
#1	-.00026	.00104
#2	.00009	.00172
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3143.8**	**4848.5**	**70673.**	**6680.5**
Stddev	5.8	.2	27.	8.9
%RSD	.18392	.00343	.03868	.13269
#1	3139.7	4848.6	70693.	6674.2
#2	3147.8	4848.4	70654.	6686.8

Sample Name: 480-48826-h-10-b Acquired: 11/15/2013 19:41:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**.02903**	**-.00000**	**.01839**	**.11324**
Stddev	.00065	.00561	.00040	.00018	.00005
%RSD	556.65	19.310	21713.	.95281	.04246
#1	.00034	.02507	.00028	.01851	.11327
#2	-.00058	.03300	-.00028	.01827	.11320
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**84.123**	**.00029**	**-.00013**	**.00028**
Stddev	.00006	.099	.00000	.00002	.00009
%RSD	39.242	.11717	.65560	16.555	31.166
#1	.00010	84.193	.00029	-.00012	.00034
#2	.00018	84.053	.00029	-.00015	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00110**	**4.5673**	**1.2182**	**1.3898**	**.00380**
Stddev	.00036	.0133	.0148	.0019	.00102
%RSD	32.815	.29119	1.2119	.13819	26.699
#1	.00084	4.5767	1.2287	1.3912	.00452
#2	.00135	4.5579	1.2078	1.3885	.00309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-10-b Acquired: 11/15/2013 19:41:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**38.821**	**.14355**	**.13371**	**.00137**	**8.1065**
Stddev	.023	.00037	.00039	.00033	.0220
%RSD	.05968	.25751	.29446	23.882	.27193
#1	38.805	.14329	.13399	.00161	8.1221
#2	38.838	.14381	.13343	.00114	8.0909
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**-.00227**	**5.696**	**-.00223**	**.00179**
Stddev	.00011	.00059	.028	.00064	.00232
%RSD	80.696	25.877	.4941	28.516	129.36
#1	.00006	-.00185	5.716	-.00178	.00015
#2	.00021	-.00268	5.677	-.00268	.00343
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.404**	**-.00003**	**.15976**	**.00068**	**.00376**
Stddev	.057	.00006	.00048	.00037	.00111
%RSD	.54576	184.44	.30298	54.201	29.599
#1	10.444	-.00008	.16010	.00094	.00455
#2	10.364	.00001	.15942	.00042	.00298
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-10-b Acquired: 11/15/2013 19:41:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00008**	**.00073**
Stddev	.00004	.00065
%RSD	44.870	89.157
#1	-.00005	.00118
#2	-.00011	.00027
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3228.3**	**4931.5**	**72358.**	**6715.9**
Stddev	3.1	7.9	33.	3.7
%RSD	.09623	.16108	.04566	.05533
#1	3226.1	4925.9	72381.	6718.6
#2	3230.5	4937.1	72335.	6713.3

Sample Name: CCV Acquired: 11/15/2013 19:43:39 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50648**	**25.699**	**.51702**	**.50133**	**.51909**	**.50637**	**25.214**
Stddev	.00148	.086	.00203	.00039	.00294	.00241	.142
%RSD	.29250	.33658	.39178	.07769	.56641	.47541	.56142
#1	.50543	25.760	.51558	.50105	.52117	.50807	25.314
#2	.50752	25.638	.51845	.50160	.51701	.50467	25.114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50270**	**.50082**	**.51503**	**.51305**	**24.748**	**26.092**	**27.161**
Stddev	.00015	.00029	.00225	.00028	.136	.138	.274
%RSD	.03049	.05736	.43647	.05373	.54958	.52729	1.0071
#1	.50260	.50103	.51344	.51324	24.844	26.190	27.355
#2	.50281	.50062	.51662	.51285	24.651	25.995	26.968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51880**	**24.588**	**.51062**	**.48387**	**.50867**	**25.926**	**.50291**
Stddev	.00296	.036	.00091	.00146	.00049	.100	.00012
%RSD	.57141	.14488	.17857	.30178	.09685	.38682	.02358
#1	.52090	24.562	.50998	.48284	.50832	25.996	.50283
#2	.51671	24.613	.51126	.48490	.50902	25.855	.50299
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 19:43:39 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50121	25.16	.51936	.51328	25.068	.51245	.51521
Stddev	.00045	.00	.00407	.00154	.125	.00120	.00217
%RSD	.08888	.0019	.78351	.29994	.49724	.23368	.42177
#1	.50090	25.16	.52224	.51219	25.156	.51161	.51675
#2	.50153	25.16	.51648	.51437	24.980	.51330	.51367
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51220	.50486	.51122	.50814
Stddev	.00079	.00258	.00041	.00374
%RSD	.15472	.51025	.08100	.73510
#1	.51276	.50303	.51093	.50550
#2	.51164	.50668	.51151	.51078
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3232.4	5018.7	73131.	6726.4
Stddev	.5	1.5	38.	38.5
%RSD	.01553	.03046	.05182	.57262
#1	3232.0	5017.6	73158.	6699.2
#2	3232.7	5019.8	73104.	6753.7

Sample Name: CCB Acquired: 11/15/2013 19:46:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00084**	**.02549**	**.00255**	**-.00037**	**-.00001**	**.00007**	**-.01073**
Stddev	.00105	.00396	.00291	.00010	.00001	.00001	.00003
%RSD	125.39	15.529	114.40	27.646	107.63	18.741	.26749
#1	-.00158	.02269	.00049	-.00030	-.00001	.00008	-.01075
#2	-.00010	.02829	.00461	-.00044	-.00000	.00006	-.01071
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**-.00007**	**-.00048**	**.00031**	**.00049**	**.03827**	**.00017**
Stddev	.00018	.00013	.00036	.00001	.00009	.03483	.00049
%RSD	276.72	170.48	75.549	4.1647	18.414	90.999	287.00
#1	.00019	-.00017	-.00073	.00032	.00055	.06290	.00052
#2	-.00006	.00002	-.00022	.00031	.00042	.01365	-.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**-.00454**	**.00001**	**.00042**	**-.00001**	**-.00532**	**-.00019**
Stddev	.00036	.00091	.00001	.00104	.00003	.01229	.00026
%RSD	2208.1	19.966	137.57	248.00	536.35	230.90	135.68
#1	-.00024	-.00518	.00001	.00115	.00002	.00337	-.00001
#2	.00027	-.00390	.00000	-.00032	-.00003	-.01401	-.00037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 19:46:02 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00003	F .0090	-.00078	-.00076	-.01591	.00006	-.00023
Stddev	.00209	.0026	.00037	.00013	.00332	.00014	.00001
%RSD	6286.0	28.67	47.062	17.786	20.887	237.30	4.3317
#1	.00151	.0072	-.00052	-.00085	-.01356	.00016	-.00022
#2	-.00144	.0108	-.00104	-.00066	-.01826	-.00004	-.00023
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00019	.00010	.00019	-.00022
Stddev	.00013	.00238	.00010	.00020
%RSD	64.606	2297.7	51.583	89.781
#1	.00028	-.00158	.00026	-.00008
#2	.00011	.00179	.00012	-.00036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3460.7	5175.7	76971.	6794.0
Stddev	.4	.9	562.	36.7
%RSD	.01112	.01651	.73000	.54046
#1	3461.0	5176.3	76574.	6820.0
#2	3460.5	5175.1	77368.	6768.1

Sample Name: CCVL Acquired: 11/15/2013 19:48:29 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00227	.20878	.01192	.01964	.00225	.00219	.49811
Stddev	.00039	.01461	.00086	.00009	.00000	.00001	.00530
%RSD	17.373	6.9958	7.2252	.46653	.10725	.26852	1.0648
#1	.00255	.21911	.01131	.01971	.00225	.00219	.49436
#2	.00199	.19845	.01252	.01958	.00225	.00218	.50186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00101	.00403	.00404	.01064	.04861	.53889	.44466
Stddev	.00008	.00012	.00030	.00004	.00216	.01591	.00207
%RSD	8.2999	3.0146	7.4274	.33381	4.4500	2.9516	.46557
#1	.00095	.00394	.00383	.01062	.05014	.52764	.44320
#2	.00107	.00411	.00425	.01067	.04708	.55013	.44613
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02781	.21231	.00328	.00277	.00997	.98162	.00999
Stddev	.00048	.00151	.00002	.00029	.00018	.00049	.00008
%RSD	1.7172	.71216	.64189	10.506	1.7626	.05021	.84994
#1	.02815	.21338	.00330	.00257	.00984	.98127	.01005
#2	.02747	.21124	.00327	.00298	.01009	.98197	.00993
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 19:48:29 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00417	.2176	.02133	.01656	.48666	.01024	.00509
Stddev	.00001	.0007	.00007	.00203	.00631	.00034	.00001
%RSD	.31517	.3178	.31216	12.236	1.2961	3.3433	.15465
#1	.00416	.2171	.02137	.01800	.48220	.01000	.00509
#2	.00418	.2181	.02128	.01513	.49112	.01048	.00508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00507	.02176	.00511	.01057
Stddev	.00029	.00218	.00005	.00005
%RSD	5.7382	10.040	1.0343	.51427
#1	.00487	.02021	.00508	.01061
#2	.00528	.02330	.00515	.01053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3451.5	5188.1	76422.	6820.4
Stddev	11.9	13.9	128.	12.5
%RSD	.34407	.26739	.16780	.18285
#1	3459.9	5198.0	76513.	6829.2
#2	3443.1	5178.3	76331.	6811.5

Sample Name: 480-48826-h-11-b Acquired: 11/15/2013 19:50:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00052**	**.03389**	**.00219**	**.01467**	**.14908**
Stddev	.00030	.01230	.00497	.00003	.00011
%RSD	58.944	36.294	227.25	.20625	.07100
#1	-.00073	.04259	-.00133	.01465	.14900
#2	-.00030	.02519	.00570	.01469	.14915
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**96.526**	**.00028**	**-.00006**	**.00056**
Stddev	.00003	.156	.00011	.00020	.00017
%RSD	24.424	.16159	39.811	321.88	29.762
#1	.00012	96.636	.00036	.00008	.00044
#2	.00009	96.416	.00020	-.00020	.00068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00090**	**4.0719**	**.51279**	**.54655**	**.00311**
Stddev	.00001	.0042	.03765	.00048	.00049
%RSD	.91999	.10195	7.3423	.08703	15.920
#1	.00091	4.0748	.48617	.54622	.00346
#2	.00090	4.0690	.53941	.54689	.00276
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-11-b Acquired: 11/15/2013 19:50:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**43.010**	**.08853**	**.08253**	**.00017**	**6.2456**
Stddev	.053	.00012	.00065	.00048	.0042
%RSD	.12251	.13711	.78581	288.29	.06758
#1	42.973	.08844	.08207	.00051	6.2486
#2	43.047	.08862	.08299	-.00017	6.2426
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**-.00116**	**1.785**	**-.00198**	**-.00119**
Stddev	.00006	.00174	.003	.00215	.00294
%RSD	110.50	150.33	.1875	108.56	246.75
#1	-.00009	.00007	1.783	-.00046	.00089
#2	-.00001	-.00239	1.787	-.00350	-.00327
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.314**	**-.00002**	**.11234**	**.00059**	**.00284**
Stddev	.036	.00019	.00023	.00005	.00310
%RSD	.34515	790.00	.20137	7.9868	109.31
#1	10.288	-.00016	.11218	.00056	.00503
#2	10.339	.00011	.11250	.00062	.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-11-b Acquired: 11/15/2013 19:50:55 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00001	.00103
Stddev	.00019	.00028
%RSD	2429.8	27.117
#1	.00014	.00123
#2	-.00013	.00083
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3215.7	4929.7	71846.	6734.0
Stddev	1.1	.6	24.	3.1
%RSD	.03423	.01198	.03380	.04559
#1	3214.9	4929.3	71863.	6736.2
#2	3216.4	4930.2	71829.	6731.9

Sample Name: 480-48826-h-12-b Acquired: 11/15/2013 19:53:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00072**	**-.00250**	**.00556**	**.01378**	**.12957**
Stddev	.00032	.00038	.00077	.00032	.00039
%RSD	43.953	15.327	13.794	2.3253	.30397
#1	-.00050	-.00223	.00610	.01400	.12985
#2	-.00095	-.00277	.00502	.01355	.12929
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**129.03**	**.00018**	**.00025**	**.00035**
Stddev	.00005	.60	.00008	.00006	.00003
%RSD	30.452	.46194	45.054	25.258	8.2475
#1	.00018	129.45	.00012	.00021	.00033
#2	.00012	128.61	.00023	.00030	.00037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00108**	**3.9722**	**.42415**	**.46747**	**.00410**
Stddev	.00001	.0043	.00573	.00329	.00084
%RSD	.65724	.10912	1.3508	.70368	20.429
#1	.00107	3.9692	.42820	.46980	.00351
#2	.00108	3.9753	.42009	.46515	.00470
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-12-b Acquired: 11/15/2013 19:53:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**56.765**	**.19393**	**.18464**	**.00044**	**8.4921**
Stddev	.080	.00012	.00093	.00005	.0257
%RSD	.14052	.06112	.50223	11.352	.30263
#1	56.821	.19402	.18530	.00041	8.4739
#2	56.708	.19385	.18399	.00048	8.5102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**-.00215**	F **12.96**	**-.00161**	**-.00033**
Stddev	.00062	.00189	.01	.00234	.00069
%RSD	274.13	87.646	.0460	144.88	208.47
#1	-.00021	-.00082	12.96	.00004	.00016
#2	.00067	-.00349	12.97	-.00327	-.00082
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**10.127**	**.00003**	**.14708**	**.00086**	**.00215**
Stddev	.020	.00069	.00038	.00007	.00321
%RSD	.19880	2322.6	.25955	7.7342	149.30
#1	10.141	-.00046	.14735	.00090	.00442
#2	10.113	.00052	.14681	.00081	-.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-12-b Acquired: 11/15/2013 19:53:17 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00028**	**.00167**
Stddev	.00044	.00048
%RSD	158.83	28.782
#1	-.00059	.00200
#2	.00003	.00133
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3162.3**	**4855.1**	**71033.**	**6700.8**
Stddev	5.4	8.0	270.	18.1
%RSD	.16983	.16449	.37999	.27054
#1	3166.1	4860.7	70842.	6688.0
#2	3158.5	4849.4	71224.	6713.6

Sample Name: 480-48826-h-13-b Acquired: 11/15/2013 19:55:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00029**	**.03711**	**.00438**	**.01547**	**.15355**
Stddev	.00059	.04973	.00005	.00010	.00065
%RSD	201.90	133.99	1.0515	.66920	.42369
#1	-.00071	.00195	.00435	.01540	.15401
#2	.00012	.07228	.00441	.01554	.15309
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**118.28**	**.00024**	**.00093**	**.00006**
Stddev	.00007	.01	.00006	.00014	.00019
%RSD	39.279	.00569	24.028	15.486	340.78
#1	.00022	118.27	.00020	.00083	.00019
#2	.00012	118.28	.00028	.00104	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00094**	**4.7426**	**.52018**	**.54170**	**.00329**
Stddev	.00010	.0095	.03940	.00180	.00035
%RSD	10.551	.20065	7.5748	.33147	10.505
#1	.00101	4.7359	.54805	.54043	.00353
#2	.00087	4.7494	.49232	.54297	.00305
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-13-b Acquired: 11/15/2013 19:55:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**54.038**	**.17777**	**.16830**	**.00017**	**7.4175**
Stddev	.241	.00051	.00059	.00022	.0292
%RSD	.44586	.28479	.34818	127.23	.39332
#1	54.208	.17813	.16789	.00002	7.4381
#2	53.868	.17741	.16871	.00033	7.3968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00176**	**-.00220**	**1.319**	**-.00045**	**-.00065**
Stddev	.00002	.00060	.010	.00071	.00203
%RSD	1.1572	27.204	.7376	158.03	310.37
#1	.00174	-.00262	1.313	-.00096	.00078
#2	.00177	-.00178	1.326	.00005	-.00209
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.511**	**-.00029**	**.14291**	**.00099**	**.00519**
Stddev	.040	.00070	.00060	.00010	.00545
%RSD	.35114	242.59	.42017	10.478	104.92
#1	11.539	.00021	.14333	.00106	.00134
#2	11.482	-.00078	.14248	.00091	.00905
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-13-b Acquired: 11/15/2013 19:55:38 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00007**	**.00093**
Stddev	.00014	.00026
%RSD	206.99	27.868
#1	.00003	.00075
#2	-.00017	.00112
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3176.8**	**4883.8**	**71315.**	**6676.4**
Stddev	1.3	8.5	248.	16.9
%RSD	.04182	.17394	.34832	.25315
#1	3177.8	4889.8	71139.	6688.3
#2	3175.9	4877.8	71491.	6664.4

Sample Name: 480-48826-h-14-b Acquired: 11/15/2013 19:58:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.03129**	**.00605**	**.01625**	**.13414**
Stddev	.00008	.01502	.00114	.00023	.00012
%RSD	25.292	48.018	18.832	1.3892	.08851
#1	-.00038	.04191	.00686	.01641	.13423
#2	-.00026	.02066	.00524	.01610	.13406
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**100.97**	**.00034**	**-.00008**	**.00041**
Stddev	.00010	.27	.00001	.00011	.00014
%RSD	112.75	.26346	3.6845	130.52	32.948
#1	.00002	100.78	.00035	-.00001	.00032
#2	.00016	101.15	.00033	-.00016	.00051
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00117**	**5.3272**	**.83447**	**.95424**	**.00124**
Stddev	.00013	.0027	.02076	.00567	.00051
%RSD	11.513	.05097	2.4877	.59412	41.045
#1	.00126	5.3291	.81979	.95023	.00088
#2	.00107	5.3252	.84915	.95825	.00160
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-14-b Acquired: 11/15/2013 19:58:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**44.081**	**.26323**	**.24776**	**.00139**	**10.860**
Stddev	.040	.00020	.00132	.00007	.037
%RSD	.09070	.07615	.53080	5.2819	.33761
#1	44.053	.26309	.24869	.00144	10.834
#2	44.109	.26337	.24683	.00133	10.886
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**-.00278**	F **15.08**	**-.00318**	**.00016**
Stddev	.00005	.00142	.05	.00219	.00176
%RSD	10.355	51.264	.3063	68.807	1104.0
#1	.00043	-.00379	15.11	-.00473	-.00109
#2	.00050	-.00177	15.05	-.00163	.00140
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit			10.00		
Low Limit			-.2000		

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**11.823**	**.00040**	**.13905**	**.00103**	**.00331**
Stddev	.098	.00012	.00039	.00006	.00177
%RSD	.82518	29.444	.27840	5.6334	53.377
#1	11.754	.00032	.13878	.00099	.00206
#2	11.892	.00049	.13933	.00107	.00457
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-14-b Acquired: 11/15/2013 19:58:00 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00007	.00046
Stddev	.00004	.00014
%RSD	58.504	30.452
#1	.00004	.00056
#2	.00010	.00036
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3207.5	4913.1	71629.	6687.1
Stddev	4.9	4.9	118.	26.7
%RSD	.15165	.09875	.16523	.40001
#1	3211.0	4916.5	71712.	6706.0
#2	3204.1	4909.6	71545.	6668.2

Sample Name: 480-48826-h-15-b Acquired: 11/15/2013 20:00:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00049**	**.02880**	**.00296**	**.02126**	**.15037**
Stddev	.00040	.00918	.00337	.00013	.00022
%RSD	82.741	31.886	113.67	.59733	.14793
#1	-.00020	.02231	.00058	.02135	.15052
#2	-.00077	.03529	.00534	.02117	.15021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**135.03**	**.00022**	**.00070**	**.00042**
Stddev	.00007	.11	.00009	.00014	.00049
%RSD	110.02	.08180	39.293	19.395	116.05
#1	.00001	135.11	.00016	.00060	.00077
#2	.00011	134.95	.00028	.00079	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00139**	**2.4783**	**.44460**	**.53383**	**.00518**
Stddev	.00005	.0084	.03826	.00211	.00065
%RSD	3.5055	.34086	8.6050	.39567	12.603
#1	.00136	2.4843	.41755	.53532	.00564
#2	.00142	2.4723	.47165	.53233	.00471
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-15-b Acquired: 11/15/2013 20:00:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**58.478**	**.40751**	**.38913**	**.00503**	**7.5727**
Stddev	.094	.00084	.00016	.00047	.0088
%RSD	.16022	.20649	.04202	9.2537	.11653
#1	58.544	.40811	.38925	.00535	7.5790
#2	58.412	.40692	.38902	.00470	7.5665
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**-.00110**	**7.610**	**-.00147**	**.00084**
Stddev	.00057	.00035	.013	.00160	.00048
%RSD	61.515	31.596	.1765	108.73	56.841
#1	.00132	-.00085	7.600	-.00260	.00118
#2	.00052	-.00134	7.619	-.00034	.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**8.0132**	**-.00032**	**.18403**	**.00114**	**.00393**
Stddev	.0048	.00067	.00043	.00030	.00140
%RSD	.06028	212.49	.23466	26.180	35.622
#1	8.0166	.00016	.18372	.00093	.00294
#2	8.0098	-.00079	.18433	.00135	.00492
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: 480-48826-h-15-b Acquired: 11/15/2013 20:00:21 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00013**	**.00096**
Stddev	.00016	.00038
%RSD	129.05	39.321
#1	-.00024	.00070
#2	-.00001	.00123
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3157.9**	**4850.4**	**70588.**	**6678.4**
Stddev	1.4	5.0	30.	5.1
%RSD	.04463	.10330	.04276	.07678
#1	3158.9	4853.9	70566.	6682.0
#2	3156.9	4846.8	70609.	6674.8

Sample Name: BLANK Acquired: 11/15/2013 20:02:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.00627**	**-.00007**	**-.00090**	**.00010**
Stddev	.00051	.00825	.00224	.00003	.00001
%RSD	157.04	131.61	3295.8	3.1578	10.121
#1	-.00068	.00043	.00151	-.00088	.00011
#2	.00004	.01210	-.00165	-.00092	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**-.01522**	**-.00003**	**.00002**	**-.00005**
Stddev	.00001	.00664	.00001	.00004	.00027
%RSD	12.342	43.613	24.679	240.76	532.26
#1	.00012	-.01052	-.00003	-.00001	.00014
#2	.00010	-.01991	-.00002	.00004	-.00024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**-.00116**	**-.04513**	**-.00039**	**.00039**
Stddev	.00008	.00362	.02275	.00038	.00037
%RSD	16.054	313.67	50.399	98.680	94.724
#1	.00054	.00141	-.02905	-.00012	.00013
#2	.00043	-.00372	-.06122	-.00066	.00065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:02:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00161**	**-.00002**	**-.00078**	**-.00000**	**.00395**
Stddev	.00031	.00000	.00037	.00001	.00255
%RSD	19.015	16.349	47.973	536.39	64.502
#1	-.00183	-.00002	-.00051	-.00001	.00575
#2	-.00139	-.00002	-.00104	.00001	.00215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**.00021**	**.0045**	**.00048**	**.00055**
Stddev	.00000	.00157	.0061	.00047	.00138
%RSD	.03176	766.51	136.4	97.598	250.59
#1	-.00009	-.00091	.0088	.00081	-.00043
#2	-.00009	.00132	.0002	.00015	.00153
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02913**	**.00046**	**-.00014**	**-.00004**	**.00024**
Stddev	.00405	.00042	.00027	.00023	.00411
%RSD	13.905	89.714	187.76	518.78	1680.5
#1	-.02627	.00017	-.00033	.00012	.00315
#2	-.03200	.00076	.00005	-.00021	-.00266
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:02:43 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00002**	**-.00008**
Stddev	.00025	.00044
%RSD	1041.6	529.29
#1	-.00020	-.00039
#2	.00015	.00023
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3449.2**	**5153.9**	**76358.**	**6738.1**
Stddev	2.0	2.0	326.	19.7
%RSD	.05833	.03912	.42722	.29224
#1	3450.6	5152.5	76127.	6752.0
#2	3447.7	5155.3	76588.	6724.1

Sample Name: BLANK Acquired: 11/15/2013 20:05:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00048**	**.00715**	**-.00053**	**-.00116**	**.00007**
Stddev	.00011	.02298	.00070	.00025	.00002
%RSD	22.078	321.18	131.86	21.348	25.562
#1	-.00040	.02340	-.00004	-.00099	.00008
#2	-.00055	-.00909	-.00103	-.00134	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**-.01411**	**.00005**	**.00002**	**-.00055**
Stddev	.00003	.00773	.00006	.00008	.00016
%RSD	18.435	54.751	114.89	427.45	30.017
#1	.00016	-.01957	.00009	.00008	-.00066
#2	.00012	-.00865	.00001	-.00004	-.00043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00056**	**-.00162**	**.03977**	**-.00070**	**-.00084**
Stddev	.00020	.00124	.01853	.00022	.00004
%RSD	35.854	76.836	46.596	31.290	4.9154
#1	.00071	-.00249	.02666	-.00085	-.00081
#2	.00042	-.00074	.05287	-.00054	-.00087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:05:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00039**	**-.00004**	**.00014**	**-.00006**	**-.00386**
Stddev	.00075	.00004	.00071	.00029	.00546
%RSD	194.14	94.540	498.02	454.03	141.41
#1	-.00092	-.00001	-.00036	-.00027	-.00000
#2	.00014	-.00007	.00064	.00014	-.00773
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**.00081**	**.0062**	**-.00002**	**.00124**
Stddev	.00005	.00166	.0023	.00141	.00030
%RSD	122.36	206.22	37.45	7657.8	24.540
#1	.00001	-.00037	.0046	.00098	.00145
#2	.00008	.00198	.0079	-.00101	.00102
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02985**	**.00002**	**-.00006**	**.00015**	**.00138**
Stddev	.00967	.00036	.00003	.00043	.00153
%RSD	32.406	1436.9	49.282	283.24	110.72
#1	-.03670	-.00023	-.00004	-.00015	.00030
#2	-.02301	.00028	-.00009	.00046	.00246
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:05:08 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00008	.00005
Stddev	.00003	.00016
%RSD	31.326	334.96
#1	.00007	.00016
#2	.00010	-.00007
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3442.1	5158.3	76187.	6692.5
Stddev	4.5	14.7	127.	6.3
%RSD	.13054	.28591	.16695	.09411
#1	3445.2	5168.7	76277.	6688.1
#2	3438.9	5147.8	76097.	6697.0

Sample Name: BLANK Acquired: 11/15/2013 20:07:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00039**	**.01393**	**.00084**	**-.00113**	**.00005**
Stddev	.00038	.00121	.00321	.00007	.00000
%RSD	95.899	8.6760	384.11	6.2514	2.0207
#1	-.00066	.01307	-.00143	-.00108	.00005
#2	-.00013	.01478	.00311	-.00118	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**-.01457**	**.00011**	**.00012**	**-.00038**
Stddev	.00000	.00451	.00006	.00006	.00000
%RSD	2.4073	30.930	55.399	53.048	.57031
#1	.00017	-.01138	.00015	.00016	-.00038
#2	.00017	-.01775	.00006	.00007	-.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.00261**	**-.00127**	**-.00093**	**-.00019**
Stddev	.00003	.00423	.02583	.00048	.00034
%RSD	23.885	162.36	2035.2	52.173	175.75
#1	.00010	.00039	-.01953	-.00127	.00005
#2	.00014	-.00560	.01699	-.00059	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:07:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00418**	**-.00001**	**.00003**	**-.00020**	**-.00976**
Stddev	.00510	.00009	.00011	.00023	.00163
%RSD	122.01	929.77	446.84	116.16	16.724
#1	-.00778	-.00007	-.00005	-.00004	-.00860
#2	-.00057	.00005	.00010	-.00037	-.01091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.00090**	**-.0008**	**-.00124**	**-.00422**
Stddev	.00017	.00000	.0037	.00125	.00197
%RSD	723.74	.17510	477.0	100.85	46.634
#1	.00014	.00090	.0019	-.00035	-.00283
#2	-.00010	.00089	-.0034	-.00212	-.00562
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02595**	**.00001**	**-.00016**	**.00021**	**.00157**
Stddev	.01167	.00087	.00006	.00004	.00135
%RSD	44.965	6744.3	39.107	20.906	86.317
#1	-.03421	.00063	-.00021	.00018	.00061
#2	-.01770	-.00060	-.00012	.00024	.00253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:07:33 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	.00022	.00001
Stddev	.00012	.00022
%RSD	56.553	1989.0
#1	.00013	.00017
#2	.00030	-.00014
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3449.3	5168.5	77106.	6774.4
Stddev	.3	8.8	213.	49.7
%RSD	.00810	.17090	.27602	.73433
#1	3449.1	5174.7	77256.	6809.6
#2	3449.5	5162.3	76955.	6739.2

Sample Name: BLANK Acquired: 11/15/2013 20:09:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**.00625**	**.00070**	**-.00107**	**.00006**
Stddev	.00006	.00807	.00008	.00006	.00001
%RSD	16.155	129.19	12.166	5.4009	9.0840
#1	-.00042	.01196	.00076	-.00111	.00007
#2	-.00034	.00054	.00064	-.00103	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Be3130	Ca3179	Cd2288	Co2286	Cr2677
Line	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}	267.716 {126}
IS Ref	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**-.01540**	**.00015**	**.00008**	**-.00032**
Stddev	.00005	.00159	.00007	.00001	.00068
%RSD	43.746	10.342	45.961	11.356	212.61
#1	.00008	-.01652	.00010	.00008	-.00081
#2	.00015	-.01427	.00020	.00007	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Cu3247	Fe2599	K_7664	K_7664-2	Li6707
Line	324.754 {104}	259.940 {130}	766.490 { 44}	766.490 { 44}2	670.784 { 50}
IS Ref	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**.00055**	**-.00431**	**-.01767**	**-.00099**	**-.00084**
Stddev	.00012	.00277	.05071	.00057	.00008
%RSD	22.105	64.235	287.03	57.742	9.4951
#1	.00046	-.00235	-.05352	-.00058	-.00078
#2	.00063	-.00627	.01819	-.00139	-.00089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:09:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895
Line	279.079 {121}2	257.610 {131}	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00054**	**-.00000**	**-.00052**	**-.00001**	**-.00036**
Stddev	.00013	.00001	.00016	.00001	.00100
%RSD	23.508	316.03	30.081	122.38	279.75
#1	-.00063	-.00001	-.00063	-.00000	.00035
#2	-.00045	.00001	-.00041	-.00002	-.00106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.00027**	**-.00070**	**.0030**	**-.00211**	**.00140**
Stddev	.00022	.00112	.0029	.00114	.00427
%RSD	79.925	159.64	97.74	53.875	303.93
#1	-.00012	-.00149	.0009	-.00292	.00442
#2	-.00042	.00009	.0051	-.00131	-.00161
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Elem	Si2881	Sn1899	Sr4077	Ti3349	Tl1908
Line	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}	190.856 {477}
IS Ref	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm
Avg	**-.02642**	**.00000**	**-.00012**	**.00015**	**-.00036**
Stddev	.00496	.00029	.00005	.00018	.00213
%RSD	18.770	15594.	43.462	124.27	585.34
#1	-.02291	.00021	-.00008	.00002	.00114
#2	-.02993	-.00020	-.00016	.00028	-.00187
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					
Low Limit					

Sample Name: BLANK Acquired: 11/15/2013 20:09:59 Type: Unk
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	V_2924	Zn2062
Line	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(Y_3600)
Units	ppm	ppm
Avg	**-.00008**	**-.00007**
Stddev	.00005	.00018
%RSD	59.793	260.26
#1	-.00005	.00006
#2	-.00011	-.00020
Check ?	Chk Pass	Chk Pass
High Limit		
Low Limit		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**3451.0**	**5165.7**	**76307.**	**6737.0**
Stddev	6.0	7.9	347.	9.1
%RSD	.17385	.15214	.45457	.13557
#1	3455.3	5171.2	76062.	6743.5
#2	3446.8	5160.1	76552.	6730.5

Sample Name: CCV Acquired: 11/15/2013 20:12:26 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50595**	**25.824**	**.51772**	**.49997**	**.52004**	**.50617**	**25.381**
Stddev	.00267	.080	.00422	.00070	.00364	.00120	.132
%RSD	.52759	.31013	.81542	.13956	.69950	.23697	.52096
#1	.50407	25.768	.51474	.50047	.51747	.50532	25.287
#2	.50784	25.881	.52071	.49948	.52261	.50702	25.474
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50378**	**.50105**	**.51563**	**.51260**	**24.752**	**26.293**	**27.242**
Stddev	.00014	.00121	.00230	.00216	.052	.166	.122
%RSD	.02776	.24103	.44575	.42206	.21132	.63246	.44788
#1	.50368	.50020	.51401	.51107	24.715	26.175	27.156
#2	.50388	.50190	.51726	.51413	24.789	26.411	27.328
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52146**	**24.578**	**.51072**	**.48010**	**.50856**	**26.174**	**.50370**
Stddev	.00216	.022	.00081	.00008	.00122	.181	.00123
%RSD	.41504	.08868	.15888	.01733	.23961	.69143	.24382
#1	.51993	24.563	.51015	.48004	.50770	26.046	.50283
#2	.52299	24.594	.51129	.48016	.50942	26.302	.50456
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 20:12:26 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50479	25.27	.52100	.51094	25.153	.51596	.51904
Stddev	.00375	.10	.00129	.00136	.193	.00031	.00286
%RSD	.74365	.3775	.24694	.26637	.76854	.06011	.55091
#1	.50213	25.34	.52191	.51190	25.016	.51574	.51702
#2	.50744	25.20	.52009	.50998	25.290	.51617	.52106
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51445	.50851	.51087	.50526
Stddev	.00010	.00514	.00386	.00436
%RSD	.01962	1.0114	.75500	.86195
#1	.51438	.50487	.50814	.50218
#2	.51452	.51214	.51360	.50834
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3239.2	5034.9	73446.	6714.5
Stddev	2.4	.5	225.	21.7
%RSD	.07466	.00903	.30637	.32327
#1	3240.9	5034.6	73605.	6729.8
#2	3237.5	5035.2	73287.	6699.2

Sample Name: CCB Acquired: 11/15/2013 20:14:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00044**	**.02828**	**.00242**	**-.00066**	**.00000**	**.00011**	**-.01262**
Stddev	.00037	.02654	.00264	.00028	.00002	.00004	.00231
%RSD	84.536	93.867	109.25	42.581	363.86	35.623	18.292
#1	-.00070	.04705	.00055	-.00086	.00002	.00008	-.01425
#2	-.00018	.00951	.00428	-.00046	-.00001	.00014	-.01099
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.00002**	**-.00029**	**.00025**	**-.00232**	**.02825**	**.00080**
Stddev	.00004	.00019	.00018	.00015	.00218	.00084	.00001
%RSD	126.53	869.16	61.387	60.775	94.361	2.9631	1.5514
#1	.00006	.00016	-.00041	.00036	-.00386	.02884	.00079
#2	.00000	-.00011	-.00016	.00014	-.00077	.02766	.00081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00192**	**-.00001**	**-.00003**	**.00019**	**-.00327**	**-.00019**
Stddev	.00003	.00030	.00002	.00010	.00007	.00473	.00004
%RSD	143.87	15.577	358.34	317.65	38.049	144.41	18.952
#1	.00000	-.00213	.00001	.00004	.00024	-.00661	-.00022
#2	-.00005	-.00171	-.00002	-.00011	.00014	.00007	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 20:14:48 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00088	F .0059	-.00073	.00025	-.01851	.00055	-.00015
Stddev	.00000	.0017	.00051	.00224	.00215	.00069	.00012
%RSD	.27540	28.97	70.444	911.83	11.634	124.37	77.528
#1	.00088	.0047	-.00036	-.00134	-.01699	.00007	-.00023
#2	.00088	.0071	-.00109	.00183	-.02004	.00104	-.00007
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00022	.00155	-.00004	.00007
Stddev	.00006	.00252	.00001	.00012
%RSD	28.790	162.10	27.272	176.73
#1	.00026	-.00023	-.00005	-.00002
#2	.00017	.00333	-.00003	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3461.4	5186.5	76866.	6794.2
Stddev	4.1	6.8	271.	6.1
%RSD	.11831	.13103	.35204	.09003
#1	3464.3	5191.3	76674.	6798.6
#2	3458.5	5181.7	77057.	6789.9

Sample Name: CCVL Acquired: 11/15/2013 20:17:15 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00216**	**.22627**	**.01187**	**.01936**	**.00223**	**.00208**	**.50257**
Stddev	.00046	.01046	.00128	.00028	.00001	.00005	.00189
%RSD	21.428	4.6231	10.770	1.4277	.55271	2.2695	.37519
#1	.00249	.21887	.01278	.01956	.00222	.00211	.50123
#2	.00184	.23367	.01097	.01917	.00224	.00205	.50390
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00107**	**.00408**	**.00378**	**.01060**	**.04546**	**.52798**	**.44103**
Stddev	.00009	.00011	.00033	.00015	.00187	.04871	.00248
%RSD	8.6364	2.7746	8.8493	1.4058	4.1060	9.2258	.56166
#1	.00114	.00416	.00354	.01050	.04414	.49353	.43928
#2	.00101	.00400	.00401	.01071	.04678	.56242	.44278
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02955**	**.20933**	**.00333**	**.00290**	**.00979**	**.97224**	**.01027**
Stddev	.00041	.00220	.00002	.00086	.00022	.00544	.00007
%RSD	1.3731	1.0528	.72243	29.521	2.2287	.55922	.67193
#1	.02984	.21089	.00332	.00230	.00995	.96839	.01022
#2	.02926	.20777	.00335	.00351	.00964	.97608	.01032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCVL Acquired: 11/15/2013 20:17:15 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00481	.2113	.01927	.01769	.49331	.00983	.00496
Stddev	.00087	.0022	.00165	.00132	.00340	.00030	.00025
%RSD	17.998	1.025	8.5577	7.4542	.68898	3.0241	5.0854
#1	.00543	.2098	.02043	.01863	.49090	.01004	.00514
#2	.00420	.2129	.01810	.01676	.49571	.00962	.00479
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00525	.02235	.00522	.01057
Stddev	.00022	.00033	.00034	.00063
%RSD	4.1210	1.4750	6.5601	5.9357
#1	.00540	.02258	.00546	.01013
#2	.00510	.02211	.00497	.01101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3457.9	5198.3	76351.	6806.5
Stddev	10.4	12.6	168.	6.7
%RSD	.29962	.24265	.22004	.09798
#1	3465.2	5207.2	76470.	6811.2
#2	3450.6	5189.4	76232.	6801.8

Sample Name: icsa-1716849 Acquired: 11/15/2013 20:19:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00019**	**554.90**	**-.00038**	**-.00106**	**.00192**	**.00006**	**506.07**
Stddev	.00015	3.13	.00002	.00007	.00000	.00020	3.74
%RSD	75.820	.56399	4.4334	6.8402	.05552	352.60	.73883
#1	-.00030	552.68	-.00039	-.00111	.00192	.00020	503.43
#2	-.00009	557.11	-.00037	-.00101	.00192	-.00008	508.71
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00047**	**-.00091**	**.00041**	**.00274**	**204.72**	**.01906**	**.00431**
Stddev	.00014	.00018	.00004	.00018	.97	.03069	.00026
%RSD	30.498	19.592	9.4198	6.4756	.47614	160.97	6.0068
#1	.00057	-.00078	.00038	.00287	204.03	.04076	.00412
#2	.00037	-.00103	.00043	.00262	205.41	-.00264	.00449
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00260**	**515.76**	**.00136**	**.00213**	**-.00113**	**.08322**	**-.00023**
Stddev	.00102	.84	.00011	.00008	.00035	.00342	.00043
%RSD	39.376	.16291	7.9705	3.8541	31.298	4.1108	185.34
#1	.00332	516.35	.00128	.00219	-.00088	.08080	-.00053
#2	.00188	515.16	.00144	.00207	-.00138	.08564	.00007
Check ?	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: icsa-1716849 Acquired: 11/15/2013 20:19:41 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00926	-.1115	-.01738	-.00751	-.02280	.00177	.00508
Stddev	.00038	.0061	.00093	.00510	.00277	.00016	.00002
%RSD	4.0808	5.426	5.3265	67.987	12.157	8.8594	.41948
#1	.00899	-.1158	-.01673	-.01112	-.02084	.00188	.00509
#2	.00953	-.1072	-.01804	-.00390	-.02475	.00166	.00506
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit							
Low Limit							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00327	.00441	-.00065	.00431
Stddev	.00014	.00307	.00032	.00020
%RSD	4.2725	69.649	49.660	4.6882
#1	.00337	.00224	-.00088	.00417
#2	.00317	.00659	-.00042	.00445
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2681.2	4570.3	65275.	6323.6
Stddev	2.8	12.1	291.	49.2
%RSD	.10563	.26545	.44605	.77829
#1	2679.2	4561.7	65069.	6358.4
#2	2683.2	4578.8	65481.	6288.8

Sample Name: icsab-1723354 Acquired: 11/15/2013 20:22:15 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22497	540.21	.09867	.00416	.54394	.52011	503.70
Stddev	.00058	3.95	.00153	.00032	.00473	.00100	1.53
%RSD	.25879	.73052	1.5538	7.7724	.86984	.19133	.30347
#1	.22538	543.00	.09758	.00439	.54729	.52082	504.78
#2	.22456	537.42	.09975	.00393	.54059	.51941	502.61
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0465	.51112	.49009	.55736	99.146	.08430	.01896
Stddev	.0024	.00000	.00219	.00039	.918	.00949	.00047
%RSD	.22673	.00057	.44778	.07080	.92613	11.259	2.4658
#1	1.0482	.51112	.48854	.55709	99.796	.07759	.01929
#2	1.0448	.51112	.49164	.55764	98.497	.09101	.01863
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None
Value							
Range							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.60178	518.12	.47540	.49564	-.00049	.06682	.98602
Stddev	.00637	.37	.00071	.00355	.00043	.00431	.00234
%RSD	1.0579	.07131	.14974	.71663	88.554	6.4481	.23707
#1	.60628	517.86	.47489	.49313	-.00079	.06377	.98767
#2	.59727	518.38	.47590	.49816	-.00018	.06986	.98437
Check ?	None	Chk Pass	Chk Pass	Chk Pass	None	None	Chk Pass
Value							
Range							

Sample Name: icsab-1723354 Acquired: 11/15/2013 20:22:15 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05347	F .3683	.60761	.04102	1.1139	.00192	.54405
Stddev	.00241	.0022	.00063	.00473	.0148	.00021	.00533
%RSD	4.5089	.5893	.10317	11.523	1.3251	10.915	.97895
#1	.05517	.3668	.60717	.04436	1.1244	.00177	.54782
#2	.05176	.3699	.60805	.03767	1.1035	.00206	.54028
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	None	None
Value		.2000					
Range		20.00%					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00300	.11292	.49843	.96461
Stddev	.00031	.00508	.00333	.01184
%RSD	10.361	4.5005	.66760	1.2270
#1	.00322	.10932	.49608	.95624
#2	.00278	.11651	.50078	.97298
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2683.2	4598.0	65434.	6278.4
Stddev	2.0	2.1	177.	24.5
%RSD	.07482	.04675	.27038	.39026
#1	2681.8	4596.5	65559.	6261.1
#2	2684.6	4599.5	65309.	6295.7

Sample Name: CCV Acquired: 11/15/2013 20:24:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50777**	**25.846**	**.52229**	**.49980**	**.52017**	**.50574**	**25.435**
Stddev	.00033	.073	.00230	.00205	.00088	.00042	.121
%RSD	.06498	.28123	.44108	.41024	.16862	.08259	.47726
#1	.50754	25.794	.52066	.49835	.52079	.50544	25.521
#2	.50800	25.897	.52392	.50125	.51955	.50603	25.349
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50299**	**.50177**	**.51875**	**.51540**	**24.683**	**26.413**	F **27.564**
Stddev	.00024	.00010	.00410	.00261	.004	.152	.225
%RSD	.04833	.01936	.79046	.50560	.01650	.57635	.81672
#1	.50316	.50170	.52165	.51724	24.685	26.521	27.405
#2	.50282	.50184	.51585	.51355	24.680	26.305	27.723
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value							25.000
Range							10.000%

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52431**	**24.657**	**.51217**	**.47659**	**.50773**	**26.291**	**.50267**
Stddev	.00224	.015	.00005	.00180	.00127	.130	.00069
%RSD	.42766	.06168	.00907	.37676	.25059	.49412	.13664
#1	.52590	24.646	.51214	.47532	.50863	26.382	.50219
#2	.52273	24.668	.51221	.47786	.50683	26.199	.50316
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Sample Name: CCV Acquired: 11/15/2013 20:24:49 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50573	25.16	.52061	.50470	25.233	.51486	.52009
Stddev	.00051	.02	.00303	.00296	.038	.00061	.00221
%RSD	.10152	.0972	.58186	.58588	.15004	.11766	.42465
#1	.50537	25.18	.51846	.50679	25.259	.51443	.52165
#2	.50610	25.15	.52275	.50261	25.206	.51529	.51852
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51409	.50471	.51337	.51286
Stddev	.00033	.00276	.00034	.00217
%RSD	.06418	.54740	.06692	.42256
#1	.51385	.50276	.51362	.51440
#2	.51432	.50666	.51313	.51133
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3233.9	5028.2	72968.	6622.3
Stddev	4.4	3.4	318.	19.2
%RSD	.13567	.06763	.43533	.28947
#1	3237.0	5030.6	72743.	6608.8
#2	3230.8	5025.8	73192.	6635.9

Sample Name: CCB Acquired: 11/15/2013 20:27:11 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00042**	**.00517**	**.00070**	**-.00087**	**-.00002**	**.00025**	**-.01607**
Stddev	.00032	.00332	.00010	.00027	.00003	.00002	.00387
%RSD	77.051	64.231	13.992	30.773	163.70	8.4129	24.091
#1	-.00064	.00282	.00077	-.00106	.00000	.00024	-.01881
#2	-.00019	.00752	.00063	-.00068	-.00004	.00027	-.01334
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664	K_7664-2
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**.00004**	**-.00050**	**.00027**	**-.00289**	**.02765**	**.00014**
Stddev	.00003	.00000	.00012	.00010	.00129	.03270	.00043
%RSD	18.382	5.8603	22.829	37.599	44.695	118.25	295.38
#1	.00019	.00004	-.00059	.00034	-.00197	.05077	.00045
#2	.00015	.00004	-.00042	.00020	-.00380	.00453	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Elem	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Ni2316
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**-.00095**	**-.00001**	**.00029**	**.00009**	**-.00714**	**-.00039**
Stddev	.00063	.00245	.00001	.00016	.00008	.01068	.00041
%RSD	400.92	259.20	88.296	55.027	81.918	149.73	106.17
#1	-.00029	-.00268	-.00000	.00041	.00004	-.01469	-.00068
#2	.00060	.00079	-.00002	.00018	.00015	.00042	-.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Sample Name: CCB Acquired: 11/15/2013 20:27:11 Type: QC
Method: ICAP1(v4) Mode: CONC Corr. Factor: 1.000000
User: MxM Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00054	F .0069	-.00018	-.00220	-.03212	.00006	-.00024
Stddev	.00043	.0026	.00064	.00351	.01277	.00028	.00003
%RSD	81.228	37.34	355.29	159.32	39.749	469.50	13.491
#1	.00084	.0087	-.00063	-.00469	-.04114	-.00014	-.00027
#2	.00023	.0051	.00027	.00028	-.02309	.00026	-.00022
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		.0030					
Low Limit		-.0040					

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00039	-.00003	.00002	-.00027
Stddev	.00005	.00023	.00007	.00035
%RSD	13.983	806.35	346.99	130.86
#1	.00042	-.00019	.00007	-.00002
#2	.00035	.00013	-.00003	-.00052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	3446.2	5154.7	77354.	6733.4
Stddev	6.7	5.5	125.	57.3
%RSD	.19364	.10615	.16122	.85132
#1	3450.9	5158.5	77266.	6692.9
#2	3441.5	5150.8	77442.	6774.0

Run File: I2111413A Instrument: ICAP2

Analyst: JRK Data Review: JRK 11/15/13

Spikes IDs: 1653961(W1), 1311054 (W2), 1622883(Sn), 1684515(Ag), 1451136 (Si), 1320125(TCLP)
1509289(TCLP Sr)
Pipette IDs: 08-20-13-(1-7,8,10,13,14)
Internal Standard: 1739112

Seq#	Run File ID	Sample ID	Date / Time	Type
1	I2111413A	ic-1749384	11/14/13 10:25 AM	Standard
2	I2111413A	ic-1757696	11/14/13 10:28 AM	Standard
3	I2111413A	ic-1757694	11/14/13 10:30 AM	Standard
4	I2111413A	ic-1757693	11/14/13 10:32 AM	Standard
5	I2111413A	ICV-1747721	11/14/13 10:34 AM	QC
6	I2111413A	ICB-1749384	11/14/13 10:36 AM	QC
7	I2111413A	ICVL-1739111	11/14/13 10:39 AM	QC
8	I2111413A	cri-1739110	11/14/13 10:41 AM	QC
9	I2111413A	icsa-1716849	11/14/13 10:43 AM	QC
10	I2111413A	icsab-1723354	11/14/13 10:45 AM	QC
11	I2111413A	ccv-1757648	11/14/13 10:48 AM	QC
12	I2111413A	ccb-1749384	11/14/13 10:50 AM	QC
13	I2111413A	CCVL	11/14/13 10:52 AM	QC
14	I2111413A	mb 480-151082/1-a	11/14/13 10:54 AM	Unknown
15	I2111413A	CCV	11/14/13 10:57 AM	QC
16	I2111413A	CCB	11/14/13 10:59 AM	QC
17	I2111413A	CCVL	11/14/13 11:07 AM	QC
18	I2111413A	lcs 480-151082/2-a	11/14/13 11:09 AM	Unknown
19	I2111413A	lcsd 480-151082/3-a	11/14/13 11:11 AM	Unknown
20	I2111413A	480-49805-d-2-a	11/14/13 11:13 AM	Unknown
21	I2111413A	480-49805-a-4-a	11/14/13 11:15 AM	Unknown
22	I2111413A	480-49805-d-6-a	11/14/13 11:18 AM	Unknown
23	I2111413A	480-49805-d-7-a	11/14/13 11:20 AM	Unknown
24	I2111413A	480-49805-a-9-a	11/14/13 11:22 AM	Unknown
25	I2111413A	480-49805-a-9-aSD@5	11/14/13 11:24 AM	Unknown
26	I2111413A	480-49805-a-9-a PDS	11/14/13 11:27 AM	Unknown
27	I2111413A	CCV	11/14/13 11:29 AM	QC
28	I2111413A	CCB	11/14/13 11:31 AM	QC
29	I2111413A	CCVL	11/14/13 11:33 AM	QC
30	I2111413A	480-49805-a-9-b ms	11/14/13 11:36 AM	Unknown
31	I2111413A	480-49805-a-9-c msd	11/14/13 11:38 AM	Unknown
32	I2111413A	480-49759-j-6-d	11/14/13 11:40 AM	Unknown
33	I2111413A	480-49811-b-1-a	11/14/13 11:43 AM	Unknown
34	I2111413A	480-49811-b-2-a	11/14/13 11:45 AM	Unknown
35	I2111413A	480-49811-b-3-a	11/14/13 11:47 AM	Unknown
36	I2111413A	480-49811-b-4-a	11/14/13 11:49 AM	Unknown
37	I2111413A	480-49811-b-5-a	11/14/13 11:52 AM	Unknown
38	I2111413A	480-49829-a-6-a	11/14/13 11:54 AM	Unknown
39	I2111413A	CCV	11/14/13 11:56 AM	QC
40	I2111413A	CCB	11/14/13 11:58 AM	QC

41	I2111413A	CCVL	11/14/13 12:01 PM	QC
42	I2111413A	480-49811-b-7-a	11/14/13 12:03 PM	Unknown
43	I2111413A	480-49811-b-8-a	11/14/13 12:05 PM	Unknown
44	I2111413A	mb 480-151468/1-b	11/14/13 12:07 PM	Unknown
45	I2111413A	lcs 480-151468/2-b	11/14/13 12:10 PM	Unknown
46	I2111413A	480-48255-i-1-g	11/14/13 12:12 PM	Unknown
47	I2111413A	480-48255-i-2-e	11/14/13 12:14 PM	Unknown
48	I2111413A	480-48255-i-2-eSD@5	11/14/13 12:17 PM	Unknown
49	I2111413A	480-48255-i-2-e PDS	11/14/13 12:19 PM	Unknown
50	I2111413A	480-48255-i-2-f ms	11/14/13 12:21 PM	Unknown
51	I2111413A	CCV	11/14/13 12:23 PM	QC
52	I2111413A	CCB	11/14/13 12:26 PM	QC
53	I2111413A	CCVL	11/14/13 12:28 PM	QC
54	I2111413A	480-48255-i-2-g msd	11/14/13 12:30 PM	Unknown
55	I2111413A	480-49723-b-1-b	11/14/13 12:32 PM	Unknown
56	I2111413A	mb 480-151115/1-a	11/14/13 12:35 PM	Unknown
57	I2111413A	lcs 480-151115/2-a	11/14/13 12:37 PM	Unknown
58	I2111413A	480-49386-h-1-b	11/14/13 12:39 PM	Unknown
59	I2111413A	480-49407-a-2-b	11/14/13 12:42 PM	Unknown
60	I2111413A	480-49407-a-2-b SD@5	11/14/13 12:44 PM	Unknown
61	I2111413A	480-49407-a-2-b PDS	11/14/13 12:46 PM	Unknown
62	I2111413A	480-49407-a-2-c ms	11/14/13 12:48 PM	Unknown
63	I2111413A	CCV	11/14/13 12:50 PM	QC
64	I2111413A	CCB	11/14/13 12:53 PM	QC
65	I2111413A	CCVL	11/14/13 12:55 PM	QC
66	I2111413A	480-49407-a-2-d msd	11/14/13 12:57 PM	Unknown
67	I2111413A	480-49407-b-3-b	11/14/13 12:59 PM	Unknown
68	I2111413A	mb 480-149929/1-b	11/14/13 01:02 PM	Unknown
69	I2111413A	lcs 480-149929/2-b	11/14/13 01:04 PM	Unknown
70	I2111413A	480-49222-c-1-b	11/14/13 01:06 PM	Unknown
71	I2111413A	480-49222-c-2-b	11/14/13 01:08 PM	Unknown
72	I2111413A	480-49222-c-3-b	11/14/13 01:11 PM	Unknown
73	I2111413A	480-49222-c-3-bSD@5	11/14/13 01:13 PM	Unknown
74	I2111413A	480-49222-c-3-b PDS	11/14/13 01:15 PM	Unknown
75	I2111413A	CCV	11/14/13 01:17 PM	QC
76	I2111413A	CCB	11/14/13 01:19 PM	QC
77	I2111413A	CCVL	11/14/13 01:22 PM	QC
78	I2111413A	480-49222-c-3-c ms	11/14/13 01:24 PM	Unknown
79	I2111413A	480-49222-c-3-d msd	11/14/13 01:26 PM	Unknown
80	I2111413A	480-49222-c-4-b	11/14/13 01:28 PM	Unknown
81	I2111413A	480-49222-c-5-b	11/14/13 01:31 PM	Unknown
82	I2111413A	480-49222-c-9-b	11/14/13 01:33 PM	Unknown
83	I2111413A	480-49222-c-10-b	11/14/13 01:35 PM	Unknown
84	I2111413A	480-49222-c-11-b	11/14/13 01:37 PM	Unknown
85	I2111413A	480-49222-c-12-b	11/14/13 01:40 PM	Unknown
86	I2111413A	blank	11/14/13 01:42 PM	Unknown
87	I2111413A	CCV	11/14/13 01:44 PM	QC
88	I2111413A	CCB	11/14/13 01:46 PM	QC
89	I2111413A	CCVL	11/14/13 01:49 PM	QC
90	I2111413A	480-48473-b-17-a	11/14/13 01:51 PM	Unknown

91	I2111413A	480-48473-b-17-a@5	11/14/13 01:53 PM	Unknown
92	I2111413A	480-48473-b-17-a@10	11/14/13 01:55 PM	Unknown
93	I2111413A	480-48473-b-17-a@20	11/14/13 01:58 PM	Unknown
94	I2111413A	480-48473-b-18-a@5	11/14/13 02:00 PM	Unknown
95	I2111413A	480-48473-b-18-a@20	11/14/13 02:02 PM	Unknown
96	I2111413A	480-48473-b-18-a@50	11/14/13 02:04 PM	Unknown
97	I2111413A	480-48473-b-18-a@100	11/14/13 02:06 PM	Unknown
98	I2111413A	480-48473-b-18-a@200	11/14/13 02:08 PM	Unknown
99	I2111413A	CCV	11/14/13 02:11 PM	QC
100	I2111413A	CCB	11/14/13 02:13 PM	QC
101	I2111413A	CCVL	11/14/13 02:15 PM	QC
102	I2111413A	480-48473-A-19-A@5	11/14/13 02:18 PM	Unknown
103	I2111413A	48473-A-19-Asd@25	11/14/13 02:20 PM	Unknown
104	I2111413A	48473-A-19-A pds@5	11/14/13 02:22 PM	Unknown
105	I2111413A	48473-A-19-B MS@5	11/14/13 02:24 PM	Unknown
106	I2111413A	48473-A-19-C MSD@5	11/14/13 02:27 PM	Unknown
107	I2111413A	480-48473-A-24-K@5	11/14/13 02:29 PM	Unknown
108	I2111413A	480-48473-A-24-K@10	11/14/13 02:31 PM	Unknown
109	I2111413A	480-48473-A-24-K@50	11/14/13 02:33 PM	Unknown
110	I2111413A	480-48473-B-26-A@5	11/14/13 02:36 PM	Unknown
111	I2111413A	CCV	11/14/13 02:38 PM	QC
112	I2111413A	CCB	11/14/13 02:40 PM	QC
113	I2111413A	CCVL	11/14/13 02:43 PM	QC
114	I2111413A	480-48473-B-27-A@20	11/14/13 02:45 PM	Unknown
115	I2111413A	480-48473-F-40-A@5	11/14/13 02:47 PM	Unknown
116	I2111413A	480-48473-F-45-A@5	11/14/13 02:49 PM	Unknown
117	I2111413A	480-48473-F-45-A@10	11/14/13 02:52 PM	Unknown
118	I2111413A	480-48473-F-45-A@20	11/14/13 02:54 PM	Unknown
119	I2111413A	480-48473-B-46-I@5	11/14/13 02:56 PM	Unknown
120	I2111413A	480-48473-B-47-H@5	11/14/13 02:58 PM	Unknown
121	I2111413A	480-48473-A-50-B@5	11/14/13 03:00 PM	Unknown
122	I2111413A	480-48473-a-51-i@5	11/14/13 03:03 PM	Unknown
123	I2111413A	CCV	11/14/13 03:05 PM	QC
124	I2111413A	CCB	11/14/13 03:07 PM	QC
125	I2111413A	CCVL	11/14/13 03:09 PM	QC
126	I2111413A	480-48473-a-51-i@10	11/14/13 03:12 PM	Unknown
127	I2111413A	480-48473-a-51-i@20	11/14/13 03:14 PM	Unknown
128	I2111413A	480-48583-g-7-a	11/14/13 03:16 PM	Unknown
129	I2111413A	480-49623-c-1-c	11/14/13 03:19 PM	Unknown
130	I2111413A	480-49711-a-6-b@5	11/14/13 03:21 PM	Unknown
131	I2111413A	49711-a-6-b SD@25	11/14/13 03:23 PM	Unknown
132	I2111413A	49711-a-6-b PDS@5	11/14/13 03:26 PM	Unknown
133	I2111413A	49711-A-6-C MS@5	11/14/13 03:28 PM	Unknown
134	I2111413A	49711-a-6-d msd@5	11/14/13 03:30 PM	Unknown
135	I2111413A	CCV	11/14/13 03:33 PM	QC
136	I2111413A	CCB	11/14/13 03:35 PM	QC
137	I2111413A	CCVL	11/14/13 03:37 PM	QC
138	I2111413A	480-49725-A-1-C@5	11/14/13 03:40 PM	Unknown
139	I2111413A	480-49725-A-1-C@10	11/14/13 03:42 PM	Unknown
140	I2111413A	480-49728-A-1-B@5	11/14/13 03:44 PM	Unknown

141	I2111413A	480-48969-C-1-A	11/14/13 03:47 PM	Unknown
142	I2111413A	480-48969-C-2-A@2	11/14/13 03:49 PM	Unknown
143	I2111413A	480-48966-P-1-A@10	11/14/13 03:51 PM	Unknown
144	I2111413A	blank	11/14/13 03:54 PM	Unknown
145	I2111413A	blank	11/14/13 03:56 PM	Unknown
146	I2111413A	blank	11/14/13 03:58 PM	Unknown
147	I2111413A	CCV	11/14/13 04:00 PM	QC
148	I2111413A	CCB	11/14/13 04:02 PM	QC
149	I2111413A	CCVL	11/14/13 04:05 PM	QC
150	I2111413A	MB 480-149337/1-A	11/14/13 04:07 PM	Unknown
151	I2111413A	LCSSRM 480-149337/2-	11/14/13 04:09 PM	Unknown
152	I2111413A	480-49225-B-1-A	11/14/13 04:11 PM	Unknown
153	I2111413A	480-49225-B-2-A	11/14/13 04:14 PM	Unknown
154	I2111413A	480-49234-C-1-A	11/14/13 04:16 PM	Unknown
155	I2111413A	480-49234-C-1-B MS	11/14/13 04:18 PM	Unknown
156	I2111413A	480-49234-C-1-C MSD	11/14/13 04:20 PM	Unknown
157	I2111413A	480-49236-D-1-A	11/14/13 04:23 PM	Unknown
158	I2111413A	480-49236-D-1-A sd@5	11/14/13 04:25 PM	Unknown
159	I2111413A	CCV	11/14/13 04:27 PM	QC
160	I2111413A	CCB	11/14/13 04:30 PM	QC
161	I2111413A	CCVL	11/14/13 04:32 PM	QC
162	I2111413A	480-49236-D-1-A pds	11/14/13 04:34 PM	Unknown
163	I2111413A	480-49236-D-2-A	11/14/13 04:36 PM	Unknown
164	I2111413A	480-49246-A-1-A	11/14/13 04:39 PM	Unknown
165	I2111413A	480-49246-A-2-A	11/14/13 04:41 PM	Unknown
166	I2111413A	480-49246-A-3-A	11/14/13 04:43 PM	Unknown
167	I2111413A	480-49246-B-4-A	11/14/13 04:46 PM	Unknown
168	I2111413A	480-49173-H-10-A	11/14/13 04:48 PM	Unknown
169	I2111413A	MB 480-151394/1-A	11/14/13 04:50 PM	Unknown
170	I2111413A	LCSSRM 480-151394/2-	11/14/13 04:53 PM	Unknown
171	I2111413A	CCV	11/14/13 04:55 PM	QC
172	I2111413A	CCB	11/14/13 04:57 PM	QC
173	I2111413A	CCVL	11/14/13 04:59 PM	QC
174	I2111413A	480-49854-A-1-B	11/14/13 05:01 PM	Unknown
175	I2111413A	480-49854-A-2-B	11/14/13 05:04 PM	Unknown
176	I2111413A	480-49854-A-2-B sd@5	11/14/13 05:06 PM	Unknown
177	I2111413A	480-49854-A-2-B pds	11/14/13 05:08 PM	Unknown
178	I2111413A	480-49854-A-2-C MS	11/14/13 05:10 PM	Unknown
179	I2111413A	480-49854-A-2-D MSD	11/14/13 05:13 PM	Unknown
180	I2111413A	480-49854-A-3-B	11/14/13 05:15 PM	Unknown
181	I2111413A	480-49854-A-4-B	11/14/13 05:18 PM	Unknown
182	I2111413A	480-49854-A-5-B	11/14/13 05:20 PM	Unknown
183	I2111413A	CCV	11/14/13 05:23 PM	QC
184	I2111413A	CCB	11/14/13 05:25 PM	QC
185	I2111413A	CCVL	11/14/13 05:27 PM	QC
186	I2111413A	480-49854-A-9-B	11/14/13 05:30 PM	Unknown
187	I2111413A	480-49854-A-10-B	11/14/13 05:32 PM	Unknown
188	I2111413A	480-49854-A-11-B	11/14/13 05:34 PM	Unknown
189	I2111413A	480-49854-A-12-B	11/14/13 05:36 PM	Unknown
190	I2111413A	480-49854-A-13-B	11/14/13 05:39 PM	Unknown

191	I2111413A	480-49854-A-14-B	11/14/13 05:41 PM	Unknown
192	I2111413A	480-49854-A-15-B	11/14/13 05:43 PM	Unknown
193	I2111413A	480-49854-A-16-B	11/14/13 05:45 PM	Unknown
194	I2111413A	480-49854-A-17-B	11/14/13 05:48 PM	Unknown
195	I2111413A	CCV	11/14/13 05:50 PM	QC
196	I2111413A	CCB	11/14/13 05:52 PM	QC
197	I2111413A	CCVL	11/14/13 05:55 PM	QC
198	I2111413A	480-49854-A-18-B	11/14/13 05:57 PM	Unknown
199	I2111413A	480-49854-A-19-B	11/14/13 05:59 PM	Unknown
200	I2111413A	480-49854-A-20-B	11/14/13 06:02 PM	Unknown
201	I2111413A	480-49854-A-6-B	11/14/13 06:04 PM	Unknown
202	I2111413A	480-49854-A-7-B	11/14/13 06:06 PM	Unknown
203	I2111413A	480-49854-A-8-B	11/14/13 06:08 PM	Unknown
204	I2111413A	MB 480-146518/1-A	11/14/13 06:11 PM	Unknown
205	I2111413A	480-48347-A-1-A	11/14/13 06:13 PM	Unknown
206	I2111413A	480-48347-A-2-A	11/14/13 06:15 PM	Unknown
207	I2111413A	CCV	11/14/13 06:18 PM	QC
208	I2111413A	CCB	11/14/13 06:20 PM	QC
209	I2111413A	ccvl	11/14/13 06:22 PM	QC
210	I2111413A	480-48347-A-3-A	11/14/13 06:25 PM	Unknown
211	I2111413A	480-48347-A-3-A sd@5	11/14/13 06:27 PM	Unknown
212	I2111413A	480-48347-A-3-A pds	11/14/13 06:29 PM	Unknown
213	I2111413A	480-48347-A-3-B MS	11/14/13 06:31 PM	Unknown
214	I2111413A	480-48347-A-3-C MSD	11/14/13 06:34 PM	Unknown
215	I2111413A	480-48347-A-4-A	11/14/13 06:36 PM	Unknown
216	I2111413A	480-48347-A-5-A	11/14/13 06:38 PM	Unknown
217	I2111413A	480-48347-A-6-A	11/14/13 06:40 PM	Unknown
218	I2111413A	480-48539-C-1-A@10	11/14/13 06:43 PM	Unknown
219	I2111413A	CCV	11/14/13 06:45 PM	QC
220	I2111413A	CCB	11/14/13 06:47 PM	QC
221	I2111413A	ccvl	11/14/13 06:50 PM	QC
222	I2111413A	480-48230-2 sol raw	11/14/13 06:52 PM	Unknown
223	I2111413A	480-48230-3 sol raw	11/14/13 06:54 PM	Unknown
224	I2111413A	480-48230-4 sol raw	11/14/13 06:56 PM	Unknown
225	I2111413A	480-48674-4 raw	11/14/13 06:59 PM	Unknown
226	I2111413A	480-48704-1 raw	11/14/13 07:01 PM	Unknown
227	I2111413A	480-48311-B-32-A@10	11/14/13 07:03 PM	Unknown
228	I2111413A	480-48311-B-32-A@20	11/14/13 07:05 PM	Unknown
229	I2111413A	480-48539-C-1-A@5	11/14/13 07:08 PM	Unknown
230	I2111413A	MB 480-149743/1-A	11/14/13 07:10 PM	Unknown
231	I2111413A	CCV	11/14/13 07:12 PM	QC
232	I2111413A	CCB	11/14/13 07:15 PM	QC
233	I2111413A	CCVL	11/14/13 07:17 PM	QC
234	I2111413A	LCS 480-149743/2-A	11/14/13 07:19 PM	Unknown
235	I2111413A	480-49333-B-1-A	11/14/13 07:22 PM	Unknown
236	I2111413A	480-49333-B-2-A	11/14/13 07:24 PM	Unknown
237	I2111413A	480-49333-B-2-A sd@5	11/14/13 07:26 PM	Unknown
238	I2111413A	480-49333-B-2-A PDS	11/14/13 07:28 PM	Unknown
239	I2111413A	480-49333-B-2-B MS	11/14/13 07:30 PM	Unknown
240	I2111413A	480-49333-B-2-C MSD	11/14/13 07:33 PM	Unknown

241	I2111413A	480-49333-B-3-A	11/14/13 07:35 PM	Unknown
242	I2111413A	480-49333-B-4-A	11/14/13 07:37 PM	Unknown
243	I2111413A	CCV	11/14/13 07:39 PM	QC
244	I2111413A	CCB	11/14/13 07:41 PM	QC
245	I2111413A	CCVL	11/14/13 07:44 PM	QC
246	I2111413A	480-49333-b-5-a	11/14/13 07:46 PM	Unknown
247	I2111413A	480-49333-b-6-a	11/14/13 07:48 PM	Unknown
248	I2111413A	480-49329-f-1-a	11/14/13 07:51 PM	Unknown
249	I2111413A	480-49329-f-2-a	11/14/13 07:53 PM	Unknown
250	I2111413A	480-49329-f-3-a	11/14/13 07:55 PM	Unknown
251	I2111413A	480-49329-f-4-a	11/14/13 07:58 PM	Unknown
252	I2111413A	480-49329-f-5-a	11/14/13 08:00 PM	Unknown
253	I2111413A	480-49329-f-6-a	11/14/13 08:02 PM	Unknown
254	I2111413A	480-49329-f-7-a	11/14/13 08:05 PM	Unknown
255	I2111413A	CCV	11/14/13 08:07 PM	QC
256	I2111413A	CCB	11/14/13 08:09 PM	QC
257	I2111413A	CCVL	11/14/13 08:12 PM	QC
258	I2111413A	480-49329-f-8-a	11/14/13 08:14 PM	Unknown
259	I2111413A	480-49329-f-9-a	11/14/13 08:17 PM	Unknown
260	I2111413A	480-49329-f-10-a	11/14/13 08:19 PM	Unknown
261	I2111413A	480-49329-f-11-a	11/14/13 08:21 PM	Unknown
262	I2111413A	480-49329-f-12-a	11/14/13 08:23 PM	Unknown
263	I2111413A	480-48737-5 SOL RAW	11/14/13 08:26 PM	Unknown
264	I2111413A	480-48737-6 SOL RAW	11/14/13 08:28 PM	Unknown
265	I2111413A	CCVL	11/14/13 08:30 PM	QC
266	I2111413A	icsa-1716849	11/14/13 08:33 PM	QC
267	I2111413A	CCV	11/14/13 08:35 PM	QC
268	I2111413A	CCB	11/14/13 08:37 PM	QC
269	I2111413A	icsab-1723354	11/14/13 08:40 PM	QC
270	I2111413A	CCV	11/14/13 08:42 PM	QC
271	I2111413A	CCB	11/14/13 08:44 PM	QC

I2111413A

Author: JRK

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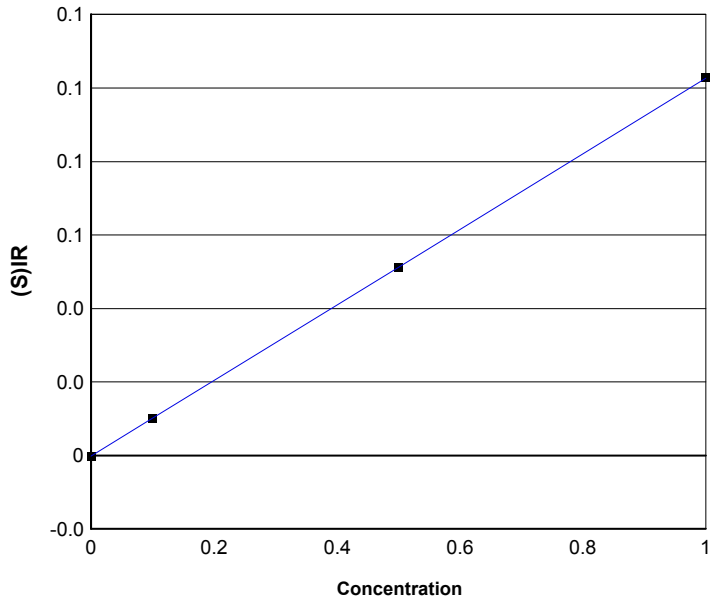
Instrument Name: Icap6500 Serial Number: 20094602

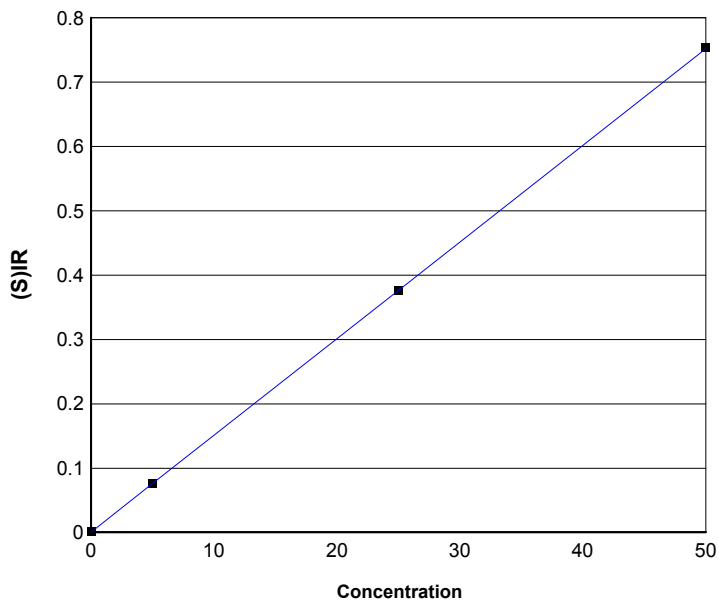
Method Name: ICAP2 2012 (217)



Element Name:	Ag
Element Wavelength:	Ag 328.068 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00016031
A1 (Gain):	0.10277
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

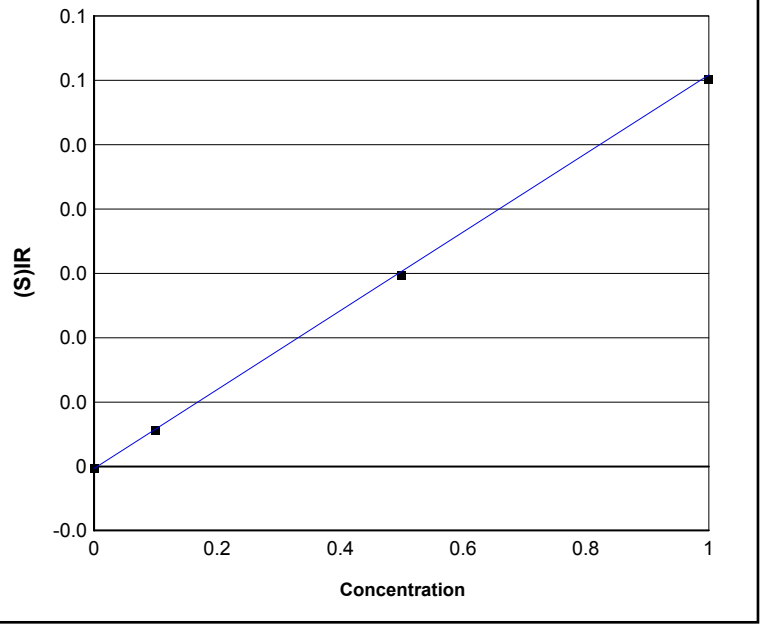
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000014039	0.00000	-0.00016016	0.000072223	1
IC4	1.0000	1.0000	0.0027539	0.27539	0.10290	0.00014825	1
IC2	0.10000	0.100000	-0.0014106	-1.4106	0.0099721	0.000038444	1
IC3	0.50000	0.50000	-0.0013434	-0.26867	0.051088	0.00010055	1



Element Name:	Al
Element Wavelength:	Al 308.215 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.00065881
A1 (Gain):	0.015036
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

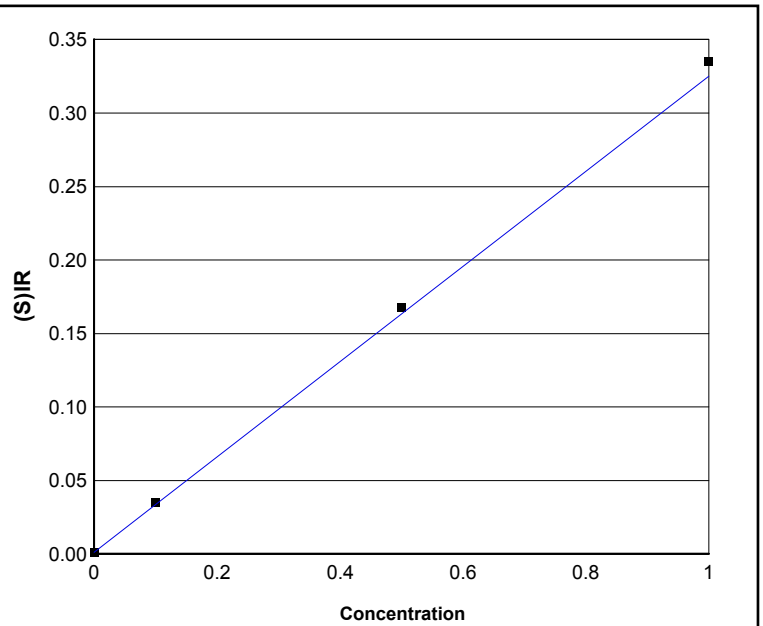
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000071508	0.00000	0.00065870	0.00011446	1
IC4	50.000	50.010	0.0091738	0.018348	0.75324	0.00040588	1
IC2	5.0000	5.0100	0.010085	0.20170	0.076055	0.00017745	1
IC3	25.000	24.980	-0.019259	-0.077036	0.37659	0.0014759	1



Element Name:	As
Element Wavelength:	As 189.042 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.00033202
A1 (Gain):	0.061220
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

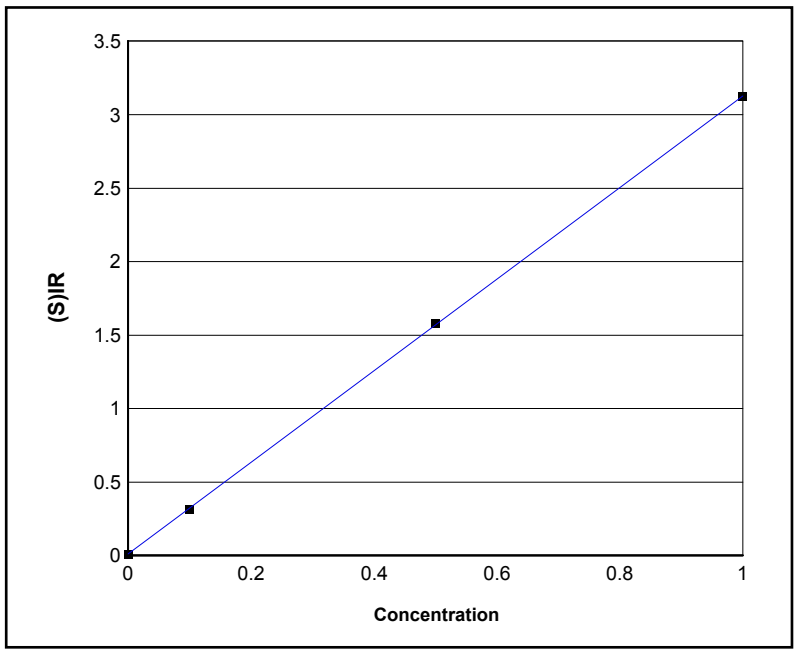
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000013973	0.00000	-0.00033193	0.000087085	1
IC4	1.0000	1.0000	0.0042992	0.42992	0.060154	0.00016134	1
IC2	0.10000	0.100000	-0.0012093	-1.2093	0.0056163	0.000059275	1
IC3	0.50000	0.50000	-0.0030899	-0.61799	0.029590	0.000094128	1



Element Name:	B
Element Wavelength:	B 208.959 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0012534
A1 (Gain):	0.32378
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

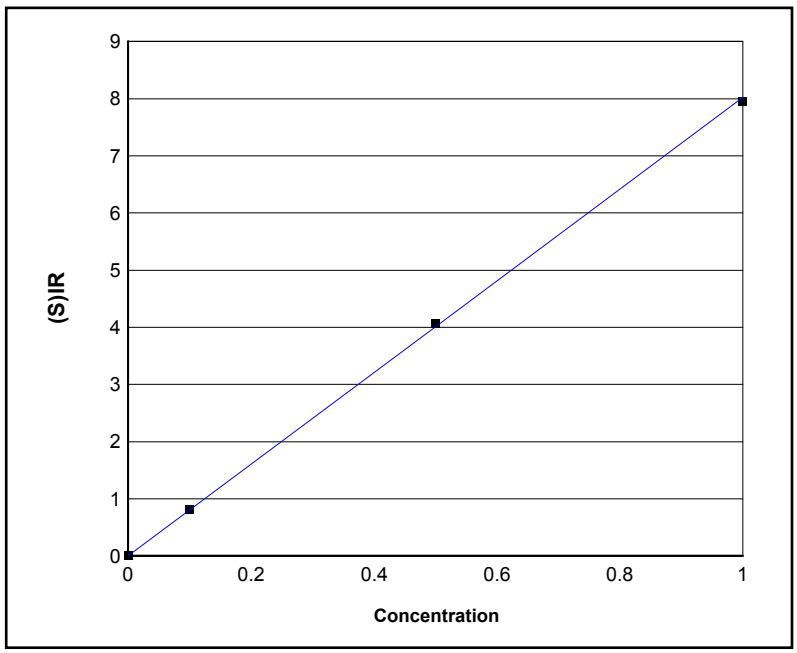
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000011139	0.00000	0.0012531	0.00011174	1
IC4	1.0000	1.0000	0.00016834	0.016834	0.33500	0.00035375	1
IC2	0.10000	0.10000	0.0014134	1.4134	0.035080	0.00029061	1
IC3	0.50000	0.50000	-0.0015818	-0.31635	0.16759	0.0015511	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.010288
A1 (Gain):	3.1160
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

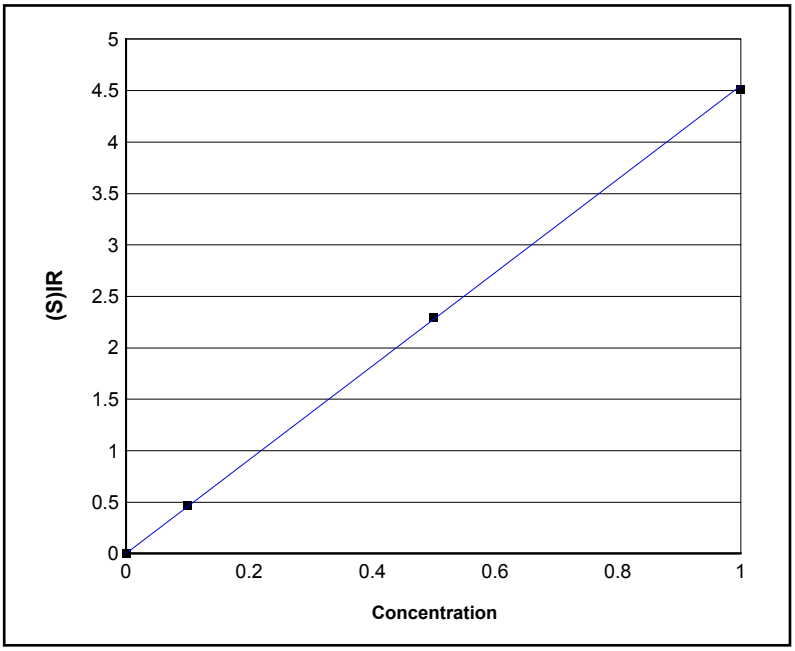
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000019443	0.00000	0.010295	0.0014641	1
IC4	1.0000	1.00000	-0.00013333	-0.013333	3.1258	0.012801	1
IC2	0.10000	0.100000	-0.0024470	-2.4470	0.31426	0.000082054	1
IC3	0.50000	0.50000	0.0025804	0.51607	1.5763	0.010751	1



Element Name:	Ba
Element Wavelength:	Ba 455.403 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99994
A0 (Offset):	0.0017738
A1 (Gain):	8.0204
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

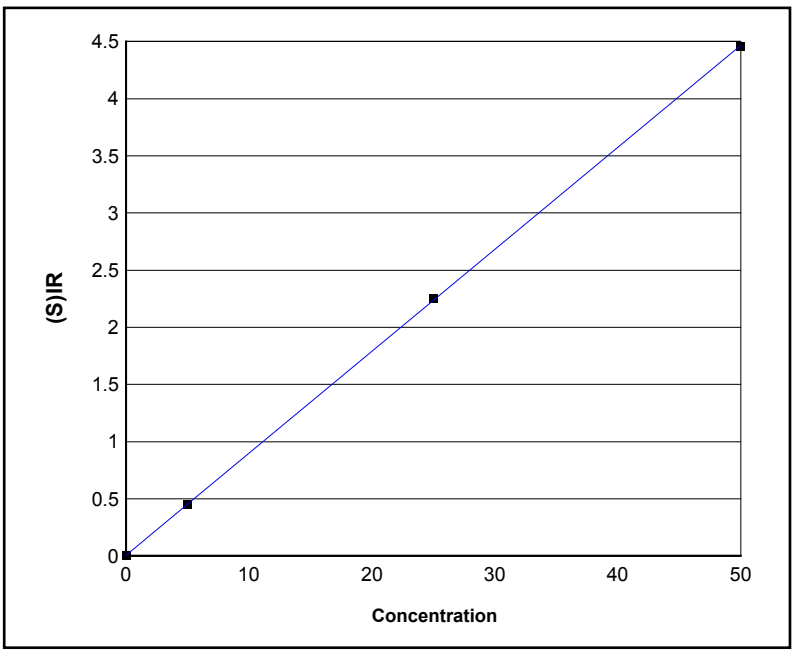
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000022612	0.00000	0.0017557	0.000077283	1
IC4	1.0000	0.99000	-0.0087732	-0.87732	7.9518	0.038258	1
IC2	0.10000	0.10000	0.0017299	1.7299	0.81769	0.0013889	1
IC3	0.50000	0.51000	0.0070433	1.4087	4.0685	0.010638	1



Element Name:	Be
Element Wavelength:	Be 313.042 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99995
A0 (Offset):	0.00066018
A1 (Gain):	4.5471
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

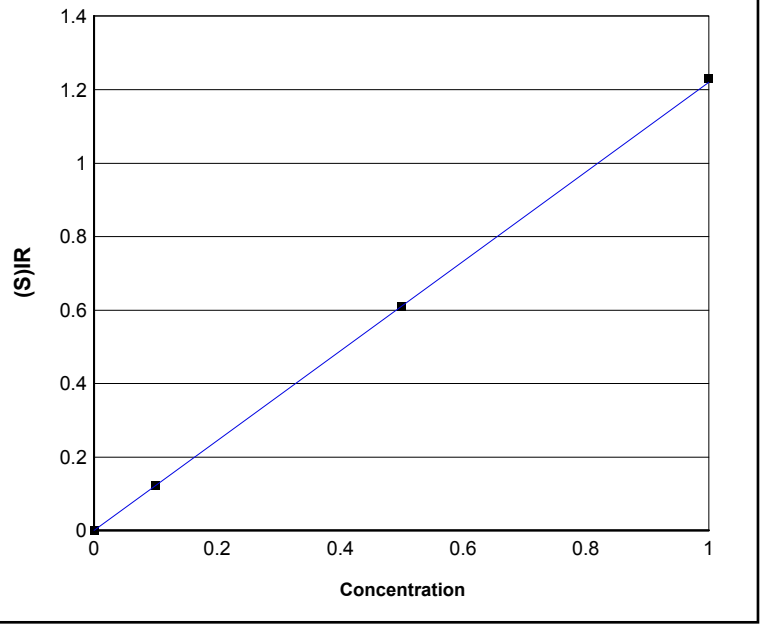
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000029421	0.00000	0.00064680	0.000059551	1
IC4	1.0000	0.99000	-0.0073973	-0.73973	4.5121	0.0044933	1
IC2	0.10000	0.10000	0.0027529	2.7529	0.46768	0.0012482	1
IC3	0.50000	0.50000	0.0046444	0.92887	2.2943	0.016006	1



Element Name:	Ca
Element Wavelength:	Ca 317.933 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0072355
A1 (Gain):	0.089192
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

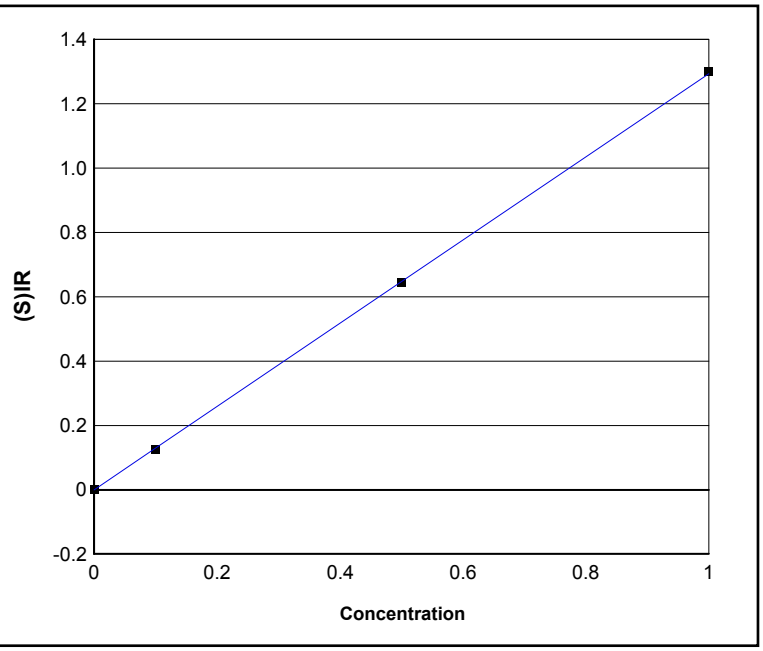
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000047956	0.00000	0.0072359	0.00012506	1
IC4	50.000	49.890	-0.11101	-0.22202	4.4570	0.0032571	1
IC2	5.0000	4.9800	-0.019871	-0.39741	0.45143	0.0010586	1
IC3	25.000	25.130	0.13088	0.52352	2.2487	0.0096811	1



Element Name:	Cd
Element Wavelength:	Cd 228.802 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.00046149
A1 (Gain):	1.2201
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

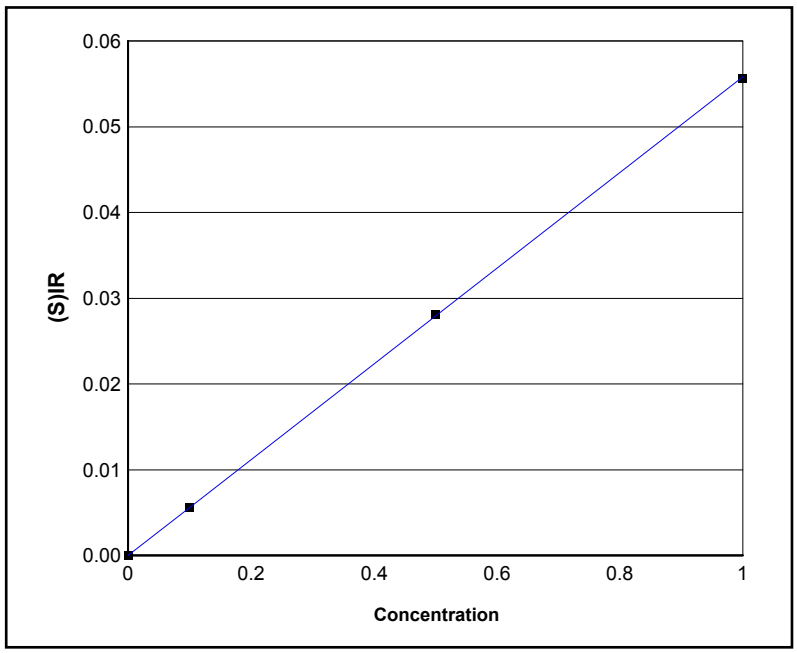
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000011416	0.00000	0.00046288	0.000076609	1
IC4	1.0000	1.0000	0.0031935	0.31935	1.2292	0.0016606	1
IC2	0.10000	0.100000	-0.0010279	-1.0279	0.12169	0.00065107	1
IC3	0.50000	0.50000	-0.0021656	-0.43312	0.61023	0.0014264	1



Element Name:	Co
Element Wavelength:	Co 228.616 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99995
A0 (Offset):	-0.0000031278
A1 (Gain):	1.2934
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

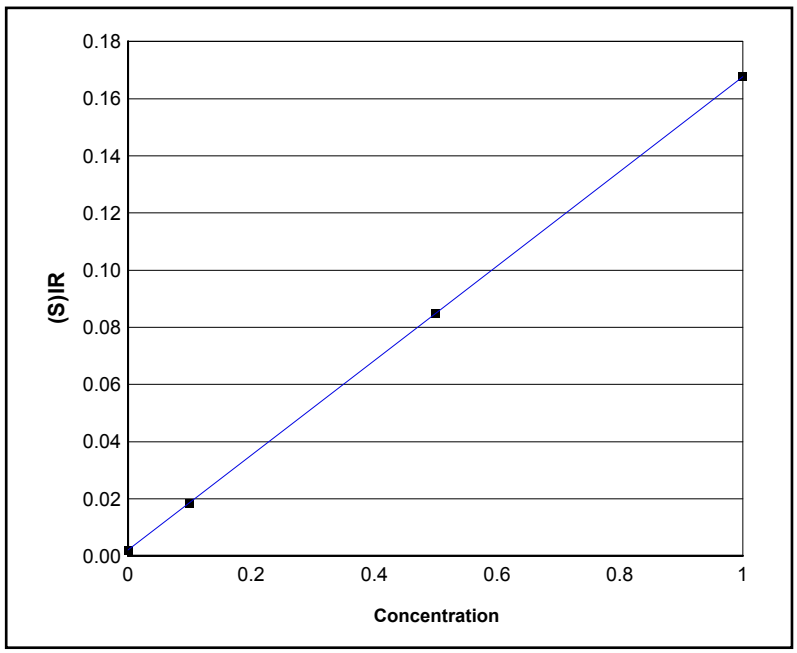
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000031820	0.00000	0.0000009879	0.000068135	1
IC4	1.0000	1.0100	0.0061886	0.61886	1.3020	0.0015516	1
IC2	0.10000	0.100000	-0.0032039	-3.2039	0.12525	0.00066677	1
IC3	0.50000	0.50000	-0.0029847	-0.59694	0.64314	0.0028934	1



Element Name:	Cr
Element Wavelength:	Cr 267.716 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.000020561
A1 (Gain):	0.055845
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

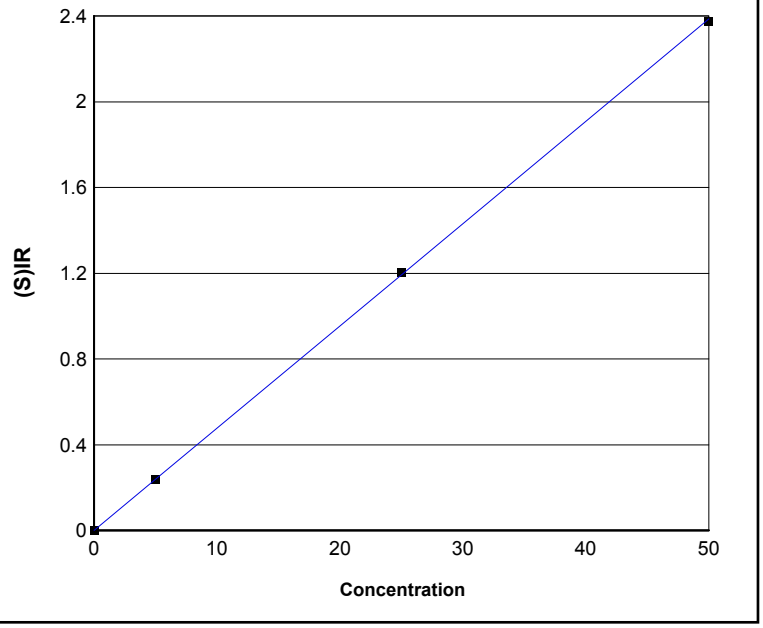
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000013418	0.00000	0.000020486	0.000011934	1
IC4	1.0000	1.00000	-0.0041403	-0.41403	0.055645	0.00027458	1
IC2	0.10000	0.10000	0.0011597	1.1597	0.0056709	0.000016392	1
IC3	0.50000	0.50000	0.0029806	0.59612	0.028115	0.000036790	1



Element Name:	Cu
Element Wavelength:	Cu 324.754 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0020548
A1 (Gain):	0.16556
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

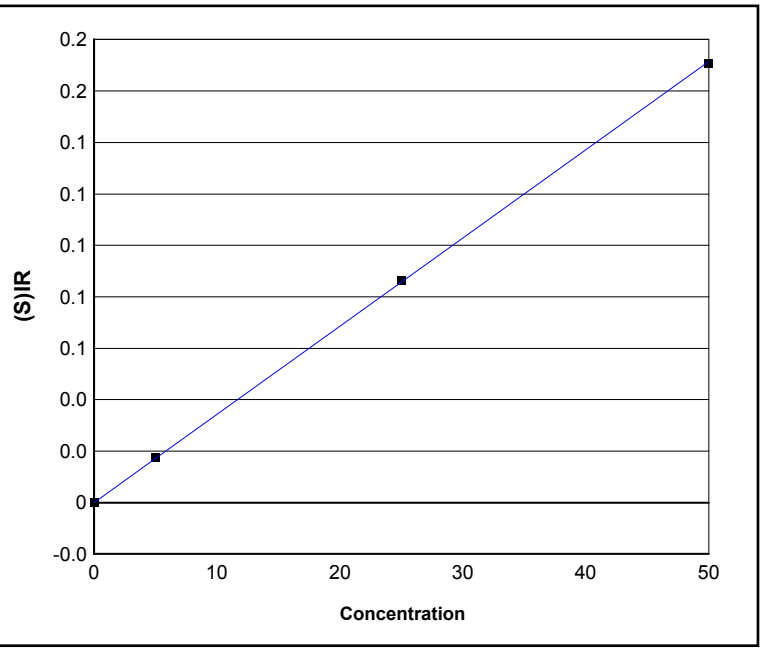
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000011336	0.00000	0.0020550	0.000036357	1
IC4	1.0000	1.0000	0.0016935	0.16935	0.16783	0.00061904	1
IC2	0.10000	0.100000	-0.0012053	-1.2053	0.018404	0.000088072	1
IC3	0.50000	0.50000	-0.00048818	-0.097636	0.084719	0.00043292	1



Element Name:	Fe
Element Wavelength:	Fe 259.940 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	0.00053958
A1 (Gain):	0.047728
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

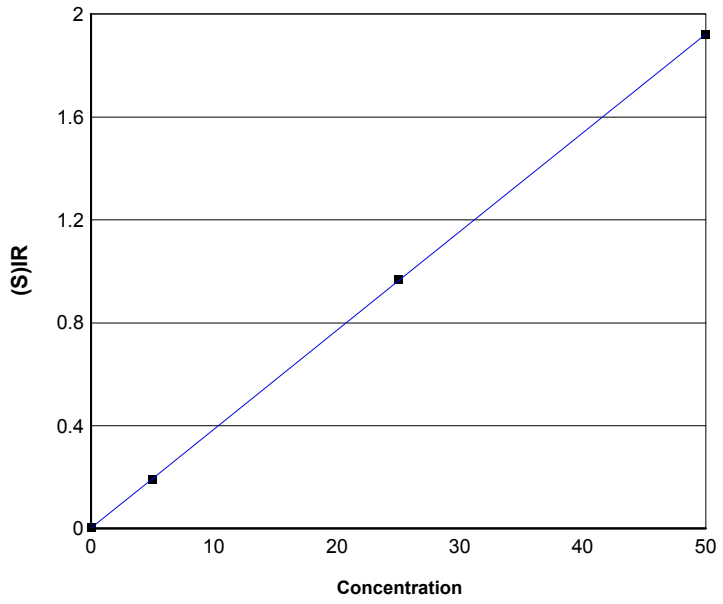
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000000000	-0.000045071	0.00000	0.00053743	0.000045247	1
IC4	50.000	49.730	-0.26758	-0.53517	2.3742	0.0044900	1
IC2	5.0000	5.0200	0.022891	0.45781	0.24027	0.000020379	1
IC3	25.000	25.240	0.24469	0.97877	1.2054	0.0052212	1



Element Name:	Fe
Element Wavelength:	Fe 271.441 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	-0.00012289
A1 (Gain):	0.0034340
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

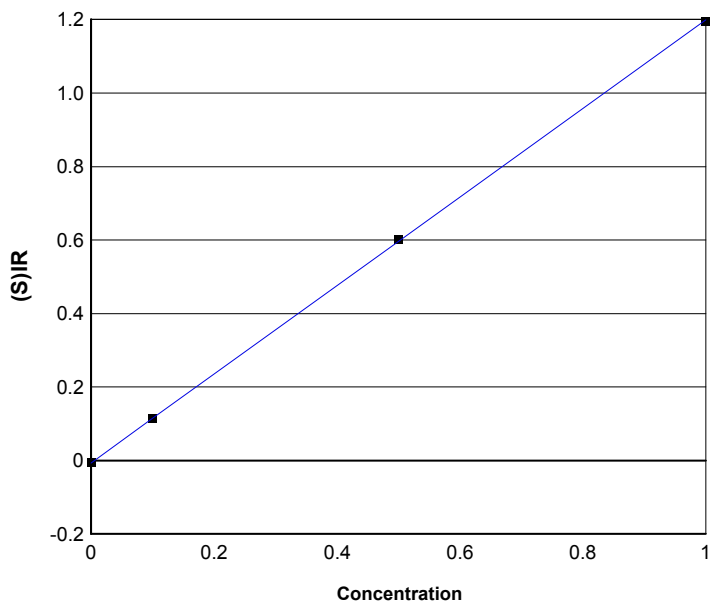
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00000000	-0.00011101	0.00000	-0.00012327	0.000092436	1
IC4	50.000	49.740	-0.25655	-0.51309	0.17069	0.00080260	1
IC2	5.0000	5.1100	0.10670	2.1339	0.017413	0.00027036	1
IC3	25.000	25.150	0.14985	0.59940	0.086241	0.00090619	1



Element Name:	K
Element Wavelength:	K 766.490 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	0.0024859
A1 (Gain):	0.038409
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

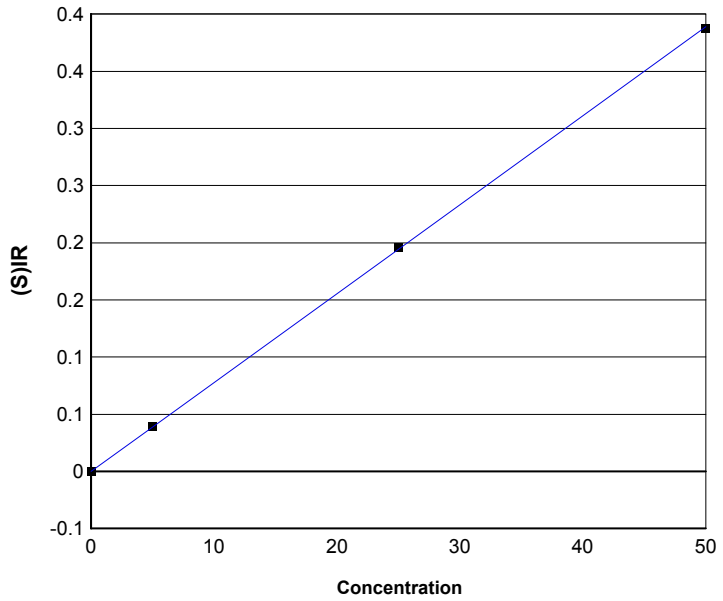
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000000000	0.000028764	0.00000	0.0024870	0.00070963	1
IC4	50.000	49.930	-0.069964	-0.13993	1.9203	0.0082955	1
IC2	5.0000	4.9600	-0.044700	-0.89401	0.19281	0.00085707	1
IC3	25.000	25.110	0.11466	0.45866	0.96712	0.010254	1



Element Name:	Li
Element Wavelength:	Li 670.784 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.0063654
A1 (Gain):	1.2059
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

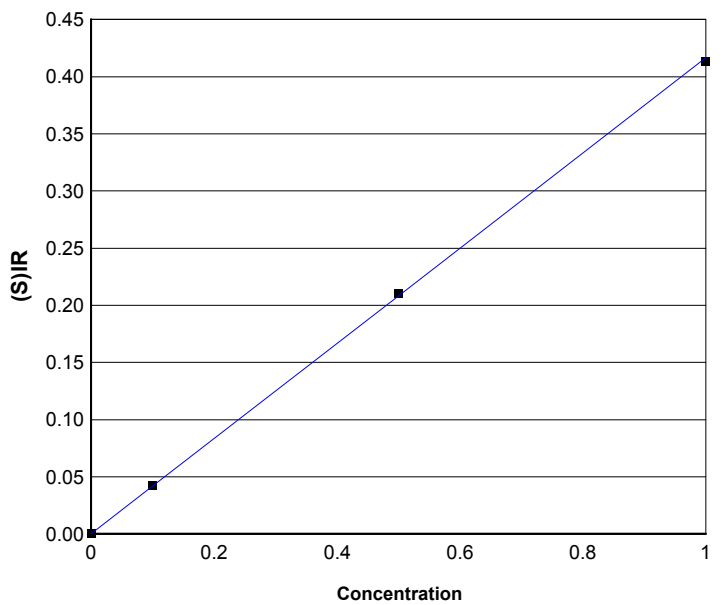
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000009416	0.00000	-0.0063665	0.0017611	1
IC2	0.10000	0.10000	0.00061126	0.61126	0.11510	0.00011036	1
IC3	0.50000	0.50000	0.0039144	0.78287	0.60202	0.0077095	1
IC4	1.0000	1.00000	-0.0045256	-0.45256	1.1955	0.0050748	1



Element Name:	Mg
Element Wavelength:	Mg 279.079 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.000043630
A1 (Gain):	0.0077800
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

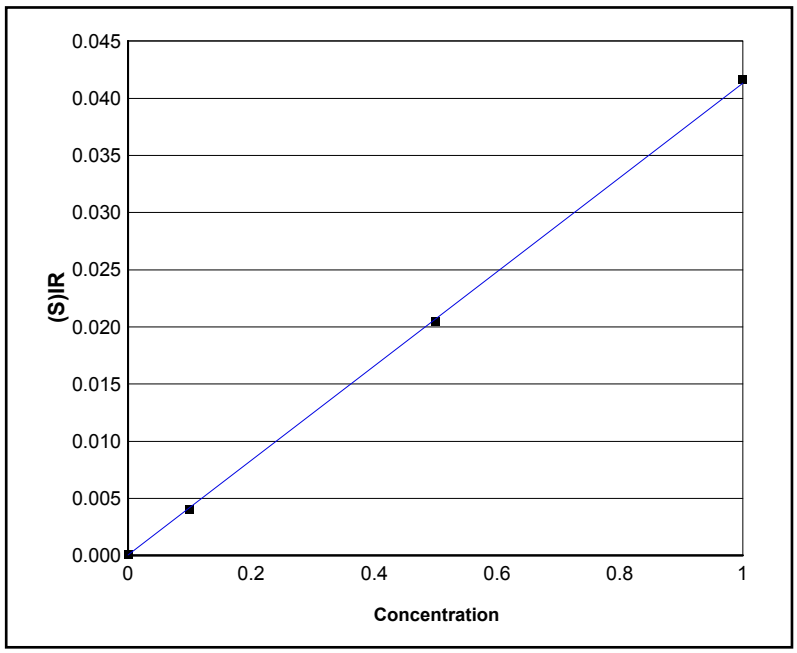
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000000000	-0.000051804	0.00000	-0.000044033	0.0000086562	1
IC4	50.000	49.810	-0.18824	-0.37649	0.38746	0.00063016	1
IC2	5.0000	5.0400	0.041224	0.82448	0.039174	0.0000026150	1
IC3	25.000	25.150	0.14702	0.58808	0.19558	0.00010039	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99995
A0 (Offset):	0.00019545
A1 (Gain):	0.41639
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

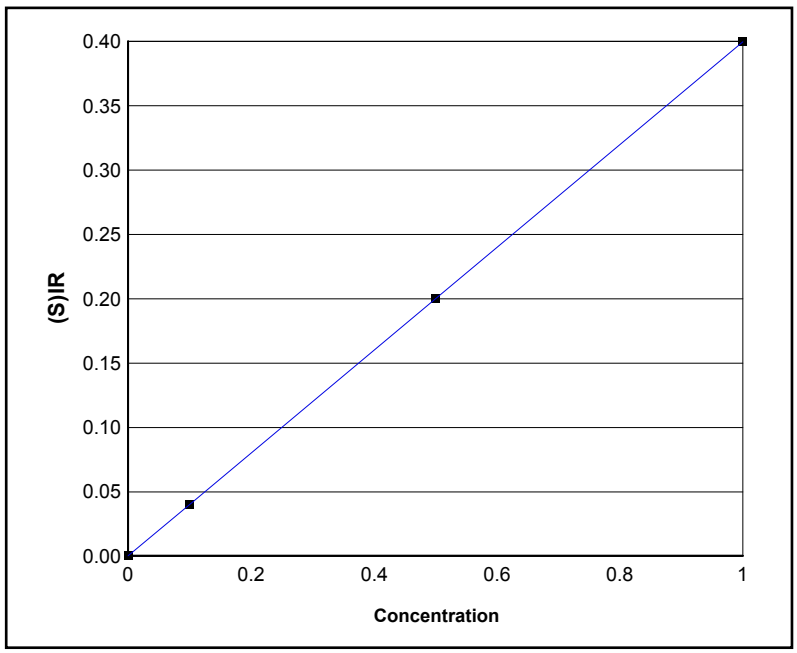
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000025115	0.00000	0.00019440	0.000040748	1
IC4	1.0000	0.99000	-0.0074895	-0.74895	0.41347	0.00085189	1
IC2	0.10000	0.10000	0.0022032	2.2032	0.042752	0.00012578	1
IC3	0.50000	0.51000	0.0052863	1.0573	0.21059	0.00046789	1



Element Name:	Mn
Element Wavelength:	Mn 257.610 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99993
A0 (Offset):	0.000059176
A1 (Gain):	0.041261
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

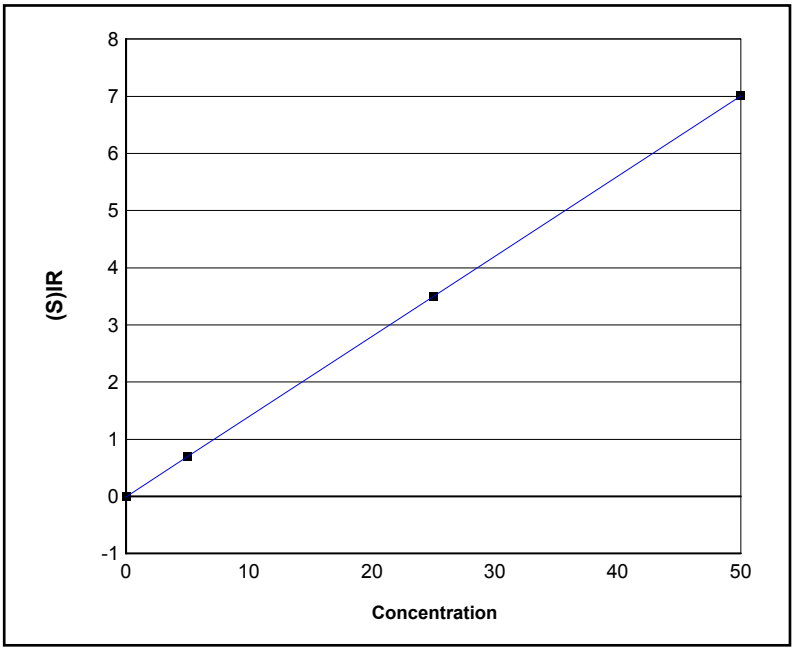
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000035287	0.00000	0.000059321	0.000023084	1
IC4	1.0000	1.0100	0.0076814	0.76814	0.041637	0.00012469	1
IC2	0.10000	0.100000	-0.0034507	-3.4507	0.0040429	0.000036991	1
IC3	0.50000	0.50000	-0.0042308	-0.84615	0.020515	0.000021108	1



Element Name:	Mo
Element Wavelength:	Mo 202.030 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.000096681
A1 (Gain):	0.39983
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

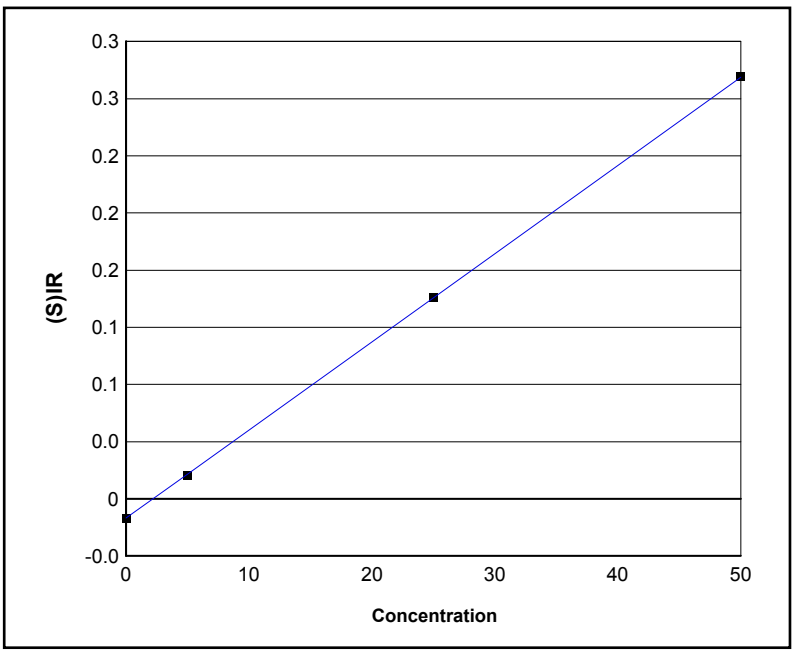
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000002675	0.00000	0.000096574	0.000015164	1
IC4	1.0000	1.00000	-0.00013504	-0.013504	0.39988	0.00042849	1
IC2	0.10000	0.10000	0.00031745	0.31745	0.040207	0.00010355	1
IC3	0.50000	0.50000	-0.00018241	-0.036483	0.19994	0.00082379	1



Element Name:	Na
Element Wavelength:	Na 589.592 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.0040681
A1 (Gain):	0.14026
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

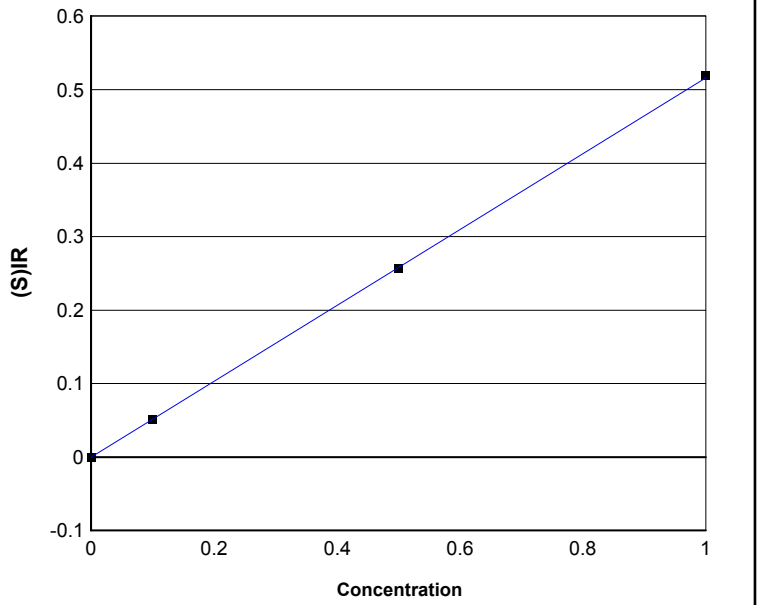
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.000000000	0.000021106	0.00000	-0.0040651	0.00036785	1
IC4	50.000	50.060	0.056919	0.11384	7.0167	0.020580	1
IC2	5.0000	4.9800	-0.019267	-0.38535	0.69451	0.00090501	1
IC3	25.000	24.960	-0.037651	-0.15061	3.4970	0.030588	1



Element Name:	Na
Element Wavelength:	Na 818.326 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99997
A0 (Offset):	-0.013532
A1 (Gain):	0.0061730
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

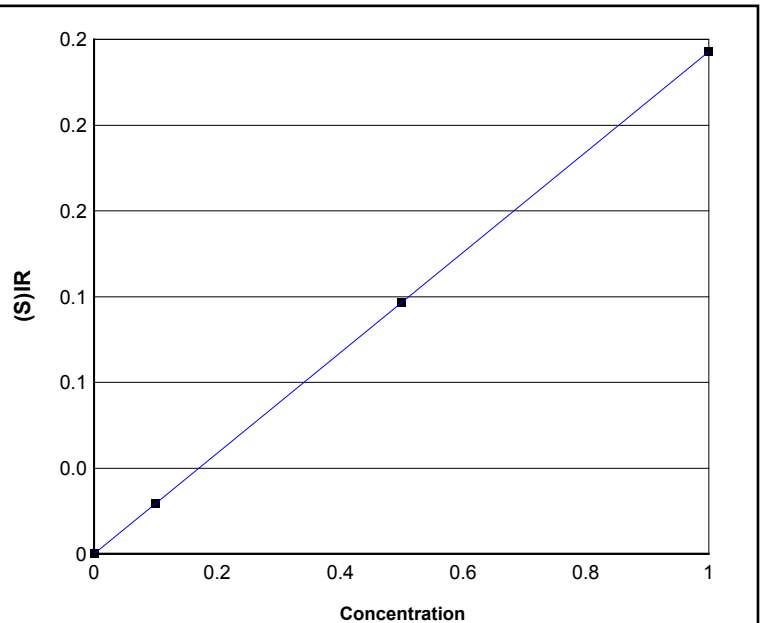
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00000000	0.00012902	0.00000	-0.013532	0.00023482	1
IC4	50.000	50.100	0.099875	0.19975	0.29573	0.00042083	1
IC2	5.0000	4.8500	-0.14879	-2.9758	0.016414	0.000029942	1
IC3	25.000	25.050	0.048914	0.19566	0.14109	0.0016684	1



Element Name:	Ni
Element Wavelength:	Ni 231.604 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99998
A0 (Offset):	-0.00010910
A1 (Gain):	0.51618
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

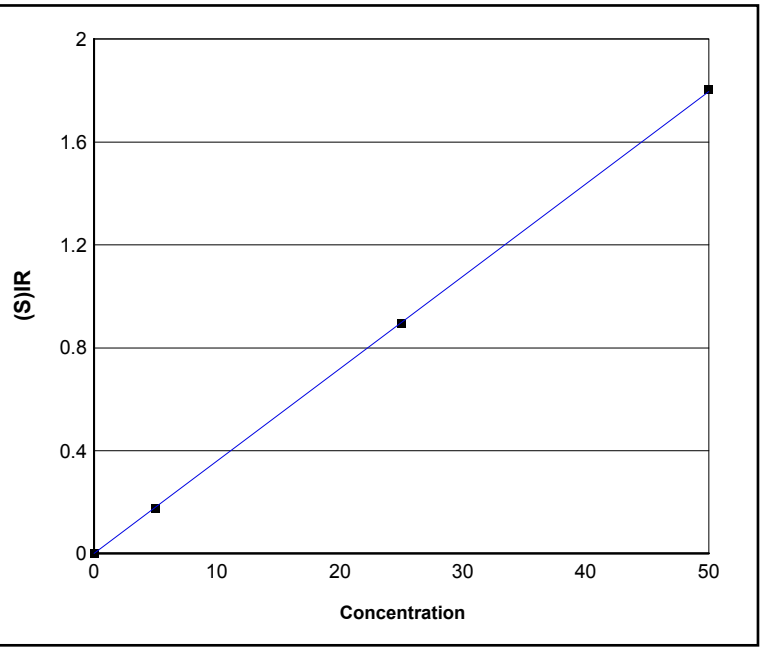
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000018194	0.00000	-0.00010816	0.000064942	1
IC4	1.0000	1.0000	0.0047554	0.47554	0.51924	0.00051834	1
IC2	0.10000	0.100000	-0.0016798	-1.6798	0.050713	0.00050093	1
IC3	0.50000	0.50000	-0.0030756	-0.61511	0.25675	0.0015540	1



Element Name:	Pb
Element Wavelength:	Pb 220.353 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.000076555
A1 (Gain):	0.23424
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

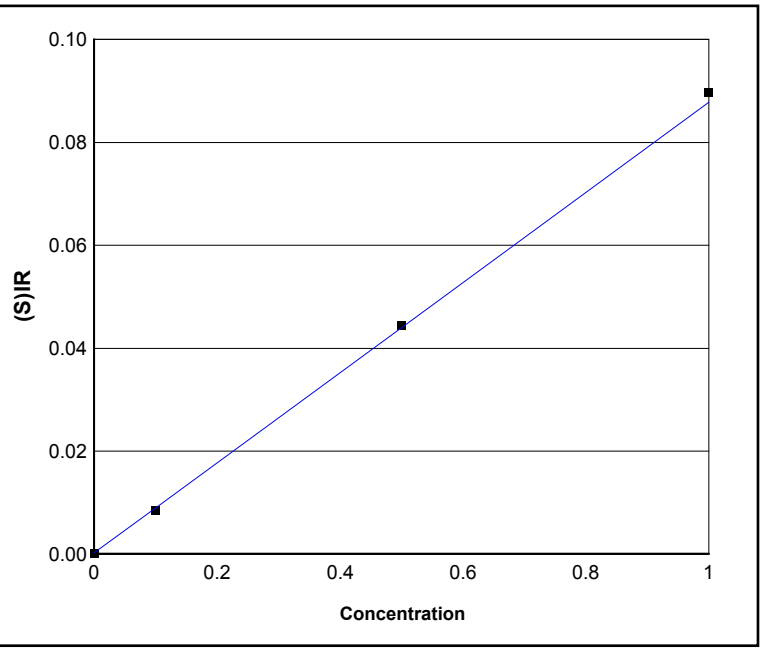
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000003350	0.00000	0.000076477	0.00046184	1
IC4	1.0000	1.0000	0.000045389	0.0045389	0.23460	0.0015524	1
IC2	0.10000	0.10000	0.00042438	0.42438	0.023627	0.0010345	1
IC3	0.50000	0.50000	-0.00046977	-0.093954	0.11722	0.00096558	1



Element Name:	S
Element Wavelength:	S 182.034 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99996
A0 (Offset):	0.00039584
A1 (Gain):	0.035917
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

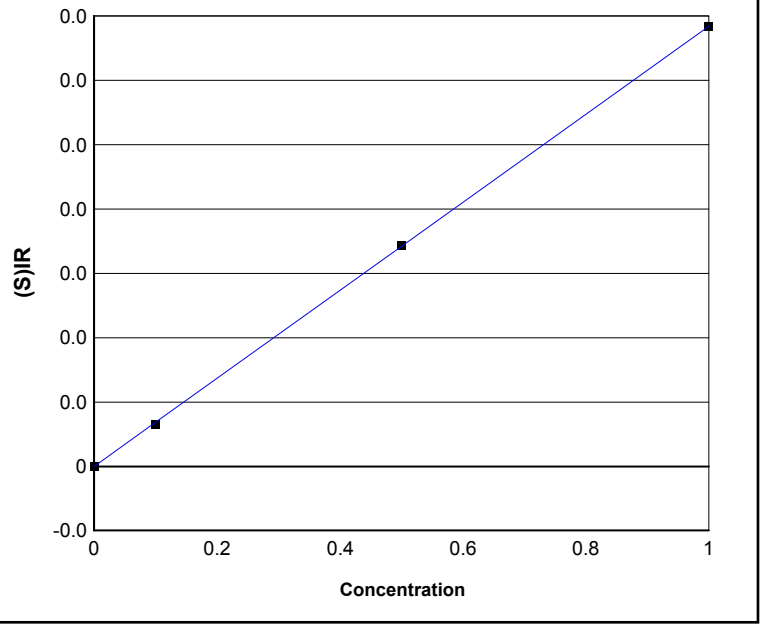
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00000000	0.00013093	0.00000	0.00040054	0.00013284	1
IC2	5.0000	4.8700	-0.12935	-2.5871	0.17533	0.00019984	1
IC3	25.000	24.850	-0.14516	-0.58064	0.89311	0.0018769	1
IC4	50.000	50.270	0.27451	0.54903	1.8061	0.0018050	1



Element Name:	Sb
Element Wavelength:	Sb 206.833 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99986
A0 (Offset):	0.00019292
A1 (Gain):	0.087642
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

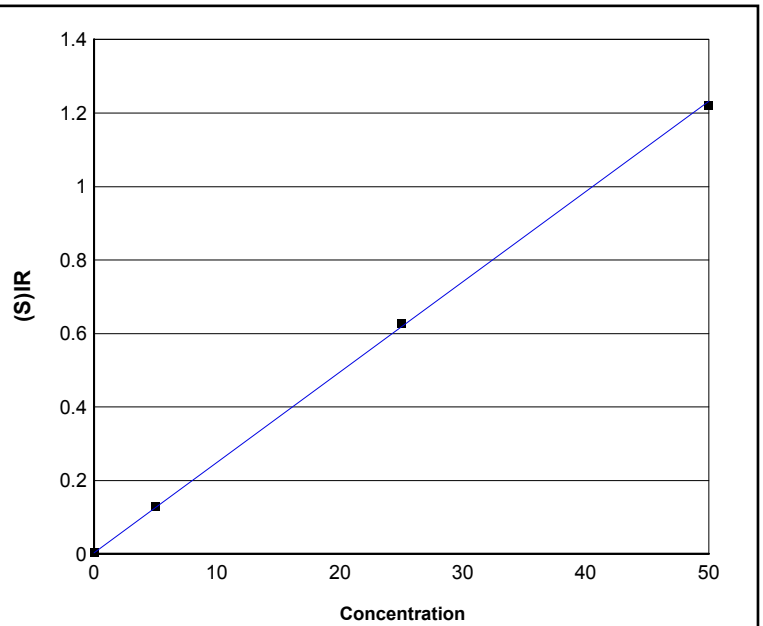
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000057418	0.00000	0.00019342	0.000020240	1
IC4	1.0000	1.0100	0.0085291	0.85291	0.089742	0.00046256	1
IC2	0.10000	0.090000	-0.0061111	-6.1111	0.0085375	0.00014069	1
IC3	0.50000	0.50000	-0.0024180	-0.48359	0.044382	0.00033189	1



Element Name:	Se
Element Wavelength:	Se 196.090 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99991
A0 (Offset):	-0.000018175
A1 (Gain):	0.034212
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

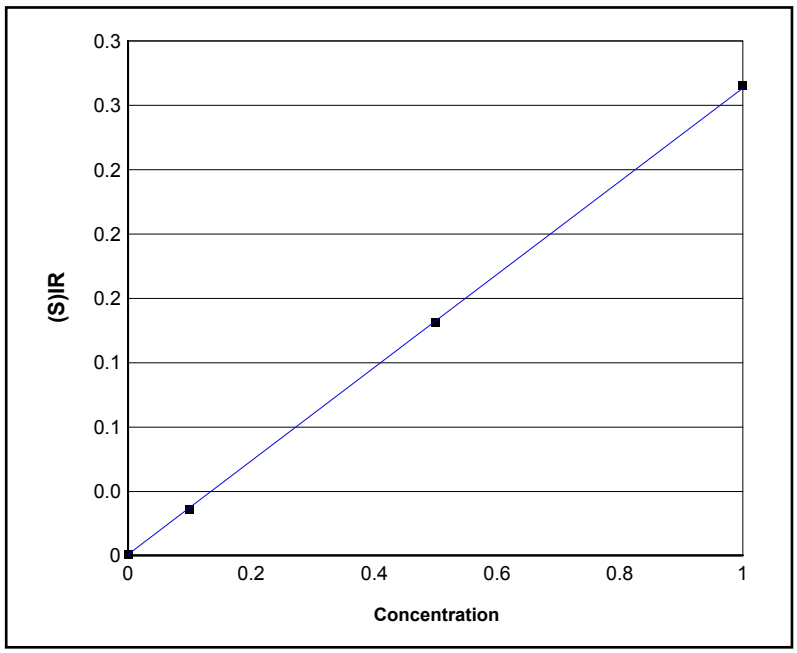
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000043560	0.00000	-0.000018026	0.000039823	1
IC4	1.0000	1.0000	0.0023126	0.23126	0.034222	0.000092567	1
IC2	0.10000	0.090000	-0.0051559	-5.1559	0.0032215	0.00017246	1
IC3	0.50000	0.50000	0.0028433	0.56865	0.017160	0.00014337	1



Element Name:	Si
Element Wavelength:	Si 288.158 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99991
A0 (Offset):	0.0035692
A1 (Gain):	0.024582
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

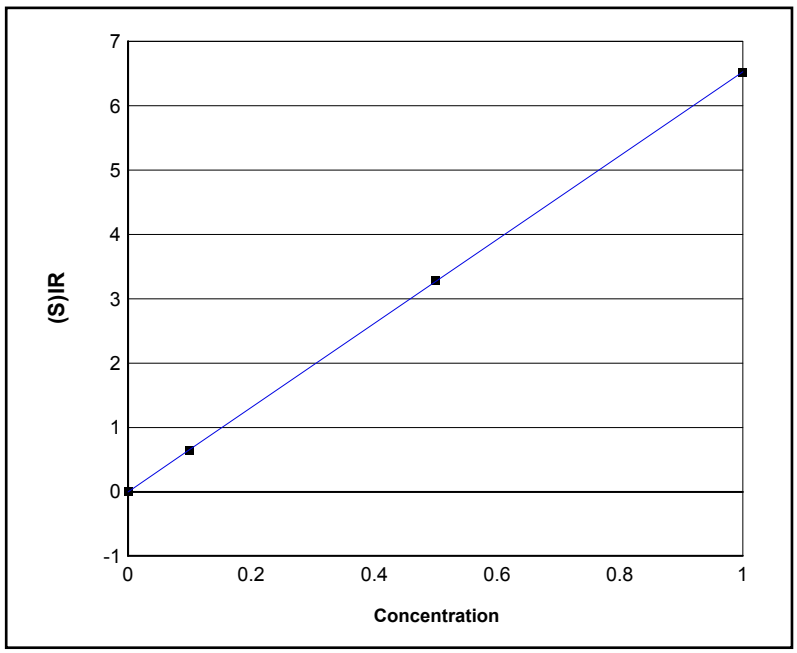
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.00000000	-0.00015860	0.00000	0.0035653	0.000086456	1
IC2	5.0000	5.1400	0.13640	2.7280	0.12983	0.0016925	1
IC3	25.000	25.360	0.35834	1.4334	0.62693	0.00080662	1
IC4	50.000	49.510	-0.49474	-0.98949	1.2205	0.0046586	1



Element Name:	Sn
Element Wavelength:	Sn 189.989 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99992
A0 (Offset):	0.00083457
A1 (Gain):	0.28988
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

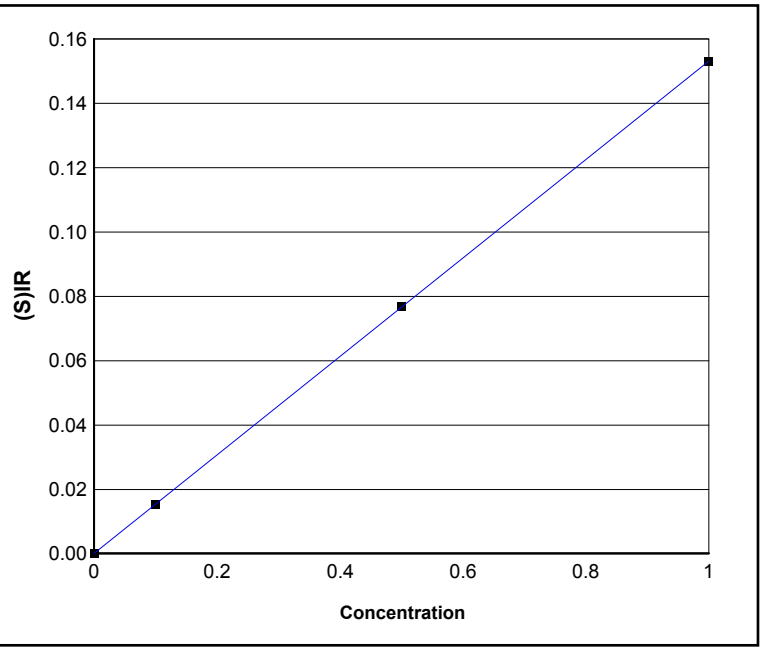
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000042989	0.00000	0.00083582	0.000055845	1
IC4	1.0000	1.0100	0.0071895	0.71895	0.29265	0.00059546	1
IC2	0.10000	0.100000	-0.0044749	-4.4749	0.028510	0.00018148	1
IC3	0.50000	0.50000	-0.0027145	-0.54291	0.14491	0.000029709	1



Element Name:	Sr
Element Wavelength:	Sr 407.771 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.0015900
A1 (Gain):	6.5301
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		**QC Normalize**	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

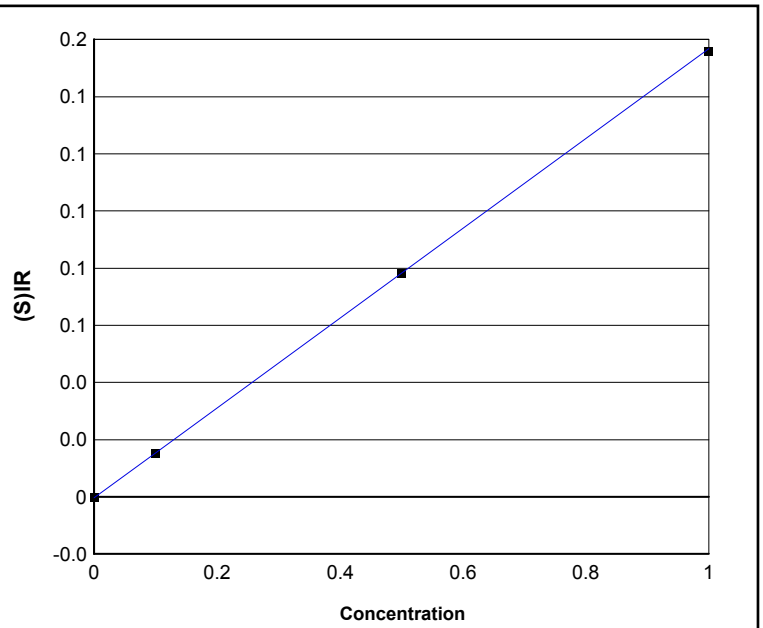
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000004798	0.00000	-0.0015869	0.00015674	1
IC2	0.10000	0.100000	-0.00077380	-0.77380	0.64637	0.0020148	1
IC3	0.50000	0.50000	0.0021658	0.43315	3.2776	0.024810	1
IC4	1.0000	1.00000	-0.0013920	-0.13920	6.5194	0.023526	1



Element Name:	Ti
Element Wavelength:	Ti 334.904 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	0.000011524
A1 (Gain):	0.15318
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

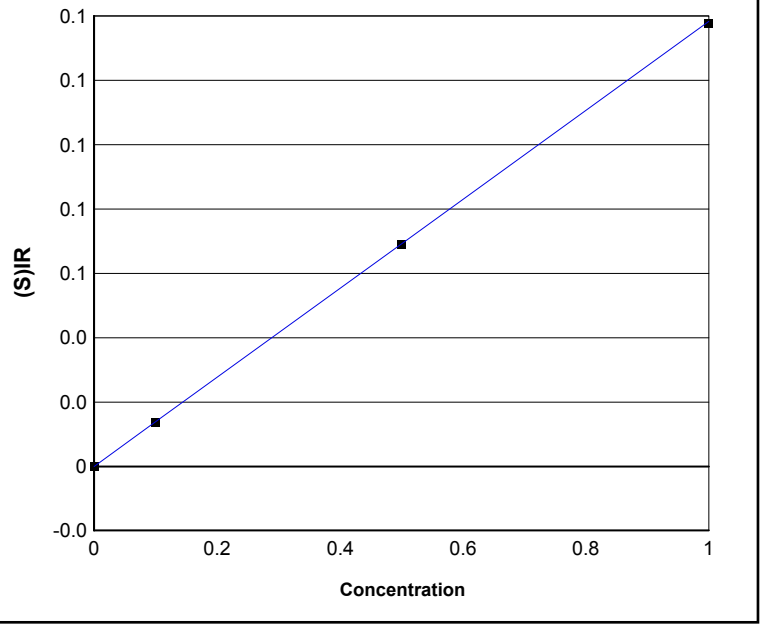
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000002104	0.00000	0.000011556	0.000033194	1
IC4	1.0000	1.00000	-0.0016134	-0.16134	0.15298	0.00020166	1
IC2	0.10000	0.100000	-0.00046470	-0.46470	0.015262	0.000044739	1
IC3	0.50000	0.50000	0.0020781	0.41563	0.076936	0.00017150	1



Element Name:	Tl
Element Wavelength:	Tl 190.856 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99999
A0 (Offset):	-0.00032847
A1 (Gain):	0.15718
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

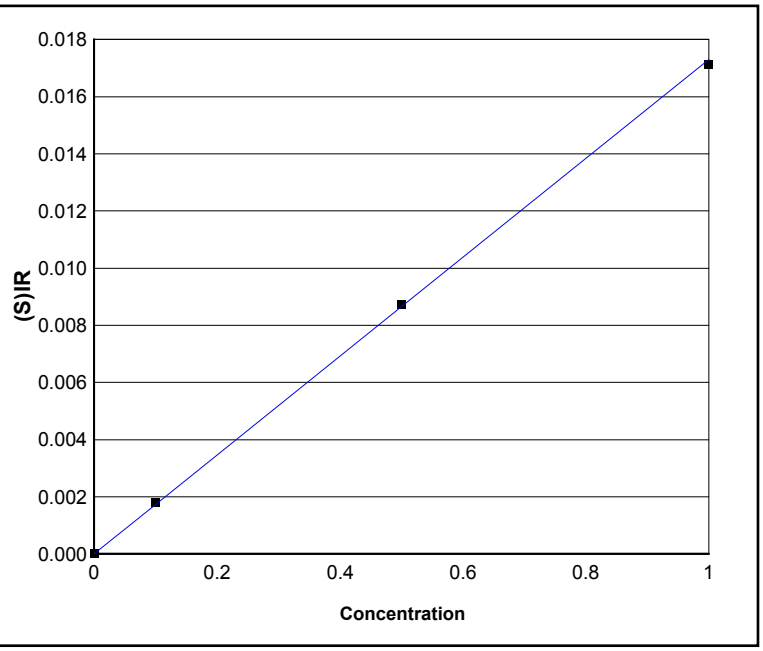
Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000002524	0.00000	-0.00032843	0.000080128	1
IC4	1.0000	1.00000	-0.0020202	-0.20202	0.15577	0.00047842	1
IC2	0.10000	0.100000	-0.00056798	-0.56798	0.015224	0.000082622	1
IC3	0.50000	0.50000	0.0025881	0.51763	0.078286	0.00086640	1



Element Name:	V
Element Wavelength:	V 292.402 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	1.00000
A0 (Offset):	-0.000037777
A1 (Gain):	0.13836
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	0.0000000300	0.00000	-0.000037773	0.0000005038	1
IC4	1.0000	1.00000	-0.00093647	-0.093647	0.13777	0.00047569	1
IC2	0.10000	0.100000	-0.00015456	-0.15456	0.013735	0.00011054	1
IC3	0.50000	0.50000	0.0010910	0.21821	0.069082	0.000031805	1



Element Name:	Zn
Element Wavelength:	Zn 206.200 nm
Concentration Units:	ppm
Date of Calibration:	11/14/2013 10:34:37AM
Date of Fit:	11/14/2013 11:03:08AM
Type of Fit:	Linear
Correlation:	0.99992
A0 (Offset):	0.0000025675
A1 (Gain):	0.017307
A2 (Curvature):	0.00000
n (Exponent):	1.0000

Reslope		QC Normalize	
Slope:	1.0000	**Slope factor:**	1.0000
Y Int:	0.00000	**Offset:**	0.00000

Standard Name	Stated	Found	Diff	% Diff	(S)IR	Stddev	Emphasis
IC1	0.00000	0.0000000000	-0.0000034268	0.00000	0.0000025082	0.0000092009	1
IC4	1.0000	0.99000	-0.0090130	-0.90130	0.017118	0.000026456	1
IC2	0.10000	0.10000	0.0031568	3.1568	0.0017844	0.000018959	1
IC3	0.50000	0.51000	0.0058562	1.1712	0.0087399	0.000039781	1

Sample Name: IC1 Acquired: 11/14/2013 10:25:57 Type: Cal
Method: ICAP2 2012 (v217) Mode: IR Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**-.00016**	**.00066**	**-.00033**	**.00125**	**.01029**	**.00176**	**.00065**	**.00724**	**.00046**	**.00000**	**.00002**	**.00206**
Stddev	.00007	.00011	.00009	.00011	.00146	.00008	.00006	.00013	.00008	.00007	.00001	.00004
%RSD	45.094	17.377	26.236	8.9176	14.222	4.4019	9.2070	1.7284	16.550	6897.1	58.253	1.7692
#1	-.00011	.00058	-.00039	.00133	.01133	.00181	.00060	.00715	.00041	-.00005	.00001	.00203
#2	-.00021	.00074	-.00027	.00117	.00926	.00170	.00069	.00732	.00052	.00005	.00003	.00208

Elem	Fe2599	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Na8183	Ni2316	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00054**	**-.00012**	**.00249**	**-.00637**	**-.00004**	**.00019**	**.00006**	**.00010**	**-.00407**	**-.01353**	**-.00011**	**.00008**
Stddev	.00005	.00009	.00071	.00176	.00001	.00004	.00002	.00002	.00037	.00023	.00006	.00046
%RSD	8.4191	74.987	28.533	27.662	19.658	20.961	38.914	15.702	9.0489	1.7354	60.042	603.90
#1	.00051	-.00019	.00199	-.00761	-.00004	.00022	.00004	.00009	-.00433	-.01370	-.00015	.00040
#2	.00057	-.00006	.00299	-.00512	-.00005	.00017	.00008	.00011	-.00381	-.01337	-.00006	-.00025

Elem	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00040**	**.00019**	**-.00002**	**.00357**	**.00084**	**-.00159**	**.00001**	**-.00033**	**-.00004**	**.00000**
Stddev	.00013	.00002	.00004	.00009	.00006	.00016	.00003	.00008	.00000	.00001
%RSD	33.165	10.464	220.92	2.4249	6.6815	9.8773	287.23	24.397	1.3339	366.83
#1	.00031	.00021	.00001	.00350	.00088	-.00148	-.00001	-.00027	-.00004	.00001
#2	.00049	.00018	-.00005	.00363	.00080	-.00170	.00004	-.00039	-.00004	.00000

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2130.5**	**3943.3**	**62794.**	**6899.6**
Stddev	2.0	1.6	.	11.2
%RSD	.09582	.04082	.00056	.16211
#1	2129.1	3942.1	62793.	6891.7
#2	2131.9	3944.4	62794.	6907.6

Sample Name: IC2 Acquired: 11/14/2013 10:28:13 Type: Cal
Method: ICAP2 2012 (v217) Mode: IR Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.00997**	**.07605**	**.00562**	**.03508**	**.31426**	**.81769**	**.46768**	**.45143**	**.12169**	**.12525**	**.00567**	**.01840**
Stddev	.00004	.00018	.00006	.00029	.00008	.00139	.00125	.00106	.00065	.00067	.00002	.00009
%RSD	.38551	.23332	1.0554	.82841	.02611	.16985	.26688	.23451	.53503	.53234	.28905	.47854
#1	.01000	.07618	.00566	.03529	.31420	.81867	.46857	.45217	.12215	.12478	.00566	.01847
#2	.00994	.07593	.00557	.03487	.31432	.81671	.46680	.45068	.12123	.12572	.00568	.01834

Elem	Fe2599	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Na8183	Ni2316	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.24027**	**.01741**	**.19281**	**.11510**	**.03917**	**.04275**	**.00404**	**.04021**	**.69451**	**.01641**	**.05071**	**.02363**
Stddev	.00002	.00027	.00086	.00011	.00000	.00013	.00004	.00010	.00091	.00003	.00050	.00103
%RSD	.00848	1.5526	.44450	.09588	.00668	.29421	.91497	.25755	.13031	.18242	.98777	4.3783
#1	.24029	.01760	.19221	.11518	.03918	.04284	.00402	.04028	.69515	.01639	.05107	.02436
#2	.24026	.01722	.19342	.11503	.03917	.04266	.00407	.04013	.69387	.01644	.05036	.02290

Elem	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.17533**	**.00854**	**.00322**	**.12983**	**.02851**	**.64637**	**.01526**	**.01522**	**.01373**	**.00178**
Stddev	.00020	.00014	.00017	.00169	.00018	.00201	.00004	.00008	.00011	.00002
%RSD	.11398	1.6479	5.3534	1.3036	.63655	.31171	.29315	.54272	.80484	1.0625
#1	.17548	.00864	.00310	.12864	.02864	.64779	.01529	.01528	.01381	.00177
#2	.17519	.00844	.00334	.13103	.02838	.64494	.01523	.01517	.01366	.00180

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2067.3**	**3917.6**	**61739.**	**6976.2**
Stddev	1.2	3.5	180.	25.1
%RSD	.06022	.08949	.29173	.35932
#1	2068.2	3915.1	61866.	6958.4
#2	2066.5	3920.1	61612.	6993.9

Sample Name: IC3 Acquired: 11/14/2013 10:30:27 Type: Cal
Method: ICAP2 2012 (v217) Mode: IR Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.05109**	**.37659**	**.02959**	**.16759**	**1.5763**	**4.0685**	**2.2943**	**2.2487**	**.61023**	**.64314**	**.02811**	**.08472**
Stddev	.00010	.00148	.00009	.00155	.0107	.0106	.0160	.0097	.00143	.00289	.00004	.00043
%RSD	.19682	.39191	.31810	.92555	.68206	.26147	.69764	.43052	.23374	.44988	.13086	.51101
#1	.05102	.37763	.02952	.16649	1.5839	4.0760	2.3056	2.2556	.60922	.64109	.02809	.08503
#2	.05116	.37555	.02966	.16868	1.5687	4.0610	2.2830	2.2419	.61124	.64518	.02814	.08441

Elem	Fe2599	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Na8183	Ni2316	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1.2054**	**.08624**	**.96712**	**.60202**	**.19558**	**.21059**	**.02052**	**.19994**	**3.4970**	**.14109**	**.25675**	**.11722**
Stddev	.0052	.00091	.01025	.00771	.00010	.00047	.00002	.00082	.0306	.00167	.00155	.00097
%RSD	.43314	1.0508	1.0603	1.2806	.05133	.22218	.10289	.41202	.87469	1.1825	.60525	.82372
#1	1.2091	.08688	.97437	.60747	.19551	.21026	.02053	.19936	3.5187	.14227	.25565	.11654
#2	1.2017	.08560	.95987	.59657	.19565	.21092	.02050	.20052	3.4754	.13991	.25785	.11791

Elem	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**.89311**	**.04438**	**.01716**	**.62693**	**.14491**	**3.2776**	**.07694**	**.07829**	**.06908**	**.00874**
Stddev	.00188	.00033	.00014	.00081	.00003	.0248	.00017	.00087	.00003	.00004
%RSD	.21016	.74779	.83551	.12866	.02050	.75697	.22291	1.1067	.04604	.45516
#1	.89178	.04415	.01706	.62750	.14489	3.2951	.07681	.07767	.06906	.00871
#2	.89443	.04462	.01726	.62636	.14493	3.2601	.07706	.07890	.06910	.00877

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1932.1**	**3840.0**	**60091.**	**6943.0**
Stddev	2.1	5.2	28.	25.8
%RSD	.10631	.13518	.04595	.37134
#1	1933.6	3843.6	60071.	6924.8
#2	1930.7	3836.3	60110.	6961.3

Sample Name: IC4 Acquired: 11/14/2013 10:32:32 Type: Cal
Method: ICAP2 2012 (v217) Mode: IR Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	.10290	.75324	.06015	.33500	3.1258	7.9518	4.5121	4.4570	1.2292	1.3020	.05564	.16783
Stddev	.00015	.00041	.00016	.00035	.0128	.0383	.0045	.0033	.0017	.0015	.00027	.00062
%RSD	.14408	.05388	.26822	.10560	.40954	.48112	.09958	.07308	.13510	.11917	.49346	.36886
#1	.10300	.75295	.06004	.33475	3.1168	7.9248	4.5089	4.4547	1.2304	1.3031	.05584	.16739
#2	.10279	.75353	.06027	.33525	3.1349	7.9789	4.5152	4.4593	1.2280	1.3009	.05545	.16826

Elem	Fe2599	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mn2576-2	Mo2020	Na5895	Na8183	Ni2316	Pb2203
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2.3742	.17069	1.9203	1.1955	.38746	.41347	.04164	.39988	7.0167	.29573	.51924	.23460
Stddev	.0045	.00080	.0083	.0051	.00063	.00085	.00012	.00043	.0206	.00042	.00052	.00155
%RSD	.18912	.47020	.43200	.42449	.16264	.20604	.29948	.10716	.29331	.14230	.09983	.66174
#1	2.3710	.17126	1.9144	1.1919	.38790	.41407	.04155	.39957	7.0021	.29603	.51961	.23350
#2	2.3774	.17013	1.9261	1.1991	.38701	.41286	.04173	.40018	7.0313	.29543	.51887	.23570

Elem	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1.8061	.08974	.03422	1.2205	.29265	6.5194	.15298	.15577	.13777	.01712
Stddev	.0018	.00046	.00009	.0047	.00060	.0235	.00020	.00048	.00048	.00003
%RSD	.09994	.51543	.27049	.38170	.20347	.36086	.13183	.30714	.34528	.15455
#1	1.8048	.08942	.03416	1.2172	.29307	6.5028	.15283	.15611	.13811	.01714
#2	1.8074	.09007	.03429	1.2238	.29223	6.5360	.15312	.15543	.13743	.01710

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1841.5	3760.8	59067.	6990.1
Stddev	2.0	10.6	102.	23.7
%RSD	.10656	.28309	.17264	.33863
#1	1842.9	3768.3	59139.	7006.8
#2	1840.1	3753.3	58995.	6973.3

Sample Name: ICV-1747721 Acquired: 11/14/2013 10:34:42 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37808	19.087	.38342	.37393	.38641	.37941	18.881	.37667	.37086	.38511	.37715	18.527	18.875
Stddev	.00109	.087	.00520	.00035	.00033	.00142	.009	.00084	.00011	.00046	.00064	.058	.093
%RSD	.28881	.45714	1.3554	.09231	.08579	.37498	.04520	.22400	.03032	.11967	.16877	.31057	.49306
#1	.37731	19.148	.38709	.37417	.38664	.38042	18.887	.37608	.37078	.38478	.37760	18.568	18.941
#2	.37885	19.025	.37974	.37368	.38618	.37841	18.875	.37727	.37094	.38543	.37670	18.486	18.809
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.37740	18.590	.38780	.38253	18.797	.37387	.37249	18.744	.38525	.37451	19.201	.37848	.37743
Stddev	.00078	.017	.00017	.00009	.069	.00126	.00005	.013	.00275	.00393	.109	.00062	.00153
%RSD	.20711	.08988	.04512	.02228	.36833	.33639	.01336	.06851	.71422	1.0492	.56995	.16473	.40522
#1	.37795	18.602	.38793	.38259	18.846	.37298	.37245	18.735	.38720	.37728	19.123	.37804	.37851
#2	.37685	18.578	.38768	.38247	18.748	.37476	.37253	18.753	.38330	.37173	19.278	.37892	.37634
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.38604	.37987	.38037	.38429
Stddev	.00077	.00045	.00103	.00184
%RSD	.20035	.11971	.27143	.48001
#1	.38659	.37955	.38110	.38299
#2	.38550	.38019	.37964	.38559
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1973.3	3859.7	60697.	7020.0
Stddev	4.8	10.1	62.	2.7
%RSD	.24284	.26213	.10203	.03803
#1	1976.7	3866.9	60741.	7018.1
#2	1969.9	3852.6	60653.	7021.9

Sample Name: ICB-1749384 Acquired: 11/14/2013 10:36:49 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00031	-.01562	.00469	-.00021	-.00001	-.00014	-.01558	-.00012	.00002	-.00015	-.00029	-.00265	.03510
Stddev	.00038	.00234	.00166	.00030	.00001	.00001	.00488	.00004	.00002	.00075	.00049	.00201	.00417
%RSD	123.25	14.994	35.373	139.41	64.625	5.8445	31.304	34.940	118.48	489.63	171.14	75.793	11.886
#1	.00004	-.01728	.00352	.00000	.00000	-.00014	-.01903	-.00015	.00000	-.00068	-.00063	-.00123	.03805
#2	.00057	-.01397	.00587	-.00042	-.00001	-.00015	-.01213	-.00009	.00003	.00038	.00006	-.00407	.03215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00219	-.00282	-.00004	.00011	.01822	.00014	.00049	-.00090	-.00197	.00363	-.01385	-.00202	.00000
Stddev	.00024	.00226	.00007	.00005	.01804	.00054	.00130	.00154	.00021	.00007	.02386	.00031	.00010
%RSD	10.735	80.213	158.71	40.993	99.056	386.23	265.79	171.84	10.530	1.8501	172.28	15.381	2342.3
#1	.00203	-.00442	.00001	.00008	.03097	.00052	.00141	.00019	-.00212	.00367	-.03071	-.00224	-.00007
#2	.00236	-.00122	-.00009	.00015	.00546	-.00024	-.00043	-.00199	-.00182	.00358	.00302	-.00180	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	-.00031	.00036	-.00012	.00085
Stddev	.00003	.00031	.00048	.00042
%RSD	9.5413	84.038	393.40	48.834
#1	-.00033	.00015	-.00046	.00056
#2	-.00029	.00058	.00022	.00115
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2139.0	3961.2	62746.	7033.8
Stddev	.5	.0	79.	47.5
%RSD	.02226	.00009	.12539	.67511
#1	2138.6	3961.2	62690.	7000.2
#2	2139.3	3961.2	62802.	7067.4

Sample Name: ICVL-1739111 Acquired: 11/14/2013 10:39:07 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00305	.19250	.01122	.01940	.00201	.00182	.48763	.00096	.00402	.00332	.00946	.04480	.51592
Stddev	.00008	.00715	.00084	.00013	.00002	.00007	.00177	.00013	.00006	.00048	.00029	.00206	.02857
%RSD	2.5398	3.7125	7.4967	.66764	.80246	3.6444	.36286	13.970	1.5193	14.386	3.0876	4.6003	5.5384
#1	.00300	.18744	.01062	.01949	.00200	.00187	.48638	.00086	.00397	.00366	.00966	.04334	.49572
#2	.00311	.19755	.01181	.01931	.00202	.00177	.48889	.00105	.00406	.00298	.00925	.04626	.53613
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03159	.20854	.00337	.00978	.98433	.01003	.00585	.19806	.01627	.01262	.43644	.00719	.00498
Stddev	.00020	.00162	.00001	.00011	.00118	.00066	.00111	.00438	.00021	.00773	.00326	.00044	.00001
%RSD	.62330	.77836	.17939	1.1068	.11948	6.5877	18.966	2.2094	1.2811	61.285	.74763	6.1069	.19391
#1	.03146	.20739	.00337	.00986	.98517	.01050	.00664	.19497	.01642	.01809	.43875	.00688	.00498
#2	.03173	.20968	.00337	.00970	.98350	.00957	.00507	.20116	.01613	.00715	.43414	.00751	.00497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00447	.01847	.00463	.01060
Stddev	.00007	.00058	.00018	.00011
%RSD	1.4562	3.1544	3.7916	1.0765
#1	.00451	.01888	.00451	.01068
#2	.00442	.01806	.00475	.01052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2171.2	4059.0	63851.	7326.2
Stddev	4.5	19.5	54.	18.2
%RSD	.20742	.48069	.08489	.24906
#1	2174.4	4072.8	63889.	7339.1
#2	2168.0	4045.2	63813.	7313.3

Sample Name: cri-1739110 Acquired: 11/14/2013 10:41:24 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00603**	**.38493**	**.02048**	**.03836**	**.00417**	**.00397**	**.97963**	**.00177**	**.00782**	**.00801**	**.02035**	**.10042**	**1.0136**
Stddev	.00063	.01089	.00062	.00056	.00000	.00005	.00550	.00003	.00027	.00060	.00037	.00294	.0128
%RSD	10.382	2.8298	3.0198	1.4729	.04477	1.2110	.56113	1.7257	3.4515	7.4910	1.8321	2.9327	1.2658
#1	.00647	.37723	.02004	.03876	.00417	.00394	.98352	.00179	.00763	.00758	.02061	.10250	1.0045
#2	.00559	.39263	.02091	.03796	.00417	.00401	.97575	.00175	.00801	.00843	.02008	.09833	1.0227
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06243**	**.40101**	**.00641**	**.02034**	**2.0070**	**.01970**	**.01050**	**.39212**	**.03750**	**.03144**	**.95885**	**.01653**	**.01010**
Stddev	.00044	.00611	.00005	.00031	.0135	.00063	.00093	.00024	.00056	.00181	.01947	.00051	.00012
%RSD	.70563	1.5232	.74864	1.5435	.67330	3.1983	8.8215	.06044	1.4953	5.7693	2.0303	3.0898	1.2339
#1	.06212	.39669	.00637	.02057	1.9975	.01926	.01116	.39195	.03789	.03016	.97261	.01617	.01001
#2	.06275	.40533	.00644	.02012	2.0166	.02015	.00985	.39229	.03710	.03272	.94508	.01689	.01019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00977**	**.03879**	**.00992**	**.02051**
Stddev	.00002	.00172	.00020	.00090
%RSD	.17143	4.4247	2.0384	4.3750
#1	.00976	.04000	.00978	.02114
#2	.00978	.03757	.01007	.01988
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2125.6**	**3920.0**	**62350.**	**7020.3**
Stddev	4.2	5.6	72.	10.4
%RSD	.19632	.14292	.11584	.14884
#1	2122.6	3916.1	62401.	7012.9
#2	2128.5	3924.0	62299.	7027.7

Sample Name: icsa-1716849 Acquired: 11/14/2013 10:43:42 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00140**	**551.17**	**-.00034**	**-.00372**	**.00185**	**-.00012**	**519.31**	**-.00149**	**-.00069**	**.00078**	**.00341**	**204.88**	**-.04548**
Stddev	.00021	1.84	.00135	.00056	.00004	.00002	.69	.00009	.00011	.00086	.00005	.42	.07023
%RSD	14.788	.33371	404.35	15.091	2.0552	15.181	.13332	6.3592	16.098	109.67	1.3928	.20323	154.43
#1	.00125	552.47	-.00129	-.00332	.00187	-.00014	518.82	-.00156	-.00061	.00139	.00337	205.18	-.09513
#2	.00154	549.87	.00062	-.00411	.00182	-.00011	519.80	-.00143	-.00077	.00018	.00344	204.59	.00418
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00792**	**535.51**	**.00201**	**-.00243**	**.09711**	**-.00011**	**-.00386**	**.09283**	**-.00886**	**-.00122**	**-.04398**	**.00166**	**.00499**
Stddev	.00100	.47	.00016	.00098	.00438	.00107	.00325	.00405	.00457	.00051	.00255	.00053	.00001
%RSD	12.677	.08757	8.1742	40.486	4.5129	979.47	84.174	4.3662	51.566	42.130	5.7982	31.953	.11936
#1	.00721	535.84	.00212	-.00173	.09401	.00065	-.00616	.08997	-.01209	-.00158	-.04578	.00203	.00499
#2	.00863	535.18	.00189	-.00312	.10021	-.00087	-.00156	.09570	-.00563	-.00086	-.04218	.00128	.00498
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00277**	**-.00614**	**.00000**	**.00308**
Stddev	.00029	.00850	.0004	.00063
%RSD	10.527	138.35	18539.	20.517
#1	.00297	-.00013	.00025	.00263
#2	.00256	-.01216	-.00026	.00353
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1556.1**	**3466.7**	**53285.**	**6714.3**
Stddev	1.6	2.6	118.	30.0
%RSD	.10416	.07519	.22197	.44742
#1	1557.3	3468.6	53368.	6735.6
#2	1555.0	3464.9	53201.	6693.1

Sample Name: icsab-1723354 Acquired: 11/14/2013 10:45:56 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22652	542.72	.11558	.00176	.51686	.52441	522.80	1.0639	.51848	.50106	.57248	100.42	.03272
Stddev	.00146	2.33	.00424	.00006	.00154	.00238	2.67	.0016	.00042	.00099	.00143	.71	.02471
%RSD	.64359	.42840	3.6695	3.5183	.29847	.45397	.51079	.15249	.08194	.19836	.24959	.70438	75.520
#1	.22755	544.36	.11258	.00171	.51795	.52609	524.68	1.0628	.51878	.50036	.57349	100.92	.05020
#2	.22549	541.07	.11858	.00180	.51577	.52272	520.91	1.0651	.51818	.50176	.57147	99.916	.01525
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.54672	542.33	.48559	-.00246	.08137	1.0034	.05266	.57321	.61659	.05868	1.0757	.00153	.54374
Stddev	.00200	.81	.00047	.00021	.00796	.0062	.00150	.00085	.00920	.00350	.0240	.00237	.00418
%RSD	.36620	.14957	.09761	8.4901	9.7857	.62109	2.8471	.14855	1.4915	5.9696	2.2331	155.30	.76881
#1	.54813	542.91	.48593	-.00260	.07574	1.0078	.05160	.57381	.62309	.06116	1.0927	.00321	.54670
#2	.54530	541.76	.48526	-.00231	.08700	.99898	.05372	.57260	.61008	.05621	1.0587	-.00015	.54079
Check ?	None	Chk Pass	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None	None
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00214	.10172	.50859	.98315
Stddev	.00059	.00164	.00044	.00527
%RSD	27.749	1.6145	.08589	.53569
#1	.00256	.10288	.50890	.98687
#2	.00172	.10056	.50828	.97942
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1548.8	3441.6	52970.	6653.1
Stddev	1.8	5.5	189.	26.3
%RSD	.11444	.16059	.35685	.39485
#1	1547.5	3445.5	52836.	6634.5
#2	1550.0	3437.7	53103.	6671.6

Sample Name: ccv-1757648 Acquired: 11/14/2013 10:48:04 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49688**	**25.149**	**.50217**	**.48913**	**.49928**	**.49529**	**24.755**	**.49735**	**.49061**	**.50297**	**.49969**	**24.331**	**25.033**
Stddev	.00219	.099	.00242	.00174	.00357	.00074	.051	.00111	.00066	.00125	.00035	.015	.084
%RSD	.44123	.39449	.48230	.35558	.71462	.15030	.20679	.22412	.13378	.24913	.06926	.06336	.33638
#1	.49843	25.219	.50046	.49036	.50180	.49581	24.719	.49814	.49107	.50385	.49993	24.320	24.973
#2	.49533	25.078	.50389	.48790	.49676	.49476	24.791	.49656	.49015	.50208	.49944	24.342	25.092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49598**	**24.446**	**.50542**	**.50317**	**24.737**	**.49317**	**.49254**	**24.909**	**.51129**	**.49663**	**24.478**	**.50286**	**.50049**
Stddev	.00199	.038	.00007	.00348	.037	.00056	.00195	.101	.00243	.00567	.146	.00027	.00007
%RSD	.40092	.15645	.01417	.69164	.14786	.11395	.39566	.40481	.47461	1.1408	.59760	.05379	.01325
#1	.49738	24.473	.50547	.50563	24.763	.49357	.49391	24.980	.51301	.50063	24.375	.50305	.50045
#2	.49457	24.419	.50537	.50071	24.711	.49278	.49116	24.837	.50958	.49262	24.582	.50266	.50054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.50795**	**.49460**	**.50184**	**.50480**
Stddev	.00019	.00323	.00242	.00564
%RSD	.03683	.65359	.48131	1.1180
#1	.50782	.49232	.50355	.50879
#2	.50808	.49689	.50013	.50081
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1945.7**	**3829.8**	**60074.**	**7080.2**
Stddev	6.0	17.6	214.	23.9
%RSD	.30890	.45874	.35634	.33692
#1	1941.4	3817.4	59923.	7097.1
#2	1949.9	3842.2	60225.	7063.3

Sample Name: ccb-1749384 Acquired: 11/14/2013 10:50:14 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00018**	**.00141**	**.00184**	**-.00086**	**.00001**	**-.00011**	**-.02006**	**-.00011**	**.00009**	**.00005**	**.00053**	**-.00510**	**-.00424**
Stddev	.00028	.02597	.00063	.00023	.00003	.00003	.00415	.00026	.00012	.00005	.00022	.00198	.03657
%RSD	155.72	1847.4	34.410	26.255	237.90	29.450	20.664	233.93	126.84	102.51	41.674	38.797	861.49
#1	-.00002	.01977	.00139	-.00102	-.00001	-.00013	-.02299	.00007	.00001	.00009	.00037	-.00370	-.03010
#2	.00037	-.01696	.00228	-.00070	.00004	-.00009	-.01713	-.00030	.00018	.00001	.00068	-.00650	.02161
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00221**	**.00412**	**.00004**	**.00019**	**.01617**	**.00012**	**.00047**	**.00073**	**.00076**	**.00183**	**-.02121**	**-.00133**	**.00010**
Stddev	.00006	.00757	.00002	.00000	.00966	.00009	.00023	.00109	.00020	.00329	.00917	.00034	.00013
%RSD	2.7231	183.71	44.860	.80228	59.711	72.695	48.212	149.21	26.704	179.77	43.239	25.420	122.79
#1	.00225	-.00123	.00005	.00019	.00935	.00018	.00031	-.00004	.00062	.00416	-.01472	-.00157	.00001
#2	.00216	.00948	.00003	.00019	.02300	.00006	.00063	.00150	.00090	-.00050	-.02769	-.00109	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00015**	**-.00032**	**.00003**	**-.00017**
Stddev	.00045	.00066	.00006	.00057
%RSD	293.70	202.68	237.30	344.67
#1	-.00047	-.00079	-.00002	.00024
#2	.00016	.00014	.00007	-.00057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2143.5**	**3927.0**	**62870.**	**7086.5**
Stddev	.2	11.1	131.	9.5
%RSD	.00898	.28153	.20857	.13380
#1	2143.6	3934.8	62963.	7093.2
#2	2143.3	3919.2	62777.	7079.8

Sample Name: CCVL Acquired: 11/14/2013 10:52:30 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00244**	**.15781**	**.01281**	**.01849**	**.00200**	**.00189**	**.47690**	**.00082**	**.00395**	**.00358**	**.01016**	**.04185**	**.47206**
Stddev	.00016	.00315	.00177	.00040	.00002	.00006	.00116	.00009	.00001	.00014	.00024	.00069	.00035
%RSD	6.5012	1.9970	13.797	2.1754	1.0412	3.4202	.24261	10.479	.30633	3.7828	2.3459	1.6440	.07463
#1	.00232	.16004	.01156	.01820	.00201	.00185	.47772	.00089	.00396	.00367	.00999	.04234	.47231
#2	.00255	.15558	.01406	.01877	.00198	.00194	.47608	.00076	.00394	.00348	.01033	.04137	.47181
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03137**	**.20298**	**.00320**	**.00981**	**.97909**	**.00965**	**.00417**	**.19908**	**.01852**	**.01470**	**.43807**	**.00794**	**.00484**
Stddev	.00179	.00681	.00005	.00009	.00133	.00047	.00018	.00093	.00044	.00032	.00590	.00079	.00006
%RSD	5.7123	3.3558	1.4379	.93769	.13622	4.8699	4.3607	.46895	2.3826	2.1844	1.3467	9.9483	1.1564
#1	.03010	.20779	.00323	.00975	.98004	.00998	.00404	.19974	.01883	.01447	.43389	.00850	.00480
#2	.03264	.19816	.00317	.00988	.97815	.00932	.00430	.19842	.01821	.01493	.44224	.00738	.00488
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00437**	**.02017**	**.00494**	**.01039**
Stddev	.00016	.00087	.00008	.00006
%RSD	3.7131	4.3200	1.7078	.56000
#1	.00426	.02079	.00488	.01043
#2	.00449	.01955	.00500	.01034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2180.2**	**4059.9**	**64224.**	**7312.9**
Stddev	2.1	11.4	227.	9.9
%RSD	.09689	.28171	.35333	.13475
#1	2181.7	4068.0	64384.	7319.9
#2	2178.7	4051.8	64064.	7306.0

Sample Name: mb 480-151082/1-a Acquired: 11/14/2013 10:54:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.01922**	**.00206**	**.00164**	**.00004**	**-.00014**	**.02055**	**.00011**	**.00017**
Stddev	.00001	.00335	.00251	.00006	.00000	.00005	.00835	.00023	.00014
%RSD	10.832	17.406	121.45	3.5407	1.6085	36.762	40.652	208.12	83.032
#1	.00009	-.02159	.00383	.00168	.00004	-.00010	.01464	-.00005	.00027
#2	.00007	-.01686	.00029	.00160	.00004	-.00017	.02645	.00027	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**.00012**	**-.00134**	**-.02183**	**.00189**	**.00197**	**-.00015**	**-.00012**	**.01631**
Stddev	.00011	.00004	.00456	.00189	.00073	.00118	.00004	.00028	.00076
%RSD	68.163	28.792	340.48	8.6628	38.611	60.182	28.955	224.71	4.6739
#1	.00008	.00015	.00188	-.02317	.00240	.00281	-.00012	-.00032	.01685
#2	.00024	.00010	-.00456	-.02049	.00137	.00113	-.00018	.00007	.01577
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00027**	**-.00060**	**.00626**	**-.00112**	**.00235**	**-.06080**	**-.00172**	**.00034**	**.00036**
Stddev	.00045	.00104	.00052	.00034	.00085	.00181	.00047	.00006	.00026
%RSD	167.84	174.05	8.2598	30.141	36.340	2.9807	27.579	18.424	73.710
#1	.00058	-.00134	.00663	-.00088	.00295	-.05952	-.00205	.00038	.00017
#2	-.00005	.00014	.00590	-.00136	.00174	-.06208	-.00138	.00030	.00054
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00062**	**-.00008**	**.00042**
Stddev	.00068	.00056	.00041
%RSD	110.34	692.92	96.772
#1	.00110	.00032	.00013
#2	.00014	-.00048	.00071
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2155.8**	**3969.5**	**63378.**	**7146.3**
Stddev	3.9	6.6	111.	34.2
%RSD	.18002	.16527	.17439	.47814
#1	2153.1	3974.2	63456.	7122.2
#2	2158.5	3964.9	63300.	7170.5

Sample Name: CCV Acquired: 11/14/2013 10:57:05 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49647	25.129	.50495	.49224	.50198	.49748	24.749	.49931	.49290	.50577	.50179	24.283	25.128
Stddev	.00159	.120	.00302	.00113	.00112	.00185	.181	.00123	.00051	.00159	.00007	.056	.024
%RSD	.32018	.47590	.59743	.22911	.22382	.37206	.73175	.24690	.10384	.31527	.01411	.23016	.09555
#1	.49534	25.045	.50708	.49304	.50118	.49617	24.621	.49844	.49254	.50465	.50184	24.243	25.145
#2	.49759	25.214	.50281	.49145	.50277	.49879	24.877	.50018	.49327	.50690	.50174	24.322	25.111
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49767	24.345	.50605	.50469	24.796	.49329	.49175	24.969	.51322	.49910	24.615	.50478	.50142
Stddev	.00109	.059	.00207	.00015	.002	.00116	.00399	.011	.00019	.00083	.170	.00232	.00011
%RSD	.21887	.24219	.40836	.03037	.00701	.23466	.81088	.04332	.03777	.16657	.69008	.45896	.02217
#1	.49844	24.303	.50459	.50458	24.798	.49247	.48893	24.961	.51336	.49969	24.495	.50642	.50134
#2	.49690	24.386	.50751	.50480	24.795	.49411	.49457	24.977	.51308	.49852	24.735	.50315	.50150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50866	.49751	.50130	.50158
Stddev	.00156	.00180	.00026	.00295
%RSD	.30662	.36114	.05088	.58847
#1	.50756	.49878	.50112	.49949
#2	.50976	.49624	.50148	.50367
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1934.4	3810.0	60082.	7051.5
Stddev	2.1	5.0	121.	36.2
%RSD	.10910	.13237	.20152	.51350
#1	1935.9	3813.6	60167.	7077.1
#2	1932.9	3806.4	59996.	7025.9

Sample Name: CCB Acquired: 11/14/2013 10:59:17 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**-.02324**	**.00046**	**-.00128**	**-.00001**	**-.00013**	**-.01432**	**-.00002**	**.00009**	**.00012**	**-.00042**	**-.00261**	**-.00378**
Stddev	.00020	.00589	.00061	.00038	.00000	.00000	.00452	.00005	.00017	.00001	.00019	.00081	.00362
%RSD	173.45	25.357	133.20	29.565	11.873	.57012	31.591	335.43	196.48	5.0129	45.168	30.831	95.807
#1	.00003	-.01907	.00003	-.00155	.00000	-.00013	-.01112	-.00005	.00021	.00012	-.00055	-.00204	-.00122
#2	-.00026	-.02741	.00089	-.00101	-.00001	-.00013	-.01751	.00002	-.00003	.00012	-.00029	-.00318	-.00634
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**.00226**	**.00004**	**.00051**	**.00633**	**-.00012**	**.00102**	**.00031**	**-.00236**	**.00237**	**-.03474**	**-.00168**	**.00017**
Stddev	.00011	.00270	.00002	.00029	.00677	.00016	.00359	.00288	.00057	.00502	.00363	.00065	.00006
%RSD	18.756	119.43	49.663	56.035	107.00	136.95	350.23	926.16	24.301	212.26	10.449	38.693	33.866
#1	.00050	.00418	.00003	.00031	.01112	-.00023	-.00151	-.00173	-.00195	.00592	-.03730	-.00214	.00013
#2	.00066	.00035	.00006	.00071	.00154	.00000	.00356	.00235	-.00276	-.00119	-.03217	-.00122	.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00051**	**-.00025**	**-.00012**	**-.00032**
Stddev	.00013	.00043	.00042	.00060
%RSD	25.388	170.33	351.82	188.52
#1	-.00042	.00005	-.00042	.00011
#2	-.00060	-.00056	.00018	-.00075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2140.7**	**3941.0**	**62677.**	**7033.1**
Stddev	.7	11.1	1.	55.4
%RSD	.03080	.28114	.00106	.78704
#1	2140.2	3948.8	62677.	6994.0
#2	2141.2	3933.1	62678.	7072.3

Sample Name: CCVL Acquired: 11/14/2013 11:07:01 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00334**	**.17847**	**.00871**	**.01782**	**.00199**	**.00193**	**.47668**	**.00093**	**.00396**	**.00330**	**.00948**	**.04430**	**.50816**
Stddev	.00063	.01116	.00039	.00007	.00001	.00001	.00336	.00005	.00023	.00011	.00020	.00085	.00487
%RSD	18.789	6.2506	4.4502	.38302	.31250	.30483	.70581	4.9539	5.7343	3.2745	2.1522	1.9285	.95902
#1	.00379	.17058	.00899	.01787	.00200	.00192	.47430	.00089	.00380	.00322	.00934	.04369	.51161
#2	.00290	.18636	.00844	.01777	.00199	.00193	.47906	.00096	.00412	.00338	.00963	.04490	.50472
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03200**	**.20442**	**.00322**	**.00949**	**.97610**	**.01020**	**.00407**	**.19846**	**.01768**	**.01581**	**.43827**	**.00775**	**.00494**
Stddev	.00050	.00264	.00003	.00014	.00234	.00005	.00044	.00553	.00047	.00058	.00154	.00045	.00012
%RSD	1.5586	1.2911	1.0450	1.4969	.24003	.50030	10.892	2.7883	2.6766	3.6806	.35070	5.8457	2.3423
#1	.03235	.20628	.00319	.00959	.97776	.01016	.00376	.20238	.01734	.01540	.43936	.00807	.00503
#2	.03164	.20255	.00324	.00939	.97445	.01023	.00439	.19455	.01801	.01622	.43719	.00742	.00486
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00492**	**.02094**	**.00484**	**.01091**
Stddev	.00014	.00070	.00018	.00052
%RSD	2.9298	3.3260	3.7749	4.7830
#1	.00482	.02045	.00497	.01054
#2	.00502	.02143	.00471	.01128
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2193.1**	**4063.6**	**64329.**	**7331.1**
Stddev	3.1	11.4	15.	34.9
%RSD	.14236	.28112	.02256	.47630
#1	2195.3	4071.6	64318.	7355.8
#2	2190.9	4055.5	64339.	7306.4

Sample Name: lcs 480-151082/2-a Acquired: 11/14/2013 11:09:18 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05106**	**10.566**	**.21149**	**.20799**	**.21390**	**.21046**	**10.328**	**.20666**	**.20355**
Stddev	.00096	.017	.00395	.00100	.00032	.00049	.040	.00087	.00024
%RSD	1.8789	.15806	1.8693	.47993	.14948	.23105	.38315	.42027	.11623
#1	.05038	10.578	.21428	.20869	.21367	.21012	10.300	.20727	.20371
#2	.05173	10.554	.20869	.20728	.21412	.21080	10.356	.20604	.20338
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21010**	**.20759**	**10.339**	**10.454**	**.21256**	**10.627**	**.21074**	**.21631**	**10.317**
Stddev	.00031	.00066	.012	.004	.00031	.007	.00030	.00158	.002
%RSD	.14601	.31810	.11467	.03639	.14812	.06831	.14253	.73021	.01880
#1	.20988	.20713	10.330	10.451	.21278	10.622	.21053	.21743	10.318
#2	.21032	.20806	10.347	10.457	.21234	10.632	.21095	.21520	10.315
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20068**	**.20690**	**10.080**	**.20631**	**.21317**	**10.160**	**.20041**	**.20854**	**.20246**
Stddev	.00060	.00047	.071	.00080	.00230	.079	.00135	.00046	.00036
%RSD	.29983	.22513	.70626	.38651	1.0768	.78115	.67194	.21909	.17767
#1	.20025	.20723	10.131	.20688	.21155	10.104	.20136	.20822	.20272
#2	.20110	.20657	10.030	.20575	.21479	10.216	.19945	.20887	.20221
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20620**	**.21057**	**.20731**
Stddev	.00106	.00086	.00193
%RSD	.51268	.40832	.93275
#1	.20695	.20996	.20868
#2	.20546	.21118	.20595
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2043.6**	**3887.1**	**61828.**	**7108.9**
Stddev	1.3	6.6	15.	11.5
%RSD	.06160	.17021	.02403	.16116
#1	2044.5	3882.4	61839.	7117.0
#2	2042.7	3891.8	61818.	7100.8

Sample Name: lcsd 480-151082/3-a Acquired: 11/14/2013 11:11:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05103**	**10.534**	**.20899**	**.20821**	**.21177**	**.20829**	**10.216**	**.20432**	**.20276**
Stddev	.00013	.079	.00098	.00043	.00032	.00058	.017	.00062	.00025
%RSD	.24529	.75091	.46814	.20441	.14892	.27859	.16316	.30142	.12155
#1	.05112	10.590	.20968	.20791	.21155	.20870	10.228	.20388	.20258
#2	.05094	10.478	.20830	.20851	.21199	.20788	10.205	.20475	.20293
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21033**	**.20500**	**10.208**	**10.203**	**.20971**	**10.591**	**.20876**	**.21507**	**10.170**
Stddev	.00024	.00042	.007	.010	.00094	.004	.00044	.00037	.012
%RSD	.11585	.20635	.07159	.09487	.44979	.03907	.21016	.16983	.11773
#1	.21050	.20530	10.213	10.196	.20904	10.588	.20907	.21533	10.161
#2	.21016	.20470	10.203	10.210	.21038	10.594	.20845	.21481	10.178
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20070**	**.20917**	**10.103**	**.20210**	**.21222**	**9.9966**	**.19891**	**.20645**	**.20089**
Stddev	.00029	.00134	.013	.00171	.00299	.0266	.00020	.00033	.00149
%RSD	.14620	.64155	.13233	.84535	1.4095	.26616	.10072	.15923	.74001
#1	.20050	.20823	10.093	.20331	.21434	9.9778	.19905	.20622	.19984
#2	.20091	.21012	10.112	.20089	.21011	10.015	.19877	.20668	.20195
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20376**	**.20900**	**.20888**
Stddev	.00154	.00006	.00274
%RSD	.75372	.02641	1.3136
#1	.20485	.20896	.21082
#2	.20268	.20904	.20694
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2043.7**	**3899.6**	**61930.**	**7198.7**
Stddev	.2	4.4	160.	10.5
%RSD	.01008	.11248	.25802	.14528
#1	2043.5	3902.7	62043.	7191.3
#2	2043.8	3896.5	61817.	7206.1

Sample Name: 480-49805-d-2-a Acquired: 11/14/2013 11:13:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00158**	**64.482**	**.06071**	**.03886**	**.38255**	**.00637**	**35.301**	**.00776**	**.05058**
Stddev	.00035	.210	.00417	.00014	.00017	.00006	.067	.00015	.00038
%RSD	21.977	.32592	6.8760	.36541	.04516	.94273	.18989	1.9673	.74308
#1	-.00183	64.630	.05775	.03896	.38267	.00641	35.349	.00786	.05084
#2	-.00134	64.333	.06366	.03876	.38243	.00633	35.254	.00765	.05031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.11587**	**.33974**	**60.391**	**8.9979**	**.07155**	**22.693**	**.84716**	**.00953**	**335.24**
Stddev	.00009	.00013	.022	.0378	.00085	.051	.00147	.00030	.97
%RSD	.07449	.03717	.03621	.41968	1.1877	.22438	.17361	3.1638	.29056
#1	.11581	.33966	60.375	9.0246	.07215	22.729	.84612	.00974	335.93
#2	.11593	.33983	60.406	8.9712	.07095	22.657	.84820	.00931	334.55
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09782**	**.18519**	**17.910**	**-.00168**	**.00706**	**52.692**	**.01184**	**.22820**	**2.0027**
Stddev	.00083	.00174	.006	.00354	.00565	.089	.00046	.00025	.0033
%RSD	.84880	.93880	.03235	210.63	79.994	.16935	3.8612	.11145	.16266
#1	.09723	.18396	17.914	.00082	.00307	52.756	.01151	.22838	2.0004
#2	.09841	.18642	17.906	-.00418	.01106	52.629	.01216	.22802	2.0050
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00360**	**.15905**	**1.3593**
Stddev	.00024	.00076	.0001
%RSD	6.7623	.47535	.01029
#1	-.00343	.15959	1.3594
#2	-.00377	.15852	1.3592
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1748.2**	**4114.2**	**64465.**	**7973.5**
Stddev	6.6	8.2	1.	12.8
%RSD	.37891	.20034	.00209	.16036
#1	1752.9	4120.1	64466.	7964.4
#2	1743.6	4108.4	64464.	7982.5

Sample Name: 480-49805-a-4-a Acquired: 11/14/2013 11:15:54 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00121**	**77.657**	**.02939**	**.05663**	**.25078**	**.00095**	**32.901**	**.00193**	**.01955**
Stddev	.00035	.371	.00002	.00019	.00012	.00007	.019	.00017	.00004
%RSD	28.989	.47738	.05776	.33089	.04916	7.1848	.05912	8.6241	.21853
#1	.00146	77.919	.02940	.05650	.25087	.00100	32.887	.00204	.01952
#2	.00096	77.395	.02937	.05676	.25070	.00091	32.915	.00181	.01958
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.15958**	**1.6155**	**42.903**	**8.0517**	**.03169**	**13.470**	**.75771**	**.01657**	**113.18**
Stddev	.00129	.0012	.056	.0356	.00068	.041	.00160	.00028	.36
%RSD	.80967	.07609	.13110	.44176	2.1584	.30802	.21158	1.6771	.32231
#1	.15866	1.6164	42.943	8.0266	.03217	13.440	.75657	.01677	113.44
#2	.16049	1.6147	42.864	8.0769	.03121	13.499	.75884	.01638	112.92
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05115**	**.12944**	**16.120**	**.03037**	**.00578**	**32.386**	**.02766**	**.17695**	**1.1668**
Stddev	.00078	.00005	.039	.00166	.00402	.031	.00099	.00010	.0021
%RSD	1.5254	.03820	.24008	5.4731	69.547	.09591	3.5865	.05435	.18134
#1	.05171	.12947	16.092	.02920	.00294	32.408	.02836	.17688	1.1653
#2	.05060	.12940	16.147	.03155	.00862	32.365	.02696	.17702	1.1683
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00090**	**.09963**	**2.1619**
Stddev	.00120	.00002	.0166
%RSD	133.49	.01877	.76581
#1	.00174	.09965	2.1502
#2	.00005	.09962	2.1736
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1867.6**	**3854.6**	**60520.**	**7185.8**
Stddev	2.8	2.8	250.	3.9
%RSD	.14801	.07215	.41239	.05481
#1	1865.6	3856.5	60696.	7183.0
#2	1869.5	3852.6	60343.	7188.6

Sample Name: 480-49805-d-6-a Acquired: 11/14/2013 11:18:04 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00081**	**14.782**	**.03505**	**.05028**	**.14115**	**.00170**	**23.607**	**.00006**	**.01143**
Stddev	.00056	.017	.00084	.00010	.00065	.00009	.006	.00012	.00019
%RSD	69.186	.11212	2.4010	.18906	.45985	5.0034	.02733	197.66	1.7019
#1	-.00121	14.771	.03564	.05035	.14069	.00164	23.602	.00014	.01156
#2	-.00041	14.794	.03445	.05022	.14161	.00176	23.612	-.00002	.01129
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03863**	**.06404**	**19.528**	**6.6221**	**.01706**	**9.0242**	**.38377**	**.00304**	**138.35**
Stddev	.00025	.00052	.007	.0246	.00025	.0204	.00183	.00002	.08
%RSD	.65635	.81982	.03417	.37152	1.4947	.22589	.47585	.52406	.05648
#1	.03845	.06366	19.523	6.6047	.01688	9.0098	.38248	.00303	138.41
#2	.03881	.06441	19.533	6.6395	.01724	9.0386	.38507	.00305	138.30
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03604**	**.05248**	**10.601**	**-.00186**	**.00233**	**22.717**	**-.00079**	**.12788**	**.69813**
Stddev	.00124	.00008	.023	.00008	.00098	.028	.00052	.00042	.00176
%RSD	3.4527	.15899	.21934	4.5472	42.087	.12271	65.383	.33117	.25280
#1	.03692	.05254	10.584	-.00180	.00303	22.737	-.00043	.12758	.69688
#2	.03516	.05243	10.617	-.00192	.00164	22.697	-.00116	.12818	.69937
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00120**	**.04750**	**.12871**
Stddev	.00107	.00009	.00242
%RSD	89.778	.18146	1.8797
#1	-.00196	.04744	.13043
#2	-.00044	.04756	.12700
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1893.8**	**3918.6**	**62143.**	**7381.2**
Stddev	2.3	7.7	179.	6.0
%RSD	.12019	.19556	.28775	.08183
#1	1892.2	3924.0	62270.	7376.9
#2	1895.5	3913.2	62017.	7385.4

Sample Name: 480-49805-d-7-a Acquired: 11/14/2013 11:20:16 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**16.023**	**.01005**	**.06022**	**.16788**	**.00239**	**39.028**	**.00749**	**.00465**
Stddev	.00082	.040	.00284	.00012	.00032	.00004	.000	.00005	.00006
%RSD	150.29	.24706	28.226	.19978	.19121	1.7233	.00009	.68427	1.2627
#1	.00003	15.995	.01205	.06030	.16811	.00236	39.028	.00746	.00461
#2	-.00113	16.051	.00804	.06013	.16766	.00242	39.028	.00753	.00469
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01633**	**.04924**	**14.992**	**6.1355**	**.01408**	**9.7217**	**.53499**	**.00110**	**217.73**
Stddev	.00049	.00032	.036	.0289	.00050	.0281	.00132	.00002	.92
%RSD	2.9903	.64194	.24343	.47082	3.5849	.28944	.24647	2.0093	.42297
#1	.01668	.04946	14.966	6.1559	.01443	9.7416	.53592	.00108	218.38
#2	.01599	.04901	15.018	6.1151	.01372	9.7018	.53405	.00111	217.08
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01178**	**.03765**	**4.7449**	**-.00412**	**-.00233**	**42.356**	**.00072**	**.22403**	**.38625**
Stddev	.00013	.00240	.0003	.00158	.00206	.068	.00126	.00007	.00021
%RSD	1.0864	6.3657	.00603	38.331	88.322	.16164	175.20	.03195	.05536
#1	.01168	.03596	4.7451	-.00524	-.00088	42.308	.00161	.22408	.38610
#2	.01187	.03935	4.7447	-.00301	-.00379	42.404	-.00017	.22398	.38640
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00133**	**.04205**	**.27288**
Stddev	.00056	.00004	.00037
%RSD	41.989	.09867	.13498
#1	-.00172	.04208	.27314
#2	-.00093	.04202	.27262
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1828.6**	**3848.8**	**60464.**	**7374.5**
Stddev	1.8	6.6	36.	35.3
%RSD	.09646	.17150	.05884	.47835
#1	1827.4	3853.5	60489.	7399.5
#2	1829.8	3844.2	60439.	7349.6

Sample Name: 480-49805-a-9-a Acquired: 11/14/2013 11:22:31 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**2.0118**	**.01245**	**.04754**	**.17503**	**.00002**	**58.340**	**.00196**	**.00229**
Stddev	.00087	.0427	.00123	.00038	.00020	.00008	.069	.00009	.00014
%RSD	6506.5	2.1213	9.8893	.79821	.11282	448.69	.11882	4.7796	5.9575
#1	-.00060	2.0420	.01158	.04781	.17517	.00007	58.389	.00203	.00239
#2	.00063	1.9816	.01332	.04727	.17489	-.00004	58.291	.00189	.00219
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00147**	**.03318**	**.93769**	**8.8971**	**.00483**	**7.5791**	**.52121**	**-.00015**	**1050.3**
Stddev	.00085	.00004	.01381	.0775	.00003	.0156	.00045	.00017	2.3
%RSD	58.238	.13349	1.4730	.87071	.58869	.20584	.08548	114.91	.22081
#1	.00086	.03315	.94745	8.8423	.00481	7.5901	.52089	-.00003	1048.7
#2	.00207	.03321	.92792	8.9519	.00485	7.5681	.52152	-.00027	1052.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00760**	**.00707**	**20.610**	**-.00185**	**.00096**	**5.2037**	**-.00075**	**.37074**	**.01378**
Stddev	.00023	.00298	.069	.00060	.00859	.0471	.00003	.00005	.00027
%RSD	3.0479	42.102	.33630	32.255	893.44	.90490	3.9694	.01429	1.9456
#1	.00777	.00918	20.561	-.00228	.00704	5.2370	-.00077	.37078	.01397
#2	.00744	.00497	20.659	-.00143	-.00511	5.1704	-.00073	.37070	.01359
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00238**	**.00038**	**.07773**
Stddev	.00056	.00025	.00145
%RSD	23.617	64.586	1.8695
#1	-.00198	.00056	.07876
#2	-.00278	.00021	.07670
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1627.6**	**3537.3**	**54001.**	**7381.4**
Stddev	3.6	14.3	67.	2.9
%RSD	.22297	.40408	.12355	.03989
#1	1630.2	3547.4	53954.	7379.3
#2	1625.0	3527.2	54048.	7383.5

Sample Name: 480-49805-a-9-aSD@5 Acquired: 11/14/2013 11:24:51 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**.39856**	**.00129**	**.00796**	**.03617**	**-.00010**	**11.948**	**.00024**	**.00033**
Stddev	.00077	.02038	.00175	.00008	.00002	.00005	.057	.00000	.00035
%RSD	121.73	5.1145	135.94	1.0404	.05763	51.078	.47989	.47595	103.65
#1	.00118	.38414	.00253	.00802	.03615	-.00013	11.907	.00024	.00009
#2	.00009	.41297	.00005	.00790	.03618	-.00006	11.988	.00024	.00058
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**.00745**	**.19318**	**1.7765**	**.00226**	**1.5791**	**.10736**	**-.00007**	**214.81**
Stddev	.00015	.00035	.00183	.0020	.00051	.0071	.00033	.00010	.16
%RSD	58.086	4.6966	.94505	.11248	22.722	.45152	.30366	139.24	.07476
#1	-.00037	.00720	.19447	1.7751	.00190	1.5740	.10713	.00000	214.70
#2	-.00015	.00770	.19189	1.7779	.00263	1.5841	.10759	-.00015	214.93
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00127**	**.00162**	**3.8938**	**-.00197**	**.00716**	**1.0201**	**-.00067**	**.07530**	**.00250**
Stddev	.00036	.00269	.0109	.00089	.00038	.0088	.00053	.00027	.00025
%RSD	28.472	166.07	.27989	45.074	5.2645	.86574	79.967	.36076	9.8071
#1	.00102	.00352	3.9015	-.00135	.00743	1.0139	-.00105	.07511	.00233
#2	.00153	-.00028	3.8861	-.00260	.00690	1.0263	-.00029	.07549	.00267
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00148**	**-.00002**	**.01643**
Stddev	.00176	.00006	.00083
%RSD	119.07	297.73	5.0597
#1	-.00273	-.00006	.01584
#2	-.00023	.00002	.01702
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1869.9**	**3755.7**	**58287.**	**7202.6**
Stddev	.3	5.2	91.	64.3
%RSD	.01685	.13893	.15690	.89220
#1	1870.1	3752.0	58222.	7248.0
#2	1869.7	3759.4	58352.	7157.2

Sample Name: 480-49805-a-9-a PDS Acquired: 11/14/2013 11:27:09 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05484**	**11.893**	**.23104**	**.24434**	**.36076**	**.19901**	**67.474**	**.21925**	**.21989**
Stddev	.00004	.037	.00443	.00149	.00031	.00004	.008	.00088	.00001
%RSD	.07304	.30823	1.9190	.60851	.08643	.01989	.01132	.40175	.00453
#1	.05487	11.919	.23418	.24539	.36054	.19904	67.479	.21987	.21989
#2	.05481	11.867	.22791	.24329	.36098	.19898	67.468	.21863	.21988
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21200**	**.24698**	**10.873**	**18.566**	**.19216**	**17.517**	**.71110**	**.20827**	**1035.8**
Stddev	.00105	.00083	.003	.020	.00063	.042	.00124	.00124	.2
%RSD	.49528	.33430	.02956	.10712	.32718	.24171	.17380	.59415	.02086
#1	.21274	.24639	10.870	18.552	.19171	17.487	.71198	.20915	1036.0
#2	.21126	.24756	10.875	18.580	.19260	17.547	.71023	.20740	1035.7
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.22033**	**.22882**	**19.851**	**.20739**	**.22295**	**14.942**	**.20993**	**.55810**	**.21605**
Stddev	.00122	.00073	.059	.00493	.00070	.003	.00198	.00023	.00118
%RSD	.55398	.32072	.29524	2.3764	.31428	.02331	.94116	.04174	.54790
#1	.21946	.22934	19.892	.21087	.22246	14.945	.20853	.55794	.21689
#2	.22119	.22830	19.810	.20390	.22345	14.940	.21133	.55827	.21522
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.19901**	**.21385**	**.29062**
Stddev	.00154	.00168	.00043
%RSD	.77450	.78678	.14794
#1	.19792	.21504	.29031
#2	.20010	.21266	.29092
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1615.8**	**3561.8**	**54088.**	**7374.3**
Stddev	3.6	8.9	83.	33.4
%RSD	.22451	.24934	.15278	.45259
#1	1618.3	3555.5	54146.	7397.9
#2	1613.2	3568.1	54029.	7350.7

Sample Name: CCV Acquired: 11/14/2013 11:29:27 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49256	25.135	.50312	.48681	.50755	.49511	24.875	.49649	.49072	.50212	.49680	24.366	25.227
Stddev	.00061	.102	.00445	.00066	.00015	.00002	.084	.00086	.00088	.00031	.00063	.024	.008
%RSD	.12481	.40636	.88492	.13467	.02865	.00397	.33735	.17286	.17928	.06205	.12658	.09828	.03081
#1	.49300	25.062	.50627	.48635	.50765	.49509	24.934	.49588	.49010	.50234	.49724	24.383	25.232
#2	.49213	25.207	.49997	.48727	.50744	.49512	24.815	.49710	.49134	.50190	.49635	24.349	25.221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49554	24.210	.50458	.50339	24.856	.49152	.49082	24.873	.51121	.50491	24.666	.50465	.50052
Stddev	.00241	.041	.00017	.00062	.131	.00023	.00001	.026	.00042	.00285	.144	.00080	.00019
%RSD	.48541	.16998	.03295	.12223	.52589	.04777	.00122	.10331	.08212	.56409	.58534	.15846	.03870
#1	.49724	24.181	.50470	.50295	24.949	.49169	.49081	24.855	.51150	.50290	24.564	.50521	.50065
#2	.49384	24.239	.50446	.50382	24.764	.49135	.49082	24.891	.51091	.50692	24.768	.50408	.50038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50825	.49815	.49854	.50486
Stddev	.00091	.00017	.00066	.00105
%RSD	.17896	.03457	.13306	.20820
#1	.50889	.49803	.49901	.50412
#2	.50761	.49827	.49807	.50561
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1947.0	3839.0	60212.	7006.5
Stddev	2.8	1.3	239.	28.8
%RSD	.14295	.03359	.39645	.41071
#1	1945.0	3839.9	60044.	6986.1
#2	1948.9	3838.1	60381.	7026.8

Sample Name: CCB Acquired: 11/14/2013 11:31:31 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00043**	**-.01004**	**.00215**	**-.00112**	**-.00001**	**-.00010**	**-.01091**	**.00003**	**.00004**	**-.00035**	**.00016**	**-.00458**	**.01775**
Stddev	.00050	.02497	.00130	.00004	.00002	.00008	.00428	.00009	.00011	.00002	.00006	.00049	.03020
%RSD	117.81	248.72	60.309	3.2298	159.98	76.299	39.220	310.74	305.39	7.1818	34.468	10.602	170.21
#1	.00007	-.02770	.00307	-.00110	-.00002	-.00015	-.01393	.00009	-.00004	-.00033	.00012	-.00492	-.00361
#2	.00078	.00762	.00124	-.00115	.00000	-.00005	-.00788	-.00003	.00012	-.00036	.00020	-.00423	.03910
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00105**	**.00098**	**.00005**	**.00033**	**.04787**	**.00028**	**-.00047**	**-.00096**	**-.00166**	**.00203**	**-.02413**	**-.00215**	**.00010**
Stddev	.00017	.00083	.00003	.00014	.01175	.00022	.00253	.00304	.00000	.00161	.00579	.00051	.00016
%RSD	16.074	84.636	62.252	43.062	24.538	79.300	540.04	315.58	.04560	79.194	24.007	23.598	160.25
#1	.00117	.00039	.00007	.00043	.03956	.00012	.00132	.00119	-.00166	.00316	-.02004	-.00251	-.00001
#2	.00093	.00157	.00003	.00023	.05617	.00044	-.00226	-.00311	-.00166	.00089	-.02823	-.00179	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00023**	**.00035**	**-.00009**	**-.00031**
Stddev	.00081	.00155	.00014	.00023
%RSD	348.58	447.65	153.01	74.201
#1	-.00034	.00144	.00001	-.00015
#2	.00081	-.00075	-.00020	-.00047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2151.4**	**3947.5**	**63309.**	**7056.5**
Stddev	3.9	7.2	242.	5.0
%RSD	.18197	.18233	.38179	.07124
#1	2148.6	3942.4	63480.	7052.9
#2	2154.1	3952.6	63138.	7060.1

Sample Name: CCVL Acquired: 11/14/2013 11:33:50 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00218	.17345	.00986	.01839	.00203	.00192	.48285	.00081	.00419	.00353	.00975	.04552
Stddev	.00071	.01893	.00145	.00001	.00003	.00001	.00239	.00004	.00039	.00040	.00025	.00440
%RSD	32.613	10.915	14.758	.07494	1.7025	.38101	.49507	5.4659	9.3529	11.388	2.5791	9.6728
#1	.00268	.16006	.01089	.01840	.00201	.00191	.48454	.00078	.00391	.00381	.00958	.04863
#2	.00167	.18683	.00883	.01838	.00205	.00192	.48116	.00084	.00447	.00324	.00993	.04241
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49751	.02977	.20164	.00327	.00925	.98701	.00974	W .00337	.19887	.01689	.01388	.43300
Stddev	.01008	.00024	.00352	.00006	.00006	.00584	.00001	.00025	.00410	.00046	.00178	.00146
%RSD	2.0262	.79402	1.7444	1.9583	.69454	.59137	.09021	7.3832	2.0619	2.7206	12.842	.33615
#1	.50464	.02994	.19915	.00331	.00930	.98288	.00973	.00320	.19597	.01656	.01514	.43197
#2	.49038	.02960	.20413	.00322	.00921	.99113	.00974	.00355	.20177	.01721	.01262	.43403
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00805	.00490	.00444	.01970	.00484	.01064
Stddev	.00000	.00012	.00032	.00011	.00003	.00011
%RSD	.00724	2.4340	7.2125	.55516	.53153	1.0796
#1	.00804	.00498	.00421	.01978	.00482	.01072
#2	.00805	.00481	.00467	.01962	.00486	.01056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2197.2	4082.4	64503.	7359.4
Stddev	1.9	17.1	48.	18.5
%RSD	.08633	.41907	.07395	.25173
#1	2198.5	4094.5	64537.	7372.5
#2	2195.8	4070.3	64469.	7346.3

Sample Name: 480-49805-a-9-b ms Acquired: 11/14/2013 11:36:07 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05651**	**12.501**	**.23138**	**.25198**	**.37490**	**.19827**	**69.922**	**.21847**	**.21844**
Stddev	.00014	.031	.00046	.00044	.00013	.00035	.551	.00009	.00089
%RSD	.25149	.24589	.19925	.17488	.03539	.17735	.78832	.03955	.40869
#1	.05641	12.479	.23105	.25229	.37500	.19852	70.312	.21841	.21781
#2	.05661	12.523	.23170	.25167	.37481	.19802	69.532	.21853	.21907
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20981**	**.24797**	**10.887**	**19.387**	**.20046**	**17.689**	**.73017**	**.20747**	**1085.9**
Stddev	.00048	.00028	.031	.064	.00189	.013	.00329	.00102	3.0
%RSD	.23078	.11168	.28491	.32983	.94299	.07100	.45097	.49353	.27800
#1	.21015	.24817	10.909	19.341	.19912	17.698	.73249	.20820	1088.1
#2	.20946	.24778	10.865	19.432	.20179	17.680	.72784	.20675	1083.8
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21804**	**.22294**	**31.558**	**.21002**	**.22346**	**15.265**	**.21936**	**.58320**	**.21802**
Stddev	.00056	.00186	.081	.00186	.00282	.022	.00009	.00119	.00133
%RSD	.25877	.83294	.25530	.88449	1.2636	.14281	.04267	.20358	.60847
#1	.21764	.22426	31.615	.21133	.22546	15.250	.21930	.58404	.21896
#2	.21844	.22163	31.501	.20871	.22146	15.280	.21943	.58236	.21709
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20201**	**.21167**	**.29315**
Stddev	.00536	.00150	.00293
%RSD	2.6545	.70830	.99870
#1	.19822	.21273	.29522
#2	.20580	.21061	.29108
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1607.2**	**3546.0**	**53905.**	**7311.5**
Stddev	1.1	5.0	13.	66.7
%RSD	.06894	.14075	.02406	.91259
#1	1608.0	3542.5	53896.	7264.3
#2	1606.4	3549.6	53914.	7358.6

Sample Name: 480-49805-a-9-c msd Acquired: 11/14/2013 11:38:22 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05592	12.494	.23170	.25403	.37640	.19957	70.866	.22010	.21969
Stddev	.00021	.035	.00319	.00146	.00111	.00099	.212	.00122	.00062
%RSD	.37699	.27701	1.3776	.57300	.29551	.49514	.29855	.55509	.28144
#1	.05607	12.519	.22945	.25300	.37562	.20027	71.016	.21923	.22012
#2	.05577	12.470	.23396	.25506	.37719	.19887	70.716	.22096	.21925
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21169	.24867	10.922	19.493	.20085	17.766	.73596	.20838	1091.0
Stddev	.00213	.00060	.004	.096	.00126	.017	.00101	.00035	1.5
%RSD	1.0078	.23930	.03919	.49073	.62959	.09648	.13716	.16669	.13371
#1	.21018	.24825	10.919	19.425	.19995	17.754	.73525	.20814	1090.0
#2	.21320	.24909	10.925	19.560	.20174	17.778	.73668	.20863	1092.0
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21995	.22534	31.815	.21198	.22600	15.387	.21963	.58487	.21797
Stddev	.00067	.00440	.085	.00129	.00109	.041	.00069	.00130	.00053
%RSD	.30440	1.9548	.26800	.60813	.48415	.26586	.31486	.22274	.24231
#1	.21947	.22845	31.755	.21106	.22522	15.416	.22012	.58395	.21760
#2	.22042	.22222	31.875	.21289	.22677	15.359	.21914	.58580	.21835
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	.19880	.21166	.29384
Stddev	.00166	.00027	.00161
%RSD	.83253	.12852	.54899
#1	.19997	.21147	.29498
#2	.19763	.21185	.29270
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1608.0	3543.6	53932.	7251.6
Stddev	1.8	9.3	303.	25.9
%RSD	.11038	.26366	.56173	.35652
#1	1606.7	3550.2	54147.	7233.3
#2	1609.2	3536.9	53718.	7269.9

Sample Name: 480-49759-j-6-d Acquired: 11/14/2013 11:40:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Ba4554-2	Be3130	Ca3179	Cd2288
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00130**	**.03512**	**.02414**	**.49127**	**.75383**	**.69790**	**-.00019**	**735.70**	**.00004**
Stddev	.00002	.00277	.00159	.00045	.00256	.00306	.00011	1.88	.00013
%RSD	1.3112	7.9000	6.5711	.09092	.33975	.43845	57.679	.25596	317.51
#1	-.00131	.03316	.02526	.49095	.75564	.69574	-.00026	737.03	.00014
#2	-.00129	.03709	.02302	.49159	.75202	.70006	-.00011	734.37	-.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Co2286	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Line	228.616 {447}	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}
IS Ref	(In2306)	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01409**	**.00092**	**.00716**	**.26874**	**204.89**	**.64729**	**6.9049**	**.16146**	**.03795**
Stddev	.00012	.00046	.00034	.00446	.83	.00066	.0396	.00025	.00009
%RSD	.84133	49.987	4.7800	1.6609	.40474	.10252	.57394	.15355	.23619
#1	.01418	.00125	.00741	.27190	205.48	.64682	6.8769	.16164	.03788
#2	.01401	.00060	.00692	.26558	204.31	.64776	6.9329	.16129	.03801
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Na8183	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Line	818.326 { 41}	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}
IS Ref	(Y_3774)	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1594.4**	**.01538**	**.00386**	**54.934**	**-.00120**	**.00441**	**1.8536**	**-.00137**	**4.5994**
Stddev	7.2	.00006	.00046	.026	.00269	.00264	.0167	.00073	.0137
%RSD	.45285	.36164	11.961	.04812	223.43	59.976	.89902	53.788	.29840
#1	1599.5	.01534	.00419	54.953	.00070	.00254	1.8418	-.00188	4.6091
#2	1589.2	.01542	.00354	54.916	-.00310	.00628	1.8654	-.00085	4.5897
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ti3349	Tl1908	V_2924	Zn2062
Line	334.904 {101}	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(Y_3600)	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm	ppm
Avg	**.00336**	**-.00362**	**.00225**	**.01831**
Stddev	.00014	.00019	.00043	.00133
%RSD	4.2020	5.2723	19.228	7.2579
#1	.00326	-.00349	.00195	.01737
#2	.00346	-.00376	.00256	.01925
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1430.8**	**3231.5**	**49620.**	**7241.9**
Stddev	3.0	2.2	95.	.2
%RSD	.20939	.06933	.19185	.00224
#1	1428.7	3233.1	49688.	7241.7
#2	1432.9	3230.0	49553.	7242.0

Sample Name: 480-49811-b-1-a Acquired: 11/14/2013 11:43:07 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00046**	**.01918**	**.00072**	**.13559**	**.16562**	**-.00006**	**87.207**	**.00002**	**.00024**
Stddev	.00038	.02214	.00335	.00035	.00020	.00007	.294	.00020	.00031
%RSD	83.678	115.43	463.85	.25491	.12132	118.54	.33661	845.48	131.44
#1	-.00073	.03484	-.00164	.13535	.16576	-.00001	87.415	-.00011	.00002
#2	-.00019	.00353	.00309	.13583	.16548	-.00011	87.000	.00016	.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.00155**	**7.0407**	**2.1553**	**.01237**	**13.695**	**.40666**	**.00538**	**47.326**
Stddev	.00032	.00006	.0149	.0134	.00019	.029	.00141	.00047	.093
%RSD	525.92	3.6935	.21151	.62154	1.5307	.20955	.34649	8.7144	.19655
#1	-.00017	.00159	7.0513	2.1648	.01224	13.715	.40766	.00505	47.392
#2	.00029	.00151	7.0302	2.1459	.01250	13.674	.40567	.00571	47.260
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**.00262**	**8.1359**	**-.00375**	**.00438**	**7.3896**	**-.00096**	**.47539**	**.00025**
Stddev	.00027	.00097	.0059	.00022	.00236	.0001	.00032	.00020	.00048
%RSD	28.844	36.888	.07299	5.9638	53.834	.00098	33.442	.04228	197.35
#1	.00111	.00330	8.1401	-.00359	.00604	7.3896	-.00119	.47553	.00059
#2	.00073	.00194	8.1317	-.00391	.00271	7.3895	-.00073	.47525	-.00010
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00054**	**-.00016**	**.00226**
Stddev	.00092	.00040	.00002
%RSD	170.05	254.56	.72400
#1	.00011	-.00044	.00227
#2	-.00119	.00012	.00225
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1927.5**	**3761.2**	**59991.**	**7133.4**
Stddev	3.9	12.4	134.	1.1
%RSD	.19988	.32890	.22308	.01584
#1	1930.2	3769.9	59896.	7134.2
#2	1924.8	3752.4	60085.	7132.6

Sample Name: 480-49811-b-2-a Acquired: 11/14/2013 11:45:21 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**-.02437**	**.00333**	**.34134**	**.07484**	**-.00013**	**91.683**	**.00023**	**.00033**
Stddev	.00013	.00575	.00220	.00037	.00016	.00002	.110	.00014	.00019
%RSD	212.62	23.608	66.142	.10784	.20977	17.015	.12002	63.738	56.844
#1	-.00016	-.02844	.00177	.34160	.07473	-.00011	91.605	.00012	.00047
#2	.00003	-.02031	.00489	.34108	.07495	-.00014	91.761	.00033	.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**.00239**	**.28802**	**1.2575**	**.02307**	**26.465**	**.18960**	**.03243**	**23.981**
Stddev	.00162	.00018	.00260	.0765	.00042	.000	.00026	.00019	.641
%RSD	1479.2	7.6157	.90235	6.0831	1.8156	.00044	.13874	.58925	2.6740
#1	.00125	.00226	.28986	1.3116	.02337	26.465	.18942	.03257	24.435
#2	-.00104	.00252	.28618	1.2034	.02277	26.465	.18979	.03230	23.528
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00101**	**.00080**	**9.1755**	**-.00418**	**-.00197**	**8.4707**	**-.00192**	**.37162**	**.00058**
Stddev	.00016	.00126	.0220	.00050	.00218	.0190	.00105	.00176	.00028
%RSD	15.526	157.85	.24013	12.004	110.33	.22435	54.519	.47263	48.410
#1	.00089	-.00009	9.1599	-.00454	-.00043	8.4842	-.00118	.37286	.00038
#2	.00112	.00169	9.1911	-.00383	-.00351	8.4573	-.00266	.37038	.00078
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00019**	**.00015**	**.00272**
Stddev	.00033	.00010	.00021
%RSD	178.98	67.194	7.7685
#1	-.00042	.00008	.00287
#2	.00005	.00022	.00257
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1937.6**	**3764.2**	**59932.**	**7087.8**
Stddev	1.2	11.1	60.	17.6
%RSD	.06036	.29613	.10081	.24762
#1	1938.4	3772.1	59890.	7100.2
#2	1936.7	3756.4	59975.	7075.4

Sample Name: 480-49811-b-3-a Acquired: 11/14/2013 11:47:35 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**.00437**	**.00402**	**.12875**	**.08015**	**-.00012**	**117.96**	**-.00005**	**-.00003**
Stddev	.00089	.01839	.00123	.00099	.00003	.00003	.00	.00011	.00012
%RSD	394.15	421.03	30.604	.76747	.03916	23.572	.00321	217.50	433.32
#1	-.00085	-.00864	.00315	.12945	.08013	-.00014	117.95	-.00013	-.00011
#2	.00040	.01737	.00488	.12805	.08017	-.00010	117.96	.00003	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**.00157**	**10.409**	**1.2856**	**.01676**	**17.810**	**.86509**	**.00108**	**35.927**
Stddev	.00104	.00043	.032	.0787	.00150	.062	.00327	.00008	.086
%RSD	923.54	27.429	.31020	6.1231	8.9592	.34798	.37752	7.7403	.23941
#1	-.00062	.00187	10.432	1.2300	.01570	17.766	.86278	.00114	35.988
#2	.00085	.00126	10.387	1.3413	.01782	17.854	.86740	.00102	35.867
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00059**	**.00371**	**17.268**	**-.00455**	**-.00209**	**8.3815**	**-.00188**	**.43602**	**.00049**
Stddev	.00022	.00021	.025	.00153	.00454	.0006	.00104	.00024	.00057
%RSD	37.885	5.6800	.14693	33.541	217.25	.00759	55.287	.05430	116.02
#1	.00043	.00385	17.251	-.00563	-.00530	8.3820	-.00114	.43618	.00090
#2	.00074	.00356	17.286	-.00347	.00112	8.3811	-.00261	.43585	.00009
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00240**	**.00053**	**.00039**
Stddev	.00196	.00075	.00007
%RSD	81.674	141.09	18.653
#1	-.00101	.00106	.00045
#2	-.00379	.00000	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1913.1**	**3741.9**	**59936.**	**7110.1**
Stddev	4.2	7.3	270.	17.4
%RSD	.22174	.19506	.44987	.24436
#1	1910.1	3736.7	60127.	7122.4
#2	1916.1	3747.0	59746.	7097.9

Sample Name: 480-49811-b-4-a Acquired: 11/14/2013 11:49:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**.01647**	**.00177**	**.27037**	**.06263**	**-.00022**	**183.71**	**.00023**	**-.00018**
Stddev	.00042	.03370	.00043	.00179	.00004	.00014	.35	.00000	.00002
%RSD	84.900	204.54	24.577	.66234	.06730	63.261	.19240	1.4595	11.902
#1	.00080	-.00735	.00146	.27164	.06266	-.00032	183.46	.00023	-.00017
#2	.00020	.04030	.00207	.26910	.06260	-.00012	183.96	.00023	-.00020
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**.00458**	**.08278**	**2.0432**	**.00977**	**29.489**	**.98136**	**.00045**	**270.79**
Stddev	.00017	.00040	.00072	.0108	.00062	.142	.00172	.00002	.80
%RSD	189.66	8.7265	.87223	.52968	6.3346	.48184	.17501	4.5219	.29380
#1	.00003	.00430	.08329	2.0508	.01021	29.388	.98015	.00044	270.23
#2	-.00020	.00486	.08227	2.0355	.00933	29.589	.98258	.00047	271.36
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00091**	**.00261**	**13.169**	**-.00514**	**.00028**	**7.5774**	**-.00215**	**1.0554**	**.00074**
Stddev	.00055	.00074	.020	.00162	.00433	.0301	.00036	.0023	.00046
%RSD	59.891	28.355	.15042	31.551	1526.7	.39676	16.905	.21391	61.929
#1	.00130	.00209	13.183	-.00628	.00335	7.5562	-.00189	1.0538	.00042
#2	.00053	.00314	13.155	-.00399	-.00278	7.5987	-.00241	1.0570	.00107
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00045**	**-.00004**	**.00549**
Stddev	.00042	.00060	.00055
%RSD	93.118	1479.9	9.9476
#1	.00074	-.00046	.00511
#2	.00015	.00038	.00588
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1746.4**	**3602.8**	**56545.**	**7153.7**
Stddev	.9	7.4	210.	5.7
%RSD	.04935	.20653	.37221	.07947
#1	1745.8	3597.5	56694.	7157.8
#2	1747.1	3608.0	56396.	7149.7

Sample Name: 480-49811-b-5-a Acquired: 11/14/2013 11:52:07 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**.03503**	**.00128**	**.21249**	**.28495**	**-.00006**	**41.070**	**.00062**	**-.00010**
Stddev	.00114	.00322	.00076	.00019	.00051	.00002	.022	.00003	.00027
%RSD	1794.7	9.1812	59.264	.08810	.17916	31.114	.05470	4.2929	264.77
#1	-.00087	.03731	.00182	.21235	.28458	-.00005	41.086	.00061	-.00029
#2	.00074	.03276	.00074	.21262	.28531	-.00008	41.054	.00064	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**.00250**	**.00301**	**100.79**	**.24413**	**11.231**	**.00709**	**.00100**	**145.71**
Stddev	.00096	.00028	.00292	.22	.00191	.011	.00166	.00018	.94
%RSD	2651.4	11.120	97.126	.22171	.78180	.10133	23.354	18.181	.64523
#1	-.00072	.00270	.00508	100.63	.24278	11.239	.00826	.00113	145.04
#2	.00064	.00230	.00094	100.95	.24548	11.223	.00592	.00087	146.37
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00327**	**.00050**	**9.4670**	**.00284**	**-.00014**	**3.6312**	**-.00223**	**3.4676**	**.00000**
Stddev	.00001	.00361	.0192	.00029	.00542	.0084	.00011	.0051	.00003
%RSD	.27164	717.27	.20237	10.155	3930.0	.23135	5.1073	.14639	4045.3
#1	.00327	.00306	9.4534	.00304	-.00397	3.6372	-.00215	3.4640	-.00002
#2	.00328	-.00205	9.4805	.00263	.00369	3.6253	-.00231	3.4712	.00002
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00082**	**-.00049**	**.00278**
Stddev	.00023	.00016	.00116
%RSD	28.671	33.354	41.974
#1	-.00065	-.00038	.00195
#2	-.00098	-.00061	.00360
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1848.6**	**3729.9**	**57887.**	**7145.6**
Stddev	1.7	12.0	37.	23.7
%RSD	.09000	.32298	.06363	.33145
#1	1847.4	3721.4	57913.	7162.3
#2	1849.8	3738.4	57861.	7128.8

Sample Name: 480-49829-a-6-a Acquired: 11/14/2013 11:54:21 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00075**	**.01419**	**.00078**	**.01201**	**.10594**	**-.00005**	**49.681**	**.00002**	**.00754**
Stddev	.00001	.00880	.00103	.00066	.00003	.00001	.226	.00016	.00022
%RSD	1.4749	62.065	131.43	5.5159	.02591	9.9011	.45393	682.40	2.9102
#1	.00074	.02041	.00151	.01154	.10592	-.00006	49.841	-.00009	.00769
#2	.00075	.00796	.00006	.01248	.10596	-.00005	49.522	.00014	.00738
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00029**	**.00100**	**3.0626**	**2.7990**	**.02313**	**12.646**	**9.9096**	**.01519**	**64.571**
Stddev	.00080	.00026	.0253	.0341	.00101	.061	.0090	.00007	.457
%RSD	281.49	25.625	.82584	1.2191	4.3471	.47894	.09042	.44651	.70761
#1	.00085	.00118	3.0804	2.7748	.02384	12.603	9.9032	.01524	64.894
#2	-.00028	.00082	3.0447	2.8231	.02242	12.689	9.9159	.01514	64.248
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00868**	**.00675**	**9.3524**	**-.00296**	**.00384**	**23.819**	**-.00170**	**.52163**	**.00001**
Stddev	.00065	.00030	.0134	.00160	.00297	.051	.00085	.00077	.00051
%RSD	7.5377	4.4810	.14307	53.934	77.441	.21342	49.945	.14667	8582.1
#1	.00822	.00653	9.3429	-.00183	.00594	23.855	-.00110	.52217	-.00036
#2	.00915	.00696	9.3618	-.00409	.00174	23.783	-.00229	.52109	.00037
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00211**	**.00073**	**.00166**
Stddev	.00132	.00057	.00083
%RSD	62.755	78.112	50.042
#1	-.00117	.00114	.00225
#2	-.00304	.00033	.00108
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1949.5**	**3785.2**	**60415.**	**7173.6**
Stddev	7.4	13.7	177.	25.4
%RSD	.37951	.36126	.29346	.35360
#1	1954.7	3794.9	60540.	7155.7
#2	1944.3	3775.5	60289.	7191.5

Sample Name: CCV Acquired: 11/14/2013 11:56:42 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49027	25.136	.50629	.48812	.50126	.49587	24.878	.49556	.48704	.50396	.49781	24.363	25.290
Stddev	.00115	.085	.00009	.00327	.00074	.00207	.142	.00185	.00127	.00154	.00151	.070	.057
%RSD	.23533	.33768	.01746	.67054	.14746	.41667	.57122	.37242	.25978	.30603	.30293	.28799	.22521
#1	.48946	25.076	.50623	.48580	.50074	.49441	24.778	.49426	.48794	.50287	.49888	24.314	25.330
#2	.49109	25.196	.50636	.49043	.50178	.49733	24.979	.49687	.48615	.50505	.49674	24.413	25.250
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49878	24.203	.50231	.50188	24.788	.48841	.48911	24.965	.51284	.49477	24.525	.50006	.50061
Stddev	.00148	.005	.00192	.00113	.023	.00141	.00249	.201	.00457	.00673	.235	.00185	.00062
%RSD	.29633	.02083	.38300	.22433	.09133	.28783	.50954	.80490	.89084	1.3603	.95961	.37037	.12294
#1	.49983	24.199	.50095	.50108	24.772	.48940	.49087	24.823	.50961	.49001	24.359	.50137	.50017
#2	.49774	24.206	.50367	.50267	24.804	.48741	.48734	25.107	.51607	.49952	24.691	.49875	.50104
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50709	.49717	.49897	.49898
Stddev	.00022	.00418	.00003	.00320
%RSD	.04363	.84095	.00504	.64177
#1	.50725	.49421	.49899	.49671
#2	.50694	.50013	.49895	.50124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1947.7	3825.9	60282.	6992.9
Stddev	1.5	12.3	.	32.1
%RSD	.07713	.32268	.00053	.45833
#1	1946.6	3834.6	60281.	7015.6
#2	1948.8	3817.2	60282.	6970.2

Sample Name: CCB Acquired: 11/14/2013 11:58:53 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**-.02213**	**.00235**	**-.00104**	**.00006**	**-.00007**	**-.01032**	**.00001**	**.00011**	**.00055**	**.00090**	**-.00045**	**-.02867**
Stddev	.00039	.02771	.00249	.00001	.00008	.00001	.00756	.00015	.00017	.00085	.00016	.00209	.03039
%RSD	314.38	125.24	106.07	.48860	141.27	16.905	73.275	2745.1	150.11	155.37	17.707	464.33	106.01
#1	-.00040	-.00253	.00411	-.00104	.00011	-.00008	-.01567	.00011	.00023	.00115	.00079	-.00193	-.05016
#2	.00015	-.04172	.00059	-.00104	.00000	-.00006	-.00497	-.00010	-.00001	-.00005	.00102	.00103	-.00718
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00244**	**.00821**	**.00012**	**.00031**	**.04906**	**.00027**	**.00041**	**.00145**	**-.00169**	**-.00219**	**-.02529**	**-.00208**	**.00005**
Stddev	.00012	.00270	.00015	.00023	.01576	.00018	.00198	.00361	.00091	.00776	.01351	.00014	.00003
%RSD	4.9581	32.862	123.14	74.023	32.130	64.191	484.71	248.10	54.045	354.76	53.420	6.6140	56.119
#1	.00253	.01012	.00022	.00015	.03791	.00015	.00181	.00401	-.00233	.00330	-.03484	-.00218	.00003
#2	.00236	.00631	.00002	.00047	.06021	.00040	-.00099	-.00110	-.00104	-.00768	-.01573	-.00198	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00031**	**.00006**	**.00025**	**.00092**
Stddev	.00053	.00064	.00037	.00113
%RSD	173.60	1029.5	151.03	123.35
#1	.00069	.00052	-.00002	.00171
#2	-.00007	-.00039	.00051	.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2152.0**	**3937.8**	**63514.**	**7122.2**
Stddev	1.8	.1	175.	37.3
%RSD	.08389	.00181	.27518	.52403
#1	2153.3	3937.7	63391.	7095.8
#2	2150.7	3937.8	63638.	7148.6

Sample Name: CCVL Acquired: 11/14/2013 12:01:11 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00266	.19908	.01077	.01846	.00202	.00181	.48141	.00096	.00386	.00390	.01016	.04676	.50757
Stddev	.00081	.01468	.00277	.00049	.00003	.00001	.00006	.00013	.00006	.00017	.00041	.00113	.02251
%RSD	30.496	7.3743	25.766	2.6682	1.5430	.43197	.01178	13.436	1.5677	4.3113	4.0619	2.4134	4.4352
#1	.00208	.18870	.00881	.01811	.00200	.00180	.48145	.00087	.00390	.00402	.00987	.04755	.52349
#2	.00323	.20946	.01273	.01881	.00205	.00181	.48137	.00105	.00381	.00378	.01046	.04596	.49165
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03068	.20174	.00329	.00992	1.0011	.00938	.00438	.20123	.01771	.01761	.42050	.00876	.00495
Stddev	.00100	.00636	.00000	.00040	.0041	.00019	.00107	.00386	.00056	.00755	.00613	.00118	.00001
%RSD	3.2485	3.1533	.09944	3.9940	.41151	2.0773	24.293	1.9204	3.1789	42.881	1.4586	13.437	.13940
#1	.03139	.19724	.00329	.00964	.99818	.00924	.00514	.19850	.01731	.02294	.41617	.00793	.00494
#2	.02998	.20624	.00329	.01020	1.0040	.00951	.00363	.20397	.01811	.01227	.42484	.00959	.00495
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00467	.02038	.00472	.01034
Stddev	.00009	.00023	.00051	.00018
%RSD	1.9049	1.1460	10.800	1.7529
#1	.00474	.02054	.00508	.01021
#2	.00461	.02021	.00436	.01047
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2188.0	4068.5	64570.	7311.7
Stddev	6.9	10.9	73.	25.9
%RSD	.31336	.26738	.11382	.35404
#1	2192.8	4076.2	64622.	7330.0
#2	2183.1	4060.8	64518.	7293.4

Sample Name: 480-49811-b-7-a Acquired: 11/14/2013 12:03:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**-.00910**	**.00233**	**2.0230**	**.32590**	**-.00008**	**101.32**	**.00020**	**.00006**
Stddev	.00064	.00646	.00169	.0029	.00026	.00003	.20	.00031	.00027
%RSD	214.41	70.994	72.450	.14312	.08077	35.797	.19297	156.84	484.85
#1	-.00015	-.01367	.00352	2.0210	.32571	-.00009	101.45	.00042	-.00014
#2	.00075	-.00453	.00114	2.0251	.32609	-.00006	101.18	-.00002	.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00059**	**.00213**	**5.2572**	**18.293**	**.04367**	**64.348**	**.71565**	**.01324**	**33.607**
Stddev	.00016	.00018	.0077	.028	.00074	.008	.00047	.00040	.002
%RSD	27.742	8.5897	.14632	.15401	1.7010	.01297	.06604	3.0379	.00497
#1	.00070	.00200	5.2518	18.274	.04419	64.343	.71531	.01296	33.608
#2	.00047	.00226	5.2626	18.313	.04314	64.354	.71598	.01352	33.606
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00062**	**.00215**	**.27340**	**-.00379**	**-.00022**	**11.567**	**-.00124**	**1.2584**	**.00039**
Stddev	.00014	.00148	.00705	.00223	.00482	.033	.00032	.0011	.00032
%RSD	22.071	68.716	2.5798	58.910	2228.2	.28208	25.631	.08764	83.355
#1	.00072	.00111	.27839	-.00221	-.00363	11.590	-.00101	1.2576	.00016
#2	.00052	.00320	.26842	-.00537	.00319	11.544	-.00146	1.2592	.00062
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00227**	**.00000**	**.00035**
Stddev	.00232	.0002	.00090
%RSD	102.25	5844.0	260.72
#1	.00063	.00011	.00099
#2	.00391	-.00012	-.00029
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1881.9**	**3710.4**	**59516.**	**7176.3**
Stddev	.7	10.9	142.	5.6
%RSD	.03894	.29442	.23908	.07769
#1	1882.4	3718.1	59415.	7172.4
#2	1881.4	3702.7	59616.	7180.3

Sample Name: 480-49811-b-8-a Acquired: 11/14/2013 12:05:39 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**-.01466**	**-.00084**	**.10416**	**.42004**	**-.00012**	**184.19**	**.00021**	**-.00066**
Stddev	.00007	.02542	.00099	.00031	.00042	.00002	.05	.00005	.00018
%RSD	23764.	173.41	118.27	.30073	.10040	13.496	.02470	24.721	26.936
#1	.00005	.00332	-.00154	.10394	.41974	-.00011	184.22	.00025	-.00079
#2	-.00005	-.03264	-.00014	.10438	.42034	-.00013	184.16	.00017	-.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**.00249**	**7.6901**	**6.8970**	**.00845**	**31.155**	**.96466**	**.00008**	**621.79**
Stddev	.00008	.00004	.0057	.0113	.00007	.048	.00146	.00003	.37
%RSD	24.046	1.4283	.07444	.16362	.77500	.15273	.15087	36.774	.05874
#1	.00038	.00246	7.6860	6.8890	.00841	31.189	.96569	.00006	621.53
#2	.00027	.00251	7.6941	6.9050	.00850	31.122	.96364	.00010	622.05
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**.00202**	**16.920**	**-.00313**	**.00275**	**5.5398**	**-.00054**	**.97593**	**.00070**
Stddev	.00042	.00367	.000	.00081	.00513	.0140	.00024	.00129	.00037
%RSD	203.06	181.79	.00126	25.962	186.66	.25319	44.079	.13172	53.135
#1	-.00009	.00461	16.920	-.00370	.00637	5.5498	-.00071	.97502	.00043
#2	.00050	-.00058	16.920	-.00255	-.00088	5.5299	-.00037	.97684	.00096
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00081**	**-.00018**	**.00181**
Stddev	.00053	.00022	.00149
%RSD	64.860	123.51	82.228
#1	.00118	-.00034	.00286
#2	.00044	-.00002	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1654.3**	**3508.7**	**54844.**	**7199.8**
Stddev	1.9	7.3	26.	15.3
%RSD	.11551	.20875	.04754	.21313
#1	1655.6	3513.9	54862.	7210.6
#2	1652.9	3503.5	54826.	7188.9

Sample Name: mb 480-151468/1-b Acquired: 11/14/2013 12:07:59 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	**-.01023**	**.00161**	**.00340**	**.00014**	**-.00013**	**.05854**	**-.00019**	**-.00002**
Stddev	.00050	.01951	.00187	.00008	.00003	.00005	.02764	.00012	.00006
%RSD	118.50	190.59	116.27	2.2701	18.008	40.822	47.224	62.202	311.90
#1	.00077	.00356	.00029	.00334	.00012	-.00016	.03899	-.00011	.00002
#2	.00007	-.02403	.00294	.00345	.00016	-.00009	.07809	-.00027	-.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00188**	**.00049**	**-.00380**	**.01339**	**.00177**	**.00528**	**.00009**	**-.00032**	**.31193**
Stddev	.00005	.00022	.00107	.01449	.00065	.00715	.00001	.00002	.10589
%RSD	2.9143	45.782	28.087	108.24	37.042	135.41	5.9710	6.7324	33.947
#1	.00192	.00033	-.00455	.02363	.00223	.00022	.00009	-.00031	.23705
#2	.00184	.00064	-.00304	.00314	.00130	.01033	.00009	-.00034	.38681
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**-.00154**	**.04605**	**-.00119**	**.00399**	**-.04593**	**-.00142**	**.00045**	**-.00027**
Stddev	.00037	.00007	.00011	.00102	.00167	.00225	.00038	.00013	.00006
%RSD	340.83	4.2396	.23514	85.526	41.984	4.8892	26.604	29.299	21.007
#1	.00037	-.00149	.04613	-.00047	.00280	-.04434	-.00168	.00036	-.00023
#2	-.00015	-.00159	.04597	-.00192	.00517	-.04752	-.00115	.00055	-.00032
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00049**	**-.00031**	**.00104**
Stddev	.00127	.00019	.00030
%RSD	256.30	59.983	28.795
#1	.00139	-.00018	.00125
#2	-.00040	-.00045	.00083
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2156.9**	**3944.9**	**63837.**	**7069.4**
Stddev	4.8	2.7	71.	15.0
%RSD	.22270	.06969	.11168	.21269
#1	2160.3	3943.0	63888.	7058.7
#2	2153.5	3946.8	63787.	7080.0

Sample Name: lcs 480-151468/2-b Acquired: 11/14/2013 12:10:20 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05028	10.629	.21033	.20773	.21538	.21098	10.261	.20575	.20348
Stddev	.00018	.014	.00065	.00048	.00009	.00002	.001	.00004	.00036
%RSD	.35522	.13480	.30807	.22933	.04097	.00894	.01183	.02017	.17526
#1	.05041	10.639	.20987	.20739	.21544	.21097	10.260	.20578	.20322
#2	.05016	10.619	.21078	.20806	.21532	.21099	10.262	.20572	.20373
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.21080	.21079	10.318	10.526	.21659	10.575	.20755	.21737	10.535
Stddev	.00099	.00040	.004	.017	.00078	.036	.00115	.00043	.018
%RSD	.47024	.18911	.04301	.15993	.36112	.34166	.55293	.19722	.16849
#1	.21150	.21050	10.321	10.538	.21603	10.600	.20836	.21707	10.547
#2	.21010	.21107	10.315	10.514	.21714	10.549	.20674	.21768	10.522
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.19964	.20478	10.179	.20529	.21261	10.140	.20217	.20960	.20343
Stddev	.00090	.00059	.016	.00045	.00401	.024	.00172	.00050	.00013
%RSD	.44978	.28748	.16088	.21959	1.8853	.23201	.85047	.23705	.06273
#1	.20027	.20520	10.191	.20497	.20978	10.124	.20338	.20995	.20352
#2	.19900	.20437	10.168	.20561	.21545	10.157	.20095	.20925	.20334
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	.20611	.21117	.20459
Stddev	.00300	.00063	.00021
%RSD	1.4566	.29794	.10199
#1	.20398	.21073	.20474
#2	.20823	.21162	.20444
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2045.6	3894.3	62255.	7156.8
Stddev	2.3	2.8	195.	5.7
%RSD	.11358	.07201	.31391	.08026
#1	2044.0	3892.3	62117.	7160.9
#2	2047.2	3896.3	62394.	7152.8

Sample Name: 480-48255-i-1-g Acquired: 11/14/2013 12:12:31 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**.00326**	**.00316**	**.00557**	**.11237**	**-.00011**	**4.6035**	**.00006**	**.00157**
Stddev	.00011	.01147	.00236	.00023	.00042	.00011	.0061	.00006	.00003
%RSD	58.626	352.37	74.740	4.0951	.37249	97.034	.13332	98.632	1.6337
#1	.00011	.01137	.00149	.00573	.11207	-.00019	4.5992	.00002	.00159
#2	.00027	-.00486	.00483	.00541	.11267	-.00003	4.6079	.00011	.00155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**.00257**	**-.00014**	**1.8907**	**.00190**	**2.3321**	**.28267**	**.00024**	**2.4701**
Stddev	.00097	.00035	.00260	.0220	.00053	.0126	.00104	.00003	.0094
%RSD	161.26	13.667	1879.3	1.1639	27.770	.53925	.36802	13.739	.38218
#1	-.00008	.00281	.00170	1.9062	.00228	2.3233	.28193	.00021	2.4768
#2	.00129	.00232	-.00198	1.8751	.00153	2.3410	.28340	.00026	2.4634
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00390**	**.00231**	**.12456**	**-.00202**	**.00151**	**7.2497**	**-.00127**	**.04595**	**-.00015**
Stddev	.00024	.00257	.00177	.00063	.00087	.0250	.00030	.00002	.00033
%RSD	6.0756	111.25	1.4227	31.209	57.519	.34493	23.290	.03987	214.60
#1	.00373	.00049	.12582	-.00247	.00090	7.2674	-.00106	.04594	.00008
#2	.00406	.00412	.12331	-.00158	.00212	7.2320	-.00148	.04596	-.00038
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00078**	**.00010**	**.01628**
Stddev	.00099	.00019	.00193
%RSD	126.27	198.42	11.830
#1	.00148	-.00004	.01491
#2	.00008	.00023	.01764
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2127.4**	**3920.0**	**63225.**	**7068.3**
Stddev	2.6	7.5	54.	9.3
%RSD	.12347	.19173	.08620	.13178
#1	2129.3	3925.4	63263.	7061.7
#2	2125.5	3914.7	63186.	7074.9

Sample Name: 480-48255-i-2-e Acquired: 11/14/2013 12:14:48 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00076**	**.00162**	**.00055**	**.00542**	**.48561**	**-.00011**	**42.061**	**.00021**	**.01388**
Stddev	.00025	.00756	.00051	.00016	.00100	.00008	.127	.00003	.00007
%RSD	33.403	465.66	93.765	2.8859	.20576	68.297	.30169	15.541	.48066
#1	.00058	-.00372	.00018	.00531	.48491	-.00006	42.151	.00023	.01392
#2	.00094	.00697	.00091	.00553	.48632	-.00017	41.971	.00018	.01383
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00108**	**.00263**	**-.00372**	**3.7782**	**.00485**	**16.691**	**2.1061**	**.00017**	**11.689**
Stddev	.00023	.00068	.00072	.0063	.00040	.003	.0011	.00045	.023
%RSD	20.857	25.731	19.306	.16818	8.1655	.01697	.05294	265.35	.19928
#1	.00092	.00215	-.00321	3.7827	.00513	16.689	2.1069	-.00015	11.673
#2	.00124	.00311	-.00423	3.7737	.00457	16.693	2.1053	.00049	11.706
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00417**	**.00167**	**.56868**	**-.00260**	**.00265**	**15.519**	**-.00179**	**.37572**	**-.00019**
Stddev	.00025	.00048	.00217	.00045	.00047	.060	.00049	.00046	.00020
%RSD	5.9681	28.642	.38167	17.365	17.883	.38843	27.343	.12151	108.31
#1	.00400	.00201	.56714	-.00291	.00231	15.476	-.00145	.37540	-.00033
#2	.00435	.00133	.57021	-.00228	.00298	15.562	-.00214	.37604	-.00004
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00194**	**-.00005**	**.00983**
Stddev	.00059	.00004	.00112
%RSD	30.697	72.221	11.361
#1	-.00152	-.00003	.00904
#2	-.00236	-.00008	.01062
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2014.9**	**3804.3**	**61535.**	**7154.2**
Stddev	4.1	16.6	61.	.3
%RSD	.20429	.43656	.09989	.00486
#1	2012.0	3792.6	61492.	7154.4
#2	2017.8	3816.1	61578.	7153.9

Sample Name: 480-48255-i-2-eSD@5 Acquired: 11/14/2013 12:17:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**-.02148**	**-.00169**	**.00001**	**.09720**	**-.00006**	**8.5611**	**.00013**	**.00291**
Stddev	.00061	.00938	.00216	.00006	.00005	.00007	.0398	.00036	.00011
%RSD	451.86	43.701	127.89	1126.9	.04915	115.38	.46474	289.15	3.6814
#1	.00057	-.02811	-.00321	-.00004	.09723	-.00001	8.5892	-.00013	.00299
#2	-.00030	-.01484	-.00016	.00005	.09716	-.00010	8.5329	.00038	.00283
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.00082**	**-.00295**	**.75448**	**.00218**	**3.3099**	**.43102**	**-.00012**	**2.3509**
Stddev	.00036	.00010	.00367	.02854	.00060	.0063	.00210	.00018	.0145
%RSD	101.97	12.399	124.42	3.7825	27.593	.18927	.48738	149.14	.61493
#1	-.00010	.00075	-.00035	.77466	.00261	3.3055	.43251	.00001	2.3611
#2	-.00060	.00089	-.00554	.73430	.00176	3.3144	.42954	-.00025	2.3406
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**.00105**	**.11116**	**-.00186**	**.00265**	**3.0537**	**-.00106**	**.07511**	**-.00033**
Stddev	.00053	.00092	.00458	.00171	.00066	.0188	.00004	.00052	.00000
%RSD	57.653	87.249	4.1182	91.990	24.748	.61570	3.9784	.69479	1.0630
#1	.00129	.00170	.10792	-.00065	.00311	3.0404	-.00109	.07548	-.00033
#2	.00054	.00040	.11440	-.00307	.00219	3.0670	-.00103	.07474	-.00034
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00094**	**.00007**	**.00186**
Stddev	.00009	.00030	.00052
%RSD	9.5930	403.21	27.813
#1	-.00087	.00028	.00223
#2	-.00100	-.00014	.00149
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2113.5**	**3920.4**	**62655.**	**7097.8**
Stddev	2.9	2.1	82.	26.6
%RSD	.13894	.05357	.13095	.37508
#1	2111.4	3918.9	62597.	7079.0
#2	2115.5	3921.8	62713.	7116.7

Sample Name: 480-48255-i-2-e PDS Acquired: 11/14/2013 12:19:18 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04897**	**10.333**	**.20642**	**.20478**	**.67099**	**.20519**	**51.505**	**.20059**	**.21102**
Stddev	.00026	.024	.00086	.00099	.00063	.00007	.199	.00110	.00010
%RSD	.52582	.23451	.41857	.48520	.09419	.03462	.38549	.55013	.04556
#1	.04915	10.350	.20703	.20407	.67144	.20524	51.645	.19981	.21095
#2	.04879	10.316	.20581	.20548	.67054	.20513	51.364	.20137	.21109
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20302**	**.20529**	**10.012**	**13.987**	**.21088**	**26.403**	**2.2485**	**.21089**	**21.408**
Stddev	.00122	.00140	.004	.068	.00207	.047	.0024	.00154	.063
%RSD	.60011	.68316	.03674	.48332	.98262	.17834	.10583	.72810	.29340
#1	.20215	.20628	10.015	14.035	.21234	26.370	2.2468	.20980	21.453
#2	.20388	.20430	10.009	13.939	.20941	26.437	2.2502	.21197	21.364
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19849**	**.20524**	**.55733**	**.19936**	**.20818**	**25.289**	**.19188**	**.56910**	**.19895**
Stddev	.00008	.00016	.00196	.00136	.00662	.011	.00090	.00207	.00115
%RSD	.04097	.07920	.35241	.68228	3.1810	.04373	.46960	.36414	.57696
#1	.19843	.20513	.55594	.19839	.20350	25.297	.19124	.57056	.19814
#2	.19855	.20536	.55872	.20032	.21286	25.281	.19251	.56763	.19976
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.19913**	**.20535**	**.20662**
Stddev	.00103	.00018	.00129
%RSD	.51511	.08828	.62443
#1	.19840	.20522	.20571
#2	.19985	.20548	.20753
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1964.2**	**3815.7**	**60889.**	**7082.5**
Stddev	4.4	11.7	46.	15.0
%RSD	.22465	.30554	.07534	.21111
#1	1967.3	3823.9	60921.	7072.0
#2	1961.1	3807.4	60856.	7093.1

Sample Name: 480-48255-i-2-f ms Acquired: 11/14/2013 12:21:34 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05010**	**10.433**	**.21000**	**.20873**	**.68452**	**.20792**	**52.815**	**.20421**	**.21563**
Stddev	.00098	.005	.00228	.00150	.00627	.00012	.160	.00013	.00082
%RSD	1.9488	.05132	1.0840	.71965	.91567	.05877	.30349	.06317	.37842
#1	.05079	10.437	.21161	.20766	.68895	.20784	52.928	.20430	.21621
#2	.04941	10.429	.20839	.20979	.68008	.20801	52.702	.20412	.21505
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20703**	**.20823**	**10.174**	**14.266**	**.21370**	**27.022**	**2.3135**	**.21439**	**21.906**
Stddev	.00085	.00064	.031	.017	.00046	.068	.0095	.00077	.034
%RSD	.40915	.30824	.30761	.12038	.21602	.25127	.41148	.35735	.15558
#1	.20643	.20868	10.196	14.278	.21337	26.974	2.3068	.21494	21.930
#2	.20763	.20777	10.152	14.254	.21403	27.070	2.3202	.21385	21.881
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20160**	**.20570**	**10.678**	**.20558**	**.20869**	**25.603**	**.20164**	**.58422**	**.20256**
Stddev	.00159	.00079	.012	.00103	.00235	.041	.00039	.00027	.00061
%RSD	.78663	.38592	.11028	.50230	1.1279	.15968	.19373	.04698	.29958
#1	.20272	.20514	10.686	.20485	.20703	25.632	.20136	.58441	.20299
#2	.20048	.20626	10.670	.20631	.21036	25.574	.20191	.58403	.20213
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20026**	**.20864**	**.21090**
Stddev	.00069	.00034	.00400
%RSD	.34532	.16298	1.8979
#1	.20075	.20840	.20807
#2	.19977	.20888	.21373
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1956.0**	**3799.6**	**60890.**	**7078.3**
Stddev	5.7	4.1	75.	8.8
%RSD	.29006	.10832	.12370	.12438
#1	1952.0	3796.7	60837.	7072.1
#2	1960.0	3802.5	60943.	7084.6

Sample Name: CCV Acquired: 11/14/2013 12:23:50 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48795	24.765	.50254	.48514	.50098	.48865	24.616	.49497	.48671	.49407	.49658	24.303	25.537
Stddev	.00120	.175	.00011	.00068	.00087	.00080	.008	.00005	.00105	.00098	.00037	.032	.020
%RSD	.24692	.70764	.02253	.14004	.17300	.16381	.03406	.00969	.21646	.19819	.07427	.13174	.07903
#1	.48710	24.889	.50246	.48466	.50159	.48921	24.610	.49500	.48596	.49476	.49632	24.281	25.551
#2	.48880	24.641	.50262	.48563	.50037	.48808	24.622	.49494	.48745	.49337	.49684	24.326	25.523
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50078	24.005	.49852	.50077	24.761	.48681	.48804	24.877	.51331	.49335	24.766	.49998	.50108
Stddev	.00002	.085	.00365	.00054	.057	.00194	.00686	.071	.00301	.00008	.197	.00010	.00129
%RSD	.00428	.35586	.73231	.10826	.22947	.39904	1.4048	.28427	.58709	.01715	.79375	.02088	.25752
#1	.50080	23.945	.49594	.50039	24.801	.48544	.48319	24.927	.51544	.49329	24.627	.49991	.50199
#2	.50077	24.066	.50110	.50116	24.721	.48818	.49289	24.827	.51118	.49341	24.905	.50006	.50017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50855	.49424	.49373	.49087
Stddev	.00207	.00384	.00080	.00186
%RSD	.40670	.77680	.16110	.37912
#1	.50709	.49153	.49317	.48955
#2	.51001	.49696	.49429	.49218
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1956.7	3841.9	60845.	7096.0
Stddev	4.7	5.8	246.	20.3
%RSD	.23869	.15096	.40378	.28606
#1	1960.0	3846.0	61019.	7110.4
#2	1953.4	3837.8	60671.	7081.7

Sample Name: CCB Acquired: 11/14/2013 12:26:01 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**-.02182**	**.00225**	**-.00108**	**.00003**	**-.00011**	**-.01731**	**-.00007**	**.00003**	**.00033**	**.00081**	**-.00507**	**.03074**
Stddev	.00063	.02253	.00099	.00026	.00006	.00014	.00443	.00020	.00043	.00067	.00072	.00636	.01194
%RSD	290.78	103.25	43.920	23.521	188.71	128.53	25.561	273.82	1427.1	200.18	89.218	125.47	38.853
#1	-.00066	-.00589	.00155	-.00090	.00007	-.00001	-.01418	.00007	.00034	-.00014	.00132	-.00057	.02230
#2	.00023	-.03776	.00295	-.00126	-.00001	-.00020	-.02044	-.00021	-.00028	.00081	.00030	-.00956	.03919
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00123**	**.00242**	**.00006**	**.00019**	**.02335**	**-.00044**	**-.00158**	**.00238**	**-.00175**	**.00112**	**-.02003**	**-.00143**	**.00011**
Stddev	.00080	.00023	.00002	.00036	.00157	.00025	.00082	.00202	.00174	.00410	.01409	.00022	.00002
%RSD	65.386	9.4350	39.451	189.78	6.7360	57.596	51.948	84.776	99.528	365.61	70.352	15.402	20.163
#1	.00066	.00258	.00004	.00044	.02224	-.00026	-.00100	.00381	-.00052	-.00178	-.01007	-.00159	.00010
#2	.00180	.00226	.00008	-.00006	.02446	-.00062	-.00216	.00096	-.00298	.00402	-.03000	-.00128	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00006**	**-.00039**	**.00039**	**-.00011**
Stddev	.00014	.00068	.00001	.00016
%RSD	222.92	171.07	1.7134	144.91
#1	.00004	-.00087	.00038	-.00023
#2	-.00017	.00008	.00039	.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2156.9**	**3937.7**	**63728.**	**7087.6**
Stddev	.5	7.0	188.	39.7
%RSD	.02199	.17812	.29454	.56041
#1	2156.6	3932.7	63596.	7059.6
#2	2157.3	3942.6	63861.	7115.7

Sample Name: CCVL Acquired: 11/14/2013 12:28:21 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00296	.19234	.01277	.01848	.00204	.00193	.48427	.00077	.00390	.00405	.01018	.04433	.52837
Stddev	.00012	.01586	.00160	.00065	.00002	.00006	.00624	.00012	.00018	.00007	.00028	.00168	.03139
%RSD	4.0489	8.2463	12.536	3.4935	1.0679	3.3000	1.2888	15.940	4.5469	1.6977	2.7281	3.7932	5.9416
#1	.00288	.18113	.01390	.01893	.00205	.00197	.48868	.00068	.00403	.00409	.01037	.04314	.50617
#2	.00305	.20356	.01164	.01802	.00202	.00188	.47985	.00085	.00378	.00400	.00998	.04552	.55057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03103	.20903	.00327	.00971	1.0090	.00951	.00534	.20058	.01827	.01830	.45217	.00775	.00495
Stddev	.00089	.00989	.00007	.00016	.0149	.00074	.00029	.00117	.00144	.00170	.00610	.00013	.00016
%RSD	2.8711	4.7290	2.1722	1.6416	1.4770	7.7317	5.3795	.58271	7.8830	9.3038	1.3491	1.7155	3.1573
#1	.03040	.21602	.00332	.00960	1.0195	.01003	.00554	.20140	.01929	.01951	.45648	.00784	.00506
#2	.03166	.20204	.00322	.00982	.99844	.00899	.00513	.19975	.01725	.01710	.44786	.00765	.00484
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00467	.02098	.00510	.01032
Stddev	.00020	.00043	.00056	.00078
%RSD	4.3431	2.0678	10.957	7.5820
#1	.00482	.02129	.00549	.00977
#2	.00453	.02067	.00470	.01088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2199.2	4075.5	64867.	7310.5
Stddev	6.1	.6	154.	12.1
%RSD	.27693	.01504	.23691	.16487
#1	2203.5	4076.0	64758.	7302.0
#2	2194.9	4075.1	64975.	7319.0

Sample Name: 480-48255-i-2-g msd Acquired: 11/14/2013 12:30:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04998**	**10.428**	**.21071**	**.20921**	**.69143**	**.20834**	**52.610**	**.20444**	**.21517**
Stddev	.00041	.042	.00130	.00031	.00226	.00079	.101	.00008	.00024
%RSD	.81291	.40009	.61931	.14700	.32629	.37864	.19221	.03816	.10968
#1	.05026	10.399	.20979	.20899	.68984	.20778	52.539	.20439	.21500
#2	.04969	10.458	.21163	.20943	.69303	.20890	52.682	.20450	.21533
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20699**	**.20773**	**10.143**	**14.295**	**.21431**	**27.037**	**2.3158**	**.21539**	**21.951**
Stddev	.00009	.00001	.051	.003	.00025	.009	.0050	.00009	.080
%RSD	.04285	.00465	.50578	.02150	.11836	.03274	.21641	.04278	.36340
#1	.20705	.20772	10.107	14.293	.21448	27.031	2.3123	.21546	21.895
#2	.20693	.20774	10.179	14.297	.21413	27.044	2.3194	.21533	22.007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20108**	**.20735**	**10.706**	**.20422**	**.21008**	**25.285**	**.20153**	**.58540**	**.20204**
Stddev	.00044	.00149	.003	.00058	.00443	.083	.00240	.00213	.00095
%RSD	.21903	.71654	.03120	.28525	2.1082	.32726	1.1921	.36377	.46952
#1	.20139	.20630	10.709	.20381	.20695	25.227	.19983	.58389	.20137
#2	.20077	.20840	10.704	.20463	.21321	25.344	.20323	.58690	.20271
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.19969**	**.20955**	**.20970**
Stddev	.00410	.00118	.00271
%RSD	2.0525	.56508	1.2912
#1	.19679	.20871	.20778
#2	.20258	.21039	.21161
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1946.2**	**3778.8**	**60227.**	**7076.9**
Stddev	.1	4.1	171.	42.0
%RSD	.00345	.10892	.28367	.59292
#1	1946.2	3781.7	60348.	7106.5
#2	1946.3	3775.9	60106.	7047.2

Sample Name: 480-49723-b-1-b Acquired: 11/14/2013 12:32:52 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**-.01568**	**.00282**	**.70629**	**.70952**	**-.00014**	**43.107**	**-.00012**	**-.00015**
Stddev	.00029	.01826	.00193	.00223	.00070	.00005	.105	.00000	.00036
%RSD	181.00	116.45	68.424	.31597	.09810	38.439	.24459	2.5659	246.56
#1	-.00036	-.02860	.00418	.70787	.71001	-.00018	43.033	-.00012	.00011
#2	.00004	-.00277	.00145	.70471	.70902	-.00010	43.182	-.00011	-.00040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00175**	**.00157**	**.02019**	**1.9510**	**.12088**	**11.534**	**.10987**	**.00776**	**84.178**
Stddev	.00058	.00048	.00440	.0185	.00105	.045	.00004	.00020	.034
%RSD	33.045	30.835	21.769	.94649	.87099	.38784	.03707	2.6040	.04002
#1	.00134	.00191	.01708	1.9380	.12162	11.503	.10984	.00790	84.202
#2	.00215	.00123	.02330	1.9641	.12013	11.566	.10990	.00762	84.154
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**.00073**	**.27628**	**-.00233**	**.00263**	**4.4817**	**-.00118**	**.83075**	**.00036**
Stddev	.00047	.00008	.00071	.00145	.00170	.0105	.00090	.00561	.00032
%RSD	188.83	10.617	.25836	62.247	64.685	.23373	75.924	.67474	87.859
#1	.00058	.00079	.27679	-.00335	.00143	4.4891	-.00181	.83471	.00014
#2	-.00008	.00068	.27578	-.00130	.00384	4.4743	-.00055	.82679	.00059
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00065**	**-.00055**	**.00416**
Stddev	.00085	.00014	.00064
%RSD	130.71	24.437	15.286
#1	-.00125	-.00046	.00460
#2	-.00005	-.00065	.00371
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1932.6**	**3768.7**	**59822.**	**7125.7**
Stddev	4.1	8.0	157.	16.4
%RSD	.21278	.21209	.26190	.23050
#1	1929.7	3763.0	59932.	7137.3
#2	1935.6	3774.3	59711.	7114.1

Sample Name: mb 480-151115/1-a Acquired: 11/14/2013 12:35:11 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**-.00436**	**.00056**	**.00017**	**.00006**	**-.00017**	**-.00484**	**-.00019**	**.00022**
Stddev	.00039	.01866	.00039	.00017	.00008	.00011	.00416	.00016	.00024
%RSD	1721.5	428.48	68.999	96.404	133.78	64.535	86.020	82.743	108.84
#1	.00025	-.01755	.00029	.00006	.00011	-.00009	-.00778	-.00008	.00039
#2	-.00030	.00884	.00083	.00029	.00000	-.00025	-.00190	-.00031	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**.00070**	**-.00268**	**.01660**	**.00174**	**.00196**	**-.00003**	**-.00008**	**.04639**
Stddev	.00003	.00029	.00430	.01699	.00090	.00167	.00005	.00007	.00461
%RSD	96.611	41.104	160.28	102.36	51.470	84.858	165.17	80.693	9.9456
#1	-.00001	.00050	-.00573	.00459	.00111	.00314	.00001	-.00013	.04313
#2	-.00006	.00091	.00036	.02862	.00237	.00078	-.00007	-.00004	.04965
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00002**	**.00079**	**.00466**	**-.00101**	**.00334**	**-.06117**	**-.00234**	**.00014**	**-.00025**
Stddev	.00021	.00023	.00370	.00222	.00105	.00122	.00091	.00004	.00012
%RSD	1310.5	28.535	79.388	220.73	31.289	1.9945	38.936	26.817	48.658
#1	-.00016	.00095	.00727	.00056	.00260	-.06204	-.00299	.00011	-.00034
#2	.00013	.00063	.00204	-.00258	.00408	-.06031	-.00170	.00017	-.00016
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00027**	**-.00013**	**.00173**
Stddev	.00018	.00052	.00077
%RSD	64.886	394.37	44.614
#1	.00015	.00023	.00119
#2	.00040	-.00050	.00228
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2219.8**	**4060.4**	**65837.**	**7383.4**
Stddev	8.6	8.4	79.	4.5
%RSD	.38919	.20591	.11998	.06107
#1	2225.9	4066.4	65893.	7386.6
#2	2213.7	4054.5	65781.	7380.2

Sample Name: lcs 480-151115/2-a Acquired: 11/14/2013 12:37:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05007**	**10.378**	**.20894**	**.19888**	**.21049**	**.20571**	**10.265**	**.20490**	**.20158**
Stddev	.00003	.025	.00042	.00054	.00034	.00008	.032	.00001	.00114
%RSD	.05998	.23912	.19911	.27280	.16138	.03940	.30769	.00351	.56756
#1	.05009	10.396	.20865	.19927	.21073	.20577	10.287	.20489	.20238
#2	.05005	10.361	.20924	.19850	.21025	.20565	10.243	.20490	.20077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20829**	**.20472**	**10.248**	**10.278**	**.20943**	**10.599**	**.20716**	**.21317**	**10.184**
Stddev	.00173	.00011	.021	.026	.00070	.028	.00015	.00030	.007
%RSD	.82825	.05298	.20732	.25220	.33459	.25995	.07324	.14252	.06420
#1	.20707	.20480	10.263	10.260	.20992	10.579	.20705	.21338	10.189
#2	.20951	.20465	10.233	10.296	.20893	10.618	.20727	.21295	10.180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19919**	**.20486**	**10.120**	**.20182**	**.20870**	**9.3430**	**.19974**	**.20559**	**.20078**
Stddev	.00084	.00320	.017	.00104	.00380	.0078	.00000	.00013	.00108
%RSD	.41944	1.5641	.16918	.51522	1.8211	.08375	.00096	.06376	.53593
#1	.19978	.20713	10.108	.20109	.21138	9.3375	.19974	.20569	.20155
#2	.19859	.20259	10.132	.20256	.20601	9.3486	.19974	.20550	.20002
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20554**	**.20968**	**.20897**
Stddev	.00012	.00112	.00149
%RSD	.05771	.53529	.71291
#1	.20546	.20889	.20792
#2	.20563	.21047	.21002
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2080.2**	**3962.2**	**63010.**	**7287.4**
Stddev	2.9	11.5	229.	7.6
%RSD	.14174	.29063	.36316	.10366
#1	2082.3	3970.3	63172.	7292.8
#2	2078.1	3954.1	62848.	7282.1

Sample Name: 480-49386-h-1-b Acquired: 11/14/2013 12:39:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**.16783**	**.13496**	**18.100**	**.51122**	**-.00019**	**98.777**	**.00023**	**.05306**
Stddev	.00095	.01085	.00342	.024	.00033	.00005	.121	.00003	.00024
%RSD	185.86	6.4657	2.5367	.13429	.06399	26.501	.12295	11.210	.44498
#1	-.00016	.16016	.13254	18.082	.51146	-.00015	98.692	.00025	.05323
#2	.00118	.17551	.13738	18.117	.51099	-.00022	98.863	.00021	.05290
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.13738**	**.01089**	**10.184**	F **2888.2**	**.85221**	**161.88**	**.55241**	**.01136**	F **8259.5**
Stddev	.00051	.00011	.019	58.1	.00207	.19	.00080	.00017	52.3
%RSD	.37108	.96765	.18329	2.0109	.24276	.11738	.14400	1.4894	.63353
#1	.13702	.01097	10.197	2929.3	.85075	161.75	.55297	.01148	8296.5
#2	.13774	.01082	10.171	2847.2	.85367	162.01	.55185	.01124	8222.5
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit				600.00					5000.0
Low Limit				-.50000					-1.0000

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.37906**	**.00680**	**36.016**	**.00406**	**.01421**	**9.7902**	**.03548**	**1.4813**	**.07548**
Stddev	.00038	.00334	.012	.00342	.00622	.0163	.00055	.0002	.00024
%RSD	.10056	49.140	.03202	84.122	43.759	.16662	1.5572	.01567	.31707
#1	.37933	.00444	36.007	.00165	.01861	9.8018	.03587	1.4815	.07565
#2	.37879	.00916	36.024	.00648	.00981	9.7787	.03509	1.4812	.07531
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00213**	**.05607**	**.16454**
Stddev	.00319	.00070	.00192
%RSD	150.10	1.2565	1.1638
#1	-.00438	.05657	.16319
#2	.00013	.05557	.16590
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1163.7**	**2973.0**	**43036.**	**7641.3**
Stddev	4.5	11.1	47.	13.9
%RSD	.38527	.37362	.10884	.18243
#1	1166.9	2980.8	43069.	7651.2
#2	1160.6	2965.1	43003.	7631.4

Sample Name: 480-49407-a-2-b Acquired: 11/14/2013 12:42:04 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00027**	**-.01031**	**.00156**	**.07456**	**.15528**	**-.00018**	**92.211**	**-.00012**	**.00012**
Stddev	.00017	.01167	.00034	.00144	.00011	.00001	.595	.00001	.00031
%RSD	62.565	113.19	21.720	1.9276	.07379	3.5590	.64524	8.6001	258.74
#1	-.00038	-.01856	.00132	.07557	.15536	-.00018	91.790	-.00011	-.00010
#2	-.00015	-.00206	.00179	.07354	.15520	-.00018	92.632	-.00013	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.00661**	**.00345**	**2.2446**	**.01306**	**16.639**	**.00089**	**.00043**	**18.248**
Stddev	.00028	.00005	.00115	.0370	.00061	.028	.00005	.00000	.019
%RSD	141.10	.76805	33.274	1.6477	4.6990	.16941	5.8638	.49708	.10343
#1	.00000	.00664	.00427	2.2708	.01263	16.619	.00093	.00043	18.261
#2	.00040	.00657	.00264	2.2185	.01350	16.659	.00085	.00043	18.234
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00092**	**.00203**	**15.652**	**-.00406**	**-.00099**	**4.5736**	**-.00170**	**.30639**	**.00031**
Stddev	.00017	.00284	.023	.00035	.00365	.0107	.00039	.00179	.00016
%RSD	18.817	140.09	.14593	8.7113	369.71	.23404	23.123	.58548	53.099
#1	.00104	.00002	15.668	-.00381	.00159	4.5661	-.00198	.30512	.00019
#2	.00080	.00403	15.636	-.00431	-.00357	4.5812	-.00142	.30765	.00042
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00124**	**-.00068**	**.01009**
Stddev	.00141	.00018	.00100
%RSD	113.97	26.702	9.8917
#1	.00223	-.00081	.01079
#2	.00024	-.00056	.00938
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1975.5**	**3795.5**	**60869.**	**7243.7**
Stddev	7.1	11.7	9.	49.1
%RSD	.36019	.30776	.01490	.67729
#1	1970.4	3787.2	60875.	7278.3
#2	1980.5	3803.7	60863.	7209.0

Sample Name: 480-49407-a-2-b SD@5 Acquired: 11/14/2013 12:44:17 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**-.00860**	**.00261**	**.02216**	**.03100**	**-.00014**	**18.428**	**.00021**	**.00022**
Stddev	.00020	.02564	.00042	.00034	.00009	.00000	.038	.00010	.00017
%RSD	48.787	298.17	15.988	1.5330	.30035	.07200	.20740	50.145	74.813
#1	-.00026	-.02673	.00232	.02240	.03107	-.00014	18.455	.00013	.00034
#2	-.00054	.00953	.00291	.02192	.03093	-.00014	18.401	.00028	.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00035**	**.00196**	**-.00020**	**.47773**	**.00454**	**3.2215**	**.00018**	**.00002**	**3.6737**
Stddev	.00043	.00038	.00536	.03628	.00115	.0056	.00002	.00049	.0066
%RSD	122.87	19.405	2704.3	7.5945	25.312	.17421	11.322	2144.2	.17898
#1	-.00066	.00169	.00359	.50338	.00373	3.2254	.00017	-.00032	3.6784
#2	-.00005	.00223	-.00399	.45207	.00536	3.2175	.00020	.00037	3.6691
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**.00023**	**2.9518**	**-.00230**	**.00358**	**.87079**	**-.00215**	**.06126**	**-.00031**
Stddev	.00042	.00071	.0139	.00019	.00148	.00869	.00022	.00016	.00012
%RSD	302.21	315.72	.47000	8.0354	41.391	.99817	10.208	.25939	39.196
#1	.00044	.00073	2.9616	-.00217	.00462	.87693	-.00199	.06115	-.00023
#2	-.00016	-.00028	2.9420	-.00243	.00253	.86464	-.00230	.06138	-.00040
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00041**	**-.00026**	**.00361**
Stddev	.00028	.00048	.00028
%RSD	66.910	182.30	7.6776
#1	.00061	-.00060	.00381
#2	.00022	.00008	.00342
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2084.5**	**3882.4**	**62063.**	**7060.1**
Stddev	9.3	19.1	67.	8.0
%RSD	.44765	.49144	.10829	.11363
#1	2077.9	3869.0	62110.	7054.5
#2	2091.1	3895.9	62015.	7065.8

Sample Name: 480-49407-a-2-b PDS Acquired: 11/14/2013 12:46:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.78082**	**.01805**	**1.0323**	**.05566**	**1.1636**	**.98483**	**93.185**	**1.0060**	**.97571**
Stddev	.00159	.00859	.0037	.00046	.0035	.00484	.580	.0003	.00029
%RSD	.20427	47.570	.36359	.82773	.29867	.49122	.62241	.03105	.02973
#1	.78194	.02412	1.0349	.05598	1.1660	.98826	93.595	1.0058	.97551
#2	.77969	.01198	1.0296	.05533	1.1611	.98141	92.775	1.0062	.97592
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.98732**	**.99893**	**.00051**	**1.5915**	**.01138**	**16.443**	**.98718**	**1.0137**	**17.247**
Stddev	.00403	.00318	.00584	.0079	.00045	.042	.00222	.0005	.032
%RSD	.40827	.31859	1144.9	.49814	3.9447	.25464	.22480	.04987	.18505
#1	.99017	.99668	-.00362	1.5859	.01170	16.472	.98875	1.0140	17.270
#2	.98447	1.0012	.00464	1.5971	.01106	16.413	.98561	1.0133	17.224
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.96264**	**.97272**	**15.630**	**.99560**	**1.0319**	**4.5008**	**-.00161**	**.30665**	**.00133**
Stddev	.00307	.00022	.010	.00643	.0015	.0225	.00023	.00169	.00005
%RSD	.31933	.02253	.06329	.64623	.14153	.50083	14.297	.55108	4.0056
#1	.96481	.97287	15.637	1.0001	1.0309	4.5167	-.00177	.30784	.00129
#2	.96046	.97256	15.623	.99105	1.0329	4.4848	-.00145	.30545	.00136
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**1.0014**	**1.0268**	**.99896**
Stddev	.0004	.0005	.01233
%RSD	.03469	.04485	1.2342
#1	1.0017	1.0272	1.0077
#2	1.0012	1.0265	.99024
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1996.9**	**3843.8**	**61773.**	**7253.6**
Stddev	4.9	11.1	1.	20.4
%RSD	.24642	.28992	.00126	.28088
#1	2000.4	3851.7	61773.	7239.2
#2	1993.5	3835.9	61774.	7268.0

Sample Name: 480-49407-a-2-c ms Acquired: 11/14/2013 12:48:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05330**	**10.522**	**.21759**	**.26395**	**.36550**	**.20673**	**102.79**	**.20789**	**.20253**
Stddev	.00073	.044	.00251	.00033	.00008	.00019	.39	.00038	.00045
%RSD	1.3695	.42004	1.1517	.12494	.02151	.08971	.37733	.18486	.22184
#1	.05382	10.554	.21582	.26372	.36544	.20660	103.07	.20762	.20221
#2	.05279	10.491	.21937	.26419	.36555	.20686	102.52	.20816	.20285
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20570**	**.21462**	**10.101**	**11.323**	**.22329**	**26.924**	**.20431**	**.21629**	**25.482**
Stddev	.00151	.00026	.001	.044	.00181	.053	.00014	.00016	.026
%RSD	.73170	.11934	.01359	.38657	.80939	.19650	.06940	.07291	.10395
#1	.20464	.21444	10.100	11.292	.22202	26.887	.20421	.21618	25.464
#2	.20676	.21480	10.102	11.354	.22457	26.962	.20441	.21640	25.501
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20061**	**.21104**	**26.077**	**.21623**	**.21274**	**13.813**	**.20533**	**.51250**	**.20176**
Stddev	.00093	.00185	.033	.00179	.00424	.054	.00065	.00091	.00075
%RSD	.46130	.87438	.12596	.82910	1.9914	.38966	.31717	.17804	.37405
#1	.20126	.21234	26.100	.21496	.21574	13.851	.20579	.51315	.20123
#2	.19995	.20973	26.054	.21750	.20974	13.775	.20487	.51185	.20229
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20529**	**.20971**	**.21306**
Stddev	.00039	.00023	.00033
%RSD	.18843	.11042	.15257
#1	.20556	.20987	.21329
#2	.20501	.20955	.21283
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1931.5**	**3783.2**	**60708.**	**7212.5**
Stddev	.2	2.0	97.	.1
%RSD	.00840	.05239	.16006	.00092
#1	1931.4	3784.6	60776.	7212.5
#2	1931.6	3781.8	60639.	7212.6

Sample Name: CCV Acquired: 11/14/2013 12:50:57 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48635**	**24.886**	**.50347**	**.49471**	**.50238**	**.48838**	**24.229**	**.49411**	**.48471**	**.48963**	**.50086**	**23.820**	**25.447**
Stddev	.00007	.067	.00257	.00063	.00105	.00080	.067	.00082	.00085	.00377	.00088	.007	.153
%RSD	.01381	.26874	.50999	.12678	.20887	.16359	.27450	.16499	.17593	.76992	.17615	.03133	.60013
#1	.48631	24.839	.50165	.49426	.50164	.48781	24.182	.49353	.48411	.48697	.50024	23.815	25.555
#2	.48640	24.933	.50528	.49515	.50312	.48894	24.276	.49469	.48532	.49230	.50149	23.825	25.339
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50617**	**23.860**	**.49333**	**.50331**	**24.787**	**.48520**	**.48250**	**25.046**	**.51208**	**.49755**	**24.303**	**.49690**	**.50039**
Stddev	.00023	.039	.00272	.00030	.041	.00087	.00077	.022	.00118	.00072	.201	.00067	.00005
%RSD	.04512	.16373	.55073	.06007	.16555	.18000	.15938	.08971	.23123	.14561	.82559	.13482	.00903
#1	.50601	23.832	.49141	.50310	24.816	.48458	.48304	25.062	.51124	.49704	24.161	.49643	.50043
#2	.50633	23.887	.49525	.50352	24.758	.48582	.48195	25.030	.51292	.49806	24.445	.49738	.50036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.50448**	**.49271**	**.49188**	**.48507**
Stddev	.00145	.00243	.00097	.00145
%RSD	.28765	.49291	.19786	.29964
#1	.50346	.49099	.49119	.48404
#2	.50551	.49443	.49256	.48609
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1948.4**	**3808.8**	**60746.**	**7124.5**
Stddev	.1	7.7	142.	6.2
%RSD	.00280	.20314	.23352	.08744
#1	1948.5	3803.3	60846.	7128.9
#2	1948.4	3814.3	60646.	7120.1

Sample Name: CCB Acquired: 11/14/2013 12:53:09 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00000	-.02015	.00245	.00478	-.00001	-.00014	-.01516	-.00010	.00018	.00011	.00038	.00034	.07729
Stddev	.00045	.01951	.00063	.00028	.00001	.00003	.00587	.00022	.00004	.00066	.00045	.00121	.01495
%RSD	48981.	96.805	25.849	5.8514	165.70	22.594	38.707	219.45	24.614	615.64	118.12	353.61	19.347
#1	-.00032	-.03395	.00290	.00498	.00000	-.00016	-.01101	.00005	.00015	-.00036	.00070	.00119	.08786
#2	.00032	-.00636	.00200	.00458	-.00002	-.00012	-.01931	-.00025	.00021	.00057	.00006	-.00051	.06672
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00098	-.00017	-.00010	.00057	.09822	-.00010	-.00020	-.00027	-.00040	.00279	-.02120	-.00172	-.00002
Stddev	.00008	.00698	.00006	.00029	.00507	.00011	.00310	.00300	.00284	.00063	.02973	.00037	.00002
%RSD	8.2446	4164.1	62.429	50.279	5.1624	112.34	1546.0	1129.3	718.40	22.539	140.26	21.467	95.231
#1	.00092	.00477	-.00014	.00037	.09463	-.00018	-.00239	-.00239	.00161	.00235	-.04222	-.00198	-.00001
#2	.00104	-.00510	-.00005	.00078	.10180	-.00002	.00199	.00186	-.00240	.00324	-.00017	-.00146	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	-.00054	.00071	.00001	.00021
Stddev	.00055	.00129	.00017	.00111
%RSD	101.41	181.13	2670.5	532.27
#1	-.00093	.00162	-.00011	.00099
#2	-.00015	-.00020	.00013	-.00057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2148.2	3933.7	63110.	7089.7
Stddev	.0	2.0	49.	29.5
%RSD	.00061	.04992	.07755	.41640
#1	2148.2	3932.3	63075.	7110.6
#2	2148.2	3935.1	63145.	7068.8

Sample Name: CCVL Acquired: 11/14/2013 12:55:28 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00365	.18244	.01205	.02264	.00200	.00183	.47850	.00074	.00386	.00354	.00999	.04135	.56618
Stddev	.00066	.00517	.00065	.00078	.00001	.00008	.01080	.00014	.00002	.00046	.00042	.00235	.03415
%RSD	18.063	2.8346	5.3646	3.4251	.54450	4.1105	2.2578	19.679	.40807	12.849	4.2106	5.6857	6.0317
#1	.00319	.18610	.01159	.02319	.00199	.00177	.48614	.00063	.00387	.00387	.01029	.04301	.59033
#2	.00412	.17878	.01251	.02209	.00201	.00188	.47086	.00084	.00385	.00322	.00970	.03969	.54204
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03067	.20449	.00322	.00994	1.0456	.00958	.00477	.20038	.01825	.01811	.43588	.00794	.00498
Stddev	.00143	.00128	.00008	.00014	.0028	.00010	.00063	.00153	.00128	.00205	.00003	.00045	.00001
%RSD	4.6562	.62706	2.5533	1.3696	.26711	1.0797	13.269	.76602	6.9920	11.328	.00574	5.7270	.18229
#1	.03168	.20539	.00328	.00984	1.0476	.00965	.00522	.20146	.01916	.01666	.43589	.00826	.00498
#2	.02966	.20358	.00316	.01004	1.0436	.00951	.00433	.19929	.01735	.01956	.43586	.00762	.00497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00443	.02128	.00486	.01052
Stddev	.00006	.00060	.00036	.00023
%RSD	1.2618	2.8329	7.3658	2.1491
#1	.00447	.02171	.00512	.01036
#2	.00439	.02085	.00461	.01068
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2182.9	4039.2	64664.	7382.4
Stddev	1.0	8.1	277.	24.4
%RSD	.04420	.20041	.42849	.33097
#1	2183.6	4033.5	64860.	7399.7
#2	2182.2	4044.9	64469.	7365.1

Sample Name: 480-49407-a-2-d msd Acquired: 11/14/2013 12:57:45 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05115**	**10.398**	**.20914**	**.26276**	**.36807**	**.20154**	**104.86**	**.20303**	**.19840**
Stddev	.00126	.080	.00088	.00122	.00130	.00025	.10	.00042	.00002
%RSD	2.4556	.76795	.42273	.46599	.35402	.12545	.09992	.20463	.01095
#1	.05204	10.342	.20977	.26189	.36899	.20172	104.78	.20274	.19839
#2	.05026	10.454	.20852	.26362	.36715	.20136	104.93	.20333	.19842
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20303**	**.20993**	**9.8205**	**11.174**	**.22152**	**27.159**	**.20154**	**.21080**	**25.644**
Stddev	.00037	.00073	.0162	.179	.00006	.163	.00038	.00046	.037
%RSD	.17982	.34718	.16473	1.6004	.02905	.60125	.18719	.21931	.14322
#1	.20329	.21044	9.8090	11.048	.22147	27.275	.20127	.21047	25.618
#2	.20277	.20941	9.8319	11.301	.22156	27.044	.20181	.21113	25.670
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19553**	**.20431**	**26.272**	**.20300**	**.21168**	**14.232**	**.20450**	**.51928**	**.19898**
Stddev	.00009	.00080	.072	.00013	.00013	.010	.00022	.00028	.00219
%RSD	.04688	.39303	.27343	.06466	.06150	.07146	.10782	.05346	1.1022
#1	.19546	.20487	26.222	.20310	.21177	14.239	.20434	.51908	.20053
#2	.19559	.20374	26.323	.20291	.21159	14.224	.20465	.51947	.19743
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20079**	**.20601**	**.21053**
Stddev	.00027	.00116	.00274
%RSD	.13410	.56119	1.3000
#1	.20098	.20683	.21246
#2	.20060	.20520	.20859
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1929.0**	**3781.9**	**60138.**	**7223.9**
Stddev	.2	12.9	177.	38.9
%RSD	.01081	.34229	.29426	.53835
#1	1928.8	3791.1	60013.	7251.3
#2	1929.1	3772.8	60263.	7196.4

Sample Name: 480-49407-b-3-b Acquired: 11/14/2013 12:59:54 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00045**	**.00357**	**.00355**	**.06791**	**.13840**	**-.00012**	**89.237**	**.00027**	**-.00006**
Stddev	.00097	.00037	.00018	.00046	.00011	.00005	.466	.00020	.00013
%RSD	216.43	10.466	4.9553	.67113	.07997	44.173	.52235	74.545	220.56
#1	.00024	.00330	.00368	.06823	.13848	-.00008	89.567	.00013	.00003
#2	-.00113	.00383	.00343	.06759	.13832	-.00016	88.907	.00041	-.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00099**	**.00836**	**.00471**	**1.1446**	**.01073**	**15.928**	**.00067**	**.00126**	**23.195**
Stddev	.00065	.00053	.00188	.0131	.00060	.053	.00010	.00032	.100
%RSD	65.416	6.3018	39.827	1.1433	5.5703	.33569	15.551	25.433	.42938
#1	.00144	.00873	.00339	1.1539	.01031	15.966	.00059	.00149	23.265
#2	.00053	.00799	.00604	1.1354	.01116	15.890	.00074	.00103	23.124
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**.00345**	**15.109**	**-.00322**	**-.00412**	**4.3157**	**-.00152**	**.29301**	**.00060**
Stddev	.00003	.00339	.009	.00078	.00044	.0006	.00124	.00090	.00006
%RSD	3.1383	98.144	.05644	24.265	10.779	.01491	81.832	.30561	9.6083
#1	.00091	.00106	15.115	-.00377	-.00443	4.3161	-.00064	.29365	.00064
#2	.00095	.00585	15.103	-.00267	-.00381	4.3152	-.00240	.29238	.00056
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00029**	**.00029**	**.01900**
Stddev	.00243	.00030	.00064
%RSD	842.64	101.56	3.3711
#1	-.00143	.00051	.01855
#2	.00201	.00008	.01945
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1980.2**	**3810.0**	**61528.**	**7288.9**
Stddev	9.5	8.8	86.	19.7
%RSD	.48144	.23036	.13915	.27049
#1	1987.0	3816.2	61588.	7275.0
#2	1973.5	3803.8	61467.	7302.9

Sample Name: mb 480-149929/1-b Acquired: 11/14/2013 13:02:08 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00051**	**.00533**	**.00213**	**.00421**	**.00078**	**-.00012**	**.03392**	**-.00001**	**.00009**
Stddev	.00073	.02379	.00124	.00008	.00003	.00004	.00243	.00005	.00013
%RSD	144.79	446.16	58.032	1.9913	3.4963	35.842	7.1495	631.74	148.33
#1	.00103	.02216	.00126	.00427	.00080	-.00015	.03564	.00003	.00000
#2	-.00001	-.01149	.00301	.00415	.00076	-.00009	.03221	-.00005	.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.00047**	**-.00132**	**.02059**	**.00179**	**.00288**	**.00024**	**-.00015**	**.17590**
Stddev	.00067	.00003	.00249	.08460	.00069	.00168	.00008	.00011	.00904
%RSD	77.465	5.7510	189.01	410.84	38.243	58.405	33.798	72.152	5.1386
#1	.00133	.00049	-.00308	.08041	.00131	.00407	.00019	-.00007	.18229
#2	.00039	.00045	.00044	-.03923	.00228	.00169	.00030	-.00022	.16951
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**-.00086**	**.03826**	**-.00247**	**.00028**	**-.04189**	**-.00175**	**.00062**	**-.00012**
Stddev	.00003	.00009	.00313	.00112	.00230	.00168	.00064	.00006	.00001
%RSD	183.14	10.171	8.1810	45.268	807.32	4.0219	36.721	9.0713	11.707
#1	.00003	-.00080	.04048	-.00168	-.00134	-.04308	-.00220	.00066	-.00011
#2	.00000	-.00092	.03605	-.00326	.00191	-.04070	-.00130	.00058	-.00013
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00100**	**.00013**	**.00098**
Stddev	.00133	.00007	.00036
%RSD	133.24	53.118	36.561
#1	-.00194	.00018	.00124
#2	-.00006	.00008	.00073
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2160.6**	**3955.0**	**63737.**	**7137.0**
Stddev	5.7	5.5	126.	36.8
%RSD	.26485	.13955	.19785	.51493
#1	2156.5	3951.1	63648.	7111.0
#2	2164.6	3958.9	63827.	7163.0

Sample Name: lcs 480-149929/2-b Acquired: 11/14/2013 13:04:26 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04996**	**10.296**	**.20845**	**.20664**	**.21068**	**.20608**	**10.380**	**.20395**	**.20012**
Stddev	.00102	.047	.00048	.00135	.00010	.00117	.081	.00002	.00043
%RSD	2.0347	.45606	.22841	.65457	.04912	.56867	.77688	.00965	.21395
#1	.04924	10.329	.20879	.20568	.21075	.20691	10.323	.20394	.19981
#2	.05068	10.263	.20811	.20760	.21060	.20525	10.437	.20396	.20042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20814**	**.20607**	**10.146**	**10.294**	**.20938**	**10.494**	**.20513**	**.21541**	**10.221**
Stddev	.00055	.00003	.045	.034	.00098	.026	.00051	.00077	.043
%RSD	.26296	.01604	.44264	.32658	.46860	.24433	.25023	.35830	.41950
#1	.20776	.20604	10.178	10.318	.21007	10.512	.20477	.21596	10.252
#2	.20853	.20609	10.114	10.270	.20869	10.476	.20550	.21487	10.191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19818**	**.20418**	**9.9560**	**.20592**	**.20860**	**9.7019**	**.19475**	**.20540**	**.20080**
Stddev	.00050	.00024	.0025	.00300	.00265	.0486	.00036	.00034	.00032
%RSD	.25109	.11560	.02511	1.4571	1.2680	.50098	.18402	.16728	.16095
#1	.19853	.20435	9.9542	.20805	.21047	9.7362	.19501	.20564	.20057
#2	.19782	.20401	9.9577	.20380	.20673	9.6675	.19450	.20515	.20102
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20450**	**.20910**	**.20318**
Stddev	.00054	.00034	.00197
%RSD	.26600	.16402	.97081
#1	.20488	.20886	.20179
#2	.20411	.20934	.20458
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2052.0**	**3894.3**	**62371.**	**7112.9**
Stddev	3.3	3.1	140.	13.2
%RSD	.16063	.08034	.22376	.18504
#1	2054.3	3896.5	62273.	7122.2
#2	2049.6	3892.1	62470.	7103.6

Sample Name: 480-49222-c-1-b Acquired: 11/14/2013 13:06:36 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00043**	**.00824**	**.00188**	**.12779**	**.08722**	**-.00009**	**62.437**	**.00030**	**.00019**
Stddev	.00018	.02445	.00567	.00017	.00024	.00006	.114	.00011	.00015
%RSD	41.682	296.87	301.78	.13291	.27874	63.949	.18231	35.958	80.220
#1	-.00030	.02552	-.00213	.12791	.08739	-.00013	62.517	.00038	.00008
#2	-.00056	-.00905	.00589	.12767	.08705	-.00005	62.356	.00022	.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00111**	**.00254**	**.00894**	**7.2767**	**.04993**	**25.033**	**.00058**	**.00397**	**76.086**
Stddev	.00043	.00015	.00081	.0378	.00054	.059	.00003	.00005	.044
%RSD	38.590	6.0157	9.0650	.51905	1.0789	.23377	5.2201	1.1662	.05823
#1	.00080	.00265	.00952	7.2500	.05031	25.074	.00060	.00394	76.055
#2	.00141	.00244	.00837	7.3035	.04955	24.992	.00056	.00400	76.117
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00202**	**-.00034**	**72.055**	**-.00306**	**.00176**	**5.5804**	**-.00177**	**.54294**	**.00012**
Stddev	.00014	.00237	.020	.00199	.00150	.0278	.00001	.00185	.00025
%RSD	7.0637	697.42	.02795	65.185	84.931	.49803	.32323	.33991	212.34
#1	.00192	.00134	72.069	-.00447	.00282	5.6001	-.00177	.54424	-.00006
#2	.00212	-.00201	72.041	-.00165	.00070	5.5608	-.00176	.54163	.00029
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00043**	**.00317**	**.00111**
Stddev	.00054	.00030	.00129
%RSD	126.95	9.5248	116.20
#1	.00004	.00295	.00020
#2	.00081	.00338	.00202
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1913.7**	**3734.4**	**59765.**	**7193.0**
Stddev	5.3	4.1	56.	20.6
%RSD	.27947	.11101	.09348	.28701
#1	1917.5	3737.3	59804.	7178.4
#2	1909.9	3731.5	59725.	7207.6

Sample Name: 480-49222-c-2-b Acquired: 11/14/2013 13:08:52 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**.01011**	**.00699**	**.12745**	**.08560**	**-.00013**	**62.615**	**.00013**	**.00010**
Stddev	.00049	.00044	.00256	.00094	.00025	.00007	.124	.00015	.00005
%RSD	344.79	4.3428	36.579	.73927	.29538	50.218	.19834	111.30	51.445
#1	-.00020	.01042	.00519	.12811	.08542	-.00018	62.527	.00023	.00013
#2	.00049	.00980	.00880	.12678	.08578	-.00009	62.703	.00003	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00168**	**.00283**	**.02203**	**7.1719**	**.04910**	**25.076**	**.00053**	**.00388**	**75.822**
Stddev	.00041	.00024	.00491	.0108	.00038	.013	.00011	.00000	.499
%RSD	24.196	8.5102	22.288	.15041	.76895	.05162	21.141	.00472	.65798
#1	.00139	.00300	.02551	7.1795	.04883	25.067	.00061	.00388	75.469
#2	.00197	.00266	.01856	7.1643	.04936	25.085	.00045	.00388	76.175
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00166**	**.00165**	**72.077**	**-.00185**	**-.00024**	**5.5455**	**-.00123**	**.54065**	**.00035**
Stddev	.00028	.00160	.011	.00030	.00128	.0286	.00078	.00086	.00005
%RSD	16.893	96.821	.01525	16.038	544.28	.51498	63.334	.15935	15.448
#1	.00185	.00278	72.085	-.00206	-.00114	5.5253	-.00068	.54004	.00031
#2	.00146	.00052	72.069	-.00164	.00067	5.5657	-.00178	.54126	.00038
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00029**	**.00322**	**.00109**
Stddev	.00096	.00022	.00036
%RSD	334.32	6.7982	33.241
#1	-.00096	.00337	.00084
#2	.00039	.00306	.00135
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1916.9**	**3730.9**	**59463.**	**7160.8**
Stddev	2.1	7.6	88.	41.5
%RSD	.10995	.20489	.14808	.57955
#1	1915.4	3725.5	59400.	7190.1
#2	1918.4	3736.3	59525.	7131.4

Sample Name: 480-49222-c-3-b Acquired: 11/14/2013 13:11:06 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**-.00185**	**.00402**	**.12526**	**.10677**	**-.00016**	**61.961**	**.00003**	**.00023**
Stddev	.00026	.01803	.00462	.00131	.00017	.00018	.358	.00018	.00002
%RSD	242.31	973.43	114.94	1.0481	.15833	108.43	.57762	578.18	10.399
#1	.00029	.01090	.00075	.12619	.10689	-.00004	62.214	.00016	.00025
#2	-.00008	-.01460	.00728	.12433	.10665	-.00029	61.708	-.00010	.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00134**	**.00257**	**-.00219**	**7.1255**	**.04925**	**24.884**	**.00036**	**.00407**	**75.424**
Stddev	.00017	.00017	.00027	.0108	.00038	.078	.00000	.00020	.072
%RSD	12.493	6.7216	12.218	.15109	.76705	.31332	1.2108	4.9935	.09592
#1	.00123	.00269	-.00238	7.1179	.04952	24.939	.00036	.00392	75.372
#2	.00146	.00245	-.00200	7.1331	.04899	24.829	.00036	.00421	75.475
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00179**	**-.00030**	**71.207**	**-.00206**	**.00483**	**5.4615**	**-.00147**	**.55760**	**-.00007**
Stddev	.00015	.00287	.178	.00052	.01108	.0008	.00010	.00162	.00007
%RSD	8.3744	949.74	.24969	25.305	229.32	.01536	6.5111	.29069	99.267
#1	.00189	.00173	71.333	-.00169	.01267	5.4609	-.00154	.55874	-.00002
#2	.00168	-.00233	71.081	-.00242	-.00300	5.4621	-.00140	.55645	-.00012
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00012**	**.00277**	**.00080**
Stddev	.00054	.00043	.00033
%RSD	455.89	15.588	41.422
#1	.00050	.00247	.00104
#2	-.00027	.00308	.00057
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1919.7**	**3738.3**	**59645.**	**7204.8**
Stddev	7.4	8.4	26.	48.4
%RSD	.38297	.22559	.04440	.67157
#1	1924.9	3732.4	59627.	7170.5
#2	1914.5	3744.3	59664.	7239.0

Sample Name: 480-49222-c-3-bSD@5 Acquired: 11/14/2013 13:13:21 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00078**	**-.00717**	**.00270**	**.02566**	**.02167**	**-.00010**	**12.587**	**.00011**	**.00004**
Stddev	.00018	.00941	.00063	.00023	.00006	.00014	.019	.00001	.00006
%RSD	23.489	131.29	23.325	.89839	.25757	144.32	.15241	7.7874	150.47
#1	.00090	-.00051	.00315	.02549	.02163	-.00020	12.574	.00012	.00000
#2	.00065	-.01382	.00225	.02582	.02171	.00000	12.601	.00010	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00024**	**.00124**	**-.00010**	**1.4106**	**.01178**	**4.9450**	**.00013**	**.00084**	**14.925**
Stddev	.00028	.00011	.00023	.0003	.00037	.0239	.00003	.00048	.000
%RSD	116.48	9.2748	216.93	.02317	3.1695	.48315	25.805	57.439	.00184
#1	-.00044	.00116	-.00026	1.4104	.01152	4.9281	.00016	.00050	14.925
#2	-.00004	.00132	.00006	1.4109	.01205	4.9619	.00011	.00118	14.925
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**.00070**	**13.757**	**-.00387**	**.00055**	**1.0565**	**-.00157**	**.11267**	**-.00051**
Stddev	.00020	.00007	.023	.00018	.00107	.0376	.00066	.00034	.00065
%RSD	30.605	10.089	.16990	4.5713	194.43	3.5563	42.342	.30394	129.25
#1	.00050	.00075	13.774	-.00400	.00130	1.0300	-.00110	.11242	-.00004
#2	.00078	.00065	13.741	-.00375	-.00021	1.0831	-.00204	.11291	-.00097
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00089**	**.00080**	**-.00011**
Stddev	.00047	.00035	.00008
%RSD	52.583	43.873	76.175
#1	.00056	.00056	-.00005
#2	.00123	.00105	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2063.2**	**3878.3**	**61801.**	**7104.2**
Stddev	.7	4.0	85.	.2
%RSD	.03383	.10265	.13775	.00241
#1	2063.7	3875.5	61861.	7104.1
#2	2062.7	3881.2	61741.	7104.4

Sample Name: 480-49222-c-3-b PDS Acquired: 11/14/2013 13:15:35 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04661**	**9.9207**	**.21305**	**.32255**	**.30307**	**.20127**	**70.988**	**.20373**	**.20106**
Stddev	.00067	.0232	.00337	.00013	.00045	.00045	.166	.00001	.00073
%RSD	1.4387	.23354	1.5809	.04148	.14968	.22500	.23422	.00560	.36310
#1	.04708	9.9370	.21543	.32265	.30275	.20095	71.106	.20373	.20157
#2	.04613	9.9043	.21067	.32246	.30339	.20159	70.871	.20374	.20054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20401**	**.20537**	**9.7781**	**16.876**	**.24483**	**34.550**	**.20126**	**.21557**	**83.989**
Stddev	.00058	.00026	.0132	.111	.00138	.034	.00082	.00008	.211
%RSD	.28645	.12426	.13487	.65770	.56457	.09833	.40817	.03742	.25107
#1	.20443	.20519	9.7688	16.797	.24386	34.574	.20184	.21562	83.840
#2	.20360	.20555	9.7875	16.954	.24581	34.526	.20068	.21551	84.138
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19992**	**.20360**	**69.835**	**.20204**	**.21298**	**15.148**	**.19799**	**.74594**	**.19861**
Stddev	.00107	.00132	.064	.00253	.00046	.037	.00092	.00225	.00095
%RSD	.53747	.64756	.09116	1.2525	.21568	.24551	.46652	.30152	.47740
#1	.19916	.20267	69.880	.20025	.21331	15.121	.19734	.74435	.19928
#2	.20068	.20453	69.790	.20383	.21266	15.174	.19864	.74753	.19794
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.19918**	**.20989**	**.20246**
Stddev	.00167	.00049	.00145
%RSD	.83635	.23225	.71526
#1	.19800	.20955	.20348
#2	.20036	.21024	.20143
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1886.0**	**3732.4**	**59467.**	**7202.2**
Stddev	2.1	1.5	22.	13.1
%RSD	.10998	.04093	.03617	.18129
#1	1887.4	3733.5	59482.	7193.0
#2	1884.5	3731.3	59451.	7211.4

Sample Name: CCV Acquired: 11/14/2013 13:17:47 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48657	24.745	.50085	.48306	.50071	.48739	24.706	.49313	.48739	.49550	.49376	24.085	25.277
Stddev	.00020	.114	.00152	.00144	.00395	.00275	.184	.00005	.00048	.00014	.00225	.113	.023
%RSD	.04128	.46158	.30286	.29892	.78790	.56376	.74334	.01096	.09856	.02901	.45606	.46884	.08966
#1	.48643	24.826	.50192	.48408	.49793	.48933	24.836	.49317	.48773	.49560	.49535	24.165	25.293
#2	.48671	24.665	.49978	.48204	.50350	.48544	24.576	.49309	.48705	.49540	.49216	24.006	25.261
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49422	23.957	.49803	.49885	24.538	.48839	.48906	24.750	.50535	.49760	24.215	.50019	.49666
Stddev	.00168	.120	.00051	.00001	.112	.00376	.00528	.087	.00092	.00550	.031	.00137	.00256
%RSD	.34089	.50197	.10226	.00179	.45504	.76997	1.0795	.35191	.18193	1.1045	.12981	.27399	.51547
#1	.49541	24.042	.49767	.49884	24.617	.49105	.49279	24.811	.50470	.50149	24.193	.50115	.49847
#2	.49303	23.872	.49839	.49885	24.460	.48573	.48532	24.688	.50600	.49371	24.238	.49922	.49485
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50611	.49231	.49484	.49772
Stddev	.00372	.00031	.00094	.00199
%RSD	.73485	.06319	.18964	.40012
#1	.50874	.49209	.49550	.49631
#2	.50348	.49253	.49418	.49913
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1952.7	3848.4	60586.	7063.4
Stddev	3.3	2.2	7.	33.6
%RSD	.17013	.05724	.01125	.47575
#1	1950.3	3846.8	60581.	7039.7
#2	1955.0	3849.9	60591.	7087.2

Sample Name: CCB Acquired: 11/14/2013 13:19:56 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**-.03469**	**.00170**	**.00033**	**.00002**	**-.00007**	**-.01385**	**-.00010**	**.00011**	**-.00023**	**.00081**	**-.00576**	**-.00460**
Stddev	.00082	.04075	.00078	.00038	.00002	.00002	.00535	.00003	.00004	.00019	.00047	.00095	.00349
%RSD	262.06	117.46	45.681	116.64	160.47	25.094	38.590	29.136	36.352	81.624	58.473	16.571	75.898
#1	-.00027	-.06351	.00225	.00060	.00000	-.00008	-.01007	-.00008	.00014	-.00036	.00114	-.00508	-.00213
#2	.00089	-.00588	.00115	.00006	.00003	-.00006	-.01763	-.00012	.00008	-.00010	.00047	-.00643	-.00706
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00212**	**-.00144**	**.00007**	**.00009**	**.03801**	**.00034**	**-.00090**	**.00120**	**-.00290**	**.00525**	**-.03826**	**-.00177**	**.00008**
Stddev	.00019	.00292	.00005	.00019	.01462	.00052	.00006	.00123	.00029	.00291	.00087	.00016	.00007
%RSD	8.7880	202.48	71.646	210.33	38.476	150.39	6.3809	102.30	9.9472	55.430	2.2671	8.9982	89.395
#1	.00199	-.00351	.00011	-.00005	.02767	.00071	-.00094	.00207	-.00270	.00319	-.03764	-.00165	.00012
#2	.00225	.00062	.00004	.00023	.04835	-.00002	-.00086	.00033	-.00310	.00730	-.03887	-.00188	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00007**	**.00000**	**.00009**	**.00022**
Stddev	.00041	.00041	.00041	.00002
%RSD	602.78	10498.	444.65	11.196
#1	-.00022	-.00028	-.00020	.00020
#2	.00036	.00029	.00038	.00024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2158.6**	**3950.3**	**63613.**	**7085.1**
Stddev	.1	1.0	24.	17.1
%RSD	.00694	.02430	.03708	.24157
#1	2158.7	3949.7	63596.	7073.0
#2	2158.5	3951.0	63629.	7097.2

Sample Name: CCVL Acquired: 11/14/2013 13:22:15 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00257	.17443	.00987	.01947	.00199	.00186	.47780	.00092	.00413	.00345	.01022	.04030	.49735
Stddev	.00054	.03164	.00034	.00010	.00000	.00006	.00031	.00010	.00006	.00038	.00016	.00090	.04028
%RSD	21.059	18.141	3.4475	.52597	.04726	3.3097	.06478	10.393	1.3437	11.096	1.5311	2.2361	8.0999
#1	.00219	.15206	.01011	.01954	.00199	.00181	.47758	.00098	.00416	.00318	.01011	.04094	.52583
#2	.00295	.19681	.00963	.01940	.00199	.00190	.47802	.00085	.00409	.00372	.01033	.03967	.46886
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.02974	.20097	.00315	.00972	1.0077	.00978	.00488	.20074	.01756	.01541	.42868	.00703	.00499
Stddev	.00027	.00769	.00007	.00004	.0011	.00084	.00131	.00449	.00035	.00393	.01009	.00086	.00012
%RSD	.89467	3.8255	2.2790	.41272	.11139	8.6422	26.850	2.2364	1.9886	25.534	2.3531	12.302	2.3985
#1	.02955	.19553	.00310	.00975	1.0069	.01037	.00581	.19757	.01732	.01819	.42155	.00764	.00491
#2	.02993	.20641	.00320	.00970	1.0085	.00918	.00395	.20391	.01781	.01262	.43582	.00642	.00507
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00455	.02009	.00477	.01092
Stddev	.00042	.00027	.00046	.00021
%RSD	9.1236	1.3257	9.6007	1.9327
#1	.00426	.02028	.00510	.01077
#2	.00485	.01990	.00445	.01107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2204.9	4086.9	64818.	7327.9
Stddev	8.4	9.6	322.	6.0
%RSD	.38288	.23403	.49737	.08189
#1	2210.9	4093.6	65046.	7332.2
#2	2198.9	4080.1	64591.	7323.7

Sample Name: 480-49222-c-3-c ms Acquired: 11/14/2013 13:24:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05161**	**10.311**	**.21807**	**.33004**	**.31594**	**.20577**	**72.783**	**.20914**	**.20692**
Stddev	.00047	.052	.00032	.00044	.00048	.00105	.228	.00094	.00060
%RSD	.91066	.50074	.14823	.13439	.15224	.50807	.31335	.44978	.29194
#1	.05195	10.274	.21830	.32972	.31628	.20503	72.621	.20981	.20650
#2	.05128	10.347	.21784	.33035	.31560	.20651	72.944	.20848	.20735
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20878**	**.21250**	**10.036**	**17.624**	**.25521**	**35.462**	**.20679**	**.22054**	**86.735**
Stddev	.00016	.00115	.028	.030	.00005	.018	.00007	.00001	.367
%RSD	.07706	.53888	.28207	.17124	.02149	.04978	.03226	.00332	.42359
#1	.20867	.21331	10.016	17.603	.25524	35.474	.20683	.22053	86.475
#2	.20890	.21169	10.056	17.645	.25517	35.450	.20674	.22054	86.994
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20487**	**.20970**	**82.018**	**.20740**	**.22062**	**15.252**	**.20224**	**.76608**	**.20314**
Stddev	.00006	.00372	.072	.00019	.00133	.079	.00230	.00163	.00103
%RSD	.02801	1.7740	.08835	.09018	.60061	.51521	1.1382	.21300	.50620
#1	.20491	.20707	82.069	.20753	.22156	15.196	.20387	.76493	.20386
#2	.20483	.21233	81.967	.20726	.21968	15.308	.20062	.76724	.20241
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20615**	**.21406**	**.20620**
Stddev	.00105	.00025	.00135
%RSD	.50982	.11701	.65651
#1	.20689	.21424	.20524
#2	.20540	.21388	.20716
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1877.0**	**3719.0**	**58913.**	**7161.9**
Stddev	1.4	4.5	143.	25.7
%RSD	.07204	.12004	.24236	.35875
#1	1878.0	3715.8	58813.	7180.1
#2	1876.1	3722.1	59014.	7143.8

Sample Name: 480-49222-c-3-d msd Acquired: 11/14/2013 13:26:43 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05107**	**10.356**	**.22255**	**.33286**	**.31592**	**.20717**	**73.180**	**.21074**	**.20849**
Stddev	.00122	.040	.00314	.00177	.00064	.00090	.184	.00017	.00103
%RSD	2.3819	.38335	1.4114	.53257	.20207	.43485	.25146	.08036	.49182
#1	.05021	10.328	.22033	.33160	.31547	.20654	73.310	.21086	.20776
#2	.05193	10.384	.22477	.33411	.31638	.20781	73.050	.21062	.20921
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20754**	**.21058**	**10.123**	**17.579**	**.25645**	**35.447**	**.20728**	**.22284**	**86.323**
Stddev	.00225	.00132	.003	.036	.00200	.056	.00086	.00047	1.067
%RSD	1.0841	.62913	.03189	.20399	.78122	.15771	.41328	.21003	1.2362
#1	.20595	.20964	10.121	17.554	.25504	35.408	.20667	.22251	85.568
#2	.20913	.21151	10.126	17.604	.25787	35.487	.20788	.22318	87.077
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20553**	**.21294**	**82.352**	**.21056**	**.21576**	**15.411**	**.20382**	**.76842**	**.20349**
Stddev	.00055	.00058	.170	.00197	.00545	.044	.00094	.00359	.00057
%RSD	.26676	.27224	.20641	.93495	2.5259	.28409	.46280	.46680	.28141
#1	.20515	.21253	82.232	.20917	.21190	15.380	.20449	.76589	.20308
#2	.20592	.21335	82.472	.21195	.21961	15.442	.20315	.77096	.20389
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20307**	**.21561**	**.20640**
Stddev	.00031	.00321	.00124
%RSD	.15111	1.4888	.60149
#1	.20285	.21334	.20552
#2	.20328	.21788	.20728
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1878.5**	**3716.2**	**59338.**	**7152.7**
Stddev	7.1	10.2	148.	44.4
%RSD	.37565	.27379	.24869	.62071
#1	1883.5	3723.4	59443.	7121.3
#2	1873.5	3709.0	59234.	7184.1

Sample Name: 480-49222-c-4-b Acquired: 11/14/2013 13:28:51 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**.00942**	**.00542**	**.12930**	**.08981**	**-.00008**	**63.722**	**.00023**	**-.00004**
Stddev	.00018	.02481	.00099	.00010	.00003	.00008	.235	.00011	.00021
%RSD	79.594	263.31	18.229	.08082	.02961	107.80	.36958	49.577	541.50
#1	.00010	.02697	.00472	.12938	.08983	-.00013	63.556	.00015	-.00018
#2	.00035	-.00812	.00612	.12923	.08979	-.00002	63.889	.00031	.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00141**	**.00199**	**.00216**	**7.3794**	**.05075**	**25.754**	**.00055**	**.00430**	**77.557**
Stddev	.00010	.00028	.00377	.0137	.00095	.019	.00006	.00003	.281
%RSD	7.3104	13.918	174.20	.18504	1.8649	.07229	11.629	.62507	.36229
#1	.00149	.00218	.00483	7.3697	.05008	25.768	.00051	.00428	77.359
#2	.00134	.00179	-.00050	7.3890	.05142	25.741	.00060	.00432	77.756
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00161**	**.00087**	**74.041**	**-.00190**	**.00367**	**5.6735**	**-.00161**	**.55582**	**.00040**
Stddev	.00023	.00222	.036	.00039	.00694	.0025	.00002	.00164	.00011
%RSD	14.535	256.29	.04834	20.520	189.33	.04364	1.0904	.29554	27.179
#1	.00144	-.00070	74.015	-.00218	-.00124	5.6718	-.00160	.55466	.00048
#2	.00177	.00244	74.066	-.00163	.00857	5.6753	-.00162	.55698	.00032
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00077**	**.00333**	**.00159**
Stddev	.00167	.00008	.00010
%RSD	217.39	2.3038	6.0068
#1	-.00195	.00338	.00152
#2	.00041	.00327	.00165
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1915.2**	**3731.4**	**59425.**	**7272.6**
Stddev	5.1	1.0	66.	41.7
%RSD	.26498	.02797	.11112	.57379
#1	1911.6	3732.2	59378.	7302.1
#2	1918.8	3730.7	59472.	7243.1

Sample Name: 480-49222-c-5-b Acquired: 11/14/2013 13:31:06 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00027**	**.02172**	**.00443**	**.12746**	**.08751**	**-.00014**	**63.220**	**.00020**	**.00032**
Stddev	.00010	.01688	.00153	.00016	.00023	.00003	.079	.00010	.00050
%RSD	37.586	77.720	34.427	.12593	.26736	22.247	.12432	47.168	157.55
#1	.00035	.03365	.00551	.12735	.08735	-.00011	63.165	.00013	.00067
#2	.00020	.00978	.00335	.12757	.08768	-.00016	63.276	.00027	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00169**	**.00286**	**.01104**	**7.3107**	**.04992**	**25.347**	**.00064**	**.00398**	**76.821**
Stddev	.00018	.00025	.00317	.0148	.00192	.038	.00001	.00016	.665
%RSD	10.743	8.7983	28.761	.20212	3.8458	.15093	1.9277	4.0737	.86517
#1	.00156	.00304	.00879	7.3002	.05127	25.320	.00063	.00387	76.351
#2	.00181	.00269	.01328	7.3211	.04856	25.374	.00064	.00410	77.291
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00189**	**.00138**	**72.833**	**-.00099**	**.00437**	**5.6312**	**-.00201**	**.54857**	**.00027**
Stddev	.00010	.00415	.440	.00232	.00645	.0003	.00011	.00002	.00015
%RSD	5.2447	300.46	.60475	234.55	147.68	.00576	5.7176	.00391	56.588
#1	.00196	-.00155	72.521	-.00263	-.00019	5.6314	-.00193	.54856	.00016
#2	.00182	.00431	73.144	.00065	.00893	5.6310	-.00209	.54859	.00037
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00155**	**.00282**	**.00214**
Stddev	.00046	.00008	.00022
%RSD	29.475	2.7109	10.274
#1	-.00188	.00276	.00229
#2	-.00123	.00287	.00198
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1914.6**	**3740.8**	**59577.**	**7211.1**
Stddev	1.7	21.4	29.	9.3
%RSD	.08815	.57257	.04887	.12885
#1	1913.5	3755.9	59556.	7217.7
#2	1915.8	3725.6	59597.	7204.6

Sample Name: 480-49222-c-9-b Acquired: 11/14/2013 13:33:21 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**.13108**	**.00692**	**.12622**	**.09220**	**-.00016**	**63.144**	**.00018**	**-.00012**
Stddev	.00000	.02120	.00088	.00070	.00017	.00001	.073	.00026	.00007
%RSD	1.8821	16.171	12.749	.55327	.18108	5.3647	.11590	145.17	55.264
#1	.00013	.14607	.00755	.12672	.09232	-.00016	63.196	.00037	-.00007
#2	.00012	.11609	.00630	.12573	.09208	-.00015	63.093	.00000	-.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00178**	**.00324**	**.12217**	**7.2566**	**.04844**	**25.104**	**.01528**	**.00388**	**76.720**
Stddev	.00016	.00021	.00159	.0210	.00066	.065	.00005	.00007	.283
%RSD	8.7695	6.4452	1.3031	.28934	1.3703	.25875	.34057	1.7883	.36919
#1	.00189	.00338	.12329	7.2715	.04891	25.150	.01524	.00383	76.520
#2	.00167	.00309	.12104	7.2418	.04797	25.059	.01532	.00393	76.920
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00186**	**.00406**	**72.434**	**-.00512**	**.00395**	**5.9122**	**-.00168**	**.54743**	**.00344**
Stddev	.00012	.00315	.014	.00120	.00366	.0150	.00024	.00047	.00002
%RSD	6.5223	77.554	.01901	23.437	92.540	.25416	14.517	.08514	.72001
#1	.00177	.00628	72.444	-.00597	.00137	5.9016	-.00185	.54710	.00346
#2	.00194	.00183	72.425	-.00428	.00654	5.9228	-.00150	.54776	.00342
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00009**	**.00348**	**.00373**
Stddev	.00012	.00079	.00007
%RSD	131.07	22.616	1.7946
#1	-.00017	.00403	.00378
#2	-.00001	.00292	.00369
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1921.3**	**3747.3**	**59870.**	**7200.2**
Stddev	.3	7.3	17.	15.7
%RSD	.01558	.19485	.02775	.21843
#1	1921.5	3752.5	59882.	7211.3
#2	1921.1	3742.2	59858.	7189.1

Sample Name: 480-49222-c-10-b Acquired: 11/14/2013 13:35:35 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00002**	**.00020**	**.00575**	**.12406**	**.08515**	**-.00015**	**61.815**	**-.00007**	**.00031**
Stddev	.00048	.00343	.00098	.00053	.00039	.00009	.062	.00024	.00004
%RSD	2195.4	1706.0	17.020	.42395	.46179	59.488	.09961	358.91	12.766
#1	-.00032	.00263	.00505	.12443	.08543	-.00021	61.859	-.00024	.00028
#2	.00036	-.00222	.00644	.12369	.08487	-.00008	61.772	.00010	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00194**	**.00302**	**.00811**	**7.1862**	**.04918**	**24.758**	**.00046**	**.00387**	**75.377**
Stddev	.00062	.00021	.00034	.0871	.00006	.079	.00004	.00002	.405
%RSD	32.044	6.9347	4.2133	1.2124	.11813	.31754	8.1719	.41866	.53762
#1	.00238	.00317	.00787	7.1245	.04914	24.813	.00044	.00388	75.091
#2	.00150	.00288	.00835	7.2478	.04922	24.702	.00049	.00386	75.664
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00247**	**.00194**	**71.339**	**-.00220**	**.00400**	**5.4808**	**-.00143**	**.53680**	**-.00002**
Stddev	.00027	.00052	.189	.00186	.00196	.0533	.00022	.00060	.00036
%RSD	10.942	26.839	.26433	84.637	48.974	.97307	15.323	.11266	1767.6
#1	.00228	.00231	71.473	-.00351	.00261	5.4431	-.00127	.53637	.00024
#2	.00267	.00157	71.206	-.00088	.00538	5.5185	-.00158	.53723	-.00028
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00017**	**.00293**	**.00360**
Stddev	.00325	.00038	.00031
%RSD	1876.9	12.993	8.5115
#1	-.00213	.00320	.00382
#2	.00247	.00266	.00338
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1923.4**	**3744.3**	**59665.**	**7205.7**
Stddev	2.4	6.1	110.	6.5
%RSD	.12415	.16177	.18492	.09011
#1	1925.1	3740.0	59587.	7201.1
#2	1921.7	3748.6	59743.	7210.3

Sample Name: 480-49222-c-11-b Acquired: 11/14/2013 13:37:50 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00030**	**-.01941**	**.00813**	**.12865**	**.08907**	**-.00014**	**63.805**	**.00011**	**.00029**
Stddev	.00013	.00760	.00018	.00041	.00002	.00000	.133	.00015	.00045
%RSD	44.179	39.156	2.2547	.31811	.02268	1.2262	.20877	132.38	157.41
#1	.00040	-.02478	.00826	.12894	.08906	-.00014	63.710	.00001	.00060
#2	.00021	-.01403	.00800	.12837	.08908	-.00014	63.899	.00022	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00112**	**.00277**	**.00009**	**7.4009**	**.04941**	**25.532**	**.00031**	**.00364**	**77.653**
Stddev	.00008	.00004	.00582	.0161	.00075	.020	.00007	.00015	.394
%RSD	6.9463	1.5561	6695.2	.21808	1.5149	.07678	21.953	4.0140	.50683
#1	.00106	.00274	-.00403	7.3895	.04888	25.518	.00036	.00374	77.375
#2	.00117	.00281	.00420	7.4123	.04994	25.546	.00026	.00353	77.931
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00254**	**.00145**	**73.637**	**-.00176**	**.00415**	**5.6285**	**-.00176**	**.55121**	**.00029**
Stddev	.00079	.00102	.122	.00044	.00507	.0026	.00113	.00193	.00029
%RSD	31.206	70.525	.16620	25.237	122.18	.04633	64.263	.35082	101.17
#1	.00198	.00072	73.724	-.00207	.00057	5.6266	-.00256	.54984	.00008
#2	.00310	.00217	73.551	-.00145	.00774	5.6303	-.00096	.55257	.00050
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00117**	**.00307**	**.00679**
Stddev	.00069	.00015	.00095
%RSD	58.769	4.8605	14.008
#1	-.00165	.00318	.00746
#2	-.00068	.00297	.00611
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1925.2**	**3744.7**	**59839.**	**7221.3**
Stddev	4.5	2.1	69.	9.7
%RSD	.23383	.05493	.11613	.13396
#1	1928.4	3746.1	59790.	7214.5
#2	1922.0	3743.2	59888.	7228.2

Sample Name: 480-49222-c-12-b Acquired: 11/14/2013 13:40:05 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**-.01828**	**.00431**	**.12427**	**.08464**	**-.00010**	**61.796**	**.00019**	**-.00001**
Stddev	.0006	.01172	.00115	.00065	.00023	.00003	.272	.00008	.00012
%RSD	21281.	64.122	26.768	.52301	.26596	30.729	.44002	43.329	1338.9
#1	.00040	-.00999	.00513	.12381	.08480	-.00013	61.988	.00013	-.00010
#2	-.00040	-.02657	.00350	.12473	.08448	-.00008	61.604	.00024	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00122**	**.00281**	**.00206**	**7.2558**	**.04966**	**24.615**	**.00026**	**.00390**	**75.953**
Stddev	.00040	.00024	.00145	.0478	.00176	.071	.00006	.00030	.189
%RSD	32.991	8.5624	70.656	.65918	3.5444	.28711	21.154	7.5935	.24855
#1	.00151	.00264	.00103	7.2219	.05090	24.665	.00022	.00369	75.820
#2	.00094	.00298	.00309	7.2896	.04842	24.565	.00030	.00410	76.087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00202**	**.00280**	**71.608**	**-.00258**	**.00368**	**5.5343**	**-.00200**	**.53928**	**.00008**
Stddev	.00011	.00271	.039	.00282	.00167	.0254	.00087	.00008	.00010
%RSD	5.5558	96.952	.05451	109.06	45.269	.45813	43.458	.01545	122.92
#1	.00194	.00088	71.635	-.00458	.00486	5.5522	-.00139	.53934	.00016
#2	.00210	.00471	71.580	-.00059	.00250	5.5163	-.00262	.53922	.00001
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00088**	**.00273**	**.00118**
Stddev	.00046	.00031	.00025
%RSD	52.307	11.203	21.094
#1	-.00056	.00295	.00101
#2	-.00121	.00251	.00136
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1932.1**	**3745.3**	**60058.**	**7199.9**
Stddev	1.8	2.2	146.	7.8
%RSD	.09517	.05846	.24332	.10884
#1	1933.4	3743.7	59954.	7194.4
#2	1930.8	3746.8	60161.	7205.4

Sample Name: blank Acquired: 11/14/2013 13:42:19 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00055**	**-.03047**	**.00229**	**-.00091**	**.00001**	**-.00017**	**-.01083**	**.00001**	**.00024**
Stddev	.00089	.00543	.00170	.00045	.00000	.00005	.00501	.00003	.00034
%RSD	162.49	17.830	74.579	49.200	21.441	27.765	46.261	490.38	142.32
#1	.00008	-.03432	.00349	-.00059	.00001	-.00014	-.01437	.00002	.00047
#2	-.00118	-.02663	.00108	-.00123	.00001	-.00021	-.00729	-.00001	.00000
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.00078**	**-.00245**	**.01567**	**.00128**	**-.00081**	**.00004**	**-.00033**	**.04049**
Stddev	.00020	.00016	.00447	.00981	.00076	.00007	.00010	.00024	.00586
%RSD	249.32	20.121	182.55	62.607	59.115	8.9402	250.05	74.501	14.461
#1	.00006	.00089	.00071	.02261	.00182	-.00076	.00011	-.00050	.04464
#2	-.00022	.00067	-.00561	.00874	.00075	-.00086	-.00003	-.00016	.03635
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00045**	**-.00007**	**.00277**	**-.00267**	**.00582**	**-.04463**	**-.00183**	**.00005**	**-.00034**
Stddev	.00048	.00020	.00203	.00315	.00077	.00678	.00092	.00002	.00016
%RSD	105.56	283.30	73.463	117.75	13.311	15.181	50.236	33.335	46.759
#1	.00011	-.00022	.00421	-.00045	.00527	-.03984	-.00118	.00004	-.00022
#2	.00079	.00007	.00133	-.00490	.00637	-.04942	-.00247	.00006	-.00045
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00055**	**-.00032**	**.00090**
Stddev	.00013	.00011	.00011
%RSD	23.042	33.497	11.743
#1	.00064	-.00025	.00083
#2	.00046	-.00040	.00098
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2153.6**	**3939.9**	**63292.**	**7109.4**
Stddev	1.7	5.1	146.	7.0
%RSD	.07947	.12850	.23094	.09851
#1	2154.8	3943.4	63395.	7104.4
#2	2152.4	3936.3	63188.	7114.3

Sample Name: CCV Acquired: 11/14/2013 13:44:40 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48527	24.767	.49786	.48320	.50622	.48734	24.684	.49183	.48455	.49219	.49460	24.163	25.466
Stddev	.00217	.058	.00636	.00156	.00176	.00186	.074	.00018	.00158	.00000	.00145	.072	.157
%RSD	.44624	.23263	1.2765	.32261	.34726	.38138	.30086	.03587	.32698	.00045	.29307	.29880	.61835
#1	.48680	24.808	.49337	.48210	.50747	.48865	24.737	.49195	.48567	.49219	.49562	24.214	25.578
#2	.48373	24.726	.50236	.48430	.50498	.48602	24.632	.49170	.48343	.49219	.49357	24.112	25.355
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49408	23.821	.49725	.49893	24.652	.48474	.48356	24.801	.51000	.49478	24.247	.49622	.49952
Stddev	.00172	.062	.00176	.00189	.056	.00106	.00095	.092	.00081	.00793	.160	.00087	.00112
%RSD	.34899	.26043	.35337	.37908	.22659	.21784	.19631	.37039	.15856	1.6036	.66005	.17531	.22342
#1	.49530	23.865	.49849	.50027	24.692	.48548	.48289	24.866	.50943	.48917	24.134	.49684	.50031
#2	.49286	23.777	.49600	.49760	24.613	.48399	.48423	24.736	.51057	.50039	24.360	.49561	.49873
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50530	.49168	.49084	.49389
Stddev	.00033	.00326	.00036	.00234
%RSD	.06481	.66254	.07416	.47287
#1	.50506	.48937	.49110	.49554
#2	.50553	.49398	.49058	.49224
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1973.2	3870.9	61067.	7114.1
Stddev	2.2	3.1	110.	31.4
%RSD	.11152	.07896	.18025	.44085
#1	1974.8	3873.1	60989.	7091.9
#2	1971.7	3868.8	61145.	7136.3

Sample Name: CCB Acquired: 11/14/2013 13:46:46 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00007**	**.00929**	**.00083**	**-.00016**	**.00000**	**.00009**	**-.00212**	**.00001**	**.00013**	**-.00035**	**.00065**	**.00484**	**.04975**
Stddev	.00051	.05442	.00165	.00039	.00001	.00026	.01061	.00000	.00010	.00056	.00009	.01311	.03970
%RSD	685.29	585.57	198.09	245.98	728.87	295.21	500.63	13.609	74.661	158.76	13.917	271.02	79.789
#1	.00028	-.02919	-.00033	.00012	.00001	-.00010	-.00962	.00001	.00006	-.00075	.00071	-.00443	.02168
#2	-.00043	.04778	.00200	-.00044	-.00001	.00028	.00538	.00001	.00019	.00004	.00058	.01410	.07782
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00088**	**.00332**	**-.00004**	**.00023**	**.04391**	**-.00010**	**.00112**	**.00098**	**-.00194**	**.00514**	**-.01501**	**-.00167**	**.00037**
Stddev	.00048	.00174	.00008	.00029	.00891	.00007	.00050	.00039	.00240	.00065	.01466	.00051	.00028
%RSD	54.642	52.487	209.91	123.12	20.295	76.382	45.030	39.928	123.83	12.691	97.722	30.403	74.709
#1	-.00123	.00208	.00002	.00044	.03761	-.00015	.00148	.00126	-.00024	.00468	-.02537	-.00131	.00018
#2	-.00054	.00455	-.00009	.00003	.05021	-.00004	.00076	.00071	-.00364	.00560	-.00464	-.00203	.00057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00022**	**-.00078**	**.00007**	**.00015**
Stddev	.00011	.00112	.00023	.00027
%RSD	51.872	142.47	338.02	173.46
#1	-.00029	.00001	-.00009	-.00003
#2	-.00014	-.00158	.00023	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2177.5**	**3974.9**	**63679.**	**7108.8**
Stddev	.3	2.2	14.	5.3
%RSD	.01379	.05585	.02145	.07392
#1	2177.2	3976.5	63689.	7112.6
#2	2177.7	3973.4	63670.	7105.1

Sample Name: CCVL Acquired: 11/14/2013 13:49:07 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00276**	**.18666**	**.01124**	**.01926**	**.00203**	**.00187**	**.48342**	**.00072**	**.00371**	**.00367**	**.01068**	**.04169**
Stddev	.00007	.01709	.00182	.00016	.00001	.00010	.00052	.00013	.00002	.00027	.00037	.00190
%RSD	2.4845	9.1581	16.152	.81332	.61008	5.1026	.10694	17.694	.60167	7.4331	3.4894	4.5471
#1	.00281	.19874	.00995	.01938	.00202	.00180	.48378	.00081	.00370	.00386	.01094	.04303
#2	.00271	.17457	.01252	.01915	.00204	.00194	.48305	.00063	.00373	.00348	.01042	.04035
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50848**	**.03216**	**.19654**	**.00320**	**.00956**	**1.0067**	**.00947**	W **.00343**	**.19969**	**.01832**	**.01788**	**.42590**
Stddev	.03401	.00077	.00384	.00004	.00017	.0055	.00012	.00137	.00324	.00018	.00222	.00839
%RSD	6.6886	2.3786	1.9533	1.2023	1.8173	.54545	1.2451	39.895	1.6246	.95975	12.440	1.9691
#1	.48443	.03271	.19383	.00323	.00944	1.0028	.00955	.00246	.19740	.01820	.01630	.43183
#2	.53253	.03162	.19926	.00317	.00969	1.0106	.00938	.00440	.20199	.01844	.01945	.41997
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00804**	**.00487**	**.00449**	**.01983**	**.00487**	**.01012**
Stddev	.00017	.00003	.00041	.00078	.00038	.00091
%RSD	2.0556	.71102	9.0985	3.9392	7.7416	8.9630
#1	.00793	.00484	.00478	.01927	.00461	.01076
#2	.00816	.00489	.00420	.02038	.00514	.00948
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2216.0**	**4083.8**	**65226.**	**7316.9**
Stddev	4.0	20.2	396.	41.1
%RSD	.18038	.49389	.60730	.56222
#1	2218.8	4098.0	65506.	7346.0
#2	2213.2	4069.5	64946.	7287.8

Sample Name: 480-48473-b-17-a Acquired: 11/14/2013 13:51:24 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02627**	**357.75**	**.14333**	**.74006**	**1.1500**	**.00022**	**302.97**	**.03761**	**2.5986**
Stddev	.00070	1.66	.01017	.00297	.0108	.00026	.83	.00018	.0056
%RSD	2.6510	.46289	7.0964	.40103	.93712	117.38	.27284	.48643	.21659
#1	.02578	358.92	.15053	.73796	1.1576	.00004	303.55	.03774	2.6026
#2	.02676	356.58	.13614	.74216	1.1424	.00041	302.38	.03748	2.5947
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576-2	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**13.095**	**17.481**	F **2001.8**	**4.3535**	**.08243**	**36.131**	**21.844**	**2.5246**	**1.4920**
Stddev	.015	.013	7.3	.0559	.00024	.035	.007	.0060	.0072
%RSD	.11115	.07566	.36574	1.2836	.28591	.09792	.03180	.23583	.48128
#1	13.105	17.490	2006.9	4.3140	.08260	36.106	21.849	2.5204	1.4971
#2	13.084	17.472	1996.6	4.3930	.08226	36.156	21.839	2.5288	1.4869
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			800.00						
Low Limit			-.05000						

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F **28.904**	**5.5647**	**13.671**	F **-.02852**	**.01829**	**25.916**	**1.5349**	**1.0902**	**2.2860**
Stddev	.029	.0131	.040	.00060	.00658	.438	.0018	.0076	.0013
%RSD	.10015	.23467	.29609	2.0961	35.963	1.6902	.11417	.69822	.05609
#1	28.925	5.5739	13.643	-.02809	.02294	26.226	1.5337	1.0956	2.2869
#2	28.884	5.5555	13.700	-.02894	.01364	25.607	1.5362	1.0848	2.2851
Check ?	Chk Fail	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	25.000			50.000					
Low Limit	-.01000			-.02000					

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.01892**	**.36345**	**8.3926**
Stddev	.00239	.00083	.0196
%RSD	12.612	.22872	.23309
#1	-.01723	.36404	8.4064
#2	-.02060	.36287	8.3788
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1482.2**	**3400.1**	**54882.**	**7041.9**
Stddev	3.4	2.4	267.	58.7
%RSD	.23058	.07004	.48712	.83292
#1	1479.8	3401.7	54693.	7000.4
#2	1484.6	3398.4	55071.	7083.3

Sample Name: 480-48473-b-17-a@5 Acquired: 11/14/2013 13:53:44 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00472**	**72.774**	**.02602**	**.15699**	**.22991**	**.00000**	**64.146**	**.00781**	**.50432**
Stddev	.00083	.066	.00058	.00061	.00011	.00006	.049	.00003	.00101
%RSD	17.512	.09013	2.2351	.38927	.04660	2243.2	.07617	.37133	.20007
#1	.00530	72.727	.02643	.15742	.22984	.00004	64.180	.00783	.50503
#2	.00413	72.820	.02561	.15656	.22999	-.00004	64.111	.00779	.50361
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.8226**	**3.2657**	**423.88**	**.90556**	**.01738**	**8.1425**	**4.2171**	**.53142**	**.32139**
Stddev	.0073	.0041	.08	.03009	.00101	.0022	.0031	.00050	.00396
%RSD	.25672	.12454	.01977	3.3228	5.8296	.02761	.07389	.09375	1.2313
#1	2.8175	3.2686	423.82	.92684	.01667	8.1441	4.2149	.53177	.32419
#2	2.8278	3.2629	423.94	.88428	.01810	8.1410	4.2193	.53107	.31859
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**5.7124**	**1.0953**	**2.8826**	**-.00830**	**.00225**	**5.2094**	**.29480**	**.22515**	**.47754**
Stddev	.0191	.0017	.0010	.00572	.00051	.0300	.00384	.00039	.00146
%RSD	.33467	.15120	.03427	68.929	22.617	.57651	1.3029	.17360	.30621
#1	5.6988	1.0965	2.8819	-.00426	.00189	5.2306	.29209	.22487	.47858
#2	5.7259	1.0941	2.8833	-.01235	.00261	5.1881	.29752	.22542	.47651
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00213**	**.07554**	**1.9156**
Stddev	.00297	.00010	.0022
%RSD	139.36	.13157	.11301
#1	-.00423	.07547	1.9140
#2	-.00003	.07561	1.9171
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1895.0**	**3787.4**	**60623.**	**7152.5**
Stddev	5.1	11.1	73.	4.6
%RSD	.26823	.29210	.12037	.06478
#1	1898.6	3795.2	60572.	7149.2
#2	1891.4	3779.6	60675.	7155.8

Sample Name: 480-48473-b-17-a@10 Acquired: 11/14/2013 13:55:52 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00266	36.435	.01606	.08008	.11522	.00001	32.125	.00397	.25037
Stddev	.00092	.059	.00360	.00011	.00008	.00008	.137	.00007	.00033
%RSD	34.499	.16298	22.396	.14109	.06551	620.65	.42589	1.6572	.13002
#1	.00331	36.477	.01352	.08016	.11517	-.00004	32.222	.00392	.25014
#2	.00201	36.393	.01860	.08000	.11528	.00007	32.028	.00402	.25061
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.4460	1.6147	212.71	.45331	.00986	4.2199	2.1533	.26792	.18448
Stddev	.0012	.0003	.86	.04626	.00045	.0049	.0002	.00115	.00023
%RSD	.08324	.01881	.40579	10.204	4.5434	.11553	.00761	.42868	.12575
#1	1.4451	1.6145	212.10	.42060	.00955	4.2165	2.1532	.26874	.18464
#2	1.4468	1.6149	213.32	.48602	.01018	4.2234	2.1534	.26711	.18431
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.8871	.54902	1.4348	-.00572	.00416	2.4929	.14669	.11270	.23909
Stddev	.0060	.00194	.0023	.00192	.00320	.0378	.00132	.00004	.00099
%RSD	.20896	.35311	.16256	33.473	76.939	1.5146	.90264	.03418	.41368
#1	2.8829	.54765	1.4332	-.00437	.00189	2.5196	.14575	.11273	.23839
#2	2.8914	.55039	1.4365	-.00708	.00642	2.4662	.14763	.11268	.23979
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	-.00028	.03788	.98398
Stddev	.00155	.00008	.00333
%RSD	559.91	.21267	.33830
#1	-.00137	.03782	.98163
#2	.00082	.03793	.98634
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1982.5	3867.0	61415.	7215.1
Stddev	2.5	5.5	161.	14.1
%RSD	.12717	.14263	.26195	.19566
#1	1984.3	3863.1	61301.	7205.1
#2	1980.7	3870.9	61529.	7225.1

Sample Name: 480-48473-b-17-a@20 Acquired: 11/14/2013 13:58:01 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00136**	**18.396**	**.00753**	**.03976**	**.05803**	**-.00009**	**16.490**	**.00212**	**.12514**
Stddev	.00028	.239	.00213	.00024	.00006	.00000	.087	.00005	.00019
%RSD	20.635	1.2979	28.349	.59998	.10196	.86033	.52558	2.5852	.15407
#1	.00156	18.565	.00904	.03959	.05799	-.00009	16.551	.00216	.12528
#2	.00116	18.227	.00602	.03993	.05807	-.00008	16.429	.00208	.12501
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.72816**	**.81062**	**108.13**	**.21488**	**.00540**	**2.1440**	**1.0798**	**.13624**	**.10863**
Stddev	.00586	.00157	.60	.02477	.00055	.0150	.0001	.00013	.00971
%RSD	.80427	.19426	.55402	11.527	10.115	.70118	.00755	.09234	8.9397
#1	.72402	.80951	108.55	.23240	.00501	2.1546	1.0797	.13633	.10176
#2	.73230	.81174	107.70	.19737	.00579	2.1333	1.0798	.13615	.11550
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.4446**	**.27882**	**.74272**	**-.00246**	**.00368**	**1.2033**	**.07208**	**.05703**	**.12060**
Stddev	.0011	.00086	.00006	.00030	.00192	.0249	.00007	.00030	.00041
%RSD	.07697	.30863	.00764	12.176	52.348	2.0661	.10303	.52482	.34374
#1	1.4438	.27821	.74276	-.00267	.00232	1.2208	.07203	.05725	.12089
#2	1.4454	.27942	.74268	-.00224	.00504	1.1857	.07213	.05682	.12031
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00192**	**.01903**	**.49713**
Stddev	.00182	.00002	.00298
%RSD	94.759	.09367	.60041
#1	-.00321	.01905	.49924
#2	-.00063	.01902	.49502
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2050.9**	**3907.0**	**62488.**	**7178.9**
Stddev	1.8	10.2	28.	54.9
%RSD	.08950	.26186	.04509	.76442
#1	2052.2	3914.3	62508.	7140.1
#2	2049.6	3899.8	62468.	7217.7

Sample Name: 480-48473-b-18-a@5 Acquired: 11/14/2013 14:00:13 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00268**	**13.799**	**.02742**	**.04457**	**.19975**	**-.00130**	**161.84**	**.00635**	**4.3473**
Stddev	.00009	.071	.00201	.00015	.00004	.00003	.17	.00025	.0018
%RSD	3.4238	.51225	7.3182	.32904	.02198	1.9509	.10600	3.8714	.04072
#1	.00274	13.849	.02883	.04468	.19971	-.00128	161.96	.00618	4.3485
#2	.00261	13.749	.02600	.04447	.19978	-.00132	161.72	.00653	4.3460
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**8.0246**	**1.8046**	**116.69**	**1.0347**	**.02437**	**12.246**	**1.2812**	**1.9671**	**.28308**
Stddev	.0104	.0066	.14	.0084	.00053	.022	.0036	.0039	.01139
%RSD	.12905	.36878	.11577	.81023	2.1716	.17980	.27957	.20044	4.0235
#1	8.0320	1.7999	116.78	1.0287	.02399	12.231	1.2837	1.9699	.27503
#2	8.0173	1.8093	116.59	1.0406	.02474	12.262	1.2787	1.9643	.29114
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	F **32.150**	**.83897**	**1.7186**	F **-.04982**	**.00945**	**1.5923**	**.14740**	**.26851**	**1.4321**
Stddev	.047	.00108	.0032	.00058	.00619	.0338	.00005	.00080	.0027
%RSD	.14501	.12908	.18627	1.1678	65.554	2.1214	.03611	.29848	.18694
#1	32.183	.83974	1.7163	-.05023	.00507	1.6162	.14744	.26794	1.4302
#2	32.117	.83821	1.7208	-.04941	.01383	1.5684	.14736	.26908	1.4340
Check ?	Chk Fail	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit	25.000			50.000					
Low Limit	-.01000			-.02000					

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00576**	**.13123**	**1.3831**
Stddev	.00149	.00090	.0004
%RSD	25.887	.68529	.03035
#1	.00470	.13186	1.3834
#2	.00681	.13059	1.3828
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1835.7**	**3754.0**	**60285.**	**7106.7**
Stddev	2.7	8.4	21.	27.8
%RSD	.14821	.22243	.03515	.39141
#1	1833.8	3748.1	60270.	7087.0
#2	1837.6	3759.9	60300.	7126.4

Sample Name: 480-48473-b-18-a@20 Acquired: 11/14/2013 14:02:22 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00093**	**3.3904**	**.00873**	**.01041**	**.05012**	**-.00041**	**40.237**	**.00135**	**1.0437**
Stddev	.00094	.0352	.00067	.00056	.00009	.00007	.082	.00018	.0030
%RSD	101.05	1.0397	7.6704	5.3818	.17194	16.360	.20309	13.150	.28491
#1	.00159	3.4153	.00920	.01081	.05006	-.00046	40.179	.00148	1.0416
#2	.00027	3.3654	.00826	.01002	.05018	-.00036	40.295	.00123	1.0458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.0641**	**.44933**	**29.520**	**.26347**	**.00749**	**3.1034**	**.32931**	**.49745**	**.09887**
Stddev	.0059	.00149	.002	.01836	.00063	.0042	.00189	.00074	.00873
%RSD	.28633	.33088	.00627	6.9679	8.3560	.13478	.57396	.14954	8.8316
#1	2.0683	.44828	29.521	.25049	.00705	3.1005	.33065	.49798	.10504
#2	2.0600	.45038	29.518	.27645	.00793	3.1064	.32798	.49693	.09269
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**7.7389**	**.20006**	**.42497**	**-.01518**	**.00310**	**.34559**	**.03407**	**.06712**	**.36229**
Stddev	.0002	.00323	.00442	.00281	.00579	.00666	.00005	.00016	.00061
%RSD	.00230	1.6150	1.0412	18.485	186.92	1.9273	.15942	.23470	.16874
#1	7.7388	.20234	.42184	-.01716	.00719	.34088	.03403	.06701	.36273
#2	7.7390	.19777	.42810	-.01319	-.00100	.35030	.03410	.06723	.36186
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00072**	**.03255**	**.35553**
Stddev	.00164	.00051	.00227
%RSD	227.49	1.5614	.63823
#1	.00188	.03219	.35713
#2	-.00044	.03290	.35392
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2055.1**	**3904.7**	**62705.**	**7126.5**
Stddev	2.4	3.6	133.	5.0
%RSD	.11767	.09190	.21248	.07025
#1	2056.8	3902.2	62611.	7130.1
#2	2053.4	3907.3	62800.	7123.0

Sample Name: 480-48473-b-18-a@50 Acquired: 11/14/2013 14:04:31 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**1.3219**	**.00410**	**.00305**	**.01984**	**-.00023**	**15.946**	**.00068**	**.40480**
Stddev	.00004	.0005	.00082	.00089	.00006	.00000	.009	.00010	.00132
%RSD	15.990	.03939	19.936	29.143	.32114	.46585	.05711	14.733	.32583
#1	-.00023	1.3215	.00352	.00242	.01989	-.00023	15.940	.00075	.40387
#2	-.00029	1.3222	.00467	.00368	.01980	-.00023	15.953	.00061	.40573
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.81459**	**.17477**	**11.688**	**.11059**	**.00329**	**1.2195**	**.13152**	**.19591**	**.04287**
Stddev	.00378	.00034	.026	.02243	.00140	.0006	.00031	.00060	.00190
%RSD	.46460	.19310	.21832	20.286	42.689	.05316	.23218	.30656	4.4264
#1	.81192	.17501	11.670	.12645	.00428	1.2200	.13174	.19633	.04153
#2	.81727	.17453	11.706	.09473	.00229	1.2190	.13130	.19548	.04421
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**3.0485**	**.07646**	**.16325**	**-.01040**	**.00198**	**.09940**	**.01206**	**.02632**	**.14211**
Stddev	.0152	.00232	.00033	.00136	.00209	.00463	.00073	.00000	.00061
%RSD	.49883	3.0310	.20222	13.106	105.39	4.6596	6.0896	.01255	.42841
#1	3.0377	.07482	.16302	-.00943	.00051	.09612	.01154	.02632	.14168
#2	3.0592	.07810	.16349	-.01136	.00346	.10267	.01258	.02632	.14254
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00113**	**.01263**	**.14123**
Stddev	.00028	.00050	.00019
%RSD	24.500	3.9815	.13648
#1	.00093	.01299	.14137
#2	.00132	.01228	.14110
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2119.4**	**3949.2**	**63011.**	**7151.6**
Stddev	3.2	6.7	35.	6.1
%RSD	.15039	.16862	.05554	.08472
#1	2121.6	3944.5	63036.	7155.9
#2	2117.1	3953.9	62986.	7147.4

Sample Name: 480-48473-b-18-a@100 Acquired: 11/14/2013 14:06:44 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	**.70219**	**.00349**	**.00100**	**.01071**	**-.00019**	**8.4739**	**.00035**	**.21301**
Stddev	.00005	.03709	.00012	.00006	.00004	.00002	.0103	.00013	.00034
%RSD	12.837	5.2817	3.5760	6.1114	.37732	8.9568	.12195	38.198	.15977
#1	.00038	.67597	.00358	.00105	.01068	-.00021	8.4812	.00026	.21325
#2	.00045	.72842	.00340	.00096	.01074	-.00018	8.4666	.00045	.21277
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.43500**	**.09324**	**6.1729**	**.03024**	**.00345**	**.65192**	**.06998**	**.10389**	**.03698**
Stddev	.00101	.00025	.0188	.01828	.00040	.00015	.00000	.00007	.01147
%RSD	.23288	.26728	.30518	60.441	11.524	.02299	.00242	.06460	31.022
#1	.43572	.09306	6.1863	.04317	.00373	.65182	.06998	.10384	.04510
#2	.43429	.09342	6.1596	.01732	.00316	.65203	.06998	.10393	.02887
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.6065**	**.03986**	**.08640**	**-.00488**	**.00742**	**.05645**	**.00579**	**.01389**	**.07609**
Stddev	.0014	.00009	.00277	.00031	.00157	.00654	.00012	.00019	.00027
%RSD	.08764	.22497	3.2071	6.3572	21.213	11.578	2.1382	1.3555	.35064
#1	1.6075	.03980	.08444	-.00509	.00853	.05183	.00588	.01402	.07590
#2	1.6055	.03993	.08835	-.00466	.00630	.06107	.00570	.01376	.07628
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00039**	**.00678**	**.07559**
Stddev	.00146	.00020	.00007
%RSD	374.11	3.0226	.09596
#1	.00142	.00692	.07564
#2	-.00064	.00664	.07553
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2152.3**	**3971.4**	**63522.**	**7151.6**
Stddev	2.9	1.8	120.	10.7
%RSD	.13587	.04430	.18838	.14997
#1	2154.3	3972.6	63438.	7144.0
#2	2150.2	3970.1	63607.	7159.2

Sample Name: 480-48473-b-18-a@200 Acquired: 11/14/2013 14:08:57 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**.33878**	**.00222**	**-.00089**	**.00520**	**-.00024**	**4.0794**	**.00021**	**.10290**
Stddev	.00016	.00171	.00228	.00020	.00001	.00001	.0015	.00022	.00060
%RSD	103.80	.50558	102.74	22.181	.10051	4.4217	.03592	106.98	.58053
#1	.00026	.33999	.00383	-.00103	.00520	-.00025	4.0783	.00037	.10248
#2	.00004	.33757	.00061	-.00075	.00519	-.00023	4.0804	.00005	.10333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20742**	**.04604**	**2.9857**	**.06790**	**.00166**	**.30901**	**.03358**	**.05044**	**.03243**
Stddev	.00193	.00008	.0027	.00669	.00120	.00007	.00006	.00041	.01247
%RSD	.93219	.18014	.08986	9.8561	71.883	.02292	.17418	.80840	38.463
#1	.20879	.04610	2.9839	.06316	.00082	.30906	.03354	.05073	.02361
#2	.20605	.04598	2.9876	.07263	.00251	.30896	.03363	.05015	.04125
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.77462**	**.01868**	**.04194**	**-.00211**	**.00247**	**-.01787**	**.00159**	**.00681**	**.03641**
Stddev	.00089	.00104	.00415	.00125	.00272	.00330	.00063	.00003	.00008
%RSD	.11470	5.5799	9.8919	59.428	110.38	18.446	39.808	.38094	.21318
#1	.77525	.01942	.03901	-.00299	.00054	-.01554	.00204	.00679	.03646
#2	.77399	.01794	.04488	-.00122	.00439	-.02020	.00115	.00683	.03635
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00075**	**.00335**	**.03605**
Stddev	.00091	.00026	.00025
%RSD	120.65	7.8836	.69673
#1	.00011	.00317	.03623
#2	.00140	.00354	.03588
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2168.8**	**3974.6**	**63973.**	**7220.7**
Stddev	4.4	7.2	3.	28.8
%RSD	.20501	.18184	.00498	.39825
#1	2165.7	3969.5	63971.	7200.4
#2	2172.0	3979.7	63975.	7241.1

Sample Name: CCV Acquired: 11/14/2013 14:11:17 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48275	24.649	.50587	.48439	.50606	.48480	24.643	.49684	.48622	.49240	.50119	24.153	25.748
Stddev	.00171	.012	.00381	.00071	.00673	.00133	.066	.00033	.00030	.00151	.00086	.060	.080
%RSD	.35387	.04954	.75244	.14646	1.3302	.27537	.26600	.06610	.06219	.30726	.17073	.24943	.31189
#1	.48396	24.640	.50318	.48388	.51082	.48574	24.689	.49660	.48644	.49347	.50180	24.195	25.804
#2	.48154	24.658	.50857	.48489	.50130	.48385	24.596	.49707	.48601	.49133	.50059	24.110	25.691
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50017	23.740	.49898	.50592	24.706	.48125	.46822	25.139	.51421	.50268	24.235	.49975	.50179
Stddev	.00105	.026	.00140	.00116	.037	.00102	.00061	.082	.00207	.00087	.107	.00234	.00045
%RSD	.21062	.11082	.28023	.22972	.14918	.21214	.13052	.32696	.40211	.17276	.44080	.46724	.09059
#1	.50092	23.722	.49799	.50509	24.732	.48198	.46865	25.197	.51275	.50207	24.159	.50140	.50211
#2	.49943	23.759	.49997	.50674	24.680	.48053	.46778	25.081	.51568	.50330	24.310	.49810	.50147
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50967	.49306	.49455	.48800
Stddev	.00113	.00178	.00028	.00267
%RSD	.22229	.36071	.05763	.54650
#1	.50887	.49180	.49435	.48612
#2	.51048	.49432	.49475	.48989
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1982.8	3865.4	61604.	7182.7
Stddev	3.0	1.4	114.	3.1
%RSD	.14933	.03575	.18443	.04289
#1	1980.7	3866.4	61524.	7180.5
#2	1984.9	3864.4	61685.	7184.8

Sample Name: CCB Acquired: 11/14/2013 14:13:25 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00059**	**-.02131**	**.00180**	**-.00129**	**-.00001**	**-.00013**	**-.01178**	**.00010**	**-.00003**	**-.00004**	**.00090**	**-.00216**	**.07079**
Stddev	.00036	.01906	.00207	.00005	.00002	.00005	.00330	.00018	.00006	.00015	.00001	.00193	.01094
%RSD	60.035	89.441	115.26	4.0405	283.26	36.443	28.047	176.63	213.37	344.05	.69997	89.317	15.449
#1	.00034	-.00783	.00326	-.00133	.00001	-.00016	-.00944	-.00003	.00001	-.00015	.00091	-.00352	.07852
#2	.00085	-.03479	.00033	-.00125	-.00002	-.00010	-.01412	.00023	-.00007	.00006	.00090	-.00079	.06306
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00248**	**.00182**	**.00015**	**.00025**	**.03167**	**.00018**	**.00044**	**-.00025**	**-.00132**	**.00349**	**-.01093**	**-.00200**	**.00001**
Stddev	.00013	.00351	.00000	.00007	.00386	.00009	.00074	.00090	.00105	.00053	.00517	.00014	.00008
%RSD	5.2578	193.15	3.0778	27.713	12.185	48.487	168.92	357.37	79.672	15.279	47.302	7.2105	875.53
#1	.00257	-.00066	.00014	.00029	.03439	.00024	-.00009	-.00089	-.00207	.00386	-.01458	-.00210	-.00004
#2	.00239	.00429	.00015	.00020	.02894	.00012	.00096	.00038	-.00058	.00311	-.00727	-.00190	.00006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00015**	**-.00053**	**.00011**	**.00031**
Stddev	.00054	.00086	.00007	.00079
%RSD	361.84	163.11	65.162	253.47
#1	.00053	-.00113	.00006	.00087
#2	-.00023	.00008	.00016	-.00025
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2181.8**	**3974.4**	**63809.**	**7112.8**
Stddev	.8	.4	92.	27.4
%RSD	.03823	.00887	.14452	.38586
#1	2181.2	3974.1	63744.	7132.2
#2	2182.4	3974.6	63874.	7093.4

Sample Name: CCVL Acquired: 11/14/2013 14:15:46 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00312**	**.18958**	**.01014**	**.01871**	**.00200**	**.00182**	**.48024**	**.00097**	**.00415**	**.00355**	**.01014**	**.04273**	**.49980**
Stddev	.00032	.02761	.00477	.00034	.00000	.00003	.00387	.00005	.00006	.00000	.00035	.00139	.01872
%RSD	10.296	14.565	47.086	1.8061	.17921	1.6379	.80559	5.0403	1.5180	.08765	3.4495	3.2478	3.7457
#1	.00290	.17005	.00676	.01895	.00200	.00180	.48297	.00093	.00411	.00355	.01039	.04371	.51304
#2	.00335	.20910	.01352	.01847	.00201	.00184	.47750	.00100	.00419	.00356	.00989	.04175	.48656
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03175**	**.19902**	**.00317**	**.00954**	**.99367**	**.00975**	**.00462**	**.20208**	**.01822**	**.01898**	**.44722**	**.00711**	**.00496**
Stddev	.00010	.00223	.00006	.00018	.00399	.00017	.00074	.00124	.00165	.00274	.00016	.00023	.00001
%RSD	.30716	1.1181	1.7974	1.9343	.40126	1.7153	15.981	.61373	9.0492	14.416	.03583	3.3039	.17394
#1	.03168	.19744	.00313	.00941	.99649	.00986	.00514	.20296	.01938	.01705	.44733	.00694	.00497
#2	.03182	.20059	.00321	.00967	.99085	.00963	.00409	.20121	.01705	.02092	.44711	.00727	.00496
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00444**	**.01911**	**.00499**	**.01043**
Stddev	.00043	.00014	.00026	.00090
%RSD	9.6650	.73771	5.1632	8.6679
#1	.00413	.01901	.00481	.00979
#2	.00474	.01921	.00517	.01107
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2235.1**	**4101.3**	**65903.**	**7366.4**
Stddev	2.3	4.7	166.	39.3
%RSD	.10292	.11568	.25187	.53323
#1	2236.7	4104.6	66020.	7394.2
#2	2233.5	4097.9	65785.	7338.6

Sample Name: 480-48473-A-19-A@5 Acquired: 11/14/2013 14:18:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01399**	**16.784**	**.05031**	**.05355**	**.94447**	**.00075**	**45.928**	**.02644**	**.33997**
Stddev	.00047	.086	.00092	.00011	.00114	.00001	.312	.00007	.00015
%RSD	3.3336	.51180	1.8251	.20168	.12023	1.8465	.67865	.24725	.04535
#1	.01366	16.723	.04966	.05347	.94367	.00074	45.707	.02649	.34008
#2	.01432	16.845	.05096	.05362	.94528	.00076	46.148	.02640	.33986
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.59793**	**11.585**	**199.29**	**1.6863**	**.02211**	**6.3240**	**1.4633**	**.14308**	**.41255**
Stddev	.00264	.079	.67	.0394	.00010	.0270	.0078	.00049	.00385
%RSD	.44115	.68081	.33861	2.3349	.43285	.42656	.52998	.34586	.93265
#1	.59606	11.530	198.82	1.7141	.02204	6.3049	1.4579	.14342	.41527
#2	.59979	11.641	199.77	1.6584	.02218	6.3431	1.4688	.14273	.40983
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.2211**	**2.9656**	**1.9451**	**.02299**	**-.00105**	**3.2597**	**1.0218**	**.13479**	**.24525**
Stddev	.0003	.0042	.0126	.00212	.00420	.0767	.0010	.00006	.00094
%RSD	.02741	.14220	.64885	9.2183	400.25	2.3530	.09287	.04152	.38480
#1	1.2213	2.9686	1.9362	.02449	-.00402	3.3139	1.0211	.13475	.24458
#2	1.2209	2.9626	1.9541	.02149	.00192	3.2054	1.0224	.13483	.24592
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00063**	**.06669**	**4.5013**
Stddev	.00032	.00002	.0148
%RSD	50.383	.03449	.32966
#1	-.00086	.06670	4.4908
#2	-.00041	.06667	4.5118
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1974.3**	**3808.2**	**61710.**	**7153.7**
Stddev	4.7	9.0	175.	2.9
%RSD	.23908	.23622	.28364	.04078
#1	1970.9	3801.9	61586.	7155.8
#2	1977.6	3814.6	61834.	7151.6

Sample Name: 48473-A-19-Asd@25 Acquired: 11/14/2013 14:20:17 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00351**	**3.3076**	**.01081**	**.00913**	**.18780**	**.00012**	**9.2841**	**.00503**	**.06451**
Stddev	.00047	.0441	.00239	.00005	.00048	.00006	.0078	.00002	.00003
%RSD	13.464	1.3326	22.117	.56434	.25511	52.875	.08379	.33432	.04133
#1	.00317	3.3388	.00912	.00909	.18814	.00008	9.2786	.00502	.06453
#2	.00384	3.2764	.01250	.00916	.18746	.00016	9.2896	.00504	.06449
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.11993**	**2.1990**	**40.288**	**.31897**	**.00616**	**1.2880**	**.29738**	**.02719**	**.10017**
Stddev	.00030	.0089	.129	.01480	.00030	.0084	.00011	.00048	.01646
%RSD	.25217	.40517	.31951	4.6400	4.8422	.65252	.03533	1.7537	16.430
#1	.12015	2.2053	40.379	.32943	.00637	1.2821	.29731	.02753	.11181
#2	.11972	2.1927	40.197	.30850	.00595	1.2940	.29746	.02685	.08853
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.23217**	**.57247**	**.36970**	**.00258**	**.00243**	**.54562**	**.19363**	**.02678**	**.04845**
Stddev	.00003	.00111	.00020	.00102	.00626	.00801	.00031	.00014	.00053
%RSD	.01188	.19345	.05453	39.588	258.10	1.4683	.16164	.51849	1.0955
#1	.23216	.57169	.36955	.00186	.00685	.55129	.19385	.02688	.04883
#2	.23219	.57326	.36984	.00330	-.00200	.53996	.19341	.02669	.04807
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00063**	**.01323**	**.91732**
Stddev	.00093	.00028	.00605
%RSD	149.13	2.1308	.65995
#1	-.00003	.01303	.91304
#2	.00128	.01343	.92160
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2124.0**	**3944.8**	**63403.**	**7198.9**
Stddev	3.2	1.9	102.	12.3
%RSD	.15218	.04892	.16126	.17138
#1	2126.3	3943.5	63475.	7207.6
#2	2121.7	3946.2	63330.	7190.2

Sample Name: 48473-A-19-A pds@5 Acquired: 11/14/2013 14:22:32 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02094**	**20.308**	**.33908**	**.10723**	**.99565**	**.32250**	**60.603**	**.32160**	**.62744**
Stddev	.00002	.115	.00099	.00510	.00132	.00149	.055	.00047	.00089
%RSD	.08291	.56812	.29127	4.7560	.13282	.46344	.09152	.14583	.14259
#1	.02095	20.389	.33978	.10363	.99659	.32356	60.564	.32127	.62681
#2	.02093	20.226	.33838	.11084	.99472	.32145	60.642	.32193	.62807
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.89262**	**11.392**	**209.83**	**5.8394**	**.10064**	**21.293**	**1.7131**	**.45404**	**4.2414**
Stddev	.00035	.033	.75	.2180	.00409	.118	.0010	.00071	.1788
%RSD	.03891	.29388	.35687	3.7336	4.0599	.55264	.05896	.15672	4.2147
#1	.89237	11.368	209.30	5.9936	.10353	21.376	1.7124	.45455	4.3678
#2	.89287	11.415	210.36	5.6853	.09775	21.209	1.7138	.45354	4.1150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.4575**	**3.1379**	**1.8685**	**.31959**	**.29711**	**3.7725**	**1.0152**	**.20969**	**.54916**
Stddev	.0014	.0047	.0024	.00285	.00042	.0028	.0089	.00308	.00397
%RSD	.09292	.14915	.13025	.89035	.13970	.07434	.87465	1.4707	.72278
#1	1.4566	3.1345	1.8702	.31758	.29740	3.7705	1.0089	.21187	.55197
#2	1.4585	3.1412	1.8668	.32160	.29682	3.7744	1.0215	.20751	.54635
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.26500**	**.38229**	**4.6612**
Stddev	.00145	.00225	.0295
%RSD	.54619	.58759	.63215
#1	.26398	.38388	4.6404
#2	.26603	.38071	4.6821
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1945.2**	**3816.2**	**61217.**	**7138.8**
Stddev	3.7	.8	80.	12.5
%RSD	.18978	.02209	.13025	.17544
#1	1947.8	3816.8	61273.	7147.7
#2	1942.6	3815.6	61161.	7130.0

Sample Name: 48473-A-19-B MS@5 Acquired: 11/14/2013 14:24:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02850**	**22.012**	**.13241**	**.12235**	**.86801**	**.08370**	**47.926**	**.12369**	**.48924**
Stddev	.00029	.154	.00334	.00013	.00199	.00026	.150	.00017	.00046
%RSD	1.0173	.69930	2.5220	.10458	.22896	.30934	.31317	.13927	.09454
#1	.02829	22.121	.13005	.12226	.86942	.08388	48.032	.12381	.48957
#2	.02870	21.903	.13477	.12244	.86661	.08352	47.820	.12357	.48891
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.87588**	F **32.087**	**141.52**	**6.5991**	**.10879**	**9.7891**	**2.4448**	**.30165**	**4.5425**
Stddev	.00006	.063	.66	.0500	.00076	.0149	.0060	.00013	.0099
%RSD	.00661	.19593	.46364	.75721	.69980	.15215	.24421	.04259	.21807
#1	.87584	32.132	141.98	6.5638	.10826	9.7785	2.4406	.30156	4.5495
#2	.87592	32.043	141.05	6.6344	.10933	9.7996	2.4490	.30174	4.5355
Check ?	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit		25.000							
Low Limit		-.01000							

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**3.4016**	**2.2042**	**6.0964**	**.08762**	**.08489**	**5.1677**	**.34783**	**.21967**	**1.4518**
Stddev	.0018	.0031	.0094	.00096	.00188	.0095	.00224	.00049	.0047
%RSD	.05248	.14076	.15436	1.0948	2.2153	.18284	.64445	.22137	.32115
#1	3.4004	2.2020	6.1030	.08694	.08356	5.1744	.34624	.22001	1.4485
#2	3.4029	2.2064	6.0897	.08830	.08622	5.1610	.34941	.21933	1.4551
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.07877**	**.19425**	**8.3496**
Stddev	.00046	.00038	.0141
%RSD	.58055	.19575	.16906
#1	.07909	.19398	8.3595
#2	.07844	.19451	8.3396
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1975.2**	**3844.8**	**61960.**	**7097.0**
Stddev	1.5	4.1	57.	19.6
%RSD	.07710	.10644	.09229	.27563
#1	1976.3	3841.9	61920.	7083.2
#2	1974.2	3847.7	62001.	7110.9

Sample Name: 48473-A-19-C MSD@5 Acquired: 11/14/2013 14:27:10 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02347**	**21.307**	**.13305**	**.11879**	**.88431**	**.07856**	**45.609**	**.10794**	**.27185**
Stddev	.00064	.010	.00207	.00010	.00252	.00009	.076	.00044	.00049
%RSD	2.7182	.04673	1.5586	.08817	.28533	.12088	.16596	.40441	.17958
#1	.02392	21.300	.13452	.11872	.88610	.07850	45.662	.10825	.27219
#2	.02302	21.314	.13159	.11887	.88253	.07863	45.555	.10764	.27150
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52420**	**2.1564**	**210.58**	**6.4656**	**.10659**	**9.6470**	**1.8938**	**.20710**	**4.2503**
Stddev	.00203	.0060	.08	.0479	.00053	.0035	.0034	.00090	.0029
%RSD	.38656	.27825	.03724	.74122	.49530	.03644	.18144	.43619	.06885
#1	.52277	2.1606	210.64	6.4995	.10696	9.6445	1.8962	.20773	4.2524
#2	.52564	2.1521	210.52	6.4317	.10621	9.6495	1.8914	.20646	4.2483
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.2378**	**2.2489**	**5.8632**	**.09432**	**.07949**	**6.5003**	**.73962**	**.18588**	**.61408**
Stddev	.0012	.0039	.0372	.00179	.00006	.0102	.00223	.00043	.00013
%RSD	.09917	.17540	.63486	1.8970	.06930	.15752	.30156	.22903	.02039
#1	1.2370	2.2461	5.8895	.09558	.07945	6.5075	.74120	.18618	.61417
#2	1.2387	2.2517	5.8369	.09305	.07953	6.4930	.73805	.18558	.61399
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.07363**	**.15547**	**4.1840**
Stddev	.00058	.00032	.0251
%RSD	.78455	.20335	.59957
#1	.07404	.15525	4.1663
#2	.07323	.15570	4.2017
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1971.9**	**3912.6**	**62787.**	**7291.2**
Stddev	2.7	3.4	61.	27.4
%RSD	.13590	.08626	.09780	.37521
#1	1973.8	3910.3	62744.	7271.8
#2	1970.0	3915.0	62830.	7310.5

Sample Name: 480-48473-A-24-K@5 Acquired: 11/14/2013 14:29:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00487**	**16.550**	**.04834**	**1.3682**	**3.3514**	**.00080**	**40.841**	**.02359**	**.88053**
Stddev	.00090	.118	.00157	.0027	.0041	.00009	.089	.00009	.00150
%RSD	18.378	.71111	3.2410	.20125	.12205	10.720	.21786	.39611	.17038
#1	.00550	16.633	.04944	1.3702	3.3485	.00086	40.778	.02352	.88159
#2	.00424	16.467	.04723	1.3663	3.3543	.00074	40.904	.02365	.87946
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**6.0400**	**1.5947**	**279.08**	**2.1079**	**.02126**	**11.155**	**2.5745**	**1.2097**	**3.9023**
Stddev	.0063	.0008	1.56	.0106	.00067	.021	.0060	.0059	.0168
%RSD	.10467	.04859	.55789	.50290	3.1736	.19131	.23449	.48497	.42973
#1	6.0445	1.5941	277.98	2.1154	.02174	11.170	2.5787	1.2138	3.8904
#2	6.0355	1.5952	280.18	2.1004	.02078	11.140	2.5702	1.2055	3.9141
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**9.3387**	**7.1750**	**1.4146**	**.08693**	**.00757**	**3.2607**	**.18146**	**.15743**	**.69301**
Stddev	.0191	.0007	.0017	.00615	.00003	.0248	.00037	.00002	.00193
%RSD	.20431	.01035	.11723	7.0701	.41380	.75933	.20130	.01039	.27909
#1	9.3252	7.1755	1.4158	.09127	.00754	3.2432	.18172	.15745	.69438
#2	9.3522	7.1745	1.4134	.08258	.00759	3.2782	.18121	.15742	.69164
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00085**	**.09627**	**7.6212**
Stddev	.00048	.00141	.0527
%RSD	56.841	1.4661	.69175
#1	-.00051	.09727	7.6585
#2	-.00119	.09527	7.5839
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1950.8**	**3829.9**	**61411.**	**7129.0**
Stddev	.2	6.9	179.	7.7
%RSD	.01214	.18108	.29185	.10818
#1	1950.6	3825.0	61284.	7134.5
#2	1951.0	3834.8	61538.	7123.6

Sample Name: 480-48473-A-24-K@10 Acquired: 11/14/2013 14:31:43 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00265**	**8.2136**	**.02426**	**.67543**	**1.6255**	**.00037**	**20.436**	**.01167**	**.42954**
Stddev	.00038	.0347	.00134	.00057	.0019	.00002	.016	.00025	.00150
%RSD	14.161	.42237	5.5177	.08453	.11566	5.8796	.07775	2.1055	.34974
#1	.00292	8.1890	.02520	.67583	1.6268	.00038	20.448	.01149	.42848
#2	.00239	8.2381	.02331	.67502	1.6241	.00035	20.425	.01184	.43060
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**3.0419**	**.83057**	**139.19**	**.99068**	**.01009**	**5.6380**	**1.2925**	**.59944**	**1.9352**
Stddev	.0147	.06919	.45	.07908	.00133	.0326	.0040	.00033	.0103
%RSD	.48229	8.3310	.32494	7.9828	13.146	.57849	.30800	.05570	.53074
#1	3.0523	.78164	139.51	1.0466	.00915	5.6149	1.2953	.59921	1.9425
#2	3.0315	.87950	138.87	.93476	.01103	5.6610	1.2897	.59968	1.9279
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**4.6051**	**3.5425**	**.68924**	**.04217**	**.00300**	**1.5587**	**.08698**	**.07766**	**.34513**
Stddev	.0047	.0015	.00686	.00159	.00005	.0102	.00001	.00010	.00130
%RSD	.10239	.04344	.99560	3.7807	1.7075	.65280	.00877	.12996	.37768
#1	4.6018	3.5436	.68439	.04105	.00296	1.5515	.08697	.07774	.34421
#2	4.6084	3.5414	.69410	.04330	.00303	1.5659	.08698	.07759	.34605
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00095**	**.04773**	**3.8998**
Stddev	.00213	.00063	.0223
%RSD	225.05	1.3176	.57193
#1	.00246	.04729	3.9156
#2	-.00056	.04818	3.8840
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2043.7**	**3922.5**	**62428.**	**7146.4**
Stddev	3.0	4.2	9.	19.0
%RSD	.14596	.10604	.01494	.26522
#1	2045.8	3925.5	62435.	7133.0
#2	2041.6	3919.6	62422.	7159.8

Sample Name: 480-48473-A-24-K@50 Acquired: 11/14/2013 14:33:59 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**1.6552**	**.00477**	**.13750**	**.33464**	**.00010**	**4.1089**	**.00239**	**.08482**
Stddev	.00057	.0102	.00257	.00155	.00010	.00002	.0015	.00001	.00021
%RSD	347.42	.61584	53.813	1.1261	.03035	16.114	.03730	.36105	.25021
#1	-.00024	1.6624	.00658	.13640	.33457	.00009	4.1100	.00239	.08467
#2	.00057	1.6480	.00295	.13859	.33472	.00011	4.1078	.00238	.08497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.61504**	**.15818**	**28.271**	**.19328**	**.00315**	**1.1324**	**.26132**	**.12193**	**.41289**
Stddev	.00066	.00027	.185	.04300	.00128	.0090	.00069	.00076	.00814
%RSD	.10661	.17176	.65349	22.249	40.711	.79574	.26362	.61985	1.9704
#1	.61550	.15837	28.402	.22369	.00224	1.1388	.26083	.12140	.41864
#2	.61457	.15799	28.141	.16288	.00406	1.1261	.26180	.12247	.40714
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.91475**	**.70424**	**.13846**	**.00640**	**.00176**	**.32230**	**.01630**	**.01567**	**.06905**
Stddev	.00578	.00349	.00241	.00022	.00536	.03494	.00055	.00012	.00107
%RSD	.63219	.49511	1.7379	3.4512	304.07	10.842	3.4035	.76848	1.5497
#1	.91066	.70178	.13676	.00656	-.00203	.34701	.01669	.01559	.06829
#2	.91884	.70671	.14016	.00625	.00556	.29759	.01591	.01576	.06981
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00016**	**.00935**	**.76649**
Stddev	.00053	.00001	.00615
%RSD	328.55	.10316	.80172
#1	-.00021	.00935	.76215
#2	.00054	.00934	.77084
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2155.3**	**3974.3**	**64519.**	**7191.0**
Stddev	3.3	10.3	132.	43.0
%RSD	.15150	.25851	.20397	.59795
#1	2157.6	3981.6	64612.	7160.6
#2	2153.0	3967.0	64425.	7221.4

Sample Name: 480-48473-B-26-A@5 Acquired: 11/14/2013 14:36:13 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00623**	**15.106**	**.03350**	**.07501**	**.65576**	**.00050**	**58.196**	**.02379**	**.31298**
Stddev	.00059	.084	.00330	.00006	.00164	.00000	.243	.00039	.00100
%RSD	9.4253	.55769	9.8598	.07537	.25011	.08908	.41838	1.6460	.32048
#1	.00664	15.166	.03583	.07505	.65692	.00050	58.368	.02407	.31227
#2	.00581	15.047	.03116	.07497	.65460	.00050	58.024	.02351	.31368
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0761**	**2.4377**	**191.25**	**1.6644**	**.02703**	**8.4320**	**2.3574**	**.36985**	**.78185**
Stddev	.0012	.0060	.46	.0218	.00106	.0002	.0013	.00138	.01157
%RSD	.11260	.24591	.23981	1.3080	3.9250	.00271	.05484	.37399	1.4793
#1	1.0752	2.4420	191.58	1.6490	.02778	8.4322	2.3583	.37083	.79003
#2	1.0769	2.4335	190.93	1.6798	.02628	8.4319	2.3565	.36888	.77368
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.8659**	**2.5646**	**1.3223**	**.01088**	**.00548**	**2.9066**	**.19378**	**.14996**	**.35898**
Stddev	.0039	.0032	.0072	.00007	.00135	.0204	.00130	.00079	.00195
%RSD	.13727	.12557	.54129	.65641	24.632	.70274	.67325	.52450	.54239
#1	2.8631	2.5669	1.3273	.01093	.00644	2.9211	.19470	.15052	.35760
#2	2.8687	2.5624	1.3172	.01083	.00453	2.8922	.19286	.14941	.36035
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00047**	**.10272**	**5.7018**
Stddev	.00070	.00052	.0040
%RSD	148.63	.50374	.06989
#1	.00002	.10308	5.7046
#2	-.00096	.10235	5.6990
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1969.6**	**3838.3**	**61784.**	**7168.6**
Stddev	2.7	8.7	44.	42.8
%RSD	.13465	.22635	.07187	.59740
#1	1967.7	3832.1	61753.	7138.3
#2	1971.5	3844.4	61816.	7198.9

Sample Name: CCV Acquired: 11/14/2013 14:38:31 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48136	24.752	.50112	.48238	.50674	.48654	24.965	.49693	.48621	.48984	.49967	24.482	26.201
Stddev	.00134	.021	.00207	.00057	.00726	.00020	.027	.00024	.00119	.00006	.00074	.077	.029
%RSD	.27741	.08466	.41256	.11784	1.4319	.04052	.10781	.04742	.24455	.01254	.14878	.31520	.10922
#1	.48042	24.737	.50258	.48198	.51188	.48640	24.984	.49676	.48705	.48979	.49914	24.428	26.181
#2	.48230	24.767	.49966	.48278	.50161	.48668	24.946	.49710	.48537	.48988	.50019	24.537	26.221
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50624	23.621	.49931	.50475	24.942	.47537	.47798	25.163	.51721	.50497	24.476	.49920	.50645
Stddev	.00481	.007	.00146	.00052	.085	.00147	.00276	.104	.00175	.00206	.286	.00234	.00126
%RSD	.94924	.02856	.29338	.10311	.34204	.30962	.57652	.41171	.33824	.40771	1.1690	.46885	.24783
#1	.50284	23.626	.50034	.50512	24.882	.47641	.47603	25.090	.51845	.50643	24.274	.50085	.50556
#2	.50964	23.616	.49827	.50438	25.003	.47433	.47993	25.236	.51598	.50351	24.679	.49754	.50733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50920	.49213	.49050	.48904
Stddev	.00022	.00142	.00142	.00422
%RSD	.04364	.28903	.29031	.86364
#1	.50904	.49313	.48950	.49203
#2	.50936	.49112	.49151	.48605
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1998.2	3888.3	61996.	7108.9
Stddev	3.1	.3	65.	24.5
%RSD	.15557	.00836	.10542	.34509
#1	1996.0	3888.6	61950.	7126.2
#2	2000.4	3888.1	62042.	7091.5

Sample Name: CCB Acquired: 11/14/2013 14:40:40 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**-.01936**	**.00249**	**-.00075**	**.00000**	**-.00005**	**-.01065**	**.00002**	**.00000**	**.00022**	**.00101**	**-.00211**	**-.01244**
Stddev	.00051	.00991	.00276	.00060	.0000	.00006	.00076	.00011	.0000	.00030	.00016	.00383	.06962
%RSD	127.87	51.189	110.69	79.632	552.46	126.71	7.1708	488.42	1154.8	134.01	15.512	181.61	559.60
#1	-.00076	-.01235	.00444	-.00033	-.00002	-.00009	-.01119	-.00006	.00002	.00001	.00090	.00060	-.06167
#2	-.00004	-.02637	.00054	-.00117	.00001	-.00001	-.01011	.00010	-.00003	.00044	.00112	-.00482	.03679
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00197**	**-.00031**	**.00008**	**.00031**	**.02395**	**-.00014**	**-.00035**	**-.00126**	**-.00216**	**.00315**	**-.01399**	**-.00159**	**.00003**
Stddev	.00050	.00103	.00000	.00023	.00254	.00007	.00126	.00401	.00168	.00531	.00662	.00066	.00012
%RSD	25.573	329.04	6.3599	74.444	10.603	50.490	357.52	317.91	77.959	168.80	47.329	41.172	477.38
#1	.00161	.00042	.00008	.00047	.02575	-.00009	.00054	.00157	-.00334	.00691	-.01867	-.00206	-.00006
#2	.00232	-.00104	.00007	.00015	.02216	-.00019	-.00125	-.00410	-.00097	-.00061	-.00931	-.00113	.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.00127**	**.00009**	**-.00003**
Stddev	.00006	.00002	.00038	.00084
%RSD	75.649	1.8155	419.00	2912.0
#1	-.00012	.00125	-.00018	.00057
#2	-.00004	.00129	.00036	-.00062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2193.2**	**3986.8**	**64694.**	**7052.5**
Stddev	2.1	2.5	120.	38.7
%RSD	.09509	.06363	.18502	.54940
#1	2191.8	3988.6	64779.	7025.1
#2	2194.7	3985.0	64609.	7079.9

Sample Name: CCVL Acquired: 11/14/2013 14:43:01 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00281**	**.18921**	**.01034**	**.01863**	**.00199**	**.00191**	**.48982**	**.00089**	**.00405**	**.00360**	**.01094**	**.04776**
Stddev	.00027	.01400	.00022	.00048	.00001	.00020	.00720	.00014	.00005	.00027	.00011	.00893
%RSD	9.7580	7.4011	2.1344	2.6006	.61674	10.290	1.4695	15.442	1.2605	7.6273	.96940	18.703
#1	.00300	.17930	.01049	.01829	.00200	.00205	.49491	.00099	.00401	.00341	.01086	.05408
#2	.00262	.19911	.01018	.01898	.00198	.00177	.48473	.00079	.00408	.00380	.01101	.04145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.45903**	**.03139**	**.20087**	**.00316**	**.00967**	**.99664**	**.00914**	**.00512**	**.20132**	**.01933**	W **.02136**	**.42380**
Stddev	.04295	.00080	.00467	.00004	.00031	.01569	.00065	.00010	.00066	.00197	.00190	.01387
%RSD	9.3556	2.5329	2.3271	1.2461	3.1733	1.5740	7.1186	1.8668	.32696	10.186	8.9006	3.2722
#1	.48940	.03083	.20418	.00313	.00989	1.0077	.00868	.00519	.20179	.01794	.02270	.41399
#2	.42867	.03195	.19756	.00319	.00945	.98555	.00960	.00506	.20085	.02073	.02002	.43360
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass
Value											.01500	
Range											30.000%	

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00760**	**.00497**	**.00463**	**.01956**	**.00476**	**.00989**
Stddev	.00034	.00024	.00027	.00036	.00016	.00006
%RSD	4.5018	4.7674	5.7736	1.8233	3.3905	.64862
#1	.00735	.00513	.00481	.01981	.00465	.00994
#2	.00784	.00480	.00444	.01931	.00488	.00984
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2245.7**	**4121.5**	**66318.**	**7333.4**
Stddev	5.3	14.6	78.	15.9
%RSD	.23657	.35493	.11792	.21686
#1	2249.4	4131.8	66263.	7322.2
#2	2241.9	4111.1	66373.	7344.7

Sample Name: 480-48473-B-27-A@20 Acquired: 11/14/2013 14:45:19 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00130**	**2.8879**	**.00866**	**.02742**	**.11051**	**.00005**	**13.098**	**.01543**	**.04066**
Stddev	.00065	.0116	.00348	.00032	.00012	.00002	.018	.00007	.00012
%RSD	50.235	.40148	40.195	1.1609	.10838	42.941	.13832	.43730	.29994
#1	.00176	2.8797	.01112	.02720	.11042	.00004	13.085	.01538	.04057
#2	.00084	2.8961	.00620	.02765	.11059	.00007	13.110	.01547	.04074
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.12821**	**15.095**	**31.682**	**.43290**	**.00481**	**2.0498**	**.39052**	**.03487**	**.12342**
Stddev	.00127	.006	.174	.02115	.00113	.0129	.00025	.00012	.00012
%RSD	.99374	.03772	.54943	4.8853	23.419	.62769	.06435	.35059	.10084
#1	.12911	15.099	31.559	.41795	.00560	2.0589	.39034	.03479	.12351
#2	.12731	15.091	31.805	.44786	.00401	2.0407	.39070	.03496	.12333
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.31101**	**.46392**	**.38235**	**-.00035**	**.00519**	**.41559**	**.03087**	**.02728**	**.04502**
Stddev	.00184	.00382	.00097	.00200	.00162	.00160	.00019	.00005	.00023
%RSD	.59053	.82244	.25486	578.18	31.288	.38593	.60476	.17421	.51017
#1	.30971	.46123	.38304	-.00176	.00634	.41445	.03073	.02725	.04486
#2	.31231	.46662	.38166	.00107	.00404	.41672	.03100	.02732	.04518
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00227**	**.01871**	**.87966**
Stddev	.00089	.00036	.00348
%RSD	39.161	1.9206	.39602
#1	-.00164	.01845	.88213
#2	-.00290	.01896	.87720
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2115.0**	**3932.9**	**63203.**	**7078.9**
Stddev	.8	13.5	16.	5.9
%RSD	.03839	.34376	.02555	.08311
#1	2115.6	3923.4	63215.	7083.1
#2	2114.5	3942.5	63192.	7074.7

Sample Name: 480-48473-F-40-A@5 Acquired: 11/14/2013 14:47:34 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00758**	**15.464**	**.02835**	**.05646**	**.82460**	**.00060**	**77.275**	**.03793**	**.19078**
Stddev	.00056	.064	.00324	.00015	.00277	.00011	.013	.00021	.00063
%RSD	7.4478	.41549	11.440	.27002	.33558	18.463	.01726	.54529	.33058
#1	.00718	15.510	.02605	.05657	.82656	.00068	77.284	.03808	.19122
#2	.00797	15.419	.03064	.05636	.82264	.00052	77.266	.03779	.19033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50515**	**3.6786**	**169.77**	**1.5931**	**.02334**	**9.9305**	**2.0430**	**.13264**	**.29594**
Stddev	.00099	.0047	.14	.0076	.00082	.0276	.0068	.00037	.01524
%RSD	.19539	.12879	.08104	.47871	3.4971	.27783	.33439	.27946	5.1483
#1	.50585	3.6820	169.68	1.5985	.02392	9.9500	2.0382	.13291	.28517
#2	.50446	3.6753	169.87	1.5877	.02276	9.9110	2.0478	.13238	.30671
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.3173**	**3.1352**	**1.9322**	**.01602**	**.00620**	**3.1352**	**.20188**	**.17068**	**.22184**
Stddev	.0025	.0031	.0126	.00289	.00572	.0177	.00145	.00019	.00142
%RSD	.19093	.09882	.65144	18.054	92.347	.56461	.71820	.11115	.64082
#1	1.3155	3.1330	1.9233	.01807	.00215	3.1477	.20291	.17054	.22284
#2	1.3191	3.1374	1.9411	.01398	.01024	3.1227	.20086	.17081	.22083
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00212**	**.06908**	**5.7877**
Stddev	.00091	.00022	.0152
%RSD	43.026	.32412	.26233
#1	-.00147	.06924	5.7769
#2	-.00276	.06892	5.7984
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1959.3**	**3828.2**	**61356.**	**7086.8**
Stddev	.4	5.6	29.	14.6
%RSD	.01979	.14519	.04649	.20638
#1	1959.0	3824.3	61336.	7076.5
#2	1959.6	3832.1	61377.	7097.2

Sample Name: 480-48473-F-45-A@5 Acquired: 11/14/2013 14:49:48 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00509**	**18.311**	**.03692**	**.03393**	**.89529**	**.00065**	**68.344**	**.02703**	**.32185**
Stddev	.00104	.050	.00322	.00025	.00460	.00000	.311	.00029	.00038
%RSD	20.498	.27428	8.7215	.74334	.51409	.30834	.45473	1.0708	.11687
#1	.00583	18.347	.03465	.03411	.89855	.00065	68.564	.02682	.32211
#2	.00435	18.276	.03920	.03375	.89204	.00065	68.124	.02723	.32158
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.0296**	**1.5569**	**247.64**	**2.5524**	**.02088**	**9.7229**	**2.6384**	**.51996**	**.40424**
Stddev	.0032	.0014	.76	.0260	.00062	.0032	.0024	.00079	.00197
%RSD	.15516	.08705	.30514	1.0182	2.9831	.03330	.09124	.15163	.48727
#1	2.0318	1.5559	248.18	2.5707	.02044	9.7252	2.6401	.52052	.40563
#2	2.0273	1.5579	247.11	2.5340	.02132	9.7206	2.6367	.51940	.40285
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**4.7731**	**4.4833**	**1.4812**	**.00275**	**.00335**	**3.2116**	**.13979**	**.19810**	**.50202**
Stddev	.0048	.0069	.0116	.00448	.00349	.0165	.00125	.00017	.00079
%RSD	.10149	.15294	.78068	162.98	104.29	.51295	.89272	.08528	.15806
#1	4.7766	4.4882	1.4730	.00592	.00088	3.2233	.14068	.19821	.50146
#2	4.7697	4.4785	1.4894	-.00042	.00581	3.2000	.13891	.19798	.50258
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00175**	**.08302**	**4.0932**
Stddev	.00096	.00031	.0098
%RSD	55.062	.37410	.23811
#1	-.00243	.08280	4.1001
#2	-.00107	.08324	4.0863
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1953.8**	**3836.9**	**61375.**	**7074.4**
Stddev	3.8	5.7	38.	40.7
%RSD	.19699	.14866	.06147	.57553
#1	1951.1	3832.9	61349.	7045.6
#2	1956.5	3841.0	61402.	7103.1

Sample Name: 480-48473-F-45-A@10 Acquired: 11/14/2013 14:52:01 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00288**	**9.1419**	**.01731**	**.01630**	**.44332**	**.00027**	**34.454**	**.01348**	**.15926**
Stddev	.00063	.0684	.00175	.00005	.00007	.00003	.094	.00008	.00017
%RSD	22.035	.74877	10.106	.33558	.01570	12.390	.27326	.59606	.10917
#1	.00243	9.1903	.01607	.01626	.44337	.00025	34.520	.01353	.15914
#2	.00332	9.0935	.01855	.01634	.44327	.00030	34.387	.01342	.15939
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0271**	**.78005**	**124.92**	**1.2628**	**.01133**	**4.9532**	**1.3361**	**.26159**	**.20792**
Stddev	.0000	.00432	.19	.0467	.00077	.0311	.0033	.00014	.00824
%RSD	.00109	.55344	.14886	3.7011	6.7877	.62808	.24768	.05178	3.9624
#1	1.0271	.78310	125.05	1.2958	.01079	4.9752	1.3384	.26168	.20210
#2	1.0271	.77700	124.79	1.2297	.01187	4.9312	1.3338	.26149	.21375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.3958**	**2.2442**	**.74022**	**.00021**	**-.00023**	**1.4704**	**.06781**	**.09900**	**.25108**
Stddev	.0123	.0069	.00092	.00074	.00753	.0124	.00089	.00012	.00308
%RSD	.51158	.30816	.12424	354.49	3267.3	.84250	1.3174	.11799	1.2276
#1	2.4044	2.2491	.74087	.00073	.00509	1.4792	.06845	.09892	.25326
#2	2.3871	2.2393	.73957	-.00031	-.00555	1.4617	.06718	.09909	.24890
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00220**	**.04133**	**2.0877**
Stddev	.00187	.00027	.0027
%RSD	85.196	.64235	.13005
#1	-.00352	.04152	2.0897
#2	-.00087	.04114	2.0858
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2039.3**	**3903.4**	**62468.**	**7103.5**
Stddev	4.5	8.2	28.	12.4
%RSD	.22162	.20899	.04416	.17422
#1	2036.1	3909.2	62449.	7112.3
#2	2042.5	3897.7	62488.	7094.8

Sample Name: 480-48473-F-45-A@20 Acquired: 11/14/2013 14:54:11 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**4.5797**	**.01025**	**.00719**	**.22214**	**.00003**	**17.131**	**.00669**	**.07874**
Stddev	.00010	.0259	.00019	.00020	.00022	.00006	.095	.00000	.00005
%RSD	9.4426	.56636	1.8302	2.7651	.09819	193.81	.55465	.02946	.06545
#1	.00111	4.5980	.01038	.00705	.22230	-.00001	17.064	.00669	.07878
#2	.00097	4.5614	.01011	.00733	.22199	.00008	17.198	.00669	.07871
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.50765**	**.38744**	**61.615**	**.64719**	**.00753**	**2.4812**	**.66408**	**.13085**	**.11540**
Stddev	.00273	.00033	.116	.03134	.00142	.0076	.00205	.00013	.00085
%RSD	.53752	.08556	.18815	4.8426	18.926	.30728	.30892	.10247	.73510
#1	.50572	.38768	61.533	.62503	.00652	2.4758	.66263	.13076	.11480
#2	.50958	.38721	61.697	.66935	.00853	2.4866	.66553	.13095	.11600
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.1819**	**1.1064**	**.36442**	**-.00368**	**.00501**	**.72674**	**.03338**	**.04951**	**.12574**
Stddev	.0008	.0051	.00113	.00040	.00169	.01320	.00063	.00018	.00022
%RSD	.06699	.46373	.31021	10.816	33.705	1.8163	1.8875	.36042	.17761
#1	1.1813	1.1101	.36522	-.00340	.00382	.71741	.03293	.04938	.12558
#2	1.1824	1.1028	.36362	-.00396	.00621	.73607	.03383	.04963	.12590
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00017**	**.02096**	**1.0285**
Stddev	.00106	.00014	.0070
%RSD	613.53	.65631	.68176
#1	-.00092	.02106	1.0235
#2	.00058	.02086	1.0335
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2101.4**	**3946.2**	**63363.**	**7172.8**
Stddev	2.9	14.0	95.	18.3
%RSD	.13588	.35416	.14995	.25554
#1	2103.4	3956.1	63430.	7185.8
#2	2099.3	3936.3	63295.	7159.9

Sample Name: 480-48473-B-46-I@5 Acquired: 11/14/2013 14:56:23 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00610**	**53.732**	**.01705**	**.05293**	**.83237**	**.00347**	**230.11**	**.02021**	**.13342**
Stddev	.00103	.003	.00367	.00061	.00033	.00004	.12	.00003	.00019
%RSD	16.813	.00499	21.547	1.1574	.04023	1.0303	.05129	.15545	.14130
#1	.00537	53.734	.01965	.05250	.83261	.00344	230.20	.02019	.13355
#2	.00682	53.730	.01445	.05337	.83213	.00350	230.03	.02024	.13328
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.27716**	**.87927**	**56.574**	**3.1670**	**.06043**	**36.707**	**1.5443**	**.08323**	**1.2644**
Stddev	.00113	.00017	.061	.0101	.00016	.114	.0010	.00048	.0104
%RSD	.40630	.01978	.10836	.31840	.26806	.31029	.06339	.57588	.82508
#1	.27636	.87914	56.617	3.1599	.06032	36.626	1.5436	.08357	1.2570
#2	.27796	.87939	56.530	3.1742	.06054	36.787	1.5450	.08289	1.2718
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**4.1223**	**1.1343**	**1.5946**	**.00372**	**.00384**	**25.692**	**.08635**	**.51331**	**.81546**
Stddev	.0074	.0074	.0081	.00249	.00438	.037	.00063	.00023	.00366
%RSD	.17921	.65472	.50715	67.138	114.19	.14326	.73070	.04437	.44883
#1	4.1275	1.1291	1.6003	.00195	.00694	25.718	.08680	.51315	.81287
#2	4.1171	1.1396	1.5888	.00548	.00074	25.666	.08591	.51347	.81805
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00264**	**.04598**	**2.2773**
Stddev	.00166	.00007	.0069
%RSD	62.850	.14233	.30286
#1	-.00382	.04602	2.2724
#2	-.00147	.04593	2.2821
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1838.7**	**3977.2**	**63537.**	**7449.2**
Stddev	1.6	6.0	98.	2.9
%RSD	.08522	.14994	.15379	.03933
#1	1839.8	3981.4	63606.	7451.2
#2	1837.6	3973.0	63467.	7447.1

Sample Name: 480-48473-B-47-H@5 Acquired: 11/14/2013 14:58:39 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00838	13.570	.03007	.05819	.86349	.00048	73.272	.02605	.35821
Stddev	.00040	.042	.00423	.00013	.00291	.00002	.042	.00009	.00000
%RSD	4.7287	.31136	14.073	.22550	.33647	3.6383	.05680	.32720	.00081
#1	.00810	13.600	.03306	.05829	.86554	.00047	73.242	.02611	.35821
#2	.00866	13.540	.02708	.05810	.86144	.00049	73.301	.02599	.35820
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.0380	2.1507	147.40	1.6094	.02380	9.5127	1.9809	.19464	.34556
Stddev	.0041	.0091	.50	.0386	.00038	.0284	.0050	.00031	.00979
%RSD	.39168	.42252	.34231	2.4016	1.6087	.29812	.25097	.15766	2.8340
#1	1.0351	2.1443	147.04	1.5821	.02407	9.4926	1.9844	.19485	.35249
#2	1.0409	2.1572	147.75	1.6367	.02353	9.5328	1.9774	.19442	.33864
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	2.9686	2.0364	2.1589	.00828	.00759	2.8333	.15895	.18199	.24019
Stddev	.0093	.0019	.0023	.00011	.00185	.0257	.00049	.00028	.00099
%RSD	.31224	.09173	.10589	1.3376	24.370	.90631	.30892	.15641	.41036
#1	2.9620	2.0350	2.1573	.00836	.00628	2.8514	.15860	.18219	.23949
#2	2.9751	2.0377	2.1605	.00820	.00890	2.8151	.15929	.18179	.24089
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	-.00186	.07997	4.5808
Stddev	.00078	.00005	.0108
%RSD	41.944	.06061	.23534
#1	-.00131	.07993	4.5884
#2	-.00242	.08000	4.5732
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1981.8	3845.7	61577.	7101.1
Stddev	3.3	8.1	10.	12.2
%RSD	.16704	.21038	.01640	.17157
#1	1984.1	3840.0	61570.	7109.8
#2	1979.4	3851.4	61584.	7092.5

Sample Name: 480-48473-A-50-B@5 Acquired: 11/14/2013 15:00:53 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	**16.959**	**.01732**	**.01237**	**.15712**	**.00112**	**11.000**	**.00045**	**.02053**
Stddev	.00012	.001	.00257	.00047	.00077	.00003	.025	.00005	.00011
%RSD	28.398	.00656	14.861	3.7749	.49204	2.7676	.22474	10.664	.55343
#1	.00033	16.958	.01550	.01204	.15657	.00110	11.018	.00042	.02045
#2	.00050	16.960	.01914	.01270	.15766	.00114	10.983	.00049	.02061
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02442**	**.06817**	**49.465**	**3.0879**	**.04713**	**8.1454**	**.87845**	**.00250**	**.16382**
Stddev	.00069	.00227	.227	.0259	.00047	.0172	.00271	.00046	.00172
%RSD	2.8160	3.3366	.45805	.83844	.99827	.21101	.30887	18.309	1.0519
#1	.02394	.06657	49.625	3.0696	.04746	8.1575	.88036	.00217	.16260
#2	.02491	.06978	49.305	3.1062	.04680	8.1332	.87653	.00282	.16504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06399**	**.09222**	**2.5352**	**-.00325**	**-.00257**	**2.9527**	**.00673**	**.03643**	**.11261**
Stddev	.00073	.00354	.0120	.00086	.00169	.0442	.00044	.00011	.00722
%RSD	1.1407	3.8396	.47416	26.334	65.745	1.4981	6.5582	.29235	6.4084
#1	.06348	.09472	2.5437	-.00386	-.00376	2.9214	.00642	.03651	.11771
#2	.06451	.08972	2.5267	-.00265	-.00137	2.9839	.00705	.03636	.10750
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00114**	**.03696**	**.24586**
Stddev	.00204	.00033	.00288
%RSD	179.42	.89089	1.1708
#1	-.00258	.03672	.24383
#2	.00031	.03719	.24790
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2095.0**	**3977.1**	**64151.**	**7222.5**
Stddev	3.7	4.2	88.	13.1
%RSD	.17714	.10456	.13645	.18107
#1	2097.6	3974.1	64089.	7213.2
#2	2092.4	3980.0	64213.	7231.7

Sample Name: 480-48473-a-51-i@5 Acquired: 11/14/2013 15:03:06 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00071**	**2.7583**	**.02653**	**.03257**	**1.6616**	**.00006**	**108.51**	**-.00089**	**.01783**
Stddev	.00004	.0189	.00216	.00004	.0053	.00010	.11	.00027	.00003
%RSD	6.0709	.68490	8.1353	.13240	.31944	155.78	.09958	30.310	.16579
#1	.00074	2.7716	.02806	.03254	1.6578	.00013	108.44	-.00070	.01781
#2	.00068	2.7449	.02501	.03260	1.6653	-.00001	108.59	-.00108	.01785
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.07080**	**1.8987**	**271.39**	**.45464**	**.00819**	**2.6410**	**1.2773**	**.00385**	**.22633**
Stddev	.00024	.0033	.90	.01061	.00083	.0057	.0030	.00007	.00968
%RSD	.33587	.17362	.33309	2.3341	10.146	.21746	.23804	1.7452	4.2774
#1	.07063	1.8964	270.75	.46214	.00761	2.6369	1.2751	.00380	.23318
#2	.07097	1.9011	272.03	.44714	.00878	2.6450	1.2794	.00389	.21949
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.16819**	**1.7742**	**7.8070**	**.07829**	**.00166**	**1.8858**	**2.4589**	**.39879**	**.08609**
Stddev	.00022	.0034	.0462	.00322	.00363	.0147	.0056	.00049	.00010
%RSD	.12894	.18894	.59219	4.1122	218.61	.78109	.22723	.12385	.11506
#1	.16834	1.7765	7.7743	.07601	.00423	1.8962	2.4549	.39844	.08602
#2	.16804	1.7718	7.8397	.08057	-.00091	1.8753	2.4628	.39914	.08616
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00231**	**.01334**	**1.3151**
Stddev	.00076	.00043	.0037
%RSD	32.734	3.2316	.28466
#1	-.00178	.01364	1.3178
#2	-.00285	.01303	1.3125
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1944.3**	**3763.8**	**60363.**	**7126.8**
Stddev	3.4	10.6	53.	5.6
%RSD	.17444	.28041	.08801	.07881
#1	1941.9	3771.2	60325.	7122.8
#2	1946.7	3756.3	60400.	7130.8

Sample Name: CCV Acquired: 11/14/2013 15:05:24 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48116**	**24.567**	**.50026**	**.48122**	**.50305**	**.48467**	**24.959**	**.49626**	**.48659**	**.49102**	**.49738**	**24.368**	**26.133**
Stddev	.00209	.150	.00914	.00009	.00163	.00242	.160	.00093	.00067	.00108	.00203	.142	.150
%RSD	.43372	.61133	1.8272	.01849	.32485	.49912	.64295	.18763	.13716	.21940	.40716	.58457	.57377
#1	.48264	24.673	.49380	.48128	.50189	.48639	25.072	.49560	.48612	.49178	.49881	24.468	26.239
#2	.47969	24.461	.50673	.48116	.50420	.48296	24.845	.49692	.48706	.49026	.49595	24.267	26.027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49789**	**23.613**	**.50110**	**.50413**	**24.751**	**.47638**	**.47527**	**25.170**	**.51190**	**.50044**	**24.417**	**.49795**	**.50474**
Stddev	.00093	.066	.00110	.00158	.110	.00071	.00476	.063	.00024	.00661	.058	.00106	.00263
%RSD	.18699	.27991	.21859	.31304	.44302	.14816	1.0014	.25069	.04734	1.3200	.23906	.21277	.52180
#1	.49855	23.659	.50187	.50301	24.828	.47687	.47864	25.126	.51207	.50511	24.458	.49870	.50660
#2	.49723	23.566	.50032	.50524	24.673	.47588	.47191	25.215	.51173	.49577	24.375	.49720	.50288
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.50935**	**.48865**	**.49026**	**.49211**
Stddev	.00143	.00145	.00342	.00231
%RSD	.28022	.29767	.69711	.47025
#1	.51036	.48967	.49268	.49375
#2	.50834	.48762	.48784	.49048
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2003.5**	**3896.0**	**62130.**	**7133.5**
Stddev	.5	6.1	103.	50.7
%RSD	.02525	.15543	.16499	.71020
#1	2003.2	3900.2	62058.	7097.7
#2	2003.9	3891.7	62203.	7169.3

Sample Name: CCB Acquired: 11/14/2013 15:07:35 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.00390**	**.00234**	**-.00147**	**.00002**	**.00020**	**.03087**	**-.00014**	**.00017**	**-.00028**	**.00082**	F **.05472**
Stddev	.00001	.02751	.00058	.00072	.00001	.00045	.06342	.00008	.00007	.00037	.00020	.08065
%RSD	15.303	704.84	24.971	49.093	38.370	226.54	205.43	59.002	38.783	133.67	24.200	147.40
#1	.00006	.02336	.00275	-.00096	.00002	.00051	.07572	-.00020	.00022	-.00002	.00068	.11174
#2	.00005	-.01555	.00192	-.00198	.00003	-.00012	-.01397	-.00008	.00012	-.00054	.00096	-.00231
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit												.05000
Low Limit												-.05000

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03971**	**.00206**	**-.00078**	**.00007**	**.00037**	**.03866**	**-.00027**	**.00011**	**-.00550**	**-.00172**	**.00118**	**.00222**
Stddev	.01179	.00243	.00380	.00006	.00004	.00609	.00022	.00018	.00093	.00057	.00138	.01780
%RSD	29.689	117.61	485.81	90.683	11.346	15.750	82.416	161.67	16.922	33.168	116.74	803.01
#1	.04805	.00035	.00190	.00011	.00034	.04297	-.00043	.00024	-.00485	-.00212	.00021	.01480
#2	.03138	.00378	-.00347	.00002	.00040	.03436	-.00011	-.00002	-.00616	-.00132	.00216	-.01037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit												
Low Limit												

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00108**	**.00039**	**.00015**	**.00005**	**-.00002**	**-.00026**
Stddev	.00010	.00056	.00001	.00024	.00050	.00044
%RSD	9.0417	143.73	5.3601	478.92	3209.7	168.34
#1	-.00101	.00078	.00014	-.00012	.00034	.00005
#2	-.00115	-.00001	.00015	.00022	-.00037	-.00057
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit						
Low Limit						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2198.7**	**3987.3**	**64433.**	**7118.6**
Stddev	.9	4.1	274.	18.4
%RSD	.03902	.10355	.42523	.25899
#1	2198.1	3984.3	64627.	7131.7
#2	2199.3	3990.2	64240.	7105.6

Sample Name: CCVL Acquired: 11/14/2013 15:09:55 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00267	.21395	.01125	.01831	.00212	.00185	.56404	.00074	.00402	.00350	.01106	.04204
Stddev	.00037	.00982	.00039	.00020	.00000	.00007	.00467	.00007	.00005	.00016	.00008	.00247
%RSD	13.941	4.5877	3.4983	1.0667	.02296	3.8970	.82708	9.2328	1.2513	4.7203	.74729	5.8715
#1	.00294	.20701	.01098	.01845	.00212	.00190	.56734	.00069	.00405	.00338	.01100	.04379
#2	.00241	.22089	.01153	.01817	.00212	.00180	.56074	.00079	.00398	.00361	.01111	.04030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.55058	.03216	.20455	F .00480	.00995	1.0248	.00968	.00559	.22784	.01824	W .02033	.43682
Stddev	.00994	.00032	.00259	.00003	.00008	.0029	.00088	.00166	.00103	.00107	.00232	.00846
%RSD	1.8045	.99740	1.2675	.72486	.83713	.28679	9.1066	29.622	.45380	5.8879	11.411	1.9369
#1	.54356	.03193	.20638	.00483	.00989	1.0269	.00905	.00676	.22857	.01900	.02197	.43083
#2	.55761	.03238	.20271	.00478	.01001	1.0227	.01030	.00442	.22711	.01748	.01869	.44280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass
Value				.00300							.01500	
Range				50.000%							30.000%	

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00754	.00507	.00422	.01960	.00474	F .03515
Stddev	.00032	.00014	.00003	.00270	.00025	.00037
%RSD	4.2348	2.8447	.72943	13.773	5.2162	1.0647
#1	.00731	.00517	.00420	.01769	.00491	.03488
#2	.00776	.00496	.00424	.02151	.00456	.03541
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value						.01000
Range						50.000%

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2240.1	4098.8	66082.	7435.3
Stddev	4.3	12.1	64.	21.6
%RSD	.19377	.29579	.09687	.29045
#1	2243.2	4107.3	66127.	7450.6
#2	2237.0	4090.2	66036.	7420.1

Sample Name: 480-48473-a-51-i@10 Acquired: 11/14/2013 15:12:13 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**1.3874**	**.01374**	**.01506**	**.83874**	**-.00005**	**54.457**	**-.00037**	**.00895**
Stddev	.00135	.0128	.00004	.00019	.00136	.00005	.104	.00007	.00006
%RSD	209.80	.92413	.31045	1.2456	.16232	103.99	.19032	18.400	.67157
#1	.00160	1.3783	.01377	.01519	.83778	-.00001	54.384	-.00042	.00900
#2	-.00031	1.3965	.01371	.01493	.83971	-.00009	54.530	-.00032	.00891
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03640**	**.93696**	**137.18**	**.21764**	**.00636**	**1.3499**	**.64125**	**.00213**	**.13302**
Stddev	.00008	.00477	.06	.04781	.00101	.0080	.00006	.00041	.00596
%RSD	.22796	.50862	.04081	21.965	15.822	.59105	.00925	19.078	4.4786
#1	.03646	.93359	137.14	.25145	.00565	1.3556	.64121	.00242	.13724
#2	.03635	.94033	137.22	.18384	.00708	1.3443	.64129	.00185	.12881
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.08301**	**.88837**	**3.8639**	**.03862**	**-.00105**	**.89254**	**1.2204**	**.20238**	**.04299**
Stddev	.00081	.00103	.0027	.00085	.00595	.01246	.0014	.00056	.00064
%RSD	.97314	.11549	.07076	2.2013	566.78	1.3961	.11138	.27472	1.4921
#1	.08244	.88910	3.8659	.03922	-.00526	.88373	1.2194	.20198	.04345
#2	.08358	.88765	3.8620	.03802	.00316	.90135	1.2213	.20277	.04254
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00104**	**.00681**	**.67154**
Stddev	.00130	.00025	.00267
%RSD	124.58	3.6365	.39765
#1	-.00012	.00698	.67343
#2	-.00196	.00663	.66965
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2032.7**	**3857.9**	**61596.**	**7077.1**
Stddev	.8	12.7	93.	28.9
%RSD	.04096	.32996	.15067	.40808
#1	2032.1	3848.9	61531.	7097.5
#2	2033.3	3866.9	61662.	7056.7

Sample Name: 480-48473-a-51-i@20 Acquired: 11/14/2013 15:14:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00001**	**.69417**	**.00902**	**.00665**	**.41993**	**.00004**	**27.547**	**-.00027**	**.00412**
Stddev	.00016	.00967	.00050	.00016	.00008	.00006	.085	.00002	.00016
%RSD	1536.3	1.3932	5.5564	2.3918	.01815	174.80	.30848	8.1763	3.8703
#1	-.00010	.70101	.00867	.00677	.41998	-.00001	27.487	-.00025	.00423
#2	.00012	.68734	.00937	.00654	.41987	.00008	27.607	-.00028	.00401
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01718**	**.47165**	**69.113**	**.10765**	**.00381**	**.66994**	**.32503**	**.00080**	**.07869**
Stddev	.00048	.00141	.045	.01012	.00088	.00138	.00009	.00005	.00751
%RSD	2.7792	.29810	.06555	9.3994	23.097	.20608	.02716	6.3883	9.5484
#1	.01751	.47264	69.081	.10050	.00444	.67092	.32510	.00083	.07338
#2	.01684	.47065	69.145	.11481	.00319	.66897	.32497	.00076	.08400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04116**	**.44209**	**1.9258**	**.01723**	**.00188**	**.41212**	**.60584**	**.10131**	**.02113**
Stddev	.00028	.00362	.0037	.00082	.00556	.00839	.00253	.00002	.00003
%RSD	.68754	.81961	.19344	4.7489	296.63	2.0357	.41710	.01748	.15190
#1	.04096	.44466	1.9232	.01665	.00581	.41805	.60762	.10132	.02115
#2	.04136	.43953	1.9284	.01781	-.00206	.40619	.60405	.10130	.02110
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00045**	**.00339**	**.33636**
Stddev	.00179	.00041	.00174
%RSD	399.82	12.081	.51874
#1	.00082	.00367	.33760
#2	-.00172	.00310	.33513
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2104.1**	**3929.2**	**63241.**	**7098.0**
Stddev	3.4	2.7	134.	1.3
%RSD	.16375	.06928	.21206	.01820
#1	2101.7	3927.3	63146.	7097.1
#2	2106.5	3931.1	63336.	7098.9

Sample Name: 480-48583-g-7-a Acquired: 11/14/2013 15:16:39 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**5.9848**	**.00836**	**.58336**	**1.5394**	**.00025**	**91.022**	**.00304**	**.03593**
Stddev	.00039	.0056	.00158	.00272	.0044	.00001	.322	.00005	.00004
%RSD	263.23	.09426	18.871	.46655	.28498	3.3304	.35414	1.7259	.11014
#1	.00042	5.9888	.00948	.58144	1.5363	.00024	91.250	.00301	.03590
#2	-.00013	5.9808	.00725	.58529	1.5425	.00025	90.794	.00308	.03596
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576-2	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00766**	**.16355**	**9.6391**	**28.998**	**.00851**	**19.768**	**40.611**	**.04969**	**40.854**
Stddev	.00021	.00005	.0605	.088	.00138	.014	.013	.00063	.042
%RSD	2.7739	.03120	.62774	.30393	16.205	.07295	.03238	1.2630	.10389
#1	.00781	.16352	9.6819	28.936	.00754	19.758	40.602	.05014	40.824
#2	.00751	.16359	9.5963	29.060	.00949	19.778	40.621	.04925	40.884
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06709**	**.01443**	**19.882**	**-.00277**	**.01367**	**14.896**	**.00141**	**.33994**	**.26026**
Stddev	.00014	.00065	.101	.00238	.00197	.062	.00042	.00036	.00277
%RSD	.21104	4.5213	.50654	85.964	14.429	.41784	29.853	.10445	1.0636
#1	.06719	.01489	19.811	-.00109	.01227	14.940	.00170	.33968	.25830
#2	.06699	.01397	19.953	-.00446	.01506	14.852	.00111	.34019	.26221
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.01653**	**.02767**	**.06280**
Stddev	.00064	.00038	.00158
%RSD	3.8974	1.3674	2.5112
#1	-.01699	.02740	.06169
#2	-.01608	.02793	.06392
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1935.6**	**3988.8**	**64201.**	**7510.3**
Stddev	4.0	11.7	52.	8.3
%RSD	.20433	.29240	.08077	.11110
#1	1932.8	3997.0	64237.	7504.4
#2	1938.4	3980.5	64164.	7516.2

Sample Name: 480-49623-c-1-c Acquired: 11/14/2013 15:19:01 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00450**	**.00079**	**.77916**	**.74703**	**.61646**	**-.00011**	**56.377**	F **-.00456**	**.01071**
Stddev	.00029	.01451	.00110	.00088	.00068	.00001	.198	.00023	.00053
%RSD	6.4498	1827.1	.14106	.11730	.11007	8.6410	.35077	5.1005	4.9047
#1	.00470	.01106	.77838	.74765	.61598	-.00011	56.517	-.00473	.01108
#2	.00429	-.00947	.77994	.74641	.61694	-.00010	56.237	-.00440	.01033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576-2	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}2	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00395**	**.00813**	**411.05**	**7.1996**	**.17431**	**4.5293**	**28.312**	**-.00394**	**1518.2**
Stddev	.00068	.00037	1.05	.0148	.00080	.0178	.030	.00018	2.4
%RSD	17.127	4.5303	.25431	.20549	.45793	.39389	.10430	4.4452	.15811
#1	.00443	.00839	411.79	7.2101	.17487	4.5419	28.292	-.00382	1519.9
#2	.00347	.00787	410.31	7.1891	.17374	4.5167	28.333	-.00406	1516.5
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04695**	**.00821**	**38.042**	**-.00066**	**.02274**	**2.0618**	**.00767**	**4.6536**	**-.00001**
Stddev	.00064	.00191	.039	.00061	.00431	.0042	.00046	.0034	.00027
%RSD	1.3534	23.261	.10234	91.955	18.941	.20257	6.0318	.07423	2507.3
#1	.04650	.00956	38.070	-.00109	.02578	2.0647	.00734	4.6560	-.00020
#2	.04740	.00686	38.015	-.00023	.01969	2.0588	.00799	4.6511	.00018
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.01763**	**.00350**	**.72122**
Stddev	.00284	.00080	.00144
%RSD	16.088	22.967	.19916
#1	-.01963	.00406	.72020
#2	-.01562	.00293	.72223
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1584.9**	**3391.0**	**52365.**	**7395.1**
Stddev	4.0	3.7	101.	14.0
%RSD	.24999	.10884	.19354	.18966
#1	1582.0	3388.4	52437.	7385.2
#2	1587.7	3393.6	52293.	7405.0

Sample Name: 480-49711-a-6-b@5 Acquired: 11/14/2013 15:21:27 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00037**	**.02044**	**.00427**	**.00353**	**.82821**	**-.00018**	**1.2889**	**.00171**	**.00177**
Stddev	.00080	.00466	.00105	.00018	.00177	.00008	.0594	.00001	.00014
%RSD	217.76	22.792	24.464	5.1503	.21317	43.903	4.6077	.59137	7.9081
#1	.00093	.01715	.00501	.00340	.82696	-.00013	1.3308	.00172	.00186
#2	-.00020	.02374	.00353	.00366	.82946	-.00024	1.2469	.00170	.00167
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00805**	**.00348**	**55.601**	**.07127**	**.00225**	**.02764**	**.31683**	**-.00024**	**303.03**
Stddev	.00055	.00004	.605	.03229	.00090	.00070	.00117	.00008	.51
%RSD	6.8318	1.2095	1.0877	45.310	40.114	2.5177	.36933	32.939	.16839
#1	.00844	.00351	56.029	.09411	.00288	.02813	.31766	-.00029	303.39
#2	.00766	.00345	55.174	.04844	.00161	.02715	.31600	-.00018	302.67
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00423**	**-.00018**	**.22749**	**-.00215**	**.00058**	**.15627**	**.00019**	**.01636**	**-.00047**
Stddev	.00010	.00228	.00268	.00136	.00212	.02205	.00003	.00403	.00011
%RSD	2.2839	1295.8	1.1759	63.388	362.06	14.113	15.461	24.643	23.325
#1	.00416	-.00179	.22938	-.00118	.00208	.14068	.00017	.01921	-.00039
#2	.00430	.00144	.22560	-.00311	-.00091	.17186	.00021	.01351	-.00055
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00087**	**.00014**	**2.4571**
Stddev	.00017	.00005	.0003
%RSD	19.014	36.898	.01124
#1	-.00099	.00011	2.4573
#2	-.00075	.00018	2.4569
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1876.5**	**3773.8**	**59004.**	**7248.6**
Stddev	1.4	7.2	40.	5.7
%RSD	.07457	.19176	.06784	.07840
#1	1877.5	3768.7	59033.	7252.6
#2	1875.5	3778.9	58976.	7244.6

Sample Name: 49711-a-6-b SD@25 Acquired: 11/14/2013 15:23:52 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**-.01831**	**.00254**	**-.00019**	**.16198**	**-.00008**	**.24086**	**.00024**	**.00037**
Stddev	.00028	.01205	.00052	.00008	.00005	.00001	.00136	.00016	.00009
%RSD	312.41	65.811	20.398	43.627	.02915	19.127	.56567	65.725	25.520
#1	.00029	-.00979	.00291	-.00013	.16202	-.00007	.24183	.00013	.00044
#2	-.00011	-.02683	.00217	-.00025	.16195	-.00009	.23990	.00035	.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00174**	**.00132**	**11.379**	**.02034**	**.00184**	**.00724**	**.06344**	**.00011**	**61.955**
Stddev	.00017	.00002	.002	.01806	.00096	.00044	.00015	.00012	.286
%RSD	9.5116	1.6283	.01330	88.803	52.303	6.0642	.24210	109.16	.46196
#1	.00163	.00134	11.380	.00757	.00252	.00693	.06355	.00019	61.753
#2	.00186	.00131	11.378	.03311	.00116	.00755	.06333	.00003	62.157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00125**	**-.00009**	**.04612**	**-.00368**	**.00272**	**-.01889**	**-.00122**	**.00269**	**-.00022**
Stddev	.00044	.00227	.00128	.00005	.00559	.02550	.00049	.00008	.00004
%RSD	35.330	2650.8	2.7835	1.2744	205.48	135.02	40.578	3.0492	17.134
#1	.00094	.00152	.04703	-.00364	-.00123	-.03692	-.00087	.00274	-.00019
#2	.00156	-.00169	.04521	-.00371	.00667	-.00086	-.00156	.00263	-.00024
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00031**	**-.00012**	**.48213**
Stddev	.00059	.00049	.00165
%RSD	188.69	405.18	.34135
#1	.00010	.00023	.48329
#2	-.00073	-.00047	.48096
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2055.5**	**3897.3**	**62061.**	**7184.2**
Stddev	1.3	9.8	77.	19.4
%RSD	.06532	.25031	.12335	.27049
#1	2054.5	3904.2	62115.	7170.5
#2	2056.4	3890.4	62007.	7197.9

Sample Name: 49711-a-6-b PDS@5 Acquired: 11/14/2013 15:26:06 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0002**	**.00233**	**1.0732**	**-.00749**	**1.8440**	**.98384**	**1.1659**	**1.0459**	**1.0375**
Stddev	.0018	.02042	.0067	.00022	.0031	.00002	.0030	.0039	.0020
%RSD	.17601	875.26	.62331	2.9707	.16986	.00212	.25758	.37643	.19601
#1	1.0014	.01677	1.0685	-.00733	1.8418	.98385	1.1681	1.0431	1.0360
#2	.99891	-.01210	1.0779	-.00765	1.8462	.98383	1.1638	1.0486	1.0389
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0168**	**1.0338**	**51.760**	**.07601**	**.00303**	**.01450**	**1.3108**	**1.0404**	**281.61**
Stddev	.0007	.0006	.056	.00413	.00008	.00012	.0027	.0023	.03
%RSD	.07060	.05687	.10874	5.4401	2.5661	.80982	.20631	.22149	.01033
#1	1.0163	1.0342	51.720	.07893	.00297	.01442	1.3088	1.0388	281.63
#2	1.0174	1.0334	51.800	.07308	.00308	.01459	1.3127	1.0421	281.59
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.99817**	**.98612**	**.21572**	**1.0312**	**1.0886**	**.14764**	**.00030**	**.01256**	**.00073**
Stddev	.00483	.00490	.00246	.0044	.0042	.02655	.00043	.00005	.00006
%RSD	.48348	.49675	1.1426	.42801	.38100	17.984	143.75	.41572	7.9774
#1	.99476	.98266	.21397	1.0343	1.0857	.16641	.00000	.01252	.00069
#2	1.0016	.98959	.21746	1.0281	1.0915	.12887	.00060	.01259	.00077
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.99051**	**1.0517**	**3.2687**
Stddev	.00242	.0006	.0068
%RSD	.24431	.06127	.20773
#1	.99223	1.0513	3.2639
#2	.98880	1.0522	3.2735
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1877.7**	**3765.1**	**59439.**	**7300.6**
Stddev	4.3	13.2	32.	33.7
%RSD	.23053	.35189	.05338	.46144
#1	1880.7	3774.5	59462.	7324.4
#2	1874.6	3755.8	59417.	7276.8

Sample Name: 49711-A-6-C MS@5 Acquired: 11/14/2013 15:28:31 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.18986**	**.03287**	**.20086**	**.00106**	**1.0263**	**.18322**	**1.2539**	**.19768**	**.19525**
Stddev	.00053	.00242	.00080	.00098	.0032	.00096	.0005	.00026	.00022
%RSD	.28084	7.3694	.39909	93.135	.31711	.52615	.04194	.13229	.11372
#1	.18948	.03115	.20029	.00175	1.0286	.18391	1.2543	.19787	.19509
#2	.19024	.03458	.20142	.00036	1.0240	.18254	1.2535	.19750	.19541
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19888**	**.19630**	**55.863**	**.09602**	**.00238**	**.02704**	**.50764**	**.19346**	**305.40**
Stddev	.00163	.00024	.071	.01671	.00018	.00240	.00148	.00063	1.49
%RSD	.82050	.12456	.12679	17.398	7.4840	8.8580	.29231	.32551	.48911
#1	.19773	.19612	55.913	.08421	.00225	.02873	.50659	.19301	306.45
#2	.20003	.19647	55.813	.10783	.00250	.02535	.50869	.19390	304.34
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19164**	**.18724**	**.22385**	**.19490**	**.20646**	**.14954**	**-.00073**	**.21472**	**-.00028**
Stddev	.00021	.00409	.00068	.00074	.00474	.01043	.00037	.00058	.00003
%RSD	.10964	2.1836	.30317	.38080	2.2965	6.9764	50.882	.26866	9.8891
#1	.19179	.19013	.22338	.19438	.20982	.14216	-.00047	.21513	-.00026
#2	.19149	.18434	.22433	.19543	.20311	.15691	-.00099	.21432	-.00030
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.18399**	**.19606**	**2.6593**
Stddev	.00148	.00129	.0080
%RSD	.80454	.65572	.30171
#1	.18294	.19515	2.6536
#2	.18504	.19697	2.6650
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1871.6**	**3762.3**	**58792.**	**7293.7**
Stddev	.4	4.3	206.	43.2
%RSD	.02138	.11555	.35038	.59287
#1	1871.4	3765.4	58938.	7263.1
#2	1871.9	3759.3	58647.	7324.3

Sample Name: 49711-a-6-d msd@5 Acquired: 11/14/2013 15:30:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19325**	**.03888**	**.20476**	**.00061**	**1.0403**	**.18671**	**1.2709**	**.20138**	**.19918**
Stddev	.00085	.04435	.00174	.00043	.0012	.00046	.0026	.00014	.00015
%RSD	.43808	114.06	.85000	70.233	.11449	.24684	.20278	.06824	.07385
#1	.19385	.07024	.20353	.00031	1.0411	.18639	1.2727	.20128	.19928
#2	.19266	.00752	.20599	.00091	1.0395	.18704	1.2691	.20148	.19907
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20171**	**.19995**	**56.522**	**.03106**	**.00116**	**.03357**	**.51194**	**.19714**	**307.58**
Stddev	.00009	.00043	.008	.00795	.00125	.00423	.00097	.00098	.87
%RSD	.04696	.21259	.01400	25.598	107.75	12.608	.18985	.49743	.28138
#1	.20178	.19965	56.528	.02544	.00028	.03656	.51125	.19644	308.19
#2	.20164	.20025	56.516	.03668	.00204	.03057	.51262	.19783	306.96
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19537**	**.19023**	**.22603**	**.19693**	**.21429**	**.14405**	**-.00008**	**.21750**	**-.00050**
Stddev	.00010	.00003	.00185	.00115	.00803	.00758	.00075	.00024	.00011
%RSD	.04959	.01413	.81788	.58331	3.7461	5.2619	926.24	.10833	22.485
#1	.19530	.19025	.22734	.19774	.20861	.13869	.00045	.21733	-.00058
#2	.19544	.19021	.22473	.19612	.21997	.14941	-.00061	.21766	-.00042
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.18989**	**.19922**	**2.6773**
Stddev	.00150	.00022	.0017
%RSD	.79045	.11175	.06512
#1	.19095	.19938	2.6761
#2	.18883	.19907	2.6786
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1876.6**	**3777.7**	**59085.**	**7248.3**
Stddev	1.0	16.8	122.	20.9
%RSD	.05149	.44341	.20702	.28852
#1	1877.2	3789.6	59172.	7233.5
#2	1875.9	3765.9	58999.	7263.1

Sample Name: CCV Acquired: 11/14/2013 15:33:25 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48008	24.668	.50204	.47729	.51032	.48504	24.936	.49631	.48624	.48939	.49506	24.255	26.099
Stddev	.00094	.158	.00453	.00003	.00034	.00087	.035	.00093	.00000	.00212	.00084	.072	.094
%RSD	.19592	.64016	.90330	.00539	.06760	.17974	.14175	.18745	.00058	.43366	.16891	.29685	.35978
#1	.48074	24.557	.49883	.47727	.51056	.48443	24.911	.49565	.48624	.49089	.49565	24.204	26.033
#2	.47941	24.780	.50524	.47731	.51008	.48566	24.961	.49697	.48624	.48789	.49446	24.306	26.166
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50040	23.474	.50343	.50405	24.899	.47391	.47398	25.025	.51345	.49633	24.424	.49979	.50457
Stddev	.00101	.053	.00300	.00088	.056	.00131	.00309	.091	.00045	.00187	.164	.00088	.00015
%RSD	.20260	.22424	.59573	.17470	.22395	.27662	.65200	.36500	.08791	.37708	.66979	.17693	.02914
#1	.49968	23.511	.50555	.50343	24.939	.47484	.47179	24.960	.51313	.49766	24.309	.50041	.50447
#2	.50111	23.437	.50131	.50467	24.860	.47298	.47616	25.090	.51377	.49501	24.540	.49916	.50468
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50768	.48945	.48785	.48993
Stddev	.00125	.00343	.00084	.00088
%RSD	.24581	.69996	.17137	.17920
#1	.50680	.49187	.48844	.49055
#2	.50856	.48703	.48726	.48931
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2001.4	3892.4	61823.	7085.8
Stddev	1.3	12.1	152.	14.1
%RSD	.06689	.31125	.24623	.19962
#1	2000.5	3901.0	61716.	7095.8
#2	2002.4	3883.9	61931.	7075.8

Sample Name: CCB Acquired: 11/14/2013 15:35:34 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00028**	**-.00620**	**.00283**	**-.00130**	**.00002**	**-.00001**	**-.00967**	**.00011**	**.00001**	**.00039**	**.00120**	**-.00074**	**.02282**
Stddev	.00011	.01422	.00017	.00012	.00004	.00006	.01036	.00003	.00002	.00001	.00014	.00449	.01589
%RSD	37.143	229.35	6.0428	8.9745	202.64	777.79	107.13	30.187	335.11	3.5232	11.972	606.13	69.627
#1	-.00036	-.01626	.00295	-.00121	.00005	.00004	-.00235	.00009	-.00001	.00038	.00131	.00243	.01158
#2	-.00021	.00385	.00271	-.00138	-.00001	-.00005	-.01700	.00014	.00002	.00039	.00110	-.00392	.03405
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00201**	**.00279**	**.00009**	**.00015**	**.04151**	**.00091**	**-.00051**	**-.00244**	**-.00216**	**.00509**	**-.02172**	**-.00188**	**.00014**
Stddev	.00105	.00794	.00006	.00035	.01381	.00049	.00089	.00322	.00023	.00021	.00540	.00017	.00018
%RSD	52.191	284.26	61.701	232.83	33.283	54.116	176.35	131.83	10.570	4.0383	24.867	8.8702	128.97
#1	.00276	.00840	.00005	-.00010	.05127	.00125	.00013	-.00017	-.00232	.00494	-.01790	-.00200	.00027
#2	.00127	-.00282	.00013	.00040	.03174	.00056	-.00114	-.00472	-.00200	.00524	-.02554	-.00176	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00000**	**.00001**	**.00050**	**-.00071**
Stddev	.0006	.00158	.00031	.00089
%RSD	39608.	22536.	63.006	124.35
#1	-.00045	.00112	.00072	-.00134
#2	.00044	-.00111	.00027	-.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2210.0**	**4000.5**	**64275.**	**7083.3**
Stddev	1.3	.3	60.	6.9
%RSD	.06092	.00667	.09279	.09801
#1	2209.1	4000.4	64233.	7078.4
#2	2211.0	4000.7	64317.	7088.2

Sample Name: CCVL Acquired: 11/14/2013 15:37:56 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00259**	**.16448**	**.01248**	**.01775**	**.00200**	**.00174**	**.48767**	**.00085**	**.00391**	**.00335**	**.01094**	**.04240**
Stddev	.00007	.00607	.00239	.00058	.00001	.00008	.00177	.00008	.00024	.00042	.00000	.00281
%RSD	2.6289	3.6909	19.110	3.2918	.59589	4.8672	.36334	9.2979	6.0980	12.498	.00373	6.6376
#1	.00254	.16878	.01080	.01817	.00200	.00168	.48892	.00090	.00408	.00306	.01094	.04439
#2	.00264	.16019	.01417	.01734	.00199	.00180	.48641	.00079	.00374	.00365	.01094	.04041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.54679**	**.02987**	**.19641**	**.00316**	**.00972**	**1.0041**	**.00936**	W **.00251**	**.20356**	**.01742**	**.01948**	**.43419**
Stddev	.00349	.00064	.00320	.00005	.00047	.0027	.00019	.00041	.00329	.00071	.00438	.00068
%RSD	.63883	2.1466	1.6302	1.6444	4.8101	.26431	1.9813	16.502	1.6159	4.0626	22.499	.15575
#1	.54432	.02942	.19867	.00312	.01006	1.0022	.00949	.00280	.20589	.01692	.01638	.43467
#2	.54926	.03032	.19415	.00319	.00939	1.0059	.00923	.00222	.20123	.01792	.02257	.43371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00710**	**.00501**	**.00426**	**.02015**	**.00475**	**.01009**
Stddev	.00075	.00012	.00026	.00206	.00002	.00052
%RSD	10.533	2.3255	6.1998	10.224	.50742	5.1601
#1	.00657	.00493	.00407	.01870	.00473	.01045
#2	.00762	.00509	.00444	.02161	.00477	.00972
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2247.8**	**4098.4**	**66177.**	**7356.5**
Stddev	3.3	.7	78.	23.7
%RSD	.14827	.01676	.11839	.32196
#1	2250.2	4097.9	66232.	7373.2
#2	2245.5	4098.8	66122.	7339.7

Sample Name: 480-49725-A-1-C@5 Acquired: 11/14/2013 15:40:14 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**.34984**	**.00107**	**.12014**	**.04776**	**.00000**	**85.964**	**.00009**	**.00165**
Stddev	.00019	.00422	.00184	.00053	.00011	.00004	.297	.00003	.00042
%RSD	53.240	1.2067	172.04	.44159	.23211	848.43	.34591	37.033	25.630
#1	.00022	.34685	-.00023	.12052	.04768	.00003	85.754	.00011	.00135
#2	.00049	.35282	.00237	.11977	.04784	-.00002	86.174	.00007	.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00137**	**.00243**	**.31145**	**4.2378**	**.01019**	**10.010**	**.24634**	**.00556**	**315.26**
Stddev	.00035	.00028	.00516	.0297	.00127	.018	.00002	.00005	.33
%RSD	25.141	11.400	1.6556	.70143	12.453	.17536	.00795	.91402	.10394
#1	.00162	.00223	.30780	4.2167	.01109	9.9979	.24633	.00559	315.03
#2	.00113	.00262	.31509	4.2588	.00930	10.023	.24635	.00552	315.49
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00765**	**.00390**	**10.385**	**-.00357**	**.00362**	**9.0264**	**-.00149**	**.23261**	**.01371**
Stddev	.00000	.00214	.013	.00018	.00108	.1971	.00004	.00051	.00031
%RSD	.00724	54.899	.12710	5.0983	29.710	2.1842	2.9182	.21877	2.2828
#1	.00765	.00239	10.394	-.00344	.00438	9.1658	-.00146	.23225	.01349
#2	.00765	.00542	10.375	-.00370	.00286	8.8870	-.00152	.23297	.01393
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00224**	**.00490**	**.02729**
Stddev	.00069	.00009	.00123
%RSD	30.702	1.8034	4.4989
#1	-.00175	.00496	.02642
#2	-.00272	.00483	.02816
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1826.3**	**3694.8**	**58114.**	**7165.3**
Stddev	3.4	7.6	75.	5.9
%RSD	.18369	.20664	.12987	.08293
#1	1828.7	3689.4	58060.	7161.1
#2	1823.9	3700.2	58167.	7169.5

Sample Name: 480-49725-A-1-C@10 Acquired: 11/14/2013 15:42:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**.19000**	**.00056**	**.06019**	**.02472**	**-.00001**	**43.922**	**-.00001**	**.00076**
Stddev	.00108	.00486	.00127	.00014	.00009	.00001	.370	.00007	.00015
%RSD	815.89	2.5597	229.07	.23047	.37155	53.560	.84307	1350.8	20.441
#1	-.00090	.19344	.00146	.06029	.02466	-.00002	44.184	-.00006	.00065
#2	.00063	.18656	-.00034	.06009	.02479	-.00001	43.660	.00005	.00087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00072**	**.00240**	**.16450**	**2.1636**	**.00714**	**5.1134**	**.12613**	**.00252**	**161.41**
Stddev	.00075	.00013	.00219	.0222	.00083	.0213	.00050	.00003	.19
%RSD	104.03	5.3542	1.3286	1.0268	11.682	.41711	.39699	1.0018	.11594
#1	.00019	.00231	.16605	2.1793	.00655	5.0983	.12578	.00254	161.27
#2	.00125	.00249	.16296	2.1479	.00773	5.1284	.12649	.00250	161.54
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00345**	**.00119**	**5.1529**	**-.00146**	**.00300**	**4.6640**	**-.00157**	**.11786**	**.00790**
Stddev	.00009	.00213	.0097	.00124	.00406	.0584	.00022	.00017	.00056
%RSD	2.5134	178.48	.18799	84.939	135.43	1.2519	13.728	.14177	7.0975
#1	.00339	-.00031	5.1460	-.00058	.00013	4.7053	-.00142	.11798	.00750
#2	.00351	.00270	5.1597	-.00234	.00588	4.6227	-.00173	.11775	.00829
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00072**	**.00237**	**.01464**
Stddev	.00256	.00041	.00026
%RSD	356.82	17.515	1.7547
#1	-.00109	.00266	.01482
#2	.00253	.00208	.01446
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1936.5**	**3799.3**	**59928.**	**7119.0**
Stddev	.7	4.6	38.	34.3
%RSD	.03794	.12018	.06331	.48206
#1	1937.0	3802.5	59901.	7094.7
#2	1936.0	3796.1	59955.	7143.2

Sample Name: 480-49728-A-1-B@5 Acquired: 11/14/2013 15:44:49 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00068**	**-.00973**	**.00155**	**.00971**	**.27727**	**-.00007**	**8.6927**	**.22848**	**.02160**
Stddev	.00008	.02176	.00014	.00043	.00068	.00008	.0118	.00006	.00040
%RSD	12.467	223.61	9.2911	4.4761	.24406	118.96	.13550	.02782	1.8571
#1	.00074	.00566	.00145	.00941	.27679	-.00012	8.6844	.22852	.02189
#2	.00062	-.02512	.00165	.01002	.27775	-.00001	8.7011	.22843	.02132
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00090**	**.01240**	**67.051**	**.26175**	**.00508**	**.09937**	**.43145**	**-.00011**	**306.56**
Stddev	.00012	.00027	.532	.00594	.00065	.00190	.00019	.00005	1.24
%RSD	13.360	2.1657	.79338	2.2683	12.725	1.9116	.04292	45.767	.40373
#1	.00099	.01221	66.675	.25756	.00554	.09802	.43158	-.00014	307.43
#2	.00082	.01259	67.427	.26595	.00463	.10071	.43131	-.00007	305.68
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05140**	**.03915**	**.58046**	**-.00087**	**.00274**	**.00383**	**.00071**	**.01087**	**-.00070**
Stddev	.00052	.00025	.00597	.00094	.00239	.00215	.00039	.00003	.00016
%RSD	1.0032	.64374	1.0284	108.36	87.148	56.122	54.580	.28289	22.804
#1	.05103	.03933	.57623	-.00153	.00442	.00535	.00043	.01085	-.00058
#2	.05176	.03897	.58468	-.00020	.00105	.00231	.00098	.01089	-.00081
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00108**	**.00023**	F **74.949**
Stddev	.00087	.00021	.234
%RSD	80.669	88.939	.31275
#1	-.00046	.00009	75.115
#2	-.00170	.00038	74.783
Check ?	Chk Pass	Chk Pass	Chk Fail
High Limit			20.000
Low Limit			-.01000

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1864.8**	**3757.3**	**58988.**	**7222.1**
Stddev	5.2	19.3	51.	23.6
%RSD	.28129	.51493	.08630	.32624
#1	1868.5	3771.0	58952.	7205.4
#2	1861.1	3743.6	59024.	7238.7

Sample Name: 480-48969-C-1-A Acquired: 11/14/2013 15:47:05 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00010**	**.03167**	**.00036**	**1.7989**	**.00695**	**-.00012**	**214.90**	**.00043**	**.00006**
Stddev	.00010	.03330	.00179	.0040	.00002	.00000	1.50	.00043	.00004
%RSD	102.10	105.15	498.10	.22100	.30308	3.1426	.69611	99.486	58.430
#1	-.00003	.05522	-.00091	1.7961	.00697	-.00011	215.96	.00073	.00004
#2	-.00017	.00812	.00163	1.8017	.00694	-.00012	213.85	.00013	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00086**	**.00243**	**.02718**	**2.0227**	**.04433**	**121.15**	**.00975**	**-.00002**	**122.30**
Stddev	.00005	.00033	.01924	.0026	.00022	.08	.00011	.00009	.07
%RSD	5.4092	13.431	70.800	.12684	.49441	.07003	1.1572	513.35	.05856
#1	.00089	.00220	.04079	2.0246	.04417	121.09	.00983	-.00008	122.35
#2	.00083	.00267	.01357	2.0209	.04448	121.21	.00968	.00005	122.24
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00151**	**.00531**	**326.33**	**-.00154**	**.00077**	**16.517**	**-.00186**	**.46205**	**.00157**
Stddev	.00007	.00058	.96	.00448	.00580	.170	.00007	.00200	.00020
%RSD	4.3141	10.902	.29387	289.68	754.25	1.0316	3.5157	.43334	12.806
#1	.00156	.00490	325.65	-.00471	.00487	16.637	-.00182	.46347	.00143
#2	.00147	.00572	327.01	.00162	-.00333	16.396	-.00191	.46064	.00171
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00056**	**-.00017**	**.00390**
Stddev	.00040	.00080	.00118
%RSD	70.906	475.50	30.278
#1	.00028	.00040	.00473
#2	.00084	-.00073	.00306
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1823.2**	**3643.8**	**58483.**	**7189.6**
Stddev	2.8	16.0	8.	39.1
%RSD	.15195	.43867	.01421	.54339
#1	1825.2	3655.2	58477.	7161.9
#2	1821.3	3632.5	58489.	7217.2

Sample Name: 480-48969-C-2-A@2 Acquired: 11/14/2013 15:49:15 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00147**	**.04653**	**.00282**	**.52127**	**.00573**	**.00004**	**76.869**	F **-.00256**	**.12717**
Stddev	.00078	.02171	.00169	.00105	.00000	.00000	.224	.00020	.00021
%RSD	52.903	46.658	59.899	.20209	.00275	6.3537	.29097	7.9895	.16893
#1	.00092	.03118	.00401	.52052	.00573	.00004	77.027	-.00271	.12701
#2	.00202	.06188	.00162	.52201	.00573	.00004	76.711	-.00242	.12732
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576-2	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00225**	**.00399**	**241.22**	**3.2164**	**.00332**	**44.467**	**29.529**	**-.00344**	**46.794**
Stddev	.00059	.00042	.74	.0142	.00034	.043	.153	.00009	.012
%RSD	26.304	10.580	.30480	.44133	10.162	.09758	.51876	2.7479	.02585
#1	-.00183	.00369	241.74	3.2264	.00309	44.498	29.638	-.00338	46.803
#2	-.00267	.00429	240.70	3.2063	.00356	44.437	29.421	-.00351	46.786
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03918**	**.00122**	**259.99**	**-.00415**	**.00815**	**3.1287**	**.00218**	**.21770**	**-.00032**
Stddev	.00024	.00146	.30	.00017	.00096	.0109	.00054	.00080	.00005
%RSD	.60835	119.65	.11679	4.0053	11.827	.34800	24.737	.36584	14.246
#1	.03901	.00225	259.77	-.00403	.00883	3.1210	.00256	.21827	-.00035
#2	.03935	.00019	260.20	-.00427	.00747	3.1364	.00179	.21714	-.00029
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.01272**	**.00189**	**.04979**
Stddev	.00294	.00005	.00211
%RSD	23.118	2.7968	4.2382
#1	-.01480	.00185	.05128
#2	-.01064	.00192	.04829
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1924.0**	**3766.7**	**60977.**	**7198.8**
Stddev	1.4	5.0	48.	.3
%RSD	.07269	.13301	.07950	.00366
#1	1923.0	3770.2	60943.	7198.6
#2	1925.0	3763.1	61011.	7199.0

Sample Name: 480-48966-P-1-A@10 Acquired: 11/14/2013 15:51:29 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**.00060**	**-.00301**	**.04644**	F **100.02**	**-.00016**	**137.67**	F **-.00287**	F **-.01233**
Stddev	.00044	.01606	.00642	.00033	.36	.00016	.57	.00004	.00018
%RSD	183.22	2694.6	213.50	.71861	.35935	105.75	.41610	1.3743	1.4904
#1	-.00007	-.01076	.00153	.04667	99.765	-.00027	138.07	-.00284	-.01220
#2	.00055	.01195	-.00755	.04620	100.27	-.00004	137.26	-.00290	-.01246
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Fail	Chk Fail
High Limit					10.000			5.0000	20.000
Low Limit					-.00200			-.00100	-.00400

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00062**	**.00241**	**.97427**	**1.9410**	**1.2630**	**9.5583**	**.05862**	**.00002**	**435.78**
Stddev	.00024	.00039	.01105	.0834	.0040	.0058	.00047	.00003	2.27
%RSD	38.207	16.135	1.1339	4.2959	.32007	.06056	.80506	129.38	.52135
#1	.00079	.00269	.98208	2.0000	1.2659	9.5624	.05829	.00000	437.39
#2	.00045	.00214	.96646	1.8821	1.2601	9.5542	.05895	.00004	434.17
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00029**	**.00255**	**.01791**	**-.00220**	**.00432**	**.07022**	**-.00087**	F **44.787**	**.00022**
Stddev	.00074	.00147	.00181	.00065	.00516	.01005	.00031	.386	.00056
%RSD	258.27	57.609	10.124	29.486	119.25	14.312	35.912	.86182	259.62
#1	-.00024	.00151	.01663	-.00174	.00797	.06311	-.00110	45.060	.00061
#2	.00081	.00359	.01920	-.00266	.00068	.07732	-.00065	44.514	-.00018
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								10.000	
Low Limit								-.00500	

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00305**	**-.00007**	**.00058**
Stddev	.00158	.00069	.00060
%RSD	51.833	1022.5	103.31
#1	-.00417	-.00055	.00016
#2	-.00193	.00042	.00100
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1707.4**	**3551.9**	**55967.**	**7134.4**
Stddev	1.6	9.1	23.	17.4
%RSD	.09378	.25706	.04073	.24326
#1	1708.5	3545.5	55983.	7122.2
#2	1706.2	3558.4	55951.	7146.7

Sample Name: blank Acquired: 11/14/2013 15:54:00 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**-.01914**	**.00230**	**-.00070**	**.00479**	**-.00010**	**-.01285**	**-.00011**	**.00034**
Stddev	.00016	.00184	.00308	.00025	.00618	.00007	.00199	.00002	.00008
%RSD	67.522	9.5915	133.75	35.917	129.12	70.693	15.476	20.901	25.058
#1	.00034	-.02044	.00448	-.00052	.00042	-.00015	-.01425	-.00013	.00028
#2	.00012	-.01785	.00012	-.00088	.00916	-.00005	-.01144	-.00010	.00040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00037**	**.00138**	**-.00673**	**.01448**	**.00257**	**.00325**	**.00006**	**.00004**	**.06415**
Stddev	.00038	.00009	.00334	.00301	.00097	.00001	.00004	.00030	.00229
%RSD	102.36	6.3361	49.677	20.798	37.688	.15803	63.701	768.03	3.5624
#1	.00064	.00144	-.00437	.01661	.00326	.00324	.00008	.00025	.06576
#2	.00010	.00131	-.00910	.01235	.00189	.00325	.00003	-.00017	.06253
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00032**	**-.00088**	**.00634**	**-.00265**	**.00335**	**-.05437**	**-.00155**	**.00069**	**-.00020**
Stddev	.00014	.00131	.00005	.00029	.00321	.00329	.00030	.00011	.00013
%RSD	43.029	148.19	.72603	10.811	95.776	6.0477	19.545	16.009	65.560
#1	.00042	.00004	.00630	-.00285	.00108	-.05204	-.00134	.00061	-.00029
#2	.00022	-.00181	.00637	-.00245	.00562	-.05669	-.00177	.00076	-.00011
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00036**	**.00014**	**.00001**
Stddev	.00078	.00034	.00000
%RSD	218.37	242.50	35.795
#1	-.00019	.00039	.00001
#2	.00091	-.00010	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2207.8**	**4004.9**	**64480.**	**7064.2**
Stddev	.4	1.8	254.	45.1
%RSD	.01874	.04378	.39362	.63912
#1	2207.5	4006.2	64301.	7096.1
#2	2208.1	4003.7	64660.	7032.3

Sample Name: blank Acquired: 11/14/2013 15:56:17 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**-.01980**	**.00246**	**-.00093**	**.00667**	**-.00011**	**.44394**	**.00000**	**.00028**
Stddev	.00023	.00109	.00062	.00017	.00087	.00006	.43185	.00007	.00005
%RSD	138.81	5.5155	25.152	18.798	13.033	59.001	97.278	47316.	17.575
#1	-.00032	-.02057	.00202	-.00105	.00606	-.00015	.74930	.00005	.00025
#2	.00000	-.01902	.00290	-.00081	.00729	-.00006	.13857	-.00005	.00032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**.00156**	**.16793**	**-.00551**	**.00546**	**.00573**	**.00126**	**.00020**	**1.3144**
Stddev	.00026	.00024	.06551	.00222	.00355	.00046	.00012	.00009	1.3425
%RSD	156.09	15.123	39.008	40.378	65.013	8.0522	9.4758	48.252	102.14
#1	-.00035	.00140	.21426	-.00708	.00797	.00541	.00118	.00026	2.2638
#2	.00002	.00173	.12161	-.00394	.00295	.00606	.00135	.00013	.36513
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.00015**	**.00055**	**-.00332**	**-.00115**	**-.04067**	**-.00159**	**.13402**	**-.00036**
Stddev	.00008	.00167	.00151	.00002	.00160	.02275	.00045	.14606	.00026
%RSD	93.154	1086.5	276.32	.72128	139.00	55.936	28.365	108.98	73.018
#1	.00003	-.00103	-.00052	-.00333	-.00229	-.05676	-.00127	.23730	-.00055
#2	.00015	.00134	.00161	-.00330	-.00002	-.02458	-.00191	.03074	-.00018
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00006**	**.00024**	**.00073**
Stddev	.00110	.00009	.00035
%RSD	1795.4	39.124	47.924
#1	-.00084	.00030	.00048
#2	.00071	.00017	.00097
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2228.8**	**4009.1**	**65221.**	**7083.2**
Stddev	.3	3.2	16.	.5
%RSD	.01132	.07930	.02438	.00663
#1	2228.6	4006.8	65210.	7083.5
#2	2229.0	4011.3	65233.	7082.8

Sample Name: blank Acquired: 11/14/2013 15:58:35 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**-.02187**	**.00148**	**-.00104**	**.00005**	**.00001**	**-.01740**	**-.00007**	**.00016**
Stddev	.00015	.00337	.00451	.00025	.00002	.00005	.00437	.00021	.00024
%RSD	161.35	15.432	305.53	23.933	45.085	478.77	25.104	295.59	156.26
#1	-.00020	-.01948	.00467	-.00122	.00003	.00005	-.02048	.00008	.00033
#2	.00001	-.02425	-.00171	-.00087	.00007	-.00002	-.01431	-.00022	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00047**	**.00167**	**-.00582**	**-.00885**	**.00123**	**-.00332**	**.00004**	**-.00040**	**.04701**
Stddev	.00007	.00055	.00180	.05642	.00040	.00281	.00005	.00044	.00777
%RSD	15.412	32.656	30.863	637.17	32.935	84.583	136.46	109.49	16.526
#1	.00042	.00206	-.00455	-.04875	.00151	-.00531	.00007	-.00071	.05250
#2	.00052	.00128	-.00709	.03104	.00094	-.00133	.00000	-.00009	.04151
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00024**	**.00021**	**-.00331**	**-.00148**	**.00135**	**-.04379**	**-.00180**	**.00010**	**.00000**
Stddev	.00067	.00250	.00301	.00207	.00057	.00830	.00010	.00003	.00017
%RSD	276.62	1193.5	90.723	139.93	42.118	18.955	5.5784	31.258	5910.6
#1	.00072	-.00156	-.00119	-.00294	.00095	-.04966	-.00173	.00007	-.00012
#2	-.00023	.00198	-.00544	-.00002	.00176	-.03792	-.00187	.00012	.00013
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00017**	**-.00014**	**-.00072**
Stddev	.00061	.00038	.00024
%RSD	359.44	267.59	33.847
#1	-.00026	-.00041	-.00055
#2	.00060	.00013	-.00089
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2217.2**	**4021.0**	**65025.**	**7101.0**
Stddev	3.1	3.6	334.	13.9
%RSD	.14031	.09027	.51352	.19572
#1	2215.0	4018.4	65261.	7110.8
#2	2219.4	4023.5	64789.	7091.2

Sample Name: CCV Acquired: 11/14/2013 16:00:54 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.47854	24.562	.50047	.47824	.51250	.48346	24.851	.49769	.48414	.48455	.49916	24.471	26.559
Stddev	.00038	.071	.00286	.00221	.00079	.00245	.187	.00299	.00150	.00178	.00028	.121	.069
%RSD	.07924	.28843	.57185	.46288	.15503	.50670	.75097	.60118	.30950	.36835	.05678	.49488	.26043
#1	.47827	24.512	.50249	.47981	.51194	.48173	24.719	.49981	.48520	.48582	.49896	24.385	26.510
#2	.47881	24.612	.49844	.47668	.51306	.48519	24.983	.49558	.48308	.48329	.49936	24.556	26.607
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50672	23.391	.49600	.50383	25.026	.47188	.47406	25.218	.51339	.49922	24.561	.49960	.50858
Stddev	.00245	.039	.00002	.00333	.096	.00073	.00123	.066	.00209	.00594	.204	.00065	.00143
%RSD	.48309	.16484	.00498	.66145	.38540	.15382	.25861	.26083	.40733	1.1892	.82904	.13096	.28092
#1	.50499	23.364	.49598	.50619	24.958	.47137	.47492	25.264	.51487	.49502	24.417	.49914	.50757
#2	.50845	23.419	.49601	.50148	25.095	.47240	.47319	25.171	.51191	.50342	24.705	.50007	.50959
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50801	.49254	.48689	.48105
Stddev	.00041	.00042	.00080	.00071
%RSD	.08136	.08565	.16513	.14858
#1	.50771	.49284	.48746	.48054
#2	.50830	.49224	.48632	.48155
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2001.9	3885.9	62084.	7059.2
Stddev	1.1	22.1	110.	59.0
%RSD	.05420	.56798	.17710	.83556
#1	2001.1	3870.3	62162.	7100.9
#2	2002.6	3901.5	62006.	7017.5

Sample Name: CCB Acquired: 11/14/2013 16:02:59 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00091**	**-.02757**	**.00065**	**-.00085**	**-.00001**	**-.00004**	**-.01051**	**.00005**	**.00047**	**-.00023**	**.00164**	**-.00093**	**-.04625**
Stddev	.00027	.00007	.00041	.00001	.00001	.00014	.00520	.00009	.00012	.00012	.00018	.00133	.02215
%RSD	29.810	.27177	63.107	1.4674	108.78	337.19	49.541	169.29	25.668	50.200	11.258	143.38	47.879
#1	.00072	-.02762	.00093	-.00084	.00000	-.00014	-.01419	-.00001	.00039	-.00015	.00151	.00001	-.06191
#2	.00110	-.02752	.00036	-.00085	-.00001	.00006	-.00683	.00011	.00056	-.00032	.00177	-.00187	-.03059
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00182**	**.00005**	**.00004**	**.00039**	**.03638**	**.00013**	**-.00003**	**.02560**	**-.00144**	**.00513**	**-.02746**	**-.00181**	**.00002**
Stddev	.00020	.00056	.00003	.00041	.00999	.00007	.00129	.03633	.00156	.00448	.01520	.00003	.00003
%RSD	11.160	1034.2	79.925	105.05	27.463	54.505	4097.0	141.89	107.79	87.244	55.361	1.6504	133.41
#1	.00167	.00045	.00007	.00010	.04345	.00008	-.00095	-.00009	-.00254	.00197	-.03821	-.00179	.00000
#2	.00196	-.00034	.00002	.00068	.02932	.00018	.00088	.05129	-.00034	.00830	-.01671	-.00183	.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00021**	**-.00178**	**.00017**	**-.00013**
Stddev	.00025	.00040	.00012	.00073
%RSD	120.61	22.606	67.231	554.86
#1	.00039	-.00149	.00026	-.00064
#2	.00003	-.00206	.00009	.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2203.5**	**3978.7**	**64773.**	**7031.7**
Stddev	4.5	.4	257.	4.0
%RSD	.20288	.01051	.39673	.05714
#1	2206.7	3978.4	64954.	7034.5
#2	2200.4	3979.0	64591.	7028.8

Sample Name: CCVL Acquired: 11/14/2013 16:05:18 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00300	.16350	W .01338	.01799	.00201	.00181	.48882	.00083	.00419	.00371	.01063	.04528
Stddev	.00064	.01549	.00339	.00034	.00000	.00011	.00149	.00001	.00010	.00041	.00008	.00227
%RSD	21.390	9.4746	25.340	1.8740	.21146	5.8148	.30418	.65075	2.4240	11.194	.73597	5.0225
#1	.00254	.17445	.01578	.01822	.00201	.00173	.48777	.00083	.00426	.00341	.01068	.04689
#2	.00345	.15255	.01099	.01775	.00201	.00188	.48987	.00084	.00411	.00400	.01057	.04367
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.01000									
Range			30.000%									

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48763	.03258	.19805	.00319	.00962	1.0231	.00880	.00592	.20126	.01818	.01877	.44300
Stddev	.04030	.00089	.00741	.00014	.00048	.0045	.00013	.00007	.00153	.00154	.00159	.01302
%RSD	8.2649	2.7224	3.7430	4.5157	4.9657	.44167	1.4209	1.2510	.75839	8.4775	8.4951	2.9401
#1	.51613	.03196	.20329	.00329	.00995	1.0199	.00889	.00587	.20234	.01927	.01764	.45221
#2	.45913	.03321	.19280	.00309	.00928	1.0263	.00872	.00597	.20018	.01709	.01990	.43379
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00686	.00495	.00449	.02021	.00475	.00983
Stddev	.00039	.00002	.00009	.00069	.00066	.00064
%RSD	5.6745	.48666	2.0124	3.4251	13.977	6.5433
#1	.00714	.00497	.00456	.01972	.00522	.00937
#2	.00659	.00493	.00443	.02069	.00428	.01028
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.01000					
Range	-30.000%					

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2244.2	4106.3	66235.	7342.6
Stddev	8.2	5.8	214.	45.3
%RSD	.36641	.14142	.32378	.61629
#1	2250.0	4110.4	66386.	7374.6
#2	2238.4	4102.2	66083.	7310.6

Sample Name: MB 480-149337/1-A Acquired: 11/14/2013 16:07:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**-.00855**	**.00327**	**-.00078**	F **.00418**	**-.00013**	**.22283**	**.00017**	**-.00001**
Stddev	.00047	.00588	.00033	.00001	.00112	.00006	.01039	.00007	.00006
%RSD	1360.6	68.734	10.003	.69688	26.746	43.895	4.6619	38.830	415.14
#1	-.00030	-.01270	.00304	-.00078	.00497	-.00009	.21549	.00022	.00003
#2	.00037	-.00439	.00350	-.00079	.00339	-.00017	.23018	.00012	-.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit					.00200				
Low Limit					-.00300				

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00082**	**.00249**	**.02054**	**.05826**	**.00250**	**.01944**	**.00136**	**.00050**	**.05658**
Stddev	.00059	.00016	.00383	.00796	.00061	.00233	.00030	.00018	.00470
%RSD	71.573	6.5799	18.672	13.668	24.214	12.002	21.829	36.539	8.3101
#1	.00040	.00261	.02325	.06389	.00208	.01779	.00158	.00063	.05990
#2	.00123	.00238	.01782	.05263	.00293	.02109	.00115	.00037	.05326
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00015**	**.00110**	**.01622**	**-.00222**	**.00314**	**.10763**	F **.04037**	**.00026**	**.00024**
Stddev	.00008	.00070	.00356	.00092	.00033	.00091	.00067	.00028	.00027
%RSD	54.125	63.234	21.934	41.448	10.635	.84958	1.6608	105.30	115.65
#1	.00020	.00061	.01874	-.00287	.00338	.10698	.04084	.00007	.00043
#2	.00009	.00160	.01371	-.00157	.00291	.10827	.03990	.00046	.00004
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit							.01000		
Low Limit							-.01000		

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00002**	**.00031**	**.00815**
Stddev	.00082	.00035	.00035
%RSD	3950.8	114.21	4.3184
#1	.00056	.00006	.00790
#2	-.00060	.00055	.00840
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2153.9**	**3878.1**	**63384.**	**6806.2**
Stddev	3.9	5.3	9.	20.9
%RSD	.18067	.13658	.01493	.30700
#1	2151.2	3874.3	63391.	6791.4
#2	2156.7	3881.8	63378.	6821.0

Sample Name: LCSSRM 480-149337/2- Acquired: 11/14/2013 16:09:48 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.38754**	**80.610**	**1.0280**	**1.4684**	**3.3577**	**.73805**	**66.513**	**1.8573**	**1.3512**
Stddev	.00039	.044	.0145	.0130	.0037	.00126	.014	.0106	.0048
%RSD	.10053	.05433	1.4089	.88712	.11034	.17071	.02091	.57150	.35400
#1	.38726	80.579	1.0383	1.4776	3.3603	.73894	66.503	1.8648	1.3545
#2	.38781	80.641	1.0178	1.4592	3.3550	.73716	66.523	1.8498	1.3478
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.3343**	**1.0694**	**108.99**	**29.941**	**.08080**	**27.375**	**3.1131**	**1.4610**	**28.898**
Stddev	.0020	.0046	.16	.069	.00069	.017	.0096	.0110	.058
%RSD	.15046	.42700	.14491	.22972	.85321	.06280	.30920	.75188	.19983
#1	1.3328	1.0727	108.87	29.990	.08128	27.387	3.1063	1.4687	28.939
#2	1.3357	1.0662	109.10	29.893	.08031	27.363	3.1199	1.4532	28.858
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.5843**	**1.1376**	**2.4454**	**.80456**	**1.5440**	**14.535**	**1.0498**	**1.0274**	**3.0545**
Stddev	.0041	.0026	.0125	.00927	.0144	.031	.0040	.0011	.0023
%RSD	.26054	.22867	.50933	1.1527	.93006	.21604	.37723	.11022	.07630
#1	1.5872	1.1358	2.4542	.81112	1.5542	14.557	1.0526	1.0282	3.0561
#2	1.5814	1.1395	2.4366	.79800	1.5339	14.513	1.0470	1.0266	3.0528
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**1.7829**	**.95700**	**1.5007**
Stddev	.0103	.00175	.0073
%RSD	.57723	.18276	.48434
#1	1.7901	.95576	1.4956
#2	1.7756	.95824	1.5059
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1863.3**	**3853.5**	**62266.**	**7110.0**
Stddev	4.2	21.3	164.	28.2
%RSD	.22716	.55359	.26377	.39693
#1	1860.3	3838.4	62150.	7090.0
#2	1866.3	3868.5	62382.	7130.0

Sample Name: 480-49225-B-1-A Acquired: 11/14/2013 16:11:57 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00970**	**12.450**	**.22792**	**.02533**	**.45594**	F **-.00224**	**96.833**	F **-.03533**	**.13185**
Stddev	.00008	.031	.00158	.00226	.00452	.00016	.109	.00034	.00052
%RSD	.83355	.25278	.69339	8.9430	.99243	6.9737	.11301	.96274	.39648
#1	.00964	12.428	.22904	.02693	.45914	-.00235	96.756	-.03557	.13222
#2	.00976	12.473	.22681	.02372	.45274	-.00213	96.910	-.03509	.13148
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Fail	Chk Pass
High Limit						25.000		5.0000	
Low Limit						-.00200		-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576-2	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}2	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.86070**	**1.3560**	F **2982.0**	**1.9160**	**.10287**	**21.928**	**39.296**	**.25926**	**1.5777**
Stddev	.00079	.0031	2.8	.0482	.00023	.083	.003	.00011	.0033
%RSD	.09171	.23164	.09244	2.5145	.21877	.37790	.00791	.04121	.20967
#1	.86126	1.3582	2980.0	1.9501	.10271	21.869	39.298	.25918	1.5800
#2	.86014	1.3538	2983.9	1.8819	.10303	21.987	39.294	.25933	1.5754
Check ?	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit			800.00						
Low Limit			-.05000						

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.70159**	**.27015**	**71.623**	**.07621**	**.02006**	**11.002**	**.20228**	**.51372**	**3.1791**
Stddev	.00040	.00441	.043	.00207	.00455	.026	.00031	.00010	.0028
%RSD	.05737	1.6311	.05998	2.7205	22.685	.24000	.15392	.02034	.08859
#1	.70188	.26703	71.653	.07474	.02327	10.984	.20206	.51380	3.1771
#2	.70131	.27327	71.592	.07768	.01684	11.021	.20250	.51365	3.1811
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	F **-.03604**	**1.1926**	**2.7698**
Stddev	.00106	.0027	.0069
%RSD	2.9342	.22919	.24944
#1	-.03529	1.1907	2.7649
#2	-.03678	1.1946	2.7747
Check ?	Chk Fail	Chk Pass	Chk Pass
High Limit	40.000		
Low Limit	-.02000		

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1544.6**	**3279.2**	**54459.**	**7253.7**
Stddev	4.5	9.1	39.	2.3
%RSD	.29255	.27896	.07248	.03225
#1	1541.4	3272.7	54431.	7252.1
#2	1547.8	3285.6	54487.	7255.4

Sample Name: 480-49225-B-2-A Acquired: 11/14/2013 16:14:14 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00058**	**.01140**	**.00250**	**.00102**	**.00066**	**-.00011**	**.31729**	**.00001**	**-.00002**
Stddev	.00081	.02209	.00115	.00012	.00001	.00000	.00181	.00008	.00011
%RSD	140.71	193.71	46.031	11.577	2.1582	.63259	.56889	713.88	749.77
#1	.00000	-.00422	.00331	.00111	.00068	-.00011	.31856	.00007	.00006
#2	-.00115	.02702	.00169	.00094	.00065	-.00011	.31601	-.00005	-.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00199**	**.00673**	**1.7384**	**.76545**	**3.7671**	**.09989**	**.02344**	**.00136**	**1.2203**
Stddev	.00023	.00055	.1731	.00873	.0243	.00612	.00027	.00021	.0067
%RSD	11.770	8.1085	9.9568	1.1399	.64550	6.1248	1.1633	15.283	.54981
#1	.00182	.00711	1.8608	.77162	3.7843	.09557	.02363	.00121	1.2250
#2	.00215	.00634	1.6160	.75928	3.7499	.10422	.02325	.00150	1.2156
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00255**	**-.00230**	**.18851**	**-.00100**	**.00323**	**.02373**	**.04167**	**.00078**	**.00220**
Stddev	.00031	.00009	.00422	.00257	.00026	.00816	.00040	.00002	.00051
%RSD	12.268	4.1103	2.2397	257.06	8.1302	34.386	.96013	2.2744	23.056
#1	.00233	-.00236	.19149	.00082	.00305	.01796	.04139	.00080	.00184
#2	.00278	-.00223	.18552	-.00282	.00342	.02950	.04195	.00077	.00256
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00140**	**.00046**	**.00854**
Stddev	.00089	.00003	.00022
%RSD	63.702	6.8147	2.5324
#1	-.00203	.00043	.00870
#2	-.00077	.00048	.00839
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2111.6**	**3868.6**	**62861.**	**6936.6**
Stddev	1.7	.8	208.	23.0
%RSD	.07896	.02058	.33057	.33098
#1	2110.4	3869.2	62714.	6920.3
#2	2112.7	3868.0	63008.	6952.8

Sample Name: 480-49234-C-1-A Acquired: 11/14/2013 16:16:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00050**	**77.420**	**.07415**	**.16322**	**1.6992**	**.00998**	**440.28**	F **-.00136**	**.04822**
Stddev	.00034	.162	.00182	.00126	.0063	.00010	.67	.00002	.00035
%RSD	68.381	.20961	2.4553	.77191	.37074	1.0496	.15275	1.1574	.72692
#1	.00026	77.535	.07286	.16411	1.6948	.00991	440.76	-.00137	.04846
#2	.00074	77.305	.07544	.16233	1.7037	.01006	439.80	-.00135	.04797
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.07350**	**.18457**	**293.39**	**8.5160**	**.12698**	**66.943**	**4.9708**	**.00628**	**1.7167**
Stddev	.00054	.00091	.44	.0355	.00066	.108	.0210	.00051	.0132
%RSD	.72839	.49392	.14982	.41622	.51732	.16164	.42349	8.1651	.77119
#1	.07388	.18521	293.70	8.4909	.12652	66.867	4.9559	.00664	1.7074
#2	.07312	.18392	293.08	8.5410	.12745	67.020	4.9856	.00591	1.7261
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.14917**	**.45288**	**10.699**	**-.00034**	**-.00031**	**54.532**	**.06196**	**.91914**	**2.4446**
Stddev	.00163	.00024	.023	.00433	.00145	.210	.00010	.00207	.0036
%RSD	1.0946	.05277	.21661	1273.2	463.82	.38594	.16193	.22529	.14572
#1	.14801	.45271	10.716	-.00340	-.00133	54.681	.06189	.91767	2.4421
#2	.15032	.45305	10.683	.00272	.00071	54.384	.06203	.92060	2.4472
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00656**	**.10017**	**1.0790**
Stddev	.00164	.00028	.0100
%RSD	25.068	.27842	.92878
#1	-.00772	.10037	1.0719
#2	-.00539	.09997	1.0861
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1700.5**	**3817.6**	**61811.**	**7378.6**
Stddev	1.7	7.8	46.	45.6
%RSD	.10070	.20429	.07397	.61850
#1	1701.7	3812.1	61843.	7346.4
#2	1699.3	3823.1	61779.	7410.9

Sample Name: 480-49234-C-1-B MS Acquired: 11/14/2013 16:18:49 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09245**	**128.89**	**.42783**	**.59710**	**2.0542**	**.39205**	**450.21**	**.38449**	**.44740**
Stddev	.00079	.10	.00454	.00081	.0092	.00118	.59	.00163	.00183
%RSD	.85965	.07399	1.0603	.13487	.45011	.30169	.13181	.42302	.40927
#1	.09189	128.96	.42462	.59653	2.0607	.39289	450.63	.38334	.44611
#2	.09301	128.82	.43103	.59767	2.0476	.39121	449.79	.38564	.44870
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.42973**	**.56818**	**194.70**	**36.386**	**.56009**	**79.955**	**6.5008**	**.38585**	**24.514**
Stddev	.00274	.00012	.04	.115	.00326	.075	.0219	.00118	.080
%RSD	.63705	.02155	.02177	.31534	.58242	.09403	.33665	.30634	.32459
#1	.43167	.56827	194.73	36.467	.56240	80.008	6.4854	.38502	24.570
#2	.42780	.56810	194.67	36.305	.55778	79.902	6.5163	.38669	24.458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49246**	**.79216**	**32.502**	**.30553**	**.29013**	**59.572**	**.44165**	**1.4577**	**3.5328**
Stddev	.00506	.00180	.078	.00141	.00179	.849	.00072	.0053	.0007
%RSD	1.0277	.22753	.24032	.46131	.61587	1.4257	.16349	.35996	.01968
#1	.48888	.79088	32.447	.30453	.29139	58.972	.44114	1.4614	3.5323
#2	.49604	.79343	32.557	.30652	.28887	60.173	.44216	1.4540	3.5333
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.37101**	**.49456**	**1.2309**
Stddev	.00056	.00133	.0040
%RSD	.15151	.26836	.32854
#1	.37141	.49550	1.2280
#2	.37062	.49362	1.2337
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1680.3**	**3787.0**	**60759.**	**7151.3**
Stddev	8.3	8.2	28.	48.1
%RSD	.49104	.21657	.04655	.67317
#1	1686.2	3792.8	60779.	7117.3
#2	1674.5	3781.2	60739.	7185.4

Sample Name: 480-49234-C-1-C MSD Acquired: 11/14/2013 16:20:59 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09324**	**171.60**	**.42143**	**.67230**	**3.4569**	**.38931**	**715.92**	**.38168**	**.44607**
Stddev	.00152	.01	.00378	.00053	.0211	.00001	3.66	.00115	.00032
%RSD	1.6328	.00689	.89662	.07820	.61001	.00256	.51100	.30147	.07113
#1	.09216	171.59	.41876	.67193	3.4719	.38930	718.51	.38086	.44584
#2	.09432	171.61	.42411	.67268	3.4420	.38932	713.34	.38249	.44629
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.42241**	**.55936**	**221.72**	**39.320**	**.60745**	**117.58**	**6.8971**	**.36756**	**23.789**
Stddev	.00061	.00280	.42	.125	.00192	.42	.0232	.00212	.108
%RSD	.14351	.49997	.19159	.31860	.31668	.35987	.33592	.57681	.45326
#1	.42198	.55738	222.02	39.408	.60881	117.29	6.8807	.36606	23.865
#2	.42284	.56134	221.42	39.231	.60609	117.88	6.9134	.36906	23.712
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48516**	**.83244**	**40.505**	**.26139**	**.21424**	**29.912**	**.43449**	**2.2976**	**5.0499**
Stddev	.00217	.00815	.185	.00449	.00265	.188	.00444	.0067	.0118
%RSD	.44809	.97928	.45724	1.7179	1.2392	.62910	1.0212	.29279	.23440
#1	.48362	.82668	40.374	.25822	.21611	30.045	.43135	2.3024	5.0416
#2	.48670	.83820	40.636	.26457	.21236	29.779	.43763	2.2929	5.0583
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.37902**	**.49269**	**1.4087**
Stddev	.00547	.00260	.0004
%RSD	1.4440	.52807	.02567
#1	.37515	.49085	1.4090
#2	.38289	.49453	1.4085
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1573.3**	**3774.7**	**60119.**	**7238.8**
Stddev	8.6	18.3	163.	43.3
%RSD	.54640	.48527	.27031	.59848
#1	1579.4	3787.6	60234.	7208.2
#2	1567.2	3761.7	60004.	7269.5

Sample Name: 480-49236-D-1-A Acquired: 11/14/2013 16:23:13 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00090**	**78.767**	**.03502**	**.10329**	**.89608**	**.00526**	**684.43**	**.00025**	**.06340**
Stddev	.00013	.728	.00501	.00001	.00808	.00086	5.48	.00012	.00077
%RSD	14.537	.92486	14.308	.01176	.90155	16.325	.80134	48.788	1.2166
#1	-.00099	79.282	.03148	.10330	.90179	.00586	688.31	.00034	.06286
#2	-.00081	78.252	.03857	.10328	.89037	.00465	680.55	.00016	.06395
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.10460**	**.16150**	**147.11**	**20.378**	**.17918**	**247.83**	**4.1748**	**.00371**	**2.4270**
Stddev	.00123	.00077	.42	.045	.00202	.18	.0002	.00035	.0571
%RSD	1.1739	.47803	.28776	.22062	1.1290	.07130	.00450	9.4841	2.3521
#1	.10373	.16205	147.41	20.346	.18061	247.70	4.1747	.00395	2.4674
#2	.10547	.16096	146.81	20.410	.17775	247.95	4.1749	.00346	2.3867
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.14523**	**.18944**	**7.4578**	**-.00525**	**-.00117**	**26.794**	**.04542**	**1.0136**	**2.2766**
Stddev	.00119	.00272	.0328	.00337	.00275	.090	.00016	.0067	.0064
%RSD	.81719	1.4349	.44013	64.304	235.89	.33478	.35624	.66568	.28308
#1	.14439	.18752	7.4810	-.00763	.00078	26.857	.04531	1.0184	2.2812
#2	.14607	.19136	7.4346	-.00286	-.00311	26.730	.04553	1.0089	2.2721
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00556**	**.15978**	**.63021**
Stddev	.00058	.00066	.00085
%RSD	10.382	.41082	.13461
#1	-.00597	.15931	.62961
#2	-.00515	.16024	.63081
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1595.3**	**3609.2**	**57929.**	**7039.0**
Stddev	3.4	17.5	255.	88.4
%RSD	.21120	.48506	.44056	1.2557
#1	1597.7	3596.8	57749.	6976.5
#2	1592.9	3621.6	58110.	7101.5

Sample Name: 480-49236-D-1-A sd@5 Acquired: 11/14/2013 16:25:36 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**16.301**	**.00812**	**.02197**	**.17383**	**.00079**	**142.10**	**-.00005**	**.01219**
Stddev	.00053	.084	.00327	.00015	.00027	.00008	.84	.00015	.00004
%RSD	1996.6	.51412	40.324	.69379	.15447	9.6034	.59279	279.26	.36092
#1	-.00035	16.242	.00581	.02187	.17364	.00085	141.51	-.00016	.01222
#2	.00040	16.360	.01044	.02208	.17402	.00074	142.70	.00005	.01216
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02282**	**.03307**	**31.189**	**4.3807**	**.03775**	**51.191**	**.89057**	**.00061**	**.53321**
Stddev	.00034	.00035	.135	.0060	.00008	.009	.00124	.00016	.01055
%RSD	1.5031	1.0695	.43269	.13581	.20624	.01788	.13924	26.715	1.9785
#1	.02258	.03282	31.094	4.3764	.03780	51.185	.89144	.00072	.52575
#2	.02307	.03332	31.285	4.3849	.03769	51.198	.88969	.00049	.54067
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02811**	**.03898**	**1.4861**	**-.00173**	**-.00100**	**7.4112**	**.00647**	**.20558**	**.51646**
Stddev	.00003	.00054	.0021	.00140	.00185	.0228	.00023	.00124	.00580
%RSD	.12404	1.3739	.13846	81.398	184.81	.30837	3.5584	.60441	1.1236
#1	.02809	.03936	1.4876	-.00272	-.00231	7.4274	.00631	.20470	.52056
#2	.02814	.03860	1.4847	-.00073	.00031	7.3951	.00663	.20646	.51235
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00201**	**.03399**	**.14058**
Stddev	.00164	.00017	.00234
%RSD	81.550	.48599	1.6612
#1	-.00318	.03410	.14223
#2	-.00085	.03387	.13893
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1931.0**	**3817.7**	**61699.**	**7164.6**
Stddev	1.2	7.2	29.	30.5
%RSD	.05970	.18990	.04668	.42526
#1	1931.8	3822.9	61719.	7186.2
#2	1930.2	3812.6	61678.	7143.1

Sample Name: CCV Acquired: 11/14/2013 16:27:51 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48074	24.449	.50288	.48428	.51032	.48361	24.971	.49795	.48526	.48792	.49996	24.363	26.424
Stddev	.00114	.044	.00348	.00061	.00519	.00099	.049	.00054	.00069	.00152	.00078	.081	.151
%RSD	.23749	.18168	.69271	.12591	1.0172	.20405	.19598	.10835	.14128	.31079	.15655	.33065	.57083
#1	.47994	24.481	.50535	.48384	.51399	.48431	25.006	.49757	.48478	.48685	.50051	24.420	26.531
#2	.48155	24.418	.50042	.48471	.50665	.48291	24.937	.49833	.48575	.48900	.49940	24.306	26.318
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50854	23.553	.49655	.50587	25.061	.47666	.47521	25.156	.51879	.49703	25.008	.49719	.50920
Stddev	.00235	.034	.00062	.00112	.169	.00028	.00002	.030	.00222	.00255	.222	.00170	.00270
%RSD	.46173	.14467	.12419	.22197	.67275	.05979	.00507	.12008	.42784	.51399	.88913	.34103	.53063
#1	.51020	23.529	.49611	.50508	25.180	.47646	.47523	25.177	.51722	.49523	24.851	.49599	.51112
#2	.50688	23.578	.49698	.50666	24.942	.47686	.47519	25.134	.52036	.49884	25.165	.49839	.50729
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51271	.49146	.48815	.48402
Stddev	.00152	.00037	.00124	.00401
%RSD	.29587	.07589	.25310	.82832
#1	.51164	.49120	.48728	.48119
#2	.51379	.49172	.48903	.48686
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1998.8	3882.7	62300.	7110.2
Stddev	4.6	5.4	22.	33.5
%RSD	.23224	.13900	.03577	.47141
#1	2002.0	3886.5	62315.	7086.5
#2	1995.5	3878.9	62284.	7133.9

Sample Name: CCB Acquired: 11/14/2013 16:30:01 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**-.01552**	**.00063**	**-.00091**	**.00004**	**-.00003**	**-.01208**	**-.00002**	**.00030**	**-.00022**	**.00172**	**.00018**	**-.03518**
Stddev	.00064	.03427	.00244	.00008	.00006	.00008	.00299	.00008	.00009	.00035	.00025	.00313	.05394
%RSD	475.31	220.76	387.85	9.0745	146.27	269.51	24.784	325.40	29.600	159.01	14.450	1719.4	153.33
#1	-.00059	-.03976	-.00110	-.00097	.00000	.00003	-.01420	.00003	.00036	-.00047	.00189	-.00203	.00296
#2	.00032	.00871	.00235	-.00085	.00008	-.00008	-.00996	-.00008	.00024	.00003	.00154	.00240	-.07332
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00252**	**.00401**	**.00004**	**.00006**	**.02980**	**.00000**	**-.00105**	**-.00132**	**-.00152**	**.00432**	**-.01769**	**-.00150**	**.00009**
Stddev	.00017	.00120	.00011	.00002	.00867	.00014	.00055	.00063	.00100	.00120	.02507	.00092	.00008
%RSD	6.5868	29.884	281.46	36.623	29.081	15575.	52.229	47.541	65.749	27.695	141.71	61.721	93.181
#1	.00264	.00485	-.00004	.00007	.02367	.00010	-.00066	-.00088	-.00223	.00348	-.03542	-.00215	.00015
#2	.00241	.00316	.00012	.00004	.03593	-.00010	-.00143	-.00176	-.00082	.00517	.00004	-.00084	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00008**	**.00149**	**.00021**	**-.00040**
Stddev	.00040	.00131	.00009	.00024
%RSD	512.84	88.229	40.881	59.218
#1	-.00021	.00242	.00027	-.00057
#2	.00036	.00056	.00015	-.00024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2211.0**	**4005.7**	**64851.**	**7028.8**
Stddev	1.1	4.1	147.	61.9
%RSD	.04804	.10170	.22664	.88085
#1	2210.2	4008.6	64955.	6985.0
#2	2211.7	4002.8	64748.	7072.6

Sample Name: CCVL Acquired: 11/14/2013 16:32:22 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00263**	**.19071**	**.01205**	**.01814**	**.00202**	**.00190**	**.48559**	**.00096**	**.00388**	**.00383**	**.01035**	**.04064**	**.51901**
Stddev	.00070	.02069	.00141	.00051	.00002	.00001	.00528	.00022	.00012	.00001	.00012	.00566	.01118
%RSD	26.625	10.847	11.683	2.7962	1.0673	.31444	1.0869	23.100	3.0732	.31185	1.1341	13.920	2.1547
#1	.00213	.17609	.01105	.01850	.00204	.00190	.48932	.00080	.00396	.00382	.01027	.03664	.52691
#2	.00313	.20534	.01304	.01778	.00201	.00190	.48186	.00111	.00380	.00384	.01043	.04464	.51110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03059**	**.20228**	**.00317**	**.00980**	**.99100**	**.00884**	**.00457**	**.20103**	**.01694**	**.01840**	**.45623**	**.00766**	**.00502**
Stddev	.00093	.00797	.00005	.00000	.01012	.00020	.00024	.00238	.00282	.00494	.01398	.00032	.00011
%RSD	3.0523	3.9393	1.5212	.00727	1.0215	2.2725	5.1751	1.1845	16.657	26.857	3.0648	4.1127	2.2302
#1	.03125	.20792	.00320	.00980	.99816	.00870	.00440	.20271	.01894	.02190	.44634	.00744	.00494
#2	.02993	.19665	.00313	.00980	.98384	.00898	.00473	.19935	.01495	.01491	.46612	.00788	.00509
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00449**	**.01999**	**.00448**	**.00989**
Stddev	.00011	.00181	.00028	.00017
%RSD	2.4287	9.0511	6.3022	1.7155
#1	.00456	.02127	.00468	.00977
#2	.00441	.01871	.00428	.01001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2248.3**	**4119.4**	**66058.**	**7371.3**
Stddev	7.9	14.6	307.	25.5
%RSD	.35012	.35375	.46409	.34595
#1	2253.9	4129.7	66275.	7389.4
#2	2242.8	4109.1	65841.	7353.3

Sample Name: 480-49236-D-1-A pds Acquired: 11/14/2013 16:34:39 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.09587	95.413	.43047	.48027	1.2749	.37826	649.97	.39062	.46399
Stddev	.00002	.024	.00468	.00030	.0015	.00004	2.91	.00019	.00069
%RSD	.02266	.02524	1.0876	.06262	.11452	.01098	.44799	.04822	.14812
#1	.09588	95.430	.42716	.48006	1.2739	.37823	647.91	.39076	.46350
#2	.09585	95.396	.43378	.48048	1.2759	.37829	652.03	.39049	.46447
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.45302	.55172	154.74	41.436	.58256	247.89	4.2103	.38734	22.591
Stddev	.00272	.00281	.63	.020	.00175	1.10	.0243	.00063	.015
%RSD	.60114	.51020	.40505	.04905	.30086	.44361	.57674	.16239	.06720
#1	.45109	.54973	154.29	41.422	.58380	247.11	4.1931	.38778	22.602
#2	.45494	.55371	155.18	41.451	.58132	248.67	4.2275	.38690	22.580
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51924	.57898	6.9221	.38133	.39402	47.428	.44603	1.3498	2.5519
Stddev	.00085	.00193	.0107	.00014	.00731	.185	.00079	.0017	.0086
%RSD	.16281	.33292	.15500	.03583	1.8552	.39067	.17718	.12544	.33739
#1	.51864	.57761	6.9297	.38124	.38886	47.559	.44659	1.3486	2.5458
#2	.51984	.58034	6.9145	.38143	.39919	47.297	.44547	1.3510	2.5580
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	.38137	.52167	.91159
Stddev	.00363	.00141	.00052
%RSD	.95130	.27124	.05691
#1	.37881	.52067	.91122
#2	.38394	.52267	.91195
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1577.7	3599.6	57599.	7016.9
Stddev	.5	3.7	.	6.4
%RSD	.03142	.10144	.00049	.09151
#1	1577.4	3597.0	57599.	7012.4
#2	1578.1	3602.2	57600.	7021.4

Sample Name: 480-49236-D-2-A Acquired: 11/14/2013 16:36:57 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00699**	**54.576**	**.09174**	**.07386**	**1.4386**	**.00324**	**212.03**	**.00320**	**.04590**
Stddev	.00033	.159	.00027	.00031	.0029	.00004	.23	.00009	.00000
%RSD	4.7337	.29159	.29618	.42068	.20326	1.3540	.10917	2.8738	.00021
#1	.00675	54.688	.09193	.07408	1.4407	.00321	212.20	.00327	.04590
#2	.00722	54.463	.09155	.07364	1.4365	.00327	211.87	.00314	.04590
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.16122**	**1.0786**	**128.61**	**7.8238**	**.10185**	**47.223**	**1.4670**	**.01485**	**1.4153**
Stddev	.00015	.0012	.48	.0450	.00115	.046	.0009	.00027	.0025
%RSD	.09373	.11271	.37062	.57503	1.1252	.09689	.05911	1.8158	.17612
#1	.16133	1.0794	128.28	7.7920	.10266	47.256	1.4676	.01504	1.4171
#2	.16112	1.0777	128.95	7.8556	.10104	47.191	1.4663	.01466	1.4136
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.10627**	**2.0749**	**34.624**	**.00253**	**.00903**	**12.235**	**.29532**	**.61583**	**1.1136**
Stddev	.00041	.0017	.188	.00062	.00058	.041	.00125	.00074	.0027
%RSD	.38390	.07958	.54360	24.472	6.4102	.33307	.42244	.11992	.23756
#1	.10656	2.0737	34.757	.00209	.00944	12.206	.29444	.61636	1.1155
#2	.10598	2.0761	34.491	.00297	.00862	12.264	.29620	.61531	1.1118
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00030**	**.12613**	**2.9588**
Stddev	.00253	.00039	.0146
%RSD	850.21	.31066	.49424
#1	-.00149	.12641	2.9485
#2	.00209	.12586	2.9692
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1817.3**	**3725.0**	**59839.**	**6900.8**
Stddev	.7	18.1	37.	25.3
%RSD	.03931	.48474	.06110	.36597
#1	1816.7	3712.2	59865.	6882.9
#2	1817.8	3737.8	59813.	6918.6

Sample Name: 480-49246-A-1-A Acquired: 11/14/2013 16:39:12 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.16625**	**55.259**	**.03949**	**.06161**	**.90320**	**.00350**	**437.60**	**.00053**	**.03633**
Stddev	.00151	.063	.00072	.00012	.00379	.00006	.87	.00025	.00006
%RSD	.91092	.11370	1.8354	.19674	.41945	1.7908	.19978	47.051	.15962
#1	.16518	55.304	.03898	.06170	.90588	.00346	438.22	.00070	.03637
#2	.16732	55.215	.04000	.06153	.90052	.00354	436.98	.00035	.03628
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09070**	**.15846**	**111.37**	**7.9454**	**.08405**	**55.034**	**6.3181**	**.00333**	**5.6955**
Stddev	.00147	.00092	.42	.0016	.00005	.083	.0118	.00053	.0018
%RSD	1.6190	.58089	.37816	.02040	.06357	.15026	.18600	15.977	.03191
#1	.08967	.15781	111.67	7.9442	.08401	54.975	6.3098	.00371	5.6942
#2	.09174	.15911	111.07	7.9465	.08409	55.092	6.3265	.00296	5.6968
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09318**	**.10600**	**2.5961**	**-.00302**	**.00011**	**9.7348**	**.03605**	**.78832**	**2.0127**
Stddev	.00057	.00009	.0055	.00124	.00343	.0596	.00102	.00134	.0107
%RSD	.61687	.08867	.21266	41.147	3097.6	.61252	2.8260	.17013	.53397
#1	.09359	.10607	2.6000	-.00389	-.00231	9.7770	.03533	.78927	2.0051
#2	.09277	.10594	2.5922	-.00214	.00253	9.6927	.03677	.78737	2.0203
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00413**	**.12576**	**.33246**
Stddev	.00075	.00002	.00007
%RSD	18.287	.01826	.02121
#1	-.00359	.12575	.33251
#2	-.00466	.12578	.33241
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1721.7**	**3750.3**	**60294.**	**7219.2**
Stddev	5.0	6.2	31.	45.6
%RSD	.29017	.16634	.05085	.63192
#1	1718.2	3745.9	60273.	7186.9
#2	1725.3	3754.7	60316.	7251.5

Sample Name: 480-49246-A-2-A Acquired: 11/14/2013 16:41:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.17786**	**35.080**	**.04779**	**.04230**	**1.7611**	**.00206**	**314.08**	**.00577**	**.03096**
Stddev	.00038	.103	.00276	.00028	.0066	.00017	1.65	.00000	.00044
%RSD	.21549	.29493	5.7733	.66674	.37577	8.0781	.52589	.04926	1.4287
#1	.17813	35.153	.04974	.04250	1.7657	.00194	315.25	.00577	.03127
#2	.17759	35.007	.04584	.04210	1.7564	.00218	312.91	.00577	.03065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06463**	**.33117**	**77.332**	**6.1518**	**.08078**	**100.16**	**1.9672**	**.00253**	**1.3125**
Stddev	.00163	.00092	.263	.0030	.00094	.05	.0004	.00016	.0059
%RSD	2.5159	.27720	.34062	.04942	1.1624	.04833	.02168	6.3847	.44714
#1	.06578	.33052	77.518	6.1540	.08012	100.19	1.9669	.00241	1.3166
#2	.06348	.33182	77.146	6.1497	.08145	100.12	1.9675	.00264	1.3083
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.10426**	**.52877**	**2.6085**	**.02117**	**.00234**	**11.992**	**.06719**	**.36116**	**1.0446**
Stddev	.00097	.00001	.0075	.00126	.00630	.087	.00006	.00083	.0036
%RSD	.92961	.00151	.28713	5.9367	269.86	.72583	.09570	.22997	.34354
#1	.10494	.52876	2.6138	.02029	-.00212	12.053	.06723	.36175	1.0421
#2	.10357	.52878	2.6032	.02206	.00679	11.930	.06714	.36057	1.0472
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00177**	**.08829**	**1.0183**
Stddev	.00147	.00073	.0095
%RSD	82.908	.82724	.93231
#1	-.00073	.08880	1.0250
#2	-.00281	.08777	1.0116
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1759.4**	**3683.7**	**59416.**	**6987.7**
Stddev	6.0	8.3	122.	44.6
%RSD	.33976	.22507	.20588	.63798
#1	1755.2	3677.8	59330.	6956.2
#2	1763.6	3689.5	59503.	7019.2

Sample Name: 480-49246-A-3-A Acquired: 11/14/2013 16:43:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09699**	**39.943**	**.04325**	**.03185**	**1.0458**	**.00204**	**317.77**	**.00224**	**.03432**
Stddev	.00094	.164	.00086	.00039	.0044	.00017	1.14	.00004	.00014
%RSD	.96964	.41011	1.9850	1.2352	.41967	8.5281	.35822	1.6277	.41115
#1	.09633	40.059	.04264	.03213	1.0489	.00191	318.57	.00221	.03422
#2	.09766	39.827	.04386	.03157	1.0427	.00216	316.96	.00226	.03442
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06232**	**.22341**	**83.320**	**6.2553**	**.07703**	**112.05**	**2.3286**	**.00249**	**10.007**
Stddev	.00045	.00100	.335	.0269	.00011	.05	.0030	.00002	.027
%RSD	.71526	.44772	.40151	.43006	.14357	.04502	.12751	.95125	.27244
#1	.06264	.22271	83.084	6.2363	.07711	112.02	2.3307	.00250	10.026
#2	.06200	.22412	83.557	6.2743	.07695	112.09	2.3265	.00247	9.9873
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09609**	**.14697**	**3.4175**	**-.00199**	**.00341**	**12.115**	**.04577**	**.37966**	**1.0947**
Stddev	.00079	.00209	.0154	.00032	.00154	.041	.00024	.00257	.0020
%RSD	.82510	1.4197	.44936	16.030	45.040	.33468	.52971	.67580	.17964
#1	.09665	.14549	3.4284	-.00222	.00232	12.086	.04560	.38148	1.0960
#2	.09553	.14844	3.4067	-.00176	.00450	12.144	.04594	.37785	1.0933
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00170**	**.09720**	**.42334**
Stddev	.00044	.00013	.00107
%RSD	25.700	.13684	.25345
#1	-.00201	.09730	.42410
#2	-.00139	.09711	.42258
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1747.0**	**3745.2**	**59800.**	**7091.8**
Stddev	1.5	10.1	43.	53.3
%RSD	.08329	.27071	.07147	.75161
#1	1745.9	3738.1	59770.	7054.1
#2	1748.0	3752.4	59831.	7129.5

Sample Name: 480-49246-B-4-A Acquired: 11/14/2013 16:46:04 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.24943**	**52.445**	**.04900**	**.06576**	**3.1281**	**.00234**	**971.72**	**.00975**	**.04900**
Stddev	.00103	.135	.00689	.00033	.0070	.00003	1.65	.00003	.00104
%RSD	.41256	.25675	14.063	.50326	.22303	1.1786	.17024	.28539	2.1222
#1	.24870	52.540	.04413	.06552	3.1330	.00232	972.89	.00973	.04974
#2	.25016	52.350	.05388	.06599	3.1232	.00236	970.55	.00977	.04827
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.10890**	**.63996**	**120.04**	**8.8936**	**.14725**	**358.64**	**10.844**	**.00552**	**1.5230**
Stddev	.00049	.00195	.33	.0576	.00074	.38	.032	.00009	.0169
%RSD	.44783	.30542	.27742	.64748	.50046	.10722	.29454	1.6708	1.1082
#1	.10855	.63857	120.28	8.8528	.14672	358.37	10.822	.00559	1.5349
#2	.10924	.64134	119.80	8.9343	.14777	358.91	10.867	.00546	1.5111
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19211**	**.63884**	**4.7310**	**.03853**	**-.00257**	**10.878**	**.08651**	**1.0395**	**1.0995**
Stddev	.00140	.00189	.0127	.00332	.00364	.026	.00024	.0038	.0019
%RSD	.72675	.29511	.26857	8.6288	141.51	.24171	.28081	.36343	.17119
#1	.19112	.63751	4.7399	.03618	-.00514	10.860	.08668	1.0422	1.0982
#2	.19310	.64017	4.7220	.04088	.00000	10.897	.08633	1.0368	1.1009
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00785**	**.11367**	**2.0223**
Stddev	.00343	.00025	.0012
%RSD	43.716	.22373	.05868
#1	-.01028	.11349	2.0215
#2	-.00543	.11385	2.0232
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1531.7**	**3528.2**	**56585.**	**7137.3**
Stddev	.1	3.2	33.	48.2
%RSD	.00687	.09063	.05907	.67542
#1	1531.7	3530.5	56608.	7103.2
#2	1531.6	3526.0	56561.	7171.4

Sample Name: 480-49173-H-10-A Acquired: 11/14/2013 16:48:32 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00004**	**36.339**	**.01787**	**.06183**	**.23093**	**.00174**	**64.485**	**.00019**	**.01804**
Stddev	.00018	.110	.00201	.00064	.00010	.00008	.056	.00004	.00020
%RSD	480.15	.30337	11.264	1.0378	.04291	4.3594	.08744	20.316	1.1234
#1	-.00009	36.261	.01929	.06228	.23086	.00179	64.525	.00022	.01790
#2	.00016	36.417	.01645	.06137	.23100	.00168	64.445	.00016	.01819
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05547**	**.04429**	**45.488**	**17.834**	**.03927**	**16.153**	**.57997**	**.00512**	**1.3997**
Stddev	.00028	.00006	.081	.073	.00030	.007	.00080	.00014	.0059
%RSD	.50455	.13482	.17824	.40845	.77631	.04466	.13876	2.7623	.42343
#1	.05527	.04425	45.546	17.886	.03905	16.158	.58054	.00522	1.3955
#2	.05567	.04433	45.431	17.783	.03948	16.148	.57940	.00502	1.4039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05071**	**.03591**	**29.020**	**-.00490**	**.00095**	**56.494**	**.00025**	**.14950**	**.50123**
Stddev	.00078	.00083	.014	.00113	.00235	.314	.00094	.00040	.00052
%RSD	1.5462	2.3037	.04828	22.998	246.09	.55609	382.75	.26895	.10319
#1	.05127	.03532	29.010	-.00410	-.00071	56.716	-.00042	.14978	.50160
#2	.05016	.03649	29.030	-.00570	.00261	56.272	.00091	.14922	.50087
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00032**	**.09153**	**.12289**
Stddev	.00176	.00083	.00030
%RSD	546.64	.90984	.24431
#1	-.00092	.09211	.12310
#2	.00157	.09094	.12268
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2011.6**	**3951.8**	**63611.**	**7340.1**
Stddev	5.3	15.7	191.	14.8
%RSD	.26165	.39633	.30021	.20112
#1	2015.3	3962.8	63746.	7350.5
#2	2007.9	3940.7	63476.	7329.7

Sample Name: MB 480-151394/1-A Acquired: 11/14/2013 16:50:44 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00036**	**-.00997**	**.00304**	**-.00120**	**.00015**	**-.00013**	**.04057**	**-.00003**	**-.00010**
Stddev	.00002	.01880	.00344	.00011	.00001	.00003	.00416	.00028	.00018
%RSD	6.1623	188.56	113.27	8.8068	5.9524	21.762	10.253	810.97	183.16
#1	.00034	.00332	.00061	-.00127	.00016	-.00011	.03762	-.00023	-.00023
#2	.00038	-.02327	.00547	-.00112	.00015	-.00015	.04351	.00016	.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**.00149**	**.00528**	**.00202**	**.00324**	**.00201**	**.00030**	**-.00026**	**.05387**
Stddev	.00027	.00004	.00358	.02114	.00030	.00146	.00003	.00014	.00915
%RSD	316.09	2.6980	67.814	1045.9	9.1107	72.309	10.450	53.636	16.993
#1	.00011	.00146	.00275	.01697	.00345	.00304	.00028	-.00036	.06035
#2	-.00028	.00152	.00780	-.01293	.00303	.00098	.00033	-.00016	.04740
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00077**	**.00227**	**.01551**	**-.00262**	**.00425**	**.13901**	F **.02671**	**.00024**	**.00067**
Stddev	.00012	.00224	.00229	.00246	.00662	.03046	.00117	.00001	.00009
%RSD	15.088	98.780	14.793	94.013	155.72	21.915	4.3806	5.5197	14.065
#1	.00069	.00068	.01389	-.00436	.00894	.11747	.02588	.00025	.00060
#2	.00086	.00386	.01713	-.00088	-.00043	.16055	.02754	.00023	.00074
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass	Chk Pass
High Limit							.01000		
Low Limit							-.01000		

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00128**	**.00006**	**.00295**
Stddev	.00134	.00031	.00013
%RSD	105.20	481.91	4.5141
#1	-.00033	-.00016	.00285
#2	-.00223	.00028	.00304
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2166.0**	**3912.3**	**63429.**	**6935.8**
Stddev	7.3	7.6	126.	14.7
%RSD	.33749	.19487	.19795	.21196
#1	2160.8	3906.9	63340.	6946.2
#2	2171.1	3917.7	63517.	6925.4

Sample Name: LCSSRM 480-151394/2- Acquired: 11/14/2013 16:53:00 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.38064**	**71.735**	**1.0049**	**1.4028**	**3.1610**	**.71629**	**66.261**	**1.8184**	**1.3199**
Stddev	.00070	.456	.0001	.0012	.0284	.00622	.442	.0005	.0035
%RSD	.18356	.63503	.00717	.08692	.89689	.86812	.66691	.02888	.26277
#1	.38113	72.057	1.0049	1.4020	3.1811	.72069	66.573	1.8180	1.3175
#2	.38014	71.413	1.0048	1.4037	3.1410	.71189	65.948	1.8188	1.3224
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.3028**	**1.0326**	**106.43**	**27.836**	**.07630**	**26.448**	**3.0801**	**1.4136**	**27.714**
Stddev	.0002	.0019	.76	.212	.00077	.020	.0044	.0006	.294
%RSD	.01664	.18144	.71661	.76071	1.0081	.07418	.14218	.04130	1.0596
#1	1.3030	1.0313	106.97	27.985	.07684	26.462	3.0770	1.4140	27.921
#2	1.3026	1.0340	105.89	27.686	.07575	26.434	3.0832	1.4132	27.506
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.5569**	**1.1401**	**2.3704**	**.89212**	**1.5214**	**13.265**	**1.0034**	**.97396**	**2.9218**
Stddev	.0017	.0025	.0039	.00496	.0001	.012	.0013	.00788	.0062
%RSD	.11126	.22271	.16560	.55615	.00843	.09038	.13160	.80935	.21123
#1	1.5557	1.1383	2.3676	.88861	1.5213	13.273	1.0024	.97953	2.9174
#2	1.5581	1.1419	2.3732	.89563	1.5215	13.256	1.0043	.96839	2.9261
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	None	Chk Pass	None	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**1.7512**	**.93453**	**1.4944**
Stddev	.0073	.00114	.0040
%RSD	.41964	.12173	.27055
#1	1.7460	.93373	1.4972
#2	1.7564	.93534	1.4915
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1879.7**	**3894.2**	**62510.**	**7162.7**
Stddev	1.1	2.4	107.	64.4
%RSD	.06042	.06070	.17085	.89916
#1	1880.5	3892.5	62434.	7117.2
#2	1878.9	3895.9	62585.	7208.3

Sample Name: CCV Acquired: 11/14/2013 16:55:11 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48212	24.546	.50342	.48196	.50463	.48285	24.980	.49553	.48658	.49122	.49645	24.244	26.131
Stddev	.00322	.118	.00384	.00138	.00136	.00101	.045	.00066	.00076	.00066	.00034	.053	.060
%RSD	.66767	.48227	.76256	.28720	.26875	.20885	.18056	.13418	.15584	.13481	.06829	.21693	.23067
#1	.47985	24.630	.50613	.48294	.50367	.48356	24.948	.49600	.48712	.49168	.49621	24.281	26.173
#2	.48440	24.462	.50070	.48099	.50559	.48214	25.012	.49506	.48604	.49075	.49669	24.207	26.088
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50015	23.599	.50014	.50374	24.829	.47772	.47957	25.090	.51597	.49824	25.092	.49977	.50562
Stddev	.00188	.051	.00178	.00004	.072	.00121	.00058	.078	.00378	.00128	.254	.00098	.00157
%RSD	.37546	.21459	.35534	.00811	.29048	.25380	.12173	.31277	.73218	.25788	1.0135	.19706	.31130
#1	.50148	23.563	.49888	.50371	24.880	.47857	.47916	25.145	.51330	.49915	24.913	.50046	.50673
#2	.49882	23.635	.50139	.50377	24.778	.47686	.47998	25.034	.51864	.49733	25.272	.49907	.50451
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50998	.48762	.49076	.49174
Stddev	.00012	.00182	.00163	.00285
%RSD	.02338	.37349	.33189	.57922
#1	.51007	.48634	.48960	.48972
#2	.50990	.48891	.49191	.49375
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2001.3	3899.5	62136.	7153.5
Stddev	3.0	.4	247.	.9
%RSD	.15006	.01124	.39751	.01200
#1	2003.4	3899.2	62311.	7154.1
#2	1999.2	3899.9	61961.	7152.8

Sample Name: CCB Acquired: 11/14/2013 16:57:24 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**-.01751**	**.00374**	**.00011**	**.00002**	**-.00005**	**-.01261**	**-.00002**	**.00001**	**.00028**	**.00085**	**-.00099**	**.02175**
Stddev	.00093	.02685	.00115	.00008	.00002	.00008	.00362	.00009	.00006	.00039	.00006	.00134	.00239
%RSD	2456.0	153.33	30.762	77.879	124.72	145.17	28.721	546.07	1070.8	140.00	6.6133	135.46	10.990
#1	-.00070	-.03650	.00455	.00005	.00000	-.00011	-.01517	-.00008	-.00004	.00000	.00089	-.00004	.02344
#2	.00062	.00148	.00292	.00017	.00003	.00000	-.01005	.00005	.00005	.00055	.00081	-.00194	.02006
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00180**	**.00013**	**-.00002**	**.00022**	**.02300**	**.00008**	**-.00015**	**.00009**	**-.00162**	**.00315**	**-.01431**	**-.00162**	**.00003**
Stddev	.00021	.00908	.00000	.00018	.00568	.00023	.00055	.00103	.00214	.00200	.00485	.00083	.00007
%RSD	11.830	6997.5	11.287	85.475	24.684	276.15	357.06	1133.7	131.45	63.533	33.884	51.347	192.30
#1	.00195	-.00629	-.00002	.00009	.02701	-.00008	-.00054	.00082	-.00313	.00173	-.01088	-.00220	-.00001
#2	.00165	.00655	-.00002	.00035	.01898	.00025	.00023	-.00064	-.00011	.00456	-.01773	-.00103	.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00021**	**.00028**	**-.00031**	**-.00020**
Stddev	.00032	.00041	.00012	.00029
%RSD	155.81	145.68	40.190	142.76
#1	-.00044	-.00001	-.00039	.00000
#2	.00002	.00057	-.00022	-.00041
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2198.7**	**3991.5**	**64255.**	**7202.5**
Stddev	9.4	5.0	113.	8.0
%RSD	.42542	.12486	.17580	.11071
#1	2192.1	3988.0	64335.	7208.1
#2	2205.3	3995.0	64175.	7196.9

Sample Name: CCVL Acquired: 11/14/2013 16:59:43 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00243**	**.16348**	**.01109**	**.01827**	**.00202**	**.00183**	**.48677**	**.00090**	**.00384**	**.00362**	**.01056**	**.04409**	**.49534**
Stddev	.00007	.00314	.00077	.00039	.00001	.00002	.00034	.00017	.00024	.00036	.00012	.00200	.00583
%RSD	2.8489	1.9185	6.9484	2.1227	.32904	.82521	.06884	19.184	6.2102	9.8053	1.1061	4.5304	1.1771
#1	.00248	.16570	.01163	.01854	.00202	.00182	.48700	.00078	.00367	.00337	.01064	.04267	.49122
#2	.00238	.16126	.01054	.01799	.00202	.00184	.48653	.00102	.00401	.00387	.01047	.04550	.49946
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03151**	**.20288**	**.00321**	**.00962**	**1.0012**	**.00958**	**.00587**	**.20026**	**.01705**	**.01538**	**.44220**	**.00772**	**.00501**
Stddev	.00022	.00702	.00005	.00007	.0044	.00035	.00059	.00034	.00036	.00098	.00662	.00092	.00007
%RSD	.69974	3.4606	1.4926	.67659	.44276	3.6210	10.133	.16986	2.1387	6.3754	1.4979	11.965	1.3116
#1	.03135	.19792	.00318	.00958	1.0044	.00933	.00629	.20050	.01680	.01469	.43752	.00707	.00506
#2	.03167	.20785	.00325	.00967	.99808	.00982	.00545	.20002	.01731	.01608	.44688	.00837	.00496
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00484**	**.02048**	**.00483**	**.01042**
Stddev	.00041	.00108	.00066	.00085
%RSD	8.4080	5.2536	13.580	8.1564
#1	.00513	.01972	.00436	.01102
#2	.00456	.02124	.00529	.00982
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2244.8**	**4124.2**	**65912.**	**7396.5**
Stddev	1.2	5.3	462.	14.8
%RSD	.05559	.12963	.70121	.20072
#1	2243.9	4128.0	66239.	7407.0
#2	2245.6	4120.4	65585.	7386.0

Sample Name: 480-49854-A-1-B Acquired: 11/14/2013 17:01:59 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00041**	**7.5267**	**.01093**	**.01099**	**.22646**	**.00034**	**10.730**	**.00034**	**.04333**
Stddev	.00054	.0032	.00151	.00007	.00011	.00005	.026	.00009	.00022
%RSD	133.46	.04324	13.814	.66825	.04659	13.976	.23832	25.595	.51231
#1	.00079	7.5244	.01199	.01104	.22653	.00031	10.712	.00040	.04317
#2	.00002	7.5290	.00986	.01094	.22638	.00037	10.748	.00028	.04349
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.08853**	**.21912**	**32.481**	**.85089**	**.00862**	**7.5400**	**.79728**	**.00116**	**.56506**
Stddev	.00028	.00065	.077	.02352	.00168	.0164	.00036	.00011	.00145
%RSD	.32160	.29502	.23567	2.7640	19.476	.21809	.04493	9.6608	.25684
#1	.08873	.21866	32.427	.83426	.00743	7.5283	.79702	.00108	.56404
#2	.08833	.21958	32.536	.86752	.00981	7.5516	.79753	.00124	.56609
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.16753**	**.03179**	**9.5403**	**-.00117**	**.01065**	**7.2968**	**.02574**	**.05891**	**.46794**
Stddev	.00030	.00036	.0009	.00054	.00780	.0604	.00026	.00012	.00051
%RSD	.18096	1.1292	.00897	46.380	73.235	.82788	1.0265	.20997	.10949
#1	.16774	.03154	9.5396	-.00156	.01616	7.3395	.02555	.05882	.46830
#2	.16732	.03205	9.5409	-.00079	.00513	7.2541	.02593	.05900	.46757
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00255**	**.05341**	**.18556**
Stddev	.00061	.00016	.00041
%RSD	24.030	.30288	.22037
#1	-.00298	.05352	.18528
#2	-.00211	.05330	.18585
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2090.8**	**3883.8**	**63201.**	**6961.0**
Stddev	4.6	.1	128.	11.9
%RSD	.22135	.00352	.20226	.17142
#1	2087.5	3883.9	63110.	6952.5
#2	2094.0	3883.7	63291.	6969.4

Sample Name: 480-49854-A-2-B Acquired: 11/14/2013 17:04:11 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**34.017**	**.01617**	**.00587**	**.45150**	**.00094**	**14.675**	**-.00024**	**.09226**
Stddev	.00047	.089	.00000	.00008	.00010	.00004	.059	.00009	.00079
%RSD	256.55	.26181	.02136	1.2820	.02136	3.9912	.39865	36.191	.85801
#1	.00015	34.080	.01616	.00593	.45157	.00091	14.633	-.00018	.09282
#2	-.00051	33.954	.01617	.00582	.45144	.00096	14.716	-.00031	.09170
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.13318**	**.16523**	**97.623**	**5.6156**	**.04231**	**34.543**	**1.0613**	**.00007**	**.53747**
Stddev	.00111	.00000	.225	.0418	.00035	.071	.0017	.00003	.00208
%RSD	.83466	.00106	.23089	.74526	.81589	.20504	.15533	49.857	.38774
#1	.13240	.16523	97.464	5.5860	.04255	34.493	1.0601	.00009	.53600
#2	.13397	.16522	97.782	5.6452	.04206	34.593	1.0625	.00004	.53894
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.23418**	**.05475**	**1.9612**	**-.00360**	**.00837**	**7.5777**	**.02364**	**.05767**	**2.7244**
Stddev	.00130	.00077	.0095	.00008	.00107	.0134	.00060	.00010	.0048
%RSD	.55307	1.3989	.48175	2.2762	12.849	.17682	2.5343	.17503	.17549
#1	.23510	.05529	1.9545	-.00366	.00913	7.5682	.02322	.05774	2.7210
#2	.23327	.05421	1.9678	-.00354	.00761	7.5872	.02407	.05760	2.7278
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00269**	**.13510**	**.62571**
Stddev	.00179	.00019	.00164
%RSD	66.457	.13861	.26244
#1	-.00143	.13523	.62455
#2	-.00396	.13496	.62687
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1991.4**	**3878.5**	**62236.**	**7080.8**
Stddev	2.3	4.8	50.	27.1
%RSD	.11762	.12437	.08061	.38224
#1	1989.7	3875.1	62271.	7061.7
#2	1993.0	3881.9	62200.	7100.0

Sample Name: 480-49854-A-2-B sd@5 Acquired: 11/14/2013 17:06:24 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**6.9901**	**.00313**	**-.00057**	**.09339**	**.00011**	**3.0933**	**-.00002**	**.01827**
Stddev	.00053	.0141	.00244	.00002	.00002	.00003	.0092	.00011	.00017
%RSD	89.321	.20141	77.853	4.0529	.02296	29.550	.29635	441.03	.90674
#1	-.00022	6.9801	.00141	-.00058	.09341	.00009	3.0869	-.00010	.01839
#2	-.00097	7.0001	.00485	-.00055	.09338	.00013	3.0998	.00005	.01816
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02695**	**.03467**	**20.759**	**1.1435**	**.00901**	**7.2932**	**.22476**	**-.00015**	**.13199**
Stddev	.00008	.00019	.071	.0157	.00007	.0056	.00098	.00017	.00466
%RSD	.28623	.54778	.34116	1.3751	.76454	.07646	.43513	116.10	3.5316
#1	.02700	.03481	20.809	1.1547	.00906	7.2892	.22407	-.00026	.13529
#2	.02689	.03454	20.709	1.1324	.00896	7.2971	.22545	-.00003	.12869
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04682**	**.00991**	**.40494**	**-.00262**	**.00677**	**1.6332**	**.00343**	**.01202**	**.57204**
Stddev	.00047	.00202	.00569	.00044	.00403	.0121	.00057	.00005	.00378
%RSD	.99307	20.393	1.4051	16.836	59.492	.73992	16.478	.44983	.66151
#1	.04650	.01134	.40092	-.00231	.00961	1.6246	.00303	.01206	.56937
#2	.04715	.00848	.40897	-.00294	.00392	1.6417	.00383	.01198	.57472
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00047**	**.02788**	**.13103**
Stddev	.00128	.00052	.00084
%RSD	273.81	1.8707	.64403
#1	-.00044	.02824	.13044
#2	.00137	.02751	.13163
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2145.9**	**4005.5**	**64484.**	**7169.6**
Stddev	1.3	5.8	24.	2.2
%RSD	.05853	.14422	.03737	.03116
#1	2146.8	4009.6	64501.	7168.0
#2	2145.0	4001.4	64467.	7171.2

Sample Name: 480-49854-A-2-B pds Acquired: 11/14/2013 17:08:40 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09063**	**53.213**	**.45238**	**.39667**	**.86089**	**.43299**	**35.585**	**.43401**	**.53405**
Stddev	.00077	.066	.00843	.00859	.00177	.00237	.037	.00961	.01064
%RSD	.84796	.12461	1.8636	2.1650	.20517	.54649	.10279	2.2137	1.9920
#1	.09118	53.166	.44642	.39060	.85964	.43466	35.611	.42721	.52652
#2	.09009	53.260	.45834	.40274	.86214	.43131	35.559	.44080	.54157
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.55724**	**.59601**	**116.19**	**25.991**	**.44828**	**54.319**	**1.4485**	**.46358**	**20.216**
Stddev	.00225	.00236	.38	.058	.00108	.045	.0038	.00905	.010
%RSD	.40374	.39630	.32357	.22438	.24061	.08258	.25954	1.9524	.04781
#1	.55883	.59768	116.46	25.950	.44905	54.350	1.4512	.45718	20.209
#2	.55565	.59434	115.93	26.032	.44752	54.287	1.4458	.46998	20.223
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.65502**	**.47975**	**1.9422**	**.43305**	**.44809**	**27.354**	**.44655**	**.45465**	**3.0830**
Stddev	.01158	.01112	.0037	.00845	.00900	.076	.01252	.00011	.0022
%RSD	1.7675	2.3182	.18967	1.9518	2.0084	.27873	2.8040	.02461	.07200
#1	.64684	.47188	1.9396	.42707	.44172	27.408	.43769	.45472	3.0845
#2	.66321	.48761	1.9448	.43903	.45445	27.300	.45540	.45457	3.0814
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.42597**	**.56477**	**1.0081**
Stddev	.01054	.00167	.0073
%RSD	2.4754	.29616	.71877
#1	.41852	.56595	1.0132
#2	.43343	.56359	1.0029
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1893.8**	**3795.8**	**60609.**	**7077.9**
Stddev	.8	8.2	48.	21.7
%RSD	.03985	.21560	.07915	.30608
#1	1893.3	3790.0	60575.	7062.6
#2	1894.4	3801.6	60643.	7093.2

Sample Name: 480-49854-A-2-C MS Acquired: 11/14/2013 17:10:53 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09329**	**70.806**	**.40027**	**.38362**	**.93359**	**.38433**	**44.633**	**.38612**	**.49038**
Stddev	.00002	.505	.00080	.00008	.00577	.00138	.233	.00071	.00085
%RSD	.02601	.71377	.19926	.02030	.61852	.35874	.52298	.18508	.17263
#1	.09331	71.163	.40083	.38368	.93768	.38530	44.798	.38663	.49098
#2	.09328	70.448	.39971	.38357	.92951	.38335	44.468	.38562	.48978
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.57663**	**.58777**	**125.27**	**27.709**	**.45737**	**61.531**	**1.3841**	**.40600**	**21.239**
Stddev	.00081	.00101	.33	.195	.00154	.019	.0005	.00177	.140
%RSD	.13975	.17215	.26675	.70337	.33666	.03150	.03645	.43616	.65685
#1	.57720	.58848	125.51	27.847	.45846	61.517	1.3845	.40725	21.338
#2	.57606	.58705	125.04	27.571	.45628	61.545	1.3838	.40475	21.140
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.65677**	**.43924**	**21.097**	**.33669**	**.39841**	**25.774**	**.41453**	**.50278**	**5.0501**
Stddev	.00120	.00463	.068	.00090	.00815	.089	.00040	.00310	.0109
%RSD	.18255	1.0548	.32407	.26825	2.0450	.34572	.09530	.61662	.21632
#1	.65592	.44251	21.146	.33605	.40417	25.837	.41481	.50497	5.0424
#2	.65762	.43596	21.049	.33733	.39265	25.711	.41425	.50059	5.0579
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.37831**	**.58268**	**1.0879**
Stddev	.00083	.00145	.0029
%RSD	.21989	.24804	.27110
#1	.37772	.58166	1.0900
#2	.37890	.58370	1.0858
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1872.5**	**3820.3**	**60848.**	**7070.0**
Stddev	3.4	15.3	128.	48.8
%RSD	.18277	.39932	.21008	.69024
#1	1870.1	3809.6	60758.	7035.5
#2	1875.0	3831.1	60939.	7104.5

Sample Name: 480-49854-A-2-D MSD Acquired: 11/14/2013 17:13:05 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09377**	**71.400**	**.40204**	**.39027**	**.96090**	**.38492**	**45.822**	**.38463**	**.49869**
Stddev	.00176	.236	.00488	.00022	.00448	.00084	.045	.00034	.00015
%RSD	1.8736	.33081	1.2130	.05632	.46655	.21806	.09757	.08860	.03085
#1	.09253	71.233	.40549	.39043	.95773	.38433	45.790	.38487	.49880
#2	.09501	71.567	.39859	.39012	.96407	.38552	45.853	.38439	.49858
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.58062**	**.58877**	**135.72**	**27.828**	**.46087**	**61.442**	**1.7328**	**.40297**	**21.448**
Stddev	.00104	.00072	.03	.076	.00424	.155	.0016	.00073	.138
%RSD	.17930	.12180	.02016	.27365	.91987	.25243	.09191	.18201	.64225
#1	.57988	.58826	135.70	27.774	.45787	61.552	1.7317	.40349	21.351
#2	.58136	.58928	135.73	27.882	.46386	61.333	1.7339	.40245	21.545
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.66120**	**.44408**	**21.540**	**.32125**	**.38817**	**29.535**	**.42897**	**.50910**	**5.0380**
Stddev	.00145	.00183	.020	.00179	.00268	.020	.00092	.00157	.0092
%RSD	.21874	.41294	.09411	.55699	.69129	.06905	.21400	.30749	.18215
#1	.66222	.44278	21.555	.32252	.39007	29.549	.42962	.50799	5.0445
#2	.66018	.44537	21.526	.31998	.38627	29.520	.42832	.51021	5.0316
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.37882**	**.58797**	**1.1174**
Stddev	.00104	.00072	.0021
%RSD	.27381	.12203	.18323
#1	.37955	.58848	1.1160
#2	.37808	.58746	1.1189
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1863.3**	**3811.6**	**60448.**	**7037.5**
Stddev	4.7	8.4	10.	17.3
%RSD	.25129	.22138	.01609	.24615
#1	1860.0	3805.7	60441.	7049.7
#2	1866.6	3817.6	60455.	7025.2

Sample Name: 480-49854-A-3-B Acquired: 11/14/2013 17:15:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00021	27.929	.01670	.00993	.49020	.00082	13.322	.00011	.09005
Stddev	.00016	.015	.00070	.00014	.00013	.00001	.018	.00003	.00018
%RSD	75.223	.05347	4.2003	1.3723	.02576	1.1299	.13357	26.876	.19874
#1	.00032	27.939	.01621	.01003	.49011	.00082	13.309	.00014	.08992
#2	.00010	27.918	.01720	.00984	.49029	.00081	13.334	.00009	.09018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.18656	.21539	100.63	4.0033	.03011	22.457	3.7692	.00106	.41128
Stddev	.00124	.00010	.09	.0361	.00076	.049	.0202	.00010	.00528
%RSD	.66682	.04742	.08948	.90276	2.5289	.21774	.53506	9.1859	1.2834
#1	.18744	.21532	100.69	3.9778	.02957	22.492	3.7834	.00113	.40755
#2	.18568	.21546	100.56	4.0289	.03065	22.422	3.7549	.00099	.41501
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.27124	.05929	1.9390	-.00269	.00982	10.585	.03060	.06710	2.0532
Stddev	.00087	.00063	.0019	.00223	.00161	.039	.00011	.00011	.0014
%RSD	.32137	1.0571	.09520	83.014	16.392	.37176	.37144	.17063	.06943
#1	.27185	.05973	1.9377	-.00111	.01095	10.612	.03052	.06718	2.0542
#2	.27062	.05884	1.9403	-.00427	.00868	10.557	.03068	.06702	2.0522
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	-.00374	.14032	.27489
Stddev	.00077	.00018	.00387
%RSD	20.646	.12537	1.4084
#1	-.00428	.14045	.27216
#2	-.00319	.14020	.27763
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2000.8	3872.4	61940.	7039.4
Stddev	1.0	1.5	42.	15.2
%RSD	.05045	.03785	.06765	.21548
#1	2000.1	3871.4	61910.	7028.7
#2	2001.6	3873.5	61970.	7050.1

Sample Name: 480-49854-A-4-B Acquired: 11/14/2013 17:18:12 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**62.390**	**.03392**	**.01184**	**.63514**	**.00225**	**15.639**	**.00069**	**.16059**
Stddev	.00076	.284	.00112	.00002	.00624	.00003	.019	.00021	.00055
%RSD	344.30	.45511	3.3124	.17732	.98211	1.3308	.12197	30.267	.34098
#1	-.00076	62.591	.03472	.01185	.63073	.00227	15.652	.00084	.16020
#2	.00032	62.190	.03313	.01182	.63955	.00223	15.625	.00054	.16097
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.57063**	**.21706**	**161.32**	**3.4766**	**.06300**	**18.079**	**4.2818**	**.00319**	**.46041**
Stddev	.00304	.00022	.17	.0556	.00073	.006	.0020	.00007	.00179
%RSD	.53361	.10185	.10719	1.5996	1.1664	.03322	.04727	2.1512	.38834
#1	.56848	.21722	161.20	3.4373	.06352	18.083	4.2804	.00314	.45914
#2	.57278	.21690	161.44	3.5159	.06248	18.075	4.2832	.00324	.46167
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.43580**	**.29184**	**2.3564**	**-.00441**	**.00986**	**12.600**	**.03198**	**.08379**	**3.9773**
Stddev	.00010	.00884	.0072	.00137	.00737	.041	.00003	.00022	.0017
%RSD	.02310	3.0306	.30365	31.074	74.754	.32871	.09411	.26177	.04258
#1	.43573	.29810	2.3513	-.00537	.01508	12.629	.03200	.08394	3.9785
#2	.43587	.28559	2.3614	-.00344	.00465	12.570	.03196	.08363	3.9761
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00233**	**.22811**	**.42599**
Stddev	.00123	.00066	.00533
%RSD	52.630	.28905	1.2516
#1	-.00146	.22858	.42222
#2	-.00320	.22764	.42976
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1966.0**	**3918.0**	**62708.**	**7114.8**
Stddev	.6	1.9	246.	47.9
%RSD	.02855	.04854	.39196	.67341
#1	1966.4	3916.6	62534.	7080.9
#2	1965.6	3919.3	62882.	7148.7

Sample Name: 480-49854-A-5-B Acquired: 11/14/2013 17:20:46 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**55.038**	**.03472**	**.01993**	**1.0051**	**.00177**	**30.990**	**.00146**	**.30718**
Stddev	.00051	.015	.00005	.00062	.0030	.00003	.008	.00013	.00003
%RSD	100.23	.02716	.15238	3.1255	.30109	1.8630	.02645	9.0324	.00968
#1	-.00015	55.028	.03468	.01949	1.0072	.00174	30.996	.00155	.30716
#2	-.00086	55.049	.03476	.02037	1.0029	.00179	30.984	.00136	.30721
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.63534**	**3.2145**	**214.98**	**4.5439**	**.05238**	**128.24**	**6.3313**	**.00044**	**.55705**
Stddev	.00066	.0048	1.05	.0275	.00115	.02	.0088	.00023	.00616
%RSD	.10370	.15000	.49031	.60575	2.1995	.01171	.13932	52.695	1.1060
#1	.63487	3.2179	214.23	4.5245	.05157	128.23	6.3250	.00028	.55269
#2	.63580	3.2111	215.73	4.5634	.05320	128.25	6.3375	.00061	.56141
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.3842**	**.21140**	**4.4200**	**-.00459**	**.02386**	**13.331**	**.12198**	**.16829**	**3.0882**
Stddev	.0017	.00058	.0191	.00081	.00030	.009	.00028	.00017	.0050
%RSD	.12296	.27603	.43309	17.577	1.2372	.07029	.22568	.10031	.16366
#1	1.3830	.21182	4.4335	-.00402	.02365	13.337	.12217	.16841	3.0847
#2	1.3854	.21099	4.4064	-.00516	.02407	13.324	.12179	.16817	3.0918
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00348**	**.18357**	**.83071**
Stddev	.00146	.00033	.00007
%RSD	41.825	.17882	.00827
#1	-.00451	.18381	.83066
#2	-.00245	.18334	.83076
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1870.6**	**3801.3**	**60824.**	**7001.4**
Stddev	1.3	1.1	94.	9.1
%RSD	.06974	.02783	.15532	.13045
#1	1871.5	3800.5	60757.	6994.9
#2	1869.6	3802.0	60890.	7007.9

Sample Name: CCV Acquired: 11/14/2013 17:23:11 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48409	24.611	.50430	.48134	.50866	.48430	25.034	.49519	.48588	.49395	.49480	24.207	25.841
Stddev	.00119	.101	.00111	.00002	.00085	.00036	.067	.00024	.00099	.00003	.00020	.032	.092
%RSD	.24481	.40927	.22076	.00349	.16686	.07498	.26825	.04752	.20328	.00529	.03993	.13410	.35731
#1	.48325	24.682	.50509	.48133	.50926	.48456	25.082	.49503	.48658	.49393	.49466	24.230	25.906
#2	.48493	24.540	.50352	.48135	.50806	.48404	24.987	.49536	.48518	.49396	.49494	24.184	25.776
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49520	23.740	.50033	.50248	24.738	.47894	.48090	24.968	.51272	.49272	24.888	.49697	.50406
Stddev	.00028	.091	.00033	.00139	.053	.00051	.00460	.040	.00088	.00441	.279	.00079	.00120
%RSD	.05639	.38184	.06551	.27661	.21283	.10711	.95722	.16049	.17119	.89593	1.1215	.15835	.23898
#1	.49540	23.804	.50056	.50149	24.775	.47930	.48416	24.997	.51210	.49584	24.691	.49752	.50491
#2	.49500	23.676	.50010	.50346	24.701	.47857	.47765	24.940	.51335	.48960	25.086	.49641	.50320
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.51420	.49006	.49249	.49693
Stddev	.00110	.00034	.00093	.00208
%RSD	.21360	.06933	.18870	.41922
#1	.51342	.49030	.49315	.49840
#2	.51497	.48982	.49183	.49546
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2007.0	3917.6	62137.	7143.9
Stddev	.4	5.4	51.	23.1
%RSD	.02114	.13762	.08275	.32397
#1	2007.3	3921.4	62173.	7127.5
#2	2006.7	3913.8	62101.	7160.3

Sample Name: CCB Acquired: 11/14/2013 17:25:25 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00097**	**-.02321**	**.00287**	**-.00078**	**.00002**	**-.00010**	**-.01818**	**.00019**	**.00023**	**.00032**	**.00065**	**-.00458**	**.03033**
Stddev	.00103	.01056	.00007	.00064	.00001	.00003	.00074	.00028	.00035	.00007	.00034	.00097	.00250
%RSD	106.38	45.504	2.4701	81.061	47.911	31.891	4.0790	147.36	153.02	22.973	52.418	21.227	8.2566
#1	.00170	-.01574	.00282	-.00123	.00001	-.00007	-.01765	-.00001	-.00002	.00037	.00089	-.00526	.02856
#2	.00024	-.03068	.00292	-.00033	.00003	-.00012	-.01870	.00038	.00048	.00027	.00041	-.00389	.03210
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00193**	**.00140**	**.00007**	**.00029**	**.02600**	**.00024**	**-.00019**	**.00692**	**-.00144**	**.00219**	**-.01378**	**-.00128**	**.00016**
Stddev	.00180	.00237	.00002	.00034	.00409	.00048	.00031	.01155	.00074	.00143	.00118	.00009	.00009
%RSD	93.136	169.58	29.641	118.47	15.735	199.58	162.55	166.86	51.279	65.199	8.5461	7.3199	56.623
#1	.00066	.00308	.00005	.00005	.02890	-.00010	-.00040	-.00125	-.00092	.00118	-.01294	-.00135	.00022
#2	.00321	-.00028	.00008	.00053	.02311	.00058	.00003	.01509	-.00196	.00320	-.01461	-.00122	.00009
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00021**	**.00133**	**.00012**	**-.00056**
Stddev	.00007	.00089	.00027	.00011
%RSD	33.558	66.804	227.31	19.611
#1	.00026	.00070	.00031	-.00048
#2	.00016	.00195	-.00007	-.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2190.5**	**3997.7**	**64324.**	**7181.6**
Stddev	2.0	7.5	79.	64.3
%RSD	.09069	.18752	.12206	.89577
#1	2189.1	4003.0	64379.	7136.1
#2	2191.9	3992.4	64268.	7227.1

Sample Name: CCVL Acquired: 11/14/2013 17:27:49 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	W .00179	.16835	.00944	.01802	.00202	.00178	.47949	.00091	.00397	.00354	.01085	.04467
Stddev	.00045	.02231	.00404	.00011	.00003	.00002	.00578	.00007	.00029	.00023	.00029	.00346
%RSD	24.914	13.255	42.775	.63630	1.3202	1.0959	1.2047	7.4750	7.3050	6.3898	2.6334	7.7350
#1	.00148	.15258	.00659	.01794	.00204	.00177	.48357	.00096	.00418	.00338	.01105	.04711
#2	.00211	.18413	.01230	.01810	.00200	.00180	.47541	.00086	.00377	.00370	.01065	.04223
Check ?	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value	.00300											
Range	-30.000%											

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50780	.03261	.19631	.00322	.00931	.99329	.00935	W .00322	.20349	.01668	.01771	.44074
Stddev	.02980	.00038	.00522	.00005	.00026	.00061	.00053	.00065	.00052	.00048	.00079	.01091
%RSD	5.8682	1.1657	2.6589	1.6655	2.7534	.06114	5.6210	20.209	.25413	2.8533	4.4453	2.4761
#1	.48673	.03234	.19262	.00318	.00913	.99372	.00898	.00368	.20313	.01702	.01826	.43302
#2	.52888	.03288	.20000	.00325	.00949	.99286	.00972	.00276	.20386	.01634	.01715	.44846
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00725	.00496	.00460	.01931	.00482	.01012
Stddev	.00060	.00008	.00044	.00003	.00033	.00009
%RSD	8.2944	1.5700	9.5062	.13934	6.8457	.87986
#1	.00683	.00490	.00491	.01929	.00505	.01006
#2	.00768	.00501	.00429	.01933	.00458	.01019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2259.7	4148.8	66667.	7413.4
Stddev	6.9	11.7	2.	27.6
%RSD	.30390	.28315	.00274	.37251
#1	2264.5	4157.1	66666.	7432.9
#2	2254.8	4140.5	66669.	7393.9

Sample Name: 480-49854-A-9-B Acquired: 11/14/2013 17:30:10 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00097	59.266	.04273	.02409	1.1579	.00198	34.487	.00180	.32813
Stddev	.00035	.331	.00313	.00065	.0132	.00011	.098	.00008	.00019
%RSD	36.213	.55880	7.3190	2.6886	1.1422	5.5051	.28475	4.6901	.05939
#1	.00122	59.501	.04495	.02455	1.1673	.00205	34.557	.00186	.32799
#2	.00072	59.032	.04052	.02363	1.1486	.00190	34.418	.00174	.32827
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.63127	4.9288	220.31	5.0714	.05270	82.821	8.6438	.00081	.53540
Stddev	.00342	.0032	.08	.0679	.00036	.003	.0350	.00028	.01633
%RSD	.54107	.06491	.03553	1.3391	.68301	.00315	.40516	35.175	3.0502
#1	.63369	4.9266	220.25	5.1194	.05295	82.822	8.6190	.00101	.54695
#2	.62886	4.9311	220.36	5.0233	.05244	82.819	8.6686	.00061	.52386
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	1.5447	.23212	4.9967	-.00619	.03273	13.038	.16968	.20084	2.8273
Stddev	.0021	.00336	.0158	.00107	.00088	.120	.00031	.00120	.0000
%RSD	.13313	1.4461	.31626	17.223	2.6974	.92401	.18003	.59564	.00148
#1	1.5461	.23450	4.9855	-.00544	.03336	13.123	.16990	.20168	2.8274
#2	1.5432	.22975	5.0078	-.00695	.03211	12.953	.16947	.19999	2.8273
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	-.00488	.20518	.99254
Stddev	.00044	.00015	.00300
%RSD	9.0714	.07078	.30237
#1	-.00520	.20528	.99466
#2	-.00457	.20508	.99042
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1869.9	3782.4	60746.	7017.3
Stddev	3.6	2.4	123.	48.8
%RSD	.19210	.06364	.20254	.69579
#1	1867.4	3780.7	60659.	6982.7
#2	1872.4	3784.1	60833.	7051.8

Sample Name: 480-49854-A-10-B Acquired: 11/14/2013 17:32:25 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00016**	**24.336**	**.00958**	**.00113**	**.36468**	**.00057**	**13.319**	**-.00073**	**.09584**
Stddev	.00020	.014	.00454	.00024	.00065	.00005	.044	.00026	.00037
%RSD	125.14	.05950	47.400	21.266	.17746	9.3414	.32698	35.686	.39034
#1	-.00030	24.347	.00637	.00096	.36422	.00054	13.289	-.00054	.09611
#2	-.00002	24.326	.01279	.00130	.36513	.00061	13.350	-.00091	.09558
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20279**	**.19798**	**111.42**	**3.5123**	**.03030**	**70.896**	**1.4974**	**-.00031**	**.73650**
Stddev	.00121	.00007	.41	.0345	.00106	.053	.0008	.00030	.01214
%RSD	.59676	.03682	.36360	.98181	3.5073	.07429	.05206	97.018	1.6484
#1	.20365	.19793	111.13	3.4879	.03106	70.859	1.4969	-.00010	.72791
#2	.20194	.19803	111.71	3.5367	.02955	70.933	1.4980	-.00053	.74508
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.47632**	**.02292**	**.66251**	**-.00456**	**.00177**	**10.590**	**.04634**	**.06162**	**2.0070**
Stddev	.00049	.00458	.00126	.00093	.00144	.065	.00045	.00024	.0034
%RSD	.10214	19.973	.19006	20.428	81.482	.61641	.96429	.39206	.17116
#1	.47598	.01969	.66340	-.00522	.00075	10.637	.04665	.06145	2.0046
#2	.47666	.02616	.66162	-.00390	.00279	10.544	.04602	.06179	2.0095
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00255**	**.08356**	**.43947**
Stddev	.00038	.00034	.00082
%RSD	14.769	.41024	.18754
#1	-.00281	.08332	.44006
#2	-.00228	.08380	.43889
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1949.7**	**3816.6**	**61048.**	**6992.3**
Stddev	2.6	13.0	39.	15.4
%RSD	.13116	.34040	.06321	.21963
#1	1951.5	3807.4	61021.	7003.2
#2	1947.8	3825.7	61075.	6981.5

Sample Name: 480-49854-A-11-B Acquired: 11/14/2013 17:34:41 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**22.578**	**.01483**	**.00724**	**.38318**	**.00065**	**15.853**	**-.00014**	**.11308**
Stddev	.00019	.044	.00293	.00008	.00026	.00002	.094	.00007	.00016
%RSD	37.150	.19409	19.758	1.1345	.06755	3.5102	.59493	48.366	.13767
#1	-.00065	22.609	.01275	.00718	.38300	.00067	15.786	-.00019	.11297
#2	-.00038	22.547	.01690	.00730	.38337	.00063	15.919	-.00009	.11319
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.18182**	**.27172**	**96.076**	**3.4448**	**.03035**	**60.882**	**1.6355**	**-.00004**	**.67957**
Stddev	.00074	.00127	.161	.0486	.00110	.171	.0037	.00000	.00113
%RSD	.40896	.46881	.16717	1.4103	3.6088	.28073	.22511	9.2287	.16559
#1	.18234	.27263	95.962	3.4104	.02957	60.761	1.6329	-.00003	.68036
#2	.18129	.27082	96.189	3.4791	.03112	61.003	1.6381	-.00004	.67877
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48088**	**.03112**	**9.6461**	**-.00380**	**.00519**	**12.643**	**.04372**	**.06316**	**2.0681**
Stddev	.00007	.00115	.0084	.00056	.00611	.106	.00139	.00008	.0005
%RSD	.01457	3.7055	.08722	14.843	117.74	.83842	3.1744	.12051	.02502
#1	.48093	.03031	9.6521	-.00340	.00951	12.718	.04470	.06311	2.0678
#2	.48083	.03194	9.6402	-.00420	.00087	12.568	.04274	.06322	2.0685
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00134**	**.09302**	**.47542**
Stddev	.00032	.00017	.00054
%RSD	23.995	.18238	.11327
#1	-.00157	.09290	.47580
#2	-.00111	.09314	.47504
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1954.7**	**3832.0**	**61184.**	**7074.1**
Stddev	3.5	3.6	62.	19.5
%RSD	.18128	.09341	.10111	.27496
#1	1952.2	3834.6	61140.	7060.3
#2	1957.2	3829.5	61228.	7087.9

Sample Name: 480-49854-A-12-B Acquired: 11/14/2013 17:36:54 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00039**	**46.383**	**.02903**	**.00079**	**.58457**	**.00137**	**64.197**	F **-.00185**	**.11794**
Stddev	.00127	.015	.00051	.00036	.00241	.00000	.196	.00020	.00138
%RSD	321.94	.03307	1.7488	45.263	.41259	.27350	.30466	10.772	1.1672
#1	.00050	46.393	.02867	.00104	.58627	.00137	64.058	-.00171	.11697
#2	-.00129	46.372	.02939	.00054	.58286	.00137	64.335	-.00200	.11891
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.33295**	**.21087**	**216.18**	**4.4846**	**.08601**	**72.354**	**3.7583**	**-.00029**	**.74107**
Stddev	.00062	.00095	.49	.0082	.00145	.303	.0040	.00031	.01323
%RSD	.18645	.45184	.22769	.18198	1.6824	.41904	.10497	108.53	1.7856
#1	.33339	.21154	215.83	4.4789	.08704	72.568	3.7611	-.00007	.75043
#2	.33251	.21019	216.53	4.4904	.08499	72.139	3.7555	-.00051	.73171
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.35703**	**.03472**	**2.5242**	**-.00487**	**.00320**	**6.7189**	**.04920**	**.09958**	**1.8940**
Stddev	.00149	.00198	.0030	.00027	.00901	.0597	.00015	.00007	.0011
%RSD	.41846	5.7080	.11916	5.4611	281.67	.88904	.30214	.06829	.05701
#1	.35809	.03331	2.5221	-.00468	-.00317	6.6767	.04910	.09953	1.8932
#2	.35598	.03612	2.5263	-.00506	.00957	6.7612	.04931	.09963	1.8948
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00247**	**.20389**	**.59440**
Stddev	.00135	.00025	.00361
%RSD	54.731	.12038	.60775
#1	-.00151	.20372	.59695
#2	-.00343	.20406	.59184
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1869.5**	**3746.8**	**59954.**	**7072.9**
Stddev	1.2	7.0	221.	6.3
%RSD	.06421	.18615	.36838	.08856
#1	1870.3	3741.9	59798.	7068.4
#2	1868.6	3751.8	60110.	7077.3

Sample Name: 480-49854-A-13-B Acquired: 11/14/2013 17:39:14 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**19.692**	**.01079**	**.01076**	**.55571**	**.00057**	**12.455**	**-.00027**	**.06696**
Stddev	.00049	.069	.00056	.00003	.00333	.00002	.007	.00001	.00010
%RSD	769.31	.34894	5.1570	.25611	.59861	3.3577	.05790	4.8162	.14925
#1	-.00041	19.741	.01119	.01075	.55336	.00055	12.460	-.00026	.06689
#2	.00028	19.644	.01040	.01078	.55807	.00058	12.450	-.00028	.06703
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.24755**	**.18930**	**75.152**	**2.4151**	**.02337**	**29.274**	**4.3606**	**-.00034**	**.67376**
Stddev	.00031	.00003	.341	.0230	.00069	.019	.0028	.00003	.00236
%RSD	.12343	.01462	.45437	.95115	2.9401	.06452	.06509	8.1205	.35015
#1	.24734	.18932	74.910	2.4313	.02288	29.288	4.3586	-.00032	.67209
#2	.24777	.18928	75.393	2.3988	.02385	29.261	4.3626	-.00036	.67542
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.28835**	**.03518**	**3.7270**	**-.00444**	**.00376**	**9.0123**	**.03718**	**.06020**	**1.3148**
Stddev	.00139	.00237	.0031	.00012	.00277	.0056	.00037	.00003	.0017
%RSD	.48034	6.7399	.08331	2.7024	73.819	.06273	.98715	.05813	.13104
#1	.28933	.03350	3.7248	-.00453	.00180	9.0163	.03744	.06018	1.3160
#2	.28737	.03685	3.7292	-.00436	.00572	9.0083	.03692	.06023	1.3136
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00252**	**.07895**	**.43738**
Stddev	.00008	.00002	.00129
%RSD	3.1591	.02078	.29603
#1	-.00258	.07897	.43647
#2	-.00247	.07894	.43830
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2010.1**	**3868.5**	**62134.**	**7001.0**
Stddev	4.6	4.8	102.	10.2
%RSD	.22655	.12375	.16407	.14516
#1	2006.9	3865.1	62207.	6993.9
#2	2013.3	3871.9	62062.	7008.2

Sample Name: 480-49854-A-14-B Acquired: 11/14/2013 17:41:33 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**27.388**	**.00644**	**.00041**	**.29370**	**.00092**	**7.8152**	**-.00062**	**.07094**
Stddev	.00122	.038	.00145	.00004	.00046	.00008	.0271	.00008	.00009
%RSD	962.88	.13749	22.490	10.850	.15712	8.7627	.34657	12.851	.13293
#1	-.00099	27.415	.00542	.00044	.29337	.00097	7.8343	-.00057	.07101
#2	.00073	27.361	.00747	.00038	.29403	.00086	7.7960	-.00068	.07087
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.11888**	**.17895**	**105.93**	**4.2735**	**.04207**	**55.863**	**1.3675**	**-.00084**	**.45973**
Stddev	.00063	.00069	.24	.0061	.00016	.023	.0030	.00004	.01485
%RSD	.53410	.38467	.22353	.14237	.37952	.04129	.22221	5.0840	3.2304
#1	.11844	.17846	105.76	4.2778	.04218	55.847	1.3697	-.00081	.47024
#2	.11933	.17943	106.10	4.2692	.04196	55.880	1.3654	-.00087	.44923
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.60136**	**.02995**	**.79080**	**-.00297**	**-.00072**	**7.6625**	**.04931**	**.03353**	**2.0104**
Stddev	.00273	.00160	.00286	.00140	.00351	.0225	.00042	.00012	.0066
%RSD	.45454	5.3559	.36223	47.127	486.67	.29366	.84465	.35047	.32769
#1	.60329	.03109	.78877	-.00397	.00176	7.6466	.04960	.03345	2.0057
#2	.59943	.02882	.79282	-.00198	-.00320	7.6784	.04901	.03362	2.0150
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00144**	**.08346**	**.30623**
Stddev	.00163	.00075	.00068
%RSD	113.70	.90440	.22156
#1	-.00028	.08400	.30671
#2	-.00259	.08293	.30575
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1966.7**	**3847.9**	**61298.**	**7042.8**
Stddev	2.7	3.1	68.	18.5
%RSD	.13600	.08064	.11089	.26200
#1	1964.8	3845.7	61250.	7029.8
#2	1968.6	3850.1	61346.	7055.9

Sample Name: 480-49854-A-15-B Acquired: 11/14/2013 17:43:46 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00053**	**24.349**	**.00813**	**.00315**	**.35137**	**.00066**	**18.514**	**-.00072**	**.09372**
Stddev	.00064	.147	.00247	.00029	.00072	.00003	.003	.00001	.00063
%RSD	122.18	.60546	30.374	9.3515	.20444	5.1842	.01734	1.8216	.66799
#1	-.00007	24.453	.00639	.00294	.35188	.00068	18.512	-.00073	.09416
#2	-.00098	24.245	.00988	.00336	.35086	.00063	18.517	-.00071	.09327
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.17104**	**.19232**	**113.56**	**2.9089**	**.03230**	**67.475**	**2.7144**	**-.00016**	**.60701**
Stddev	.00098	.00043	.40	.0312	.00080	.131	.0000	.00002	.00329
%RSD	.57069	.22148	.35327	1.0716	2.4851	.19344	.00160	9.5675	.54281
#1	.17035	.19202	113.27	2.9309	.03287	67.567	2.7145	-.00015	.60934
#2	.17173	.19262	113.84	2.8868	.03174	67.382	2.7144	-.00017	.60468
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49291**	**.03391**	**1.6659**	**-.00359**	**-.00157**	**13.448**	**.04874**	**.05626**	**1.9063**
Stddev	.00001	.00068	.0183	.00229	.00802	.056	.00026	.00007	.0022
%RSD	.00239	2.0114	1.0969	63.900	512.33	.41694	.53018	.13280	.11302
#1	.49292	.03440	1.6788	-.00521	.00411	13.487	.04892	.05632	1.9078
#2	.49290	.03343	1.6530	-.00197	-.00724	13.408	.04856	.05621	1.9048
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00182**	**.08424**	**.43363**
Stddev	.00084	.00003	.00003
%RSD	45.977	.03390	.00621
#1	-.00123	.08422	.43361
#2	-.00241	.08426	.43365
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1952.6**	**3845.0**	**61453.**	**7065.6**
Stddev	.7	7.9	237.	11.6
%RSD	.03426	.20523	.38524	.16416
#1	1953.1	3839.4	61286.	7057.4
#2	1952.1	3850.6	61621.	7073.8

Sample Name: 480-49854-A-16-B Acquired: 11/14/2013 17:45:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00089**	**26.989**	**.01024**	**.00207**	**.32082**	**.00076**	**15.681**	**-.00061**	**.07648**
Stddev	.00027	.041	.00043	.00062	.00066	.00002	.021	.00001	.00023
%RSD	29.648	.15011	4.2447	29.907	.20459	2.6212	.13481	2.3751	.30494
#1	-.00108	26.961	.01055	.00250	.32035	.00074	15.696	-.00060	.07631
#2	-.00071	27.018	.00993	.00163	.32128	.00077	15.666	-.00062	.07664
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.12304**	**.10377**	**89.602**	**2.8261**	**.02613**	**50.863**	**1.4514**	**-.00063**	**1.7195**
Stddev	.00036	.00005	.266	.0255	.00041	.058	.0086	.00035	.0164
%RSD	.29279	.05074	.29646	.90357	1.5599	.11349	.59073	54.904	.95498
#1	.12279	.10381	89.790	2.8442	.02642	50.822	1.4453	-.00088	1.7079
#2	.12330	.10373	89.414	2.8081	.02584	50.904	1.4574	-.00039	1.7311
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.38745**	**.06320**	**.66791**	**-.00293**	**.00405**	**13.220**	**.04813**	**.07098**	**1.9711**
Stddev	.00219	.00175	.00317	.00051	.00041	.016	.00070	.00024	.0038
%RSD	.56476	2.7624	.47489	17.406	10.019	.12114	1.4507	.33956	.19452
#1	.38900	.06196	.67016	-.00329	.00434	13.231	.04863	.07081	1.9684
#2	.38590	.06443	.66567	-.00257	.00377	13.209	.04764	.07115	1.9739
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00175**	**.06682**	**.38574**
Stddev	.00241	.00053	.00260
%RSD	137.29	.79327	.67458
#1	-.00005	.06720	.38390
#2	-.00346	.06645	.38758
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1974.0**	**3853.1**	**61795.**	**7116.7**
Stddev	1.7	4.3	107.	40.7
%RSD	.08799	.11121	.17335	.57225
#1	1972.8	3850.1	61871.	7088.0
#2	1975.3	3856.1	61720.	7145.5

Sample Name: 480-49854-A-17-B Acquired: 11/14/2013 17:48:12 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**37.325**	**.01566**	**.01794**	**.80891**	**.00115**	**18.246**	**-.00010**	**.13156**
Stddev	.00031	.213	.00039	.00026	.00139	.00007	.074	.00003	.00042
%RSD	102.67	.57103	2.4877	1.4659	.17242	6.0098	.40790	24.983	.31758
#1	-.00052	37.476	.01538	.01813	.80989	.00120	18.298	-.00012	.13186
#2	-.00008	37.174	.01593	.01775	.80792	.00111	18.193	-.00008	.13127
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.26184**	**.99621**	**118.59**	**3.5122**	**.03850**	**39.657**	**5.0085**	**-.00006**	**.91168**
Stddev	.00002	.00039	.41	.0288	.00137	.024	.0206	.00005	.00327
%RSD	.00838	.03870	.34740	.82018	3.5681	.06113	.41062	76.612	.35919
#1	.26185	.99648	118.88	3.5326	.03753	39.674	4.9939	-.00003	.90937
#2	.26182	.99594	118.30	3.4919	.03948	39.640	5.0230	-.00010	.91400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.58179**	**.08105**	**10.417**	**-.00234**	**.01584**	**9.9938**	**.05306**	**.10441**	**2.1733**
Stddev	.00126	.00149	.001	.00124	.00479	.0187	.00172	.00024	.0042
%RSD	.21613	1.8430	.00728	53.292	30.248	.18750	3.2476	.23005	.19494
#1	.58090	.08211	10.417	-.00146	.01923	10.007	.05184	.10424	2.1703
#2	.58268	.08000	10.418	-.00322	.01245	9.9806	.05428	.10458	2.1763
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00351**	**.12756**	**.82952**
Stddev	.00084	.00036	.00320
%RSD	23.893	.28510	.38593
#1	-.00291	.12782	.82726
#2	-.00410	.12730	.83179
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1974.3**	**3891.4**	**62043.**	**7113.9**
Stddev	2.1	15.9	151.	77.7
%RSD	.10535	.40924	.24366	1.0922
#1	1975.8	3902.7	62150.	7059.0
#2	1972.8	3880.2	61936.	7168.9

Sample Name: CCV Acquired: 11/14/2013 17:50:32 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48195	24.383	.50036	.48081	.49961	.48114	24.738	.49265	.48408	.49107	.49387	23.921	25.552
Stddev	.00140	.138	.00163	.00341	.00020	.00254	.108	.00112	.00012	.00046	.00079	.053	.147
%RSD	.29102	.56498	.32669	.70870	.03912	.52732	.43493	.22659	.02572	.09394	.15953	.22316	.57487
#1	.48295	24.480	.49920	.48322	.49975	.48293	24.814	.49344	.48417	.49139	.49331	23.959	25.656
#2	.48096	24.285	.50151	.47840	.49947	.47934	24.662	.49186	.48400	.49074	.49442	23.883	25.448
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49416	23.681	.49584	.49916	24.545	.48012	.48116	24.765	.50559	.49155	24.312	.49609	.49942
Stddev	.00161	.072	.00094	.00050	.012	.00267	.00008	.006	.00417	.00281	.122	.00164	.00104
%RSD	.32554	.30549	.19001	.09931	.04754	.55602	.01569	.02395	.82517	.57189	.50228	.33070	.20891
#1	.49530	23.630	.49651	.49951	24.553	.48201	.48111	24.769	.50264	.48956	24.226	.49725	.50016
#2	.49302	23.733	.49517	.49881	24.537	.47824	.48122	24.761	.50854	.49354	24.398	.49493	.49868
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50956	.49062	.49173	.49575
Stddev	.00185	.00295	.00040	.00117
%RSD	.36404	.60216	.08061	.23640
#1	.51087	.49271	.49145	.49492
#2	.50825	.48853	.49201	.49657
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2004.3	3929.2	62457.	7221.9
Stddev	1.8	2.5	124.	27.7
%RSD	.09134	.06372	.19878	.38410
#1	2003.0	3927.4	62369.	7202.3
#2	2005.6	3930.9	62545.	7241.5

Sample Name: CCB Acquired: 11/14/2013 17:52:46 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00027**	**-.00132**	**-.00015**	**-.00139**	**.00019**	**-.00002**	**-.00857**	**.00001**	**.00013**	**.00032**	**.00160**	**.01635**	**.00621**
Stddev	.00055	.00733	.00102	.00013	.00002	.00006	.00164	.00019	.00035	.00010	.00008	.00313	.02476
%RSD	202.61	555.86	685.69	9.2952	8.1240	318.95	19.148	2143.7	259.70	30.082	4.8343	19.123	398.85
#1	-.00066	-.00650	.00057	-.00130	.00018	.00002	-.00974	.00015	.00038	.00038	.00155	.01414	-.01130
#2	.00012	.00386	-.00087	-.00148	.00020	-.00006	-.00741	-.00013	-.00011	.00025	.00166	.01856	.02371
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00153**	**.01552**	**.00086**	**.00015**	**.02144**	**.00021**	**.00103**	**.00243**	**-.00178**	**.00264**	**-.01596**	**-.00131**	**.00017**
Stddev	.00046	.00287	.00002	.00026	.00189	.00009	.00079	.00184	.00047	.00380	.00001	.00070	.00001
%RSD	30.026	18.504	2.6713	177.43	8.8303	42.468	76.755	75.540	26.302	144.17	.07630	53.209	5.4302
#1	.00120	.01349	.00088	-.00004	.02278	.00015	.00159	.00373	-.00145	.00532	-.01597	-.00180	.00017
#2	.00185	.01755	.00084	.00033	.02010	.00028	.00047	.00113	-.00211	-.00005	-.01595	-.00082	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00056**	**.00024**	**.00016**	**-.00068**
Stddev	.00010	.00003	.00008	.00073
%RSD	17.770	10.658	51.261	108.12
#1	.00049	.00022	.00010	-.00120
#2	.00063	.00025	.00022	-.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2199.7**	**4011.6**	**64485.**	**7192.3**
Stddev	2.5	1.6	39.	21.6
%RSD	.11378	.04110	.06034	.30004
#1	2197.9	4010.4	64457.	7177.1
#2	2201.4	4012.8	64512.	7207.6

Sample Name: CCVL Acquired: 11/14/2013 17:55:11 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00290	.18783	.01249	.01786	.00219	.00189	.49251	.00085	.00397	.00324	.01060	W .06884
Stddev	.00019	.01718	.00151	.00021	.00000	.00002	.00216	.00019	.00036	.00032	.00010	.00213
%RSD	6.6389	9.1443	12.093	1.1511	.12236	.81982	.43890	22.310	9.0600	9.8164	.93432	3.1012
#1	.00277	.17568	.01355	.01772	.00219	.00190	.49404	.00098	.00371	.00347	.01053	.07035
#2	.00304	.19997	.01142	.01801	.00219	.00188	.49098	.00072	.00422	.00302	.01067	.06733
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn
Value												.05000
Range												30.000%

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51065	.03169	.21292	W .00405	.00980	1.0028	.00961	.00425	.20645	.01788	.01497	.43587
Stddev	.00158	.00042	.00788	.00009	.00008	.0075	.00015	.00208	.00035	.00100	.00564	.00789
%RSD	.30960	1.3320	3.7023	2.3265	.78479	.74701	1.6061	48.971	.16995	5.6030	37.699	1.8108
#1	.51177	.03199	.20735	.00411	.00986	1.0081	.00972	.00278	.20620	.01717	.01896	.43029
#2	.50953	.03140	.21850	.00398	.00975	.99753	.00950	.00572	.20670	.01859	.01098	.44146
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				.00300								
Range				30.000%								

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00726	.00508	.00465	.02139	.00498	.01063
Stddev	.00070	.00002	.00016	.00075	.00011	.00028
%RSD	9.6957	.41544	3.3361	3.4838	2.2057	2.6499
#1	.00776	.00507	.00476	.02191	.00490	.01083
#2	.00676	.00510	.00454	.02086	.00506	.01043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2246.0	4140.6	66253.	7424.5
Stddev	.7	19.9	232.	11.7
%RSD	.03157	.47985	.35013	.15814
#1	2246.5	4154.7	66417.	7432.8
#2	2245.5	4126.6	66089.	7416.2

Sample Name: 480-49854-A-18-B Acquired: 11/14/2013 17:57:32 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**29.416**	**.02113**	**.02009**	**.50191**	**.00096**	**32.512**	**.00171**	**.06597**
Stddev	.00078	.073	.00166	.00003	.00006	.00008	.043	.00001	.00000
%RSD	168.99	.24669	7.8687	.15380	.01251	8.2083	.13256	.45177	.00031
#1	-.00009	29.365	.02230	.02007	.50187	.00101	32.481	.00171	.06597
#2	.00102	29.467	.01995	.02011	.50196	.00090	32.542	.00172	.06597
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.22293**	**.44883**	**73.156**	**2.2923**	**.02968**	**22.835**	**2.4478**	**.00171**	**1.1724**
Stddev	.00034	.00194	.192	.0129	.00104	.022	.0086	.00006	.0020
%RSD	.15151	.43241	.26223	.56212	3.4950	.09661	.35120	3.3120	.16801
#1	.22270	.45021	73.020	2.3014	.02894	22.850	2.4417	.00175	1.1738
#2	.22317	.44746	73.292	2.2832	.03041	22.819	2.4539	.00167	1.1710
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.31122**	**.19657**	**10.832**	**-.00203**	**.01637**	**10.459**	**.04024**	**.11472**	**1.6109**
Stddev	.00070	.00185	.035	.00246	.00069	.074	.00042	.00007	.0001
%RSD	.22614	.93948	.32364	120.96	4.2448	.70871	1.0446	.06233	.00932
#1	.31072	.19526	10.857	-.00029	.01588	10.511	.04053	.11477	1.6108
#2	.31172	.19787	10.807	-.00377	.01686	10.407	.03994	.11467	1.6110
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00275**	**.21461**	**.34569**
Stddev	.00064	.00039	.00346
%RSD	23.322	.18215	1.0023
#1	-.00321	.21433	.34324
#2	-.00230	.21488	.34814
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1962.2**	**3825.4**	**61562.**	**7005.4**
Stddev	5.0	25.0	129.	26.2
%RSD	.25684	.65240	.21018	.37414
#1	1958.6	3807.7	61653.	6986.9
#2	1965.7	3843.0	61470.	7023.9

Sample Name: 480-49854-A-19-B Acquired: 11/14/2013 17:59:46 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**35.214**	**.01831**	**.01621**	**.95299**	**.00117**	**22.567**	**.00023**	**.10751**
Stddev	.00045	.139	.00134	.00000	.00041	.00005	.011	.00022	.00011
%RSD	204.45	.39507	7.3426	.02966	.04313	4.3637	.05055	93.682	.10522
#1	.00053	35.313	.01736	.01621	.95270	.00114	22.576	.00039	.10759
#2	-.00010	35.116	.01926	.01622	.95328	.00121	22.559	.00008	.10743
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.29004**	**.50583**	**108.91**	**3.1631**	**.03388**	**23.752**	**7.7583**	**-.00012**	**.84244**
Stddev	.00042	.00128	.18	.0534	.00108	.009	.0075	.00028	.00140
%RSD	.14488	.25278	.16070	1.6894	3.1802	.03852	.09641	239.25	.16559
#1	.28974	.50493	108.79	3.1253	.03464	23.746	7.7636	-.00032	.84342
#2	.29034	.50674	109.03	3.2009	.03312	23.759	7.7530	.00008	.84145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49226**	**.10345**	**5.7206**	**-.00207**	**.01729**	**9.7155**	**.03861**	**.12835**	**1.8776**
Stddev	.00166	.00414	.0082	.00233	.00622	.0445	.00135	.00026	.0015
%RSD	.33672	3.9999	.14264	112.46	35.989	.45759	3.5064	.20310	.08224
#1	.49343	.10638	5.7149	-.00371	.01289	9.7469	.03766	.12853	1.8765
#2	.49109	.10052	5.7264	-.00042	.02168	9.6841	.03957	.12816	1.8787
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00460**	**.12292**	**.70880**
Stddev	.00038	.00062	.00412
%RSD	8.2215	.50799	.58180
#1	-.00433	.12248	.71172
#2	-.00487	.12337	.70588
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1978.0**	**3865.8**	**62223.**	**7124.6**
Stddev	7.7	5.5	126.	11.1
%RSD	.39009	.14337	.20253	.15562
#1	1972.6	3861.9	62133.	7116.7
#2	1983.5	3869.7	62312.	7132.4

Sample Name: 480-49854-A-20-B Acquired: 11/14/2013 18:02:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00045**	**31.177**	**.02106**	**.01827**	**1.0462**	**.00110**	**21.997**	**.00034**	**.10003**
Stddev	.00050	.023	.00097	.00016	.0004	.00002	.066	.00021	.00022
%RSD	111.16	.07499	4.5850	.89278	.04179	1.4414	.30010	62.810	.21822
#1	.00081	31.194	.02174	.01815	1.0459	.00108	22.043	.00049	.10018
#2	.00010	31.161	.02038	.01838	1.0465	.00111	21.950	.00019	.09988
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.26284**	**.51508**	**110.03**	**3.1585**	**.03144**	**24.216**	**9.8424**	**-.00013**	**.84083**
Stddev	.00086	.00212	.01	.0006	.00200	.007	.0214	.00009	.00854
%RSD	.32771	.41137	.01134	.01757	6.3691	.03090	.21759	68.090	1.0151
#1	.26223	.51658	110.02	3.1589	.03003	24.221	9.8273	-.00007	.84687
#2	.26345	.51358	110.04	3.1581	.03286	24.210	9.8575	-.00019	.83480
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.45156**	**.08687**	**9.3010**	**-.00484**	**.01842**	**10.033**	**.04135**	**.12297**	**1.7011**
Stddev	.00080	.00308	.0322	.00040	.00006	.026	.00087	.00002	.0039
%RSD	.17772	3.5501	.34574	8.2970	.32464	.26298	2.0984	.01739	.22696
#1	.45099	.08905	9.3237	-.00455	.01846	10.052	.04073	.12296	1.7038
#2	.45212	.08469	9.2782	-.00512	.01838	10.015	.04196	.12299	1.6984
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00520**	**.10537**	**.72381**
Stddev	.00108	.00056	.00095
%RSD	20.698	.52878	.13191
#1	-.00596	.10576	.72313
#2	-.00444	.10497	.72448
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1983.5**	**3876.6**	**62646.**	**7117.6**
Stddev	.6	8.1	37.	31.4
%RSD	.03070	.20897	.05972	.44104
#1	1983.1	3870.9	62673.	7095.4
#2	1983.9	3882.4	62620.	7139.8

Sample Name: 480-49854-A-6-B Acquired: 11/14/2013 18:04:25 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**17.220**	**.01500**	**-.00070**	**.24629**	**.00051**	**5.8824**	**-.00047**	**.03479**
Stddev	.00074	.079	.00098	.00089	.00015	.00012	.0127	.00008	.00041
%RSD	422.68	.45866	6.5592	127.02	.06281	23.897	.21571	16.291	1.1681
#1	-.00070	17.164	.01570	-.00132	.24619	.00043	5.8734	-.00053	.03450
#2	.00035	17.276	.01431	-.00007	.24640	.00060	5.8914	-.00042	.03507
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.06578**	**.05415**	**63.085**	**2.5567**	**.02795**	**10.308**	**2.7363**	**-.00045**	**.32321**
Stddev	.00045	.00011	.393	.0291	.00021	.026	.0029	.00020	.01408
%RSD	.68795	.21068	.62266	1.1369	.74868	.25282	.10603	45.570	4.3574
#1	.06610	.05407	62.807	2.5772	.02810	10.289	2.7342	-.00030	.31326
#2	.06546	.05423	63.363	2.5361	.02780	10.326	2.7383	-.00059	.33317
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.09511**	**.02631**	**.36124**	**-.00482**	**.00430**	**4.2250**	**.04560**	**.02922**	**.83515**
Stddev	.00076	.00181	.00280	.00006	.00115	.0071	.00161	.00011	.00379
%RSD	.79746	6.8886	.77414	1.2089	26.854	.16750	3.5286	.39055	.45420
#1	.09457	.02503	.35926	-.00478	.00512	4.2200	.04446	.02914	.83247
#2	.09565	.02760	.36322	-.00486	.00348	4.2300	.04674	.02930	.83783
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00202**	**.08440**	**.28063**
Stddev	.00091	.00006	.00077
%RSD	45.259	.06981	.27411
#1	-.00267	.08444	.28009
#2	-.00137	.08436	.28117
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2054.7**	**3908.5**	**62528.**	**7088.4**
Stddev	14.4	18.0	167.	7.9
%RSD	.70193	.45932	.26777	.11103
#1	2064.9	3921.2	62646.	7094.0
#2	2044.5	3895.8	62409.	7082.9

Sample Name: 480-49854-A-7-B Acquired: 11/14/2013 18:06:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00012**	**73.845**	**.02701**	**.01749**	**.52817**	**.00173**	**17.921**	**.00085**	**.06417**
Stddev	.00008	.075	.00232	.00041	.00607	.00004	.023	.00024	.00016
%RSD	67.282	.10221	8.5860	2.3343	1.1495	2.4484	.12731	28.312	.25552
#1	.00018	73.899	.02537	.01778	.53247	.00170	17.937	.00102	.06406
#2	.00006	73.792	.02865	.01720	.52388	.00176	17.905	.00068	.06429
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.18412**	**.19196**	**103.83**	**3.2396**	**.06104**	**18.799**	**1.4731**	**.00327**	**.51807**
Stddev	.00289	.00433	.52	.0400	.00036	.386	.0272	.00005	.00536
%RSD	1.5672	2.2554	.50301	1.2335	.58739	2.0541	1.8470	1.6289	1.0345
#1	.18616	.19502	104.20	3.2679	.06130	19.072	1.4924	.00331	.52186
#2	.18208	.18890	103.46	3.2114	.06079	18.526	1.4539	.00323	.51428
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.22659**	**.30437**	**4.7426**	**-.00307**	**.01006**	**12.445**	**.02953**	**.10200**	**4.9348**
Stddev	.00058	.00192	.0142	.00229	.00900	.095	.00020	.00017	.1038
%RSD	.25754	.63232	.29922	74.377	89.540	.76107	.67800	.16241	2.1027
#1	.22700	.30301	4.7526	-.00146	.00369	12.512	.02967	.10212	5.0081
#2	.22618	.30573	4.7326	-.00469	.01642	12.378	.02939	.10189	4.8614
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00108**	**.20082**	**.36137**
Stddev	.00123	.00437	.00672
%RSD	114.00	2.1778	1.8596
#1	-.00021	.20391	.36612
#2	-.00195	.19773	.35662
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1953.5**	**3868.4**	**62735.**	**7032.9**
Stddev	.8	9.2	921.	11.9
%RSD	.04052	.23776	1.4674	.16926
#1	1953.0	3861.9	62084.	7024.5
#2	1954.1	3874.9	63386.	7041.3

Sample Name: 480-49854-A-8-B Acquired: 11/14/2013 18:08:56 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00058**	**29.814**	**.08694**	**-.00300**	**.60920**	**.00146**	**12.349**	F **-.00367**	**.15458**
Stddev	.00157	.014	.00291	.00031	.00071	.00003	.041	.00001	.00036
%RSD	269.51	.04550	3.3525	10.394	.11717	2.3198	.33427	.19283	.23345
#1	-.00053	29.805	.08900	-.00322	.60971	.00148	12.319	-.00368	.15483
#2	.00169	29.824	.08488	-.00278	.60870	.00143	12.378	-.00367	.15432
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.31575**	**.24861**	**367.27**	**2.3329**	**.04218**	**94.100**	**5.0498**	**-.00135**	**.68004**
Stddev	.00161	.00006	1.33	.0205	.00099	.249	.0098	.00022	.00309
%RSD	.51140	.02359	.36306	.88076	2.3502	.26463	.19373	16.295	.45490
#1	.31689	.24865	366.33	2.3184	.04288	94.276	5.0567	-.00150	.68223
#2	.31460	.24857	368.21	2.3474	.04148	93.924	5.0429	-.00119	.67785
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.56923**	**.04850**	**1.0332**	**-.00362**	**-.00026**	**9.1253**	**.05192**	**.06001**	**1.2845**
Stddev	.00010	.00042	.0035	.00291	.00538	.0223	.00303	.00005	.0007
%RSD	.01785	.87217	.33543	80.476	2034.5	.24420	5.8365	.08431	.05134
#1	.56931	.04820	1.0308	-.00568	-.00407	9.1411	.05407	.05998	1.2850
#2	.56916	.04880	1.0357	-.00156	.00354	9.1096	.04978	.06005	1.2840
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00273**	**.37923**	**.74274**
Stddev	.00119	.00064	.00005
%RSD	43.624	.16861	.00612
#1	-.00189	.37968	.74271
#2	-.00357	.37878	.74277
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1888.1**	**3743.2**	**59884.**	**7098.0**
Stddev	3.1	12.5	192.	3.7
%RSD	.16291	.33282	.31999	.05189
#1	1886.0	3734.4	59748.	7095.4
#2	1890.3	3752.0	60019.	7100.6

Sample Name: MB 480-146518/1-A Acquired: 11/14/2013 18:11:16 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.03607**	**.00374**	**.00585**	**.00034**	**-.00010**	**.11543**	**-.00009**	**.00005**
Stddev	.00066	.01057	.00125	.00053	.00002	.00002	.00078	.00001	.00024
%RSD	1366.7	29.304	33.358	9.0845	5.3795	17.039	.67281	10.931	524.74
#1	-.00042	.04355	.00286	.00548	.00035	-.00011	.11489	-.00009	.00021
#2	.00052	.02860	.00463	.00623	.00033	-.00009	.11598	-.00010	-.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00009**	**.00097**	**.06560**	**.00456**	**.00250**	**.01370**	**.00046**	**.00003**	**.03464**
Stddev	.00006	.00001	.01666	.01574	.00011	.00686	.00008	.00030	.00029
%RSD	73.068	1.0657	25.400	345.51	4.5016	50.073	16.703	1070.5	.82503
#1	-.00004	.00098	.07739	-.00657	.00242	.01856	.00051	-.00018	.03484
#2	-.00013	.00096	.05382	.01569	.00258	.00885	.00040	.00024	.03444
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**.00079**	**.00044**	**-.00148**	**.00995**	**-.03319**	**-.00188**	**.00074**	**.00037**
Stddev	.00042	.00075	.00210	.00078	.00452	.00240	.00018	.00004	.00036
%RSD	228.09	95.230	480.64	52.846	45.486	7.2451	9.5971	5.5387	98.601
#1	-.00048	.00026	-.00105	-.00093	.01315	-.03489	-.00200	.00071	.00063
#2	.00011	.00132	.00192	-.00203	.00675	-.03149	-.00175	.00077	.00011
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00014**	**-.00020**	**.00073**
Stddev	.00040	.00045	.00052
%RSD	291.86	231.15	71.871
#1	.00014	.00012	.00036
#2	-.00042	-.00052	.00109
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2238.9**	**4104.9**	**66239.**	**7327.6**
Stddev	9.5	17.1	105.	16.1
%RSD	.42355	.41624	.15832	.21923
#1	2245.6	4117.0	66313.	7338.9
#2	2232.2	4092.8	66165.	7316.2

Sample Name: 480-48347-A-1-A Acquired: 11/14/2013 18:13:38 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00019**	**9.9189**	**.12150**	**.56136**	**.52891**	**.00084**	**109.55**	F **-.00105**	**.00319**
Stddev	.00001	.0101	.00448	.00249	.00063	.00007	.47	.00030	.00003
%RSD	6.4655	.10181	3.6841	.44333	.11921	7.9445	.42977	29.114	.84171
#1	.00020	9.9118	.11834	.55960	.52847	.00079	109.89	-.00126	.00321
#2	.00018	9.9261	.12467	.56312	.52936	.00089	109.22	-.00083	.00317
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								5.0000	
Low Limit								-.00100	

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.15082**	**.06694**	**248.19**	**3.2562**	**.00561**	**20.632**	**1.3280**	**.35938**	**20.360**
Stddev	.00001	.00021	.53	.0611	.00054	.070	.0020	.00047	.091
%RSD	.00734	.31136	.21529	1.8768	9.5577	.33942	.14936	.12966	.44665
#1	.15083	.06709	247.81	3.2130	.00523	20.583	1.3266	.35905	20.424
#2	.15081	.06679	248.57	3.2995	.00599	20.682	1.3294	.35971	20.295
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01848**	**.19928**	**32.144**	**-.00116**	**.00576**	**23.527**	**.01003**	**.33618**	**.53111**
Stddev	.00128	.00073	.054	.00037	.00466	.110	.00132	.00181	.00312
%RSD	6.9325	.36420	.16912	31.786	80.944	.46791	13.116	.53988	.58801
#1	.01938	.19877	32.106	-.00142	.00905	23.449	.01096	.33746	.52890
#2	.01757	.19979	32.183	-.00090	.00246	23.605	.00910	.33489	.53331
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00733**	**.70885**	**.11369**
Stddev	.00086	.00309	.00225
%RSD	11.769	.43600	1.9783
#1	.00794	.70666	.11210
#2	.00672	.71103	.11528
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1912.5**	**3906.1**	**62664.**	**7544.0**
Stddev	.4	11.9	278.	10.9
%RSD	.02158	.30350	.44386	.14439
#1	1912.2	3914.5	62861.	7536.3
#2	1912.8	3897.7	62467.	7551.7

Sample Name: 480-48347-A-2-A Acquired: 11/14/2013 18:15:54 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00141**	**.02263**	**.00233**	**.00735**	**.00031**	**-.00012**	**.15860**	**-.00004**	**.00010**
Stddev	.00049	.00527	.00067	.00035	.00002	.00011	.00395	.00008	.00004
%RSD	34.477	23.276	28.798	4.8130	6.4971	86.884	2.4897	188.21	37.586
#1	.00175	.02636	.00280	.00760	.00032	-.00005	.16140	.00001	.00012
#2	.00107	.01891	.00185	.00710	.00029	-.00020	.15581	-.00010	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**.00063**	**.04730**	**.00527**	**.00204**	**.01120**	**.00028**	**.00011**	**.08280**
Stddev	.00009	.00012	.00313	.04650	.00112	.00021	.00006	.00013	.00624
%RSD	66.874	19.521	6.6130	881.95	55.012	1.8974	22.208	119.39	7.5349
#1	-.00019	.00054	.04951	-.02761	.00125	.01105	.00032	.00002	.07839
#2	-.00007	.00072	.04509	.03816	.00284	.01135	.00023	.00020	.08721
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00025**	**.00216**	**.02317**	**-.00238**	**-.00190**	**-.03097**	**-.00197**	**.00105**	**-.00002**
Stddev	.00020	.00065	.00119	.00146	.00107	.00975	.00054	.00005	.00020
%RSD	79.994	30.264	5.1212	61.171	56.254	31.484	27.304	5.1427	972.88
#1	.00011	.00263	.02233	-.00341	-.00266	-.03787	-.00235	.00101	.00012
#2	.00039	.00170	.02400	-.00135	-.00115	-.02408	-.00159	.00109	-.00016
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00053**	**-.00013**	**.00070**
Stddev	.00124	.00011	.00009
%RSD	234.73	87.193	12.525
#1	.00035	-.00005	.00063
#2	-.00140	-.00021	.00076
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2195.4**	**4021.5**	**64672.**	**7301.8**
Stddev	3.4	.9	368.	19.0
%RSD	.15356	.02236	.56942	.25993
#1	2193.0	4022.2	64932.	7315.2
#2	2197.8	4020.9	64412.	7288.4

Sample Name: CCV Acquired: 11/14/2013 18:18:14 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48842	24.674	.50406	.48579	.50883	.48539	24.665	.49536	.48915	.49769	.49796	23.952	25.510
Stddev	.00023	.072	.00266	.00154	.00557	.00144	.040	.00076	.00053	.00198	.00020	.050	.046
%RSD	.04654	.29350	.52735	.31621	1.0937	.29619	.16069	.15358	.10846	.39704	.03991	.20918	.18126
#1	.48858	24.623	.50594	.48687	.51277	.48640	24.693	.49590	.48953	.49909	.49782	23.916	25.477
#2	.48826	24.725	.50218	.48470	.50490	.48437	24.637	.49482	.48877	.49629	.49810	23.987	25.543
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49676	24.049	.50234	.50369	24.715	.48855	.48544	25.086	.51101	.49825	24.260	.50177	.50373
Stddev	.00154	.020	.00070	.00178	.037	.00104	.00134	.058	.00164	.00325	.216	.00142	.00112
%RSD	.30974	.08219	.13988	.35277	.15104	.21192	.27606	.22956	.32060	.65152	.89109	.28244	.22221
#1	.49567	24.063	.50283	.50494	24.741	.48929	.48638	25.127	.51217	.49595	24.107	.50077	.50452
#2	.49785	24.035	.50184	.50243	24.688	.48782	.48449	25.045	.50985	.50054	24.413	.50278	.50294
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50893	.49542	.49666	.49471
Stddev	.00126	.00476	.00140	.00410
%RSD	.24672	.96004	.28205	.82868
#1	.50982	.49878	.49765	.49182
#2	.50804	.49206	.49567	.49761
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1960.7	3854.2	60713.	7151.3
Stddev	2.7	3.1	70.	19.8
%RSD	.13775	.07958	.11510	.27660
#1	1958.8	3852.0	60663.	7165.3
#2	1962.6	3856.4	60762.	7137.3

Sample Name: CCB Acquired: 11/14/2013 18:20:24 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00034**	**.00085**	**.00241**	**-.00132**	**.00039**	**-.00001**	**.00614**	**.00001**	**.00014**	**.00025**	**.00119**	F **.08055**
Stddev	.00186	.02946	.00221	.00006	.00022	.00009	.00340	.00000	.00001	.00012	.00005	.03879
%RSD	540.21	3457.4	91.463	4.4075	55.454	679.47	55.331	32.578	4.1721	48.087	4.6105	48.152
#1	.00166	-.01998	.00397	-.00128	.00054	.00005	.00855	.00001	.00014	.00017	.00123	.10797
#2	-.00097	.02169	.00085	-.00137	.00024	-.00008	.00374	.00001	.00015	.00034	.00115	.05312
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
High Limit												.05000
Low Limit												-.05000

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02047**	**.00317**	**.02486**	**.00184**	**.00019**	**.03248**	**.00033**	**-.00017**	**.00521**	**-.00135**	**.00365**	**-.02584**
Stddev	.02100	.00018	.01191	.00109	.00041	.01500	.00072	.00047	.00127	.00050	.00455	.01999
%RSD	102.57	5.8101	47.899	59.127	222.09	46.175	217.87	281.19	24.328	36.871	124.68	77.341
#1	.03532	.00330	.03328	.00262	.00048	.02188	.00084	-.00050	.00431	-.00170	.00043	-.03997
#2	.00562	.00304	.01644	.00107	-.00011	.04309	-.00018	.00017	.00610	-.00100	.00687	-.01171
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit												
Low Limit												

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00201**	**.00015**	**.00107**	**-.00114**	**.00036**	**-.00015**
Stddev	.00055	.00007	.00043	.00072	.00033	.00112
%RSD	27.505	48.114	39.967	63.397	91.895	750.17
#1	-.00241	.00021	.00137	-.00063	.00013	.00065
#2	-.00162	.00010	.00077	-.00165	.00059	-.00094
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit						
Low Limit						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2176.6**	**3967.3**	**63815.**	**7149.2**
Stddev	2.0	3.9	134.	4.1
%RSD	.09300	.09862	.21068	.05732
#1	2175.2	3964.6	63720.	7152.1
#2	2178.0	3970.1	63910.	7146.3

Sample Name: ccvl Acquired: 11/14/2013 18:22:43 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00246	.18139	W .01406	.01818	.00217	.00194	.48460	.00101	.00412	.00398	.01008	F .07782
Stddev	.00013	.00822	.00113	.00047	.00010	.00010	.00465	.00025	.00007	.00042	.00008	.00801
%RSD	5.2781	4.5317	8.0682	2.5655	4.5574	5.2854	.95926	24.147	1.7433	10.454	.79665	10.292
#1	.00237	.18721	.01487	.01851	.00210	.00202	.48131	.00084	.00417	.00369	.01002	.08348
#2	.00255	.17558	.01326	.01785	.00224	.00187	.48789	.00119	.00407	.00427	.01013	.07216
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail
Value			.01000									.05000
Range			30.000%									50.000%

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49131	.03209	.21465	W .00399	.00994	.97869	.00967	.00515	.20565	.01793	.01421	.41819
Stddev	.00017	.00040	.01334	.00035	.00010	.00380	.00041	.00275	.00236	.00080	.00048	.00555
%RSD	.03517	1.2350	6.2137	8.7048	1.0445	.38855	4.2076	53.412	1.1468	4.4445	3.3968	1.3279
#1	.49143	.03181	.20522	.00375	.00987	.98138	.00995	.00709	.20398	.01737	.01455	.41426
#2	.49119	.03237	.22408	.00424	.01002	.97600	.00938	.00320	.20732	.01850	.01387	.42211
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				.00300								
Range				30.000%								

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00802	.00510	.00491	.02098	.00508	.01081
Stddev	.00002	.00007	.00034	.00009	.00023	.00027
%RSD	.21806	1.3616	7.0082	.43256	4.6231	2.5099
#1	.00800	.00505	.00466	.02104	.00525	.01100
#2	.00803	.00515	.00515	.02091	.00491	.01062
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2224.8	4115.7	65549.	7466.4
Stddev	9.2	10.0	78.	32.7
%RSD	.41543	.24229	.11933	.43857
#1	2231.3	4122.7	65494.	7489.5
#2	2218.2	4108.6	65605.	7443.2

Sample Name: 480-48347-A-3-A Acquired: 11/14/2013 18:25:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00065**	**.50669**	**.00460**	**.07918**	**.01851**	**-.00001**	**23.005**	**.00035**	**.00040**
Stddev	.00056	.02708	.00172	.00020	.00003	.00017	.056	.00016	.00008
%RSD	85.954	5.3440	37.413	.25851	.16172	2030.0	.24530	44.999	20.313
#1	-.00025	.52584	.00582	.07933	.01853	.00011	22.965	.00046	.00034
#2	-.00104	.48755	.00338	.07904	.01849	-.00013	23.045	.00024	.00045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00256**	**.00287**	**.87207**	**1.9203**	**.00370**	**21.993**	**.04575**	**.00535**	**66.125**
Stddev	.00053	.00003	.02877	.0581	.00133	.161	.00021	.00004	.552
%RSD	20.666	1.0368	3.2988	3.0238	36.062	.73176	.46129	.69907	.83425
#1	.00218	.00285	.89241	1.9614	.00276	22.107	.04590	.00532	66.515
#2	.00293	.00289	.85172	1.8793	.00464	21.880	.04560	.00538	65.735
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00139**	**.00196**	**9.8384**	**-.00241**	**.00100**	**.54551**	**-.00169**	**.13517**	**.01853**
Stddev	.00008	.00099	.0024	.00047	.00036	.00958	.00032	.00024	.00028
%RSD	5.5281	50.360	.02479	19.478	35.890	1.7567	18.857	.17571	1.5116
#1	.00145	.00126	9.8366	-.00275	.00126	.55229	-.00191	.13534	.01833
#2	.00134	.00266	9.8401	-.00208	.00075	.53873	-.00146	.13500	.01873
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00060**	**.01010**	**.01815**
Stddev	.00030	.00086	.00085
%RSD	50.343	8.5147	4.6680
#1	.00081	.00949	.01875
#2	.00039	.01071	.01755
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1985.5**	**3832.2**	**60988.**	**7279.0**
Stddev	1.1	.2	136.	2.0
%RSD	.05524	.00439	.22310	.02784
#1	1986.2	3832.3	60892.	7280.4
#2	1984.7	3832.0	61084.	7277.5

Sample Name: 480-48347-A-3-A sd@5 Acquired: 11/14/2013 18:27:20 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**.08255**	**.00113**	**.01407**	**.00397**	**-.00013**	**4.6779**	**.00005**	**.00022**
Stddev	.00004	.03498	.00090	.00001	.00001	.00010	.0288	.00006	.00021
%RSD	12.789	42.371	79.901	.04509	.20171	76.326	.61592	109.81	97.775
#1	.00034	.10728	.00177	.01407	.00397	-.00006	4.6575	.00001	.00007
#2	.00028	.05782	.00049	.01407	.00398	-.00020	4.6983	.00010	.00037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**.00134**	**.17827**	**.33103**	**.00233**	**4.3599**	**.00924**	**.00082**	**13.173**
Stddev	.00067	.00018	.00595	.02541	.00020	.0010	.00015	.00010	.049
%RSD	387.53	13.393	3.3391	7.6763	8.5366	.02275	1.6022	11.828	.37011
#1	-.00065	.00122	.18248	.34899	.00247	4.3592	.00913	.00089	13.138
#2	.00030	.00147	.17406	.31306	.00219	4.3606	.00934	.00075	13.207
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00069**	**.00171**	**1.9104**	**-.00179**	**.00192**	**.07644**	**-.00146**	**.02735**	**.00347**
Stddev	.00006	.00070	.0020	.00009	.00145	.00889	.00101	.00010	.00086
%RSD	8.9032	41.090	.10639	5.0407	75.421	11.632	69.227	.36053	24.836
#1	.00065	.00221	1.9089	-.00173	.00090	.07015	-.00218	.02742	.00286
#2	.00074	.00121	1.9118	-.00186	.00295	.08273	-.00075	.02728	.00408
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00032**	**.00198**	**.00321**
Stddev	.00159	.00025	.00116
%RSD	497.61	12.843	36.174
#1	-.00080	.00216	.00239
#2	.00144	.00180	.00403
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2106.2**	**3924.2**	**62932.**	**7171.4**
Stddev	2.5	5.4	286.	34.8
%RSD	.11947	.13835	.45399	.48488
#1	2108.0	3928.0	63134.	7196.0
#2	2104.4	3920.4	62730.	7146.8

Sample Name: 480-48347-A-3-A pds Acquired: 11/14/2013 18:29:42 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01890**	**12.138**	**.25994**	**.28366**	**.23962**	**.25147**	**35.049**	**.25420**	**.25407**
Stddev	.00073	.024	.00152	.00001	.00015	.00001	.290	.00119	.00183
%RSD	3.8721	.20057	.58293	.00236	.06216	.00312	.82769	.46992	.72019
#1	.01942	12.155	.26101	.28366	.23972	.25147	35.254	.25505	.25536
#2	.01838	12.121	.25887	.28365	.23951	.25146	34.844	.25336	.25277
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.26121**	**.25746**	**13.255**	**11.385**	**.21390**	**34.214**	**.29631**	**.27057**	**74.670**
Stddev	.00086	.00128	.003	.010	.00094	.040	.00023	.00198	.374
%RSD	.33104	.49739	.02611	.08926	.44157	.11749	.07702	.73210	.50153
#1	.26182	.25655	13.258	11.392	.21457	34.186	.29615	.27197	74.935
#2	.26060	.25836	13.253	11.378	.21323	34.243	.29647	.26917	74.405
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.25060**	**.25140**	**9.6640**	**.25035**	**.25647**	**6.8050**	**.13201**	**.35295**	**.27084**
Stddev	.00031	.00332	.0332	.00246	.00067	.0136	.00036	.00162	.00228
%RSD	.12353	1.3218	.34400	.98438	.26277	.20033	.27070	.45990	.84145
#1	.25082	.24905	9.6875	.25209	.25695	6.7954	.13226	.35410	.26923
#2	.25038	.25375	9.6405	.24861	.25600	6.8146	.13176	.35181	.27245
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.23893**	**.27148**	**.27015**
Stddev	.00170	.00069	.00146
%RSD	.71200	.25412	.53920
#1	.23773	.27099	.26912
#2	.24014	.27197	.27118
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1938.1**	**3825.7**	**60851.**	**7257.1**
Stddev	3.1	3.8	39.	26.2
%RSD	.15991	.09937	.06482	.36166
#1	1940.3	3823.0	60879.	7238.6
#2	1936.0	3828.4	60823.	7275.7

Sample Name: 480-48347-A-3-B MS Acquired: 11/14/2013 18:31:55 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.05116	10.549	.21627	.28319	.22359	.20377	32.038	.20925	.20623
Stddev	.00005	.077	.00221	.00087	.00009	.00070	.003	.00021	.00027
%RSD	.10534	.72816	1.0236	.30749	.04014	.34580	.00941	.10029	.13167
#1	.05120	10.604	.21471	.28380	.22353	.20427	32.036	.20940	.20603
#2	.05112	10.495	.21784	.28257	.22365	.20327	32.040	.20911	.20642
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20851	.21043	10.342	12.378	.20775	31.745	.23634	.21718	75.464
Stddev	.00035	.00007	.009	.000	.00025	.015	.00147	.00078	.225
%RSD	.16576	.03300	.08671	.00194	.12235	.04743	.62064	.36054	.29794
#1	.20826	.21048	10.348	12.378	.20793	31.734	.23531	.21773	75.305
#2	.20875	.21038	10.336	12.378	.20757	31.756	.23738	.21662	75.623
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.20331	.20327	19.723	.20760	.21283	10.133	.20335	.33452	.20922
Stddev	.00058	.00183	.008	.00312	.00235	.058	.00100	.00038	.00063
%RSD	.28297	.89872	.03921	1.5034	1.1058	.57158	.49402	.11366	.30048
#1	.20371	.20198	19.718	.20539	.21450	10.092	.20264	.33479	.20967
#2	.20290	.20456	19.729	.20981	.21117	10.174	.20406	.33425	.20878
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	.20622	.21838	.21469
Stddev	.00320	.00126	.00100
%RSD	1.5496	.57561	.46807
#1	.20396	.21749	.21398
#2	.20848	.21927	.21540
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1940.5	3838.8	60668.	7292.9
Stddev	3.3	1.7	90.	14.6
%RSD	.16785	.04449	.14812	.20022
#1	1942.8	3837.6	60731.	7303.2
#2	1938.2	3840.0	60604.	7282.5

Sample Name: 480-48347-A-3-C MSD Acquired: 11/14/2013 18:34:07 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05084**	**11.538**	**.21818**	**.28663**	**.23322**	**.20381**	**34.870**	**.20790**	**.20585**
Stddev	.00028	.007	.00017	.00003	.00030	.00117	.025	.00063	.00114
%RSD	.55605	.05651	.07868	.01140	.12858	.57370	.07254	.30103	.55248
#1	.05064	11.542	.21830	.28661	.23301	.20298	34.852	.20834	.20665
#2	.05104	11.533	.21805	.28666	.23343	.20464	34.888	.20746	.20504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21328**	**.21189**	**12.009**	**12.563**	**.20682**	**32.654**	**.26973**	**.21376**	**75.545**
Stddev	.00019	.00115	.024	.038	.00269	.042	.00117	.00065	.610
%RSD	.08964	.54296	.19862	.30492	1.3007	.12873	.43298	.30257	.80760
#1	.21342	.21107	11.992	12.536	.20492	32.683	.26890	.21421	75.113
#2	.21315	.21270	12.026	12.590	.20873	32.624	.27055	.21330	75.976
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20317**	**.20706**	**20.889**	**.20859**	**.21536**	**11.857**	**.20049**	**.34808**	**.25285**
Stddev	.00062	.00048	.003	.00327	.00168	.060	.00107	.00037	.00086
%RSD	.30400	.23004	.01360	1.5678	.77941	.50277	.53504	.10648	.34028
#1	.20361	.20672	20.887	.21090	.21418	11.815	.20125	.34782	.25346
#2	.20274	.20739	20.891	.20627	.21655	11.899	.19973	.34834	.25224
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20625**	**.22658**	**.23823**
Stddev	.00393	.00036	.00281
%RSD	1.9057	.15869	1.1789
#1	.20903	.22632	.23625
#2	.20347	.22683	.24022
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1942.2**	**3844.3**	**60604.**	**7162.0**
Stddev	.2	2.8	81.	8.3
%RSD	.00780	.07322	.13398	.11542
#1	1942.3	3846.3	60661.	7167.8
#2	1942.1	3842.3	60546.	7156.2

Sample Name: 480-48347-A-4-A Acquired: 11/14/2013 18:36:19 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**.18286**	**.00180**	**.07514**	**.01375**	**-.00010**	**21.476**	**.00006**	**.00012**
Stddev	.00001	.04679	.00105	.00001	.00002	.00005	.095	.00019	.00002
%RSD	2.7202	25.586	58.490	.00695	.15053	47.246	.44451	309.56	18.012
#1	-.00030	.21595	.00106	.07515	.01374	-.00013	21.543	.00020	.00010
#2	-.00031	.14978	.00255	.07514	.01376	-.00007	21.408	-.00007	.00013
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**.00222**	**.15621**	**1.7901**	**.00467**	**21.219**	**.02791**	**.00510**	**63.930**
Stddev	.00012	.00001	.00539	.0047	.00009	.038	.00000	.00025	.518
%RSD	20.032	.52107	3.4486	.26168	1.9442	.18126	.00505	4.8673	.81010
#1	.00052	.00223	.16002	1.7868	.00473	21.191	.02791	.00527	64.297
#2	.00069	.00222	.15240	1.7934	.00460	21.246	.02791	.00492	63.564
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00079**	**.00257**	**8.9643**	**-.00070**	**.00703**	**.08923**	**-.00151**	**.12414**	**.00345**
Stddev	.00020	.00040	.0063	.00086	.00060	.01165	.00005	.00020	.00021
%RSD	25.254	15.691	.07028	123.34	8.4905	13.058	3.1748	.16116	6.0693
#1	.00065	.00285	8.9688	-.00130	.00745	.08099	-.00148	.12428	.00360
#2	.00093	.00228	8.9599	-.00009	.00661	.09747	-.00155	.12400	.00330
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00067**	**.00646**	**.00339**
Stddev	.00022	.00023	.00026
%RSD	33.138	3.6217	7.6397
#1	.00051	.00629	.00357
#2	.00082	.00662	.00321
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1994.3**	**3871.0**	**61383.**	**7283.7**
Stddev	1.7	.8	263.	1.3
%RSD	.08504	.02104	.42795	.01806
#1	1995.5	3870.4	61569.	7282.7
#2	1993.1	3871.6	61198.	7284.6

Sample Name: 480-48347-A-5-A Acquired: 11/14/2013 18:38:35 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**3.1997**	**.00659**	**.34134**	**.14090**	**.00022**	**38.470**	**.00033**	**.00190**
Stddev	.00106	.0350	.00188	.00087	.00031	.00005	.098	.00009	.00014
%RSD	473.48	1.0938	28.547	.25602	.21843	24.669	.25496	28.730	7.2268
#1	-.00098	3.2244	.00792	.34072	.14112	.00026	38.539	.00040	.00199
#2	.00053	3.1749	.00526	.34195	.14068	.00018	38.401	.00026	.00180
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03105**	**.04729**	**18.072**	**5.4035**	**.00446**	**10.075**	**1.8844**	**.00263**	**10.303**
Stddev	.00031	.00031	.067	.0325	.00010	.009	.0038	.00001	.033
%RSD	1.0039	.64524	.37072	.60178	2.3180	.08677	.20227	.33275	.31938
#1	.03127	.04708	18.120	5.3805	.00454	10.069	1.8871	.00264	10.327
#2	.03083	.04751	18.025	5.4265	.00439	10.081	1.8817	.00262	10.280
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00425**	**.03182**	**8.2375**	**-.00363**	**-.00130**	**7.3274**	**.00018**	**.08690**	**.11355**
Stddev	.00051	.00233	.0170	.00038	.00504	.0164	.00110	.00046	.00029
%RSD	12.071	7.3157	.20598	10.526	386.61	.22342	612.06	.52670	.25817
#1	.00389	.03346	8.2495	-.00336	.00226	7.3389	-.00060	.08722	.11334
#2	.00462	.03017	8.2255	-.00390	-.00487	7.3158	.00095	.08658	.11376
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00165**	**.04079**	**.11614**
Stddev	.00270	.00056	.00038
%RSD	163.87	1.3620	.32324
#1	-.00356	.04118	.11588
#2	.00026	.04039	.11641
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2040.6**	**3899.9**	**62328.**	**7251.0**
Stddev	1.8	.5	18.	7.1
%RSD	.08943	.01363	.02942	.09724
#1	2039.3	3900.2	62315.	7246.0
#2	2041.9	3899.5	62341.	7256.0

Sample Name: 480-48347-A-6-A Acquired: 11/14/2013 18:40:47 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00066**	**.08879**	**.00265**	**.31775**	**.03321**	**-.00010**	**23.255**	**-.00001**	**.00006**
Stddev	.00030	.03037	.00003	.00037	.00004	.00003	.113	.00012	.00007
%RSD	46.415	34.202	1.1471	.11798	.13198	33.123	.48581	968.14	108.35
#1	.00087	.06732	.00263	.31801	.03317	-.00007	23.335	-.00010	.00011
#2	.00044	.11027	.00267	.31748	.03324	-.00012	23.175	.00007	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00111**	**.00126**	**1.3843**	**4.4228**	**.00384**	**6.7820**	**.18684**	**.00153**	**5.6301**
Stddev	.00042	.00037	.0019	.0692	.00055	.0121	.00013	.00036	.0052
%RSD	37.533	29.331	.13893	1.5639	14.423	.17803	.07149	23.462	.09162
#1	.00140	.00152	1.3829	4.3739	.00424	6.7735	.18693	.00128	5.6264
#2	.00081	.00100	1.3856	4.4717	.00345	6.7906	.18674	.00179	5.6337
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00035**	**.00113**	**4.9905**	**-.00251**	**-.00319**	**.04852**	**-.00159**	**.05482**	**.00221**
Stddev	.00041	.00040	.0070	.00347	.00513	.00046	.00092	.00000	.00015
%RSD	115.07	35.960	.14130	138.18	160.71	.94828	57.802	.00364	6.6841
#1	.00007	.00084	4.9855	-.00006	-.00682	.04885	-.00094	.05482	.00231
#2	.00064	.00141	4.9954	-.00496	.00044	.04820	-.00224	.05482	.00210
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00028**	**.00226**	**.00283**
Stddev	.00186	.00047	.00101
%RSD	667.32	20.605	35.776
#1	.00103	.00259	.00355
#2	-.00159	.00193	.00212
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2104.2**	**3933.3**	**63065.**	**7271.5**
Stddev	1.2	8.1	69.	18.1
%RSD	.05667	.20708	.10990	.24853
#1	2105.0	3939.1	63016.	7258.7
#2	2103.3	3927.6	63114.	7284.3

Sample Name: 480-48539-C-1-A@10 Acquired: 11/14/2013 18:43:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00089**	**-.00030**	**.10885**	**.06945**	**.03457**	**-.00015**	**197.73**	**-.00037**	**-.00035**
Stddev	.00061	.04250	.00130	.00049	.00009	.00000	.78	.00013	.00006
%RSD	68.285	14003.	1.1947	.70055	.27177	2.4371	.39563	34.945	17.329
#1	-.00132	.02975	.10793	.06979	.03450	-.00015	197.18	-.00046	-.00039
#2	-.00046	-.03035	.10977	.06911	.03464	-.00014	198.29	-.00028	-.00031
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**.00321**	**32.247**	**8.9026**	**.35038**	**19.365**	**.50566**	**-.00021**	**458.44**
Stddev	.00015	.00017	.194	.0209	.00230	.080	.00013	.00001	3.15
%RSD	328.90	5.3251	.60238	.23512	.65678	.41162	.02589	5.7096	.68736
#1	.00006	.00333	32.110	8.9174	.34875	19.309	.50557	-.00020	456.21
#2	-.00015	.00309	32.385	8.8878	.35201	19.421	.50575	-.00021	460.66
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00042**	**.00037**	**2.9302**	**-.00391**	**-.00221**	**.09427**	**-.00136**	**6.1642**	**.00047**
Stddev	.00036	.00091	.0019	.00160	.00150	.01715	.00032	.0376	.00046
%RSD	85.171	244.97	.06320	40.888	67.923	18.193	23.436	.60943	98.473
#1	.00067	.00101	2.9315	-.00278	-.00115	.08214	-.00113	6.1376	.00014
#2	.00017	-.00027	2.9288	-.00504	-.00327	.10639	-.00158	6.1908	.00080
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00022**	**-.00024**	**.00211**
Stddev	.00037	.00050	.00156
%RSD	169.87	208.96	73.609
#1	.00004	.00011	.00321
#2	-.00048	-.00059	.00101
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1695.3**	**3569.6**	**55291.**	**7195.5**
Stddev	2.4	24.4	16.	59.5
%RSD	.14289	.68393	.02853	.82651
#1	1693.6	3552.3	55279.	7237.5
#2	1697.0	3586.9	55302.	7153.4

Sample Name: CCV Acquired: 11/14/2013 18:45:28 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48441	24.498	.50296	.48098	.50586	.48378	24.829	.49423	.48737	.49490	.49829	24.084	25.855
Stddev	.00047	.101	.00130	.00020	.00425	.00235	.140	.00113	.00125	.00039	.00200	.092	.127
%RSD	.09649	.41058	.25837	.04077	.84102	.48594	.56350	.22948	.25553	.07864	.40198	.38275	.48938
#1	.48474	24.569	.50388	.48084	.50286	.48544	24.928	.49503	.48649	.49517	.49970	24.150	25.944
#2	.48408	24.427	.50204	.48112	.50887	.48212	24.730	.49343	.48826	.49462	.49687	24.019	25.765
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50068	23.895	.49889	.50130	24.839	.48664	.48434	24.858	.50563	.49453	24.153	.50054	.50492
Stddev	.00163	.019	.00122	.00255	.114	.00281	.00094	.051	.00100	.00575	.081	.00117	.00107
%RSD	.32538	.07745	.24468	.50962	.45776	.57774	.19307	.20479	.19683	1.1619	.33370	.23285	.21201
#1	.50183	23.908	.49803	.50311	24.919	.48465	.48368	24.822	.50634	.49046	24.096	.49971	.50567
#2	.49952	23.882	.49975	.49950	24.758	.48863	.48500	24.894	.50493	.49859	24.210	.50136	.50416
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50986	.49778	.49419	.49761
Stddev	.00153	.00243	.00064	.00372
%RSD	.30086	.48908	.12891	.74664
#1	.51095	.49950	.49464	.49498
#2	.50878	.49606	.49374	.50024
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1978.1	3892.5	61287.	7072.2
Stddev	1.7	9.4	68.	37.5
%RSD	.08776	.24067	.11131	.52980
#1	1979.3	3885.9	61335.	7045.7
#2	1976.9	3899.1	61239.	7098.7

Sample Name: CCB Acquired: 11/14/2013 18:47:41 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**-.02831**	**.00167**	**-.00125**	**.00002**	**-.00008**	**-.01599**	**.00001**	**.00019**	**-.00014**	**.00070**	**-.00297**	**-.03644**
Stddev	.00121	.00669	.00023	.00013	.00000	.00003	.00137	.00011	.00021	.00024	.00015	.00035	.00131
%RSD	2863.6	23.613	13.695	10.389	.66373	42.464	8.5569	1183.1	114.60	175.40	21.031	11.682	3.5834
#1	-.00090	-.02359	.00151	-.00134	.00002	-.00010	-.01502	.00009	.00034	.00003	.00080	-.00322	-.03736
#2	.00081	-.03304	.00183	-.00116	.00002	-.00005	-.01696	-.00007	.00004	-.00031	.00059	-.00273	-.03552
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00257**	**.00299**	**-.00001**	**.00034**	**.03950**	**-.00015**	**.00204**	**-.00136**	**-.00277**	**.00627**	**-.01932**	**-.00191**	**.00013**
Stddev	.00050	.00088	.00004	.00005	.01267	.00014	.00240	.00095	.00265	.00230	.01338	.00024	.00003
%RSD	19.493	29.571	285.51	14.536	32.071	93.973	117.77	69.435	95.898	36.604	69.276	12.421	24.737
#1	.00292	.00236	-.00004	.00030	.04845	-.00026	.00374	-.00069	-.00089	.00789	-.02878	-.00174	.00011
#2	.00221	.00361	.00001	.00037	.03054	-.00005	.00034	-.00203	-.00465	.00465	-.00985	-.00208	.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00006**	**-.00065**	**-.00001**	**.00019**
Stddev	.00002	.00182	.00022	.00004
%RSD	32.357	277.90	1517.6	20.819
#1	.00007	-.00194	-.00017	.00016
#2	.00004	.00063	.00014	.00021
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2183.3**	**4002.9**	**63761.**	**7134.7**
Stddev	4.0	4.4	15.	15.8
%RSD	.18277	.11104	.02373	.22119
#1	2186.1	3999.8	63751.	7145.9
#2	2180.5	4006.1	63772.	7123.5

Sample Name: ccvl Acquired: 11/14/2013 18:50:07 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00249	.16782	W .01415	.01790	.00201	.00172	.47765	.00089	.00376	.00392	.01025	.04559
Stddev	.00085	.00157	.00201	.00020	.00000	.00001	.00200	.00002	.00006	.00019	.00006	.00039
%RSD	34.108	.93297	14.208	1.0911	.14654	.76934	.41802	2.4443	1.6493	4.7358	.55375	.85210
#1	.00189	.16893	.01273	.01776	.00202	.00173	.47624	.00091	.00372	.00405	.01021	.04532
#2	.00309	.16671	.01557	.01804	.00201	.00171	.47906	.00088	.00381	.00379	.01029	.04587
Check ?	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value			.01000									
Range			30.000%									

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51122	.02991	.20044	.00321	.01001	.98996	.00943	.00354	.19948	.01587	.01488	.42272
Stddev	.03734	.00088	.00206	.00006	.00001	.01374	.00042	.00013	.00078	.00229	.00172	.00814
%RSD	7.3032	2.9489	1.0263	1.7752	.06496	1.3877	4.4231	3.7982	.39348	14.431	11.539	1.9256
#1	.53762	.02928	.20190	.00317	.01001	.99967	.00914	.00363	.19892	.01425	.01367	.41697
#2	.48482	.03053	.19899	.00325	.01002	.98024	.00973	.00344	.20003	.01748	.01609	.42848
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00789	.00497	.00469	.01958	.00486	.00997
Stddev	.00054	.00006	.00041	.00097	.00030	.00110
%RSD	6.8232	1.1136	8.7893	4.9550	6.1317	11.002
#1	.00827	.00501	.00440	.01890	.00507	.00920
#2	.00751	.00493	.00498	.02027	.00465	.01075
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2226.7	4117.8	65550.	7424.7
Stddev	4.1	7.6	228.	35.5
%RSD	.18326	.18461	.34794	.47822
#1	2229.6	4123.2	65711.	7449.8
#2	2223.9	4112.5	65389.	7399.6

Sample Name: 480-48230-2 sol raw Acquired: 11/14/2013 18:52:27 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**-.01638**	**-.00196**	**.04500**	**.01823**	**-.00012**	**77.292**	**.00005**	**.00046**
Stddev	.00072	.03133	.00278	.00022	.00003	.00003	.493	.00001	.00010
%RSD	499.19	191.26	141.82	.48926	.16609	26.575	.63773	11.359	21.050
#1	-.00037	.00577	.00001	.04516	.01826	-.00014	77.641	.00005	.00052
#2	.00065	-.03854	-.00392	.04484	.01821	-.00009	76.944	.00006	.00039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.00465**	**-.00547**	**2.4649**	**.00495**	**17.721**	**.01690**	**.00061**	**64.243**
Stddev	.00009	.00041	.00211	.0047	.00012	.021	.00001	.00027	.270
%RSD	102.64	8.8213	38.684	.19137	2.5138	.11567	.07917	43.453	.42005
#1	.00016	.00436	-.00696	2.4683	.00487	17.706	.01691	.00042	64.434
#2	.00003	.00494	-.00397	2.4616	.00504	17.735	.01689	.00080	64.052
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00442**	**-.00020**	**3.8892**	**-.00318**	**.00121**	**2.6031**	**-.00162**	**.09738**	**-.00042**
Stddev	.00039	.00108	.0159	.00304	.00199	.0100	.00029	.00020	.00022
%RSD	8.8934	533.90	.41008	95.643	164.97	.38333	17.903	.20272	53.595
#1	.00414	.00056	3.8780	-.00103	-.00020	2.6101	-.00182	.09724	-.00026
#2	.00470	-.00097	3.9005	-.00532	.00262	2.5960	-.00141	.09752	-.00057
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00228**	**-.00025**	**2.9586**
Stddev	.00132	.00018	.0071
%RSD	57.844	71.255	.23892
#1	.00134	-.00012	2.9536
#2	.00321	-.00038	2.9636
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2048.2**	**4058.9**	**63864.**	**7762.2**
Stddev	13.8	21.7	415.	28.3
%RSD	.67305	.53370	.64986	.36479
#1	2058.0	4074.2	64158.	7782.2
#2	2038.5	4043.6	63571.	7742.1

Sample Name: 480-48230-3 sol raw Acquired: 11/14/2013 18:54:44 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00022**	**-.02794**	**.00356**	**.04758**	**.05820**	**-.00007**	**92.945**	**-.00022**	**.00100**
Stddev	.00016	.00235	.00286	.00067	.00010	.00014	.190	.00016	.00011
%RSD	70.452	8.4192	80.209	1.4186	.17123	204.29	.20439	71.506	10.567
#1	.00011	-.02628	.00154	.04710	.05813	.00003	93.079	-.00011	.00093
#2	.00033	-.02960	.00558	.04805	.05827	-.00017	92.811	-.00033	.00108
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00007**	**.00170**	**.03876**	**2.4908**	**.00442**	**25.966**	**.36730**	**.00015**	**117.49**
Stddev	.00086	.00033	.00420	.0033	.00112	.045	.00052	.00015	.72
%RSD	1231.1	19.698	10.843	.13080	25.352	.17468	.14031	100.95	.61096
#1	.00068	.00193	.04173	2.4885	.00521	25.934	.36694	.00026	116.99
#2	-.00054	.00146	.03578	2.4931	.00363	25.998	.36766	.00004	118.00
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00203**	**.00169**	**6.3765**	**-.00286**	**-.00185**	**4.4006**	**-.00209**	**.11764**	**-.00003**
Stddev	.00020	.00106	.0313	.00227	.00444	.0085	.00049	.00016	.00024
%RSD	9.6129	62.885	.49042	79.470	239.71	.19229	23.253	.13180	865.78
#1	.00217	.00094	6.3986	-.00125	-.00499	4.3947	-.00243	.11775	.00014
#2	.00189	.00244	6.3544	-.00447	.00129	4.4066	-.00175	.11753	-.00020
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00128**	**.00030**	**.21996**
Stddev	.00093	.00057	.00084
%RSD	72.981	188.61	.38388
#1	.00062	.00070	.21936
#2	.00194	-.00010	.22056
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1971.7**	**3956.7**	**61904.**	**7647.9**
Stddev	11.9	21.2	147.	37.5
%RSD	.60462	.53536	.23688	.49031
#1	1980.1	3971.7	62007.	7674.4
#2	1963.3	3941.7	61800.	7621.4

Sample Name: 480-48230-4 sol raw Acquired: 11/14/2013 18:56:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00064**	**-.02688**	**.00275**	**.01400**	**.00666**	**-.00009**	**45.846**	**-.00005**	**.00004**
Stddev	.00013	.01240	.00137	.00032	.00007	.00000	.376	.00005	.00011
%RSD	20.857	46.112	49.890	2.3128	1.0994	1.0050	.81960	109.21	268.54
#1	.00073	-.01812	.00178	.01377	.00671	-.00009	46.112	-.00008	.00012
#2	.00054	-.03565	.00372	.01423	.00661	-.00009	45.581	-.00001	-.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00004**	**.00180**	**-.00145**	**.81931**	**.00368**	**13.561**	**.00100**	**-.00032**	**13.744**
Stddev	.00052	.00015	.00215	.04137	.00062	.009	.00017	.00009	.006
%RSD	1199.8	8.5706	148.03	5.0498	16.896	.06824	16.986	27.905	.04021
#1	-.00041	.00169	.00007	.79005	.00411	13.554	.00112	-.00026	13.740
#2	.00033	.00190	-.00297	.84856	.00324	13.567	.00088	-.00039	13.747
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00016**	**.00165**	**2.6598**	**-.00465**	**.00093**	**2.2346**	**-.00218**	**.05023**	**.00008**
Stddev	.00017	.00054	.0018	.00242	.00011	.0277	.00079	.00011	.00001
%RSD	104.92	32.603	.06914	52.015	12.165	1.2400	36.149	.21227	19.429
#1	.00004	.00203	2.6611	-.00294	.00085	2.2150	-.00162	.05031	.00007
#2	.00028	.00127	2.6585	-.00636	.00101	2.2542	-.00274	.05016	.00009
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00020**	**-.00005**	**.07398**
Stddev	.00090	.00074	.00010
%RSD	440.86	1477.6	.13702
#1	.00043	.00047	.07405
#2	-.00084	-.00057	.07391
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2124.7**	**4090.4**	**64109.**	**7649.8**
Stddev	8.9	9.3	302.	30.5
%RSD	.42063	.22792	.47082	.39847
#1	2131.0	4096.9	64323.	7671.3
#2	2118.4	4083.8	63896.	7628.2

Sample Name: 480-48674-4 raw Acquired: 11/14/2013 18:59:15 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00051**	**3.3039**	**.00493**	**.23804**	**.08423**	**.00006**	**323.11**	**.00043**	**.00664**
Stddev	.00068	.0101	.00231	.00041	.00018	.00000	.42	.00011	.00008
%RSD	134.44	.30428	46.850	.17224	.21790	8.4504	.13088	25.942	1.2668
#1	-.00099	3.2968	.00656	.23775	.08410	.00006	322.82	.00050	.00658
#2	-.00002	3.3110	.00330	.23833	.08436	.00006	323.41	.00035	.00670
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00630**	**.02067**	**7.6150**	**15.928**	**.01810**	**125.32**	**1.2673**	**-.00061**	**12.130**
Stddev	.00115	.00026	.0456	.030	.00032	.28	.0017	.00006	.049
%RSD	18.247	1.2635	.59899	.18789	1.7645	.22670	.13559	10.598	.40160
#1	.00712	.02049	7.6472	15.949	.01787	125.52	1.2685	-.00056	12.096
#2	.00549	.02086	7.5827	15.907	.01832	125.12	1.2661	-.00065	12.165
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01680**	**.01112**	**76.249**	**-.00588**	**.00115**	**12.850**	**-.00125**	**.38406**	**.07963**
Stddev	.00046	.00077	.006	.00001	.00068	.006	.00119	.00067	.00015
%RSD	2.7372	6.9276	.00762	.25193	59.386	.04544	95.215	.17457	.19261
#1	.01712	.01057	76.245	-.00587	.00066	12.846	-.00041	.38359	.07974
#2	.01647	.01166	76.253	-.00589	.00163	12.854	-.00209	.38454	.07952
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00073**	**.00793**	**.03195**
Stddev	.00017	.00040	.00036
%RSD	23.038	5.0965	1.1215
#1	.00061	.00764	.03220
#2	.00085	.00821	.03170
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1853.5**	**3793.4**	**59608.**	**7515.4**
Stddev	3.7	14.4	99.	95.1
%RSD	.20221	.37985	.16667	1.2659
#1	1856.1	3803.6	59678.	7582.6
#2	1850.8	3783.2	59538.	7448.1

Sample Name: 480-48704-1 raw Acquired: 11/14/2013 19:01:30 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00038**	**.07557**	**.00582**	**.00450**	**.01883**	**-.00013**	**7.6493**	**-.00053**	**.00251**
Stddev	.00172	.01455	.00217	.00033	.00001	.00008	.2582	.00021	.00001
%RSD	453.34	19.258	37.385	7.3526	.05608	57.604	3.3756	39.073	.31390
#1	-.00084	.08586	.00735	.00474	.01884	-.00008	7.4667	-.00039	.00251
#2	.00160	.06528	.00428	.00427	.01882	-.00018	7.8319	-.00068	.00252
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**.00111**	**18.878**	**1.4447**	**.00229**	**1.4376**	**.45580**	**.00028**	**18.479**
Stddev	.00014	.00010	.037	.0024	.00044	.0081	.00103	.00013	.021
%RSD	57.261	9.3305	.19495	.16471	19.340	.56147	.22582	44.872	.11280
#1	-.00035	.00103	18.904	1.4430	.00261	1.4433	.45653	.00037	18.494
#2	-.00015	.00118	18.852	1.4464	.00198	1.4319	.45507	.00019	18.464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00087**	**.00276**	**2.3741**	**-.00423**	**.00141**	**8.8885**	**-.00112**	**.06513**	**.00195**
Stddev	.00062	.00052	.0136	.00114	.00820	.0416	.00012	.00033	.00021
%RSD	70.492	18.986	.57386	26.945	581.41	.46797	11.092	.49899	10.676
#1	.00131	.00313	2.3837	-.00504	-.00439	8.9179	-.00121	.06490	.00181
#2	.00044	.00239	2.3644	-.00343	.00721	8.8591	-.00103	.06536	.00210
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00042**	**.00092**	**.00604**
Stddev	.00042	.00022	.00045
%RSD	98.518	23.712	7.4260
#1	.00072	.00107	.00572
#2	.00013	.00076	.00636
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2161.5**	**4100.3**	**64769.**	**7592.1**
Stddev	10.4	18.5	109.	57.7
%RSD	.48117	.45206	.16777	.76029
#1	2168.8	4113.4	64846.	7632.9
#2	2154.1	4087.2	64692.	7551.3

Sample Name: 480-48311-B-32-A@10 Acquired: 11/14/2013 19:03:46 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00299**	**7.5170**	**.02249**	**.01029**	**.16563**	**.00034**	**35.375**	**.01061**	**.19445**
Stddev	.00036	.0019	.00187	.00009	.00028	.00004	.135	.00003	.00039
%RSD	12.134	.02455	8.3341	.83898	.16704	10.562	.38300	.29784	.20283
#1	.00273	7.5183	.02382	.01035	.16583	.00036	35.471	.01059	.19473
#2	.00324	7.5157	.02117	.01023	.16543	.00031	35.279	.01064	.19417
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**11.045**	**.79849**	**172.68**	**1.0055**	**.01536**	**3.6353**	**1.4877**	**.31116**	**.12755**
Stddev	.005	.00189	.18	.0266	.00017	.0018	.0049	.00045	.00767
%RSD	.04260	.23671	.10600	2.6414	1.1280	.04954	.32713	.14313	6.0141
#1	11.048	.79983	172.55	1.0242	.01548	3.6340	1.4911	.31148	.12212
#2	11.042	.79716	172.81	.98668	.01523	3.6366	1.4842	.31085	.13297
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**2.3528**	**.41402**	**1.6711**	F **-.08020**	**.00354**	**2.1106**	**.09293**	**.07835**	**.10071**
Stddev	.0003	.00202	.0054	.00135	.00180	.0337	.00081	.00029	.00117
%RSD	.01065	.48715	.32309	1.6888	50.870	1.5957	.86875	.36789	1.1615
#1	2.3526	.41260	1.6749	-.08115	.00481	2.1344	.09235	.07815	.09988
#2	2.3530	.41545	1.6672	-.07924	.00227	2.0868	.09350	.07855	.10154
Check ?	Chk Pass	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				50.000					
Low Limit				-.02000					

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00252**	**.11050**	**12.578**
Stddev	.00049	.00066	.006
%RSD	19.461	.59664	.04642
#1	.00287	.11003	12.582
#2	.00217	.11096	12.574
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1978.7**	**3781.2**	**60605.**	**7063.1**
Stddev	3.5	3.2	158.	22.7
%RSD	.17903	.08560	.26071	.32120
#1	1976.2	3778.9	60493.	7047.1
#2	1981.2	3783.5	60717.	7079.1

Sample Name: 480-48311-B-32-A@20 Acquired: 11/14/2013 19:05:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00097**	**3.7422**	**.01334**	**.00416**	**.08238**	**.00009**	**17.819**	**.00529**	**.09621**
Stddev	.00019	.0222	.00222	.00049	.00002	.00005	.005	.00007	.00025
%RSD	19.585	.59315	16.638	11.782	.02626	50.687	.02780	1.3380	.26174
#1	.00111	3.7579	.01491	.00450	.08236	.00012	17.822	.00524	.09638
#2	.00084	3.7265	.01177	.00381	.08239	.00006	17.815	.00534	.09603
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**5.5826**	**.39806**	**86.641**	**.51474**	**.01077**	**1.8466**	**.74720**	**.15520**	**.07603**
Stddev	.0161	.00037	.121	.00520	.00067	.0012	.00029	.00045	.00784
%RSD	.28815	.09301	.13984	1.0100	6.2630	.06325	.03884	.29289	10.313
#1	5.5712	.39833	86.555	.51842	.01029	1.8458	.74700	.15552	.08158
#2	5.5940	.39780	86.726	.51107	.01125	1.8474	.74741	.15488	.07049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.1754**	**.20895**	**.82790**	F **-.04094**	**.00647**	**1.0075**	**.04458**	**.03904**	**.04992**
Stddev	.0023	.00151	.00550	.00208	.00629	.0169	.00012	.00000	.00021
%RSD	.19734	.72169	.66470	5.0826	97.193	1.6784	.26277	.00008	.42473
#1	1.1738	.20789	.83180	-.03946	.00202	1.0195	.04466	.03904	.05007
#2	1.1771	.21002	.82401	-.04241	.01092	.99555	.04450	.03904	.04977
Check ?	Chk Pass	Chk Pass	None	Chk Fail	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				50.000					
Low Limit				-.02000					

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00126**	**.05540**	**6.4111**
Stddev	.00163	.00057	.0258
%RSD	129.38	1.0214	.40202
#1	.00241	.05580	6.4293
#2	.00011	.05500	6.3928
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2047.9**	**3856.4**	**62179.**	**7208.8**
Stddev	2.6	5.4	55.	39.7
%RSD	.12938	.14099	.08880	.55017
#1	2049.8	3860.3	62218.	7180.8
#2	2046.0	3852.6	62140.	7236.9

Sample Name: 480-48539-C-1-A@5 Acquired: 11/14/2013 19:08:11 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00060**	**.02850**	**.22604**	**.14232**	**.06929**	**-.00011**	**395.30**	**-.00087**	**-.00071**
Stddev	.00015	.01369	.00107	.00031	.00000	.00009	.77	.00006	.00013
%RSD	24.211	48.023	.47216	.21487	.00579	87.144	.19435	7.2648	17.940
#1	-.00071	.01882	.22679	.14254	.06930	-.00004	394.75	-.00082	-.00062
#2	-.00050	.03818	.22528	.14211	.06929	-.00017	395.84	-.00091	-.00080
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	271.441 {124}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00564**	**.00350**	**64.042**	**18.273**	**.70879**	**38.617**	**1.0113**	**-.00012**	**929.10**
Stddev	.00149	.00026	.188	.035	.00315	.092	.0006	.00007	.71
%RSD	26.371	7.3903	.29324	.18941	.44508	.23856	.05880	61.648	.07659
#1	.00669	.00369	64.174	18.249	.70656	38.682	1.0117	-.00007	928.60
#2	.00459	.00332	63.909	18.298	.71102	38.552	1.0109	-.00017	929.60
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00196**	**.00219**	**6.2026**	**-.00595**	**-.00681**	**.23625**	**.00031**	F **12.324**	**.00101**
Stddev	.00061	.00109	.0108	.00145	.00007	.02001	.00048	.009	.00014
%RSD	31.099	49.682	.17472	24.345	.98523	8.4709	151.74	.07171	13.821
#1	.00239	.00142	6.2102	-.00698	-.00685	.25040	.00065	12.330	.00091
#2	.00153	.00297	6.1949	-.00493	-.00676	.22210	-.00002	12.317	.00111
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Fail	Chk Pass
High Limit								10.000	
Low Limit								-.00500	

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00433**	**-.00001**	**.01112**
Stddev	.00004	.00019	.00266
%RSD	.87079	2915.3	23.901
#1	-.00436	.00013	.01300
#2	-.00431	-.00014	.00924
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1541.9**	**3363.1**	**52450.**	**7270.6**
Stddev	2.1	5.5	36.	48.3
%RSD	.13605	.16390	.06958	.66439
#1	1540.4	3359.2	52476.	7304.8
#2	1543.4	3367.0	52424.	7236.5

Sample Name: MB 480-149743/1-A Acquired: 11/14/2013 19:10:36 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00043**	**.00525**	**.00288**	**.00088**	**.00008**	**-.00011**	**.12741**	**-.00004**	**.00030**
Stddev	.00013	.02298	.00320	.00023	.00001	.00004	.01560	.00001	.00005
%RSD	29.499	437.68	111.02	26.530	6.9893	36.941	12.246	21.343	16.661
#1	-.00034	-.01100	.00514	.00071	.00007	-.00008	.13844	-.00005	.00033
#2	-.00052	.02150	.00062	.00104	.00008	-.00014	.11637	-.00004	.00026
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00137**	**.00107**	**.04986**	**.01375**	**.00223**	**.01118**	**.00066**	**.00003**	**.25402**
Stddev	.00021	.00005	.00224	.01732	.00153	.00261	.00007	.00005	.01962
%RSD	15.675	4.5137	4.5013	125.97	68.740	23.332	10.587	172.24	7.7253
#1	.00152	.00111	.05145	.02599	.00331	.01303	.00061	.00006	.26790
#2	.00122	.00104	.04827	.00150	.00114	.00934	.00071	-.00001	.24014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00066**	**.00102**	**.00722**	**-.00361**	**.00130**	**-.05452**	**-.00175**	**.00291**	**.00001**
Stddev	.00045	.00030	.00094	.00142	.00117	.00376	.00013	.00020	.00006
%RSD	67.810	29.594	13.047	39.349	90.505	6.9060	7.4189	6.8477	1189.9
#1	.00097	.00081	.00789	-.00260	.00213	-.05718	-.00166	.00305	-.00004
#2	.00034	.00124	.00656	-.00461	.00047	-.05185	-.00184	.00277	.00005
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00055**	**.00054**	**.00300**
Stddev	.00044	.00029	.00053
%RSD	80.699	52.715	17.796
#1	.00024	.00034	.00262
#2	.00086	.00074	.00337
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2178.8**	**3980.0**	**64455.**	**7278.0**
Stddev	8.2	11.0	6.	30.9
%RSD	.37777	.27587	.00882	.42462
#1	2184.6	3987.8	64459.	7256.2
#2	2172.9	3972.2	64451.	7299.9

Sample Name: CCV Acquired: 11/14/2013 19:12:57 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48696	24.614	.50625	.48662	.50974	.48321	24.589	.49406	.48548	.49935	.49886	23.845	25.594
Stddev	.00110	.044	.00026	.00158	.00111	.00003	.048	.00198	.00181	.00007	.00133	.061	.042
%RSD	.22611	.17719	.05215	.32427	.21780	.00609	.19432	.40069	.37235	.01480	.26651	.25388	.16504
#1	.48618	24.645	.50644	.48551	.50895	.48323	24.555	.49266	.48420	.49940	.49792	23.888	25.624
#2	.48774	24.583	.50607	.48774	.51052	.48319	24.623	.49546	.48676	.49929	.49980	23.802	25.564
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50149	23.976	.49697	.50220	24.987	.48579	.48351	24.976	.51008	.49428	24.031	.49591	.50666
Stddev	.00143	.053	.00152	.00139	.014	.00030	.00420	.091	.00502	.00249	.147	.00175	.00050
%RSD	.28605	.22223	.30560	.27598	.05706	.06133	.86923	.36316	.98503	.50340	.61156	.35195	.09808
#1	.50251	23.939	.49590	.50122	24.977	.48558	.48054	24.911	.50653	.49252	23.927	.49468	.50631
#2	.50048	24.014	.49805	.50318	24.997	.48600	.48649	25.040	.51364	.49604	24.135	.49715	.50701
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50885	.49590	.49423	.49928
Stddev	.00294	.00144	.00004	.00346
%RSD	.57863	.29015	.00867	.69362
#1	.50676	.49489	.49426	.49683
#2	.51093	.49692	.49420	.50173
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1949.8	3818.6	60421.	7109.2
Stddev	1.7	1.8	57.	6.0
%RSD	.08975	.04604	.09494	.08401
#1	1948.5	3817.3	60462.	7104.9
#2	1951.0	3819.8	60381.	7113.4

Sample Name: CCB Acquired: 11/14/2013 19:15:06 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00059**	**-.01344**	**.00083**	**-.00158**	**.00013**	**.00002**	**.05881**	**.00023**	**.00021**	**.00115**	**.00090**	**.03100**	**-.01360**
Stddev	.00062	.00418	.00082	.00012	.00003	.00005	.03688	.00012	.00037	.00072	.00037	.01776	.04525
%RSD	105.08	31.130	98.699	7.6521	21.047	246.66	62.704	51.573	171.55	62.499	40.897	57.283	332.66
#1	-.00102	-.01048	.00025	-.00150	.00015	.00005	.08489	.00015	.00047	.00064	.00115	.04356	.01840
#2	-.00015	-.01640	.00142	-.00167	.00011	-.00001	.03274	.00032	-.00005	.00166	.00064	.01844	-.04560
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00219**	**.01669**	**.00040**	**.00013**	**.17986**	**.00074**	**.00086**	**.00558**	**-.00109**	**.00400**	**-.01958**	**-.00117**	**.00208**
Stddev	.00089	.00059	.00002	.00001	.07977	.00046	.00041	.00208	.00156	.00286	.00815	.00049	.00089
%RSD	40.784	3.5201	5.3826	11.069	44.351	61.462	48.010	37.363	143.10	71.569	41.653	41.920	42.713
#1	.00156	.01710	.00038	.00014	.23627	.00042	.00115	.00705	-.00219	.00198	-.02534	-.00082	.00270
#2	.00283	.01627	.00041	.00012	.12345	.00107	.00057	.00410	.00001	.00603	-.01381	-.00151	.00145
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.00050**	**-.00003**	**.00030**
Stddev	.00012	.00072	.00033	.00062
%RSD	148.03	143.64	1271.8	204.84
#1	.00016	-.00101	.00020	.00074
#2	.00000	.00001	-.00026	-.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2158.6**	**3947.4**	**63498.**	**7140.7**
Stddev	2.4	3.4	2.	5.5
%RSD	.11063	.08605	.00367	.07733
#1	2160.3	3949.8	63496.	7144.6
#2	2156.9	3945.0	63500.	7136.8

Sample Name: CCVL Acquired: 11/14/2013 19:17:29 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00307	.19866	.01010	.01789	.00207	.00189	.50864	.00092	.00414	.00445	.01012	.05961
Stddev	.00058	.00630	.00039	.00016	.00000	.00004	.00868	.00020	.00008	.00003	.00021	.00483
%RSD	18.810	3.1697	3.8287	.86839	.08427	2.2746	1.7069	21.655	1.9276	.60876	2.0899	8.1092
#1	.00266	.19420	.01037	.01778	.00207	.00192	.51478	.00078	.00420	.00443	.01027	.06303
#2	.00348	.20311	.00982	.01800	.00207	.00186	.50250	.00106	.00408	.00447	.00997	.05619
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.51758	.03162	.20754	.00348	.00951	1.0727	.00942	W .00269	.20095	.01683	.01820	.41552
Stddev	.00027	.00074	.00585	.00016	.00026	.0183	.00009	.00113	.00297	.00098	.00276	.01873
%RSD	.05285	2.3314	2.8178	4.5641	2.6948	1.7057	.92601	41.922	1.4796	5.8043	15.175	4.5077
#1	.51739	.03214	.20341	.00337	.00933	1.0857	.00948	.00349	.19885	.01752	.02016	.40228
#2	.51777	.03109	.21168	.00360	.00970	1.0598	.00936	.00189	.20305	.01614	.01625	.42877
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00835	.00598	.00437	.02059	.00500	.01213
Stddev	.00010	.00010	.00009	.00048	.00022	.00001
%RSD	1.2414	1.5977	2.1119	2.3204	4.4146	.09739
#1	.00828	.00605	.00444	.02093	.00484	.01214
#2	.00843	.00592	.00430	.02025	.00515	.01213
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2202.3	4064.0	64951.	7447.4
Stddev	3.1	7.8	122.	7.7
%RSD	.14282	.19207	.18741	.10293
#1	2204.5	4069.5	65037.	7452.8
#2	2200.1	4058.5	64865.	7441.9

Sample Name: LCS 480-149743/2-A Acquired: 11/14/2013 19:19:48 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.04877**	**10.038**	**.20488**	**.20341**	**.20862**	**.19804**	**9.8379**	**.19874**	**.19524**
Stddev	.00040	.058	.00296	.00006	.00025	.00015	.0317	.00026	.00074
%RSD	.81905	.57909	1.4454	.02707	.11755	.07598	.32205	.13038	.37712
#1	.04849	10.079	.20279	.20345	.20845	.19814	9.8603	.19892	.19472
#2	.04905	9.9972	.20697	.20338	.20879	.19793	9.8155	.19856	.19576
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19953**	**.20035**	**9.7689**	**10.245**	**.20761**	**10.168**	**.19945**	**.20969**	**10.029**
Stddev	.00004	.00096	.0137	.024	.00124	.023	.00012	.00001	.002
%RSD	.01773	.48127	.13996	.23524	.59739	.22361	.05798	.00456	.02166
#1	.19956	.19967	9.7592	10.228	.20848	10.152	.19953	.20969	10.030
#2	.19951	.20103	9.7786	10.262	.20673	10.184	.19937	.20970	10.027
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19262**	**.19842**	**9.9331**	**.19794**	**.20364**	**9.5121**	**.19366**	**.20449**	**.19574**
Stddev	.00166	.00214	.0175	.00235	.00910	.0449	.00134	.00021	.00063
%RSD	.85985	1.0807	.17605	1.1885	4.4700	.47213	.68975	.10238	.32323
#1	.19145	.19690	9.9455	.19628	.19720	9.4804	.19271	.20464	.19619
#2	.19380	.19993	9.9207	.19960	.21008	9.5439	.19460	.20435	.19529
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.19793**	**.20131**	**.19787**
Stddev	.00123	.00028	.00034
%RSD	.61992	.13743	.16980
#1	.19707	.20151	.19810
#2	.19880	.20111	.19763
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2057.6**	**3902.2**	**62664.**	**7284.3**
Stddev	6.9	4.2	53.	20.4
%RSD	.33502	.10761	.08393	.27992
#1	2062.5	3905.1	62627.	7298.7
#2	2052.7	3899.2	62701.	7269.9

Sample Name: 480-49333-B-1-A Acquired: 11/14/2013 19:22:01 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.13636**	**.00179**	**1.0142**	**.21286**	**.00000**	**152.99**	**-.00004**	**.00007**
Stddev	.00029	.00516	.00116	.0078	.00022	.00007	.11	.00007	.00004
%RSD	143.68	3.7808	64.690	.76884	.10155	2193.0	.07278	187.58	54.402
#1	.00000	.14000	.00260	1.0087	.21302	.00005	153.07	.00001	.00010
#2	-.00041	.13271	.00097	1.0197	.21271	-.00005	152.91	-.00009	.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00107**	**.00214**	**15.308**	**4.7049**	**.03571**	**21.713**	**1.4044**	**.00075**	**57.481**
Stddev	.00016	.00016	.002	.0349	.00168	.001	.0006	.00012	.008
%RSD	14.862	7.6715	.01438	.74189	4.7039	.00269	.04421	16.282	.01371
#1	.00118	.00226	15.306	4.6802	.03452	21.714	1.4049	.00084	57.487
#2	.00096	.00203	15.309	4.7296	.03689	21.713	1.4040	.00067	57.476
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00076**	**.00156**	**22.689**	**-.00334**	**.00416**	**8.7311**	**-.00175**	**.87571**	**.00227**
Stddev	.00020	.00056	.127	.00015	.00135	.0065	.00045	.00285	.00029
%RSD	26.358	36.191	.55929	4.3725	32.507	.07408	25.603	.32553	12.818
#1	.00062	.00116	22.599	-.00324	.00511	8.7265	-.00143	.87772	.00206
#2	.00090	.00195	22.778	-.00345	.00320	8.7357	-.00207	.87369	.00247
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00137**	**.00077**	**.00282**
Stddev	.00000	.00006	.00041
%RSD	.16915	7.4656	14.667
#1	-.00136	.00081	.00253
#2	-.00137	.00073	.00311
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1876.6**	**3707.4**	**58868.**	**7211.7**
Stddev	.4	12.5	96.	9.5
%RSD	.02126	.33736	.16264	.13240
#1	1876.3	3716.2	58800.	7218.5
#2	1876.9	3698.5	58936.	7205.0

Sample Name: 480-49333-B-2-A Acquired: 11/14/2013 19:24:13 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00026**	**.04344**	**.00404**	**.61837**	**.25680**	**-.00007**	**95.000**	**-.00001**	**.00003**
Stddev	.00034	.02330	.00011	.00086	.00056	.00002	.083	.00020	.00036
%RSD	130.11	53.630	2.6733	.13949	.21968	29.526	.08748	2982.7	1143.5
#1	.00002	.05992	.00396	.61776	.25640	-.00006	95.059	-.00015	.00029
#2	.00050	.02697	.00412	.61898	.25720	-.00009	94.942	.00013	-.00022
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**.00349**	**.86102**	**7.1040**	**.03912**	**20.702**	**.16337**	**.00153**	**64.217**
Stddev	.0005	.00044	.00028	.0228	.00172	.012	.00016	.00023	.287
%RSD	145160.	12.507	.03267	.32165	4.4028	.05739	.10004	14.757	.44728
#1	-.00038	.00379	.86122	7.1201	.03791	20.711	.16326	.00137	64.014
#2	.00038	.00318	.86082	7.0878	.04034	20.694	.16349	.00169	64.420
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.01232**	**.00275**	**19.786**	**-.00363**	**-.00478**	**5.5005**	**-.00085**	**1.4758**	**.00048**
Stddev	.00038	.00108	.003	.00256	.00346	.0029	.00081	.0050	.00021
%RSD	3.1196	39.071	.01616	70.515	72.543	.05253	94.442	.33848	43.394
#1	.01259	.00199	19.788	-.00544	-.00723	5.4985	-.00028	1.4723	.00033
#2	.01205	.00351	19.784	-.00182	-.00233	5.5026	-.00142	1.4794	.00063
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00026**	**.00016**	**.02908**
Stddev	.00037	.00038	.00006
%RSD	141.77	236.21	.20583
#1	.00000	.00043	.02904
#2	-.00052	-.00011	.02912
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1911.0**	**3726.8**	**59750.**	**7247.2**
Stddev	4.3	6.2	117.	13.4
%RSD	.22521	.16514	.19549	.18458
#1	1914.0	3731.2	59832.	7256.7
#2	1908.0	3722.5	59667.	7237.7

Sample Name: 480-49333-B-2-A sd@5 Acquired: 11/14/2013 19:26:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00033**	**-.00094**	**.00107**	**.11886**	**.05137**	**-.00007**	**19.077**	**.00000**	**-.00003**
Stddev	.00074	.00018	.00067	.00121	.00008	.00004	.072	.00004	.00004
%RSD	226.66	18.880	62.667	1.0173	.15820	65.094	.37805	43664.	113.09
#1	-.00020	-.00082	.00155	.11972	.05142	-.00004	19.128	.00003	-.00006
#2	.00085	-.00107	.00060	.11801	.05131	-.00010	19.026	-.00003	-.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.00135**	**.17363**	**1.3868**	**.00858**	**4.0596**	**.03348**	**.00037**	**12.623**
Stddev	.00006	.00047	.00416	.0704	.00181	.0204	.00016	.00051	.000
%RSD	100.96	34.740	2.3963	5.0735	21.114	.50260	.47239	134.85	.00047
#1	.00002	.00102	.17658	1.4365	.00986	4.0452	.03337	.00073	12.623
#2	.00010	.00168	.17069	1.3370	.00730	4.0740	.03359	.00002	12.623
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00197**	**-.00033**	**3.7357**	**-.00384**	**.00221**	**1.0481**	**-.00180**	**.29408**	**-.00013**
Stddev	.00011	.00045	.0085	.00054	.00151	.0023	.00031	.00010	.00015
%RSD	5.8335	135.50	.22773	14.090	68.689	.21759	17.197	.03358	111.84
#1	.00205	-.00001	3.7417	-.00346	.00113	1.0464	-.00158	.29415	-.00003
#2	.00189	-.00066	3.7296	-.00422	.00328	1.0497	-.00202	.29401	-.00024
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00128**	**.00015**	**.00655**
Stddev	.00032	.00036	.00055
%RSD	24.957	244.71	8.4119
#1	.00150	.00041	.00616
#2	.00105	-.00011	.00694
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2072.2**	**3876.2**	**61865.**	**7223.5**
Stddev	2.9	.4	22.	15.1
%RSD	.14234	.01128	.03615	.20890
#1	2070.1	3876.5	61881.	7234.2
#2	2074.3	3875.9	61849.	7212.9

Sample Name: 480-49333-B-2-A PDS Acquired: 11/14/2013 19:28:42 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05095**	**10.406**	**.21390**	**.80770**	**.45710**	**.20339**	**103.34**	**.20762**	**.20582**
Stddev	.00126	.001	.00051	.00166	.00071	.00024	.05	.00025	.00029
%RSD	2.4647	.00827	.23632	.20550	.15512	.11654	.04960	.12269	.14211
#1	.05006	10.407	.21426	.80887	.45660	.20322	103.37	.20780	.20602
#2	.05184	10.405	.21355	.80653	.45761	.20356	103.30	.20744	.20561
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20574**	**.20873**	**10.724**	**17.472**	**.24588**	**30.381**	**.35993**	**.21539**	**72.978**
Stddev	.00051	.00091	.024	.039	.00016	.045	.00035	.00026	.071
%RSD	.25013	.43430	.22278	.22151	.06400	.14828	.09620	.12192	.09685
#1	.20537	.20809	10.741	17.445	.24577	30.349	.36018	.21558	72.928
#2	.20610	.20937	10.707	17.500	.24600	30.413	.35969	.21521	73.028
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21367**	**.21143**	**19.107**	**.20652**	**.21574**	**15.402**	**.20177**	**1.6475**	**.20205**
Stddev	.00050	.00232	.023	.00070	.00121	.044	.00065	.0024	.00063
%RSD	.23530	1.0973	.12030	.33926	.56078	.28539	.32223	.14276	.31356
#1	.21331	.21307	19.123	.20702	.21660	15.371	.20223	1.6458	.20161
#2	.21402	.20979	19.091	.20603	.21489	15.433	.20132	1.6492	.20250
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20351**	**.20868**	**.23002**
Stddev	.00480	.00084	.00124
%RSD	2.3599	.40174	.53859
#1	.20691	.20927	.22915
#2	.20012	.20809	.23090
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1871.6**	**3744.0**	**59460.**	**7233.7**
Stddev	5.4	8.4	148.	4.6
%RSD	.28634	.22503	.24968	.06293
#1	1875.4	3750.0	59564.	7230.5
#2	1867.8	3738.1	59355.	7236.9

Sample Name: 480-49333-B-2-B MS Acquired: 11/14/2013 19:30:52 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05025**	**10.087**	**.21304**	**.80732**	**.45547**	**.20077**	**104.59**	**.20493**	**.20275**
Stddev	.00115	.108	.00495	.00458	.00117	.00042	.39	.00079	.00048
%RSD	2.2892	1.0680	2.3246	.56699	.25724	.20873	.37302	.38429	.23825
#1	.05107	10.163	.20954	.80408	.45630	.20106	104.87	.20437	.20241
#2	.04944	10.010	.21654	.81056	.45464	.20047	104.31	.20548	.20310
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20192**	**.20679**	**10.584**	**17.238**	**.24156**	**30.420**	**.35742**	**.21211**	**73.506**
Stddev	.00298	.00041	.049	.029	.00005	.063	.00111	.00131	.076
%RSD	1.4764	.19992	.46273	.16904	.01946	.20589	.31180	.61811	.10341
#1	.20403	.20708	10.619	17.259	.24159	30.464	.35821	.21119	73.560
#2	.19981	.20650	10.549	17.218	.24152	30.375	.35663	.21304	73.453
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21052**	**.20905**	**29.569**	**.20407**	**.20767**	**15.070**	**.20138**	**1.6604**	**.19983**
Stddev	.00023	.00154	.119	.00167	.00164	.029	.00020	.0047	.00081
%RSD	.10777	.73843	.40191	.81860	.78755	.19030	.09752	.28310	.40385
#1	.21068	.21014	29.485	.20289	.20883	15.091	.20152	1.6637	.20040
#2	.21036	.20796	29.653	.20525	.20652	15.050	.20124	1.6571	.19926
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20242**	**.20467**	**.22354**
Stddev	.00115	.00017	.00285
%RSD	.56657	.08288	1.2771
#1	.20323	.20455	.22556
#2	.20161	.20479	.22152
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1873.7**	**3739.9**	**59347.**	**7171.4**
Stddev	.5	16.4	87.	8.3
%RSD	.02688	.43750	.14690	.11537
#1	1874.1	3751.4	59408.	7165.5
#2	1873.4	3728.3	59285.	7177.2

Sample Name: 480-49333-B-2-C MSD Acquired: 11/14/2013 19:33:03 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.05059**	**10.273**	**.21395**	**.81929**	**.46128**	**.20151**	**105.31**	**.20629**	**.20407**
Stddev	.00076	.119	.00261	.00324	.00056	.00054	.31	.00013	.00036
%RSD	1.4992	1.1572	1.2192	.39523	.12219	.26891	.29761	.06435	.17486
#1	.05113	10.357	.21211	.81700	.46089	.20113	105.53	.20620	.20432
#2	.05005	10.189	.21580	.82158	.46168	.20189	105.09	.20638	.20382
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20345**	**.20640**	**10.634**	**17.518**	**.24519**	**30.780**	**.36076**	**.21398**	**74.238**
Stddev	.00012	.00077	.003	.006	.00122	.059	.00027	.00028	.323
%RSD	.05752	.37192	.02364	.03469	.49889	.19235	.07400	.13235	.43511
#1	.20337	.20586	10.633	17.513	.24605	30.738	.36057	.21378	74.467
#2	.20354	.20695	10.636	17.522	.24432	30.822	.36095	.21418	74.010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.21271**	**.21057**	**29.864**	**.20759**	**.21147**	**15.191**	**.20374**	**1.6790**	**.20075**
Stddev	.00026	.00289	.087	.00040	.00104	.028	.00127	.0067	.00067
%RSD	.12357	1.3724	.29277	.19434	.49361	.18136	.62275	.39772	.33496
#1	.21253	.21261	29.802	.20730	.21073	15.210	.20463	1.6837	.20122
#2	.21290	.20852	29.926	.20787	.21221	15.171	.20284	1.6743	.20027
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.20190**	**.20611**	**.22435**
Stddev	.00062	.00081	.00060
%RSD	.30901	.39103	.26593
#1	.20234	.20554	.22477
#2	.20146	.20668	.22392
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1867.0**	**3733.1**	**59219.**	**7218.9**
Stddev	5.0	18.3	147.	9.5
%RSD	.26662	.49011	.24864	.13095
#1	1870.5	3746.0	59323.	7212.2
#2	1863.5	3720.1	59115.	7225.6

Sample Name: 480-49333-B-3-A Acquired: 11/14/2013 19:35:14 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00039**	**.06958**	**.01681**	**1.4463**	**.37156**	**.00003**	**180.79**	**-.00010**	**.00050**
Stddev	.00050	.00628	.00050	.0050	.00108	.00008	.71	.00010	.00009
%RSD	127.66	9.0216	2.9796	.34779	.29024	240.11	.39421	95.403	17.328
#1	.00075	.06514	.01646	1.4427	.37080	.00009	181.30	-.00003	.00044
#2	.00004	.07402	.01717	1.4499	.37233	-.00002	180.29	-.00017	.00056
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00013**	**.00235**	**25.441**	**6.8560**	**.04313**	**27.513**	**2.2342**	**.00628**	**113.79**
Stddev	.00012	.00018	.033	.0011	.00002	.094	.0041	.00032	.11
%RSD	92.620	7.5476	.13161	.01563	.03630	.34333	.18330	5.0939	.09634
#1	-.00005	.00222	25.465	6.8568	.04314	27.447	2.2313	.00605	113.87
#2	-.00022	.00247	25.418	6.8553	.04312	27.580	2.2371	.00650	113.71
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00073**	**.00314**	**42.465**	**-.00432**	**-.00232**	**10.303**	**-.00174**	**1.1680**	**.00209**
Stddev	.00029	.00146	.082	.00132	.00027	.003	.00013	.0006	.00121
%RSD	39.794	46.493	.19255	30.552	11.850	.02554	7.5299	.04714	58.035
#1	.00093	.00211	42.407	-.00338	-.00213	10.305	-.00164	1.1684	.00295
#2	.00052	.00417	42.523	-.00525	-.00251	10.301	-.00183	1.1676	.00123
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00071**	**.00016**	**.00429**
Stddev	.00004	.00031	.00141
%RSD	5.4940	194.95	32.879
#1	-.00068	-.00006	.00529
#2	-.00074	.00038	.00330
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1822.3**	**3662.7**	**57796.**	**7217.8**
Stddev	3.0	2.0	26.	23.5
%RSD	.16620	.05438	.04472	.32579
#1	1820.2	3664.1	57815.	7201.2
#2	1824.5	3661.2	57778.	7234.5

Sample Name: 480-49333-B-4-A Acquired: 11/14/2013 19:37:28 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00047**	**.16895**	**.00361**	**3.1323**	**.13899**	**-.00016**	**155.79**	**.00023**	**.00109**
Stddev	.00061	.01635	.00026	.0137	.00029	.00002	.41	.00010	.00019
%RSD	128.65	9.6771	7.1573	.43632	.20729	14.601	.26265	42.787	17.792
#1	.00004	.18051	.00343	3.1226	.13919	-.00014	156.07	.00016	.00123
#2	.00090	.15739	.00380	3.1419	.13878	-.00018	155.50	.00030	.00096
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00046**	**.00362**	**3.9177**	**2.9086**	**.00922**	**36.976**	**1.7737**	**.00569**	**28.253**
Stddev	.00001	.00022	.0094	.0123	.00010	.192	.0073	.00012	.049
%RSD	1.1568	6.0157	.23861	.42225	1.0701	.51811	.41084	2.0563	.17260
#1	.00047	.00378	3.9243	2.9173	.00929	37.112	1.7788	.00561	28.288
#2	.00046	.00347	3.9110	2.8999	.00915	36.841	1.7685	.00578	28.219
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00237**	**.00402**	**15.285**	**-.00362**	**.00103**	**8.8359**	**-.00112**	**1.1210**	**.00325**
Stddev	.00012	.00105	.047	.00135	.00307	.0093	.00056	.0005	.00016
%RSD	4.9532	26.054	.30786	37.404	296.53	.10572	49.829	.04369	5.0166
#1	.00245	.00476	15.252	-.00457	-.00113	8.8425	-.00152	1.1214	.00336
#2	.00229	.00328	15.318	-.00266	.00320	8.8293	-.00073	1.1207	.00313
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00026**	**.00050**	**.01862**
Stddev	.00057	.00026	.00079
%RSD	224.04	52.631	4.2485
#1	.00015	.00031	.01918
#2	-.00066	.00068	.01806
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1882.6**	**3715.3**	**59470.**	**7206.8**
Stddev	2.3	18.7	182.	10.5
%RSD	.11994	.50449	.30615	.14577
#1	1884.2	3728.6	59342.	7199.4
#2	1881.0	3702.1	59599.	7214.2

Sample Name: CCV Acquired: 11/14/2013 19:39:44 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.48624	24.412	.50813	.49462	.50854	.48382	24.446	.49499	.48632	.49540	.50012	23.793	25.450
Stddev	.00029	.180	.00181	.00049	.00455	.00082	.006	.00036	.00130	.00126	.00310	.037	.057
%RSD	.05866	.73758	.35678	.09833	.89533	.17016	.02522	.07363	.26753	.25340	.61986	.15724	.22277
#1	.48644	24.539	.50685	.49496	.50532	.48440	24.450	.49473	.48724	.49451	.49793	23.819	25.490
#2	.48604	24.284	.50942	.49428	.51176	.48324	24.441	.49524	.48540	.49628	.50232	23.766	25.410
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.50421	23.995	.49475	.50333	24.758	.48767	.48911	24.989	.50990	.49954	24.097	.49832	.50386
Stddev	.00146	.034	.00068	.00070	.009	.00087	.00188	.094	.00058	.00890	.011	.00054	.00179
%RSD	.29041	.14027	.13826	.13997	.03753	.17820	.38337	.37493	.11283	1.7817	.04683	.10859	.35616
#1	.50524	23.971	.49427	.50283	24.765	.48828	.49044	25.055	.51031	.49325	24.089	.49871	.50513
#2	.50317	24.019	.49524	.50383	24.752	.48705	.48778	24.923	.50950	.50584	24.105	.49794	.50259
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50817	.49533	.49432	.49401
Stddev	.00130	.00062	.00145	.00023
%RSD	.25561	.12527	.29345	.04656
#1	.50725	.49489	.49330	.49385
#2	.50908	.49577	.49535	.49417
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1956.7	3833.2	60786.	7156.1
Stddev	2.8	.6	71.	15.4
%RSD	.14346	.01459	.11734	.21553
#1	1954.7	3833.6	60837.	7145.2
#2	1958.7	3832.8	60736.	7167.0

Sample Name: CCB Acquired: 11/14/2013 19:41:55 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**-.01488**	**.00441**	**.00314**	**.00012**	**-.00001**	**.00897**	**.00004**	**.00019**	**-.00003**	**.00061**	**.00274**	**.00440**
Stddev	.00012	.01730	.00113	.00018	.00005	.00002	.00217	.00012	.00026	.00005	.00030	.00324	.04449
%RSD	248.87	116.25	25.628	5.6518	45.833	263.47	24.176	287.49	132.84	146.15	49.498	118.37	1010.0
#1	.00004	-.00265	.00520	.00326	.00008	.00001	.01050	-.00004	.00001	.00000	.00040	.00045	-.02705
#2	-.00013	-.02711	.00361	.00301	.00016	-.00003	.00744	.00013	.00037	-.00007	.00083	.00503	.03586
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00219**	**.01129**	**.00028**	**.00066**	**.05711**	**-.00011**	**.00009**	**.01598**	**-.00313**	**.00545**	**-.02379**	**-.00159**	**.00032**
Stddev	.00002	.00188	.00016	.00006	.00995	.00048	.00278	.01103	.00227	.01030	.00711	.00040	.00014
%RSD	.73994	16.689	55.610	8.5001	17.430	429.10	3117.5	69.019	72.380	188.77	29.898	25.086	43.018
#1	.00220	.00996	.00017	.00062	.06415	.00023	-.00188	.00818	-.00473	-.00183	-.01876	-.00131	.00042
#2	.00217	.01262	.00040	.00070	.05007	-.00045	.00206	.02377	-.00153	.01273	-.02882	-.00188	.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00028**	**.00032**	**-.00006**	**.00089**
Stddev	.00007	.00039	.00028	.00007
%RSD	25.143	123.50	514.08	7.3718
#1	.00023	.00059	-.00026	.00094
#2	.00033	.00004	.00015	.00084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2162.3**	**3960.9**	**63914.**	**7213.4**
Stddev	5.0	3.0	156.	31.7
%RSD	.23034	.07590	.24342	.43920
#1	2165.8	3963.1	63804.	7191.0
#2	2158.7	3958.8	64024.	7235.8

Sample Name: CCVL Acquired: 11/14/2013 19:44:18 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00268	.18289	.01287	.02130	.00225	.00195	.53427	.00097	.00398	.00333	.01047	.05126	.50688
Stddev	.00070	.00036	.00005	.00036	.00001	.00002	.01633	.00003	.00012	.00027	.00013	.00264	.00031
%RSD	26.282	.19474	.42149	1.6907	.42807	1.2066	3.0568	3.0865	2.9111	8.1821	1.2087	5.1566	.06071
#1	.00218	.18314	.01291	.02156	.00226	.00194	.52272	.00095	.00406	.00314	.01038	.04939	.50710
#2	.00318	.18264	.01283	.02105	.00225	.00197	.54582	.00099	.00390	.00353	.01055	.05313	.50666
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03274	.21978	.00383	.00957	1.0110	.00999	.00488	.21592	.01759	.01374	.43428	.00814	.00551
Stddev	.00004	.00123	.00009	.00005	.0063	.00018	.00098	.00366	.00071	.00134	.01359	.00003	.00001
%RSD	.11050	.56128	2.4747	.50302	.62321	1.7993	20.048	1.6935	4.0159	9.7466	3.1304	.38683	.19738
#1	.03276	.21891	.00390	.00960	1.0154	.01011	.00557	.21334	.01809	.01469	.44389	.00816	.00550
#2	.03271	.22065	.00376	.00953	1.0065	.00986	.00419	.21851	.01709	.01280	.42467	.00811	.00552
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00482	.02013	.00495	.01112
Stddev	.00009	.00232	.00047	.00010
%RSD	1.9172	11.529	9.4839	.88576
#1	.00476	.01849	.00528	.01119
#2	.00489	.02177	.00461	.01105
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2205.2	4083.1	64896.	7374.6
Stddev	4.4	6.7	72.	5.7
%RSD	.19797	.16443	.11045	.07719
#1	2208.3	4087.9	64947.	7378.7
#2	2202.2	4078.4	64846.	7370.6

Sample Name: 480-49333-b-5-a Acquired: 11/14/2013 19:46:34 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.60489**	**.00075**	**1.6039**	**.04380**	**-.00004**	**237.34**	**.00009**	**.00038**
Stddev	.00027	.01426	.00235	.0064	.00007	.00006	.05	.00004	.00034
%RSD	136.45	2.3572	313.14	.39980	.15368	145.51	.02115	41.961	87.856
#1	-.00039	.61498	-.00091	1.5993	.04376	-.00008	237.30	.00012	.00062
#2	-.00001	.59481	.00241	1.6084	.04385	.00000	237.37	.00006	.00015
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00138**	**.00552**	**18.029**	**1.8910**	**.04009**	**44.954**	**.37937**	**.00106**	**40.891**
Stddev	.00060	.00035	.048	.0395	.00061	.014	.00053	.00005	.017
%RSD	43.464	6.4188	.26516	2.0879	1.5309	.03014	.14014	4.9383	.04127
#1	.00180	.00577	17.996	1.8631	.03966	44.964	.37975	.00102	40.903
#2	.00096	.00527	18.063	1.9189	.04053	44.944	.37900	.00110	40.879
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00095**	**.00484**	**124.92**	**-.00328**	**-.00189**	**11.873**	**-.00163**	**1.1639**	**.01243**
Stddev	.00018	.00229	.30	.00064	.00625	.069	.00100	.0016	.00000
%RSD	19.207	47.364	.23789	19.576	330.13	.58521	61.400	.13718	.01984
#1	.00082	.00322	124.71	-.00373	-.00631	11.824	-.00234	1.1650	.01244
#2	.00108	.00646	125.13	-.00282	.00253	11.923	-.00092	1.1628	.01243
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00133**	**.00105**	**.00554**
Stddev	.00169	.00050	.00100
%RSD	127.29	47.227	18.147
#1	-.00013	.00070	.00625
#2	-.00253	.00141	.00482
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1821.5**	**3624.8**	**58148.**	**7261.3**
Stddev	.1	13.9	174.	15.2
%RSD	.00616	.38339	.29923	.20973
#1	1821.6	3634.6	58025.	7272.1
#2	1821.4	3615.0	58271.	7250.5

Sample Name: 480-49333-b-6-a Acquired: 11/14/2013 19:48:48 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00054**	**.04025**	**.00310**	**1.1300**	**.64832**	**-.00004**	**192.39**	**-.00016**	**.00025**
Stddev	.00016	.00801	.00197	.0040	.00587	.00010	.27	.00019	.00016
%RSD	30.356	19.909	63.370	.35767	.90593	233.86	.14284	121.60	61.495
#1	.00065	.04592	.00171	1.1329	.65248	.00003	192.59	-.00030	.00014
#2	.00042	.03459	.00449	1.1272	.64417	-.00012	192.20	-.00002	.00036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00321**	**.00516**	**22.005**	**5.2207**	**.03823**	**25.801**	**.71616**	**.00036**	**46.150**
Stddev	.00001	.00038	.040	.0409	.00048	.034	.00192	.00018	.057
%RSD	.27500	7.4291	.18372	.78363	1.2530	.13218	.26851	50.278	.12406
#1	.00321	.00489	21.977	5.1918	.03789	25.777	.71480	.00049	46.110
#2	.00322	.00544	22.034	5.2496	.03857	25.825	.71752	.00023	46.191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00039**	**.00230**	**.11778**	**-.00418**	**.00304**	**14.122**	**-.00172**	**2.1323**	**.00200**
Stddev	.00031	.00056	.00206	.00081	.00439	.011	.00030	.0023	.00015
%RSD	79.301	24.453	1.7458	19.409	144.45	.07819	17.275	.10809	7.6943
#1	.00017	.00190	.11924	-.00361	.00614	14.115	-.00151	2.1307	.00211
#2	.00061	.00270	.11633	-.00475	-.00007	14.130	-.00192	2.1340	.00190
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00088**	**.00088**	**.01028**
Stddev	.00097	.00016	.00010
%RSD	110.71	17.932	1.0001
#1	-.00019	.00099	.01020
#2	-.00157	.00077	.01035
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1850.0**	**3690.3**	**58631.**	**7192.0**
Stddev	1.4	9.8	168.	16.3
%RSD	.07746	.26547	.28711	.22723
#1	1851.0	3683.4	58512.	7203.5
#2	1849.0	3697.3	58750.	7180.4

Sample Name: 480-49329-f-1-a Acquired: 11/14/2013 19:51:09 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**.02309**	**.00080**	**.02820**	**.06517**	**-.00005**	**230.19**	**-.00004**	**.00017**
Stddev	.00076	.02177	.00028	.00008	.00005	.00010	.18	.00000	.00001
%RSD	7019.1	94.288	35.273	.26719	.06977	196.54	.07892	8.8002	7.2492
#1	.00053	.00770	.00060	.02814	.06514	.00002	230.31	-.00004	.00018
#2	-.00055	.03849	.00100	.02825	.06520	-.00013	230.06	-.00004	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00053**	**.00227**	**.00640**	**1.5038**	**.02536**	**39.500**	**.00729**	**.00005**	**8.5278**
Stddev	.00048	.00008	.00220	.0026	.00005	.050	.00003	.00007	.0160
%RSD	90.880	3.4032	34.386	.17440	.18497	.12567	.43964	153.65	.18807
#1	.00087	.00222	.00796	1.5019	.02533	39.535	.00731	.00000	8.5391
#2	.00019	.00233	.00484	1.5056	.02540	39.465	.00726	.00010	8.5164
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00079**	**.00050**	**106.68**	**-.00308**	**-.00012**	**7.1059**	**-.00181**	**.53197**	**.00039**
Stddev	.00026	.00069	.04	.00009	.00018	.0025	.00016	.00133	.00008
%RSD	33.236	138.26	.03690	3.0197	141.78	.03490	8.9490	.25013	19.816
#1	.00060	.00099	106.71	-.00315	-.00025	7.1041	-.00192	.53103	.00044
#2	.00097	.00001	106.65	-.00301	.00000	7.1076	-.00169	.53291	.00033
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00051**	**-.00006**	**.00244**
Stddev	.00081	.00012	.00074
%RSD	158.70	185.91	30.265
#1	-.00108	-.00015	.00296
#2	.00006	.00002	.00191
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1861.4**	**3662.3**	**58580.**	**7265.9**
Stddev	1.8	4.9	186.	7.9
%RSD	.09852	.13384	.31739	.10896
#1	1862.7	3665.8	58711.	7260.3
#2	1860.1	3658.8	58448.	7271.5

Sample Name: 480-49329-f-2-a Acquired: 11/14/2013 19:53:25 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00008**	**.06432**	**.00117**	**.04087**	**.22068**	**-.00014**	**108.04**	**-.00010**	**.00053**
Stddev	.00036	.03403	.00017	.00035	.00017	.00010	.13	.00013	.00029
%RSD	466.64	52.910	14.730	.86620	.07765	76.443	.12476	133.56	54.280
#1	-.00034	.08839	.00129	.04062	.22080	-.00021	108.14	-.00001	.00073
#2	.00018	.04026	.00105	.04112	.22056	-.00006	107.94	-.00018	.00032
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.08764**	**.37022**	**2.0894**	**.01982**	**17.436**	**1.9461**	**.00001**	**11.710**
Stddev	.00069	.00051	.00130	.0194	.00129	.002	.0018	.00013	.028
%RSD	1241.8	.58315	.35187	.92897	6.5020	.01350	.09355	1011.7	.23904
#1	.00054	.08800	.36930	2.0757	.01891	17.437	1.9474	-.00008	11.690
#2	-.00043	.08728	.37115	2.1031	.02073	17.434	1.9448	.00010	11.730
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**.00577**	**29.241**	**-.00313**	**-.00225**	**6.5913**	**-.00202**	**.38752**	**.00105**
Stddev	.00013	.00022	.046	.00010	.00501	.0000	.00052	.00044	.00049
%RSD	21.043	3.8302	.15858	3.0417	222.86	.00061	25.727	.11453	47.049
#1	.00069	.00562	29.274	-.00320	.00129	6.5913	-.00239	.38721	.00140
#2	.00051	.00593	29.209	-.00307	-.00579	6.5914	-.00165	.38783	.00070
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00066**	**.00000**	**.05224**
Stddev	.00192	.0000	.00135
%RSD	288.49	278.10	2.5860
#1	.00202	-.00001	.05320
#2	-.00069	.00000	.05129
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1953.9**	**3754.6**	**60390.**	**7283.1**
Stddev	3.0	2.0	171.	7.6
%RSD	.15485	.05205	.28242	.10397
#1	1956.0	3753.2	60511.	7277.7
#2	1951.7	3755.9	60269.	7288.4

Sample Name: 480-49329-f-3-a Acquired: 11/14/2013 19:55:41 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00028**	**.18382**	**.00144**	**.11304**	**.11009**	**-.00013**	**98.189**	**.00009**	**-.00015**
Stddev	.00052	.00768	.00258	.00025	.00000	.00005	.047	.00002	.00045
%RSD	184.28	4.1780	179.68	.21765	.00027	38.941	.04760	22.862	294.72
#1	-.00065	.17839	.00326	.11287	.11009	-.00016	98.222	.00010	-.00048
#2	.00009	.18925	-.00039	.11322	.11009	-.00009	98.156	.00007	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**.00143**	**.47733**	**5.7073**	**.03890**	**19.807**	**.57326**	**-.00016**	**23.237**
Stddev	.00028	.00032	.00307	.0066	.00023	.028	.00041	.00001	.006
%RSD	262.47	22.283	.64292	.11646	.60040	.14173	.07088	5.2158	.02717
#1	.00009	.00166	.47950	5.7120	.03874	19.826	.57355	-.00015	23.233
#2	-.00031	.00121	.47516	5.7026	.03907	19.787	.57298	-.00016	23.242
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00048**	**.00235**	**21.854**	**-.00387**	**.00403**	**6.3637**	**-.00159**	**1.0533**	**.00157**
Stddev	.00012	.00061	.047	.00110	.00050	.0019	.00018	.0022	.00026
%RSD	24.148	26.061	.21544	28.512	12.386	.02920	11.433	.20458	16.395
#1	.00040	.00192	21.821	-.00309	.00368	6.3650	-.00146	1.0548	.00138
#2	.00056	.00278	21.888	-.00465	.00439	6.3624	-.00171	1.0518	.00175
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00043**	**-.00027**	**.00424**
Stddev	.00127	.00023	.00001
%RSD	292.44	82.770	.15550
#1	-.00133	-.00043	.00423
#2	.00046	-.00011	.00424
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1944.8**	**3751.4**	**60089.**	**7308.9**
Stddev	6.4	11.6	39.	3.3
%RSD	.32956	.30968	.06424	.04461
#1	1949.3	3759.6	60062.	7306.6
#2	1940.2	3743.2	60117.	7311.2

Sample Name: 480-49329-f-4-a Acquired: 11/14/2013 19:58:08 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**.01569**	**.00039**	**.04427**	**.02099**	**-.00008**	**217.87**	**.00016**	**.00017**
Stddev	.00082	.02643	.00153	.00067	.00006	.00011	.49	.00002	.00054
%RSD	452.40	168.41	391.78	1.5237	.30441	128.84	.22485	12.323	316.99
#1	-.00076	-.00299	.00147	.04475	.02095	-.00001	217.52	.00015	-.00021
#2	.00040	.03438	-.00069	.04380	.02104	-.00016	218.21	.00017	.00055
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**.00180**	**.00314**	**1.4073**	**.01549**	**31.796**	**.18229**	**-.00032**	**4.4200**
Stddev	.00040	.00015	.00218	.0209	.00165	.068	.00074	.00054	.0208
%RSD	316.41	8.1409	69.435	1.4824	10.641	.21232	.40507	168.69	.47143
#1	.00040	.00190	.00468	1.3925	.01432	31.748	.18177	-.00070	4.4347
#2	-.00015	.00169	.00160	1.4221	.01666	31.844	.18281	.00006	4.4053
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00154**	**-.00005**	**126.38**	**-.00495**	**.00007**	**5.8704**	**-.00202**	**.43894**	**.00073**
Stddev	.00024	.00234	.30	.00068	.00852	.0273	.00115	.00047	.00076
%RSD	15.359	4952.6	.23474	13.672	11543.	.46513	56.863	.10723	103.83
#1	.00137	.00160	126.59	-.00542	.00610	5.8511	-.00121	.43861	.00020
#2	.00171	-.00170	126.17	-.00447	-.00595	5.8897	-.00283	.43928	.00127
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00024**	**-.00016**	**.00575**
Stddev	.00040	.00029	.00162
%RSD	165.88	180.30	28.189
#1	-.00052	.00004	.00460
#2	.00004	-.00037	.00690
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1878.3**	**3684.3**	**58806.**	**7278.4**
Stddev	1.0	2.3	122.	16.6
%RSD	.05283	.06331	.20717	.22806
#1	1879.0	3682.6	58893.	7290.2
#2	1877.6	3685.9	58720.	7266.7

Sample Name: 480-49329-f-5-a Acquired: 11/14/2013 20:00:34 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00015**	**-.00805**	**.00265**	**.01885**	**.05465**	**-.00017**	**103.93**	**-.00005**	**.00016**
Stddev	.00037	.03102	.00347	.00052	.00004	.00004	.15	.00011	.00008
%RSD	253.17	385.48	131.05	2.7587	.06702	23.679	.14500	225.39	50.306
#1	-.00041	.01389	.00511	.01922	.05463	-.00014	104.03	.00003	.00021
#2	.00012	-.02998	.00019	.01848	.05468	-.00020	103.82	-.00012	.00010
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00009**	**.00158**	**-.00170**	**.69526**	**.01032**	**11.492**	**.00138**	**-.00014**	**4.2834**
Stddev	.00018	.00036	.00094	.04669	.00132	.010	.00001	.00005	.0268
%RSD	211.53	22.755	55.063	6.7156	12.764	.08558	.87445	34.819	.62668
#1	-.00004	.00133	-.00237	.72828	.00939	11.499	.00139	-.00010	4.3024
#2	.00021	.00183	-.00104	.66225	.01125	11.485	.00138	-.00017	4.2644
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**.00191**	**41.005**	**-.00393**	**-.00080**	**6.2534**	**-.00167**	**.22136**	**.00013**
Stddev	.00034	.00172	.016	.00295	.00082	.0233	.00021	.00042	.00000
%RSD	202.77	90.083	.03901	75.118	101.93	.37239	12.348	.18806	3.0186
#1	.00041	.00313	40.993	-.00602	-.00138	6.2698	-.00182	.22166	.00012
#2	-.00007	.00069	41.016	-.00184	-.00022	6.2369	-.00153	.22107	.00013
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00143**	**-.00001**	**.00186**
Stddev	.00049	.00035	.00086
%RSD	34.147	3758.5	46.365
#1	-.00108	.00024	.00125
#2	-.00177	-.00026	.00247
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1976.5**	**3794.9**	**60749.**	**7258.6**
Stddev	2.2	8.8	100.	5.0
%RSD	.10963	.23139	.16462	.06837
#1	1978.1	3801.1	60820.	7262.1
#2	1975.0	3788.7	60678.	7255.1

Sample Name: 480-49329-f-6-a Acquired: 11/14/2013 20:02:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00023**	**.01186**	**.00409**	**.01785**	**.05385**	**-.00012**	**102.29**	**-.00008**	**.00006**
Stddev	.00092	.02695	.00008	.00114	.00009	.00003	.05	.00003	.00039
%RSD	399.67	227.15	2.0660	6.4017	.17137	24.281	.04622	30.735	608.96
#1	-.00088	.03092	.00403	.01704	.05392	-.00014	102.32	-.00006	-.00021
#2	.00042	-.00719	.00415	.01865	.05379	-.00010	102.26	-.00010	.00034
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**.00125**	**-.00115**	**.69032**	**.00974**	**11.314**	**.00164**	**.00021**	**4.2336**
Stddev	.00109	.00017	.00122	.03481	.00008	.022	.00015	.00014	.0099
%RSD	766.66	14.000	105.99	5.0433	.83732	.19864	9.2033	68.896	.23296
#1	.00063	.00112	-.00201	.71494	.00968	11.298	.00153	.00031	4.2267
#2	-.00091	.00137	-.00029	.66570	.00979	11.330	.00175	.00011	4.2406
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**.00262**	**40.497**	**-.00530**	**-.00030**	**6.1092**	**-.00113**	**.21762**	**.00012**
Stddev	.00012	.00085	.049	.00076	.00501	.0282	.00052	.00039	.00022
%RSD	14.088	32.267	.12170	14.375	1648.2	.46208	46.501	.18148	178.88
#1	.00091	.00202	40.462	-.00584	-.00385	6.1292	-.00150	.21790	-.00003
#2	.00075	.00322	40.532	-.00476	.00324	6.0892	-.00076	.21734	.00028
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00018**	**-.00029**	**.00216**
Stddev	.00293	.00011	.00002
%RSD	1669.5	38.264	.90820
#1	-.00189	-.00037	.00215
#2	.00225	-.00021	.00218
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1978.0**	**3788.2**	**60772.**	**7261.3**
Stddev	.5	3.3	96.	21.3
%RSD	.02775	.08681	.15751	.29279
#1	1978.4	3790.6	60840.	7276.4
#2	1977.7	3785.9	60704.	7246.3

Sample Name: 480-49329-f-7-a Acquired: 11/14/2013 20:05:20 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00006**	**.00960**	**.00115**	**.04111**	**.07186**	**-.00007**	**104.14**	**.00024**	**.00042**
Stddev	.00033	.01785	.00085	.00017	.00005	.00001	.32	.00001	.00031
%RSD	539.54	186.04	73.913	.40833	.06569	18.769	.30859	3.8180	72.889
#1	.00029	.02222	.00174	.04099	.07182	-.00006	104.37	.00023	.00020
#2	-.00017	-.00303	.00055	.04123	.07189	-.00008	103.91	.00025	.00064
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00022**	**.00172**	**.00471**	**2.3508**	**.01598**	**22.185**	**1.2765**	**.00008**	**9.1317**
Stddev	.00006	.00033	.00190	.0079	.00110	.081	.0010	.00006	.0398
%RSD	29.005	19.279	40.442	.33425	6.8961	.36675	.07759	81.585	.43526
#1	-.00027	.00149	.00605	2.3453	.01676	22.243	1.2772	.00012	9.1598
#2	-.00018	.00196	.00336	2.3564	.01520	22.128	1.2758	.00003	9.1036
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00314**	**.00068**	**51.967**	**-.00191**	**.00289**	**5.5042**	**-.00190**	**.48514**	**.00047**
Stddev	.00050	.00170	.027	.00004	.00285	.0070	.00066	.00198	.00033
%RSD	16.013	249.87	.05135	2.2352	98.589	.12646	34.877	.40840	69.269
#1	.00350	.00188	51.948	-.00194	.00087	5.5091	-.00143	.48654	.00024
#2	.00279	-.00052	51.986	-.00188	.00490	5.4993	-.00237	.48374	.00071
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00133**	**.00002**	**.00285**
Stddev	.00029	.00006	.00029
%RSD	21.574	359.65	10.130
#1	-.00113	-.00002	.00265
#2	-.00153	.00005	.00306
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1966.6**	**3778.7**	**60799.**	**7279.7**
Stddev	1.3	10.1	115.	12.6
%RSD	.06465	.26755	.18966	.17364
#1	1967.5	3785.8	60718.	7288.6
#2	1965.7	3771.5	60881.	7270.8

Sample Name: CCV Acquired: 11/14/2013 20:07:41 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49212	24.720	.50610	.48988	.50454	.48514	24.517	.49256	.48613	.49847	.49871	23.799	25.299
Stddev	.00239	.130	.00019	.00248	.00233	.00192	.012	.00239	.00024	.00047	.00040	.006	.054
%RSD	.48574	.52454	.03723	.50709	.46178	.39479	.04888	.48456	.04861	.09525	.07960	.02337	.21281
#1	.49043	24.812	.50596	.48812	.50619	.48650	24.526	.49087	.48597	.49881	.49843	23.803	25.337
#2	.49381	24.629	.50623	.49163	.50290	.48379	24.509	.49424	.48630	.49814	.49899	23.795	25.261
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49844	24.190	.49893	.50010	24.696	.49094	.49235	24.937	.50810	.49114	24.014	.50070	.50241
Stddev	.00028	.032	.00123	.00338	.042	.00071	.00066	.136	.00572	.01080	.113	.00159	.00056
%RSD	.05652	.13036	.24710	.67527	.16922	.14469	.13467	.54478	1.1254	2.1982	.47229	.31659	.11062
#1	.49824	24.167	.49806	.49771	24.725	.49144	.49188	25.033	.50406	.48351	23.934	.49958	.50280
#2	.49864	24.212	.49980	.50248	24.666	.49044	.49281	24.841	.51214	.49877	24.094	.50182	.50201
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50862	.49674	.49723	.49743
Stddev	.00065	.00202	.00023	.00305
%RSD	.12770	.40594	.04650	.61245
#1	.50908	.49817	.49707	.49527
#2	.50816	.49531	.49739	.49958
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1948.5	3833.7	60380.	7152.4
Stddev	7.2	7.0	39.	13.3
%RSD	.37191	.18299	.06387	.18614
#1	1943.4	3828.8	60408.	7143.0
#2	1953.7	3838.7	60353.	7161.8

Sample Name: CCB Acquired: 11/14/2013 20:09:58 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00028**	**-.02437**	**.00299**	**-.00044**	**.00007**	**-.00007**	**.01682**	**-.00008**	**-.00006**	**.00084**	**.00028**	**.00199**	**.01084**
Stddev	.00010	.01720	.00166	.00007	.00001	.00004	.01015	.00014	.00012	.00052	.00001	.00619	.00800
%RSD	34.026	70.596	55.633	16.735	14.816	60.408	60.367	187.42	209.70	61.366	4.0952	311.48	73.770
#1	.00035	-.03653	.00181	-.00049	.00006	-.00004	.02399	-.00018	-.00014	.00121	.00029	.00636	.00519
#2	.00022	-.01220	.00417	-.00038	.00007	-.00009	.00964	.00003	.00003	.00048	.00027	-.00239	.01650
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00225**	**.00646**	**.00012**	**.00013**	**.03876**	**.00029**	**.00080**	**.00817**	**-.00177**	**.00428**	**-.03464**	**-.00172**	**.00029**
Stddev	.00073	.00390	.00007	.00035	.00890	.00002	.00310	.00438	.00157	.00169	.01061	.00006	.00008
%RSD	32.295	60.431	60.790	273.04	22.966	5.9872	388.64	53.624	88.431	39.517	30.624	3.5814	28.524
#1	.00276	.00370	.00017	.00038	.04505	.00027	.00299	.01126	-.00066	.00548	-.04214	-.00176	.00035
#2	.00173	.00922	.00007	-.00012	.03246	.00030	-.00140	.00507	-.00288	.00308	-.02714	-.00168	.00023
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.00007**	**.00023**	**-.00038**
Stddev	.00001	.00082	.00044	.00012
%RSD	3.4719	1094.1	197.36	30.536
#1	-.00020	-.00050	-.00009	-.00047
#2	-.00021	.00065	.00054	-.00030
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2167.1**	**3962.6**	**63542.**	**7175.8**
Stddev	2.7	2.9	39.	12.1
%RSD	.12530	.07242	.06191	.16810
#1	2165.2	3960.6	63514.	7184.3
#2	2169.0	3964.6	63569.	7167.2

Sample Name: CCVL Acquired: 11/14/2013 20:12:23 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00252	.17836	.01135	.01855	.00199	.00180	.48260	.00085	.00393	.00352	.00997	.03932	.48403
Stddev	.00046	.01313	.00128	.00039	.00002	.00005	.00513	.00007	.00015	.00011	.00027	.00006	.01366
%RSD	18.278	7.3593	11.288	2.0970	.81879	2.6044	1.0637	8.0242	3.8663	3.2172	2.7317	.14101	2.8214
#1	.00284	.16908	.01225	.01828	.00198	.00176	.47897	.00090	.00383	.00344	.01017	.03936	.47438
#2	.00219	.18764	.01044	.01883	.00200	.00183	.48623	.00080	.00404	.00360	.00978	.03928	.49369
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.03192	.20533	.00330	.00988	.98486	.00948	.00364	.19809	.01761	.01553	.42944	.00777	.00496
Stddev	.00033	.00172	.00014	.00000	.00319	.00017	.00008	.00349	.00173	.00420	.00204	.00058	.00000
%RSD	1.0196	.83914	4.3628	.01890	.32417	1.8305	2.2165	1.7622	9.8494	27.054	.47556	7.4214	.06729
#1	.03169	.20655	.00340	.00987	.98260	.00960	.00369	.19562	.01639	.01256	.43088	.00818	.00496
#2	.03215	.20412	.00320	.00988	.98712	.00936	.00358	.20056	.01884	.01850	.42800	.00737	.00497
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00474	.02136	.00486	.01025
Stddev	.00009	.00119	.00005	.00010
%RSD	1.8840	5.5706	.96041	1.0118
#1	.00468	.02052	.00483	.01018
#2	.00481	.02220	.00489	.01033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2206.2	4098.6	64886.	7465.1
Stddev	2.5	8.1	32.	23.5
%RSD	.11188	.19855	.04879	.31517
#1	2208.0	4104.4	64908.	7481.7
#2	2204.5	4092.9	64863.	7448.4

Sample Name: 480-49329-f-8-a Acquired: 11/14/2013 20:14:42 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00104**	**-.01413**	**.00125**	**.02523**	**.19282**	**-.00017**	**141.37**	**.00004**	**.00057**
Stddev	.00002	.00579	.00032	.00027	.00028	.00004	.37	.00009	.00026
%RSD	1.8890	40.987	25.972	1.0676	.14296	25.340	.25898	207.73	46.255
#1	.00105	-.01823	.00148	.02504	.19262	-.00014	141.11	-.00002	.00075
#2	.00103	-.01004	.00102	.02542	.19301	-.00020	141.63	.00010	.00038
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00006**	**.00121**	**.12337**	**1.4605**	**.02200**	**26.376**	**.78116**	**-.00012**	**6.1834**
Stddev	.00065	.00008	.00269	.0160	.00036	.043	.00084	.00017	.0151
%RSD	1098.1	6.9667	2.1813	1.0932	1.6493	.16453	.10707	140.52	.24349
#1	.00040	.00127	.12147	1.4718	.02225	26.345	.78056	.00000	6.1728
#2	-.00052	.00115	.12527	1.4492	.02174	26.407	.78175	-.00024	6.1941
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**-.00088**	**22.898**	**-.00301**	**.00407**	**7.6883**	**-.00201**	**.40639**	**.00042**
Stddev	.00083	.00217	.010	.00348	.00133	.0379	.00134	.00049	.00003
%RSD	98.933	245.11	.04277	115.93	32.687	.49326	66.602	.11999	8.1561
#1	.00025	-.00242	22.891	-.00054	.00313	7.6615	-.00296	.40604	.00044
#2	.00142	.00065	22.905	-.00547	.00501	7.7151	-.00106	.40673	.00039
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00097**	**.00014**	**.00301**
Stddev	.00162	.00012	.00054
%RSD	166.95	83.595	18.034
#1	.00211	.00023	.00340
#2	-.00017	.00006	.00263
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1931.7**	**3739.1**	**59713.**	**7288.0**
Stddev	1.4	5.2	112.	1.6
%RSD	.07154	.13919	.18726	.02223
#1	1930.7	3742.8	59792.	7286.9
#2	1932.7	3735.4	59634.	7289.2

Sample Name: 480-49329-f-9-a Acquired: 11/14/2013 20:17:01 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**.03421**	**.00092**	**.08212**	**.41455**	**-.00013**	**62.251**	**-.00005**	**-.00008**
Stddev	.00069	.00549	.00331	.00011	.00140	.00006	.133	.00022	.00008
%RSD	209.75	16.055	360.53	.13659	.33802	47.269	.21351	448.86	100.02
#1	-.00082	.03033	.00326	.08204	.41554	-.00017	62.345	-.00020	-.00014
#2	.00016	.03809	-.00142	.08220	.41356	-.00008	62.157	.00011	-.00002
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00011**	**.00186**	**.03123**	**3.4234**	**.02814**	**11.425**	**.14547**	**-.00006**	**18.692**
Stddev	.00035	.00014	.00121	.0247	.00000	.017	.00035	.00008	.071
%RSD	328.03	7.6894	3.8892	.72103	.01498	.14478	.24318	123.19	.38244
#1	-.00036	.00176	.03208	3.4059	.02814	11.437	.14572	-.00012	18.742
#2	.00014	.00196	.03037	3.4408	.02815	11.413	.14522	-.00001	18.641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00018**	**.00148**	**13.086**	**-.00341**	**.00338**	**5.9078**	**-.00171**	**.60042**	**.00008**
Stddev	.00012	.00235	.021	.00026	.00585	.0267	.00062	.00288	.00029
%RSD	68.570	158.63	.16086	7.5819	172.97	.45137	36.297	.47988	354.46
#1	-.00009	.00314	13.101	-.00323	-.00075	5.9267	-.00127	.60246	.00029
#2	-.00027	-.00018	13.071	-.00359	.00752	5.8889	-.00215	.59838	-.00012
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00117**	**-.00022**	**.00187**
Stddev	.00068	.00016	.00028
%RSD	58.151	72.257	15.152
#1	.00164	-.00033	.00167
#2	.00069	-.00011	.00207
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1996.9**	**3832.7**	**61024.**	**7284.6**
Stddev	6.4	3.6	57.	18.8
%RSD	.31810	.09351	.09307	.25801
#1	2001.4	3835.3	61064.	7271.3
#2	1992.4	3830.2	60984.	7297.9

Sample Name: 480-49329-f-10-a Acquired: 11/14/2013 20:19:20 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**.08899**	**.00251**	**.01909**	**.02732**	**-.00013**	**234.93**	**.00018**	**.00011**
Stddev	.00014	.00637	.00296	.00025	.00001	.00001	.26	.00003	.00041
%RSD	60.414	7.1599	118.26	1.3335	.02987	4.1313	.11145	16.056	358.52
#1	.00013	.08448	.00460	.01891	.02733	-.00014	234.75	.00016	.00041
#2	.00033	.09349	.00041	.01927	.02731	-.00013	235.12	.00020	-.00018
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00076**	**.00166**	**.29414**	**1.4503**	**.01918**	**30.371**	**.18276**	**.00000**	**10.526**
Stddev	.00028	.00058	.00363	.0238	.00102	.058	.00033	.00009	.028
%RSD	36.597	35.217	1.2336	1.6436	5.3083	.19043	.18120	4191.4	.26691
#1	.00056	.00125	.29157	1.4335	.01990	30.330	.18299	.00006	10.507
#2	.00095	.00207	.29670	1.4672	.01846	30.412	.18253	-.00006	10.546
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00020**	**.00073**	**166.50**	**-.00462**	**-.00191**	**5.7399**	**-.00193**	**.47905**	**.00158**
Stddev	.00038	.00275	.09	.00137	.00040	.0073	.00008	.00031	.00006
%RSD	190.51	374.63	.05152	29.743	20.842	.12769	4.1512	.06370	3.8373
#1	.00047	.00268	166.56	-.00559	-.00219	5.7347	-.00198	.47884	.00162
#2	-.00007	-.00121	166.43	-.00365	-.00163	5.7450	-.00187	.47927	.00153
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00165**	**.00021**	**.00223**
Stddev	.00063	.00021	.00080
%RSD	38.341	100.64	35.710
#1	.00210	.00036	.00167
#2	.00121	.00006	.00279
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1869.2**	**3660.0**	**58756.**	**7274.8**
Stddev	2.3	1.9	80.	2.1
%RSD	.12482	.05089	.13567	.02901
#1	1870.9	3661.3	58700.	7276.3
#2	1867.6	3658.6	58813.	7273.3

Sample Name: 480-49329-f-11-a Acquired: 11/14/2013 20:21:39 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**.14557**	**.00248**	**.26745**	**.02216**	**-.00007**	**1.2965**	**.00010**	**-.00015**
Stddev	.00022	.03954	.00267	.00032	.00001	.00020	.3817	.00002	.00005
%RSD	58.552	27.162	107.66	.12028	.02690	297.02	29.444	21.453	33.615
#1	-.00022	.17353	.00059	.26723	.02217	.00007	1.5664	.00008	-.00018
#2	-.00054	.11761	.00437	.26768	.02216	-.00020	1.0266	.00011	-.00011
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na8183
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	818.326 { 41}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00014**	**.00293**	**.13070**	**2.1583**	**.21795**	**.16981**	**.00487**	**.00990**	**171.98**
Stddev	.00034	.00001	.00375	.0262	.00055	.00311	.00007	.00001	.14
%RSD	236.36	.36309	2.8722	1.2126	.25298	1.8319	1.5173	.05516	.08030
#1	.00010	.00293	.13335	2.1768	.21756	.16761	.00482	.00990	172.07
#2	-.00038	.00294	.12804	2.1398	.21834	.17201	.00492	.00991	171.88
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00047**	**.00177**	**2.8442**	**-.00380**	**.00062**	**3.0821**	**-.00124**	**.05314**	**.00084**
Stddev	.00018	.00089	.0028	.00192	.00279	.0053	.00063	.00131	.00050
%RSD	38.027	49.936	.09816	50.460	451.18	.17051	50.489	2.4662	59.758
#1	.00059	.00115	2.8462	-.00244	.00259	3.0784	-.00080	.05407	.00048
#2	.00034	.00240	2.8422	-.00515	-.00136	3.0858	-.00168	.05221	.00119
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00205**	**.00039**	**.00663**
Stddev	.00016	.00079	.00011
%RSD	7.5956	201.28	1.6251
#1	-.00216	.00096	.00670
#2	-.00194	-.00017	.00655
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1916.6**	**3781.4**	**59694.**	**7332.8**
Stddev	5.1	6.4	403.	7.0
%RSD	.26391	.16845	.67462	.09614
#1	1920.2	3785.9	59979.	7327.9
#2	1913.0	3776.9	59410.	7337.8

Sample Name: 480-49329-f-12-a Acquired: 11/14/2013 20:23:58 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00003**	**.02265**	**.00220**	**.08638**	**.03384**	**-.00011**	**296.94**	**.00014**	**-.00004**
Stddev	.00049	.02015	.00106	.00130	.00005	.00003	1.45	.00011	.00014
%RSD	1526.1	88.973	48.236	1.5032	.13411	26.612	.48995	81.002	329.70
#1	.00038	.03689	.00145	.08730	.03381	-.00013	297.96	.00021	.00006
#2	-.00032	.00840	.00295	.08546	.03387	-.00009	295.91	.00006	-.00014
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.00743**	**.00769**	**21.755**	**.03147**	**57.244**	**.00059**	**.00070**	**10.031**
Stddev	.00042	.00045	.00039	.089	.00037	.012	.00003	.00026	.044
%RSD	828.12	6.0941	5.0575	.40865	1.1601	.02156	4.4348	36.820	.44002
#1	.00035	.00711	.00797	21.693	.03173	57.253	.00061	.00052	10.062
#2	-.00025	.00775	.00742	21.818	.03121	57.235	.00057	.00088	9.9998
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00889**	**.00044**	**237.58**	**-.00641**	**.00371**	**3.9366**	**.00565**	**1.0053**	**.00118**
Stddev	.00030	.00220	.63	.00022	.00150	.0234	.00036	.0014	.00045
%RSD	3.3225	495.68	.26374	3.3915	40.305	.59346	6.3617	.14453	37.973
#1	.00910	-.00111	238.03	-.00656	.00265	3.9201	.00540	1.0063	.00086
#2	.00868	.00200	237.14	-.00626	.00477	3.9532	.00590	1.0043	.00150
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**-.00210**	**-.00044**	**.04321**
Stddev	.00044	.00002	.00037
%RSD	20.735	4.5475	.85920
#1	-.00179	-.00045	.04347
#2	-.00241	-.00042	.04294
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1811.6**	**3610.5**	**57681.**	**7238.1**
Stddev	7.1	3.5	262.	36.7
%RSD	.39393	.09794	.45467	.50738
#1	1816.7	3608.0	57866.	7212.1
#2	1806.6	3613.0	57495.	7264.0

Sample Name: 480-48737-5 SOL RAW Acquired: 11/14/2013 20:26:18 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**-.01043**	**-.00026**	**.03137**	**.12118**	**-.00013**	**21.317**	**-.00028**	**.00031**
Stddev	.00031	.00670	.00001	.00016	.00025	.00002	.031	.00010	.00017
%RSD	121.89	64.244	3.7246	.52031	.20552	18.630	.14505	35.726	56.446
#1	-.00047	-.01516	-.00025	.03148	.12100	-.00014	21.339	-.00021	.00043
#2	-.00003	-.00569	-.00026	.03125	.12135	-.00011	21.295	-.00036	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00061**	**.00074**	**.56879**	**3.2694**	**.00369**	**4.7517**	**.15973**	**-.00011**	**34.022**
Stddev	.00009	.00027	.00778	.0161	.00091	.0169	.00007	.00008	.053
%RSD	15.278	36.745	1.3682	.49160	24.681	.35655	.04075	70.070	.15717
#1	.00068	.00093	.56329	3.2580	.00433	4.7636	.15978	-.00006	34.060
#2	.00055	.00055	.57430	3.2807	.00304	4.7397	.15969	-.00017	33.985
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00039**	**.00275**	**3.7877**	**-.00215**	**.00297**	**6.3873**	**-.00206**	**.13297**	**-.00028**
Stddev	.00005	.00004	.0289	.00005	.00460	.0055	.00038	.00012	.00039
%RSD	11.798	1.4161	.76401	2.4669	154.88	.08667	18.239	.09100	141.40
#1	.00043	.00278	3.8082	-.00219	.00622	6.3912	-.00232	.13289	-.00055
#2	.00036	.00272	3.7673	-.00212	-.00028	6.3833	-.00179	.13306	.00000
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00184**	**.00010**	**.00186**
Stddev	.00206	.00040	.00021
%RSD	112.34	385.13	11.258
#1	.00038	-.00018	.00201
#2	.00330	.00039	.00172
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2149.9**	**4165.1**	**64956.**	**7737.8**
Stddev	11.1	18.9	188.	36.4
%RSD	.51463	.45338	.28933	.46989
#1	2157.7	4178.4	65088.	7763.5
#2	2142.1	4151.7	64823.	7712.1

Sample Name: 480-48737-6 SOL RAW Acquired: 11/14/2013 20:28:34 Type: Unk
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286
Line	328.068 {103}	308.215 {109}	189.042 {478}	208.959 {461}	455.403 { 74}2	313.042 {108}	317.933 {106}	228.802 {447}	228.616 {447}
IS Ref	(Y_3600)	(Y_3774)	(Y_2243)	(Y_2243)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_2243)	(In2306)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00030**	**-.01620**	**.00047**	**.02981**	**.11989**	**-.00011**	**19.817**	**-.00023**	**.00023**
Stddev	.00107	.02538	.00197	.00027	.00012	.00004	.175	.00001	.00028
%RSD	353.53	156.69	419.16	.90817	.10350	32.463	.88533	4.3914	120.14
#1	-.00106	.00175	.00187	.03000	.11998	-.00013	19.941	-.00024	.00043
#2	.00045	-.03414	-.00093	.02962	.11980	-.00008	19.693	-.00022	.00004
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Cr2677	Cu3247	Fe2599	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895
Line	267.716 {126}	324.754 {104}	259.940 {130}	766.490 { 44}	670.784 { 50}	279.079 {121}2	257.610 {131}	202.030 {467}	589.592 { 57}
IS Ref	(Y_3600)	(Y_3600)	(Y_3774)	(Y_3774)	(Y_3774)	(Y_3600)	(Y_3600)	(Y_2243)	(Y_3774)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00000**	**.00115**	**.54915**	**3.1748**	**.00390**	**4.4952**	**.13162**	**-.00018**	**29.215**
Stddev	.0003	.00074	.00634	.0350	.00051	.0276	.00100	.00032	.001
%RSD	10005.	64.748	1.1544	1.1017	13.099	.61314	.75872	179.49	.00301
#1	.00017	.00062	.54467	3.1501	.00354	4.5147	.13232	-.00040	29.214
#2	-.00018	.00168	.55363	3.1996	.00426	4.4757	.13091	.00005	29.215
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077	Ti3349
Line	231.604 {446}	220.353 {453}	182.034 {485}	206.833 {463}	196.090 {472}	288.158 {117}2	189.989 {477}	407.771 { 83}	334.904 {101}
IS Ref	(In2306)	(In2306)	(Y_2243)	(Y_2243)	(Y_2243)	(Y_3774)	(In2306)	(Y_3774)	(Y_3600)
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00072**	**.00306**	**3.4465**	**-.00443**	**.00250**	**6.2928**	**-.00169**	**.12691**	**-.00026**
Stddev	.00002	.00001	.0192	.00044	.00212	.0534	.00051	.00004	.00023
%RSD	3.0413	.40167	.55660	9.9984	84.692	.84939	30.400	.03280	86.810
#1	.00074	.00305	3.4329	-.00474	.00100	6.3306	-.00205	.12688	-.00010
#2	.00071	.00307	3.4600	-.00412	.00400	6.2550	-.00132	.12694	-.00042
Check ?	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit									
Low Limit									

Elem	Tl1908	V_2924	Zn2062
Line	190.856 {477}	292.402 {115}	206.200 {163}
IS Ref	(In2306)	(Y_3600)	(Y_3600)
Units	ppm	ppm	ppm
Avg	**.00078**	**.00000**	**.00152**
Stddev	.00214	.0000	.00059
%RSD	276.56	671.57	39.162
#1	.00229	-.00003	.00194
#2	-.00074	.00002	.00110
Check ?	Chk Pass	Chk Pass	Chk Pass
High Limit			
Low Limit			

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Line	230.606 {446}	224.306 {450}	360.073 { 94}	377.433 { 89}
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2134.5**	**4105.8**	**64417.**	**7757.0**
Stddev	7.4	32.6	164.	19.6
%RSD	.34847	.79339	.25445	.25320
#1	2139.8	4128.9	64533.	7770.9
#2	2129.2	4082.8	64301.	7743.1

Sample Name: CCVL Acquired: 11/14/2013 20:30:52 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00270**	**.20077**	**.00951**	**.01822**	**.00211**	**.00182**	**.51685**	**.00083**	**.00405**	**.00355**	**.01042**	**.04427**
Stddev	.00025	.02283	.00337	.00033	.00002	.00000	.00869	.00005	.00027	.00079	.00028	.00022
%RSD	9.2264	11.373	35.482	1.8084	1.1716	.26124	1.6807	5.7278	6.7735	22.120	2.6549	.49355
#1	.00252	.21691	.01190	.01846	.00212	.00182	.52299	.00087	.00385	.00300	.01022	.04412
#2	.00287	.18462	.00712	.01799	.00209	.00181	.51071	.00080	.00424	.00411	.01062	.04443
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value												
Range												

Elem	K_7664	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.51127**	**.03117**	**.20603**	**.00326**	**.00954**	**1.0195**	**.00960**	W **.00338**	**.21470**	**.01778**	**.01572**	**.40733**
Stddev	.08634	.00086	.00089	.00003	.00022	.0008	.00018	.00054	.00131	.00066	.00351	.01761
%RSD	16.888	2.7554	.43067	.98926	2.3107	.07875	1.8507	16.129	.60825	3.6873	22.342	4.3227
#1	.45021	.03057	.20541	.00324	.00970	1.0201	.00973	.00376	.21562	.01825	.01324	.39488
#2	.57232	.03178	.20666	.00328	.00938	1.0189	.00948	.00299	.21377	.01732	.01820	.41978
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Warn	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								.00500				
Range								-30.000%				

Elem	Sn1899	Sr4077	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00731**	**.00507**	**.00480**	**.02095**	**.00479**	**.01026**
Stddev	.00032	.00003	.00014	.00135	.00040	.00093
%RSD	4.4336	.67684	2.9376	6.4483	8.4588	9.0704
#1	.00708	.00509	.00470	.02191	.00507	.00960
#2	.00754	.00504	.00490	.01999	.00450	.01091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value						
Range						

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2168.9**	**4014.2**	**64005.**	**7338.7**
Stddev	4.1	9.5	26.	2.2
%RSD	.18699	.23618	.04008	.02991
#1	2171.8	4007.5	64024.	7340.2
#2	2166.1	4020.9	63987.	7337.1

Sample Name: icsa-1716849 Acquired: 11/14/2013 20:33:13 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00068**	**535.73**	**.00249**	**-.00417**	**.00182**	**-.00009**	**504.07**	**-.00163**	**-.00079**	**.00053**	**.00381**	**196.24**	**-.01342**
Stddev	.00046	.07	.00092	.00066	.00002	.00008	.65	.00001	.00038	.00023	.00003	.29	.00354
%RSD	67.566	.01386	37.131	15.729	.82582	92.279	.12887	.58620	48.130	44.042	.76445	.14566	26.363
#1	.00101	535.79	.00314	-.00464	.00181	-.00015	503.62	-.00162	-.00105	.00036	.00379	196.04	-.01592
#2	.00036	535.68	.00184	-.00371	.00183	-.00003	504.53	-.00163	-.00052	.00069	.00383	196.44	-.01092
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00912**	**521.80**	**.00176**	**-.00272**	**.10795**	**.00002**	**-.00130**	**.09542**	**-.01110**	**.00031**	**-.03734**	**.00159**	**.00494**
Stddev	.00099	1.65	.00016	.00074	.00822	.00165	.00592	.00722	.00303	.00142	.00408	.00060	.00013
%RSD	10.894	.31534	9.1321	27.170	7.6171	7302.3	455.22	7.5697	27.336	456.52	10.932	37.981	2.6987
#1	.00842	520.64	.00165	-.00324	.11377	.00119	-.00549	.10053	-.00895	.00132	-.03446	.00202	.00485
#2	.00982	522.97	.00188	-.00219	.10214	-.00114	.00289	.09032	-.01324	-.00069	-.04023	.00116	.00504
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	None
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.00245**	**-.00451**	**.00019**	**.00349**
Stddev	.00037	.00175	.00008	.00023
%RSD	14.914	38.780	42.746	6.7096
#1	.00271	-.00327	.00025	.00365
#2	.00219	-.00575	.00013	.00332
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1557.2**	**3448.8**	**53457.**	**6818.2**
Stddev	.8	1.9	164.	23.2
%RSD	.05288	.05562	.30670	.33970
#1	1557.8	3450.2	53573.	6834.6
#2	1556.6	3447.4	53341.	6801.9

Sample Name: CCV Acquired: 11/14/2013 20:35:38 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49061	24.725	.50310	.48965	.51049	.48466	24.582	.49453	.48753	.49877	.49944	23.749	25.342
Stddev	.00314	.104	.00316	.00006	.00041	.00243	.184	.00082	.00090	.00100	.00274	.065	.045
%RSD	.63937	.42035	.62852	.01223	.08010	.50105	.74766	.16503	.18515	.20047	.54951	.27450	.17577
#1	.48839	24.799	.50533	.48961	.51020	.48637	24.712	.49396	.48690	.49806	.49750	23.795	25.374
#2	.49283	24.652	.50086	.48969	.51078	.48294	24.452	.49511	.48817	.49948	.50138	23.703	25.311
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.49590	24.204	.49747	.50215	24.642	.49056	.48881	24.992	.50982	.49728	23.979	.50098	.50189
Stddev	.00159	.039	.00195	.00059	.087	.00007	.00476	.033	.00188	.00696	.084	.00328	.00111
%RSD	.32034	.16184	.39222	.11685	.35505	.01484	.97481	.13094	.36778	1.3988	.34925	.65417	.22153
#1	.49703	24.177	.49609	.50256	24.703	.49051	.49218	25.015	.51115	.49236	23.920	.50330	.50267
#2	.49478	24.232	.49885	.50173	24.580	.49061	.48544	24.969	.50850	.50220	24.038	.49866	.50110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.50909	.49655	.49664	.49640
Stddev	.00108	.00112	.00214	.00115
%RSD	.21266	.22497	.43149	.23117
#1	.50832	.49734	.49816	.49559
#2	.50985	.49576	.49513	.49722
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1950.2	3831.1	60504.	7156.6
Stddev	.2	4.2	240.	40.1
%RSD	.00946	.10978	.39626	.56018
#1	1950.1	3834.0	60674.	7128.2
#2	1950.3	3828.1	60334.	7184.9

Sample Name: CCB Acquired: 11/14/2013 20:37:50 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00005	.01016	.00364	-.00099	.00002	-.00007	-.01189	.00004	-.00014	.00028	.00063	.00397	.02860
Stddev	.00017	.03447	.00089	.00011	.00003	.00006	.00474	.00016	.00001	.00048	.00009	.00559	.03458
%RSD	334.82	339.45	24.495	10.715	129.60	86.212	39.826	401.16	8.4170	171.07	14.895	140.85	120.93
#1	.00017	.03453	.00301	-.00107	.00004	-.00012	-.00855	.00016	-.00014	.00062	.00056	.00792	.05305
#2	-.00007	-.01422	.00427	-.00092	.00000	-.00003	-.01524	-.00008	-.00015	-.00006	.00069	.00002	.00414
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.00348	.00373	.00007	.00015	.03800	.00013	-.00089	.00190	-.00201	.00587	-.01679	-.00150	.00008
Stddev	.00022	.00153	.00002	.00025	.00021	.00010	.00046	.00039	.00139	.00159	.01646	.00116	.00001
%RSD	6.2106	40.990	30.755	164.61	.55227	76.749	51.441	20.630	69.176	27.167	98.088	77.056	13.192
#1	.00333	.00481	.00005	-.00003	.03815	.00021	-.00057	.00218	-.00300	.00474	-.00514	-.00232	.00008
#2	.00363	.00265	.00008	.00033	.03786	.00006	-.00122	.00162	-.00103	.00699	-.02843	-.00068	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00001	.00060	-.00001	.00007
Stddev	.00036	.00063	.00013	.00082
%RSD	6808.4	105.19	1341.7	1129.5
#1	-.00025	.00015	.00008	-.00051
#2	.00026	.00105	-.00010	.00066
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	2156.4	3954.1	63275.	7233.6
Stddev	2.6	6.6	226.	42.7
%RSD	.11972	.16629	.35744	.58972
#1	2154.6	3949.5	63435.	7203.5
#2	2158.2	3958.8	63115.	7263.8

Sample Name: icsab-1723354 Acquired: 11/14/2013 20:40:15 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.22203	527.22	.11733	.00114	.51444	.50841	511.32	1.0486	.51155	.48950	.56779	96.647	.01492
Stddev	.00025	.03	.00052	.00083	.00114	.00004	1.04	.0006	.00001	.00032	.00050	.523	.02745
%RSD	.11140	.00604	.44666	73.007	.22214	.00729	.20258	.05261	.00130	.06442	.08816	.54093	184.01
#1	.22185	527.19	.11770	.00055	.51363	.50839	512.06	1.0482	.51155	.48927	.56744	97.017	.03433
#2	.22220	527.24	.11696	.00172	.51524	.50844	510.59	1.0490	.51155	.48972	.56815	96.278	-.00449
Check ?	Chk Pass	Chk Pass	Chk Pass	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	.54323	532.22	.47425	-.00210	.10385	.99065	.05082	.57475	.61264	.04784	1.0212	.00042	.53953
Stddev	.00230	.98	.00141	.00058	.00951	.00210	.00173	.00739	.00214	.00479	.0055	.00018	.00021
%RSD	.42308	.18443	.29679	27.802	9.1596	.21241	3.3987	1.2861	.34895	10.004	.53558	44.005	.03874
#1	.54160	531.52	.47326	-.00251	.11057	.98916	.05204	.57998	.61415	.04445	1.0173	.00029	.53938
#2	.54485	532.91	.47525	-.00168	.09712	.99213	.04960	.56952	.61113	.05122	1.0251	.00055	.53968
Check ?	None	Chk Pass	Chk Pass	None	None	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	None	None	None
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	.00236	.09693	.50040	.96454
Stddev	.00060	.00041	.00198	.00707
%RSD	25.293	.42339	.39559	.73274
#1	.00278	.09664	.49900	.96954
#2	.00194	.09722	.50180	.95955
Check ?	None	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	1553.2	3455.9	53474.	6764.7
Stddev	1.4	2.0	102.	12.4
%RSD	.09055	.05648	.19111	.18295
#1	1554.2	3454.5	53546.	6756.0
#2	1552.2	3457.3	53402.	6773.5

Sample Name: CCV Acquired: 11/14/2013 20:42:31 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49196**	**24.891**	**.50316**	**.48869**	**.50789**	**.48344**	**24.779**	**.49371**	**.48792**	**.50071**	**.49919**	**23.809**	**25.275**
Stddev	.00022	.109	.00818	.00057	.00357	.00163	.218	.00009	.00087	.00136	.00003	.088	.024
%RSD	.04501	.43871	1.6256	.11624	.70306	.33662	.88050	.01751	.17882	.27205	.00601	.36767	.09643
#1	.49212	24.968	.49738	.48910	.51041	.48459	24.933	.49365	.48854	.50167	.49917	23.871	25.292
#2	.49181	24.814	.50895	.48829	.50536	.48229	24.625	.49377	.48730	.49974	.49921	23.747	25.258
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49795**	**24.356**	**.49647**	**.50203**	**24.600**	**.49215**	**.48783**	**24.942**	**.51317**	**.49072**	**23.921**	**.49966**	**.50130**
Stddev	.00075	.010	.00044	.00027	.058	.00073	.00161	.015	.00657	.00035	.018	.00107	.00056
%RSD	.15131	.04238	.08774	.05336	.23413	.14899	.33034	.06116	1.2807	.07214	.07426	.21390	.11192
#1	.49742	24.364	.49616	.50222	24.641	.49267	.48669	24.953	.50852	.49047	23.933	.50042	.50170
#2	.49848	24.349	.49677	.50184	24.559	.49163	.48897	24.931	.51782	.49097	23.908	.49891	.50091
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value													
Range													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**.50782**	**.49953**	**.49831**	**.49982**
Stddev	.00187	.00282	.00004	.00296
%RSD	.36810	.56453	.00804	.59225
#1	.50650	.49754	.49834	.49773
#2	.50914	.50152	.49828	.50191
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value				
Range				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**1949.3**	**3839.8**	**60382.**	**7174.6**
Stddev	3.9	6.1	34.	5.8
%RSD	.19963	.15794	.05708	.08039
#1	1952.1	3844.1	60406.	7170.6
#2	1946.6	3835.5	60357.	7178.7

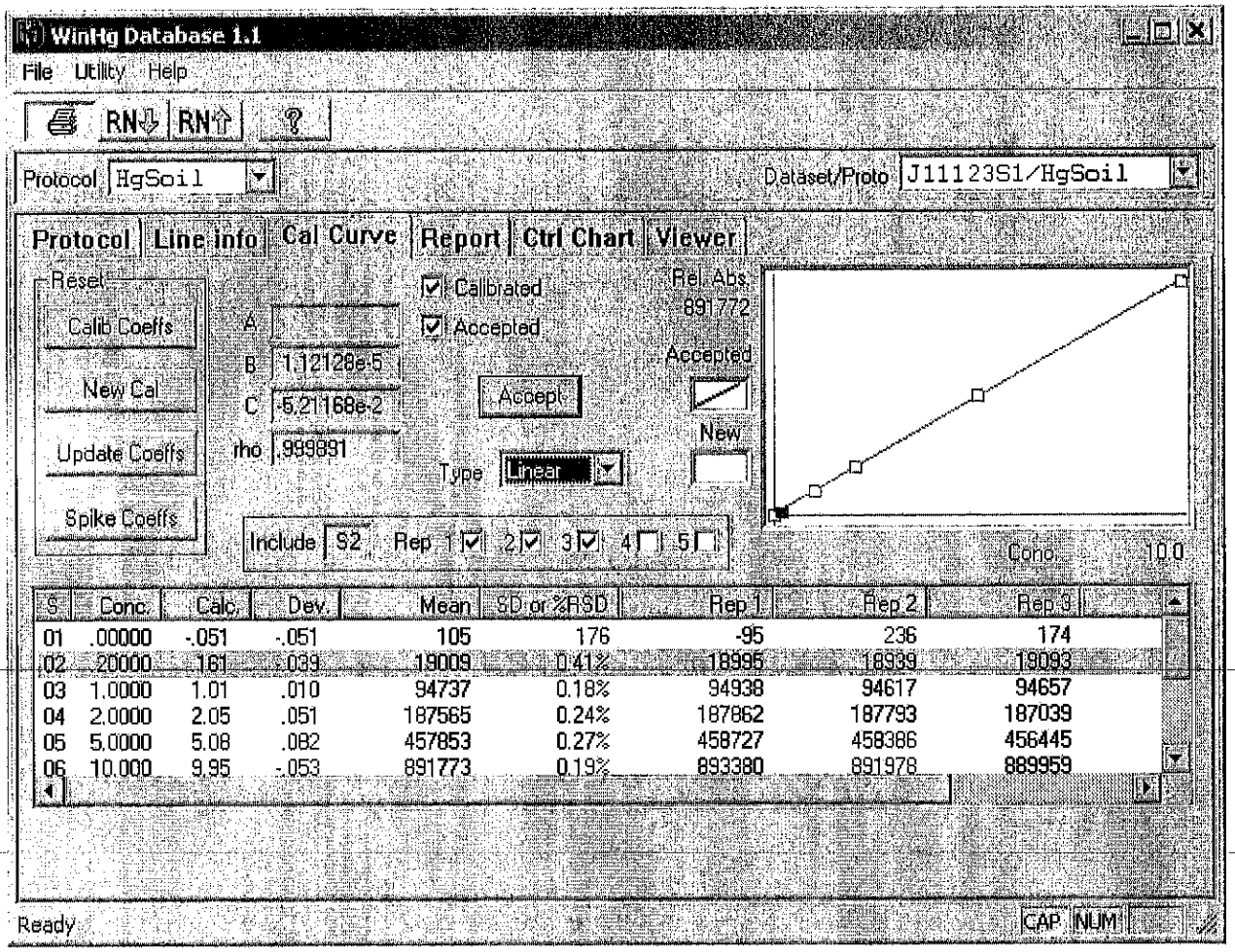
Sample Name: CCB Acquired: 11/14/2013 20:44:45 Type: QC
Method: ICAP2 2012 (v217) Mode: CONC Corr. Factor: 1.000000
User: JRK Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2089	Ba4554-2	Be3130	Ca3179	Cd2288	Co2286	Cr2677	Cu3247	Fe2599	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00083**	**.01181**	**.00336**	**-.00126**	**.00005**	**-.00012**	**.00417**	**-.00007**	**.00019**	**-.00027**	**.00053**	**.00676**	**-.01095**
Stddev	.00035	.00690	.00008	.00033	.00001	.00006	.00726	.00005	.00033	.00008	.00011	.00382	.02535
%RSD	42.297	58.460	2.4897	25.789	19.483	47.451	173.91	67.733	179.24	27.762	21.421	56.465	231.60
#1	.00058	.00693	.00330	-.00149	.00006	-.00008	.00930	-.00004	.00042	-.00033	.00061	.00946	-.02887
#2	.00108	.01669	.00342	-.00103	.00004	-.00016	-.00096	-.00010	-.00005	-.00022	.00045	.00406	.00698
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Li6707	Mg2790	Mn2576	Mo2020	Na5895	Ni2316	Pb2203	S_1820	Sb2068	Se1960	Si2881	Sn1899	Sr4077
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00214**	**.02623**	**.00003**	**.00027**	**.03030**	**.00016**	**-.00060**	**.00285**	**.00040**	**.00463**	**-.04691**	**-.00160**	**.00007**
Stddev	.00023	.00130	.00004	.00020	.01318	.00005	.00022	.00216	.00155	.00172	.00077	.00047	.00014
%RSD	10.698	4.9608	123.41	74.036	43.496	32.150	36.106	75.772	389.16	37.251	1.6445	29.376	200.20
#1	.00198	.02531	.00006	.00042	.03961	.00019	-.00076	.00438	-.00070	.00585	-.04745	-.00127	.00017
#2	.00230	.02715	.00000	.00013	.02098	.00012	-.00045	.00132	.00150	.00341	-.04636	-.00194	-.00003
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit													
Low Limit													

Elem	Ti3349	Tl1908	V_2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avg	**-.00008**	**-.00117**	**-.00037**	**.00068**
Stddev	.00021	.00044	.00044	.00034
%RSD	265.45	37.434	119.71	49.566
#1	-.00022	-.00086	-.00006	.00092
#2	.00007	-.00148	-.00067	.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit				
Low Limit				

Int. Std.	In2306	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S	Cts/S
Avg	**2160.9**	**3962.5**	**63459.**	**7191.0**
Stddev	1.5	11.0	76.	16.7
%RSD	.07152	.27667	.11994	.23265
#1	2159.8	3954.8	63405.	7179.1
#2	2162.0	3970.3	63512.	7202.8



L3

11/12/13

151422

Cal: J11123S1

151175

Burn: 151269

151288

Run: J11123S1

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 2 Ck2ICV Seq: 1 10:48:59 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.4	2.95	3.00	ppb	.000

*** Check Standard: 1 ~~Ck1CCB~~ ICB 11/12/13 Seq: 2 10:50:36 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ppb	.000

*** Check Standard: 4 ~~Ck4CCVL~~ ICVL 11/12/13 Seq: 3 10:52:13 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		84.0	.168	.200	ppb	.000

*** Check Standard: 3 Ck3CCV Seq: 4 10:53:49 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	2.00	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 5 10:55:28 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ppb	.000

*** Sample ID: Seq: 6 10:57:03 12 Nov 13 HG
mb 480-151175/1-a

Hg	-.039	ppb	.000	-.039

*** Sample ID: Seq: 7 10:59:10 12 Nov 13 HG
lcssrm 480-151175/2-

Hg	3.41	ppb	.000	3.41

*** Sample ID: Seq: 8 11:00:55 12 Nov 13 HG
lcdsrm 480-151175/3-

Hg	5.08	ppb	.000	5.08

*** Sample ID: Seq: 9 11:02:40 12 Nov 13 HG
480-49764-j-28-b

Hg	.323	ppb	.000	.323

*** Sample ID: Seq: 10 11:04:29 12 Nov 13 HG
480-49764-j-28-bSD@5

Hg	.033	ppb	.000	.033

*** Sample ID: Seq: 11 11:06:24 12 Nov 13 HG
480-49764-j-28-c ms

Hg	4.16	ppb	.000	4.16

*** Sample ID: Seq: 12 11:08:02 12 Nov 13 HG
480-49764-j-28-d msd

Hg	4.18	ppb	.000	4.18

*** Sample ID: Seq: 13 11:09:41 12 Nov 13 HG
480-49764-i-29-b

Hg	.853	ppb	.000	.853

*** Sample ID: Seq: 14 11:11:17 12 Nov 13 HG
480-49764-i-30-b

Hg	.451	ppb	.000	.451

*** Sample ID: Seq: 15 11:12:53 12 Nov 13 HG
480-49764-j-31-b

Hg	.282	ppb	.000	.282

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 3 Ck3CCV Seq: 16 11:15:09 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		101.	2.01	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 17 11:16:54 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.045	.200	ppb	.000

*** Sample ID: Seq: 18 11:18:30 12 Nov 13 HG

480-49786-b-18-b

Hg	.023	ppb	.000	.023

*** Sample ID: Seq: 19 11:20:26 12 Nov 13 HG

480-49786-b-19-b

Hg	.030	ppb	.000	.030

*** Sample ID: Seq: 20 11:22:31 12 Nov 13 HG

480-49786-b-20-b

Hg	.341	ppb	.000	.341

*** Sample ID: Seq: 21 11:24:27 12 Nov 13 HG

480-49743-d-1-b

Hg	3.19	ppb	.000	3.19

*** Sample ID: Seq: 22 11:26:23 12 Nov 13 HG

480-49743-d-2-b

Hg	5.80	ppb	.000	5.80

*** Sample ID: Seq: 23 11:28:44 12 Nov 13 HG

480-49743-d-3-b

Hg	.747	ppb	.000	.747

*** Sample ID: Seq: 24 11:30:39 12 Nov 13 HG

480-49784-a-1-a

Hg	4.46	ppb	.000	4.46

*** Sample ID: Seq: 25 11:32:21 12 Nov 13 HG

480-49784-a-2-a

Hg	3.71	ppb	.000	3.71

*** Sample ID: Seq: 26 11:35:07 12 Nov 13 HG

480-49776-a-1-a

Hg	1.03	ppb	.000	1.03

*** Sample ID: Seq: 27 11:37:43 12 Nov 13 HG

480-49651-a-1-b

Hg	1.14	ppb	.000	1.14

*** Check Standard: 3 Ck3CCV Seq: 28 11:39:29 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	2.00	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 29 11:41:09 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.047	.200	ppb	.000

*** Sample ID: Seq: 30 11:43:09 12 Nov 13 HG

480-49651-a-2-b

Hg	3.45	ppb	.000	3.45

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID:				Seq: 31	11:44:56 12 Nov 13	HG		
				480-49651-b-3-b				
Hg	3.13	ppb	.000	3.13				
*** Sample ID:				Seq: 32	11:46:54 12 Nov 13	HG		
				480-49651-b-4-b				
Hg	.300	ppb	.000	.300				
*** Sample ID:				Seq: 33	11:48:42 12 Nov 13	HG		
				480-48934-a-1-c				
Hg	1.92	ppb	.000	1.92				
*** Sample ID:				Seq: 34	11:50:39 12 Nov 13	HG		
				480-49560-a-1-d				
Hg	.070	ppb	.000	.070				
*** Sample ID:				Seq: 35	11:52:27 12 Nov 13	HG		
				mb 480-151269/1-a				
Hg	-.046	ppb	.000	-.046				
*** Sample ID:				Seq: 36	11:54:37 12 Nov 13	HG		
				lcssrm 480-151269/2-				
Hg	4.16	ppb	.000	4.16				
*** Sample ID:				Seq: 37	11:56:53 12 Nov 13	HG		
				lcdsrm 480-151269/3-				
Hg	4.76	ppb	.000	4.76				
*** Sample ID:				Seq: 38	11:58:33 12 Nov 13	HG		
				480-49647-b-1-b				
Hg	1.26	ppb	.000	1.26				
*** Sample ID:				Seq: 39	12:00:14 12 Nov 13	HG		
				480-49647-a-2-a				
Hg	18.6 H	ppb	.000	18.6				

*** Check Standard: 3 Ck3CCV Seq: 40 12:02:40 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.3	1.99	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 41 12:04:37 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.043	.200	ppb	.000

*** Sample ID:				Seq: 42	12:06:22 12 Nov 13	HG		
				480-49647-a-2-a SD@5				
Hg	4.00	ppb	.000	4.00				
*** Sample ID:				Seq: 43	12:08:03 12 Nov 13	HG		
				480-49647-a-2-b ms				
Hg	11.4 H	ppb	.000	11.4				
*** Sample ID:				Seq: 44	12:09:40 12 Nov 13	HG		
				480-49647-a-2-c msd				
Hg	14.5 H	ppb	.000	14.5				
*** Sample ID:				Seq: 45	12:11:37 12 Nov 13	HG		
				480-49854-a-1-a				
Hg	.189	ppb	.000	.189				

rerun at dilution see end

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID:					Seq: 46	12:13:28 12 Nov 13			HG
				480-49854-a-2-a					
Hg	.144	ppb	.000	.144					
*** Sample ID:					Seq: 47	12:15:23 12 Nov 13			HG
				480-49854-a-3-a					
Hg	.345	ppb	.000	.345					
*** Sample ID:					Seq: 48	12:17:30 12 Nov 13			HG
				480-49854-a-4-a					
Hg	1.11	ppb	.000	1.11					
*** Sample ID:					Seq: 49	12:19:42 12 Nov 13			HG
				480-49854-a-5-a					
Hg	1.02	ppb	.000	1.02					
*** Sample ID:					Seq: 50	12:21:18 12 Nov 13			HG
				480-49854-a-6-a					
Hg	-.021	ppb	.000	-.021					
*** Sample ID:					Seq: 51	12:22:58 12 Nov 13			HG
				480-49854-a-7-a					
Hg	1.25	ppb	.000	1.25					

*** Check Standard: 3 Ck3CCV					Seq: 52	12:24:37 12 Nov 13			HG
Line	Flag	%Rcv.	Found	True	Units	SD/RSD			
Hg		99.0	1.98	2.00	ppb	.000			

*** Check Standard: 1 Ck1CCB					Seq: 53	12:26:42 12 Nov 13			HG
Line	Flag	Found	Range(+/-)	Units	SD/RSD				
Hg		-.045	.200	ppb	.000				
*** Sample ID:					Seq: 54	12:28:29 12 Nov 13			HG
				480-49854-a-8-a					
Hg	.007	ppb	.000	.007					
*** Sample ID:					Seq: 55	12:30:40 12 Nov 13			HG
				480-49854-a-9-a					
Hg	1.48	ppb	.000	1.48					
*** Sample ID:					Seq: 56	12:32:19 12 Nov 13			HG
				480-49854-a-10-a					
Hg	.002	ppb	.000	.002					
*** Sample ID:					Seq: 57	12:34:17 12 Nov 13			HG
				480-49854-a-11-a					
Hg	.045	ppb	.000	.045					
*** Sample ID:					Seq: 58	12:36:43 12 Nov 13			HG
				480-49854-a-12-a					
Hg	.000	ppb	.000	-.000					
*** Sample ID:					Seq: 59	12:38:29 12 Nov 13			HG
				480-49854-a-13-a					
Hg	.128	ppb	.000	.128					
*** Sample ID:					Seq: 60	12:40:07 12 Nov 13			HG
				480-49854-a-14-a					
Hg	.009	ppb	.000	.009					

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID:				Seq: 61	12:41:44 12 Nov 13	HG		
				480-49854-a-15-a				
Hg	.080	ppb	.000	.080				
*** Sample ID:				Seq: 62	12:43:21 12 Nov 13	HG		
				480-49854-a-16-a				
Hg	.003	ppb	.000	.003				
*** Sample ID:				Seq: 63	12:45:58 12 Nov 13	HG		
				480-49854-a-17-a				
Hg	.388	ppb	.000	.388				
*** Check Standard: 3 Ck3CCV				Seq: 64	12:48:06 12 Nov 13	HG		
Line	Flag	%Rcv.	Found	True	Units	SD/RSD		
Hg		99.2	1.98	2.00	ppb	.000		
*** Check Standard: 1 Ck1CCB				Seq: 65	12:49:54 12 Nov 13	HG		
Line	Flag	Found	Range(+/-)	Units	SD/RSD			
Hg		-.043	.200	ppb	.000			
*** Sample ID:				Seq: 66	12:51:44 12 Nov 13	HG		
				480-49854-a-18-a				
Hg	.485	ppb	.000	.485				
*** Sample ID:				Seq: 67	12:53:31 12 Nov 13	HG		
				mb 480-151288/1-a				
Hg	-.049	ppb	.000	-.049				
*** Sample ID:				Seq: 68	12:55:28 12 Nov 13	HG		
				lcssrm 480-151288/2-				
Hg	4.29	ppb	.000	4.29				
*** Sample ID:				Seq: 69	12:57:28 12 Nov 13	HG		
				480-49854-a-19-a				
Hg	.431	ppb	.000	.431				
*** Sample ID:				Seq: 70	13:00:07 12 Nov 13	HG		
				480-49854-a-20-a				
Hg	.435	ppb	.000	.435				
*** Sample ID:				Seq: 71	13:02:04 12 Nov 13	HG		
				480-49854-a-21-a				
Hg	.651	ppb	.000	.651				
*** Sample ID:				Seq: 72	13:03:40 12 Nov 13	HG		
				480-49854-a-22-a				
Hg	.542	ppb	.000	.542				
*** Sample ID:				Seq: 73	13:05:26 12 Nov 13	HG		
				480-49854-a-23-a				
Hg	.293	ppb	.000	.293				
*** Sample ID:				Seq: 74	13:07:13 12 Nov 13	HG		
				480-49854-a-24-a				
Hg	.392	ppb	.000	.392				
*** Sample ID:				Seq: 75	13:08:49 12 Nov 13	HG		
				480-49854-a-25-a				
Hg	1.19	ppb	.000	1.19				

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Check Standard: 3 Ck3CCV Seq: 76 13:11:28 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		99.2	1.98	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 77 13:13:46 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.041	.200	ppb	.000

*** Sample ID: Seq: 78 13:15:23 12 Nov 13 HG
480-49854-a-26-a

Hg	.560	ppb	.000	.560

*** Sample ID: Seq: 79 13:17:12 12 Nov 13 HG
480-49854-a-27-a

Hg	.482	ppb	.000	.482

*** Sample ID: Seq: 80 13:19:08 12 Nov 13 HG
480-49854-a-28-a

Hg	.573	ppb	.000	.573

*** Sample ID: Seq: 81 13:21:20 12 Nov 13 HG
480-49854-a-29-a

Hg	.515	ppb	.000	.515

*** Sample ID: Seq: 82 13:22:59 12 Nov 13 HG
480-49854-a-30-a

Hg	1.23	ppb	.000	1.23

*** Sample ID: Seq: 83 13:24:37 12 Nov 13 HG
480-49854-a-31-a

Hg	.686	ppb	.000	.686

*** Sample ID: Seq: 84 13:26:38 12 Nov 13 HG
480-49854-a-32-a

Hg	.008	ppb	.000	.008

*** Sample ID: Seq: 85 13:28:27 12 Nov 13 HG
480-49854-a-33-a

Hg	.007	ppb	.000	.007

*** Sample ID: Seq: 86 13:30:15 12 Nov 13 HG
480-49854-a-34-a

Hg	1.24	ppb	.000	1.24

*** Sample ID: Seq: 87 13:32:05 12 Nov 13 HG
480-49825-a-1-a

Hg	4.06	ppb	.000	4.06

*** Check Standard: 3 Ck3CCV Seq: 88 13:34:24 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	1.97	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 89 13:35:59 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.046	.200	ppb	.000

*** Sample ID: Seq: 90 13:37:35 12 Nov 13 HG
480-49825-b-2-a

Hg	3.37	ppb	.000	3.37

Line	Conc.	Units	SD/RSD	1	2	3	4	5
*** Sample ID:				Seq: 91	13:39:13 12 Nov 13	HG		
				480-49825-b-3-a				
Hg	2.66	ppb	.000	2.66				
*** Sample ID:				Seq: 92	13:41:20 12 Nov 13	HG		
				480-49825-b-3-aSD@5				
Hg	.502	ppb	.000	.502				
*** Sample ID:				Seq: 93	13:44:27 12 Nov 13	HG		
				480-49825-bs3-b ms				
Hg	5.56	ppb	.000	5.56				
*** Sample ID:				Seq: 94	13:46:04 12 Nov 13	HG		
				480-49825-b-3-c msd				
Hg	5.69	ppb	.000	5.69				
*** Sample ID:				Seq: 95	13:48:11 12 Nov 13	HG		
				480-49825-c-4-a				
Hg	.279	ppb	.000	.279				

*** Check Standard: 4 Ck4CCVL Seq: 96 13:50:01 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		83.7	.167	.200	ppb	.000

*** Check Standard: 3 Ck3CCV Seq: 97 13:51:59 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.7	1.97	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 98 13:53:34 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.057	.200	ppb	.000

*** Sample ID:				Seq: 103	14:20:40 12 Nov 13	HG		
				480-49647-a-2-a@5				
Hg	4.01	ppb	.000	4.01				
*** Sample ID:				Seq: 104	14:22:38 12 Nov 13	HG		
				49647-a-2-aSD@25				
Hg	.767	ppb	.000	.767				
*** Sample ID:				Seq: 105	14:24:15 12 Nov 13	HG		
				49647-a-2-b ms@5				
Hg	2.34	ppb	.000	2.34				
*** Sample ID:				Seq: 106	14:26:26 12 Nov 13	HG		
				49647-a-2-c msd@5				
Hg	3.12	ppb	.000	3.12				

*** Check Standard: 4 Ck4CCVL Seq: 107 14:28:35 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		84.4	.169	.200	ppb	.000

*** Check Standard: 3 Ck3CCV Seq: 108 14:30:10 12 Nov 13 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		98.3	1.97	2.00	ppb	.000

*** Check Standard: 1 Ck1CCB Seq: 109 14:31:56 12 Nov 13 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.056	.200	ppb	.000

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151394 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	CalcMsg	InitialAmount	FinalAmount	MED_01_Si 00039	MED_01_W1 00016	MED_02_W2 00015
MB 480-151394/1		3050B, 6010C		CALC NOT SET TO RUN	+0.4601 g	50 mL			
LCSSRM 480-151394/2		3050B, 6010C		CALC NOT SET TO RUN	+0.5008 g	50 mL			
480-49854-A-1	SD801	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4750 g	50 mL			
480-49854-A-2	SD802	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4587 g	50 mL			
480-49854-A-2 MS	SD802	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4967 g	50 mL	0.5 mL	0.5 mL	0.5 mL
480-49854-A-2 MSD	SD802	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5031 g	50 mL	0.5 mL	0.5 mL	0.5 mL
480-49854-A-3	SD803	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4720 g	50 mL			
480-49854-A-4	SD804	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4762 g	50 mL			
480-49854-A-5	SD805	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5409 g	50 mL			
480-49854-A-6	SD806	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5236 g	50 mL			
480-49854-A-7	SD807	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5168 g	50 mL			
480-49854-A-8	SD808	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5346 g	50 mL			
480-49854-A-9	SD809	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4878 g	50 mL			
480-49854-A-10	SD810	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4767 g	50 mL			
480-49854-A-11	SD811	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5010 g	50 mL			
480-49854-A-12	SD812	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4511 g	50 mL			
480-49854-A-13	SD813	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4655 g	50 mL			
480-49854-A-14	SD814	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4860 g	50 mL			
480-49854-A-15	SD815	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5096 g	50 mL			
480-49854-A-16	SD816	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4664 g	50 mL			
480-49854-A-17	SD817	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5294 g	50 mL			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151394 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	CalcMsg	InitialAmount	FinalAmount	MED_01_Si 00039	MED_01_W1 00016	MED_02_W2 00015
480-49854-A-18	SD818	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4594 g	50 mL			
480-49854-A-19	SD819	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4565 g	50 mL			
480-49854-A-20	SD820	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5293 g	50 mL			

Lab Sample ID	Client Sample ID	Method Chain	Basis	MED_03_Ag 00043	MED_04_Sn 00036	MED_05_S 00004	MED_SRM_D080 00001		
MB 480-151394/1		3050B, 6010C							
LCSSRM 480-151394/2		3050B, 6010C					0.5 g		
480-49854-A-1	SD801	3050B, 6010C	T						
480-49854-A-2	SD802	3050B, 6010C	T						
480-49854-A-2 MS	SD802	3050B, 6010C	T	0.5 mL	0.5 mL	0.5 mL			
480-49854-A-2 MSD	SD802	3050B, 6010C	T	0.5 mL	0.5 mL	0.5 mL			
480-49854-A-3	SD803	3050B, 6010C	T						
480-49854-A-4	SD804	3050B, 6010C	T						
480-49854-A-5	SD805	3050B, 6010C	T						
480-49854-A-6	SD806	3050B, 6010C	T						
480-49854-A-7	SD807	3050B, 6010C	T						
480-49854-A-8	SD808	3050B, 6010C	T						
480-49854-A-9	SD809	3050B, 6010C	T						
480-49854-A-10	SD810	3050B, 6010C	T						
480-49854-A-11	SD811	3050B, 6010C	T						
480-49854-A-12	SD812	3050B, 6010C	T						
480-49854-A-13	SD813	3050B, 6010C	T						
480-49854-A-14	SD814	3050B, 6010C	T						
480-49854-A-15	SD815	3050B, 6010C	T						
480-49854-A-16	SD816	3050B, 6010C	T						
480-49854-A-17	SD817	3050B, 6010C	T						
480-49854-A-18	SD818	3050B, 6010C	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151394 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MED_03_Ag 00043	MED_04_Sn 00036	MED_05_S 00004	MED_SRM_D080 00001		
480-49854-A-19	SD819	3050B, 6010C	T						
480-49854-A-20	SD820	3050B, 6010C	T						

Batch Notes	
Balance ID	25850472
Batch Comment	30320758
Blank Soil Lot Number	1383381
First End time	1230
Hydrogen peroxide lot number	0000045549
Lot # of hydrochloric acid	0000055129
Lot # of Nitric Acid	0000050770
Hot Block ID number	-F-
Oven, Bath or Block Temperature 1	96.4 Degrees C
Oven, Bath or Block Temperature 2	AUTO TEMP Degrees C
Pipette ID	MDL8
First Start time	1030
ID number of the thermometer	111404336
Digestion Tube/Cup Lot #	1306159
Uncorrected Temperature	95.4 Celsius
Uncorrected Temperature 2	AUTO TEMP Degrees C

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151401 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	CalcMsg	InitialAmount	FinalAmount	MED_01_Si 00039	MED_01_W1 00016	MED_02_W2 00015
MB 480-151401/1		3050B, 6010C		CALC NOT SET TO RUN	+0.4806 g	50 mL			
LCSSRM 480-151401/2		3050B, 6010C		CALC NOT SET TO RUN	+0.5000 g	50 mL			
480-49854-A-21	SD821	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5392 g	50 mL			
480-49854-A-22	SD822	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5196 g	50 mL			
480-49854-A-23	SD823	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4994 g	50 mL			
480-49854-A-23 MS	SD823	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5145 g	50 mL	0.5 mL	0.5 mL	0.5 mL
480-49854-A-23 MSD	SD823	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5377 g	50 mL	0.5 mL	0.5 mL	0.5 mL
480-49854-A-24	SD824	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4748 g	50 mL			
480-49854-A-25	SD825	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4504 g	50 mL			
480-49854-A-26	SD826	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5063 g	50 mL			
480-49854-A-27	SD827	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4631 g	50 mL			
480-49854-A-28	SD828	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4642 g	50 mL			
480-49854-A-29	SD829	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5150 g	50 mL			
480-49854-A-30	SD830	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4694 g	50 mL			
480-49854-A-31	SD831	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5062 g	50 mL			
480-49854-A-32	SD806 DUP	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4890 g	50 mL			
480-49854-A-33	SD816 DUP	3050B, 6010C	T	CALC NOT SET TO RUN	+0.4982 g	50 mL			
480-49854-A-34	SD825 DUP	3050B, 6010C	T	CALC NOT SET TO RUN	+0.5048 g	50 mL			

Lab Sample ID	Client Sample ID	Method Chain	Basis	MED_03_Ag 00043	MED_04_Sn 00036	MED_05_S 00004	MED_SRM_D080 00001		
MB 480-151401/1		3050B, 6010C							
LCSSRM 480-151401/2		3050B, 6010C					0.5 g		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151401 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	MED_03_Ag 00043	MED_04_Sn 00036	MED_05_S 00004	MED_SRM_D080 00001		
480-49854-A-21	SD821	3050B, 6010C	T						
480-49854-A-22	SD822	3050B, 6010C	T						
480-49854-A-23	SD823	3050B, 6010C	T						
480-49854-A-23 MS	SD823	3050B, 6010C	T	0.5 mL	0.5 mL	0.5 mL			
480-49854-A-23 MSD	SD823	3050B, 6010C	T	0.5 mL	0.5 mL	0.5 mL			
480-49854-A-24	SD824	3050B, 6010C	T						
480-49854-A-25	SD825	3050B, 6010C	T						
480-49854-A-26	SD826	3050B, 6010C	T						
480-49854-A-27	SD827	3050B, 6010C	T						
480-49854-A-28	SD828	3050B, 6010C	T						
480-49854-A-29	SD829	3050B, 6010C	T						
480-49854-A-30	SD830	3050B, 6010C	T						
480-49854-A-31	SD831	3050B, 6010C	T						
480-49854-A-32	SD806 DUP	3050B, 6010C	T						
480-49854-A-33	SD816 DUP	3050B, 6010C	T						
480-49854-A-34	SD825 DUP	3050B, 6010C	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151401 Batch Start Date: 11/12/13 10:30 Batch Analyst: Dwyer, Nicole M

Batch Method: 3050B Batch End Date:

Batch Notes	
Balance ID	25850472
Batch Comment	30320758
Blank Soil Lot Number	1383381
First End time	1230
Hydrogen peroxide lot number	0000045549
Lot # of hydrochloric acid	0000055129
Lot # of Nitric Acid	0000050770
Hot Block ID number	-F-
Oven, Bath or Block Temperature 1	96.4 Degrees C
Oven, Bath or Block Temperature 2	AUTO TEMP Degrees C
Pipette ID	MDL8
First Start time	1030
ID number of the thermometer	111404336
Digestion Tube/Cup Lot #	1306159
Uncorrected Temperature	95.4 Celsius
Uncorrected Temperature 2	AUTO TEMP Degrees C

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151269 Batch Start Date: 11/12/13 07:15 Batch Analyst: Kacalski, Jason R

Batch Method: 7471B Batch End Date: 11/12/13 07:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MEH_SRM_D071 00003			
MB 480-151269/1		7471B, 7471B		+0.6311 g	50 mL				
LCSSRM 480-151269/2		7471B, 7471B		+0.0532 g	50 mL	0.0532 g			
LCDSRM 480-151269/3		7471B, 7471B		+0.0531 g	50 mL	0.0531 g			
480-49854-A-1	SD801	7471B, 7471B	T	+0.6646 g	50 mL				
480-49854-A-2	SD802	7471B, 7471B	T	+0.5990 g	50 mL				
480-49854-A-3	SD803	7471B, 7471B	T	+0.5941 g	50 mL				
480-49854-A-4	SD804	7471B, 7471B	T	+0.6499 g	50 mL				
480-49854-A-5	SD805	7471B, 7471B	T	+0.6280 g	50 mL				
480-49854-A-6	SD806	7471B, 7471B	T	+0.6306 g	50 mL				
480-49854-A-7	SD807	7471B, 7471B	T	+0.5928 g	50 mL				
480-49854-A-8	SD808	7471B, 7471B	T	+0.6800 g	50 mL				
480-49854-A-9	SD809	7471B, 7471B	T	+0.6284 g	50 mL				
480-49854-A-10	SD810	7471B, 7471B	T	+0.5996 g	50 mL				
480-49854-A-11	SD811	7471B, 7471B	T	+0.5939 g	50 mL				
480-49854-A-12	SD812	7471B, 7471B	T	+0.5949 g	50 mL				
480-49854-A-13	SD813	7471B, 7471B	T	+0.6165 g	50 mL				
480-49854-A-14	SD814	7471B, 7471B	T	+0.6155 g	50 mL				
480-49854-A-15	SD815	7471B, 7471B	T	+0.6737 g	50 mL				
480-49854-A-16	SD816	7471B, 7471B	T	+0.5838 g	50 mL				
480-49854-A-17	SD817	7471B, 7471B	T	+0.6383 g	50 mL				
480-49854-A-18	SD818	7471B, 7471B	T	+0.6279 g	50 mL				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151269 Batch Start Date: 11/12/13 07:15 Batch Analyst: Kacalski, Jason R

Batch Method: 7471B Batch End Date: 11/12/13 07:45

Batch Notes	
Hydroxylamine Hydrochloride Lot	1560425
Balance ID	S/N52507
Batch Comment	Cal Batch: 151422
Blank Soil Lot Number	1097340
Lot # of hydrochloric acid	1509293
Lot # of Nitric Acid	1566274
Hot Block ID number	HG-A
Potassium Permanganate Lot Number	1589260
Oven, Bath or Block Temperature 1	95.0
Pipette ID	HGL-5
Stannous Chloride Lot Number	1542450
ID number of the thermometer	S/N52507
Digestion Tube/Cup Lot #	1303205
Uncorrected Temperature	94.0 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151288 Batch Start Date: 11/12/13 07:15 Batch Analyst: Kacalski, Jason R

Batch Method: 7471B Batch End Date: 11/12/13 07:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	MEH_SRM_D071 00003			
MB 480-151288/1		7471B, 7471B		+0.6540 g	50 mL				
LCSSRM 480-151288/2		7471B, 7471B		+0.0532 g	50 mL	0.0532 g			
480-49854-A-19	SD819	7471B, 7471B	T	+0.6252 g	50 mL				
480-49854-A-20	SD820	7471B, 7471B	T	+0.6381 g	50 mL				
480-49854-A-21	SD821	7471B, 7471B	T	+0.6457 g	50 mL				
480-49854-A-22	SD822	7471B, 7471B	T	+0.6406 g	50 mL				
480-49854-A-23	SD823	7471B, 7471B	T	+0.5941 g	50 mL				
480-49854-A-24	SD824	7471B, 7471B	T	+0.6145 g	50 mL				
480-49854-A-25	SD825	7471B, 7471B	T	+0.5892 g	50 mL				
480-49854-A-26	SD826	7471B, 7471B	T	+0.6432 g	50 mL				
480-49854-A-27	SD827	7471B, 7471B	T	+0.5948 g	50 mL				
480-49854-A-28	SD828	7471B, 7471B	T	+0.6444 g	50 mL				
480-49854-A-29	SD829	7471B, 7471B	T	+0.6073 g	50 mL				
480-49854-A-30	SD830	7471B, 7471B	T	+0.6086 g	50 mL				
480-49854-A-31	SD831	7471B, 7471B	T	+0.6016 g	50 mL				
480-49854-A-32	SD806 DUP	7471B, 7471B	T	+0.6436 g	50 mL				
480-49854-A-33	SD816 DUP	7471B, 7471B	T	+0.6661 g	50 mL				
480-49854-A-34	SD825 DUP	7471B, 7471B	T	+0.6145 g	50 mL				

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

METALS BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151288 Batch Start Date: 11/12/13 07:15 Batch Analyst: Kacalski, Jason R

Batch Method: 7471B Batch End Date: 11/12/13 07:45

Batch Notes	
Hydroxylamine Hydrochloride Lot	1560425
Balance ID	S/N52507
Batch Comment	Cal Batch: 151421
Blank Soil Lot Number	1097340
Lot # of hydrochloric acid	1509293
Lot # of Nitric Acid	1566274
Hot Block ID number	HG-C
Potassium Permanganate Lot Number	1589260
Oven, Bath or Block Temperature 1	95.0
Pipette ID	HGL-5
Stannous Chloride Lot Number	1542450
ID number of the thermometer	S/N52507
Digestion Tube/Cup Lot #	1303205
Uncorrected Temperature	94.0 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY

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GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG No.:

Project: Magna Metals #360003

Client Sample ID	Lab Sample ID
SD801	480-49854-1
SD802	480-49854-2
SD803	480-49854-3
SD804	480-49854-4
SD805	480-49854-5
SD806	480-49854-6
SD807	480-49854-7
SD808	480-49854-8
SD809	480-49854-9
SD810	480-49854-10
SD811	480-49854-11
SD812	480-49854-12
SD813	480-49854-13
SD814	480-49854-14
SD815	480-49854-15
SD816	480-49854-16
SD817	480-49854-17
SD818	480-49854-18
SD819	480-49854-19
SD820	480-49854-20
SD821	480-49854-21
SD822	480-49854-22
SD823	480-49854-23
SD824	480-49854-24
SD825	480-49854-25
SD826	480-49854-26
SD827	480-49854-27
SD828	480-49854-28
SD829	480-49854-29
SD830	480-49854-30
SD831	480-49854-31
SD806 DUP	480-49854-32
SD816 DUP	480-49854-33
SD825 DUP	480-49854-34

Comments:

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GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job Number: 480-49854-1

SDG No.:

Project: Magna Metals #360003

Client Sample ID	Lab Sample ID
SD804	480-49854-4
SD805	480-49854-5
SD805 DUP	480-49854-35

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: SD804 | Lab Sample ID: 480-49854-4

Lab Name: TestAmerica Edison | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 76.3

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Cr (VI)	ND	2.5	0.64	mg/Kg			1	7196A
18540-29-9	Cr (VI)	ND	2.5	0.63	mg/Kg			1	7196A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: SD805 | Lab Sample ID: 480-49854-5

Lab Name: TestAmerica Edison | Job No.: 480-49854-1

SDG ID.:

Matrix: Solid | Date Sampled: 11/08/2013 11:10

Reporting Basis: DRY | Date Received: 11/09/2013 01:30

% Solids: 71.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Cr (VI)	ND	2.8	0.70	mg/Kg			1	7196A
18540-29-9	Cr (VI)	ND	2.7	0.67	mg/Kg			1	7196A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: SD805 DUP
Lab Sample ID: 480-49854-35
Lab Name: TestAmerica Edison
Job No.: 480-49854-1
SDG ID.:
Matrix: Solid
Date Sampled: 11/08/2013 09:39
Reporting Basis: DRY
Date Received: 11/09/2013 01:30
% Solids: 63.0

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
18540-29-9	Cr (VI)	ND	3.1	0.78	mg/Kg			1	7196A
18540-29-9	Cr (VI)	ND	3.1	0.78	mg/Kg			1	7196A

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Analyst: RAK Batch Start Date: 11/13/2013

Reporting Units: ug/L Analytical Batch No.: 192123

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	14:55	Cr (VI)	505.9	500	101	90-110		WThcrIM3_00027
8	ICB	14:55	Cr (VI)	ND					
19	CCV	16:45	Cr (VI)	492.6	500	99	90-110		WThcrIM3_00027
20	CCB	16:45	Cr (VI)	ND					
22	CCV	16:45	Cr (VI)	492.6	500	99	90-110		WThcrIM3_00027
23	CCB	16:45	Cr (VI)	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Analyst: RAK Batch Start Date: 11/13/2013

Reporting Units: ug/L Analytical Batch No.: 192130

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
7	ICV	16:45	Cr (VI)	492.6	500	99	90-110		WThcrIM3_00027
8	ICB	16:45	Cr (VI)	ND					
19	CCV	16:45	Cr (VI)	487.7	500	98	90-110		WThcrIM3_00027
20	CCB	16:45	Cr (VI)	ND					
23	CCV	16:52	Cr (VI)	487.7	500	98	90-110		WThcrIM3_00027
24	CCB	16:52	Cr (VI)	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 192123	Date: 11/13/2013 14:55	Prep Batch: 191936	Date: 11/13/2013 13:49				
7196A	MB 460-191936/1-A	Cr (VI)	ND		mg/Kg	2.0	1
Batch ID: 192130	Date: 11/13/2013 16:45	Prep Batch: 192112	Date: 11/13/2013 11:30				
7196A	MB 460-192112/1-A	Cr (VI)	ND		mg/Kg	2.0	1

7A-IN
LCS-CERTIFIED REFERENCE MATERIAL
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 192123	Date: 11/13/2013 14:55		Prep Batch: 191936			Date: 11/13/2013 13:49					
						LCS Source: WThcrsLCS_00073					
7196A	LCSSRM 460-191936/2-A	Cr (VI)	15.21		mg/Kg	15.2	100	58-107			
Batch ID: 192130	Date: 11/13/2013 16:45		Prep Batch: 192112			Date: 11/13/2013 11:30					
						LCS Source: WThcrsLCS_00073					
7196A	LCSSRM 460-192112/2-A	Cr (VI)	15.21		mg/Kg	15.2	100	58-107			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE INSOLUBLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 192123	Date: 11/13/2013 14:55		Prep Batch: 191936			Date: 11/13/2013 13:49					
						LCS Source: WThcrPbCr_00004					
7196A	LCSI 460-191936/3-A	Cr (VI)	704.9		mg/Kg	708	100	80-120			
Batch ID: 192130	Date: 11/13/2013 16:45		Prep Batch: 192112			Date: 11/13/2013 11:30					
						LCS Source: WThcrPbCr_00004					
7196A	LCSI 460-192112/3-A	Cr (VI)	704.9		mg/Kg	708	100	80-120			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture RL Date: 08/17/2009 12:10

Analyte	Wavelength/ Mass	RL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture XRL Date: 08/17/2009 12:10

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: WetHexSpec

Method: 7196A MDL Date: 01/03/2013 11:46

Prep Method: 3060A

Analyte	Wavelength/ Mass	RL (mg/Kg)	MDL (mg/Kg)
Cr (VI)		2	0.5

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: WetHexSpec

Method: 7196A XMDL Date: 09/18/2013 13:09

Analyte	Wavelength/ Mass	XRL (ug/L)	XMDL (ug/L)
Cr (VI)		10	3.58

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture RL Date: 02/15/2007 17:07

Analyte	Wavelength/ Mass	RL (%)	
Percent Moisture		1	
Percent Solids		1	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job Number: 480-49854-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: Moisture XRL Date: 01/01/2007 16:49

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		1	
Percent Solids		1	

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Prep Method: 3060A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 460-191936/1-A	11/13/2013 13:49	191936	2.50		100
LCSSRM 460-191936/2-A	11/13/2013 13:49	191936	2.50		100
LCSI 460-191936/3-A	11/13/2013 13:49	191936	2.50		100
480-49854-4	11/13/2013 13:49	191936	2.58		100
480-49854-5	11/13/2013 13:49	191936	2.50		100
480-49854-35	11/13/2013 13:49	191936	2.56		100

12-IN
PREPARATION LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Prep Method: 3060A

Lab Sample ID	Preparation Date	Prep Batch	Initial Weight (g)	Initial Volume	Final Volume (mL)
MB 460-192112/1-A	11/13/2013 11:30	192112	2.50		100
LCSSRM 460-192112/2-A	11/13/2013 11:30	192112	2.50		100
LCSI 460-192112/3-A	11/13/2013 11:30	192112	2.50		100
480-49854-4	11/13/2013 11:30	192112	2.59		100
480-49854-5	11/13/2013 11:30	192112	2.59		100
480-49854-35	11/13/2013 11:30	192112	2.56		100

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: NOEQUIP Method: Moisture

Start Date: 11/11/2013 16:06 End Date: 11/11/2013 16:23

Lab Sample ID	D / F	Type	Time	Analytes																				
				% Sol	Moist																			
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
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ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
ZZZZZZ			16:06																					
480-49854-1	1	T	16:06	X	X																			
480-49854-2	1	T	16:06	X	X																			
480-49854-3	1	T	16:06	X	X																			
480-49854-4	1	T	16:06	X	X																			
480-49854-5	1	T	16:06	X	X																			
480-49854-6	1	T	16:06	X	X																			
480-49854-7	1	T	16:06	X	X																			
480-49854-8	1	T	16:06	X	X																			
480-49854-9	1	T	16:06	X	X																			
480-49854-10	1	T	16:06	X	X																			
480-49854-11	1	T	16:06	X	X																			
480-49854-12	1	T	16:06	X	X																			
480-49854-13	1	T	16:06	X	X																			
480-49854-14	1	T	16:06	X	X																			
480-49854-15	1	T	16:06	X	X																			
480-49854-16	1	T	16:06	X	X																			
480-49854-17	1	T	16:06	X	X																			
480-49854-18	1	T	16:06	X	X																			
480-49854-19	1	T	16:06	X	X																			
480-49854-20	1	T	16:06	X	X																			
480-49854-21	1	T	16:06	X	X																			
480-49854-22	1	T	16:06	X	X																			
480-49854-23	1	T	16:06	X	X																			

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Instrument ID: NOEQUIP Method: Moisture

Start Date: 11/11/2013 16:06 End Date: 11/11/2013 16:23

Lab Sample ID	D / F	Type	Time	Analytes																			
				% Sol	Moist																		
480-49854-24	1	T	16:06	X	X																		
480-49854-25	1	T	16:06	X	X																		
480-49854-26	1	T	16:06	X	X																		
480-49854-27	1	T	16:06	X	X																		
480-49854-28	1	T	16:06	X	X																		
480-49854-29	1	T	16:06	X	X																		
480-49854-30	1	T	16:06	X	X																		
480-49854-31	1	T	16:06	X	X																		
480-49854-32	1	T	16:06	X	X																		
480-49854-33	1	T	16:06	X	X																		
480-49854-34	1	T	16:06	X	X																		
ZZZZZZ			16:06																				
ZZZZZZ			16:06																				
ZZZZZZ			16:06																				
ZZZZZZ			16:06																				
ZZZZZZ			16:23																				
ZZZZZZ			16:23																				

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Instrument ID: WetHexSpec Method: 7196A

Start Date: 11/13/2013 14:55 End Date: 11/13/2013 16:45

Lab Sample ID	D / F	Type	Time	Analytes																			
				Cr6																			
IC 460-192123/1			14:55	X																			
IC 460-192123/2			14:55	X																			
IC 460-192123/3			14:55	X																			
IC 460-192123/4			14:55	X																			
IC 460-192123/5			14:55	X																			
IC 460-192123/6			14:55	X																			
ICV 460-192123/7	1		14:55	X																			
ICB 460-192123/8	1		14:55	X																			
MB 460-191936/1-A	1	T	14:55	X																			
LCSSRM 460-191936/2-A	1	T	14:55	X																			
LCSI 460-191936/3-A	50	T	14:55	X																			
ZZZZZZ			14:55																				
ZZZZZZ			14:55																				
ZZZZZZ			14:55																				
ZZZZZZ			14:55																				
ZZZZZZ			14:55																				
480-49854-4	1	T	16:45	X																			
480-49854-5	1	T	16:45	X																			
CCV 460-192123/19	1		16:45	X																			
CCB 460-192123/20	1		16:45	X																			
480-49854-35	1	T	16:45	X																			
CCV 460-192123/22	1		16:45	X																			
CCB 460-192123/23	1		16:45	X																			

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Instrument ID: WetHexSpec Method: 7196A

Start Date: 11/13/2013 14:55 End Date: 11/13/2013 16:52

Lab Sample ID	D / F	Type	Time	Analytes																			
				Cr6																			
IC 460-192130/1			14:55	X																			
IC 460-192130/2			14:55	X																			
IC 460-192130/3			14:55	X																			
IC 460-192130/4			14:55	X																			
IC 460-192130/5			14:55	X																			
IC 460-192130/6			14:55	X																			
ICV 460-192130/7	1		16:45	X																			
ICB 460-192130/8	1		16:45	X																			
MB 460-192112/1-A	1	T	16:45	X																			
LCSSRM 460-192112/2-A	1	T	16:45	X																			
LCSI 460-192112/3-A	50	T	16:45	X																			
ZZZZZZ			16:45																				
ZZZZZZ			16:45																				
ZZZZZZ			16:45																				
ZZZZZZ			16:45																				
ZZZZZZ			16:45																				
480-49854-4	1	T	16:45	X																			
480-49854-5	1	T	16:45	X																			
CCV 460-192130/19	1		16:45	X																			
CCB 460-192130/20	1		16:45	X																			
480-49854-35	1	T	16:45	X																			
ZZZZZZ			16:52																				
CCV 460-192130/23	1		16:52	X																			
CCB 460-192130/24	1		16:52	X																			

Prep Types

T = Total/NA

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Instrument ID: NOEQUIP Method: Moisture

Start Date: 11/12/2013 20:11 End Date: 11/12/2013 20:11

Lab Sample ID	D / F	Type	Time	Analytes																				
				% Sol	Moist																			
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
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ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
ZZZZZZ			20:11																					
480-49854-35	1	T	20:11	X	X																			
480-49854-35 DU	1	T	20:11	X	X																			

Prep Types

T = Total/NA

Job # 66526, 480-49854 Batch # 192123

Sample	Dil	Abs	BG/pre	T pre / T Read	Final pre
0.0		0.00		14:40 — 14:48	2.11
0.05		0.043			1.98
0.1		0.086			1.79
0.5		0.425			1.80
0.75		0.615			1.69
1.25		1.038			1.74
ICV		0.421			1.86
ICB		0.00			1.97
MB		0.00			1.68
LCS		0.317			1.70
LCS ins	1/50	0.294			1.59
66526-1		0.036	0.036/1.90		2.11
66526-1 dup		0.021	0.020/1.84		1.98
66526-1 sol		0.238	0.031/1.75		1.75
66526-1 ins	1/50	0.176	0.0/1.59		1.84
66526-PS		0.755	0.036/4.43	— 14:55	1.91
49854-4		0.191	0.201/1.90 1.57	16:35 — 16:41	1.68
49854-5		0.215	0.231/1.78		1.74
CCV		0.410			1.86
CCB		0.00			1.97
49854-35		0.154	0.165/2.03		1.83
CCV		0.410			1.80
CCB		0.00		16:36 — 16:45	1.93

Continued on Page

Read and Understood By

RK 11/13/13

Signed Signed

Job # 66526, 49854 Batch # 191936

Sample	Sample wt (g)	Color	Titre	Time
0.0			7.41	14:00
0.05			7.41	
0.1			7.68	
0.5			7.99	
0.75			7.30	
1.25			7.81	
ICV			7.15	
ICB			7.94	
MB			7.25	
LCS			7.78	
LCS ins			7.72	
66526-1	2.50	L. Br.	7.20	
66526-1 dup	2.50		7.67	
66526-1 spk	2.50		7.53	
66526-1 ins	2.50		7.72	14:30
49854-4	2.58	V. D. Br.	7.15	16:05
49854-5T	2.50		7.84	
CCV			7.19	
CCB			7.09	
49854-3S	2.56	L. D. Br.	7.15	
CCV			7.27	
CCB			7.48	16:15

Continued on Page

Read and Understood By

RLC 11/13/12

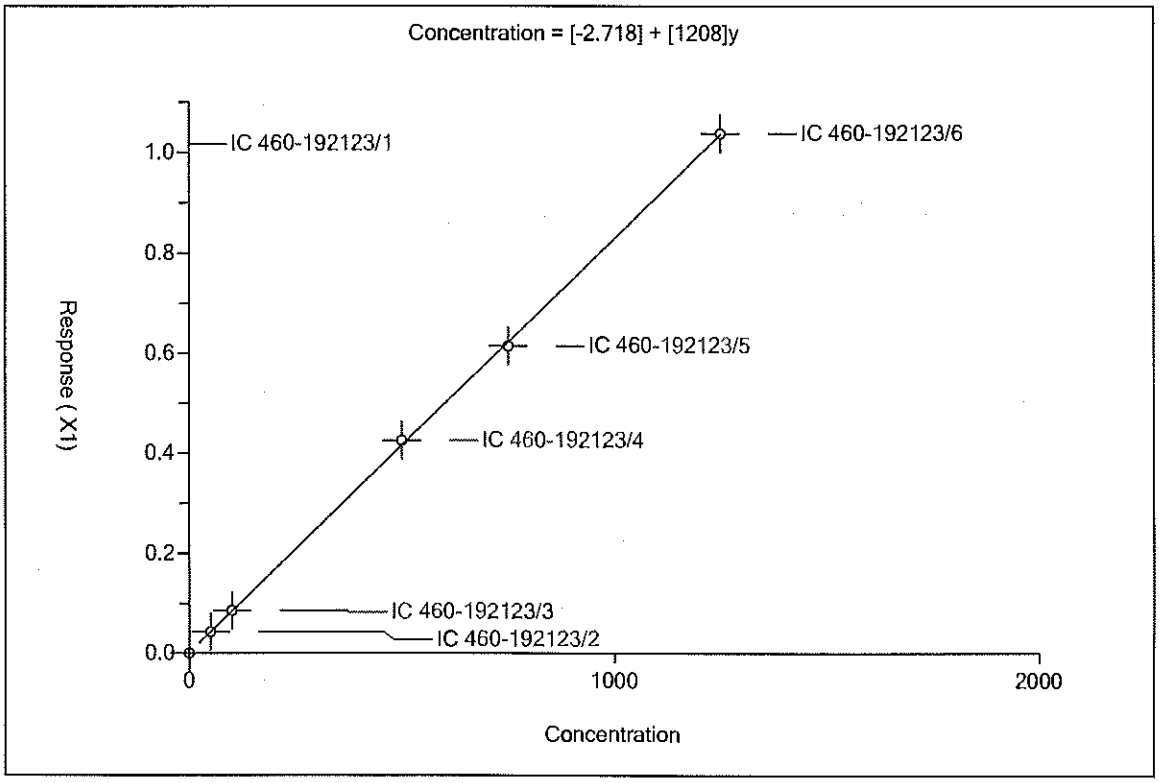
Signed Signed

Curve Type:	Linear
Weighting:	None
Origin:	None
Dependency:	Concentration
Calib Mode:	ESTD
RF Rounding:	0

Curve Coefficients	
Intercept:	-2.718
Slope:	1208

Error Coefficients	
Standard Error:	7.43
Relative Standard Error:	NC
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000 (1.000)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 460-192123/10.0		0.0			NaN	Y
2	IC 460-192123/250.0		0.043			0.00086	Y
3	IC 460-192123/3100.0		0.086			0.00086	Y
4	IC 460-192123/4500.0		0.425			0.00085	Y
5	IC 460-192123/5750.0		0.615			0.00082	Y
6	IC 460-192123/61250.0		1.038			0.00083	Y



Dilution Form
Wet Chemistry

Method No.: 7196A

Prep Batch:

Analytical Batch: 192123

Analyst: RR

Analysis Date: 11/13/12

Job/Sample Number	Dilution Factor	Sample Volume (ml)	Final Volume (ml)	Diluent
66826-1 MS	50X	1	50	DI

Sample 66526, 480-49854 Batch # 192130

Sample Dil		Abs	BG/pu	Tpu/T Read		Final pu
0.0		0.00		14:40	14:48	2.11
0.05		0.043				1.98
0.1		0.086				1.79
0.5		0.425				1.80
0.75		0.615				1.69
1.25		1.038		14:43	14:55	1.74
ICV		0.410		16:35	16:41	1.80
ICB		0.00				1.93
MB		0.00				1.98
LCSS		0.317				2.15
LCSinf	1/50	0.294				2.38
66526-1		0.016	0.013/1.88			1.80
66526-1 dup		0.021	0.031/1.75			1.76
66526-1 sol		0.414	0.014/1.67			1.74
66526-1 ins	1/50	0.159	0.0/1.57			1.81
66526-1 PS		0.205	0.013/1.88			1.69
49854-4		0.127	0.120/1.59			1.74
49854-5		0.174	0.175/2.04			1.85
CCV		0.406				1.80
CCB		0.00				1.93
49854-35		0.148	0.150/1.66	16:36	16:45	2.12
66526-1 PSd	Re	~~0.406~~ 0.641	0.031/1.75	16:45	16:50	1.74
CCV	Re	~~0.00~~ 0.406				1.80
CCB		0.00		16:40	16:52	1.93

pH 66526-1 pDS 2 = 8.35

Continued on Page

Read and Understood By

Re 11/13/13

Signed Date Signed Date

Job 66526, 480-49854 Batch # 191112

Sample	Sample wt (g)	Color	Init pH	Time
0.0			7.41	14:00
0.05			7.11	
0.1			7.68	
0.5			7.29	
0.75			7.30	
1.25			7.81	14:30
ICV			7.27	16:15
ICB			7.40	
MB			7.26	
LCS sol			7.19	
LCS ins			7.84	
66526-1	2.50	L. Br.	7.32	16:15
66526-1 dup	2.50	"	7.45	
66526-1 spk	2.50	"	7.80	
66526-1 ins	2.50	"	7.56	
49854-4	2.59	L.Y. Br	7.62	
49854-5	2.59	"	7.34	
CCV			7.27	
CCB			7.40	
49854-35	2.56	L.Y. Br.	7.87	
CCV			7.27	
CCB			7.40	16:30

Continued on Page

Read and Understood By

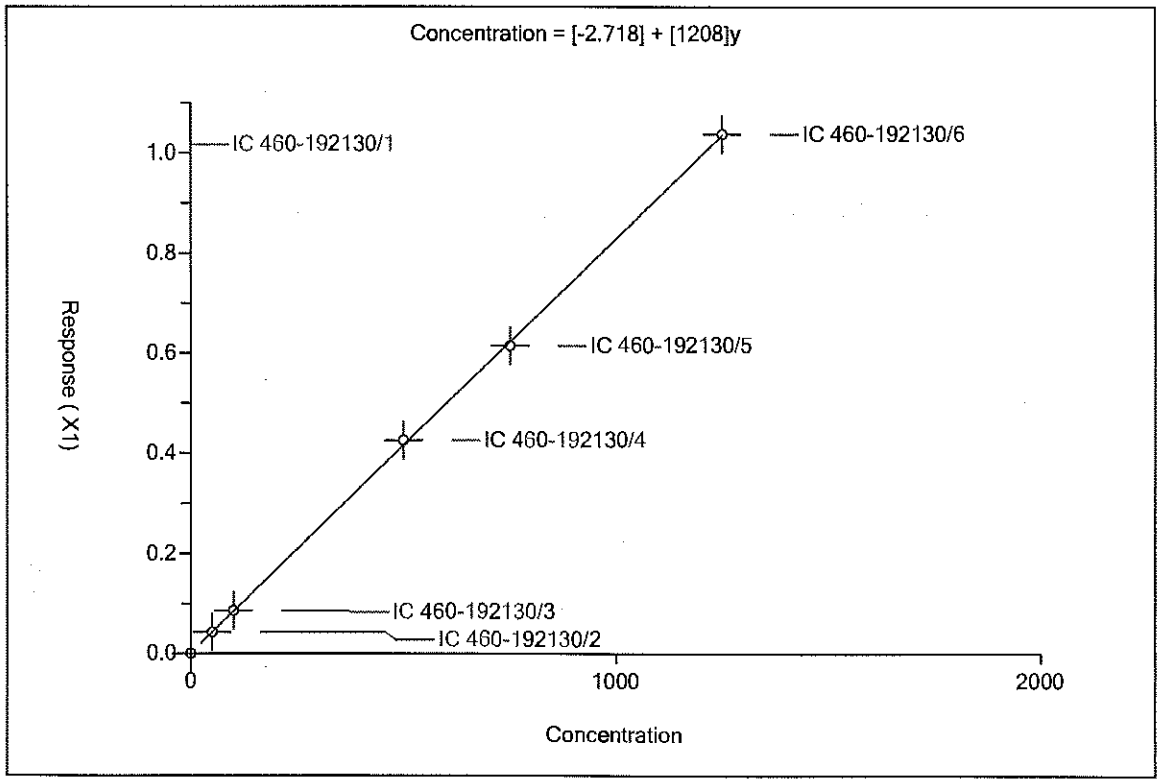
Signed 11/15/13 Signed

Curve Type:	Linear
Weighting:	None
Origin:	None
Dependency:	Concentration
Calib Mode:	ESTD
RF Rounding:	0

Curve Coefficients	
Intercept:	-2.718
Slope:	1208

Error Coefficients	
Standard Error:	7.43
Relative Standard Error:	NC
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	1.000 (1.000)

ID	Level	Concentration	Response	IS Amount	IS Response	RF	Used
1	IC 460-192130/10.0		0.0			NaN	Y
2	IC 460-192130/250.0		0.043			0.00086	Y
3	IC 460-192130/3100.0		0.086			0.00086	Y
4	IC 460-192130/4500.0		0.425			0.00085	Y
5	IC 460-192130/5750.0		0.615			0.00082	Y
6	IC 460-192130/61250.0		1.038			0.00083	Y



Dilution Form
Wet Chemistry

Method No.: 7196A

Analyst: RLe

Prep Batch: _____

Analysis Date: 11/13/12

Analytical Batch: 192130

Job/Sample Number	Dilution Factor	Sample Volume (ml)	Final Volume (ml)	Diluent
66526-1 ; MS	50x	1	50	DI

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151293 Batch Start Date: 11/11/13 16:06 Batch Analyst: Robison, Zachary J

Batch Method: Moisture Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
480-49854-A-1	SD801	Moisture	T	20	4.25 g	21.59 g	19.42 g		
480-49854-A-2	SD802	Moisture	T	21	4.25 g	15.99 g	14.00 g		
480-49854-A-3	SD803	Moisture	T	22	4.25 g	11.38 g	9.14 g		
480-49854-A-4	SD804	Moisture	T	23	4.25 g	12.34 g	10.42 g		
480-49854-A-5	SD805	Moisture	T	24	4.25 g	11.19 g	9.23 g		
480-49854-A-6	SD806	Moisture	T	25	4.25 g	22.93 g	20.89 g		
480-49854-A-7	SD807	Moisture	T	26	4.25 g	7.91 g	6.40 g		
480-49854-A-8	SD808	Moisture	T	27	4.25 g	22.48 g	20.25 g		
480-49854-A-9	SD809	Moisture	T	28	4.25 g	12.11 g	10.69 g		
480-49854-A-10	SD810	Moisture	T	29	4.25 g	20.91 g	19.01 g		
480-49854-A-11	SD811	Moisture	T	30	4.25 g	23.79 g	21.77 g		
480-49854-A-12	SD812	Moisture	T	31	4.25 g	24.95 g	22.82 g		
480-49854-A-13	SD813	Moisture	T	32	4.25 g	21.13 g	18.89 g		
480-49854-A-14	SD814	Moisture	T	33	4.35 g	18.11 g	15.74 g		
480-49854-A-15	SD815	Moisture	T	34	4.35 g	15.44 g	12.77 g		
480-49854-A-16	SD816	Moisture	T	35	4.35 g	16.88 g	14.79 g		
480-49854-A-17	SD817	Moisture	T	36	4.35 g	21.09 g	16.32 g		
480-49854-A-18	SD818	Moisture	T	37	4.35 g	15.04 g	13.25 g		
480-49854-A-19	SD819	Moisture	T	38	4.35 g	15.37 g	13.66 g		
480-49854-A-20	SD820	Moisture	T	39	4.35 g	12.70 g	10.95 g		
480-49854-A-21	SD821	Moisture	T	40	4.35 g	10.91 g	8.95 g		
480-49854-A-22	SD822	Moisture	T	41	4.35 g	17.38 g	14.99 g		
480-49854-A-23	SD823	Moisture	T	42	4.35 g	19.98 g	17.18 g		
480-49854-A-24	SD824	Moisture	T	43	4.35 g	14.75 g	13.67 g		
480-49854-A-25	SD825	Moisture	T	44	4.35 g	12.84 g	11.49 g		
480-49854-A-26	SD826	Moisture	T	45	4.35 g	14.62 g	12.84 g		
480-49854-A-27	SD827	Moisture	T	46	4.35 g	14.92 g	12.90 g		
480-49854-A-28	SD828	Moisture	T	47	4.35 g	14.87 g	12.33 g		
480-49854-A-29	SD829	Moisture	T	48	4.35 g	13.56 g	11.66 g		
480-49854-A-30	SD830	Moisture	T	49	4.35 g	14.45 g	12.74 g		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Buffalo Job No.: 480-49854-1

SDG No.:

Batch Number: 151293 Batch Start Date: 11/11/13 16:06 Batch Analyst: Robison, Zachary J

Batch Method: Moisture Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
480-49854-A-31	SD831	Moisture	T	50	4.35 g	14.45 g	12.88 g		
480-49854-A-32	SD806 DUP	Moisture	T	51	4.35 g	21.17 g	18.89 g		
480-49854-A-33	SD816 DUP	Moisture	T	52	4.35 g	23.04 g	21.08 g		
480-49854-A-34	SD825 DUP	Moisture	T	53	4.35 g	10.29 g	8.57 g		

Batch Notes	
Batch Comment	PP-FH-08-13
Date samples were placed in the oven	11/11/13
Time samples were place in the oven	16:15
Date samples were removed from oven	11/12/13
Time Samples were removed from oven	06:30

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 191936 Batch Start Date: 11/13/13 11:30 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 3060A Batch End Date: 11/13/13 13:49

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Final pH	WThcrPbCr 00004	WThcrsLCS 00073	AnalysisComment
MB 460-191936/1		3060A, 7196A		2.50 g	100 mL	7.25 SU			
LCSSRM 460-191936/2		3060A, 7196A		2.50 g	100 mL	7.78 SU		5 mL	
LCSI 460-191936/3		3060A, 7196A		2.50 g	100 mL	7.72 SU	0.011 g		
480-49854-C-4	SD804	3060A, 7196A	T	2.58 g	100 mL	7.15 SU			v.d.brown
480-49854-C-5	SD805	3060A, 7196A	T	2.50 g	100 mL	7.84 SU			v.d.brown
480-49854-A-35	SD805 DUP	3060A, 7196A	T	2.56 g	100 mL	7.15 SU			v.d.brown

Batch Notes	
Alkaline Digestion Solution Reagent ID	C 0068-13 exp 12/13/13 (ph=13.33)
Batch Comment	Temperature after 30 min.= 93C (Uncorrected); 94C (Corrected)
First End time	13:05
Potassium Phosphate Buffer Reagent ID	C9828-13 exp..02/26/14
Lead Chromate Lot #	BCBC2419 exp. 09/16/15
Lead Chromate Vendor ID	Aldrich
Magnesium Chloride Lot Number	1932C182
Magnesium Chloride Vendor	Amresco
First Start time	12:05
Ending Temperature	93C (Uncorrected); 94C (Corrected) Celsius
Starting Temperature	92C (Uncorrected); 93C (Corrected) Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192112 Batch Start Date: 11/13/13 10:00 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 3060A Batch End Date: 11/13/13 13:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	Final pH	WThcrPbCr 00004	WThcrsLCS 00073	AnalysisComment
MB 460-192112/1		3060A, 7196A		2.50 g	100 mL	7.26 SU			
LCSSRM 460-192112/2		3060A, 7196A		2.50 g	100 mL	7.19 SU		5 mL	
LCSI 460-192112/3		3060A, 7196A		2.50 g	100 mL	7.84 SU	0.011 g		
480-49854-C-4	SD804	3060A, 7196A	T	2.59 g	100 mL	7.62 SU			v.d.brown
480-49854-C-5	SD805	3060A, 7196A	T	2.59 g	100 mL	7.34 SU			v.d.brown
480-49854-A-35	SD805 DUP	3060A, 7196A	T	2.56 g	100 mL	7.87 SU			v.d.brown

Batch Notes	
Alkaline Digestion Solution Reagent ID	C 0068-13 exp 12/13/13 (ph=13.33)
Batch Comment	Temperature after 30 min.= 93C (Uncorrected); 94C (Corrected)
First End time	13:05
Potassium Phosphate Buffer Reagent ID	C9828-13 exp..02/26/14
Lead Chromate Lot #	BCBC2419 exp. 09/16/15
Lead Chromate Vendor ID	Aldrich
Magnesium Chloride Lot Number	1932C182
Magnesium Chloride Vendor	Amresco
First Start time	12:05
Ending Temperature	93C (Uncorrected); 94C (Corrected) Celsius
Starting Temperature	92C (Uncorrected); 93C (Corrected) Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192123 Batch Start Date: 11/13/13 14:30 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 7196A Batch End Date: 11/13/13 16:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	FinalAmount	ColorBlk	UnCorResp	CalcMsg	Final pH	WThcrIM 00045
IC 460-192123/1		7196A		100 mL		0.000 Absorbance	OK w/o Correction	2.11 SU	
IC 460-192123/2		7196A		100 mL		0.043 Absorbance	OK w/o Correction	1.98 SU	0.05 mL
IC 460-192123/3		7196A		100 mL		0.086 Absorbance	OK w/o Correction	1.79 SU	0.1 mL
IC 460-192123/4		7196A		100 mL		0.425 Absorbance	OK w/o Correction	1.80 SU	0.5 mL
IC 460-192123/5		7196A		100 mL		0.615 Absorbance	OK w/o Correction	1.69 SU	0.75 mL
IC 460-192123/6		7196A		100 mL		1.038 Absorbance	OK w/o Correction	1.74 SU	1.25 mL
ICV 460-192123/7		7196A		100 mL		0.421 Absorbance	OK w/o Correction	1.86 SU	
ICB 460-192123/8		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.97 SU	
MB 460-191936/1-A		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.68 SU	
LCSSRM 460-191936/2-A		7196A		100 mL		0.317 Absorbance	OK w/o Correction	1.70 SU	
LCSI 460-191936/3-A		7196A		100 mL		0.294 Absorbance	OK w/o Correction	1.59 SU	
480-49854-C-4-A	SD804	7196A	T	100 mL	0.201 Absorbance	0.191 Absorbance	OK	1.65 SU	
480-49854-C-5-A	SD805	7196A	T	100 mL	0.231 Absorbance	0.215 Absorbance	OK	1.74 SU	
CCV 460-192123/19		7196A		100 mL		0.410 Absorbance	OK w/o Correction	1.86 SU	
CCB 460-192123/20		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.97 SU	
480-49854-A-35-A	SD805 DUP	7196A	T	100 mL	0.165 Absorbance	0.154 Absorbance	OK	1.83 SU	
CCV 460-192123/22		7196A		100 mL		0.410 Absorbance	OK w/o Correction	1.80 SU	
CCB 460-192123/23		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.93 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	WThcrIM3 00027	AnalysisComment				
IC 460-192123/1		7196A							
IC 460-192123/2		7196A							

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192123 Batch Start Date: 11/13/13 14:30 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 7196A Batch End Date: 11/13/13 16:55

Lab Sample ID	Client Sample ID	Method Chain	Basis	WThcrIM3 00027	AnalysisComment				
IC 460-192123/3		7196A							
IC 460-192123/4		7196A							
IC 460-192123/5		7196A							
IC 460-192123/6		7196A							
ICV 460-192123/7		7196A		0.5 mL					
ICB 460-192123/8		7196A							
MB 460-191936/1-A		7196A							
LCSSRM 460-191936/2-A		7196A							
LCSI 460-191936/3-A		7196A			BG PH=				
480-49854-C-4-A	SD804	7196A	T		1.57				
480-49854-C-5-A	SD805	7196A	T		1.78				
CCV 460-192123/19		7196A		0.5 mL					
CCB 460-192123/20		7196A							
480-49854-A-35-A	SD805 DUP	7196A	T		2.03				
CCV 460-192123/22		7196A		0.5 mL					
CCB 460-192123/23		7196A							

Batch Notes	
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID Number	C 0037-13 exp 12/1/13
Nitric Acid Reagent ID Number	C 0012-13 exp 4/24/14
Sulfuric Acid Reagent ID Number	C 0030-13 exp 4/30/14

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192130 Batch Start Date: 11/13/13 09:19 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 7196A Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	FinalAmount	ColorBlk	UnCorResp	CalcMsg	Final pH	WThcrIM 00045
IC 460-192130/1		7196A		100 mL		0.000 Absorbance	OK w/o Correction	2.11 SU	
IC 460-192130/2		7196A		100 mL		0.043 Absorbance	OK w/o Correction	1.98 SU	0.05 mL
IC 460-192130/3		7196A		100 mL		0.086 Absorbance	OK w/o Correction	1.79 SU	0.1 mL
IC 460-192130/4		7196A		100 mL		0.425 Absorbance	OK w/o Correction	1.80 SU	0.5 mL
IC 460-192130/5		7196A		100 mL		0.615 Absorbance	OK w/o Correction	1.69 SU	0.75 mL
IC 460-192130/6		7196A		100 mL		1.038 Absorbance	OK w/o Correction	1.74 SU	1.25 mL
ICV 460-192130/7		7196A		100 mL		0.410 Absorbance	OK w/o Correction	1.80 SU	
ICB 460-192130/8		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.93 SU	
MB 460-192112/1-A		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.98 SU	
LCSSRM 460-192112/2-A		7196A		100 mL		0.317 Absorbance	OK w/o Correction	2.15 SU	
LCSI 460-192112/3-A		7196A		100 mL		0.294 Absorbance	OK w/o Correction	2.35 SU	
480-49854-C-4-B	SD804	7196A	T	100 mL	0.120 Absorbance	0.127 Absorbance	OK	1.74 SU	
480-49854-C-5-B	SD805	7196A	T	100 mL	0.175 Absorbance	0.174 Absorbance	OK	1.85 SU	
CCV 460-192130/19		7196A		100 mL		0.406 Absorbance	OK w/o Correction	1.80 SU	
CCB 460-192130/20		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.93 SU	
480-49854-A-35-B	SD805 DUP	7196A	T	100 mL	0.150 Absorbance	0.148 Absorbance	OK	2.12 SU	
CCV 460-192130/23		7196A		100 mL		0.406 Absorbance	OK w/o Correction	1.80 SU	
CCB 460-192130/24		7196A		100 mL		0.000 Absorbance	OK w/o Correction	1.93 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	WThcrIM3 00027	AnalysisComment				
IC 460-192130/1		7196A							
IC 460-192130/2		7196A							

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192130 Batch Start Date: 11/13/13 09:19 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 7196A Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	WThcrIM3 00027	AnalysisComment				
IC 460-192130/3		7196A							
IC 460-192130/4		7196A							
IC 460-192130/5		7196A							
IC 460-192130/6		7196A							
ICV 460-192130/7		7196A		0.5 mL					
ICB 460-192130/8		7196A							
MB 460-192112/1-A		7196A							
LCSSRM 460-192112/2-A		7196A							
LCSI 460-192112/3-A		7196A			BG PH=				
480-49854-C-4-B	SD804	7196A	T		1.59				
480-49854-C-5-B	SD805	7196A	T		2.04				
CCV 460-192130/19		7196A		0.5 mL					
CCB 460-192130/20		7196A							
480-49854-A-35-B	SD805 DUP	7196A	T		1.66				
CCV 460-192130/23		7196A		0.5 mL					
CCB 460-192130/24		7196A							

Batch Notes	
Spectrophotometer Cell Path Length	1 cm
Color Reagent ID Number	C 0037-13 exp 12/1/13
Filter Lot #	1 N NaOH C 9692-13 exp 1/12/14
Nitric Acid Reagent ID Number	C 0012-13 exp 4/24/14
Sulfuric Acid Reagent ID Number	C 0030-13 exp 4/30/14

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 192130 Batch Start Date: 11/13/13 09:19 Batch Analyst: Kamenetskaya, Raisa

Batch Method: 7196A Batch End Date:

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Edison Job No.: 480-49854-1

SDG No.:

Batch Number: 191803 Batch Start Date: 11/12/13 20:11 Batch Analyst: Robinson, Ian

Batch Method: Moisture Batch End Date: 11/13/13 09:37

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
480-49854-A-35	SD805 DUP	Moisture	T	272	0.99 g	6.23 g	4.29 g		
480-49854-A-35 DU	SD805 DUP	Moisture	T	273	1.00 g	6.37 g	4.43 g		

Batch Notes	
Balance ID	104 No Unit
Date samples were placed in the oven	11/12/13
Oven Temp when samples are put in oven	105 Degrees C
Time samples were place in the oven	20:30
Date samples were removed from oven	11/13/13
Oven Temp when samples removed from oven	105 Degrees C
Time Samples were removed from oven	09:37
Oven ID	3
ID number of the thermometer	38767
Uncorrected In Temperature	105 Celsius
Uncorrected Out Temperature	105 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Subcontract Data

Shipping and Receiving Documents

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☑

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
NYSDEC Remedial Bureau C	Matthew Hubicki	11/7/2013	248020
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
625 Broadway / 11th Floor	(518) 402-9662 / 518-402-9679		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Albany / NY / 12233	Hubicki M.	Stone, Judy L	
Project Name and Location (State)	**Carrier/Waybill Number**		
MAGNA METALS COHOES NY			
Contract/Purchase Order/Quote No.			
360003			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Sed	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Moisture SD	6010 Metals/Hg	Special Instructions/ Conditions of Receipt
SD 813 - SD 831	11/7	15:48			X									X		
SD 824 DUP	11/7	15:48			X									X		
SD 813 - SD 831	11/7	16:03			X										X	
SD 816 & SD 825 DUP	11/7	16:04			X										X	
SD 801 SD 812	11/8	9:30			X										X	
SD 806 DUP	11/8	11:10			X										X	
SD 801 - SD 812	11/8	11:10			X									X		

11/8/13

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☒ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	11/8/13	16:48	1. Received By	11/8/13	16:47
2. Relinquished By	11/5/13		2. Received By TAL	11/9/13	0730
3. Relinquished By			3. Received By		

Comments

3.7-41

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Page 2192 of 2194

01/06/2014

Login Sample Receipt Checklist

Client: New York State D.E.C.

Job Number: 480-49854-1

Login Number: 49854

List Source: TestAmerica Buffalo

List Number: 1

Creator: Janish, Carl M

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	False	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: New York State D.E.C.

Job Number: 480-49854-1

Login Number: 49854
List Number: 1
Creator: Rivera, Kenneth

List Source: TestAmerica Edison
List Creation: 11/12/13 05:37 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	960898
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.2°C, IR #5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.